BWP SW 12 - INITIAL SITE ASSESSMENT/
COMPREHENSIVE SITE ASSESSMENT - SCOPE OF WORK
TRANSMITTAL X260505

OLD FALL RIVER ROAD LANDFILL
452 OLD FALL RIVER ROAD, DARTMOUTH

Prepared For:

BOSTON ENVIRONMENTAL, CORP.
338 HOWARD STREET
BROCKTON, MA 02302

Prepared By

SITEC Environmental, Inc.
769 Plain Street, Unit C
Marshfield, Massachusetts 02050

May 20, 2014

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Enter your transmittal number → X260505
Transmittal Number

Your unique Transmittal Number can be accessed online: http://mass.gov/dep/service/online/trasmfrm.shtml or call MassDEP's InfoLine at 617-338-2255 or 800-462-0444 (from 508, 781, and 978 area codes).

Massachusetts Department of Environmental Protection

Transmittal Form for Permit Application and Payment

1. Please type or print. A separate Transmittal Form must be completed for each permit application.

2. Make your check payable to the Commonwealth of Massachusetts and mail it with a copy of this form to: DEP, P.O. Box 4062, Boston, MA 02211.

3. Three copies of this form will be needed.

Copy 1 - the original must accompany your permit application. **Copy 2** must accompany your fee payment. **Copy 3** should be retained for your records

4. Both fee-paying and exempt applicants must mail a copy of this transmittal form to:

MassDEP
P.O. Box 4062
Boston, MA
02211

*** Note:**
For BWSC Permits, enter the LSP.

A. Permit Information

BWP SW 12
1. Permit Code: 7 or 8 character code from permit instructions

Initial Site Assessment/Comprehensive Site Assessment Scope of Work

Closure of an Unlined, Inactive Landfill
3. Type of Project or Activity

B. Applicant Information – Firm or Individual

Boston Environmental Corporation (BEC)
1. Name of Firm - Or, if party needing this approval is an individual enter name below:

2. **Last Name** of Individual | 3. **First Name** of Individual | 4. MI

338 Howard Street
5. Street Address

6. City/Town	7. State	8. Zip Code	9. Telephone #	10. Ext. #
Brockton	MA	02302	508-897-8062	

Michael Toomey
11. Contact Person

toomey@bostonenvcorp.com
12. e-mail address (optional)

C. Facility, Site or Individual Requiring Approval

Old Fall River Road Landfill
1. Name of Facility, Site Or Individual

452 Old Fall River Road
2. Street Address

3. City/Town	4. State	5. Zip Code	6. Telephone #	7. Ext. #
Dartmouth	MA	02747		

8. DEP Facility Number (if Known)	9. Federal I.D. Number (if Known)	10. BWSC Tracking # (if Known)
172451		

D. Application Prepared by (if different from Section B)*

SITEC Environmental, Inc.
1. Name of Firm Or Individual

769 Plain Street, Unit C
2. Address

3. City/Town	4. State	5. Zip Code	6. Telephone #	7. Ext. #
Marshfield	MA	02050	781-319-0100	

Michael Quatromoni
8. Contact Person

9. LSP Number (BWSC Permits only)

E. Permit - Project Coordination

1. Is this project subject to MEPA review? ☒ yes ☐ no
If yes, enter the project's EOEA file number - assigned when an Environmental Notification Form is submitted to the MEPA unit: 15052
EOEA File Number

F. Amount Due

DEP Use Only

Permit No:

Rec'd Date:

Reviewer:

Special Provisions:

1. ☐ **Fee** Exempt (city, town or municipal housing authority)(state agency if fee is $100 or less).
There are no fee exemptions for BWSC permits, regardless of applicant status.
2. ☐ Hardship Request - payment extensions according to 310 CMR 4.04(3)(c).
3. ☐ Alternative Schedule Project (according to 310 CMR 4.05 and 4.10).
4. ☐ Homeowner (according to 310 CMR 4.02).

Check Number	Dollar Amount	Date
	$1,380.00	

Massachusetts Department of Environmental Protection
Bureau of Waste Prevention – Solid Waste Management

BWP SW 12 Initial Site Assessment
BWP SW 23 Comprehensive Site Assessment
BWP SW 24 Corrective Action Alternative Analysis
BWP SW 25 Corrective Action Design
Application for Landfill Assessment and Closure

X260505
Transmittal Number

172451
Facility ID# (if known)

A. BWP SW 12 Initial Site Assessment: 310 CMR 19.150(4)

Important:
When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

Directions:
Specify the report/plan and page numbers in which the following information is located.

	Plan/Report #	Page #	DEP Use Only
1. Initial Site Assessment (310 CMR 19.150(4))			
a. Background information	ISA/CSA-SOW	1	
b. Historical Research	ISA/CSA-SOW	2	
c. Literature/Data Search	ISA/CSA-SOW	4	
d. Hydrogeological Description	ISA/CSA-SOW	12	
e. Site Visit	ISA/CSA-SOW	14	
f. Mapping	ISA/CSA-SOW	16	
g. Field Screening	NA		
2. Comprehensive Site Assessment Scope of Work	ISA/CSA-SOW	18	
3. Funding			
a. Corrective action and/or closure-post closure cost estimate	NA		
b. Funding mechanism and schedule	NA		

B. BWP SW 23 Comprehensive Site Assessment: 310 CMR 19.150(5)

	Plan/Report #	Page #	DEP Use Only
a. ISA Summary	NA		
b. Mapping	NA		
c. Drilling Program	NA		
d. Determination of Hydraulic Conductivity	NA		
e. Sampling and Analysis Plan	NA		
f. Health and Safety Plan	NA		
g. Project Schedule	NA		

B. BWP SW 23 Comprehensive Site Assessment: 310 CMR 19.150(5) (cont.)

	Plan/Report #	Page #	DEP Use Only
h. Baseline Risk Assessment	NA		
i. Corrective Action Alternative Analysis Scope of Work Outline	NA		

C. BWP SW 24 Corrective Action Alternative Analysis: 310 CMR 19.150(6)

	Plan/Report #	Page #	DEP Use Only
a. Corrective Action Objectives	NA		
b. Alternatives Analysis	NA		
c. Recommended Alternative	NA		

Important Note: Engineering Plans must be stamped by a Registered Professional Engineer (PE). Property Line Location must be stamped by a Registered Land Surveyor (RLS).

D. BWP SW 25 Corrective Action Design: 310 CMR 19.151(2)(a)

	Plan/Report #	Page #	DEP Use Only
a. Corrective Action Design and/or closure plans	NA		
b. Implementation schedule	NA		

E. Post Closure Plans

Note: Part E is only applicable when a closure plan has been submitted and closure is being implemented.

	Plan/Report #	Page #	DEP Use Only
1. Maintenance Plan {310 CMR 19.142(5)}	NA		
2. Monitoring Plan {310 CMR 19.142(5)}	NA		
3. Post-Closure Use Plans {310 CMR 19.143} (if applicable)	NA		
4. Record Notice of Landfill Operation {310 CMR 19.141}	NA		

Massachusetts Department of Environmental Protection
Bureau of Waste Prevention – Solid Waste Management

BWP SW 12 **Initial Site Assessment**
BWP SW 23 **Comprehensive Site Assessment**
BWP SW 24 **Corrective Action Alternative Analysis**
BWP SW 25 **Corrective Action Design**
Application for Landfill Assessment and Closure

X260505
Transmittal Number

172451
Facility ID# (if known)

F. Certification & Engineer's Supervision: 310 CMR 19.011

Engineer's Supervision:

All papers pertaining to design, operation, or engineering of this site or facility shall be completed under the supervision of a Massachusetts registered professional engineer knowledgeable in solid waste facility design, construction and operation, and shall bear the seal, signature and discipline of said engineer. The soils, geology, air monitoring and groundwater sections of the application or monitoring report shall be completed by competent professionals experienced in the fields of soil science and soil engineering, geology, air monitoring and groundwater, respectively, under the supervision of a Massachusetts registered professional engineer. All mapping and surveying shall be completed by a registered surveyor.

A. Raymond Quinn, PE, LSP
Print Name

A. Raymond Quinn
Authorized Signature

Director of Engineering Services
Position/Title

SITEC Environmental, Inc.
Company

32861
P.E. #

May 20, 2014
Date

COMMONWEALTH OF MASSACHUSETTS
A. RAYMOND QUINN
SANITARY
No. 32861
REGISTERED PROFESSIONAL ENGINEER

Certification:

Any person, required by these regulations or any order issued by the Department, to submit papers shall identify themselves by name, profession, and relationship to the applicant and legal interest in the facility, and make the following certification: "I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties both civil and criminal for submitting false information including possible fines and imprisonment."

Andrew W. Daniels
Print Name

A.W. Daniels
Authorized Signature

President, Boston Environmental Corporation
Position/Title

May 20, 2014
Date

SECTION ONE - INITIAL SITE ASSESSMENT

1.0 Introduction

This Initial Site Assessment/Comprehensive Site Assessment - Scope of Work (ISA/CSA-SOW) has been prepared on behalf of Boston Environmental, Corporation (BEC) for the Massachusetts Department of Environmental Protection's (MassDEP) approval, as part of the final closure assessment of the Old Fall River Road Landfill (Landfill) in Dartmouth, MA (a. k. a. Cecil Smith Landfill). BEC, along with Mary Robinson, the current owner of the site, have entered into an Administrative Consent Order (ACO) (#ACO-SE-14-4001) with the MassDEP to facilitate the closure of the Landfill. BEC will function as the Closure Contractor and will cap and close the facility in accordance with the requirements of the ACO and the Massachusetts Solid Waste Management Regulations at 310 CMR 19.000 and applicable MassDEP policies and guidelines.

This Permit Application for an ISA/CSA-SOW approval has been prepared to meet the requirements of Paragraph 52 of the ACO. An ISA/CSA-SOW, as described in the Departments "Landfill Technical Guidance Manual", is intended to gather and evaluate all information related to the landfill site, develop a conceptual model of the site, identify potential receptors surrounding the site, and provide a scope of work for the Comprehensive Site Assessment that will follow. The Initial Site Assessment as presented in Section One of this document is intended to fulfill the requirements for an Initial Site Assessment under 310 CMR 19.150 and conforms to the "Outline for Solid Waste Site Assessments" in the "Landfill Technical Guidance Manual".

1.1 Background Information

1. **Owner:** The current owner of the property that the Old Fall River Road Landfill is located on is Mary Robinson.

2. **Operator:** Currently there are no operations being conducted at the Landfill. BEC has contracted with the Owner and entered into an Administrative Consent Order (ACO) with the Owner and MassDEP to conduct the closure activities at the Landfill.

3. **Address of Landfill:** The Landfill is located at 452 Old Fall River Road in North Dartmouth, Massachusetts.

4. **UTM Coordinates:** 4615965 m (N); 332573 m (E)

5. **Site Status:** The Old Fall River Road Landfill was an active landfill between 1954 and 1983 and is currently an inactive and uncapped landfill.

6. **Acreage:** The area of the property originally approved for landfill operations, according to the Site Assignment issued by the Town of Dartmouth in 1975 is 60

acres. On the basis of 44 test pits that were excavated at the Landfill, the extent of buried waste from the historic landfilling operation is approximately 25 acres.

7. **Abutting Properties:** The land surrounding the Landfill is predominately wooded and undeveloped. Some residential homes and one commercial property, Gosselin & Sons Landscape Materials, are located to the north of the Site. Residential properties and undeveloped land abuts the Site to the south and undeveloped land along Old Fall River Road abuts the Site to the east. The Site is bordered to the west by residential properties, wetlands and woodland and the Colebrook Swamp. The Site is bordered by Old Fall River Road to the north and Hixville Road is located further to the south. A list of abutting properties within 100 feet of the Landfill's property lines is included in Appendix A.

8. **Locus:** A Locus Map is Figure No. 1 and is included in Figures, Appendix B.

1.2 Historical Research

In 1954, a sand and gravel excavation operation began on Site and portions of the Site were used for disposal of solid waste, primarily demolition debris. The area of the sand and gravel excavation operation was subsequently used for waste disposal.

In the 1960s the Site was used for the disposal of demolition debris which generally consisted of brick, wood, steel, granite, and general demolition debris from buildings. It has been reported that much of the materials that were disposed at the site came form redevelopment projects in downtown New Bedford. During this period the Site was also used to store salvageable materials, principally scrap metals. The actual volume and the sources of materials disposed at the site is unknown.

These practices continued until 1974 - 1975 when the operations ceased due to a dispute with the Town of Dartmouth. Although a landfill site assignment was granted to the Site, the sanitary landfill permitted by the Town was never built or operated.

Between 2002 and 2005, the United States Environmental Protection Agency (USEPA) conducted site assessment investigation activities at the Site. The USEPA determined that although the Landfill had caused impacts to the environment, as a result of measured elevated levels of contaminants in the groundwater and sediments and soil, the impact was relatively low, and as such the Landfill was classified to be a low priority for further assessment, and that no further action by USEPA was planned.

In July 2009, MassDEP performed a Site inspection in response to a compliant of alleged activity occurring at the Site. During the inspection MassDEP observed that areas of the Landfill had been excavated to retrieve recyclable materials, primarily metals. The reclaimed recyclable materials were observed to have been culled and stockpiled adjacent to the excavation areas.

In August 2009, the MassDEP issued a Unilateral Administrative Order (#UAO-SE-09-4001) which required the respondent (Mary Robinson) to prepare and submit to MassDEP a Remedial Action Plan. The respondent did not submit the Remedial Action Plan and consequently the MassDEP issued a Notice of Enforcement Conference. As a result of the Enforcement Conference conducted on June 22, 2011, MassDEP issued an Administrative Consent Order with Penalty (ACOP) that set forth the terms and conditions of achieving compliance. The ACOP was not executed by the respondent and MassDEP.

In July 2012, MassDEP met with BEC, on behalf of Marry Robinson, for purposes of achieving compliance with 310 CMR 19.000 and the outstanding UAO dated August 7, 2009. BEC proposed utilization of the Department's "Revised Guidelines for Determining Closure Activities at Inactive Unlined Landfill Sites" ("Inactive Landfill Closure Guidelines"), to close and cap the Landfill through the use of approved grading/shaping materials pursuant to MassDEP Policy #COMM-97-001, and processed construction and demolition materials, in order to accrue sufficient funds to pay for the closure/capping of the Landfill, as well as to fund the required post-closure monitoring and maintenance activities during the Landfill's post-closure period of thirty (30) years.

In December 2012, MassDEP received a conceptual landfill closure proposal (the "Conceptual Closure Proposal") from BEC pursuant to the Department's "Inactive Landfill Closure Guidelines". As proposed, the existing footprint of the Landfill would be excavated/consolidated to a final size of 23-acres, and an estimated one-million cubic-yards of approved grading shaping materials would be used to achieve final landfill closure grades/configuration.

In mid-January 2013, MassDEP instructed BEC that pursuant to the outlined procedures in the Department's "Inactive Landfill Closure Guidelines", MassDEP would conduct a public informational session within the community of Dartmouth regarding the "Conceptual Closure Proposal". The purpose of the public informational sessions was to solicit input from the Town of Dartmouth officials and the community at large regarding the proposed landfill closure project.

In March 2013, BEC submitted a Notice of Intent ("NOI") to the Town of Dartmouth for the excavation/removal of solid waste from wetland resource areas surrounding the Landfill. The wetlands project was assigned Wetlands File Number #SE 15-2186.

In March 2013, BEC submitted a BRPWW10-Water Quality Certification application to MassDEP for proposed work within wetland resource areas surrounding the Landfill.

On March 28, 2013, the first public informational session on BEC's "Conceptual Closure Proposal" was conducted. As a result of public interest, two (2) additional public informational meetings were conducted on June 27, 2013 and on July 11, 2013.

In July 2013, BEC submitted their draft "Response to Public Comments" concerning issues that were raised during the three public informational sessions conducted on March 23, 2013, June 27, 2013 and on July 11, 2013.

In March 2014, BEC submitted its final/revised "Conceptual Closure Proposal" in accordance with the Department's Inactive Landfill Guidelines. As proposed in BEC's revised/final "Conceptual Closure Proposal", the project will include the following:

1. The existing foot-print of the Landfill will be reduced from approximately 25-acres to approximately 23-acres through the excavation of waste from surrounding wetland resource areas that abut the Landfill.
2. A four (4) year operational timeframe will be established, whereby approved landfill closure grading/shaping materials will be placed during the first three (3) years, in order to achieve proper Landfill closure grades/configuration, and during the fourth and final year of operation the Landfill's final capping system will be installed.
3. The total amount of approved landfill closure grading/shaping materials that will be used to close the Landfill will be approximately 926,000 cubic-yards ("yds^3").

On March 28, 2014, MassDEP executed Administrative Consent Order ACO-SE-14-4001, which determined that BEC's final/revised "Conceptual Closure Proposal" met the requirements of the "Inactive Landfill Closure Guidelines", and notified the Respondents that they could proceed with the preparation and submittal of requisite permit applications pursuant to the applicable requirements set forth at 310 CMR 19.000, and as required by the ACO regarding the assessment and closure of the Landfill.

1.3 Literature/Data Search

Information collected as part of the literature and data search, includes information regarding historic landfill operating procedures, available information on types of waste disposal, regional and local hydrogeologic conditions and information on sensitive receptors. A list of reports reviewed to compile the information contained in this ISA is presented below. Reports noted below are included in *Appendix H - Reference Documents on Compact Disc*.

1.3.1 Existing Reports Reviewed

The existing reports reviewed for this ISA include:

- Roy F. Weston, Inc., October 1, 2001, *Final Site Inspection Report for Cole Brook Pines Landfill, Dartmouth, MA. (See Appendix H - Reference Documents on Compact Disc)*

- Weston Solutions, Inc., November 30, 2004, *Draft Expanded Site Inspection Report for Cole Brook Pines Landfill, Dartmouth, MA. (See Appendix H - Reference Documents on Compact Disc)*

- Weston Solutions, Inc., January 28, 2005, *Final Expanded Site Inspection Report for Cole Brook Pines Landfill, Dartmouth, MA. (See Appendix H - Reference Documents on Compact Disc)*

- Brown & Caldwell, Inc., March 7, 2003, *Memorandum, Cole Brook Pines Landfill, Dartmouth, MA. (See Appendix H - Reference Documents on Compact Disc)*

- Haley & Aldrich, Inc., May 5, 2013, *Summary of Available Environmental Data*, Former Cole Brook Pines/Old Fall River Road Landfill, Dartmouth, MA. *(See Appendix H - Reference Documents on Compact Disc)*

- Haley & Aldrich, Inc., May 5, 2013, *Summary of Environmental Conditions*, Former Cole Brook Pines/Old Fall River Road Landfill, Dartmouth, MA. *(See Appendix H - Reference Documents on Compact Disc)*

- Haley & Aldrich, Inc., June 18, 2013, *Summary of Groundwater Assessment Findings*, Former Cole Brook Pines/Old Fall River Road Landfill, Dartmouth, MA. *(See Appendix H - Reference Documents on Compact Disc)*

- Massachusetts Department of Environmental Protection, March 28, 2014, Administrative Consent Order, #ACO-SE-14-4001, Old Fall River Road Landfill, Dartmouth, MA. *(See Appendix H - Reference Documents on Compact Disc)*

- Natural Heritage & Endangered Species Program, 2008 - 13th Edition, *Massachusetts Natural Heritage Atlas.*

- National Flood Insurance Program, 2009, *Flood Insurance Rate Map, Bristol County, Map Number 25005C0367F*.

- Bureau of Waste Site Cleanup, Department of Environmental Protection, January, 1993, *List of Confirmed Disposal Sites and Locations to be Investigated.*

- Bureau of Waste Site Cleanup, Department of Environmental Protection, January, 2002, *Standard Release Report.*

- Department of Environmental Protection, Southeast Region, 2001, *Natural Resources Map.*

1.3.2 MassDEP and Town of Dartmouth Files Reviewed

A review of state databases was conducted which identified one location listed as a "site" under the Massachusetts General Laws c.21E and Massachusetts Contingency Plan (MCP) statutory scheme within 0.5-radial miles from the property. That location was the Landfill property. The property is listed as a Tier 1D site, under Release Tracking Number 4-0012656. A site/release is classified as Tier 1D when a responsible party fails to provide a required submittal to MassDEP by a specified

deadline. The review of data bases was supported by the generation of a commercially available Summary Radius Map Report, produced by Environmental Data Resources, Inc. (EDR). A copy of this report is included in Appendix C.

Review of MassDEP's Hazardous Waste Generator files revealed that there are no know companies registered with MassDEP as Very Small Quantity Generators of waste oil. Figures within the EDR Report in Appendix C indicate the approximate location of the MassDEP sites within a one mile radius of the Landfill.

A review of MassDEP Solid Waste files identified that the Laberge Demolition Landfill is located approximately one quarter mile west and downgradient of the Landfill. The MassDEP database classifies the Laberge site as an inactive, unlined landfill with an incomplete or unknown closure status.

Information on land ownership of abutting properties presented in Section 1.1 and Appendix A was obtained from the Assessor's Office of the Town of Dartmouth.

Direct information on past waste stream amounts and types, waste hauling companies, and commercial businesses licensed to dispose of waste at the Landfill is not available. According to references listed in Section 1.3.1, observed waste materials include construction and demolition materials, tires, brick, concrete, metal materials including drums, and abandoned vehicles.

A list of private wells within one mile of the Landfill has been compiled and is included in Appendix D. The list was assembled by identifying occupied structures within one mile of the Landfill and the extent of the public water supply within that radius. Any structure not located along the public water supply system was assumed to have a private well. For properties with structures that are located along the public water supply, their individual Assessor’s records were reviewed to determine if they might also have a private well. The Assessor’s records of a random sample of properties that were assumed to have private wells were also reviewed for confirmatory purposes. Results of this compilation are that there are approximately 278 private water supply wells within the one mile radius of the Landfill.

1.3.3 Relevant United States Geological Survey (USGS) Data Reviewed

The following reports published by the U.S. Geological Survey were reviewed for the preparation of this ISA/CSA-SOW.

- Bedrock Geologic Map of Massachusetts: E-an Zen, ed., U. S. Geological Survey, 1983.
- Hydrologic Data Report 25, 1983, Hydrologic Data of the Coastal Drainage Basins of Southeastern Massachusetts, Narragansett Bay, and Rode Island Sound, Mass Water Resource Commission.
- Stone, B.D. et al, 2011, Surficial Geologic Map of the Fall River East Quadrangle, Massachusetts, USGS Open File Report.

- Willey, R.E., Williams, J.R., and Tasker, G.D., 1978, Water resources of the coastal drainage basins of Southeastern Massachusetts, Westport River, Westport to Seekonk; U.S. Geological Survey Hydrologic Atlas HA–275, 5 maps.

1.3.4 Potential Environmental and Public Health Sensitive Receptors

This section focuses on identifying the presence of the following potential environmental and public health sensitive receptors within close proximity of the Landfill:

- Public Drinking Water Supplies - Within one mile of the Landfill, no drinking water supplies (Zone II and Zone III), Interim Wellhead Protection Zones (IWPA), Zone A of the public surface water supplies and aquifer protection zones exist. The closest known public drinking water supply well is the Town of Dartmouth's Route 6/GP Well No. 4 located approximately 2.5 mile to the south of the Landfill. The closest Non-Transient/Non-Community public water supply is located in Westport, approximately 2.9 miles to the southwest of the Landfill. The western portion of the site is located within a medium yield potentially productive aquifer.

- Private Wells - According to available records, the nearest private drinking water supply well is located on the property and was installed in 1987 to serve the on-site residence. The well is reportedly installed in bedrock to a depth of 180 feet below the ground surface. The nearest off-site private drinking water supply well is located on the Gosselin & Sons Landscape Materials property, located north of and adjacent to the Landfill property. Residences located along Old Fall River Road (west of 360 Old Fall River Road), and residences located along Hixville Road, are served by private drinking water supply wells. Plans of the Dartmouth public water system were reviewed. It was assumed that any occupied structure not located adjacent to the public water system has a private water supply well. Dartmouth Board of Health records were reviewed for properties along the public water supply system to determine if they might have a private water supply system. Results of this evaluation are that there are approximately 278 private water supply wells within one mile of the Landfill. Properties that were determined to have private water supply wells are listed in Appendix D and are identified on Figure No. 2, *Potential Sensitive Receptors Plan* in Appendix B.

- Wetlands and Vernal Pools - No information was available as to the presence of any vernal pools within the vicinity of the Landfill. The closest wetland resources are bordering vegetated wetlands that exist to the north, east and west of the Landfill's perimeter.

- Ocean Sanctuaries - There are no tidal waters closer than the Acushnet River, which is located approximately five miles to the east in New Bedford.

- Areas Subject to 100 Year Flooding - According to the 2009 Flood Insurance Rate Map (FIRM) for the Town of Dartmouth (Map Number 250005C0367F), northerly

and western portions of the Landfill are within the 100 year flood plain zone, which includes Colebrook Swamp. The Colebrook Swamp is essentially a large flat area defined by the "21-meter" contour (approximately elevation 69 feet NGVD 1929 datum), so it is likely that the flood elevations on the easterly and westerly sides of the Swamp will be approximately the same. The FIRM indicates that the floodplain extends to the east beyond Colebrook Swamp onto the Old Fall River Road Landfill and floods above the "24-meter" contour on the Landfill, which converts to approximately elevation 79 feet NGVD 1929 datum. On the westerly side of the floodplain, however, portions of the Shingle Island River are not even mapped within the FEMA 100-year floodplain, and the associated flood elevation at the westerly limit of the floodplain is shown to be below the "21-meter" contour. Based upon a watershed analysis, that was included in the Notice of Intent review with the Dartmouth Conservation Commission, it was determined that flooding from the 100-year storm event within the Colebrook Swamp is closely defined by the "21 meter" (elevation 69 feet) contour and does not encroach directly onto the Old Fall River Road Landfill.

- Sensitive Terrestrial/Aquatic Habitats - According to the Natural Heritage & Endangered Species Program, 2008 - 13th Edition, Massachusetts Natural Heritage Atlas a portion of the Old Fall River Road Landfill exists within a Natural Heritage and Endangered Species Program (NHESP) Estimated Habitat of Rare Wildlife area. As shown on the Atlas, the limit of the estimated habitat lies well within the boundaries of the Landfill. Following an evaluation of the habitat value within the limits of the Landfill, it was determined that the indicated area within the Landfill could not realistically be a NHESP habitat area for rare wildlife. This conclusion is based on the fact that the entire portion of the property within the NHESP habitat area was historically used for landfill disposal activities. Documentation of this historic use is available going back to 1954. NHESP subsequently determined that the proposed project did not constitute a "take" as proposed and that it could proceed, as conditioned by NHESP. The NHESP determination is included in Appendix E.

- Coastal and Inland Waterbodies - The closest coastal waterbody is the Acushnet River located approximately five miles to the east in New Bedford. The closest inland water body is the unnamed stream which flows along the eastern side of the Landfill to the northern side and then along the western side of the Landfill, where it flows southwest for approximately one quarter mile before discharging into the Shingle Island River. The Shingle Island River then flows to Lake Noquochoke, which discharges to the East Branch of the Westport River, which discharges to Westport Harbor and into Buzzards Bay, a distance of approximately 15 miles from the Landfill.

- Schools - The closest school is the George H. Potter Elementary School, located on Cross Road, Dartmouth, which is approximately two miles south of the Landfill.

- Residential Homes - There is one residential home located within the limits of the Landfill, however it is no longer occupied. The closest off site residential home is located to the east of the access road from Old Fall River Road and is about 500 feet from the closest point of the Landfill. Other residential homes are located along Old Fall River Road and Hixville Road.

- Child Care Centers - The closest child day-care facility was identified as "Kiddie Kampus 3", located at 445 Faunce Corner Road, approximately 1.2 miles to the east of the Landfill.

- Elderly Housing - The closest nursing home is the Hathaway Manor located at 863 Hathaway Road in New Bedford, approximately 2.8 miles southwest of the Landfill.

- Farms - There are at least six potential farm fields identified within one half mile (0.5 mi.) of the Landfill.

- Hospitals - The closest hospital is Saint Lukes's Hospital in New Bedford, which is approximately five miles to the southeast of the Landfill.

Figure 2, *Potential Sensitive Receptors Plan* in Appendix B identifies the potential sensitive receptors discussed above, which are within one mile of the Landfill.

1.3.5 Evaluation of Existing Monitoring Wells

In 2013 Haley & Aldrich (H&A) conducted environmental investigation work that included the redevelopment and sampling of existing groundwater monitoring wells and the installation of six new shallow groundwater monitoring wells, screened in the shallow groundwater table at depths ranging from six feet to fifteen feet below the ground surface. In its investigation Haley & Aldrich located and inspected eight previously installed groundwater monitoring wells and redeveloped and sampled seven of them. There were six other previously existing monitoring wells that were not located. Reportedly H&A inspected each well to determine that they would produce representative groundwater samples, and that they did not appear to be tampered with or damaged. New wells were reportedly installed in accordance with MassDEP's approval. Based upon information provided by H&A in its June 18, 2013 *Summary of Groundwater Assessment Findings*, the following Table 1 presents a list of the currently existing groundwater monitoring wells that were sampled in May 2013 by H&A. Also included on Table 1 is the reference PVC casing elevation as surveyed by SITEC, the well screen interval elevations based on available well construction logs, the total depth of the wells and the depth to groundwater measurement, both as reported on H&A's "Low Flow Groundwater Sampling Logs" included in their referenced June 18, 2013 report (Appendix H), and the derived groundwater elevations. The elevations calculated below vary from those presented in H&A's report, due to what appears to be arithmetic and transposition errors in H&A's calculations.

As can be noted by the prefix for each well listed on Table 1, there are three series of wells that were included in the H&A sampling event. The "HA-#" wells are the wells installed in 2013, under

H&A's oversight. H&A provided boring logs and well construction logs for these wells in their June 18, 2013 report (Appendix H). The "MW-#" wells were installed under the direction of Weston Solutions in January 2004. Boring and well installation logs for these wells were presented in Weston's 2004 Draft and 2005, Final Expanded Site Inspection Report for Cole Brook Pines Landfill (Appendix H). The "SGA-#" wells were reportedly installed in February 2002, by Guild Drilling, under the supervision of St. Germain & Associates. These wells were originally given the designation "MW-#", but were apparently changed by Weston to the "SGA-#" series designation. Boring and well construction logs for these wells have not been available to date, consequently their well screen intervals are not known.

TABLE 1
GROUNDWATER ELEVATIONS
(HALEY & ALDRICH - MAY 29, 013)

Well I.D.	Elevation of PVC Casing (ft)	Total Well Casing Depth (ft)	Screen Interval Elevations (ft)	Depth to Water (ft)	Groundwater Elevation (ft)
HA-1	75.20	14.6	66.60 - 60.60	5.53	69.67
SGA-03	74.20	21.10	NA	6.26	67.94
HA-2	75.16	14.50	66.66 - 60.66	4.95	70.21
HA-3	84.20	18.10	74.10 - 66.10	10.30	73.90
HA-4	81.90	13.40	72.50 - 68.50	6.70	75.20
HA-5	77.32	13.10	68.42 - 64.22	5.57	71.75
HA-6	76.78	12.28	68.50 - 64.50	6.16	70.62
MW-5	74.91	16.11	68.80 - 58.80	5.61	69.30
MW-6	87.41	15.15	82.26 - 72.26	4.81	82.60
MW-7	93.34	18.03	85.31 - 75.31	9.50	83.84
SGA-01S	84.20	14.53	NA	4.65	79.55
SGA-01D	84.24	53.10	NA	5.24	79.00
SGA-04	75.17	21.47	NA	3.45	71.72

1.3.6 Evaluation of Existing Environmental Sampling data

A fairly significant amount of environmental sampling of groundwater, surface water and stream sediments has been conducted for the purpose of determining if the Old Fall River Road Landfill has had an impact on the surrounding environment. Environmental investigation work reportedly began in the 1970s. Other sampling events occurred through 2002, usually related to proposed development projects for the site as a solid waste disposal facility. The US EPA Superfund Technical Assessment and Response Team (START) initiated involvement with the site in 2000, with Roy F. Weston, Inc. conducting a series of site inspections which resulted in the issuance of an October 1, 2001 Final Inspection Prioritization Report (Appendix H). As part of that study work, soil and sediment sampling was conducted. Weston's conclusion was that based on sediment sample results a release from the site of hazardous materials to surface water had not been documented.

Subsequently, Weston Solutions (formerly Roy F. Weston, Inc.) conducted additional site assessment work in 2004, which included soil sampling, installation and sampling of groundwater monitoring wells, sediment sampling, as well as sampling an on-site drinking water supply well. Results of this investigation were reported in Weston's 2004, *Draft Expanded Site Inspection Report for Cole Brook Pines Landfill* and their 2005, *Final Expanded Site Inspection Report for Cole Brook Pines Landfill*, which did not significantly change from the 2004 draft report, which are included on the disc in Appendix H. In their report, Weston presented the following conclusions, based on their sampling program:

- Eight surface soil/source samples from potential source areas on the Landfill were collected and analyzed. Analytical results of the surface soil samples indicated the presence of one VOC, 11 SVOCs, and nine inorganic substances (metals and cyanide) above reference concentrations.
- Analytical results of 15 groundwater samples indicated the presence of 12 metals and cyanide, which were considered to be at least partially attributable to the Landfill. Six inorganic substances were detected at concentrations that exceed Massachusetts Contingency Plan (MCP) Massachusetts Oil and Hazardous Material List (MOHML) Reportable Category RCGW-1 groundwater standards.
- No hazardous substances were detected in the drinking water samples at concentrations that exceed MCP MOHML or Federal drinking water standards. Based on the lack of hazardous substances in the on-site drinking water supply well, Weston concluded that no impacts to nearby groundwater drinking water supply sources are known or suspected.
- Weston collected 17 sediment samples from 16 locations along the unnamed perennial stream that flows along three sides of the Landfill, the Shingle Island River, and from on-site wetlands. Based on analytical results of the sediment samples, on-site wetlands have been impacted by a release of two metals considered to be at least partially attributable to the Landfill.

In 2013 Haley & Aldrich (H&A) conducted environmental investigation work that included the redevelopment and sampling of seven existing groundwater monitoring wells (six shallow and one deep overburden) and the installation of six new shallow groundwater monitoring wells. In its investigation H&A located and inspected eight previously installed groundwater monitoring wells and redeveloped and sampled seven of them along with the six wells that they installed. The H&A report is included in Appendix H. In their report, H&A presented the following conclusions, based on their sampling program:

- No compounds were detected in groundwater above applicable risk-based standards established in the Massachusetts Contingency Plan, which are designed to be protective of human health and the environment.
- Up gradient (well HA-4) and down gradient wells (MW-5, MW-6, MW-7, SGA-04) did not have elevated water quality parameters indicating overburden groundwater quality up gradient and down gradient to the landfill has not been adversely degraded from a drinking water perspective. The only exception is a low detection of manganese in wells MW-5 and MW-7. Manganese is naturally occurring and is often detected in elevated concentrations in groundwater and these detections have not been attributed to the landfill.

- For general water quality parameters that relate to drinking water aesthetics, color, taste and odor, there were exceedances of certain drinking water secondary and recommended levels in groundwater samples collected from locations directly adjacent to the Landfill. The drinking water secondary and recommended levels which were exceeded include those for alkalinity, nitrate, dissolved solids, calcium, sodium, iron and manganese. These results are consistent with and typical for areas adjacent to a construction and demolition debris landfill.
- Based on historic data and the supplemental groundwater sampling conducted in May 2013, shallow groundwater has not been adversely impacted to a condition where there is immediate risk to human health or the environment.

As can be noted on the attached (Appendix B) Figure No. 3, *ISA/CSA-SOW Site Plan*, contrary to H&S's conclusions, because of variations in groundwater elevation calculations described above, monitoring wells MW-6, MW-7 and SGA-04 are not down gradient, but up gradient of the Landfill. MW-5 is likely not down gradient of the Landfill. Based on the inferred shallow groundwater contours and flow directions, HA-1, HA-2, HA-3 and SGA-03 are immediately down gradient to the Landfill. Based upon the analytical data presented in the H&A report, shallow groundwater quality at these monitoring wells indicates that there has been a low level impact to the groundwater at these immediately down gradient locations, typical of municipal landfill groundwater quality.

1.4 HYDROGEOLOGICAL DESCRIPTION

1.4.1 Regional/Local Bedrock Geology

The bedrock beneath the Old Fall River Road Landfill is referred to as the Fall River Granite. This granite is a mafic poor, light-gray, medium-grained, biotite granite. This granite tends to be heterogeneous and in fact may consist of more than a single granitic pluton. In the New Bedford area (southeast) it tends to be more gneissic (flow banded) and to the east of the site it tends to be more porphyritic (course grained). The age of the granite is Late Precambrian (600 million years) making it part of the suite of rocks in eastern Massachusetts referred to as Milford-Dedham Zone.

The state bedrock map (Zen, 1983) indicates that there may be a fault beneath the Landfill, although it has not yet been clearly identified. This fault line strikes northwest-southwest between the Westport River and Long Pond in Lakeville. The strike of this fault is in a similar direction to the border faults of the Narragansett Basin, located approximately five miles to the north. The Narragansett Basin is orientated with its longitudinal axis in a northeast-southwest direction. The rocks within the Basin consist of a suite of sandstones, conglomerate, graywackes and minor volcanics, (Zen, 1983). Minor beds of meta-antracite provide fossil evidence of middle to upper Pensylvanian age or approximately 300 million years. This would mean that the fault beneath the Landfill is less than 300 million years old, but not much younger.

A second fault striking to the northwest in the direction of Cornell Pond also passes beneath the Landfill this one appears to bisect the other fault and shows movement to the north of approximately 1500 feet.

Due to extensive erosion and the addition of later glacial deposits, exposures of the bedrock in the vicinity of the Landfill are limited to the peaks of underlying bedrock knolls on either side of the faults. According to the USGS (Williams and Wiley, 1978), there is a localized rise of the bedrock to the northwest and southwest of the Landfill at elevations of approximately 100 mean sea level (MSL). Numerous bedrock outcrops can be found a mile to the southeast.

1.4.2 Regional/Local Surficial Geology

According to the USGS (Williams and Wiley, 1978 and Stone et al, 2011) the site is underlain by glacially derived course sands and gravels up to 50 feet thick (HD-25, 1975). These coarse deposits include gravel deposits composed of 25 to 50 percent gravel-size clasts with minor amounts of sand occurring within the gravel beds as separate alternating layers, cobbles and boulders are numerous. Gravel layers generally are poorly sorted, and bedding commonly is distorted and faulted due to post depositional collapse related to the melting of glacial ice. Sand deposits beneath the site are composed mainly of very coarse to fine sand, commonly in well-sorted layers. Finer layers may contain some very fine sand, silt, and clay. Overburden borings conducted at the site confirm the USGS evaluation with the surficial deposits beneath the site consisting of grey sands and gravel to depths of at least 12 feet below ground surface.

Alluvial deposits approximately five feet in thickness form the banks and bottom of Shingle Island River to the west of the Landfill. These alluvial deposits consist of sand and gravel, silt, and some organic material and is stratified and well sorted to poorly sorted. The texture of alluvium commonly varies over short distances both laterally and vertically and generally is similar to the texture of adjacent and overlying glacial deposits.

Swamp deposits (Colebrook Swamp) east of the Landfill and more significantly to the northwest of the site in Shingle Island Swamp consist of organic muck and peat that contain minor amounts of sand, silt, and clay that is stratified both horizontally and vertically poorly sorted. Swamp deposits are estimated to be 3 to 10 feet thick. These swamp deposits in the area of the Landfill overlie glacial meltwater deposits and postglacial pond deposits in kettle depressions.

To the east of the site when bedrock nears the surface outside of the fault, a mantle of thin to thick glacial till deposits overlie the bedrock. The till consists of a non-sorted, non-stratified matrix of sand, some silt, and little clay containing scattered gravel clasts, cobbles and a few large boulders.

This overall overburden stratigraphy with significant depth to bedrock makes up a typical glacial valley aquifer common in pre-glacial fracture systems, throughout New England. The shallow well network is installed in the upper ten feet of the saturated alluvium.

1.4.3 Regional/Local Hydrogeology

As stated above, the Landfill is situated within a glacial valley aquifer. The drainage basin to this aquifer is within the major South Coastal Drainage Basin or more specifically the watershed for the Westport River which is located to the southwest along the possible bedrock fault line draining from the Shingle Island River to Noquocoke Lake to the Westport River. The drainage or watershed

boundary is defined by the glacial till highlands located approximately 1 mile to the east (Williams and Trasker, 1978) of the Landfill. Based on this divide regional groundwater and surface water flow is generally to the west-southwest in this portion of the watershed. There appears to be little mounding of the shallow groundwater table, resulting from the presence of the Landfill. Shallow groundwater flow direction was confirmed by the initial installation of overburden monitoring wells, but will be refined in the final CSA.

Depths to groundwater range from five to ten feet at the site according to Haley & Aldrich Inc. Hydraulic conductivities are estimated from 28 to 80 ft^2/day based on the transmissivities of 1,400 to 4,000 ft^3/day and a 50 foot saturated thickness (Williams and Trasker, 1978)

The Westport River Basin has groundwater resource potential for public water supplies from the over burden largely due to the presence of the course grained deposits and saturated thickness allowed by the depth to bedrock. Private wells in the area could easily supply water for domestic use of ten to 100 gallons per minute (gpm) from the overburden. The U.S. Geological Survey reports water wells completed in area bedrock obtain a majority of their yield from joint sets located within 200 feet of the bedrock surface. Wells finished in the bedrock yield from between one to greater than twenty gpm, with a majority of them averaging less than nine gpm.

Based on review of MassDEP records there are no public water supplies within a one mile radius of the site. The nearest down gradient water supply is Noquocoke Lake (PWS #4095000-05S), approximately one mile to the southwest.

1.5 SITE VISIT

SITEC Environmental personnel conducted site visits on several occasions during 2013 and 2014 to document field observations in accordance with MassDEP's Outline for Solid Waste Assessment. The conditions and observations which were made as a result of the inspections are outlined in this section and are depicted on Figure 3 in Appendix B, the *ISA/CSA-SOW Site Plan*, where applicable. The described conditions are intended to represent conditions at the time of the inspections and may not represent subsequent changes to those conditions.

1.5.1 Condition of Landfall Surface and Site

At the time of the inspections there were no active landfilling operations being conducted. A single family home with a water supply well and septic system is located in the center of the Landfill area. This home is scheduled to be relocated to an area off of the Landfill and the well and septic system will be abandoned in accordance with Massachusetts regulations, as part of the closure activities. The Landfill area had previously been used as farmland for animals and temporary lodging. Currently (May 2014) the area is no longer used for farmland and the temporary structures have been demolished. A wooden pallet recycler has conduct operations on the Landfill, with many pallets stored on site. The proposed landfill closure activities will require the relocation of current site uses. The Landfill’s surface included bare soils, gravel roads, low grassy and weedy vegetation across the interior area with more dense, wetland vegetation along most of the perimeter of the Landfill. There was no significant, identifiable erosion or sedimentation noted on the site.

1.5.2 Direction of Surface Water Runoff

Storm water run-off from the Landfill follows uncontrolled overland routes across the Landfill's surface, generally flowing east to west, before reaching the wetlands of Colebrook Swamp and the unnamed stream that flows through it, at the western side of the Landfill. The unnamed stream originates in the wetlands to the southeast of the Landfill, flows along the eastern perimeter, across the northern side, where another unnamed stream that originates north of Old Fall River Road joins it, and around to the western Landfill perimeter, where it then flows southwest to join Shingle Island River.

1.5.3 Location and Condition of Monitoring Devices

According to the Haley & Aldrich report there are thirteen, competent, shallow overburden groundwater monitoring wells located around the Landfill. Seven of those wells were installed circa 2002 to 2004 and six were installed by H&A in 2013. Twelve of the wells are screened in the shallow overburden, across the water table, and one of the wells is screened in the deep overburden, at a total depth of 53.1 feet. The wells were located during the Site Visit and are shown on Figure 3 in Appendix B. Based on the observed condition of the wells above grade, they appear to be in good shape and are undamaged. Reportedly there are another six groundwater monitoring wells that were installed during previous investigations, but they have not been located and are presumed to have been damaged or destroyed. There are currently no soil gas monitoring wells onsite.

1.5.4 Evidence of Leachate Breakouts

At the time of site inspections, no evidence of leachate outbreaks or staining was visible. Previous site assessment reports have not reported the detection of any leachate breakouts.

1.5.5 Evidence of Landfill Gas Emissions

During site visits, there were no indications of landfill gas odors. The vegetative cover of most of the Landfill's area is scrub grass and does not provide a comparative means of identifying stressed vegetation to healthy vegetation, but in general it appears to be healthy, without stress from landfill gas impacts. The wetlands around the perimeter of the Landfill did not show any indications of significant stress. There are no existing soil gas monitoring probes on site. Installation of probes and their screening will be conducted as part of the Comprehensive Site Assessment.

1.5.6 Location and Condition of Surface Water and Wetlands

The Landfill is surrounded on three sides by the Colebrook Swamp wetlands and an unnamed surface water stream. There is no indication of degradation or stress to the wetlands or in the surface waters. Previous sampling of surface waters and sediments did not indicate any negative impact from the Landfill, when comparing upstream to downstream water quality results.

1.5.7 Landfill Operation Procedures

Access to the Landfill is from Old Fall River Road and from Hixville Road. There are no landfilling activities currently being conducted. Future closure activities will be required to comply with a MassDEP approved Operations and Maintenance Plan.

1.5.8 Land Use of Adjacent Properties

The land surrounding the Landfill is predominately wooded and undeveloped. Some residential homes and one commercial property, Gosselin & Sons Landscape Materials, are located to the north of the Site. Residential properties and undeveloped land abuts the Site to the south and undeveloped land along Old Fall River Road abuts the Site to the east. The Site is bordered to the west by residential properties, wetlands and woodland and the Colebrook Swamp. The Site is bordered by Old Fall River Road to the north and Hixville Road is located further to the south.

1.5.9 Landfill Accessibility

Access to the Landfill is from Old Fall River Road. There is currently no limitation to access onto the Landfill by the public. While much of the site is surrounded by dense wetlands, there is adequate access for vehicles from Old Fall River Road and along the electric power line easement from Hixville Road.

1.5.10 Local Geology

According to boring logs prepared by Haley & Aldrich, local surficial geology surrounding the Landfill consists primarily of silty glacio-fluvial sands and organic materials. No bedrock out croppings were observed.

1.6 MAPPING

Figure 3 in Appendix B, the *ISA/CSA-SOW Site Plan*, was prepared at a scale of one inch equals 120 feet. The plan was initially prepared from ground survey conducted on behalf of BEC in August 2012. The Plan depicts site topography, property boundaries, and the extent of refuse, wetlands, surface waters as well as the existing monitoring locations.

The Site Plan also indicates the proposed locations of groundwater, surface water, sediment and soil gas monitoring points that are to be installed as part of the CSA. The shallow groundwater flow direction is assumed to be to the southwest as indicated on the Drawing, based on field information provided by Haley & Aldrich.

Within 500 feet of the Landfill's limits of waste deposition, the following information was identified on the Site Plan:

- The 100 foot wetlands buffer zone in the vicinity of the Landfill;
- All buildings, residential homes and commercial buildings;

- Private water supplies and;
- Surface water bodies.

Based upon the research conducted, there are no Zone IIs, Interim Wellhead Protection Areas (IWPAs), Aquifer Protection Zones, and Areas of Critical Environmental Concern (ACEC) within the 500-foot radius.

Figure 2, the Potential Sensitive Receptors Plan identifies the following within one mile of the Landfill:

- All surface water bodies;;
- Private water supplies and;
- Watersheds and drainage patterns;

Within one mile of the Landfill, there are no Zone IIs, IWPAs, Aquifer Protection Zones or ACECs. Approximately 278 private wells are reported to exist within a one mile radius of the Landfill.

SECTION TWO - COMPREHENSIVE SITE ASSESSMENT SCOPE OF WORK

2.0 Introduction

The Comprehensive Site Assessment (CSA) Scope of Work was developed upon the completion of the Initial Site Assessment (ISA) for the Old Fall River Road Landfill and is designed to fulfill the requirements of 310 CMR 19.140 (3) and 310 CMR 19.150 (5). The CSA Scope of Work conforms to Tasks 2.1 through 2.8 of the "Outline for Solid Waste Site Assessments," and consists of the following subsections: drilling programs; sampling and analysis program; and data compilation/report preparation. The Health and Safety Plan (Task 2.6 of the "Outline for Solid Waste Site Assessment") is presented in Appendix F.

2.0.1 Objectives of the Comprehensive Site Assessment

The objectives of the CSA are as follows:

1. Define the aquifer parameters of the intermediate and shallow overburden aquifer, and bedrock aquifer, including hydraulic conductivity, transmissivity and vertical/ horizontal groundwater flow direction;

2. Characterize the impact of the Landfill on public health, safety and the surrounding environment.

3. Identify and evaluate the downgradient impacts to overburden and bedrock groundwater and surface water; and

4. Further identify and characterize the extent of potential environmental impacts which may be present at the Site.

2.0.2 Scope of the Assessment

The scope of the assessment will include:

1. Installation of additional monitoring wells at four locations in accordance with procedures outlined in MassDEP's Standard References for Monitoring Wells. Monitoring well locations will result in there being four well clusters where one well will be screened across the water table, one well will be screened immediately above the first low permeability overburden (intermediate) layer and one well will be installed in bedrock. If a low permeability layer is not found then the intermediate well will be screened on top of the bedrock. If a significant low permeability layer is encountered above bedrock that is greater than five feet thick, at least one additional well will be added at a down gradient location, which is screened below the low permeability layer. The goal being to create well networks in the shallow, intermediate/deep overburden and bedrock.

2. Installation and sampling of landfill gas survey probes for the purpose of locating permanent gas monitoring wells.

4. Survey of the monitoring wells and surface water sampling locations for horizontal location and elevation so that groundwater and surface water elevations can be determined, and a groundwater contour and flow direction maps can be developed for the three hydrologic units;

5. Groundwater, surface water, private water supply well and sediment sampling and analysis;

6. Rising Head Slug Tests to determine hydraulic conductivity of aquifer material;

7. Interpretation of hydrogeologic and analytical data for incorporation into a report.

2.1 ISA SUMMARY

A comprehensive research program was undertaken as part of the ISA to determine the history of the Landfill and the surrounding properties. The Landfill has been the object of several environmental investigations since the mid 1980s. Several different proposals to either use the site for expanded landfill operations or for final closure have not succeeded in the past.

The 2013 study completed by Haley & Aldrich, Inc. (H&A) provided data that indicates the shallow groundwater direction beneath the site is westerly. (See Figure No. 3.) This determination was based on the measured elevations of groundwater in monitoring wells installed as part of previous studies, as well as the H&A 2013 study. Also H&A determined that the Landfill has had a minimal impact on shallow groundwater quality in the vicinity of the Landfill. The potential affects to deeper units will be delineated along with an evaluation of flow/migration potential of constituents of concern (COC). The locations of monitoring wells to be installed during the CSA are based on the inferred westerly groundwater flow.

2.2 MAPPING

Figure 3 in Appendix B, the *ISA/CSA-SOW Site Plan*, described in Section 1.6 shall be updated to conditions present at the time of the completion of the CSA Report. The Plan shall depict the site's topography, wetlands delineation, property boundaries, the extent of refuse as well as all environmental sampling locations (monitoring wells, gas probes and wells, surface water and sediment samples). The site plan shall be used to indicate inferred contaminant migration extent and direction.

2.3 DRILLING PROGRAM

Task 2.3 of the Outline for Landfill Assessment contained in Appendix C of MassDEP's *Landfill Assessment and Closure Guidance Manual*, revised 1997, specifies the requirements of drilling programs in a landfill assessment program. Additionally, the scope of work for the drilling program

must be approved by MassDEP prior to the installation of any monitoring wells. The drilling proposed for the Old Fall River Road Landfill is designed to meet the requirements of Task 2.3

2.3.1 Proposed Well Locations and Rationale

In 2013 H&A conducted environmental investigation work that included the redevelopment and sampling of existing groundwater monitoring wells and the installation of six new groundwater monitoring wells. In its investigation H&A located and inspected eight previously installed groundwater monitoring wells and redeveloped and sampled seven of them. There were six other previously existing monitoring wells that were not located. Reportedly, H&A inspected each well to determine that they would produce representative groundwater samples, and did not appear to be tampered with or damaged. The six new wells were reportedly installed in accordance with MassDEP's approval. As described in Section 1.3.5, above, well construction logs have not been located for all of the existing monitoring wells, therefore there is uncertainty as to the vertical interval of the existing well screens on those wells. If further research does not locate those construction logs, an internal inspection of the undocumented wells will be conducted, using a down-hole camera to determine their construction and well screen intervals.

As shown on the attached *Figure 3, ISA/CSA-SOW Site Plan*, inferred local shallow groundwater flow is generally from east to west. As indicated, there are thirteen existing groundwater monitoring wells in twelve locations. The proposed scope of work is to use a subset of seven of the existing well locations for further assessment in the CSA. The five locations that are not to be included in further assessment work are either up gradient or cross gradient from the Landfill. Additionally, the groundwater sampling results presented by H&A did not indicate that these wells have been impacted by the Landfill.

The monitoring wells that have been installed and sampled to date, with one exception, are all screened across the groundwater table surface. The exception is monitoring well SGA-01D, which is up gradient of the Landfill and reported as being 53.1 feet deep, which reportedly puts it in deep overburden at the top of bedrock. Further investigation of the deep overburden aquifer in downgradient and a cross gradient location and in the bedrock at an upgradient, two downgradient and one cross gradient locations is proposed to be conducted. As shown on Figure No. 3, further investigation of the deep overburden and bedrock aquifers is proposed by the installation of additional groundwater monitoring wells. The following Table 2 summarizes the proposed CSA groundwater monitoring well sampling and installation program.

TABLE 2
PROPOSED CSA GROUNDWATER MONITORING WELL PROGRAM

Existing Groundwater Monitoring Well Identification	Proposed Groundwater Monitoring Well to be Included in CSA Assessment	Locations for Installation of Bedrock and Deep Overburden Monitoring Wells
HA-1	✓	✓
SGA-03	✓	

TABLE 2 PROPOSED CSA GROUNDWATER MONITORING WELL PROGRAM		
Existing Groundwater Monitoring Well Identification	Proposed Groundwater Monitoring Well to be Included in CSA Assessment	Locations for Installation of Bedrock and Deep Overburden Monitoring Wells
HA-2	✓	✓
HA-3	✓	
HA-4		
HA-5		
HA-6	✓	
MW-5		
MW-6		
MW-7		
SGA-01S	✓	✓*
SGA-01D	✓	
SGA-04	✓	✓

* Deep overburden well already installed (SGA-01D).

2.3.2 Surface Water Evaluation

Permanent surface water monitoring points will be established at three points around the perimeter of the Landfill, in order to provide information for the CSA evaluation. These points will be established by driving piezometers into the ground, in accordance with the Standard References for Monitoring Wells. The piezometers will be surveyed to NGVD. These points in conjunction with the water elevations in the monitoring wells will be used to evaluate the flow potential and hydraulic connection between the surface and ground waters. These piezometers will also provide a location for surface water quality and sediment samples. The location of these piezometers are identified in Table 3, below.

Table 3 Proposed Piezometer Locations	
SW-1	Southeast corner of Landfill, adjacent to the gas pipeline easement
SW-2	North extent of Landfill
SW-3	Southwest of Landfill, adjacent to 24" culvert under path

2.3.3 Drilling Procedures

All drilling procedures, including soil boring, soil sampling and classification and field tests will conform to the applicable engineering methods as defined by the American Society for Testing and Materials (ASTM) Standards and MassDEP's Standard References for Monitoring Wells (MassDEP Publication # WSC-310-91).

Prior to arriving at the Landfill, the equipment to be used in drilling and monitoring well installation will be cleaned to remove possible contaminants encountered during drilling of previous jobs. All equipment which is to come in contact with the soil and groundwater will be steam cleaned. All augers, rod, bits etc. will be steamed cleaned between holes to remove soil that might lead to cross contamination of the new boring hole.

Borings in the overburden will be drilled using either a truck or bombardier mounted rotary drill rig and hollow stem augers. Standard penetration test yielding split-spoon soil samples will be-conducted at the surface and at 5 foot intervals. No oil, grease, or any other petroleum base products will be used to lubricate augers or rods in such a manner as to contaminate the boreholes. However, vegetable based materials (i.e. Crisco shortening, vegetable oil, etc.) can be used. Care will be taken that no oil, grease or other lubricants leak from the drill rig and enter the borehole.

2.3.4 Soil Sampling Procedures

Split-spoon soil samples will be collected from all borings. The split-spoon sampler will be cleaned with an alconox wash-methanol spray-potable water rinse before each sample is taken. Soil samples collected via the split-spoon procedures will be visually classified and logged by the field geologist and the drilling foreman. The log will contain the following information (refer to Appendix F for sample boring log and other forms):

1. Details for each boring arranged in tabular form; giving full information on the vertical arrangement, thickness, and classification of the material penetrated;

2. Depth of bottom, type and number of each sample taken. All samples shall be numbered consecutively;

3. Height of drop and weight of drop hammer for taking drive samples and driving casing;

4. Number of blows required for each 6-inch penetration of split-barrel sampler;

5. Size, length, and depth of bottom of casing used in each borehole;

6. Depth to groundwater table at each borehole and time of observation;

7. Description of samples visually using a combination of the Burmister Classification System and unified soil classification system (as outlined in Section 3.5 of the MassDEP's Standard References for monitoring wells).

8. Depth of split-spoon penetration and amount of soil sample recovery;

9. General stratigraphic description; and

10. Notes pertaining to drilling difficulty or other pertinent information.

Representative portions of each split-spoon sample will be placed in screw top, airtight, clear-glass jars as soon as they are taken in order to preserve the original moisture content. The jars will be sealed with aluminum foil, tightly capped and suitably boxed, marked and identified with labels or by inscription of the jar cap. The well location number, sample number, depth at which the sample was taken, record or number of blows for each 6-inches drive increment and length of recovery will be recorded on each jar. Field screening will be accomplished using a photo-ionization detector (PID) with a 10.2 electron volt lamp. The headspace soil sample screening will be in accordance with MassDEP Policy #WSC-400-89 titled "Management Procedures for Excavated Soils Contaminated with Virgin Petroleum Oils". The soil sample yielding the highest PID reading from each boring will be analyzed for the same parameters as the groundwater samples with the exception of indicator parameters. In the event that all the soil samples collected from the soil borings are below the detection limit of the PID (0.1 parts per million), then the soil sample with the most physical evidence of contamination will be submitted for analysis. Soil samples will also be analyzed if the physical evidence of contamination indicates that a significant ash layer is present. In this case the sample will be analyzed for TCLP metals and PCB's in addition to the planned parameters. If none of the soil samples from a given soil boring exhibit physical evidence of contamination, then no soil sample will be submitted for analysis.

2.3.5 Monitoring Well Construction

Overburden Monitoring Well Construction

The monitoring wells will be constructed as outlined below:

1. Advance a 4-inch steel hollow stem auger to the desired depth;

2. Install a 2-inch inside diameter, schedule 40, flush-threaded, PVC riser pipe to a 0.010-inch slotted well screen. Depending on the geologic formation, the well screens will be five to ten feet (5' - 10') in length. No glue, tape or other solvent containing materials will be used to join pipe together. Teflon tape may be placed on pipe joints to ensure a water-tight joint. A slip-on or threaded plug will be placed on the bottom of the screened section;

3. Install an Ottawa Sand Pack to 2 feet above the top of screen while retracting the augers in a manner to prevent bridging of the sand or gravel between the casing and well pipe;

4. Install a 2-foot layer of bentonite pellets or chips on top of the sand or gravel pack while retracting the casing 2 feet to prevent bridging. The pellets will be hydrated if installed above the water table;

5. Grout the remaining borehole from the bottom up via a tremie pipe system with a lean mixture of Portland cement and bentonite (powder) at a ratio of 20:1 until the grout flows at the surface;

6. Retract the casing; and

7. Install a 4-inch protective steel casing with a locking cap. The protective steel casing should be steamed clean before placing over the PVC to remove cutting oils or grease. The sleeve will be painted a highly visible color and labeled with a well number. The sleeve will be installed at least 3 feet below the surface. Locks on all wells will be identical and capable of being opened by one set of keys. See Figure 4 in Appendix B for a detail of monitoring well construction.

Bedrock Monitoring Well Construction

The boring will be advanced one foot into the top of competent bedrock, using 6-inch inside diameter flush joint casing. Split-spoon samples will be obtained in the overburden using a 2-inch outside diameter (OD), 24 inch long split-spoon sampler in accordance with ASTM-D-1586 (ASTM, 1983). The spoon will be advanced using a 140 pound hammer where the overburden material density is low and a 300 pound hammer where the material is either extremely coarse or dense material is encountered. Geologic descriptions of the samples will be performed in the field and a geologic log prepared in accordance with the Modified Burmister System.

The bedrock will then be cored using a NX core barrel in runs of five feet in order to determine the vertical location of the well screens. Based on the Rock Quality Designation (RQD), the vertical location and orientation of the bedrock fractures, will determine the length of 10-slot screen used. A 5-inch roller bit will then be spun to open up the core hole to the appropriate depth.

Inside the borehole, a monitoring well will be constructed using two-inch inside diameter Schedule 40 PVC screen (10-slot), with a riser pipe. The annular space around the well screen will be backfilled with a medium Moray sand to two-feet above the well screen. The remainder of the annular space around the riser pipe will be backfilled with a bentonite slurry to a depth three feet below the ground surface. The purpose of the complete bentonite slurry seal will be to ensure a seal of all void spaces in the bedrock and upper soil horizons and prevent possible grout contamination through interconnected fractures in the bedrock. The well will be finished with a protective (locking) casing. See Figure 4 in Appendix B for a detail of monitoring well construction.

2.3.6 Monitoring Well Development

After the monitoring wells are installed and the grout has had a sufficient amount of time to set, the bedrock and overburden monitoring wells will be purged to enhance the hydraulic connection between the well screen and the aquifer by removing cuttings, fine soil material (silt and clay) or drill cuttings. The monitoring wells will be purged using either a variable speed peristaltic pump or battery powered submersible pumps. The completed wells will be surveyed to the nearest foot (1 ft.) horizontally and to the nearest one hundredth foot (0.01 ft.) vertically for location and elevation of the top of well casing, top of protective casing, and the ground surface.

2.4 HYDRAULIC CONDUCTIVITY

Hydraulic conductivity of the aquifer material will be determined using a rising head slug test conducted in each monitoring well. In addition, the hydraulic conductivity of the overburden material and any low permeability material encountered at a thickness of three to five inches (3" - 5") or more will be estimated from the results of the sieve/hydrometer analysis using methods developed by Masch and Denny (1986) and Hazen (1881, 1911).

2.4.1 Rising Head Slug Test

The slug test will be conducted upon completion of the well development to ensure a good hydraulic connection exists between the gravel pack and the surrounding aquifer. The test is conducted by removing groundwater from the well and measuring the rate of recovery using a pressure transducer.

Recovery data versus time will be plotted and the hydraulic conductivity will be calculated using methods developed by Hvorslev (1951). This method is based on the assumption that water level rates recover asymptotically with time after an initial instantaneous change in head within a well. The recovery data when normalized on a semi-log scale, should theoretically follow a straight line. After normalization, linear regression techniques will be applied to the delta and the best-fitting straight line calculated. Hydraulic conductivity (K) of the geologic formation immediately surrounding the screened portion of each well will be determined using the following equation:

$$K = \frac{r^2 \ln(L/R)}{2TL}$$

where:
K = hydraulic conductivity
r = radius of the well riser
R = radius of the well screen
L = saturated length of the well screen
T = basic time lag

The basic time lag is determined from the best fitting straight line of the recovery data and is defined as the time required to reduce the head difference to 37 percent of its original value. The accuracy of the fit of the straight line can be assessed using the R-squared (coefficient of determination) and

residuals of the linear regression. The data are considered sufficiently accurate if the R-squared is greater than 0.80.

2.5 SAMPLING AND ANALYSIS PLAN

The sampling and analysis plan is designed to conform to the requirements outlined in 310 CMR 19.132. The monitoring program will consist of four quarterly rounds of groundwater, surface water, and landfill gas to establish background water quality and conduct a baseline risk assessment.

Groundwater samples will be collected from all existing and proposed monitoring well locations. Surface water samples will be collected from the three proposed locations described in Section 2.3.1.3. These locations will be permanently marked by the piezometers that are to be driven into the bottom sediments. The elevation of the top of the piezometers will be surveyed such that surface water elevations can be determined for comparison to groundwater elevations.

Following the quarterly rounds and during the Landfill's closure operations period, sampling will continue as semi-annual sampling of groundwater, surface water and landfill gas, or as may be approved by MassDEP.

As part of the first quarterly sampling round, a sediment sample will be collected from each surface water location. Sediment samples will be analyzed for the same analytes as the groundwater with the exception of the indicator parameters.

As part of the first quarterly sampling round the two private drinking water supply wells that are within 500 feet of the Landfill will be sampled and analyzed, assuming permission is given by the property owners to sample their wells. The two locations are 460 Old Fall River Road (Map 72-Lot 7) and 1 Stonefield Lane (Map 72-Lot 5-1). These locations are identified in *Appendix D - Private Water Supply Wells* as "Map Ref. #" numbers 265 and 266 and as shown on *Figure 2 Potential Sensitive Receptor Plan* in Appendix B.

Landfill gas will be sampled from the gas monitoring probes and wells. The gas monitoring probes and wells will be sampled and monitored at the time the groundwater and surface water samples are collected.

2.5.1 Sampling Procedures

After an appropriate period of stabilization, groundwater samples will be collected from the monitoring wells and surface water stations in accordance with the MassDEP's Standard References for Monitoring Wells (MassDEP Publication # WSC-310-91).

Prior to sampling the monitoring wells, the static water level and total depth of each well will be measured to the nearest 0.01 of a foot. During the four CSA sampling events the five monitoring wells listed on Table 2 as not being included in further CSA assessment will have their static water levels measured in order to establish groundwater flow direction. The highest portion of the PVC well riser will be used as the permanent reference point. The total volume of standing water in each

well will be calculated and each well will be purged until one of the following conditions is achieved:

1. A minimum of three well volumes have been purged and the ORP, DO, specific conductance and temperature have stabilized in accordance with US EPA *Low Stress Purging and Sampling Procedures* guidance; or

2. Five well volumes have been purged unless stability has been demonstrated; or

3. The well has been purged dry.

The wells will be purged using a variable speed peristaltic pump or battery powered submersible pumps. A copy of the Monitoring Well Sampling Log is presented in Appendix G.

Disposable, dedicated polyethylene bailers or reusable stainless steel bailers will be used to collect the groundwater samples. As an alternative samples can be taken directly from low flow sampling pumps, using dedicated tubing. The reusable bailers and other sampling equipment will be decontaminated prior to commencing field activities and between each well using the following procedure:

1. Wash equipment with a non-phosphate detergent solution (i.e. Alconox) using a brush.

2. Rinse with tap water (the source of the tap water will be noted).

3. Rinse with 1:1 nitric acid.

4. Rinse with tap water.

5. Rinse with a methanol spray.

6. Rinse the equipment thoroughly with deionized water (the deionized water will be stored in either nalgene or teflon bottles).

Each bailer will be acclimated to the groundwater by bailing three times and discarding the groundwater prior to collecting the samples. This procedure will be repeated at each location. The equipment to be utilized in the collection of samples for metal analysis only (i.e. field filtering equipment) does not require the methanol rinse. Surface water samples will be collected by slowly lowering the appropriate sample container into the surface water body so as not to disturb the bottom sediments.

Separate aliquots of sample will be collected from each well and surface water station for the parameters specified below. If it is necessary to analyze for dissolved metals, then a portion of the groundwater sample will be field filtered through 0.45 micron filters so that only the dissolved metal fraction will be analyzed. This sample will be preserved with nitric acid to a pH of less than 2 in

a one liter polyethylene container. The surface water samples collected for dissolved metals analysis will also be filtered and preserved with nitric acid.

The portion of groundwater sample collected for chlorides, total dissolved solids and alkalinity, will be collected in an unpreserved one liter polyethylene bottle. The portion of the sample collected for chemical oxygen demand (COD) will be collected in a 125 ml glass jar preserved with sulfuric acid to a pH of less than 2.

Samples for volatile organic analyses will be collected in EPA approved 40 ml glass vials with teflon septum caps. Care will be taken not to agitate the samples which would result in loss of volatile components.

Samples will be packed in ice immediately following sample collection and transported to the laboratory following EPA and MassDEP Chain of Custody Procedures. The information collected during the sampling will be recorded on Monitoring Well Sampling Logs and Chain of Custody Records. Examples of these forms are presented in Appendix G.

2.5.2 Analytical Protocol

In accordance with 310 CMR 19.132 the groundwater and surface water samples in the vicinity of the Landfill will be analyzed for the following parameters:

pH (in situ)
Alkalinity
Temperature (in situ)
Specific conductance (in situ)
Nitrate (as nitrogen)
Total Dissolved Solids
Chloride
Calcium
Sodium
Iron
Manganese
Sulfate
Chemical Oxygen Demand
Dissolved Oxygen (in situ)

Arsenic
Barium
Cadmium
Chromium
Copper
Cyanide
Lead
Mercury
Selenium
Silver
Zinc
VOCs (EPA Method 8260) (plus MEK, MIK, Acetone & 1,4 Dioxane)

2.5.3 Landfill Soil Gas Survey

The purpose of the soil gas survey is to delineate areas of landfill gas migration within the vadose zone (unsaturated soils) around the perimeter of the Landfill. Landfill gases are known to migrate both vertically and horizontally away from the solid waste buried in a landfill. By analyzing soil gas samples collected from locations beyond the landfill perimeter, it is possible to determine, first, if there is landfill gas migration, and second, if there is migration what are the migration pathways.

The locations of permanent soil gas sampling locations will be proposed in a subsequent submittal following completion of this soil gas survey.

Soil Gas Survey

The proposed soil gas survey will involve the installation of up to approximately 25 temporary soil gas survey probes along the perimeter of the Landfill. Where accessible, the survey probes will be installed within the Landfill property and outside the limit of refuse. The proposed location of the perimeter ring of soil gas survey probes is shown on *Figure No. 3, ISA/CSA-SOW Site Plan* included in Appendix B.

The spacing of the gas survey probes was based in part on the Landfill Assessment and Closure Guidance (LAC) Manual (revised 1997). The distance between the gas survey probes will be 100 feet for locations where the Landfill is within 1,500 feet of residential and commercial land use. Where land use is industrial or undeveloped the distance between the gas survey probes will be 650 feet .

Each soil gas survey probe will consist of a length of 1", slotted PVC pipe, set approximately 4 to 6 feet below existing grade, or to groundwater, whichever is less. To install the probes, a boring will be made with a two inch auger. The PVC pipe will be installed in the auger hole. The annular space surrounding the PVC pipe will be filled with clean filter sand to within one foot of the ground surface. The remaining space will be filled with a granular bentonite seal in order to form a seal around the tubing. At each location, a PVC protective pipe with an air tight cap will be installed.

Soil Gas Sampling

One round of soil gas samples will be collected a minimum of one to two weeks following gas survey probe installation. If possible, landfill gas sampling will be conducted when the barometric pressure is 29.40 inches of mercury or less and the soils are either frozen or wet from a recent rainfall. Two samples will be collected from each survey probe. In order to simulate a buildup of landfill gases in a confined space, a sample will be collected before purging. The survey probe will then be purged of two volumes (including the sand pack) and the second sample will be collected.

Gas/air samples will be field screened for percent Lower Explosive Limit (LEL), percent oxygen, hydrogen sulfide, and total volatile organic compounds using a multi gas meter and a photoionization detector. All analytical equipment will be calibrated prior to sample collection and after every ten locations sampled. The calibration results will be recorded in the daily field log. The results of each soil gas survey sample analysis will be recorded along with the following:

1. date and time of sample collection

2. date and amount of most recent precipitation

3. current temperature, and barometric pressure

4. ground cover and soil conditions

5. daily weather conditions

A single event of soil gas characterization will be conducted by sampling one of the temporary or permanent gas monitoring probes or wells, which indicates the highest potential presence of landfill gas, as determined by the initial gas screening event. If there is no indication of the presence of landfill gases, then a sample will not be taken. The sample will be collected in a SUMMA Cannister and submitted for volatiles analysis via EPA Method TO-15 in order to evaluate potential exposure to on-site and off-site receptors.

The results of the laboratory analysis will be compared to Table 3-6, Summary of Non-Methane Organic Compounds Found in Landfill Gas, as described in the EPA publication dated March 1991 "Air Emissions From Municipal Solid Waste Landfills-Background Information for Proposed Standards and Guidelines".

Gas Monitoring Well Installation

The locations of permanent landfill gas monitoring wells will be proposed in a subsequent submittal following completion of soil gas survey. An attempt will be made to install the landfill gas monitoring wells at the time the groundwater monitoring wells are installed using similar drilling methods. However it is anticipated that the gas wells will be installed at a later date than the groundwater wells, so as not to delay the groundwater monitoring well installation. The gas monitoring wells will be constructed in a similar manner as the groundwater monitoring wells (flush-thread PVC, screen and riser, sand pack and bentonite seals) with the exception of intercepting the water table. The gas monitoring wells will be designed such that they are screened within the unsaturated zone. The sampling procedures for the landfill gas monitoring wells will be similar to the sampling protocol of the soil gas probes, as described above. See Figure 4 in Appendix B for a detail of monitoring well construction.

2.5.4 Field and Lab Quality Control/Quality Assurance Plan (QA/QC)

One duplicate sample and one equipment rinsate will be collected for every ten samples collected. These QA/QC samples will be analyzed for the same parameters as the groundwater and surface water samples. Additionally, a trip blank, which will be analyzed for VOCs (using EPA method 8260), will be prepared by the laboratory to accompany the sample containers and samples throughout the entire process.

The samples will be analyzed by a Massachusetts MassDEP certified lab. Information relative to laboratory QA/QC; including method blank analysis data, matrix spike percent recovery data, and lab duplicate results will be provided in the analytical reports.

2.6 HEALTH AND SAFETY PLAN

SITEC Environmental's Health and Safety Plan is included as Appendix F.

2.7 PROJECT SCHEDULE

The proposed schedule for the CSA is presented in Table 4. The assessment will commence upon MassDEP approval.

2.8 CSA REPORT PREPARATION

In accordance with Condition 52.B of the Administrative Consent Order, SITEC Environmental will prepare an Interim ISA/CSA Report summarizing the information obtained during the initial sampling event of the assessment, consistent with 310 CMR 19.132(2)(f).

Table 4
Project Schedule

Task	Estimated Milestone Dates After MassDEP Approval	
	Start	**Finish**
1. Monitoring Well Installation	2nd Week	2nd Week
2. Monitoring Well Development	3rd Week	3rd Week
3. Sampling	3rd Week	3rd Week
4. Interim Report (Per ACO)	4th Week	5th Week
5. Hydraulic Conductivity Testing	5th Week	5th Week
6. Landfill Gas Probe Installation	6th Week	7th Week
7. Sampling	2nd Event, 13th Week 3rd Event, 26th Week 4th Event, 39th Week	
6. Report Preparation	Draft CSA Report, 20th Week Final CSA Report, 52nd Week	

Upon completion of the second round of field activities and receipt of the laboratory analyses, SITEC Environmental will prepare a Draft CSA Report summarizing all of the information obtained during the assessment, to date. Following completion of all of the described field activities, receipt of all laboratory analyses and receipt of MassDEP's comments on the Draft CSA Report, SITEC Environmental will prepare a Final CSA Report summarizing all of the information obtained during the assessment.

The reports will contain, but not be limited to, the following items:

1. An executive summary;

2. An introduction, project statement and background summary;

3. A detailed summary of the findings of the investigation including a description of the field work and water quality assessment;

4. Detailed descriptions of all field procedures including sampling methodology;

5. Evaluation of groundwater and surface, water quality on-site with respect to background quality;

6. Evaluation of site hydrogeology relative to local geology;

7. Identification and evaluation of risk to potential human and environmental sensitive receptors which may be effected by contamination emanating from the site. A Baseline Risk Assessment will be conducted, which will include:

    a. Identification of potential human and environmental sensitive receptors (From Initial Site Assessment).

    b. Summary of contaminants and level of contamination (from sampling program). Any contamination exceeding Maximum Contaminant Levels (MCLs) will be highlighted.

    c. Summary of all pathways (in ground or surface water, soil or air) by which existing contamination may reach identified public health or environmental sensitive receptors.

    d. A recommendation for a quantitative risk assessment, as appropriate.

8. Identification of possible surface water flow paths;

9. Interpretation of trends observed in piezometric and analytical data;

10. Calculation of mass water balance to determine potential volumes of leachate and surface water runoff;

11. Estimated hydraulic conductivity and transmissivity of the different stratigraphic units, with tables of results;

12. A Site Plan showing the location of all well locations, surface water stations, and surface water bodies;

13. A groundwater and surface water contour and flow direction map;

14. Geologic cross-sections;

15. Tabulation of all analytical and field screening data;

16. Tabulation of all water table and piezometric elevation data;

17. Recommendations for additional CSA work as necessary;

18. Copies of all water quality analytical reports; and

19. Copies of well logs for each boring and well installed.

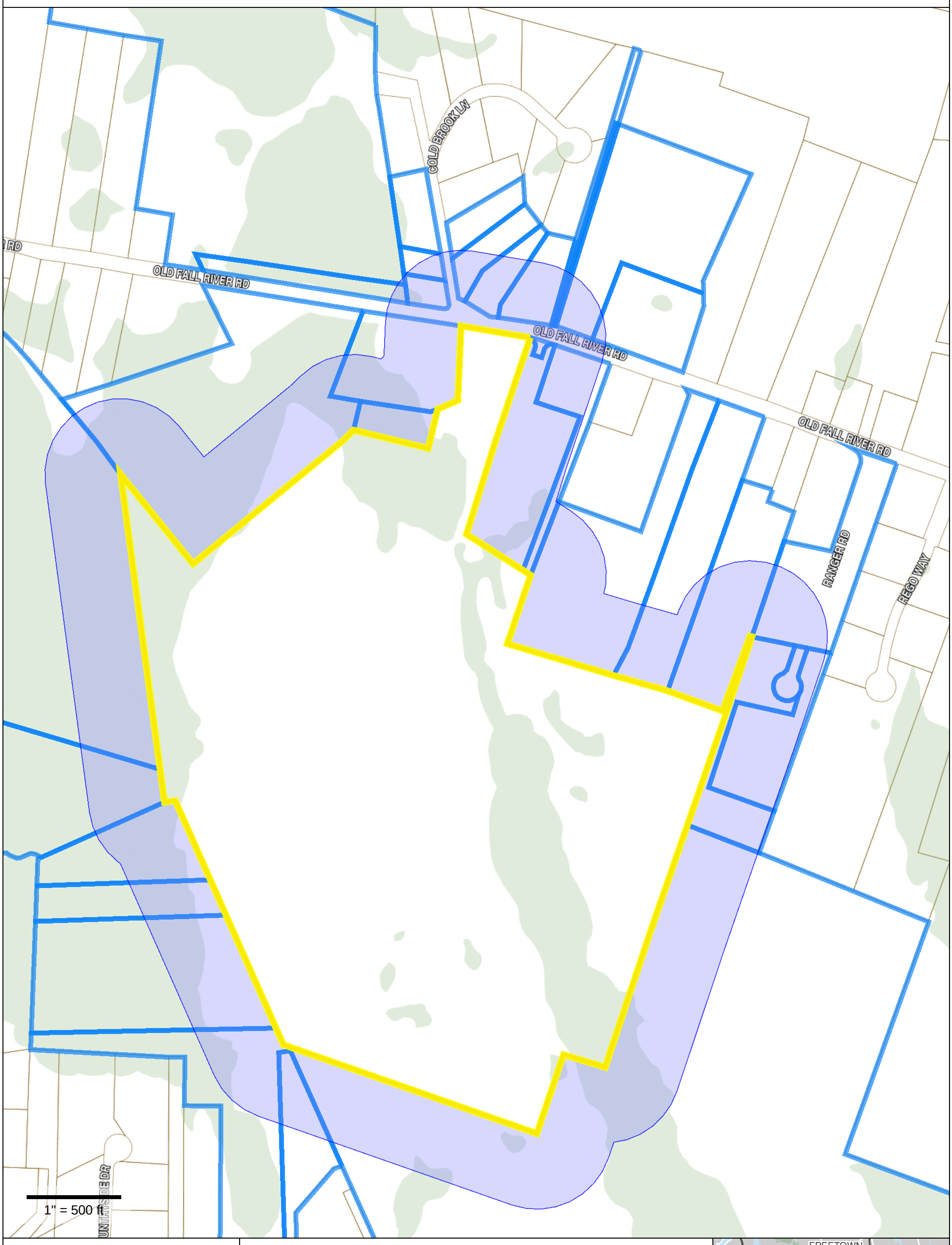
APPENDIX A

ABUTTERS LIST

Property data updated July 22, 2011

Abutters of property 72/6 72/8 72/9 at 452 OLD FALL RIVER RD

propertyid	siteaddress	ownername	owneraddress	ownercity	ownerstate	ownerzip
72/19	4 COLD BROOK LN	ELLIS SALLY L	P O BOX 79214	N DARTMOUTH	MA	02747
72/25-2	7 COLD BROOK LN	MEDEIROS DANA M & DOREEN A	7 COLD BROOK LN	N DARTMOUTH	MA	02747
192/60-1	3 GONSALVES CT	ARSENAULT MICHAEL & STACY	3 GONSALVES CT	N DARTMOUTH	MA	02747
192/59	727 HIXVILLE RD	LAVOIE RAYMOND H & ELSIE M	727 HIXVILLE RD	N DARTMOUTH	MA	02747
67/3	HIXVILLE RD	BAPTISTA GLENN A	P O XOX 70862	N DARTMOUTH	MA	02747
67/4	HIXVILLE RD	DELANO JOHN K & CYNTHIA T	32 SPRING ST	FAIRHAVEN	MA	02719
67/6	HIXVILLE RD	ROBINSON MARY	383 HIXVILLE RD	N DARTMOUTH	MA	02747
67/8	HIXVILLE RD	ROBINSON MARY	383 HIXVILLE RD	N DARTMOUTH	MA	02747
72/5	432 OLD FALL RIVER RD	REID WILLIAM C & DEBORAH HOWLAND	888 SMITH NECK RD	S DARTMOUTH	MA	02748
72/25	445 OLD FALL RIVER RD	SOUZA SHARON & STEPHEN JOSEFEK	8 CUSHMAN AVE	E FREETOWN	MA	02717
72/25-1	449 OLD FALL RIVER RD	FOURNIER ROBERT & JANE P	449 OLD FALL RIVER RD	N DARTMOUTH	MA	02747
72/7	460 OLD FALL RIVER RD	GOSSELIN ROBERT E & PATRICIA	660 OLD FALL RIVER RD	N DARTMOUTH	MA	02747
67/5	OLD FALL RIVER RD	ROBINSON MARY	383 HIXVILLE RD	N DARTMOUTH	MA	02747
67/21	OLD FALL RIVER RD	PIMENTEL MIGUEL C & CAROL A	380 OLD FALL RIVER RD	N DARTMOUTH	MA	02747
72/2	OLD FALL RIVER RD	PIMENTEL MIGUEL & CAROL	380 OLD FALL RIVER RD	N DARTMOUTH	MA	02747
72/3-1	OLD FALL RIVER RD	TABICAS LUIS M & URANIA R	414 OLD FALL RIVER RD	N DARTMOUTH	MA	02747
72/28-4	OLD FALL RIVER RD	TOWN OF DARTMOUTH	400 SLOCUM RD	N DARTMOUTH	MA	02747
67/7	OLD FALL RIVER RD	ROBINSON MARY	383 HIXVILLE RD	N DARTMOUTH	MA	02747
67/17	24 RANGER RD	ISAKSEN LINDA &	24 RANGER RD	N DARTMOUTH	MA	02747
67/18	36 RANGER RD	LORANGER NANCY S LIFE ESTATE	36 RANGER RD	N DARTMOUTH	MA	02747
67/18-1	48 RANGER RD	LORANGER CHRISTOPHER L & JUDITH E GROLEAU	36 RANGER RD	N DARTMOUTH	MA	02747
72/5-1	1 STONEFIELD LN	KOCHAN TODD A & MELISSA M	432 OLD FALL RIVER RD	N DARTMOUTH	MA	02747
72/16	511 OLD FALL RIVER RD	LECHAN DAVID B & CHRISTINE	511 OLD FALL RIVER RD	N DARTMOUTH	MA	02747
72/11	516 OLD FALL RIVER RD	SOUTHERLAND ERIC P & MELISSA M SILVA	516 OLD FALL RIVER RD	N DARTMOUTH	MA	02747
72/12	524 OLD FALL RIVER RD	BEAUDRY WILLIAM H & VIVIAN	524 OLD FALL RIVER RD	N DARTMOUTH	MA	02747
72/13	530 OLD FALL RIVER RD	PINHEIRO MARK D & JACQUELINE A	530 OLD FALL RIVER RD	N DARTMOUTH	MA	02747
72/18	OLD FALL RIVER RD	BOSWORTH ALBERT C TRUSTEE	962 KEMPTON ST	NEW BEDFORD	MA	02740
72/20	10 COLD BROOK LN	CORREIA JOSE A & VANESSA J	10 COLD BROOK LN	N DARTMOUTH	MA	02747
72/21	16 COLD BROOK LN	COELHO THOMAS M	16 COLD BROOK LN	N DARTMOUTH	MA	02747
72/17	517 OLD FALL RIVER RD	GIRARD JEROME M & JANET R	517 OLD FALL RIVER RD	N DARTMOUTH	MA	02747
72/14	538 OLD FALL RIVER RD	CROOKS CHARLES F JR & SHARRON A	538 OLD FALL RIVER RD	N DARTMOUTH	MA	02747
72/15	544 OLD FALL RIVER RD	PERRY DANNY J	544 OLD FALL RIVER RD	N DARTMOUTH	MA	02747
72/25-3	11 COLD BROOK LN	COUTO ALBERTO M & JEAN M	11 COLD BROOK LN	N DARTMOUTH	MA	02747
72/27-1	0 OLD FALL RIVER RD	TOWN OF DARTMOUTH	400 SLOCUM RD	N DARTMOUTH	MA	02747
72/27-2	439 OLD FALL RIVER RD	LIMA EDUARDO SOUSA & OLINDA M SOUSA	439 OLD FALL RIVER RD	N DARTMOUTH	MA	02747
72/27	441 OLD FALL RIVER RD	LIMA EDUARDO SOUSA	439 OLD FALL RIVER RD	N DARTMOUTH	MA	02747



Property Information

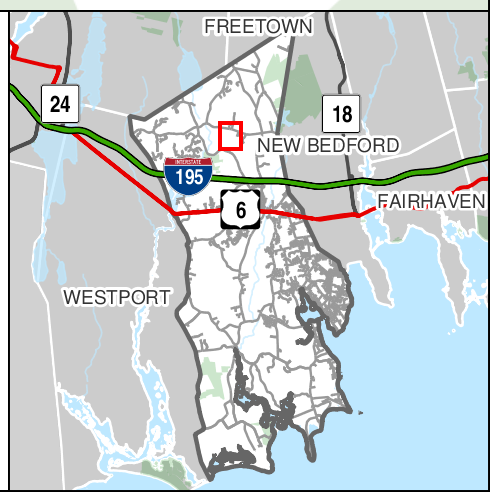
Property ID 72/6
Location 452 OLD FALL RIVER RD
Owner ROBINSON MARY

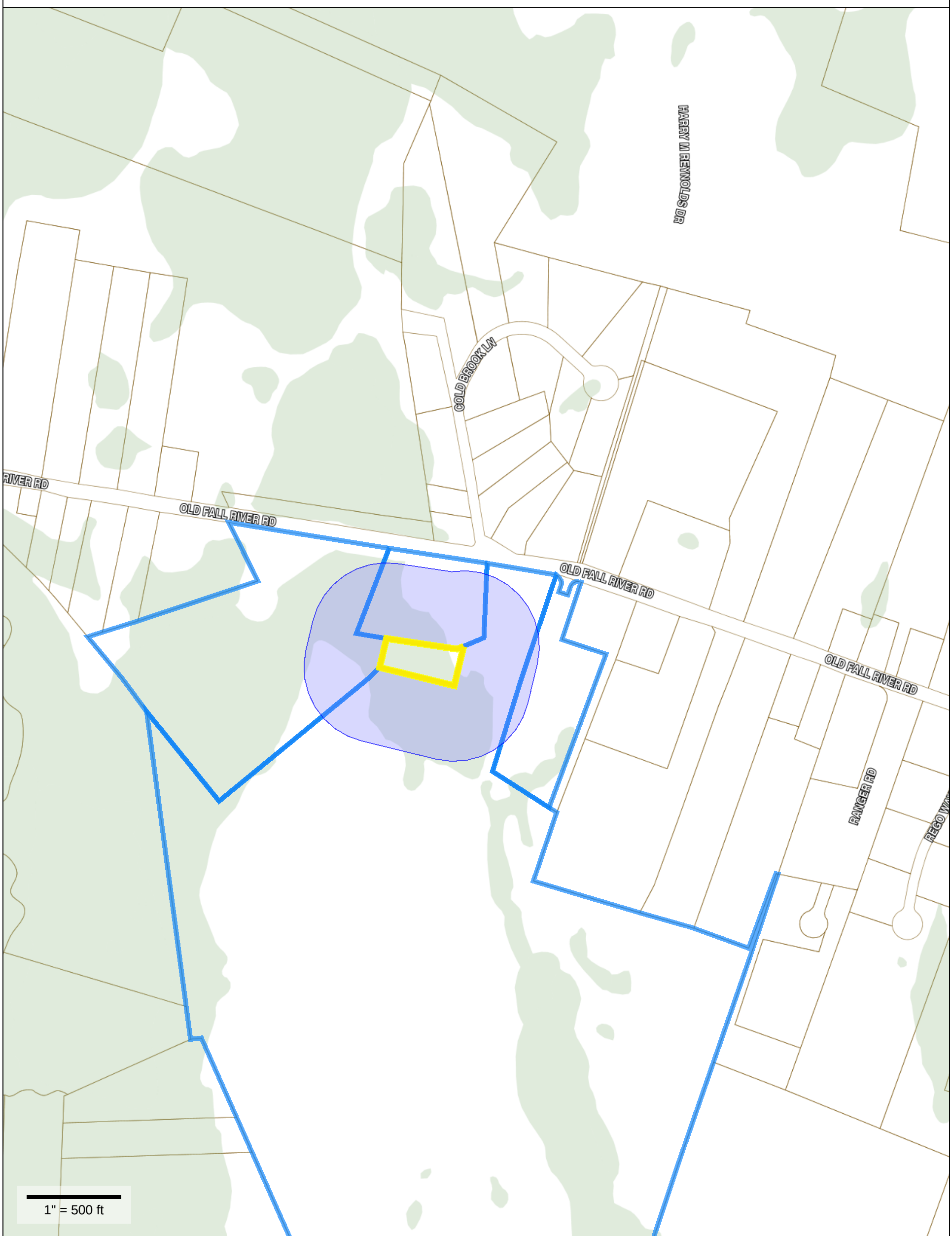
300 ft. Abutters

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

The Town makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Parcels updated December 30, 2010





Property Information

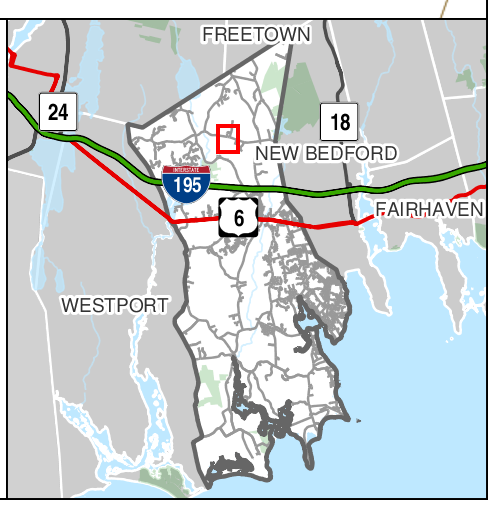
Property ID 72/8
Location OLD FALL RIVER RD
Owner ROBINSON MARY

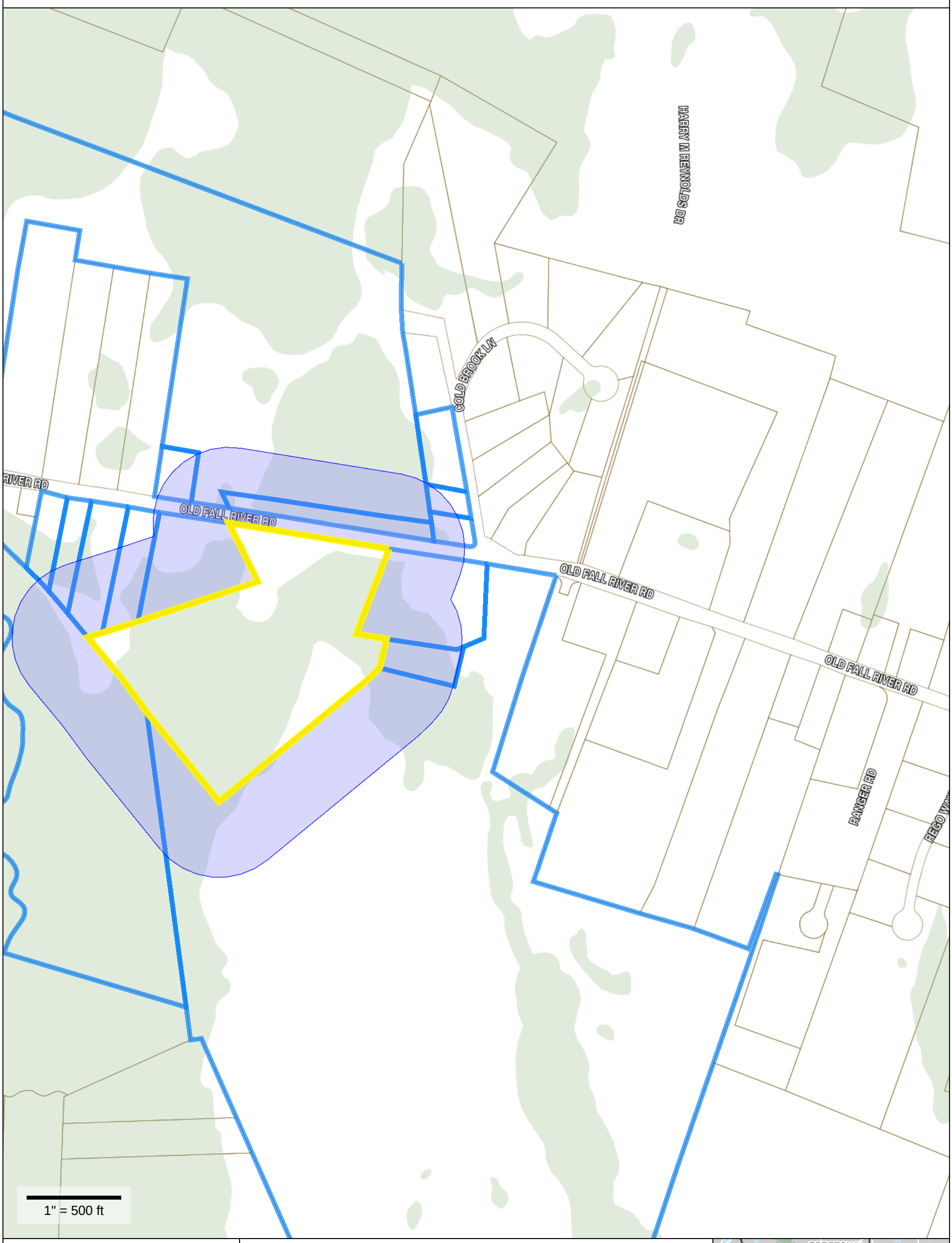
300 ft. Abutters

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

The Town makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Parcels updated December 30, 2010





Property Information

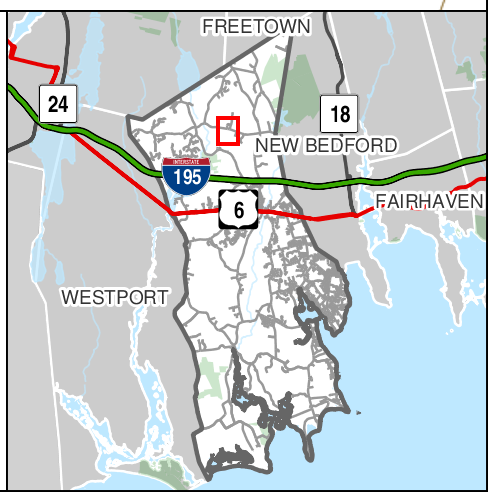
Property ID 72/9
Location OLD FALL RIVER RD
Owner ROBINSON MARY

300 ft. Abutters

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

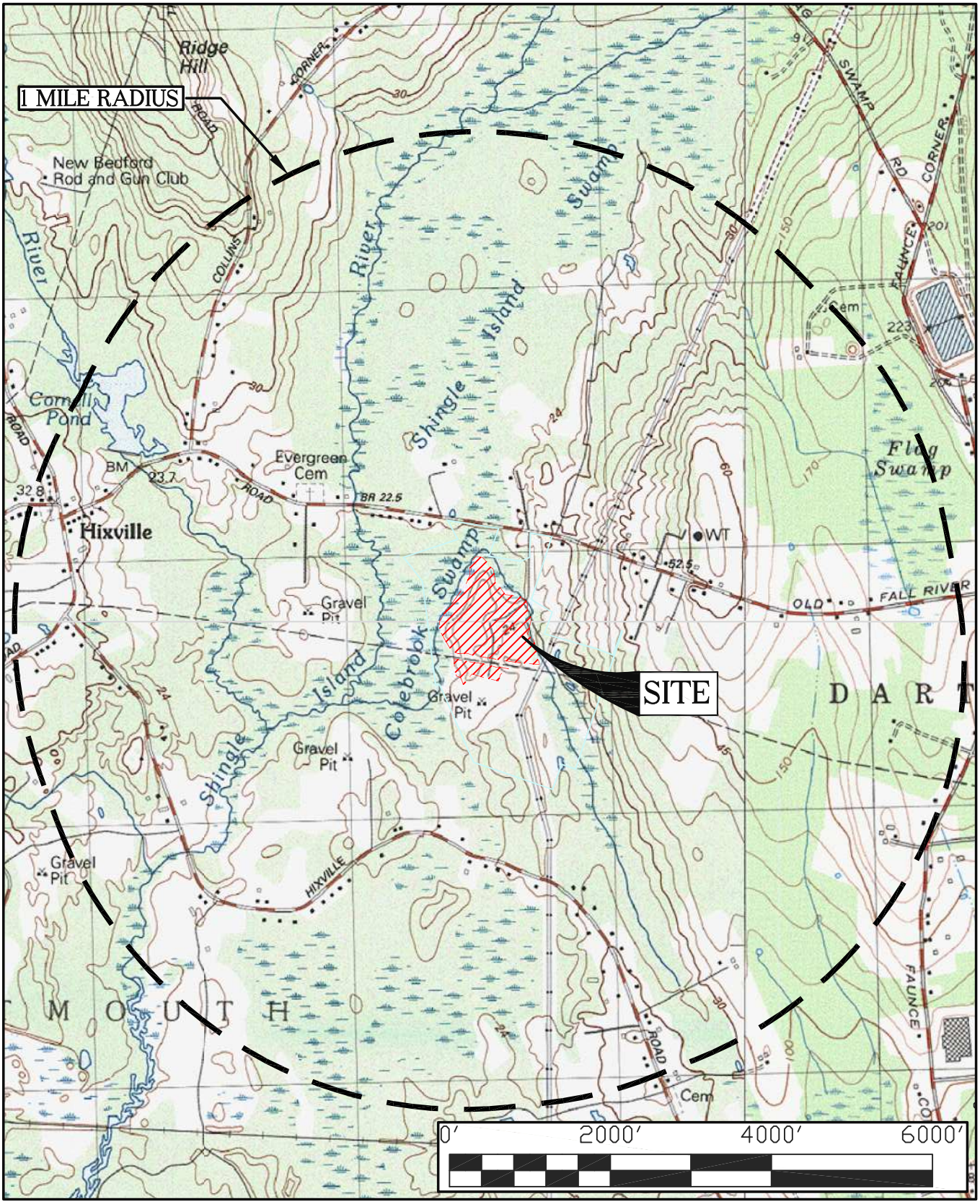
The Town makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Parcels updated December 30, 2010



APPENDIX B

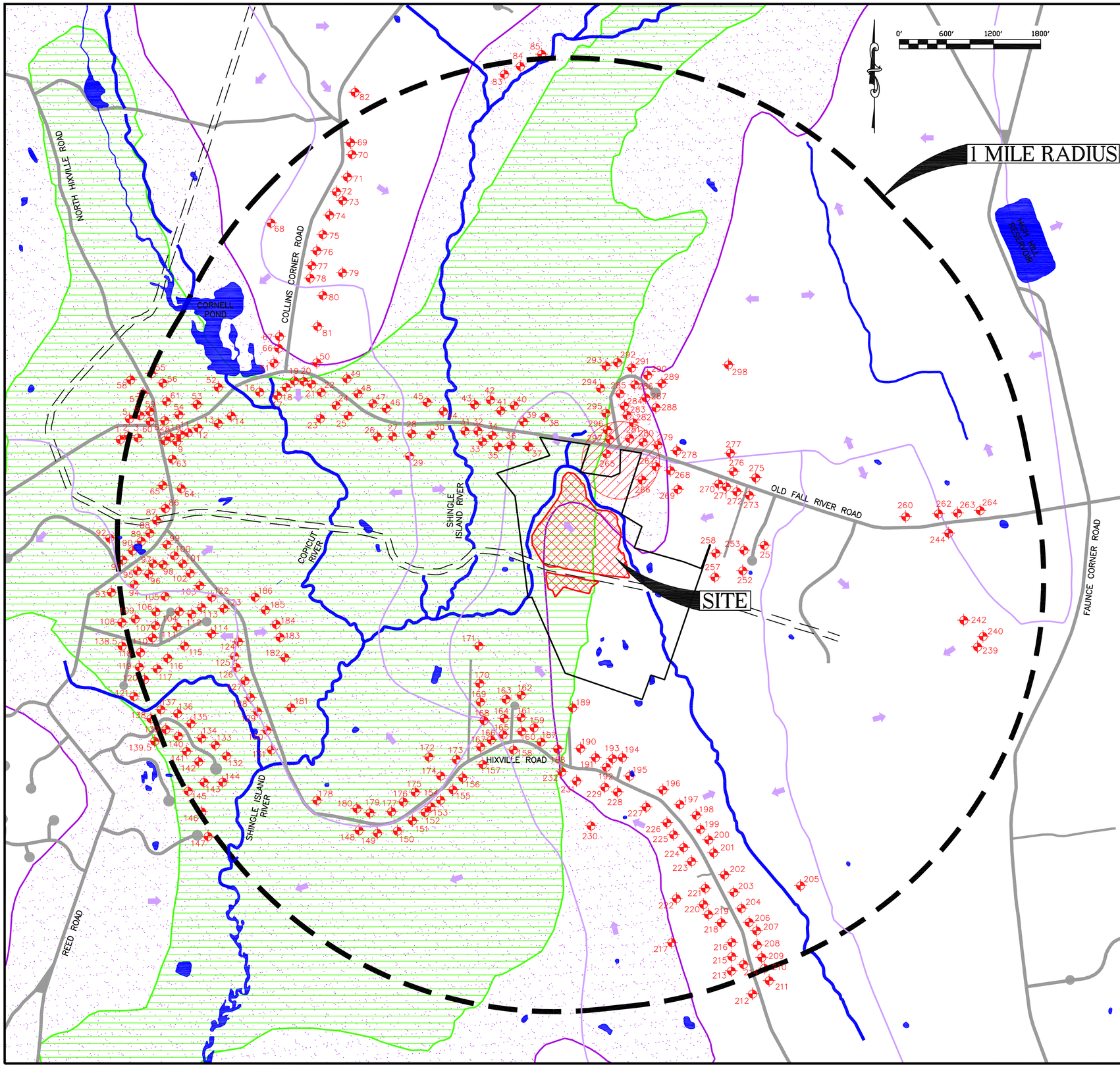
FIGURES



BASE IMAGE: USGS TOPOGRAPHIC MAP – FALL RIVER R – REVISED 1981

drawing title:	FIGURE 1: USGS LOCUS MAP
scale: AS SHOWN	project: OLD FALL RIVER ROAD LANDFILL 452 OLD FALL RIVER ROAD DARTMOUTH, MASSACHUSETTS

SITEC ENVIRONMENTAL
Civil and Environmental Engineering
Land Use Planning and Surveying
Hazardous and Solid Waste Consultants
700 Plain Street, Unit C
Marshfield, MA 02050
PHONE (781)-910-0100
FAX (781) 834-4788



LEGEND

- IWPA
- DARTMOUTH WATER RESOURCE PROTECTION DISTRICT AND ZONE III
- MEDIUM YIELD POTENTIALLY PRODUCTIVE AQUIFER
- SURFACE WATER BODY
- GENERAL SURFACE DRAINAGE PATTERN FLOW DIRECTION
- LOCAL WATERSHED BOUNDRY
- PAVED ROAD
- 277 APPROXIMATE PRIVATE WELL LOCATION WITH SITEC WELL IDENTIFICATION NUMBER (APPENDIX–D)

NOT KNOWN TO BE LOCATED WITHIN 1 MILE FROM THE SITE (NOT SHOWN ON PLAN):

- AREAS OF CRITICAL ENVIRONMENTAL CONCERN (ACEC)
- PUBLIC DRINKING WATER SUPPLIES
- ZONE A OF A PUBLIC SURFACE WATER SUPPLY

PLAN INFORMATION TAKEN FROM THE TOWN OF DARTMOUTH AND THE OFFICE OF GEOGRAPHIC INFORMATION (MassGIS), COMMONWEALTH OF MASSACHUSETTS, INFORMATION TECHNOLOGY DIVISION

No.	Date	Revision Description	Chkd. by	Appvd. by

scale: 1"=600'
date: MAY 16, 2014
drawn: HKB
checked: MQ
approved: ARQ
drawing number: RP–1

project: OLD FALL RIVER ROAD LANDFILL – FINAL CLOSURE
452 OLD FALL RIVER ROAD
DARTMOUTH, MASSACHUSETTS

client: BOSTON ENVIRONMENTAL CORPORATION
338 HOWARD STREET
BROCKTON, MASSACHUSETTS

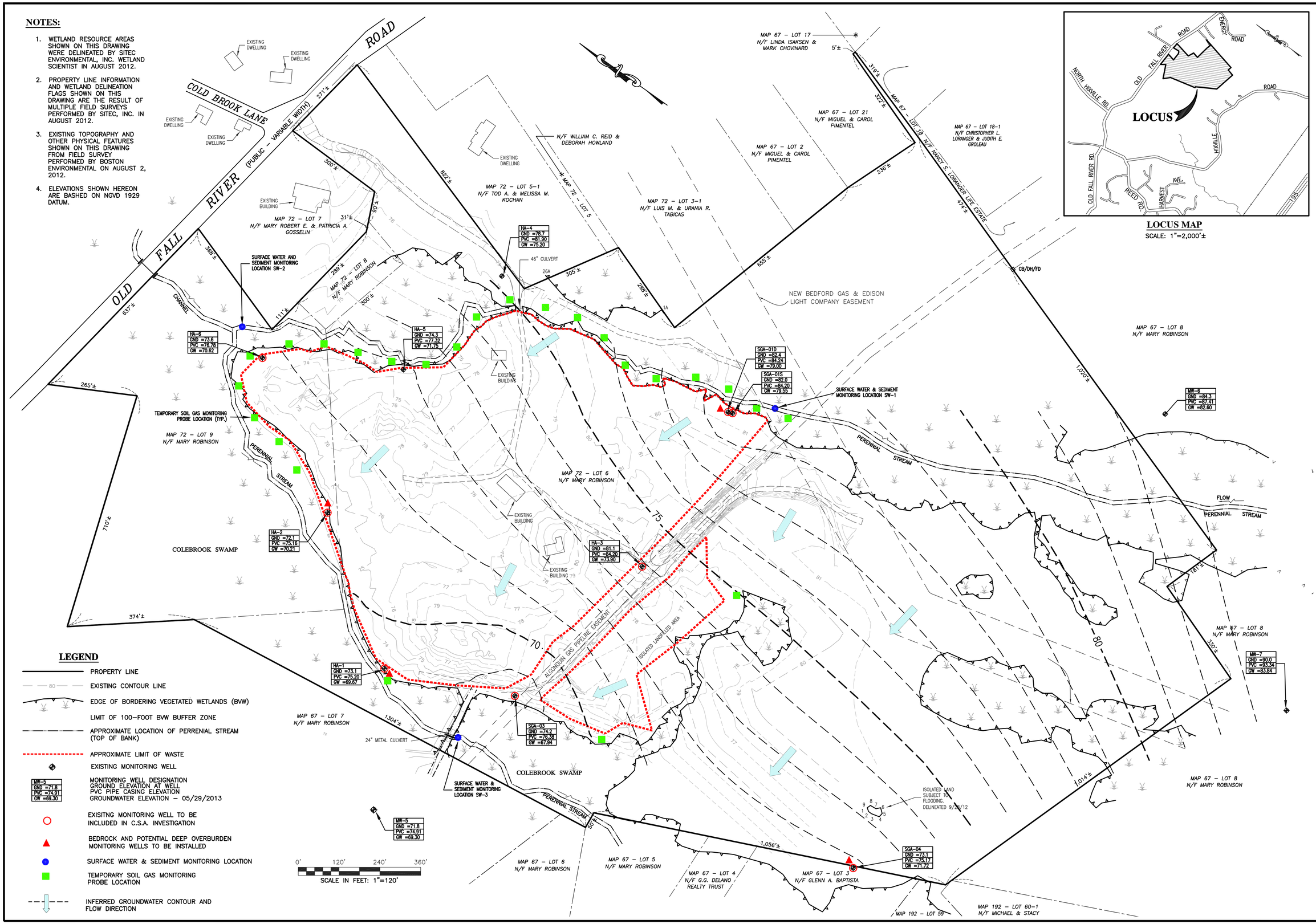
drawing title: FIGURE No. 2
POTENTIAL SENSITIVE RECEPTORS PLAN

SITEC ENVIRONMENTAL
Civil and Environmental Engineering
Land Use Planning and Surveying
Hazardous and Solid Waste Consultants
769 Plain Street, Unit C
Marshfield, MA 02050
Phone (781) 834-0500
FAX (781) 834-4783

File No. SE11–920

NOTES:

1. WETLAND RESOURCE AREAS SHOWN ON THIS DRAWING WERE DELINEATED BY SITEC ENVIRONMENTAL, INC. WETLAND SCIENTIST IN AUGUST 2012.
2. PROPERTY LINE INFORMATION AND WETLAND DELINEATION FLAGS SHOWN ON THIS DRAWING ARE THE RESULT OF MULTIPLE FIELD SURVEYS PERFORMED BY SITEC, INC. IN AUGUST 2012.
3. EXISTING TOPOGRAPHY AND OTHER PHYSICAL FEATURES SHOWN ON THIS DRAWING FROM FIELD SURVEY PERFORMED BY BOSTON ENVIRONMENTAL ON AUGUST 2, 2012.
4. ELEVATIONS SHOWN HEREON ARE BASHED ON NGVD 1929 DATUM.



LOCUS MAP
SCALE: 1"=2,000'±

LEGEND

- PROPERTY LINE
- EXISTING CONTOUR LINE
- EDGE OF BORDERING VEGETATED WETLANDS (BVW)
- LIMIT OF 100–FOOT BVW BUFFER ZONE
- APPROXIMATE LOCATION OF PERRENIAL STREAM (TOP OF BANK)
- APPROXIMATE LIMIT OF WASTE
- EXISTING MONITORING WELL
- MW–5 GND =71.8 PVC =74.91 GW =69.30 — MONITORING WELL DESIGNATION, GROUND ELEVATION AT WELL, PVC PIPE CASING ELEVATION, GROUNDWATER ELEVATION – 05/29/2013
- EXISITNG MONITORING WELL TO BE INCLUDED IN C.S.A. INVESTIGATION
- BEDROCK AND POTENTIAL DEEP OVERBURDEN MONITORING WELLS TO BE INSTALLED
- SURFACE WATER & SEDIMENT MONITORING LOCATION
- TEMPORARY SOIL GAS MONITORING PROBE LOCATION
- INFERRED GROUNDWATER CONTOUR AND FLOW DIRECTION

No.	Date	Revision Description	Chkd. by	Apprvd. by

scale: 1"=120'
date: MAY 16, 2014
drawn: JAC
checked: MQ
approved: ARQ
drawing number:

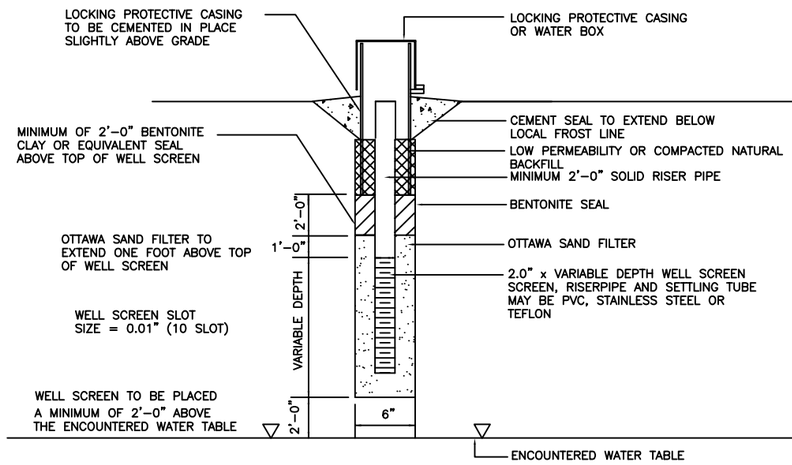
project: OLD FALL RIVER ROAD LANDFILL – FINAL CLOSURE
452 OLD FALL RIVER ROAD
DARTMOUTH, MASSACHUSETTS

client: BOSTON ENVIRONMENTAL CORPORATION
338 HOWARD STREET
BROCKTON, MASSACHUSETTS

drawing title: FIGURE 3
ISA/CSA–SOW SITE PLAN

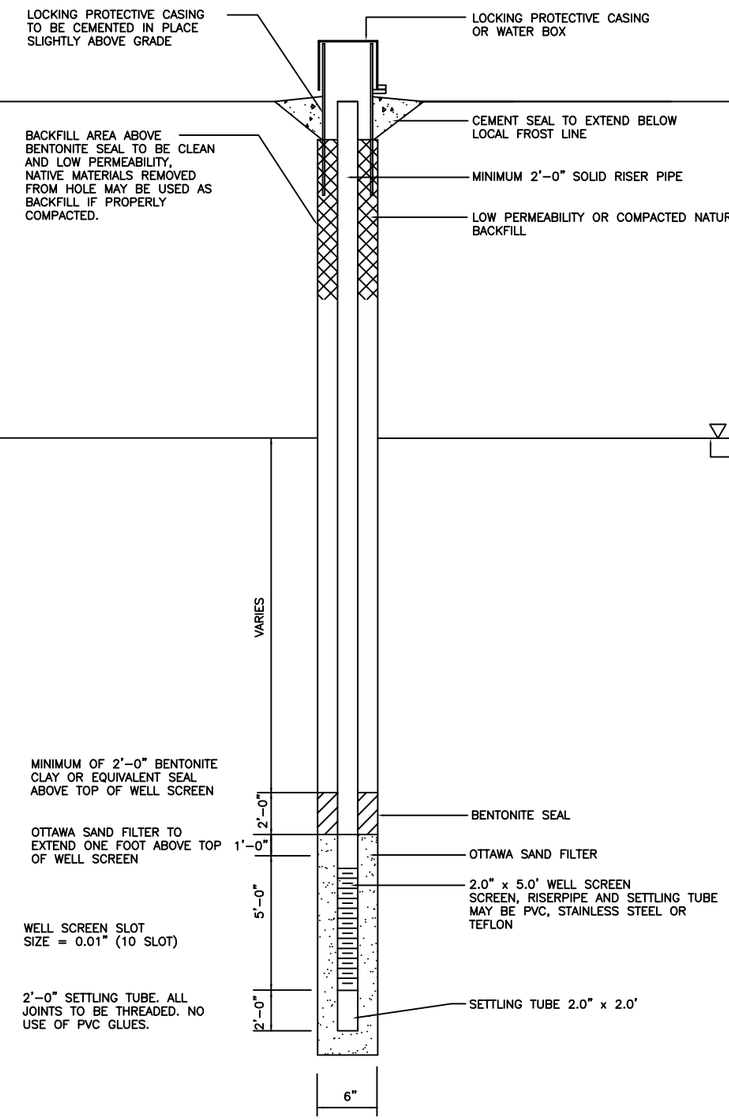
SITEC ENVIRONMENTAL
Civil and Environmental Engineering
Land Use Planning and Surveying
Hazardous and Solid Waste Consultants
769 Plain Street, Unit C
Marshfield, MA 02050
Phone (781) 834-7100
FAX (781) 834-4783

File No. SE11–920



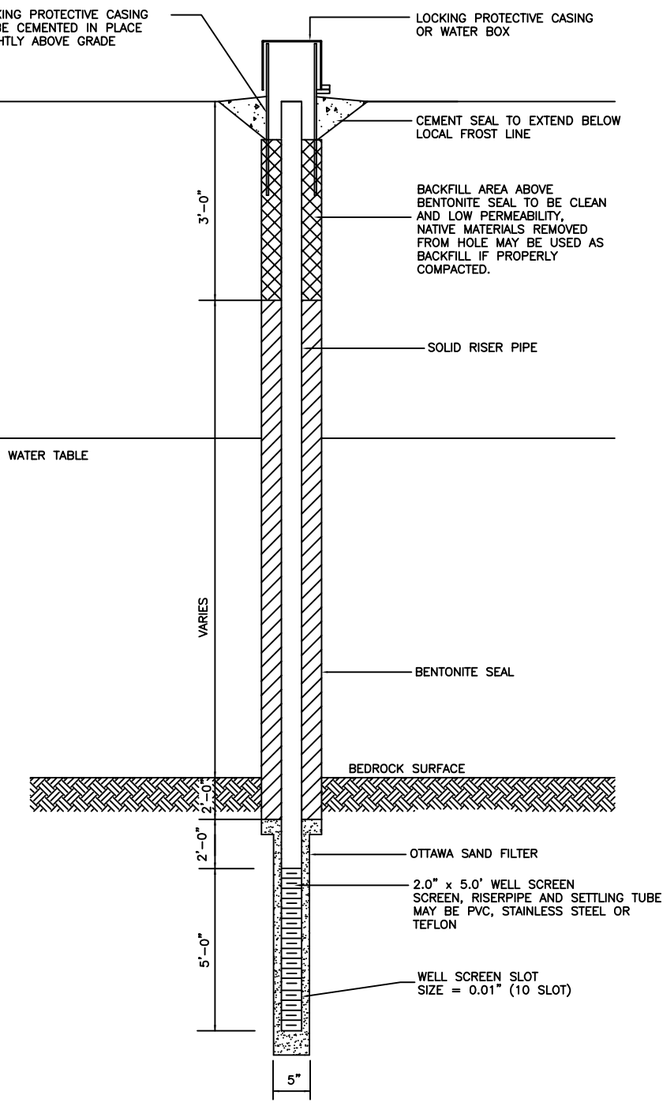
LANDFILL GAS MONITORING WELL

NOT TO SCALE



DEEP GROUNDWATER MONITORING WELL

NOT TO SCALE



BEDROCK MONITORING WELL

NOT TO SCALE

SITEC
ENVIRONMENTAL
Hazardous and Solid Waste Consultants

769 PLAIN STREET, UNIT C
MARSHFIELD, MA 02050
(781) 319-0100
FAX (781) 834-4783

DRAWING TITLE:

MONITORING WELL CONSTRUCTION DETAILS

APPENDIX C

ENVIRONMENTAL DATA RESOURCES'S REPORT

Cecil Smith Landfill
Old Fall River Road
North Dartmouth, MA 02747

Inquiry Number: 3900899.2s
April 03, 2014

The EDR Radius Map™ Report with GeoCheck®

EDR® Environmental Data Resources Inc

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Detail Map	3
Map Findings Summary	4
Map Findings	7
Orphan Summary	12
Government Records Searched/Data Currency Tracking	GR-1

GEOCHECK ADDENDUM

Physical Setting Source Addendum	A-1
Physical Setting Source Summary	A-2
Physical Setting SSURGO Soil Map	A-5
Physical Setting Source Map	A-14
Physical Setting Source Map Findings	A-16
Physical Setting Source Records Searched	A-12

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

OLD FALL RIVER ROAD
NORTH DARTMOUTH, MA 02747

COORDINATES

Latitude (North):	41.6780000 - 41˚ 40' 40.80''
Longitude (West):	71.0116000 - 71˚ 0' 41.76''
Universal Tranverse Mercator:	Zone 19
UTM X (Meters):	332558.2
UTM Y (Meters):	4615768.0
Elevation:	79 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	41071-F1 FALL RIVER EAST, MA
Most Recent Revision:	1985
East Map:	41070-F8 NEW BEDFORD NORTH, MA
Most Recent Revision:	1979

AERIAL PHOTOGRAPHY IN THIS REPORT

Photo Year:	2012
Source:	USDA

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following records. For more information on this property see page 7 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
COLE BROOK PINES LANDFILL OLD FALL RIVER RD DARTMOUTH, MA 02747	CERCLIS	MAD981069990
LANDFILL FMR OLD FALL RIVER RD NORTH DARTMOUTH, MA 02747	SPILLS 90	N/A
CECIL SMITH DUMP 452 OLD FALL RIVER RD NORTH DARTMOUTH, MA 02747	SWF/LF	N/A

EXECUTIVE SUMMARY

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ..... National Priority List
Proposed NPL ..... Proposed National Priority List Sites
NPL LIENS ..... Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ..... National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ..... Federal Facility Site Information listing

Federal CERCLIS NFRAP site List

CERC-NFRAP ..... CERCLIS No Further Remedial Action Planned

Federal RCRA CORRACTS facilities list

CORRACTS ..... Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ..... RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ..... RCRA - Large Quantity Generators
RCRA-SQG ..... RCRA - Small Quantity Generators
RCRA-CESQG ..... RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

US ENG CONTROLS ..... Engineering Controls Sites List
US INST CONTROL ..... Sites with Institutional Controls
LUCIS ..... Land Use Control Information System

Federal ERNS list

ERNS ..... Emergency Response Notification System

State- and tribal - equivalent CERCLIS

SHWS ..... Reportable Releases Database

EXECUTIVE SUMMARY

State and tribal leaking storage tank lists

LUST ..... Leaking Underground Storage Tank Listing
LAST ..... Leaking Aboveground Storage Tank Sites
INDIAN LUST ..... Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

UST ..... Summary Listing of all the Tanks Registered in the State of Massachusetts
AST ..... Aboveground Storage Tank Database
INDIAN UST ..... Underground Storage Tanks on Indian Land
FEMA UST ..... Underground Storage Tank Listing

State and tribal institutional control / engineering control registries

INST CONTROL ..... Sites With Activity and Use Limitation

State and tribal voluntary cleanup sites

INDIAN VCP ..... Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

BROWNFIELDS ..... Completed Brownfields Covenants Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

DEBRIS REGION 9 ..... Torres Martinez Reservation Illegal Dump Site Locations
ODI ..... Open Dump Inventory
INDIAN ODI ..... Report on the Status of Open Dumps on Indian Lands

Local Lists of Hazardous waste / Contaminated Sites

US CDL ..... Clandestine Drug Labs
US HIST CDL ..... National Clandestine Laboratory Register

Local Land Records

LIENS 2 ..... CERCLA Lien Information
LIENS ..... Liens Information Listing

Records of Emergency Release Reports

HMIRS ..... Hazardous Materials Information Reporting System
SPILLS ..... Historical Spill List
RELEASE ..... Reportable Releases Database
SPILLS 80 ..... SPILLS 80 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR	RCRA - Non Generators
DOT OPS	Incident and Accident Data
DOD	Department of Defense Sites
FUDS	Formerly Used Defense Sites
CONSENT	Superfund (CERCLA) Consent Decrees
ROD	Records Of Decision
UMTRA	Uranium Mill Tailings Sites
US MINES	Mines Master Index File
TRIS	Toxic Chemical Release Inventory System
TSCA	Toxic Substances Control Act
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
SSTS	Section 7 Tracking Systems
ICIS	Integrated Compliance Information System
PADS	PCB Activity Database System
MLTS	Material Licensing Tracking System
RADINFO	Radiation Information Database
FINDS	Facility Index System/Facility Registry System
RAATS	RCRA Administrative Action Tracking System
RMP	Risk Management Plans
NPDES	NPDES Permit Listing
DRYCLEANERS	Regulated Drycleaning Facilities
ENF	Enforcement Action Cases
AIRS	Permitted Facilities Listing
TIER 2	Tier 2 Information Listing
LEAD	Lead Inspection Database
INDIAN RESERV	Indian Reservations
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
2020 COR ACTION	2020 Corrective Action Program List
EPA WATCH LIST	EPA WATCH LIST
PCB TRANSFORMER	PCB Transformer Registration Database
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
US FIN ASSUR	Financial Assurance Information
MERCURY	Mercury Product Recyling Drop-Off Locations Listing
US AIRS	Aerometric Information Retrieval System Facility Subsystem
PRP	Potentially Responsible Parties
HW GEN	List of Massachusetts Hazardous Waste Generators
LEAD SMELTERS	Lead Smelter Sites
Financial Assurance	Financial Assurance Information Listing
GWDP	Ground Water Discharge Permits
COAL ASH DOE	Steam-Electric Plant Operation Data
TSD	TSD Facility

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	EDR Proprietary Manufactured Gas Plants
EDR US Hist Auto Stat	EDR Exclusive Historic Gas Stations
EDR US Hist Cleaners	EDR Exclusive Historic Dry Cleaners

EXECUTIVE SUMMARY

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LUST..... Recovered Government Archive Leaking Underground Storage Tank
RGA HWS..... Recovered Government Archive State Hazardous Waste Facilities List

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: The Solid Waste Facilities/Landfill Sites records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. The data come from the Department of Environmental Protection's Solid Waste Facility Database/Transfer Stations.

A review of the SWF/LF list, as provided by EDR, and dated 06/10/2013 has revealed that there is 1 SWF/LF site within approximately 0.5 miles of the target property.

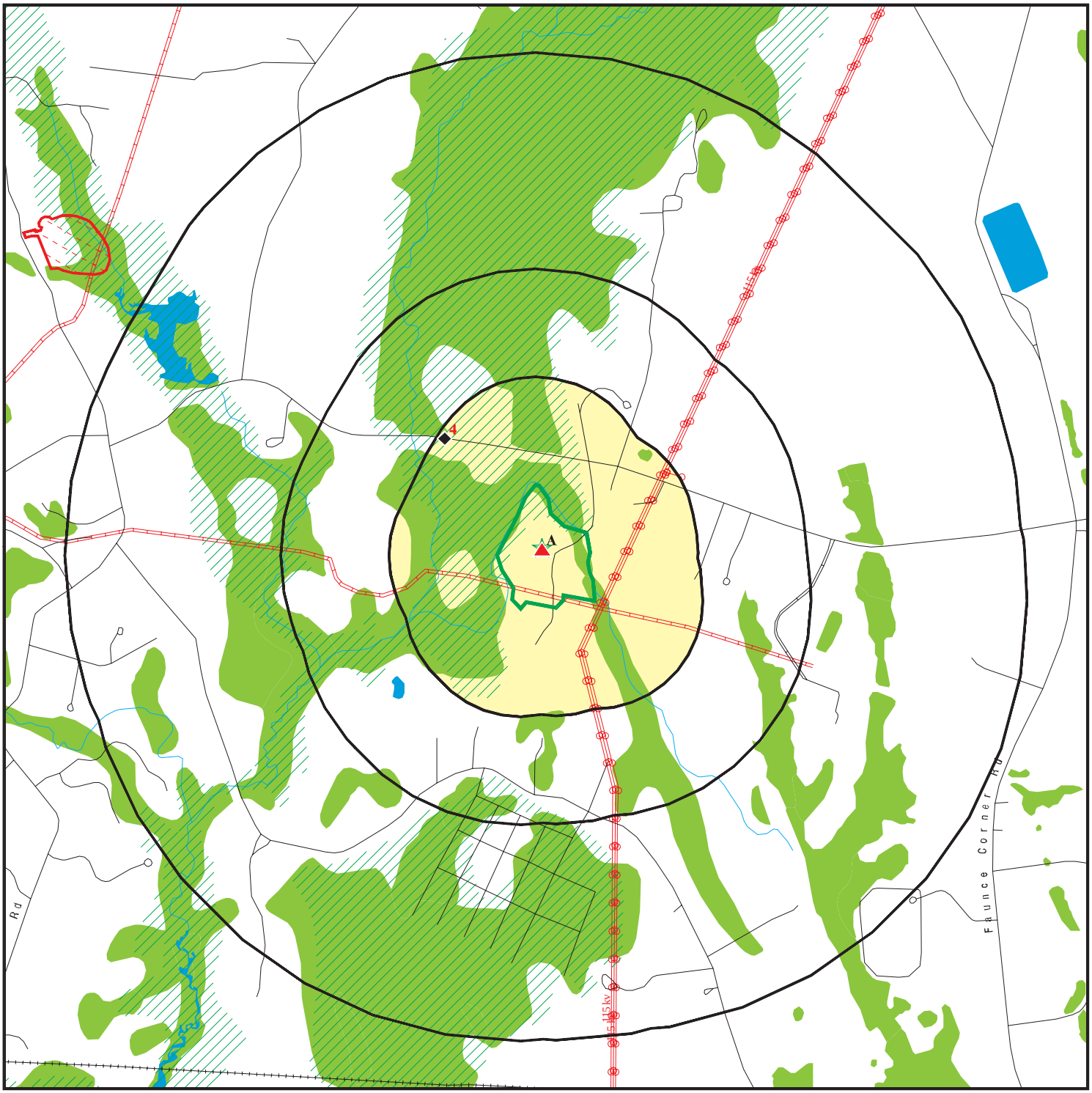
Lower Elevation	Address	Direction / Distance	Map ID	Page
LABERGE DEMOLITION LANDFILL	600 OLD FALL RIVER RD	NW 1/8 - 1/4 (0.231 mi.)	4	10

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 4 records.

Site Name	Database(s)
UMASS DARTMOUTH	HW GEN
COLONIAL HONDA	HW GEN
JARABEK FARM LANDFILL	SWF/LF
MASS DPW MAINT DEPOT	UST, Financial Assurance

OVERVIEW MAP - 3900899.2s



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites

0 1/4 1/2 1 Miles

- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- Areas of Critical Environmental Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Cecil Smith Landfill	CLIENT: Sitec Environmental
ADDRESS: Old Fall River Road	CONTACT: Geoffrey Souza
North Dartmouth MA 02747	INQUIRY #: 3900899.2s
LAT/LONG: 41.678 / 71.0116	DATE: April 03, 2014 7:52 pm

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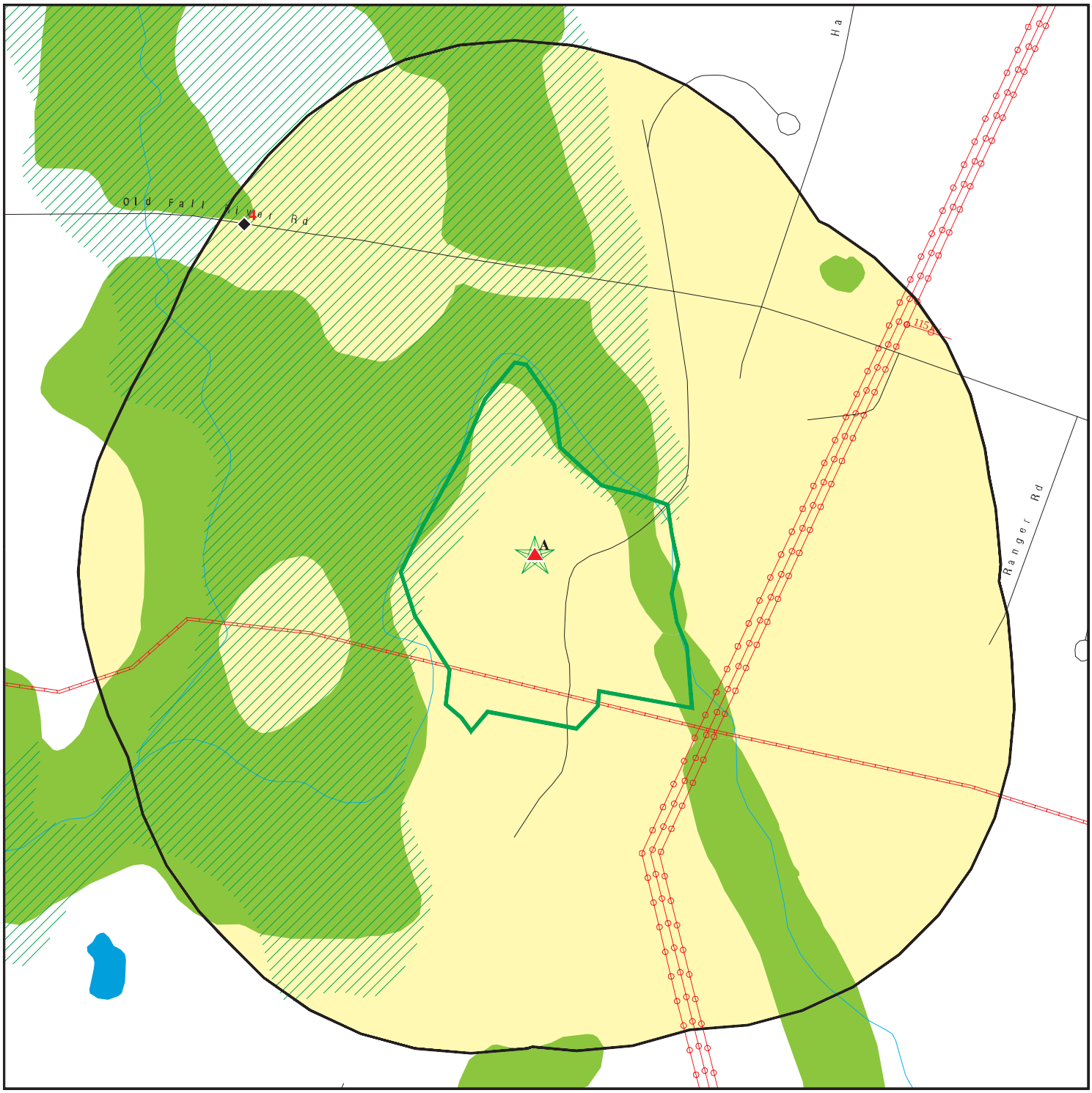
DETAIL MAP - 3900899.2s



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

Sensitive Receptors

National Priority List Sites

Dept. Defense Sites

0 1/16 1/8 1/4 Miles

Indian Reservations BIA

Power transmission lines

Oil & Gas pipelines from USGS

100-year flood zone

500-year flood zone

National Wetland Inventory

Areas of Critical Environmental Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Cecil Smith Landfill	CLIENT: Sitec Environmental
ADDRESS: Old Fall River Road	CONTACT: Geoffrey Souza
North Dartmouth MA 02747	INQUIRY #: 3900899.2s
LAT/LONG: 41.678 / 71.0116	DATE: April 03, 2014 7:52 pm

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	TP		NR	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
CERCLIS	0.500	1	0	0	0	NR	NR	1
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site List								
CERC-NFRAP	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
LUCIS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent CERCLIS								
SHWS	0.500		0	0	0	NR	NR	0
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500	1	0	1	0	NR	NR	2
State and tribal leaking storage tank lists								
LUST	0.500		0	0	0	NR	NR	0
LAST	0.500		0	0	0	NR	NR	0
INDIAN LUST	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
UST	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
FEMA UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
INST CONTROL	0.500		0	0	0	NR	NR	0
State and tribal voluntary cleanup sites								
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US CDL	TP		NR	NR	NR	NR	NR	0
US HIST CDL	TP		NR	NR	NR	NR	NR	0
Local Land Records								
LIENS 2	TP		NR	NR	NR	NR	NR	0
LIENS	TP		NR	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
SPILLS	TP		NR	NR	NR	NR	NR	0
RELEASE	TP		NR	NR	NR	NR	NR	0
SPILLS 90	TP	1	NR	NR	NR	NR	NR	1
SPILLS 80	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
DOD	1.000		0	0	0	0	NR	0
FUDS	1.000		0	0	0	0	NR	0
CONSENT	1.000		0	0	0	0	NR	0
ROD	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
TRIS	TP		NR	NR	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
ENF	TP		NR	NR	NR	NR	NR	0
AIRS	TP		NR	NR	NR	NR	NR	0
TIER 2	TP		NR	NR	NR	NR	NR	0
LEAD	TP		NR	NR	NR	NR	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
MERCURY	0.500		0	0	0	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
HW GEN	0.250		0	0	NR	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
GWDP	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
TSD	0.500		0	0	0	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	0.500		0	0	0	NR	NR	0
EDR US Hist Auto Stat	0.250		0	0	NR	NR	NR	0
EDR US Hist Cleaners	0.250		0	0	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LUST	TP		NR	NR	NR	NR	NR	0
RGA HWS	TP		NR	NR	NR	NR	NR	0

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

A1 Target Property | **COLE BROOK PINES LANDFILL**
OLD FALL RIVER RD
DARTMOUTH, MA 02747 | **CERCLIS** | **1000182730**
MAD981069990

Site 1 of 3 in cluster A

Actual: 79 ft.

CERCLIS:

Site ID:	0100923
EPA ID:	MAD981069990
Facility County:	BRISTOL
Short Name:	COLE BROOK PINES LANDFILL
Congressional District:	10
IFMS ID:	Not reported
SMSA Number:	5400
USGC Hydro Unit:	01090002
Federal Facility:	Not a Federal Facility
DMNSN Number:	0.00000
Site Orphan Flag:	N
RCRA ID:	Not reported
USGS Quadrangle:	Not reported
Site Init By Prog:	Not reported
NFRAP Flag:	Not reported
Parent ID:	Not reported
RST Code:	Not reported
EPA Region:	01
Classification:	Not reported
Site Settings Code:	Not reported
NPL Status:	Not on the NPL
DMNSN Unit Code:	Not reported
RBRAC Code:	Not reported
RResp Fed Agency Code:	Not reported
Non NPL Status:	Assessment Complete - Decision Needed
Non NPL Status Date:	02/08/05
Site Fips Code:	25005
CC Concurrence Date:	/ /
CC Concurrence FY:	Not reported
Alias EPA ID:	Not reported
Site FUDS Flag:	Not reported

CERCLIS Site Contact Name(s):

Contact ID:	1270187.00000
Contact Name:	Nancy Smith
Contact Tel:	(617) 918-1436
Contact Title:	Site Assessment Manager (SAM)
Contact Email:	Not reported

CERCLIS Site Alias Name(s):

Alias ID:	101
Alias Name:	COLD BROOK PINES LANDFILL
Alias Address:	OLD FALL RIVER RD DARTMOUTH, MA 02747
Alias ID:	102
Alias Name:	CECIL SMITH'S LANDFILL
Alias Address:	OLD FALL RIVER ROAD DARTMOUTH, MA 02748
Alias ID:	103
Alias Name:	CLEAN COMMUNITIES LANDFILL
Alias Address:	OLD FALL RIVER ROAD

COLE BROOK PINES LANDFILL (Continued) **1000182730**

DARTMOUTH, MA
Alias ID: 102
Alias ID: 103
Alias Comments: Not reported
Site Description: No further Site Assessment program action is anticipated. Pending consultation with the state, this site may be designated as a "state lead" site, or as a Low Priority Archive.

CERCLIS Assessment History:

Action Code: 001
Action: DISCOVERY
Date Started: / /
Date Completed: 02/01/83
Priority Level: Not reported
Operable Unit: SITEWIDE
Primary Responsibility: EPA Fund-Financed
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

Action Code: 001
Action: PRELIMINARY ASSESSMENT
Date Started: / /
Date Completed: 08/08/85
Priority Level: Low priority for further assessment
Operable Unit: SITEWIDE
Primary Responsibility: EPA Fund-Financed
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

Action Code: 001
Action: SITE INSPECTION
Date Started: 05/09/90
Date Completed: 02/25/91
Priority Level: Higher priority for further assessment
Operable Unit: SITEWIDE
Primary Responsibility: EPA Fund-Financed
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

Action Code: 001
Action: EXPANDED SITE INSPECTION
Date Started: 12/20/02
Date Completed: 02/08/05
Priority Level: Low priority for further assessment
Operable Unit: SITEWIDE
Primary Responsibility: EPA Fund-Financed
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

A2 Target Property | **LANDFILL FMR** | **SPILLS 90** | **S112326350**
OLD FALL RIVER RD | **N/A**
NORTH DARTMOUTH, MA 02747

Site 2 of 3 in cluster A

Actual: 79 ft.

Spills:

Status:	TIER1D
Contact Name:	Not reported
Contact Phone:	Not reported
Site ID:	4-0012656
Secondary ID:	Not reported
Cross Street:	Not reported
County:	BRISTOL
Longitude:	-71011917
Latitude:	41680236
Elevation:	68
Site Information:	Not reported Status - Tier1d, A Release Where The Responsible Party Fails To Provide A Required Submittal To Dep By A Specified Deadline.
Ltbi:	Not reported
Confirmed:	Not reported
Deleted:	Not reported
Removed:	Not reported
Ltbi:	Not reported
Confirmed:	Not reported
Deleted:	Not reported
Removed:	Not reported
Location Type:	RESIDNTIAL, OPENSPACE,
Source:	DRUMS;
Site Description:	Not reported
Chemicals:	Not reported
Petroleum Based Oil:	Not reported
Site Actions:	Not reported
Act Date:	12/3/1996
Act Use Limitation:	Not reported
Lsp:	Not reported
Act Status:	REPORTABLE RELEASE UNDER MGL 21E
Act Type:	RELEASE DISPOSITION
Rao Class:	Not reported

A3 Target Property | **CECIL SMITH DUMP** | **SWF/LF** | **S109948878**
452 OLD FALL RIVER RD | **N/A**
NORTH DARTMOUTH, MA 02747

Site 3 of 3 in cluster A

Actual: 79 ft.

LF:

Facility Phone:	Not reported
Annual Tons for 1995:	Not reported
Annual Tons for 1996:	Not reported
Annual Tons for 1997:	Not reported
Annual Tons for 1998:	Not reported
Annual Tons for 1999:	Not reported
Annual Tons for 2000:	Not reported
Annual Tons for 2001:	Not reported
Annual Tons for 2002:	Not reported
Annual Tons for 2003:	Not reported
Annual Tons for 2004:	Not reported
Annual Tons for 2005:	Not reported

CECIL SMITH DUMP (Continued) **S109948878**

Annual Tons for 20006:	Not reported
Annual Tons for 2007:	Not reported
Annual Tons for 2008:	Not reported
Annual Tons for 2009:	Not reported
Annual Tons for 2010:	Not reported
Annual Tons for 2011:	Not reported
Reg Obj Acct ID Num For Each Solid Waste Operation:	Not reported
Days of Operation:	Not reported
Note On The Physical Location Of The Site:	SOUTH OF GAS PIPELINE
Acres:	60
Active Year:	1954
Classification Group:	Land Disposal
Current Or Most Recent Closed Classification:	CSU-LF
Description Of The Last Classification:	Landfill Closure Status Unknown
Close Year:	Not reported
Name Of The Organization:	CECIL SMITH
Contacts Organization Type:	Private
Contact Persons Name And Title:	CECIL SMITH
Contact Phone Including Extension:	Not reported
Contact Mailing Street Address:	C/O 452 OLD FALL RIVER RD
Contacts Mailing City, State, Zip:	DARTMOUTH, MA 02747
Inactive Year:	1983
Land Disposal Closure Status:	Incomplete
Land Disposal Only, Category Waste Disposed:	MSW
Landfills Liner:	Not Lined
Municipality That The Operation Is Located In:	DARTMOUTH
Alpha-Numeric Identification Code:	SL0072.006
Numeric-Only Portion Of The Identification Code:	0072.006
Region:	SE
Org That Pays Any Annual Compliance Fee And/Or Permittee:	Not reported
Responsible Party Organization Type:	Not reported
Responsible Party Mailing Street Address Line 1:	Not reported
Responsible Party Mailing Street Address Line 2:	Not reported
Responsible Party Mailing City, State, Zip:	Not reported
Responsible Party Telephone Inc Extension:	Not reported
Maximum Permitted Tons Per Day:	Not reported
Current Operational Status:	Inactive

4
NW
1/8-1/4
0.231 mi.
1219 ft.

LABERGE DEMOLITION LANDFILL **SWF/LF** **S109330217**
600 OLD FALL RIVER RD **N/A**
NORTH DARTMOUTH, MA 02747

Relative:
Lower

Actual:
69 ft.

LF:

Facility Phone:	Not reported
Annual Tons for 1995:	Not reported
Annual Tons for 1996:	Not reported
Annual Tons for 1997:	Not reported
Annual Tons for 1998:	Not reported
Annual Tons for 1999:	Not reported
Annual Tons for 2000:	Not reported
Annual Tons for 2001:	Not reported
Annual Tons for 2002:	Not reported
Annual Tons for 2003:	Not reported
Annual Tons for 2004:	Not reported
Annual Tons for 2005:	Not reported
Annual Tons for 20006:	Not reported

LABERGE DEMOLITION LANDFILL (Continued) **S109330217**

Annual Tons for 2007:	Not reported
Annual Tons for 2008:	Not reported
Annual Tons for 2009:	Not reported
Annual Tons for 2010:	Not reported
Annual Tons for 2011:	Not reported
Reg Obj Acct ID Num For Each Solid Waste Operation:	Not reported
Days of Operation:	Not reported
Note On The Physical Location Of The Site:	NORTH OF GAS PIPELINE
Acres:	Not reported
Active Year:	Not reported
Classification Group:	Land Disposal
Current Or Most Recent Closed Classification:	CSU-LF
Description Of The Last Classification:	Landfill Closure Status Unknown
Close Year:	Not reported
Name Of The Organization:	DAVID LABERGE JR
Contacts Organization Type:	Private
Contact Persons Name And Title:	DAVID LABERGE JR
Contact Phone Including Extension:	Not reported
Contact Mailing Street Address:	PO BOX 4112
Contacts Mailing City, State, Zip:	DARTMOUTH, MA 02747
Inactive Year:	1988
Land Disposal Closure Status:	Incomplete
Land Disposal Only, Category Waste Disposed:	C&D WASTE
Landfills Liner:	Not Lined
Municipality That The Operation Is Located In:	DARTMOUTH
Alpha-Numeric Identification Code:	DL0072.001
Numeric-Only Portion Of The Identification Code:	0072.001
Region:	SE
Org That Pays Any Annual Compliance Fee And/Or Permittee:	Not reported
Responsible Party Organization Type:	Not reported
Responsible Party Mailing Street Address Line 1:	Not reported
Responsible Party Mailing Street Address Line 2:	Not reported
Responsible Party Mailing City, State, Zip:	Not reported
Responsible Party Telephone Inc Extension:	Not reported
Maximum Permitted Tons Per Day:	Not reported
Current Operational Status:	Inactive

Count: 4 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
NORTH DARTMOUTH	U003302607	MASS DPW MAINT DEPOT	RTE 6	02747	UST, Financial Assurance
NORTH DARTMOUTH	S112551499	UMASS DARTMOUTH	OLD WESTPORT RD	02747	HW GEN
NORTH DARTMOUTH	S109330216	JARABEK FARM LANDFILL	OLD FALL RIVER RD	02747	SWF/LF
NORTH DARTMOUTH	S112551211	COLONIAL HONDA	225 STATE RD RTE 6	02747	HW GEN

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 78

Source: EPA
Telephone: N/A
Last EDR Contact: 01/21/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 78

Source: EPA
Telephone: N/A
Last EDR Contact: 01/09/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Federal Delisted NPL site list

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 10/25/2013	Source: EPA
Date Data Arrived at EDR: 11/11/2013	Telephone: N/A
Date Made Active in Reports: 01/28/2014	Last EDR Contact: 01/09/2014
Number of Days to Update: 78	Next Scheduled EDR Contact: 04/21/2014
	Data Release Frequency: Quarterly

Federal CERCLIS list

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 10/25/2013	Source: EPA
Date Data Arrived at EDR: 11/11/2013	Telephone: 703-412-9810
Date Made Active in Reports: 02/13/2014	Last EDR Contact: 02/28/2014
Number of Days to Update: 94	Next Scheduled EDR Contact: 06/09/2014
	Data Release Frequency: Quarterly

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 05/31/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 07/08/2013	Telephone: 703-603-8704
Date Made Active in Reports: 12/06/2013	Last EDR Contact: 01/10/2014
Number of Days to Update: 151	Next Scheduled EDR Contact: 04/21/2014
	Data Release Frequency: Varies

Federal CERCLIS NFRAP site List

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 10/25/2013	Source: EPA
Date Data Arrived at EDR: 11/11/2013	Telephone: 703-412-9810
Date Made Active in Reports: 02/13/2014	Last EDR Contact: 02/28/2014
Number of Days to Update: 94	Next Scheduled EDR Contact: 06/09/2014
	Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 03/13/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: Environmental Protection Agency
Telephone: (888) 372-7341
Last EDR Contact: 03/13/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: Environmental Protection Agency
Telephone: (888) 372-7341
Last EDR Contact: 03/13/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: Environmental Protection Agency
Telephone: (888) 372-7341
Last EDR Contact: 03/13/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: Environmental Protection Agency
Telephone: (888) 372-7341
Last EDR Contact: 03/13/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Varies

Federal institutional controls / engineering controls registries

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 12/17/2013
Date Data Arrived at EDR: 01/14/2014
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 14

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 03/10/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 12/17/2013
Date Data Arrived at EDR: 01/14/2014
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 14

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 03/10/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Varies

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 11/20/2013
Date Data Arrived at EDR: 11/21/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 95

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 02/14/2014
Next Scheduled EDR Contact: 06/02/2014
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/30/2013
Date Data Arrived at EDR: 10/01/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 66

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 02/07/2014
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Annually

State- and tribal - equivalent CERCLIS

SHWS: Site Transition List

Contains information on releases of oil and hazardous materials that have been reported to DEP.

Date of Government Version: 01/10/2014
Date Data Arrived at EDR: 01/14/2014
Date Made Active in Reports: 02/28/2014
Number of Days to Update: 45

Source: Department of Environmental Protection
Telephone: 617-292-5990
Last EDR Contact: 01/14/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: Solid Waste Facility Database/Transfer Stations
Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 06/10/2013
Date Data Arrived at EDR: 07/10/2013
Date Made Active in Reports: 08/28/2013
Number of Days to Update: 49

Source: Department of Environmental Protection
Telephone: 617-292-5989
Last EDR Contact: 01/10/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank Listing
Sites within the Leaking Underground Storage Tank Listing that have a UST listed as its source.

Date of Government Version: 01/10/2014
Date Data Arrived at EDR: 01/14/2014
Date Made Active in Reports: 02/28/2014
Number of Days to Update: 45

Source: Department of Environmental Protection
Telephone: 617-292-5990
Last EDR Contact: 01/14/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Quarterly

LAST: Leaking Aboveground Storage Tank Sites
Sites within the Releases Database that have a AST listed as its source.

Date of Government Version: 01/10/2014
Date Data Arrived at EDR: 01/14/2014
Date Made Active in Reports: 02/28/2014
Number of Days to Update: 45

Source: Department of Environmental Protection
Telephone: 617-292-5500
Last EDR Contact: 01/14/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Quarterly

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 11/06/2013
Date Data Arrived at EDR: 11/07/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 29

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 03/01/2013
Date Data Arrived at EDR: 03/01/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 42

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 08/27/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 08/27/2013
Date Data Arrived at EDR: 08/27/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 66

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 09/12/2011
Date Data Arrived at EDR: 09/13/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 59

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 02/21/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 11/21/2013
Date Data Arrived at EDR: 11/26/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 90

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Semi-Annually

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 02/01/2013
Date Data Arrived at EDR: 05/01/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 184

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/30/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 02/13/2014
Date Data Arrived at EDR: 02/14/2014
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 10

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

State and tribal registered storage tank lists

UST: Summary Listing of all the Tanks Registered in the State of Massachusetts
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 01/10/2014
Date Data Arrived at EDR: 01/21/2014
Date Made Active in Reports: 02/28/2014
Number of Days to Update: 38

Source: Department of Fire Services, Office of the Public Safety
Telephone: 617-556-1035
Last EDR Contact: 01/21/2014
Next Scheduled EDR Contact: 05/05/2014
Data Release Frequency: Quarterly

AST: Aboveground Storage Tank Database
Registered Aboveground Storage Tanks.

Date of Government Version: 10/22/2009
Date Data Arrived at EDR: 10/28/2009
Date Made Active in Reports: 11/06/2009
Number of Days to Update: 9

Source: Department of Public Safety
Telephone: 617-556-1035
Last EDR Contact: 01/20/2014
Next Scheduled EDR Contact: 05/05/2014
Data Release Frequency: Quarterly

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 07/29/2013
Date Data Arrived at EDR: 08/01/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 92

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 02/05/2013
Date Data Arrived at EDR: 02/06/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 65

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 11/21/2013
Date Data Arrived at EDR: 11/26/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 90

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 02/13/2014
Date Data Arrived at EDR: 02/14/2014
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 10

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 01/29/2014
Date Data Arrived at EDR: 01/29/2014
Date Made Active in Reports: 03/12/2014
Number of Days to Update: 42

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Semi-Annually

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 02/28/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 43

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 02/01/2013
Date Data Arrived at EDR: 05/01/2013
Date Made Active in Reports: 01/27/2014
Number of Days to Update: 271

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/30/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 07/29/2013
Date Data Arrived at EDR: 07/30/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 129

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 01/13/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

INST CONTROL: Sites With Activity and Use Limitation

Activity and Use Limitations establish limits and conditions on the future use of contaminated property, and therefore allow cleanups to be tailored to these uses.

Date of Government Version: 01/10/2014
Date Data Arrived at EDR: 01/14/2014
Date Made Active in Reports: 02/28/2014
Number of Days to Update: 45

Source: Department of Environmental Protection
Telephone: 617-292-5990
Last EDR Contact: 01/14/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Quarterly

State and tribal voluntary cleanup sites

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 09/17/2013
Date Data Arrived at EDR: 10/01/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 66

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 04/01/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

State and tribal Brownfields sites

BROWNFIELDS: Completed Brownfields Covenants Listing
Under Massachusetts law, M.G.L. c. 21E is the statute that governs the cleanup of releases of oil and/or hazardous material to the environment. The Brownfields Act of 1998 amended M.G.L. c. 21E by establishing significant liability relief and financial incentives to spur the redevelopment of brownfields, while ensuring that the Commonwealth's environmental standards are met. Most brownfields are redeveloped with the benefit of liability protections that operate automatically under M.G.L. c. 21E.

Date of Government Version: 01/01/2014
Date Data Arrived at EDR: 02/07/2014
Date Made Active in Reports: 03/14/2014
Number of Days to Update: 35

Source: Office of the Attorney General
Telephone: 617-963-2423
Last EDR Contact: 02/07/2014
Next Scheduled EDR Contact: 05/19/2014
Data Release Frequency: Annually

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 09/24/2013
Date Data Arrived at EDR: 09/24/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 03/20/2014
Next Scheduled EDR Contact: 07/07/2014
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 11/04/2013
Next Scheduled EDR Contact: 02/17/2014
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 12/04/2013
Date Data Arrived at EDR: 12/10/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 65

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/04/2014
Next Scheduled EDR Contact: 06/16/2014
Data Release Frequency: Quarterly

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/01/2007
Date Data Arrived at EDR: 11/19/2008
Date Made Active in Reports: 03/30/2009
Number of Days to Update: 131

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/04/2014
Next Scheduled EDR Contact: 06/16/2014
Data Release Frequency: No Update Planned

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/06/2013
Date Data Arrived at EDR: 04/25/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 15

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

LIENS: Liens Information Listing
A listing of environmental liens.

Date of Government Version: 02/24/2014
Date Data Arrived at EDR: 02/27/2014
Date Made Active in Reports: 03/14/2014
Number of Days to Update: 15

Source: Department of Environmental Protection
Telephone: 617-292-5628
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/06/2014
Data Release Frequency: Varies

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 01/03/2014
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 52

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 04/01/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Annually

MA SPILLS: Historical Spill List
The Spills Database was the release notification tracking system for spills that occurred prior to October 1, 1993. This information should be considered to be primarily of historical interest since all of the listed spills have either been cleaned up or assigned new tracking numbers and moved to the Reportable Releases or Sites Transition List databases.

Date of Government Version: 09/30/1993
Date Data Arrived at EDR: 12/03/2003
Date Made Active in Reports: 12/31/2003
Number of Days to Update: 28

Source: Department of Environmental Protection
Telephone: 617-292-5720
Last EDR Contact: 12/03/2003
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

RELEASE: Reportable Releases
Contains information on all releases of oil and hazardous materials that have been reported to DEP

Date of Government Version: 01/10/2014
Date Data Arrived at EDR: 01/14/2014
Date Made Active in Reports: 02/28/2014
Number of Days to Update: 45

Source: Department of Environmental Protection
Telephone: 617-292-5990
Last EDR Contact: 01/14/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch
Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 12/11/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/08/2013
Number of Days to Update: 36

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SPILLS 80: SPILLS80 data from FirstSearch
Spills 80 includes those spill and release records available from FirstSearch databases prior to 1990. Typically, they may include chemical, oil and/or hazardous substance spills recorded before 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 80.

Date of Government Version: 03/10/1998
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 03/05/2013
Number of Days to Update: 61

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: Environmental Protection Agency
Telephone: (888) 372-7341
Last EDR Contact: 03/13/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Varies

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 02/06/2014
Next Scheduled EDR Contact: 05/19/2014
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 01/15/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 02/26/2013
Date Made Active in Reports: 03/13/2013
Number of Days to Update: 15

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 03/10/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 01/24/2014
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 31

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 03/27/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 11/25/2013
Date Data Arrived at EDR: 12/12/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 74

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 03/11/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/07/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 146

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/25/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Varies

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/01/2013
Date Data Arrived at EDR: 09/05/2013
Date Made Active in Reports: 10/03/2013
Number of Days to Update: 28

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 03/05/2014
Next Scheduled EDR Contact: 06/16/2014
Data Release Frequency: Semi-Annually

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/31/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 44

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 02/26/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 09/29/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 64

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 03/28/2014
Next Scheduled EDR Contact: 07/07/2014
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 01/28/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 07/20/2011
Date Data Arrived at EDR: 11/10/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 10/09/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 06/01/2013
Date Data Arrived at EDR: 07/17/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 107

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 01/28/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 07/22/2013
Date Data Arrived at EDR: 08/02/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 91

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 03/10/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Quarterly

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 01/09/2014
Date Data Arrived at EDR: 01/10/2014
Date Made Active in Reports: 03/12/2014
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 01/10/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 11/18/2013
Date Data Arrived at EDR: 02/27/2014
Date Made Active in Reports: 03/12/2014
Number of Days to Update: 13

Source: EPA
Telephone: (617) 918-1111
Last EDR Contact: 03/14/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 11/01/2013
Date Data Arrived at EDR: 12/12/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 02/26/2013
Date Made Active in Reports: 04/19/2013
Number of Days to Update: 52

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 02/28/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Biennially

NPDES: NPDES Permit Listing

Listing of treatment plants in Massachusetts that hold permits to discharge to groundwater.

Date of Government Version: 02/18/2014
Date Data Arrived at EDR: 02/21/2014
Date Made Active in Reports: 03/14/2014
Number of Days to Update: 21

Source: Department of Environmental Protection
Telephone: 508-767-2781
Last EDR Contact: 02/21/2014
Next Scheduled EDR Contact: 06/02/2014
Data Release Frequency: Varies

DRYCLEANERS: Regulated Drycleaning Facilities

A listing of Department of Environmental Protection regulated drycleaning facilities that use perchloroethylene under the Environmental Results Program.

Date of Government Version: 01/21/2014
Date Data Arrived at EDR: 01/24/2014
Date Made Active in Reports: 02/28/2014
Number of Days to Update: 35

Source: Department of Environmental Protection
Telephone: 617-292-5633
Last EDR Contact: 01/20/2014
Next Scheduled EDR Contact: 05/05/2014
Data Release Frequency: Varies

ENFORCEMENT: Enforcement Action Cases

A listing of enforcement action cases tracked by Department of Environmental Protection programs, including Solid Waste and Hazardous Waste.

Date of Government Version: 08/01/2004
Date Data Arrived at EDR: 09/01/2004
Date Made Active in Reports: 10/01/2004
Number of Days to Update: 30

Source: Department of Environmental Quality
Telephone: 617-292-5979
Last EDR Contact: 02/17/2014
Next Scheduled EDR Contact: 05/19/2014
Data Release Frequency: Varies

AIRS: Permitted Facilities Listing

A listing of Air Quality permit applications.

Date of Government Version: 01/21/2014
Date Data Arrived at EDR: 01/24/2014
Date Made Active in Reports: 02/28/2014
Number of Days to Update: 35

Source: Department of Environmental Protection
Telephone: 617-292-5789
Last EDR Contact: 01/20/2014
Next Scheduled EDR Contact: 05/05/2014
Data Release Frequency: Varies

TIER 2: Tier 2 Information Listing

A listing of facilities which store or manufacture hazardous materials and submit a chemical inventory report

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 12/19/2013
Date Made Active in Reports: 01/30/2014
Number of Days to Update: 42

Source: Massachusetts Emergency Management Agency
Telephone: 508-820-2019
Last EDR Contact: 01/20/2014
Next Scheduled EDR Contact: 05/05/2014
Data Release Frequency: Annually

LEAD: Lead Inspection Database

The Massachusetts Childhood Lead Poisoning Prevention Program data of lead inspection for the state.

Date of Government Version: 01/08/2014
Date Data Arrived at EDR: 01/13/2014
Date Made Active in Reports: 02/28/2014
Number of Days to Update: 46

Source: Department of Health & Human Services, Childhood Lead Poisoning Prevention Progr
Telephone: 617-624-5757
Last EDR Contact: 03/24/2014
Next Scheduled EDR Contact: 07/07/2014
Data Release Frequency: Varies

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 01/15/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Semi-Annually

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 01/20/2014
Next Scheduled EDR Contact: 05/05/2014
Data Release Frequency: Varies

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 04/15/2013
Date Data Arrived at EDR: 07/03/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 72

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 01/02/2014
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Quarterly

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 01/15/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: N/A

GWDP: Ground Water Discharge Permits

The Ground Water Discharge Permits datalayer (formerly known as Groundwater Discharge Points) is a statewide point dataset containing approximate locations of permitted discharges to groundwater.

Date of Government Version: 09/01/2011
Date Data Arrived at EDR: 11/08/2011
Date Made Active in Reports: 12/05/2011
Number of Days to Update: 27

Source: MassGIS
Telephone: 617-556-1150
Last EDR Contact: 02/07/2014
Next Scheduled EDR Contact: 05/19/2014
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database

The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 83

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 01/30/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 08/17/2010
Date Data Arrived at EDR: 01/03/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 77

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 03/11/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 11/20/2013
Date Data Arrived at EDR: 12/03/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 72

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 02/14/2014
Next Scheduled EDR Contact: 06/02/2014
Data Release Frequency: Quarterly

Financial Assurance 2: Financial Assurance Information Listing

A listing of financial assurance information for underground storage tanks. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 10/21/2011
Date Data Arrived at EDR: 10/25/2011
Date Made Active in Reports: 11/18/2011
Number of Days to Update: 24

Source: Office of State Fire Marshal
Telephone: 978-567-3100
Last EDR Contact: 01/20/2014
Next Scheduled EDR Contact: 05/05/2014
Data Release Frequency: Quarterly

Financial Assurance 3: Financial Assurance Information listing

Information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 09/25/2013
Date Made Active in Reports: 10/10/2013
Number of Days to Update: 15

Source: Department of Environmental Protection
Telephone: 617-292-5970
Last EDR Contact: 01/28/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Varies

COAL ASH DOE: Sleam-Electric Plan Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 01/13/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Varies

MERCURY: Mercury Product Recyling Drop-Off Locations Listing

A listing of locations, collecting and recycling for mercury-added products. Mercury is toxic to the human nervous system, as well as fish and animals. Mercury can enter the body either through skin absorption or through inhalation of mercury vapors. At room temperature, small beads of mercury will vaporize.

Date of Government Version: 09/17/2013
Date Data Arrived at EDR: 11/26/2013
Date Made Active in Reports: 01/16/2014
Number of Days to Update: 51

Source: Department of Environmental Protection
Telephone: 617-292-5632
Last EDR Contact: 02/28/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Varies

HW GEN: List of Massachusetts Hazardous Waste Generators

Permanent generator identification numbers for all Massachusetts generators of hazardous waste and waste oil that have registered with or notified MassDEP of their hazardous waste activities.

Date of Government Version: 12/17/2013
Date Data Arrived at EDR: 12/31/2013
Date Made Active in Reports: 01/16/2014
Number of Days to Update: 16

Source: Department of Environmental Protection
Telephone: 617-292-5500
Last EDR Contact: 04/01/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Semi-Annually

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 11/11/2011
Date Data Arrived at EDR: 05/18/2012
Date Made Active in Reports: 05/25/2012
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 02/14/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

LEAD SMELTER 1: Lead Smelter Sites
A listing of former lead smelter site locations.

Date of Government Version: 01/29/2013
Date Data Arrived at EDR: 02/14/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 01/03/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Varies

TSD: TSD Facility
List of Licensed Hazardous Waste Treatment, Storage Disposal Facilities (TSDFs) in Massachusetts.

Date of Government Version: 11/01/2009
Date Data Arrived at EDR: 06/04/2013
Date Made Active in Reports: 07/18/2013
Number of Days to Update: 44

Source: Department of Environmental Protection
Telephone: 617-292-5580
Last EDR Contact: 01/03/2014
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Varies

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)
The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/23/2013
Date Data Arrived at EDR: 11/06/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 30

Source: EPA
Telephone: 202-564-5962
Last EDR Contact: 03/31/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data
A listing of minor source facilities.

Date of Government Version: 10/23/2013
Date Data Arrived at EDR: 11/06/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 30

Source: EPA
Telephone: 202-564-5962
Last EDR Contact: 03/31/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Annually

EPA WATCH LIST: EPA WATCH LIST
EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 06/30/2013
Date Data Arrived at EDR: 08/13/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 31

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 02/10/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Quarterly

Financial Assurance 1: Financial Assurance Information Listing
Information for hazardous waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 12/01/2010
Date Data Arrived at EDR: 12/23/2010
Date Made Active in Reports: 02/03/2011
Number of Days to Update: 42

Source: Department of Environmental Protection
Telephone: 617-292-5970
Last EDR Contact: 03/17/2014
Next Scheduled EDR Contact: 06/30/2014
Data Release Frequency: Varies

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR US Hist Auto Stat: EDR Exclusive Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Cleaners: EDR Exclusive Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Auto Stat: EDR Proprietary Historic Gas Stations - Cole

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: N/A
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Cleaners: EDR Proprietary Historic Dry Cleaners - Cole

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: N/A
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS: Recovered Government Archive State Hazardous Waste Facilities List
The EDR Recovered Government Archive State Hazardous Waste database provides a list of SHWS incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environmental Protection in Massachusetts.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/24/2013
Number of Days to Update: 176

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank
The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environmental Protection in Massachusetts.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/24/2013
Number of Days to Update: 176

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data
Source: Rextag Strategies Corp.
Telephone: (281) 769-2247
U.S. Electric Transmission and Power Plants Systems Digital GIS Data

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

Areas of Critical Environmental Concern Datalayer: The Areas of Critical Environmental Concern (ACEC) datalayer shows the location of areas that have been designated ACECs by the Secretary of Environmental Affairs. ACEC designation requires greater environmental review of certain kinds of proposed development under state jurisdiction within the ACEC boundaries. The ACEC Program is administered by the Department of Environmental Management (DEM) on behalf of the Secretary of Environmental Affairs. The Massachusetts Coastal Zone Management (MCZM) Office managed the original Coastal ACEC Program from 1978 to 1993, and continues to play a key role in monitoring coastal ACECs. Procedures for ACEC designation and the general policies governing the effects of designation are contained in the ACEC regulations (301 CMR 12.00). The ACEC datalayer has been compiled by MCZM and DEM and includes both coastal and inland areas.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

CECIL SMITH LANDFILL
OLD FALL RIVER ROAD
NORTH DARTMOUTH, MA 02747

TARGET PROPERTY COORDINATES

Latitude (North):	41.678 - 41˚ 40’ 40.80’’
Longitude (West):	71.0116 - 71˚ 0’ 41.76’’
Universal Tranverse Mercator:	Zone 19
UTM X (Meters):	332558.2
UTM Y (Meters):	4615768.0
Elevation:	79 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	41071-F1 FALL RIVER EAST, MA
Most Recent Revision:	1985
East Map:	41070-F8 NEW BEDFORD NORTH, MA
Most Recent Revision:	1979

EDR’s GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

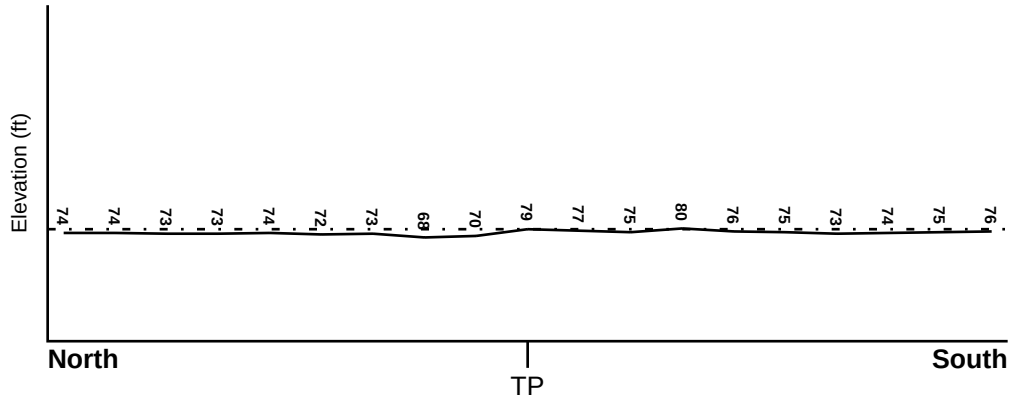
TOPOGRAPHIC INFORMATION

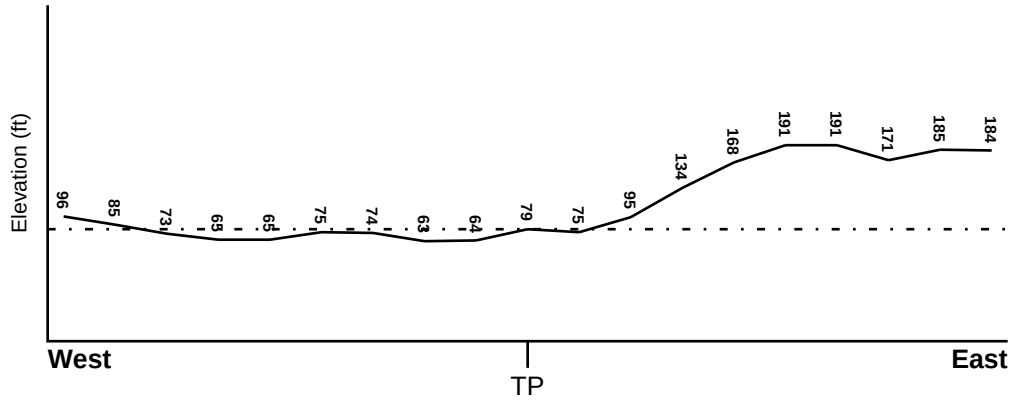
Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General West

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES





Target Property Elevation: 79 ft.

0 1/2 1 Miles

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
BRISTOL, MA	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 25005C - FEMA DFIRM Flood data

Additional Panels in search area: Not Reported

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
FALL RIVER EAST	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

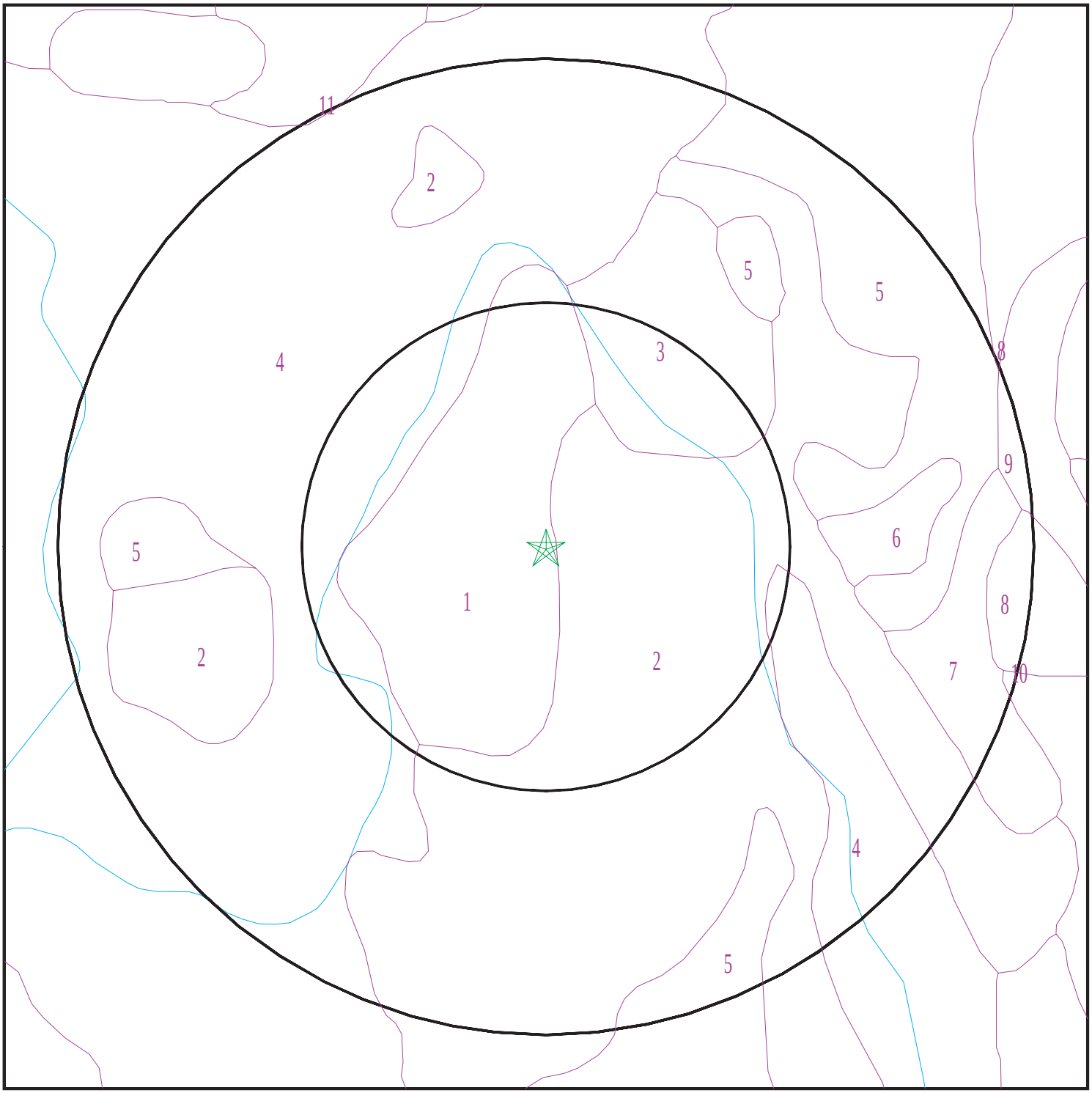
Era:	Precambrian
System:	Precambrian
Series:	Z ganitic rocks
Code:	Zg *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Plutonic and Intrusive Rocks

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 3900899.2s



Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

SITE NAME: Cecil Smith Landfill ADDRESS: Old Fall River Road North Dartmouth MA 02747 LAT/LONG: 41.678 / 71.0116	CLIENT: Sitec Environmental CONTACT: Geoffrey Souza INQUIRY #: 3900899.2s DATE: April 03, 2014 7:52 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: Udorthents

Soil Surface Texture: variable

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class:
Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	variable	Not reported	Not reported	Max: 141.14 Min: 0.42	Max: Min:
2	5 inches	59 inches	variable	Not reported	Not reported	Max: 141.14 Min: 0.42	Max: Min:

Soil Map ID: 2

Soil Component Name: Pits

Soil Surface Texture: extremely gravelly sand

Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class:
Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	extremely gravelly sand	Not reported	Not reported	Max: 141.14 Min: 42.34	Max: Min:
2	5 inches	59 inches	very gravelly coarse sand	Not reported	Not reported	Max: 141.14 Min: 42.34	Max: Min:

Soil Map ID: 3

Soil Component Name: Swansea

Soil Surface Texture: muck

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Very poorly drained

Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 15 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	muck	Not reported	Not reported	Max: 141.14 Min: 42.34	Max: Min:
2	9 inches	25 inches	muck	Not reported	Not reported	Max: 42.34 Min: 4.23	Max: Min:
3	25 inches	59 inches	gravelly loamy coarse sand	Not reported	Not reported	Max: 705 Min: 141.14	Max: Min:

Soil Map ID: 4

Soil Component Name: Freetown

Soil Surface Texture: mucky peat

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Very poorly drained

Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 15 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	1 inches	mucky peat	Not reported	Not reported	Max: 42.34 Min: 4.23	Max: Min:
2	1 inches	59 inches	muck	Not reported	Not reported	Max: 42.34 Min: 4.23	Max: Min:

Soil Map ID: 5

Soil Component Name: Hinckley

Soil Surface Texture: gravelly sandy loam

Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class: Excessively drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	gravelly sandy loam	Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6
2	9 inches	20 inches	very gravelly loamy coarse sand	Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 3.6

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
3	20 inches	59 inches	stratified cobbly coarse sand to very gravelly loamy fine sand	Not reported	Not reported	Max: 705 Min: 141.14	Max: 6 Min: 3.6

Soil Map ID: 6

Soil Component Name: Pipestone

Soil Surface Texture: loamy sand

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Poorly drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 31 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	3 inches	loamy sand	Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 7.3 Min: 3.6
2	3 inches	24 inches	loamy coarse sand	Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 7.3 Min: 3.6
3	24 inches	59 inches	sand	Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 7.3 Min: 3.6

Soil Map ID: 7

Soil Component Name: Deerfield

Soil Surface Texture: loamy sand

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 69 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	7 inches	loamy sand	Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6.5 Min: 4.5
2	7 inches	14 inches	loamy sand	Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6.5 Min: 4.5
3	14 inches	59 inches	sand	Not reported	Not reported	Max: 705 Min: 141.14	Max: 6.5 Min: 4.5

Soil Map ID: 8

Soil Component Name: Woodbridge

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 61 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	fine sandy loam	Not reported	Not reported	Max: 14.11 Min: 4.23	Max: 6 Min: 4.5
2	9 inches	27 inches	fine sandy loam	Not reported	Not reported	Max: 14.11 Min: 4.23	Max: 6 Min: 4.5
3	27 inches	59 inches	gravelly fine sandy loam	Not reported	Not reported	Max: 1.41 Min: 0	Max: 6 Min: 4.5

Soil Map ID: 9

Soil Component Name: Paxton

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 61 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	7 inches	fine sandy loam	Not reported	Not reported	Max: 14.11 Min: 4.23	Max: 6 Min: 4.5
2	7 inches	22 inches	fine sandy loam	Not reported	Not reported	Max: 14.11 Min: 4.23	Max: 6 Min: 4.5
3	22 inches	59 inches	gravelly sandy loam	Not reported	Not reported	Max: 1.41 Min: 0	Max: 6 Min: 4.5

Soil Map ID: 10

Soil Component Name: Woodbridge

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 61 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	fine sandy loam	Not reported	Not reported	Max: 14.11 Min: 4.23	Max: 6 Min: 4.5
2	9 inches	27 inches	fine sandy loam	Not reported	Not reported	Max: 14.11 Min: 4.23	Max: 6 Min: 4.5
3	27 inches	59 inches	gravelly fine sandy loam	Not reported	Not reported	Max: 1.41 Min: 0	Max: 6 Min: 4.5

Soil Map ID: 11

Soil Component Name: Windsor

Soil Surface Texture: loamy sand

Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class: Excessively drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	1 inches	loamy sand	Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 4.5
2	1 inches	11 inches	loamy sand	Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6 Min: 4.5
3	11 inches	59 inches	sand	Not reported	Not reported	Max: 141.14 Min: 42.34	Max: 6.5 Min: 4.5

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	0.500
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	0.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	USGS40000457950	0 - 1/8 Mile West
2	USGS40000458024	1/8 - 1/4 Mile NW
3	USGS40000457912	1/8 - 1/4 Mile SSW
4	USGS40000457884	1/8 - 1/4 Mile SSW
5	USGS40000457869	1/4 - 1/2 Mile SSW
6	USGS40000458113	1/4 - 1/2 Mile NE
7	USGS40000458122	1/4 - 1/2 Mile NW
8	USGS40000458192	1/4 - 1/2 Mile NNW
9	USGS40000457822	1/4 - 1/2 Mile SSW

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

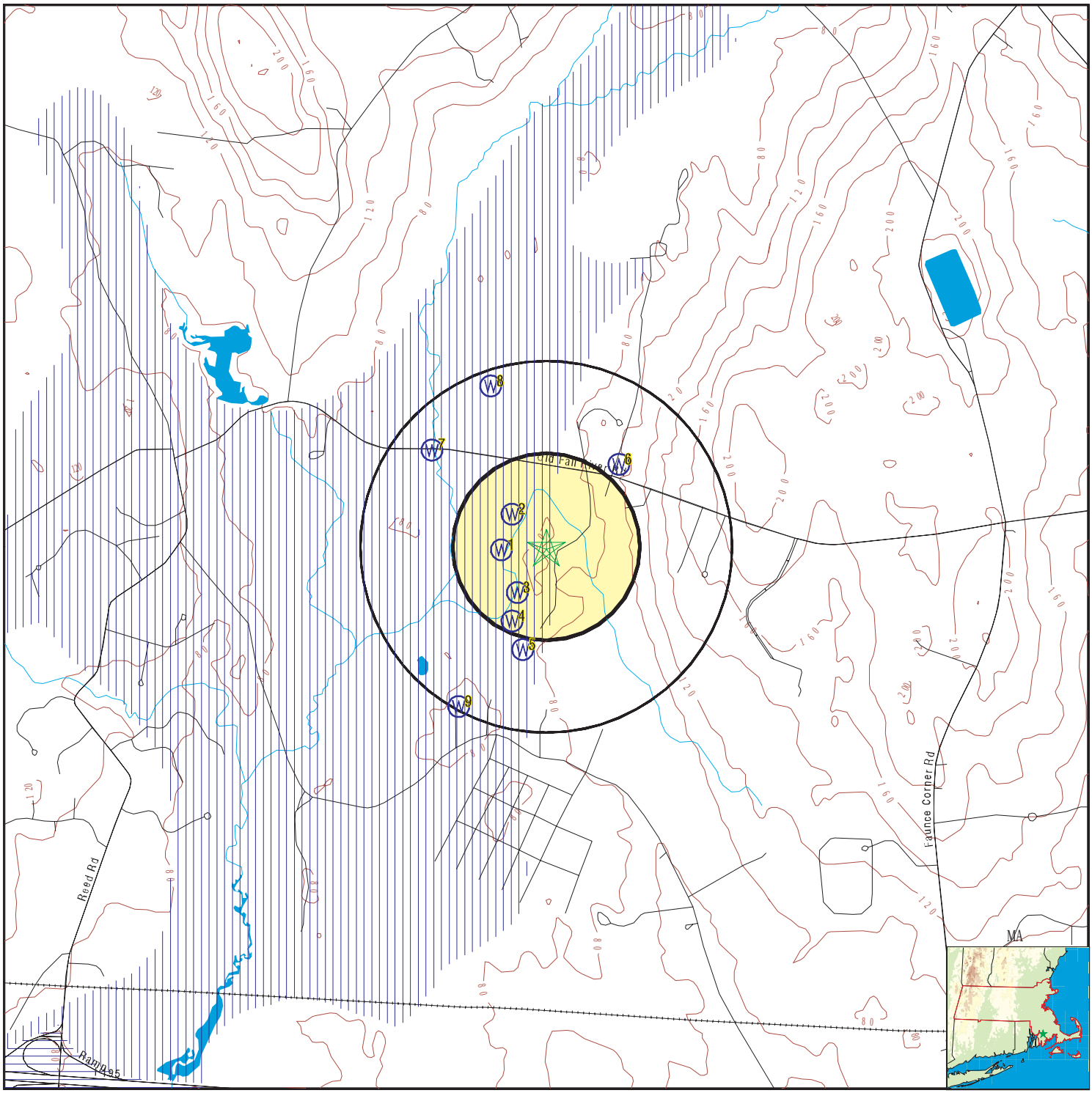
Note: PWS System location is not always the same as well location.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

PHYSICAL SETTING SOURCE MAP - 3900899.2s



County Boundary
Major Roads
Contour Lines
Earthquake epicenter, Richter 5 or greater
Water Wells
Public Water Supply Wells
Cluster of Multiple Icons

0 1/4 1/2 1 Miles

Groundwater Flow Direction
Indeterminate Groundwater Flow at Location
Groundwater Flow Varies at Location

Potentially Productive Aquifers
Not Potentially Productive Aquifers
DEP Approved Zone IIs
EPA Designated Sole Src. Aq.

SITE NAME: Cecil Smith Landfill	CLIENT: Sitec Environmental
ADDRESS: Old Fall River Road	CONTACT: Geoffrey Souza
North Dartmouth MA 02747	INQUIRY #: 3900899.2s
LAT/LONG: 41.678 / 71.0116	DATE: April 03, 2014 7:52 pm

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Map ID Direction Distance Elevation	Database	EDR ID Number
1 **West** **0 - 1/8 Mile** **Lower**	**FED USGS**	**USGS40000457950**

Org. Identifier:	USGS-MA		
Formal name:	USGS Massachusetts Water Science Center		
Monloc Identifier:	USGS-414040071005201		
Monloc name:	MA-DCW 146		
Monloc type:	Well		
Monloc desc:	IEP 7-80,WELL 64,EAST BRANCH WESTPORT R.BASIN		
Huc code:	01090002	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	41.6778808
Longitude:	-71.0139298	Sourcemap scale:	25000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	65
Vert measure units:	feet	Vertacc measure val:	1
Vert accmeasure units:	feet		
Vertcollection method:	Unknown		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Unconfined single aquifer		
Construction date:	197803	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	39
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1978-03	0.0	

2 **NW** **1/8 - 1/4 Mile** **Lower**	**FED USGS**	**USGS40000458024**

Org. Identifier:	USGS-MA		
Formal name:	USGS Massachusetts Water Science Center		
Monloc Identifier:	USGS-414045071005001		
Monloc name:	MA-DCW 147		
Monloc type:	Well		
Monloc desc:	IEP 7-80,WELL 65,EAST BRANCH WESTPORT R.BASIN		
Huc code:	01090002	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	41.6792697
Longitude:	-71.0133743	Sourcemap scale:	25000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	72
Vert measure units:	feet	Vertacc measure val:	1
Vert accmeasure units:	feet		
Vertcollection method:	Unknown		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		

Aquifer type:	Unconfined single aquifer		
Construction date:	197803	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	46.5
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1978-03	0.0	

3
SSW **FED USGS** **USGS40000457912**
1/8 - 1/4 Mile
Lower

Org. Identifier:	USGS-MA		
Formal name:	USGS Massachusetts Water Science Center		
Monloc Identifier:	USGS-414034071004901		
Monloc name:	MA-DCW 145		
Monloc type:	Well		
Monloc desc:	IEP 7-80,WELL 63,EAST BRANCH WESTPORT R. BASIN		
Huc code:	01090002	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	41.6762142
Longitude:	-71.0130965	Sourcemap scale:	25000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	75
Vert measure units:	feet	Vertacc measure val:	1
Vert accmeasure units:	feet		
Vertcollection method:	Unknown		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Unconfined single aquifer		
Construction date:	197803	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	25.8
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1978-03	10.0	

4
SSW **FED USGS** **USGS40000457884**
1/8 - 1/4 Mile
Lower

Org. Identifier:	USGS-MA		
Formal name:	USGS Massachusetts Water Science Center		
Monloc Identifier:	USGS-414030071005001		
Monloc name:	MA-DCW 144		
Monloc type:	Well		
Monloc desc:	IEP 7-80,WELL 62,EAST BRANCH WESTPORT R. BASIN		
Huc code:	01090002	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	41.6751031
Longitude:	-71.0133742	Sourcemap scale:	25000

Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	70
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Unknown		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Bedrock		
Aquifer type:	Unconfined single aquifer		
Construction date:	197803	Welldepth:	32.5
Welldepth units:	ft	Wellholedepth:	42.5
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1978-03	5.0	

5
SSW **FED USGS** **USGS40000457869**
1/4 - 1/2 Mile
Lower

Org. Identifier:	USGS-MA		
Formal name:	USGS Massachusetts Water Science Center		
Monloc Identifier:	USGS-414026071004801		
Monloc name:	MA-DCW 143		
Monloc type:	Well		
Monloc desc:	IEP 7-80,WELL 61,EAST BRANCH WESTPORT R.BASIN		
Huc code:	01090002	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	41.673992
Longitude:	-71.0128187	Sourcemap scale:	25000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	70
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Unknown		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Unconfined single aquifer		
Construction date:	197803	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	39
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1978-03	5.0	

6
NE **FED USGS** **USGS40000458113**
1/4 - 1/2 Mile
Higher

Org. Identifier:	USGS-MA		
Formal name:	USGS Massachusetts Water Science Center		
Monloc Identifier:	USGS-414052071003001		
Monloc name:	MA-DCW 174		
Monloc type:	Well		
Monloc desc:	7 COLDBROOK LN		
Huc code:	01090002	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	41.6812142
Longitude:	-71.0078186	Sourcemap scale:	25000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	101.0
Vert measure units:	feet	Vertacc measure val:	5
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Bedrock		
Aquifer type:	Unconfined single aquifer		
Construction date:	19890420	Welldepth:	240
Welldepth units:	ft	Wellholedepth:	240
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1989-04-20	10.0	

7
NW
1/4 - 1/2 Mile
Lower

FED USGS **USGS40000458122**

Org. Identifier:	USGS-MA		
Formal name:	USGS Massachusetts Water Science Center		
Monloc Identifier:	USGS-414054071010501		
Monloc name:	MA-DCB 3		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	01090002	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	41.6817697
Longitude:	-71.0175411	Sourcemap scale:	Not Reported
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	71.00
Vert measure units:	feet	Vertacc measure val:	.1
Vert accmeasure units:	feet		
Vertcollection method:	Level or other surveying method		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		

Aquifer type:	Not Reported		
Construction date:	1957	Welldepth:	55
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1957-06-01	3.00	

8
NNW **FED USGS** **USGS40000458192**
1/4 - 1/2 Mile
Lower

Org. Identifier:	USGS-MA		
Formal name:	USGS Massachusetts Water Science Center		
Monloc Identifier:	USGS-414103071005401		
Monloc name:	MA-DCW 124		
Monloc type:	Well		
Monloc desc:	FST 1-82,TW-8-81, EAST BRANCH WESTPORT R. BASIN		
Huc code:	01090002	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	41.6842697
Longitude:	-71.0144855	Sourcemap scale:	25000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	75
Vert measure units:	feet	Vertacc measure val:	5
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Sand and gravel aquifers (glaciated regions)		
Formation type:	Stratified Deposits, Undifferentiated		
Aquifer type:	Unconfined single aquifer		
Construction date:	198105	Welldepth:	47
Welldepth units:	ft	Wellholedepth:	47
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1981-11	4	

9
SSW **FED USGS** **USGS40000457822**
1/4 - 1/2 Mile
Higher

Org. Identifier:	USGS-MA		
Formal name:	USGS Massachusetts Water Science Center		
Monloc Identifier:	USGS-414018071010001		
Monloc name:	MA-DCW 169		
Monloc type:	Well		
Monloc desc:	783 HIXVILLE		
Huc code:	01090002	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	41.6717698
Longitude:	-71.016152	Sourcemap scale:	25000

Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	95.0
Vert measure units:	feet	Vertacc measure val:	5
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Bedrock		
Aquifer type:	Unconfined single aquifer		
Construction date:	19880318	Welldepth:	320
Welldepth units:	ft	Wellholedepth:	320
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 0

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: MA Radon

Radon Test Results

County	% of sites>4 pCi/L	Median
BRISTOL	23	1.8

Federal EPA Radon Zone for BRISTOL County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 02747

Number of sites tested: 4

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	Not Reported	Not Reported	Not Reported	Not Reported
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	2.500 pCi/L	100%	0%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW[R] Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Massachusetts Geographic Information System (MassGIS) Datalayers
Source: Executive Office of Environmental Affairs

Public Water Supply Database: The Public Water Supply datalayer contains the locations of public community surface and groundwater supply sources and public non-community supply sources as defined in 310 CMR 22.00.

OTHER STATE DATABASE INFORMATION

Areas of Critical Environmental Concern Datalayer: The Areas of Critical Environmental Concern (ACEC) datalayer shows the location of areas that have been designated ACECs by the Secretary of Environmental Affairs. ACEC designation requires greater environmental review of certain kinds of proposed development under state jurisdiction within the ACEC boundaries. The ACEC Program is administered by the Department of Environmental Management (DEM) on behalf of the Secretary of Environmental Affairs. The Massachusetts Coastal Zone Management (MCZM) Office managed the original Coastal ACEC Program from 1978 to 1993, and continues to play a key role in monitoring coastal ACECs. Procedures for ACEC designation and the general policies governing the effects of designation are contained in the ACEC regulations (301 CMR 12.00). The ACEC datalayer has been compiled by MCZM and DEM and includes both coastal and inland areas.

EPA Designated Sole Source Aquifers Datalayer: The Sole Source Aquifer datalayer was compiled by the Department of Environmental Protection (DEP) Division of Water Supply (DWS). Seven Sole Source Aquifers have been designated by the US Environmental Protection Agency (EPA) for Massachusetts. A Sole Source Aquifer (SSA) is an aquifer designated by US EPA as the sole or principal source of drinking water for a given aquifer service area; that is, an aquifer which is needed to supply 50% or more of the drinking water for that area and for which there are no reasonably available alternative sources should that aquifer become contaminated. The aquifers were defined by a EPA hydrogeologist.

Aquifers Datalayer: MassGIS produced an aquifer datalayer composed of 20 individual panels, generally based on the boundaries of the major drainage basins. Areas of high and medium yield were mapped. This datalayer includes polygon attribute coding to help in the identification of areas in which cleanup of hazardous waste sites must meet drinking water standards, as defined in the Massachusetts Contingency Plan (MCP) (310 CMR 40.00000).

Non-Potential Drinking Water Source Areas: Non-Potential Drinking Water Source Areas (NPDWSA) are regulatory in nature, representing one of many considerations used in determining the standards to which ground water must be cleaned in the event of a release of oil or hazardous material. NPDWSAs are not based on existing water quality and do not indicate poor ambient conditions.

DEP Approved Zone IIs Datalayer: The Department of Environmental Protection (DEP) approved Zone IIs datalayer was compiled by the DEP Division of Water Supply (DWS). The database contains 281 approved Zone IIs statewide. As stated in 310 CMR 22.02, a Zone II is "that area of an aquifer which contributes water to a well under the most severe pumping and recharge conditions that can be realistically anticipated (180 days of pumping at safe yield, with no recharge from precipitation.) It is bounded by the groundwater divides which result from pumping the well and by the contact of the aquifer with less permeable materials such as till or bedrock. In some cases, streams or lakes may act as recharge boundaries. In all cases, Zone IIs shall extend up gradient to its point of intersection with prevailing hydrogeologic boundaries (a groundwater flow divide, a contact with till or bedrock, or a recharge boundary)." These data are used in association with the Public Water Supplies datalayer. The following describes certain unique features of this association.

- Any proposed new well which will pump at least 100,000 gallons per day must have a Zone II delineation completed and approved by DEP prior to the well coming on line.
- Additionally, a new source may not be on-line yet, but other, older wells may fall within its Zone II boundary.
- Further, existing wells must have a Zone II delineated as a condition of receiving a water withdrawal permit under the Water Management Act.

RADON

State Database: MA Radon
Source: Department of Health
Telephone: 413-586-7525
Radon Test Results

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary faultlines, prepared in 1975 by the United State Geological Survey

STREET AND ADDRESS INFORMATION

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APPENDIX D

PRIVATE WATER SUPPLY WELLS

PRIVATE WATER SUPPLY WELLS WITHIN ONE MILE OF OLD FALL RIVER ROAD LANDFILL

MAP REF #	Address Number	Street Address	Map	Lot	Private Well On-Site	Public Water Connected	Water Supply Info Source	Comments
1	798	Old Fall River Road	71	6	yes		assumed	
2	796	Old Fall River Road	71	5	yes		assumed	
3	790	Old Fall River Road	71	4	yes		assumed	
5	789	Old Fall River Road	71	20	yes		assumed	
6	783	Old Fall River Road	71	21	yes		assumed	
7	770	Old Fall River Road	71	90	yes		assumed	
8	766	Old Fall River Road	71	89	yes		assumed	
9	762	Old Fall River Road	71	88	yes		assumed	
10	760	Old Fall River Road	71	86	yes		assumed	
11	754	Old Fall River Road	71	85	yes		assumed	
12	748	Old Fall River Road	71	84	yes		assumed	
13	740	Old Fall River Road	71	83	yes		assumed	
14	732	Old Fall River Road	71	82	yes		assumed	
16	700	Old Fall River Road	71	80	yes		assumed	
17	686	Old Fall River Road	71	79	yes		assumed	
18	680	Old Fall River Road	71	78	yes		assumed	
19	674	Old Fall River Road	71	77	yes		assumed	
20	668	Old Fall River Road	71	76	yes		assumed	
21	660	Old Fall River Road	71	75	yes		assumed	
22	652	Old Fall River Road	71	73-4	yes		assumed	
23	648	Old Fall River Road	71	73-3	yes		assumed	
24	644	Old Fall River Road	71	73-1	yes		assumed	
25	620	Old Fall River Road	71	72	yes		assumed	
26	600B	Old Fall River Road	71	71-1	yes		assumed	
27	600	Old Fall River Road	71	70	yes		assumed	
28	590	Old Fall River Road	71	69	yes		assumed	
29	584	Old Fall River Road	71	68	yes		assumed	
30	580	Old Fall River Road	71	68-1	yes		assumed	
31	558	Old Fall River Road	71	67	yes		assumed	
32	548	Old Fall River Road	71	66	yes		assumed	
33	544	Old Fall River Road	72	15	yes		assumed	
34	538	Old Fall River Road	72	14	yes		assumed	
35	530	Old Fall River Road	72	13	yes		assumed	
36	524	Old Fall River Road	72	12	yes		assumed	
37	516	Old Fall River Road	72	11	yes		assumed	
38	511	Old Fall River Road	72	16	yes		assumed	
39	517	Old Fall River Road	72	17	yes		assumed	
40	529	Old Fall River Road	72	16-1	yes		assumed	
41	533	Old Fall River Road	72	16-2	yes		assumed	
42	541	Old Fall River Road	72	16-3	yes		assumed	
43	547	Old Fall River Road	72	16-4	yes		assumed	
44	569	Old Fall River Road	71	65	yes		assumed	
45	571	Old Fall River Road	71	64	yes		assumed	
46	613	Old Fall River Road	71	61	yes		assumed	
47	615	Old Fall River Road	71	60	yes		assumed	
48	619	Old Fall River Road	71	58-1	yes		assumed	
49	629	Old Fall River Road	71	58	yes		assumed	
50	675	Old Fall River Road	71	57	yes		assumed	
51	681	Old Fall River Road	71	42	yes		assumed	
52	1193	North Hixville Road	71	35-2	yes		property card	
53	141	Old Fall River Road	71	38	yes		assumed	
54	755	Old Fall River Road	71	37	yes		assumed	
55	1199	North Hixville Road	71	34-1	yes		assumed	
56	1197	North Hixville Road	71	34	yes		assumed	
57	1198	North Hixville Road	71	24	yes		assumed	
58	1216	North Hixville Road	71	25	yes		assumed	
59	1190	North Hixville Road	71	23	yes		assumed	
60	1182	North Hixville Road	71	22	yes		assumed	
61	1191	North Hixville Road	71	35	yes		assumed	
62	1177	North Hixville Road	71	36	yes		assumed	
63	1163	Hixville Road	71	91	yes		assumed	
64	1141	Hixville Road	71	92	yes		assumed	
65	1140	Hixville Road	71	1	yes		assumed	
66	795	Collins Corner Road	71	43	yes		assumed	
67	787	Collins Corner Road	71	44	yes		assumed	
68	1405	North Hixville Road	75	3	yes		assumed	
69	658	Collins Corner Road	75	29	yes		assumed	
70	664	Collins Corner Road	75	30	yes		assumed	

MAP REF #	Address Number	Street Address	Map	Lot	Private Well On-Site	Public Water Connected	Water Supply Info Source	Comments
71	674	Collins Corner Road	71	45	yes		assumed	
72	688	Collins Corner Road	71	47	yes		assumed	
73	694	Collins Corner Road	71	48	yes		assumed	
74	714	Collins Corner Road	71	49	yes		assumed	
75	720	Collins Corner Road	71	50	yes		property card	
76	730	Collins Corner Road	71	51	yes		assumed	
77	738	Collins Corner Road	71	52	yes		assumed	
78	742	Collins Corner Road	71	53	yes		assumed	
79	748	Collins Corner Road	71	54	yes		assumed	
80	760	Collins Corner Road	71	55	yes		assumed	
81	780	Collins Corner Road	71	56	yes		assumed	
82	580	Collins Corner Road	75	27-1	yes		assumed	
83	522	Collins Corner Road	75	25	yes		assumed	
84	18	Antonio Way	75	24-8	yes		assumed	
85	21	Antonio Way	75	24-13	yes		assumed	
86	1100	Hixville Road	66	2-1	yes		assumed	
87	1316	Reed Road	66	2-2	yes		assumed	
88	1310	Reed Road	66	2-3	yes		assumed	
89	1306	Reed Road	66	2-4	yes		assumed	
90	1302	Reed Road	66	2-5	yes		assumed	
91	1	Butterfly Trail	66	2-6	yes		assumed	
92	5	Butterfly Trail	66	2-57	yes		assumed	
93	1279	Reed Road	66	41	yes		assumed	
94	1289	Reed Road	66	40	yes		assumed	
95	1297	Reed Road	66	39	yes		assumed	
96	1301	Reed Road	66	38	yes		property card	
97	1305	Reed Road	66	37	yes		assumed	
98	1306	Reed Road	66	36	yes		assumed	
99	1084	Hixville Road	66	35	yes		assumed	
100	1080	Hixville Road	66	34	yes		assumed	
101	1076	Hixville Road	66	33	yes		assumed	
102	1070	Hixville Road	66	32	yes		assumed	
103	1068	Hixville Road	66	31	yes		assumed	
104	11	Tupelo Court	66	51	yes		assumed	
105	14	Tupelo Court	66	50	yes		assumed	
106	10	Tupelo Court	66	49	yes		assumed	
107	6	Tupelo Court	66	48	yes		assumed	
108	9	Dartmouth Farms Trail	66	45	yes		assumed	
109	13	Dartmouth Farms Trail	66	46	yes		assumed	
110	17	Dartmouth Farms Trail	66	47	yes		assumed	
111	29	Dartmouth Farms Trail	66	52	yes		assumed	
112	33	Dartmouth Farms Trail	66	53	yes		assumed	
113	37	Dartmouth Farms Trail	66	54	yes		assumed	
114	36	Dartmouth Farms Trail	66	55	yes		property card	
115	30	Dartmouth Farms Trail	66	58	yes		assumed	
116	24	Dartmouth Farms Trail	66	59	yes		assumed	
117	20	Dartmouth Farms Trail	66	60	yes		assumed	
118	3	Red Maple Run	66	61	yes		assumed	
119	5	Red Maple Run	66	62	yes		assumed	
120	9	Red Maple Run	66	63	yes		assumed	
121	11	Red Maple Run	66	64	yes		assumed	
122	1054	Hixville Road	66	30	yes		assumed	
123	1050	Hixville Road	66	29	yes		assumed	
124	1010	Hixville Road	66	27	yes		assumed	
125	1004	Hixville Road	66	26	yes		assumed	
126	1002	Hixville Road	66	25	yes		assumed	
127	1000	Hixville Road	66	24	yes		property card	
128	980	Hixville Road	66	23-1	yes		assumed	
129	976	Hixville Road	66	23	yes		assumed	
130	958	Hixville Road	66	22	yes		assumed	
131	950	Hixville Road	66	20-8	yes		assumed	
132	51	Harvest Avenue	66	20-45	yes		assumed	
133	43	Harvest Avenue	66	20-46	yes		assumed	
134	39	Harvest Avenue	66	20-47	yes		assumed	
135	35	Harvest Avenue	66	20-48	yes		assumed	
136	31	Harvest Avenue	66	20-49	yes		assumed	
137	23	Harvest Avenue	66	20-51	yes		assumed	
138	19	Harvest Avenue	66	20-52	yes		assumed	
138.5	2	Red Maple Run	66	68	yes		assumed	
139	24	Harvest Avenue	66	20-37	yes		assumed	

MAP REF #	Address Number	Street Address	Map	Lot	Private Well On-Site	Public Water Connected	Water Supply Info Source	Comments
139.5	20	Harvest Avenue	66	20-36	yes		assumed	
140	32	Harvest Avenue	66	20-38	yes		assumed	
141	40	Harvest Avenue	66	20-39	yes		assumed	
142	44	Harvest Avenue	66	20-40	yes		assumed	
143	48	Harvest Avenue	66	20-41	yes		assumed	
144	52	Harvest Avenue	66	20-42	yes		assumed	
145	23	Autumn Court	66	20-28	yes		assumed	
146	35	Stonewall Avenue	66	20-17	yes		assumed	
147	34	Stonewall Avenue	66	20-16	yes		assumed	
148	870	Hixville Road	61	39	yes		assumed	
149	864	Hixville Road	61	38	yes		assumed	
150	840	Hixville Road	61	37	yes		assumed	
151	830	Hixville Road	61	36	yes		assumed	
152	820	Hixville Road	61	34	yes		assumed	
153	818	Hixville Road	61	33	yes		assumed	
154	814	Hixville Road	61	32	yes		assumed	
155	804	Hixville Road	66	18	yes		assumed	
156	796	Hixville Road	66	17	yes		assumed	
157	784	Hixville Road	192	43	yes		assumed	
158	750	Hixville Road	192	21	yes		assumed	
159	743	Hixville Road	192	58	yes		assumed	
160	747	Hixville Road	67	1-1	yes		assumed	
161	6	Countryside Drive	67	1-5	yes		assumed	
162	10	Countryside Drive	67	1-4	yes		assumed	
163	9	Countryside Drive	67	1-3	yes		assumed	
164	5	Countryside Drive	192	57-1	yes		assumed	
165	751	Hixville Road	192	57	yes		assumed	
166	753	Hixville Road	192	56	yes		assumed	
167	757	Hixville Road	192	55-1	yes		assumed	
168	757A	Hixville Road	192	55-2	yes		assumed	
169	783	Hixville Road	192	55	yes		assumed	
170	16	Francis Street	192	55-3	yes		assumed	
171	15	Francis Street	192	55-4	yes		assumed	
172	793	Hixville Road	61	42-4	yes		assumed	
173	795	Hixville Road	61	42-2	yes		assumed	
174	801	Hixville Road	61	42-1	yes		assumed	
175	819	Hixville Road	66	15	yes		assumed	
176	835	Hixville Road	61	42-3	yes		assumed	
177	839	Hixville Road	61	42-5	yes		assumed	
178	901	Hixville Road	61	42-8	yes		assumed	Database Error
179	873	Hixville Road	61	43	yes		assumed	
180	875	Hixville Road	61	42-7	yes		assumed	
181	959	Hixville Road	66	13	yes		assumed	
182	1005	Hixville Road	66	12	yes		assumed	
183	1007	Hixville Road	66	11	yes		assumed	
184	1009	Hixville Road	66	10	yes		assumed	
185	1011	Hixville Road	66	9	yes		assumed	
186	1015	Hixville Road	66	8	yes		assumed	
187	735	Hixville Road	192	59-1	yes		assumed	
188	727	Hixville Road	192	59	yes		assumed	
189	3	Gonsalves Court	192	60-1	yes		assumed	
190	2	Gonsalves Court	192	60	yes		assumed	
191	697	Hixville Road	192	61	yes		assumed	
192	689	Hixville Road	192	62	yes		assumed	
193	2	Pine Grove Lane	192	63-1	yes		assumed	
194	1	Pine Grove Lane	192	63-2	yes		assumed	
195	671	Hixville Road	192	63	yes		assumed	
196	651	Hixville Road	192	64	yes		assumed	
197	635	Hixville Road	67	9-1	yes		assumed	
198	627	Hixville Road	62	22	yes		assumed	
199	617	Hixville Road	62	23	yes		assumed	
200	613	Hixville Road	62	24	yes		assumed	
201	603	Hixville Road	62	25	yes		assumed	
202	585	Hixville Road	62	27	yes		assumed	
203	579	Hixville Road	62	28	yes		assumed	
204	567	Hixville Road	62	29	yes		assumed	
205	559	Hixville Road	62	30	yes		assumed	
206	555	Hixville Road	62	31	yes		assumed	
207	551	Hixville Road	62	32	yes		assumed	
208	545	Hixville Road	62	33	yes		assumed	

MAP REF #	Address Number	Street Address	Map	Lot	Private Well On-Site	Public Water Connected	Water Supply Info Source	Comments
209	527	Hixville Road	62	34-1	yes		assumed	
210	523	Hixville Road	62	34-2	yes		assumed	
211	517	Hixville Road	62	34	yes		assumed	
212	512	Hixville Road	62	15	yes		assumed	
213	526	Hixville Road	62	16	yes		assumed	
214	532	Hixville Road	62	17	yes		assumed	
215	540	Hixville Road	62	18-1	yes		assumed	
216	546	Hixville Road	62	18	yes		assumed	
217	544	Hixville Road	62	19	yes		assumed	
218	562	Hixville Road	62	19-1	yes		assumed	
219	574	Hixville Road	62	20-1	yes		assumed	
220	578	Hixville Road	62	20	yes		assumed	
221	588	Hixville Road	191	59-1	yes		assumed	
222	2	Matty Lane	191	59-2	yes		property card	
223	616	Hixville Road	191	57	yes		assumed	
224	620	Hixville Road	191	56	yes		assumed	
225	628	Hixville Road	191	55	yes		assumed	
226	640	Hixville Road	191	54	yes		assumed	
227	670	Hixville Road	191	1	yes		assumed	
228	674	Hixville Road	191	1-1	yes		assumed	
229	688	Hixville Road	191	2	yes		assumed	
230	696	Hixville Road	191	3	yes		assumed	
231	704	Hixville Road	191	4	yes		assumed	
232	716	Hixville Road	192	5	yes		assumed	
233	400	Faunce Corner Road	63	7		yes	property card	Bristol County COC
234	500	Faunce Corner Road	68	1-1		yes	property card	
235	508	Faunce Corner Road	68	2		yes	property card	
236	530	Faunce Corner Road	68	3		yes	property card	
237	532	Faunce Corner Road	68	4		yes	property card	
238	548	Faunce Corner Road	68	6		yes	property card	
239	558	Faunce Corner Road	68	8	yes		property card	
240	558	Faunce Corner Road	68	9	yes		property card	
241	576	Faunce Corner Road	68	10		yes	property card	
242	560	Faunce Corner Road	68	9-1	yes		property card	
243	636	Faunce Corner Road	68	11		yes	property card	
244	234	Old Fall River Road	68	14	yes		property card	
245	1	Energy Road	67	9		yes	property card	Power Plant
246	316	Old Fall River Road	67	12		yes	property card	
247	332	Old Fall River Road	67	13		yes	property card	
248	338	Old Fall River Road	67	14		yes	property card	
249	344	Old Fall River Road	67	15		yes	property card	
250	3	Rego Way	67	16-6		yes	property card	
251	7	Rego Way	67	16-5	yes		property card	
252	11	Rego Way	67	16-4	yes		property card	
253	10	Rego Way	67	16-3	yes		property card	
254	6	Rego Way	67	16-2		yes	property card	
255	4	Rego Way	67	16-1		yes	property card	
256	360	Old Fall River Road	67	16		yes	property card	
257	48	Ranger Road	67	18-1	yes		property card	
258	36	Ranger Road	67	18	yes		property card	
259	337	Old Fall River Road	67	22		yes	assumed	
260	263	Old Fall River Road	67	23-1	yes		property card	
261	255	Old Fall River Road	67	24		yes	property card	
262	249	Old Fall River Road	67	23	yes		property card	
263	231	Old Fall River Road	68	15	yes		property card	
264	245	Old Fall River Road	67	23-3	yes		property card	
265	460	Old Fall River Road	72	7	yes		DEP	Gosselins
266	1	Stonefield Lane	72	5-1	yes		H&A	
267	432	Old Fall River Road	72	5	yes		H&A	
268	418	Old Fall River Road	72	4	yes		assumed	
269	414	Old Fall River Road	72	3	yes		assumed	
270	390	Old Fall River Road	72	1	yes		assumed	
271	380	Old Fall River Road	67	20	yes		property card	
272	376	Old Fall River Road	67	19	yes		property card	
273	24	Ranger Road	67	17	yes		property card	
274	349	Old Fall River Road	72	32		yes	property card	
275	367	Old Fall River Road	72	31	yes		property card	
276	383	Old Fall River Road	72	29	yes		assumed	
277	385	Old Fall River Road	72	28-2	yes		assumed	
278	439	Old Fall River Road	72	27-2	yes		assumed	

MAP REF #	Address Number	Street Address	Map	Lot	Private Well On-Site	Public Water Connected	Water Supply Info Source	Comments
279	441	Old Fall River Road	72	27	yes		assumed	
280	445	Old Fall River Road	72	25	yes		assumed	
281	449	Old Fall River Road	72	25-1	yes		assumed	
282	7	Cold Brook Lane	72	25-2	yes		assumed	
283	11	Cold Brook Lane	72	25-3	yes		assumed	
284	15	Cold Brook Lane	72	25-4	yes		assumed	
285	39	Cold Brook Lane	72	23-1	yes		assumed	
286	53	Cold Brook Lane	72	23-2	yes		assumed	
287	61	Cold Brook Lane	72	23-3	yes		assumed	
288	67	Cold Brook Lane	72	23-4	yes		assumed	
289	66	Cold Brook Lane	72	23-5	yes		property card	
290	60	Cold Brook Lane	72	23-6	yes		assumed	
291	54	Cold Brook Lane	72	23-7	yes		assumed	
292	48	Cold Brook Lane	72	23-8	yes		assumed	
293	42	Cold Brook Lane	72	23-9	yes		assumed	
294	36	Cold Brook Lane	72	22	yes		assumed	
295	16	Cold Brook Lane	72	21	yes		assumed	
296	10	Cold Brook Lane	72	20	yes		assumed	
297	4	Cold Brook Lane	72	19	yes		assumed	
298	443	Old Fall River Road	72	36	yes		assumed	
299	798	Faunce Corner Road	73	9		yes	property card	
300	748	Faunce Corner Road	73	2		yes	property card	
			TOTALS =		278	22		

APPENDIX E

NHESP DETERMINATION

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

MassWildlife

Wayne F. MacCallum, *Director*

July 15, 2013

Michael Toomey
Boston Environmental Corporation
338 Howard Street
Brockton, MA 02302

RE: Applicant: Michael Toomey
Project Location: 452 Old Fall River Road, Dartmouth (Book 4889, Page 329, Bristol County Registry of Deeds)
Project Description: Closure of the Former Cecil Smith Landfill
NHESP File No.: 13-32053
Documents Referenced:

- Eastern Box Turtle Protection Plan (dated May 14, 2013; prepared by LEC Environmental Consultants, Inc.)
- Operation and Maintenance Plan (dated May 16, 2013; prepared by LEC Environmental Consultants, Inc.)
- Habitat Cover Type Map (dated June 20, 2013; prepared by LEC Environmental Consultants, Inc.)

Dear Applicant:

The Massachusetts Division of Fisheries & Wildlife's Natural Heritage & Endangered Species Program (the "Division") received the MESA Project Review Checklist, site plans (dated August 28, 2012, revised March 7, 2013; prepared by SITEC Environmental, Inc.; the "Project Plan") and other required materials for review pursuant to the Massachusetts Endangered Species Act (MESA) (MGL c.131A) and its implementing regulations (321 CMR 10.00).

Based on a review of the information provided and the information currently contained in our database, the proposed project occurs within the habitat of the Eastern Box Turtle (*Terrapene carolina*), a species state-listed as "Special Concern". This species and its habitats are protected pursuant to the MESA and its implementing regulations. A Fact Sheet for this species can be found on our website, www.mass.gov/nhesp.

As proposed, the project includes placement of fill material and the construction of a landfill cap, access roads, grading, and stormwater management structures totaling ±24.36 acres (the "Work") on a ±112.12-acre parcel (the "Property"), as shown on the Project Plan. The Division notes that the Applicant has also proposed to restore early-successional habitat conditions within a ±2.1-acre Proposed Restoration Area, as shown on the Habitat Cover Type Map referenced above, including the removal of surface debris and invasive species.

Division of Fisheries and Wildlife
Temporary Correspondence: 100 Hartwell Street, Suite 230, West Boylston, MA 01583
Permanent: Field Headquarters, North Drive, Westborough, MA 01581 (508) 389-6300 Fax (508) 389-7890
An Agency of the Department of Fish and Game

Based on the information provided and the information contained in our database, the NHESP has determined that this project, as currently proposed, **must be conditioned in order to avoid a prohibited "take" of state-listed species (321 CMR 10.18(2)(a))**. The project must adhere to the following conditions:

1. Recorded Letter: Prior to the start of Work, the Applicant shall record this letter in the Bristol County Registry of Deeds or the Land Court for the district in which the property is located so as to become a record part of the chain of title for the property. The Applicant shall provide the Division with proof of said recordation within five (5) business days of recording.
2. Seed Mix: Prior to the start of Work the Applicant shall submit, for Division review and approval, a seed mix(s) for the re-vegetation of the capped landfill, its associated stormwater management basins, and any other areas within the limit of Work to be seeded and stabilized,. To the greatest extent possible, all seed shall be composed primarily of ecotype-forbs listed as native to Bristol County, Massachusetts, as provided in *The Vascular Plants of Massachusetts: A County Checklist, First Revision* (Dow Cullina, Connolly, Sorrie & Somers, 2011).
3. Restoration Plan: Prior to the start of Work the Applicant shall submit, for Division review and approval, a Restoration Plan for the Proposed Restoration Area, as shown on the Habitat Cover Type Map referenced above. Said Plan shall detail procedures for the proposed invasive species removal and reporting of completed restoration activities to the Division after completion.
4. Turtle Protection Plan: All construction activities shall be subject to the protective measures outlined within the Eastern Box Turtle Protection Plan referenced above, unless otherwise approved in writing by the Division.
5. Operation and Maintenance Plan: Any mechanized vegetation management of the capped landfill or its associated stormwater management areas, as shown on the Project Plan, shall be subject to the protective measures outlined within the Operation and Maintenance Plan.

Provided the above-noted conditions are implemented and there are no changes to the project plans, this project will not result in a "take" of state-listed species. This determination is a final decision of the Division of Fisheries and Wildlife pursuant to 321 CMR 10.18. Any changes to the proposed project or any additional work beyond that shown on the site plans may require an additional filing with the Division pursuant to the MESA. This project may be subject to further review if no physical work is commenced within five years from the date of issuance of this determination, or if there is a change to the project.

The Division notes that all work is subject to the anti-segmentation provisions (321 CMR 10.16) of the MESA. Any proposed future projects or activities proposed on the property within mapped *Priority* and *Estimated* Habitat, as indicated in the Massachusetts Natural Heritage Atlas will require review by the Division pursuant to the MESA. **The Division, at its discretion, may take into account the cumulative impacts relevant to state-listed species, including but not limited to those associated with the current project, when or if future projects or activities are proposed**.

Please note that this determination addresses only the matter of state-listed species and their habitats. If you have any questions regarding this letter please contact Jesse E. Leddick, Endangered Species Review Biologist, at (508) 389-6386 or jesse.leddick@state.ma.us.

Sincerely,

Thomas W. French, Ph.D.
Assistant Director
Massachusetts Division of Fisheries & Wildlife

On this 15th day of July, 2013, before me, the undersigned notary public, personally appeared Thomas W. French, PhD., Assistant Director, proved to me through satisfactory evidence of identification, which was personal knowledge, to be the person whose name is signed on the preceding or attached document, and who swore or affirmed to me that the contents of the document are truthful and accurate to the best of his/her knowledge and belief.

Amy Coman, Notary Public
My Commission expires: April 28, 2017

AMY SUE COMAN
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires
April 28, 2017

cc: MA DEP Southeast Region
Town of Dartmouth Conservation Commission
Michael Quatromoni, SITEC Environmental, Inc.
Brian Madden, LEC Environmental Consultants, Inc.

APPENDIX F

HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN

For the

OLD FALL RIVER ROAD LANDFILL FINAL CLOSURE
452 OLD FALL RIVER ROAD, DARTMOUTH, MA

Prepared For:

Boston Environmental, Corp.
338 Howard Street
Brockton, MA 02302

Prepared By

SITEC Environmental, Inc.
769 Plain Street, Unit C
Marshfield, MA 02050

May 2014

HEALTH AND SAFETY PLAN

For the

OLD FALL RIVER ROAD LANDFILL FINAL CLOSURE
452 OLD FALL RIVER ROAD, DARTMOUTH, MA

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APPENDIX

Appendix A - Route to Saint Luke's Hospital

1.0 INTRODUCTION

This Health and Safety Plan (HASP) has been developed for waste consolidation activities at the Old Fall River Road Landfill in Dartmouth, Massachusetts. This type of activity is included under the jurisdiction of the Occupational Safety and Health Act (OSHA) regulations codified at 29 CFR 1910. The purpose of this HASP is to establish site specific health and safety requirements to be followed by all Boston Environmental, Corporation (BEC) personnel and contractors involved in conducting field work for this project.

The levels of protection and the procedures specified in this plan are based on the best information available from historical data and preliminary evaluations of the area. Therefore, these recommendations represent the minimum health and safety requirements to be observed by all personnel engaged in this project. Unforeseen site conditions or changes in scope of work may warrant a reassessment of protection levels and controls.

1.1 Site Description

The Old Fall River Road Landfill is located at 452 Old Fall River Road in Dartmouth, Massachusetts. The Landfill was an active landfill from 1954 to 1974. The Landfill was a privately operated and was used primarily for the disposal of construction debris waste during this period. The materials that were placed in the landfill generally consisted of demolition debris, brick, concrete and granite, along with scrap steel and tires. A single family home with a water supply well and septic system is located on the Site. The single family home is located in the center of the Landfill area. This home is scheduled to be relocated to an area off the Landfill and the well and septic system will be abandoned in accordance with Massachusetts regulations as part of the closure activities. The Site currently is used as farmland for animals and temporary lodging. A wooden pallet recycler also conducts activities on the Site. The proposed landfill closure activities will require the relocation of current site tenants.

1.2 Project Description

This Corrective Action Design (CAD) has been prepared by BEC for the Department of Environmental Protection's (MassDEP) approval of the final closure construction of the Cecil Smith Landfill (Landfill) in Dartmouth. The CAD seeks the approval of the use of specific waste materials for grading and shaping the site to achieve final grades for the Landfill, under the DEP's July 6, 2001 *Revised Guidelines for Determining Closure Activities at Inactive Unlined Landfill Sites* (Unlined Landfill Policy). Specifically the proposed final closure grades of the Landfill will be achieved by filling the site with soils or other materials, that are specifically approved by DEP for use as shaping and grading materials in unlined landfills. The materials that are to be accepted at the facility and the methods of accepting and screening the materials are described in *Section 4.0 Landfill Grading Materials Acceptance Plan* of the CAD.

2.0 SITE ORGANIZATION

The project personnel are organized to assure clarity of responsibility for health and safety tasks. The Project Coordinator is responsible to review site health and safety plans, determine if proposed plan changes meet relevant health and safety requirements, and verify that on-site project execution provides a safe and healthful work environment. The Health and Safety

Coordinator is responsible for assuring that the appropriate personnel and protective equipment are available to perform site work safely and is ultimately responsible for safe completion of the project. The Health and Safety Coordinator will have received 40 hours of Health and Safety training as defined at 29 CFR 1910.120 (e)(3). The Health and Safety Coordinator will have the following primary responsibilities:

- Developing and implementing safety procedures and training programs.
- Maintaining a high level of safety awareness.
- Providing personnel involved in the waste excavation work with information regarding the potential hazards of the project, should they occur, including health and safety provisions and standards in this Health and Safety Plan (the HASP) and other items in the Hazardous Materials Management Plan.
- Reviewing personal protection equipment available to personnel and determining the appropriate level of protection.
- Reviewing the utilization of equipment provided to personnel and their compliance with health and safety measures.
- Preparation and submittal of project reports including progress, accident and incident reports.
- Frequent communication and coordination with the Project Coordinator and other personnel assigned to the reclamation project. This will include conducting, at a minimum, weekly meetings with site personnel to review health and safety procedures and any possible improvements in the HASP. These weekly meetings will be conducted at the site order to discuss any specific issues that may arise. All operational personnel assigned to the waste excavation activities will be required to attend and participate in these meetings. The minutes of these meetings and operator attendance will be maintained by the Health and Safety Coordinator.

The Health and Safety Coordinator will be responsible for monitoring site health and safety, verifying the hazards of planned work, making health and safety decisions, and reporting unexpected hazards and noncompliance to the Project Coordinator who will provide support relative to mitigation actions, modifications to the Health and Safety Plan and the identification of any potential corrective actions that should be taken. The Project Coordinator will be responsible for the following.

- Frequent communication and coordination with the Health and Safety Coordinator regarding health and safety matters.
- Maintaining a high level of safety awareness. Equipment availability and maintenance.
- Enforcement of health and safety plan.
- Team member communications.
- Corrective action initiation.
- Project suspension authority, if necessary.

Both the Health and Safety Coordinator and the Project Coordinator are responsible for on-site enforcement of the health and safety plan. These personnel are identified below.

Title	Name	Phone Number
Health and Safety Coordinator	TBD	
Project Coordinator	Michael Toomey, BEC	(508) 897-8062

Operations Personnel are those individuals that are directly involved in the excavation, transportation, handling or inspection activities during the waste consolidation portion of the closure project. Their primary responsibilities are the following:

- Maintain a high level of safety awareness and performance of all work safely.
- Understand and follow the Health and Safety Plan and Hazardous Materials Management Plan.
- Understand the proper use and maintenance of personal protective equipment.
- Report any unsafe condition to the Health and Safety Coordinator and/or the Project Coordinator.
- Understand symptoms of potential exposure to contaminants and weather stress.

The Environmental Field Technician stationed at the excavation area shall be certified as having completed 40 hour OSHA , HAZWOPPER, Health and Safety Training. Laborers, equipment operators and other site personnel who may provide supporting functions shall receive awareness training on this Health and Safety Plan and on the Hazardous Materials Management Plan prior to initiating activities associated with the project. Acknowledgment of training records will be maintained by the Health and Safety Coordinator for all employees involved in the project.

3.0 TASKS

The following field work tasks will be conducted by operations personnel as part of the waste excavation and consolidation project.

- Removal of the existing cover material;
- Excavation of the buried waste material from the designated areas;
- Inspection, and screening of the excavated waste;
- Removal of MassDEP listed waste ban items;
- Consolidation of the excavated materials into the Landfill.

4.0 PROJECT HAZARD EVALUATION

This section identifies the anticipated site hazards and dictates protective measures. Section 4.1 identifies hazards and Section 4.2 evaluates and prescribes controls for those hazards.

4.1 Hazard Identification

A numerical ranking of 0 to 4 is used to indicate the presence and probability/severity of a hazard. These rankings are: 0 - that hazard is not posed by the planned tasks at this site or the impact of that hazard is insignificant; 1 - the worst case potential for exposure is less than

relevant action limits and the potential for serious injury is very low even without controls; 2 -the worst case potential for exposure is less than the relevant action limit and the potential for serious injury is low and controllable with standard operating procedures; 3 - the worst case potential for exposure is greater than the relevant action limit and the potential for a serious injury is moderate and controllable with specific controls; 4 - a high probability of encountering that hazard and a high probability for a serious adverse outcome if nothing is done to control the hazard.

4.1.1 Physical Hazards

Tasks: Earth Excavation and Backfill

1 - Heat Stress	0 - Enclosed Space	0 - Ergonomic Hazards
1 - Cold Stress	1 - Explosive/Flammable	2 - Heavy Lifting
2 - Noise	1 - Oxygen-Deficient	2 - Tripping/Falling
1 - Confined Space	0 - Electrical Equipment	2 - Heavy equipment.

Tasks: Waste Excavation, soil screening and hauling

1 - Heat Stress	0 - Enclosed Space	0 - Ergonomic Hazards
1 - Cold Stress	3 - Explosive/Flammable	2 - Heavy Lifting
2 - Noise	3 - Oxygen-Deficient	2 - Tripping/Falling
2 - Confined Space	0 - Electrical Equipment	2 - Heavy equipment.

4.1.2 Chemical Hazards

Tasks: Waste Excavation, soil screening and hauling

3 - Volatile Organic	1 - Inorganics	3 - Carcinogens
2 - Corrosive	1 - Reproductive toxicant	3 - Methane (flammability)
2 - Metals	3 - Asbestos	3 - Hydrogen sulfide

4.2 Description of Hazards and Controls

This section contains information on the appropriate control measures for these hazards.

4.2.1 Physical Hazards

Noise

Tasks:	Earth and Waste excavation, screening and hauling.
Sound level:	Variable - dB(A)
Noise source(s):	Excavator, dozer, screener, loader, trucks and compactors
Controls:	Hearing protection if noise exposures exceed 85 dB(A)

Explosive/Flammable

Tasks:	All, primarily waste excavation
Description:	Methane, equipment fuel

Location: Excavation of waste from within areas adjacent to the main Landfill, most probably within low lying excavation areas and depressions.
Controls: Exclude ignition sources (flame, standard electrical motors) from area of excavation into landfill, test for %LEL and stop work if >10%.

Oxygen-Deficient Atmosphere

Tasks: All, primarily waste excavation
Description: Methane and carbon dioxide from opened landfill areas
Location: Low areas adjacent to Landfill, most probably within Landfill excavation areas
Controls: Test for oxygen concentration, stop work if concentrations are less than 19.5%.

Heavy Lifting, Tripping/Falling

Task: Excavation, screening, backfilling and grading and shaping work
Description: Laborers working to support excavation work.
Locations: Around excavation area.
Controls: Always observe the buddy system. Never enter or exit the excavation area alone and never work alone in an isolated area. Never wander off by yourself. Do not wear loose clothes around heavy equipment.

4.2.2 Chemical Hazards

Tasks: Excavation of waste.
Description: Unknown volatile organic compounds, methane, hydrogen sulfide and carbon dioxide, that may be present.
Locations: Landfill excavation areas.
Controls: Use of Personnel Protection Equipment (PPE), monitoring

5.0 GENERAL HAZARD CONTROLS

An Exclusion Zone (EZ) will be established around any operation where access control is needed to protect personnel. EZs will be large enough to preclude injury or unacceptable exposure to anyone outside the EZ. Workers in EZs will abide by a "buddy system." A pre-job health and safety meeting will be conducted that will cover site hazards, hazards controls, emergency procedures and hazard communication.

Standard operating procedures and safe work practices to be followed in controlled areas consist of the following:

- Always observe the buddy system. Never enter or exit site alone and never work alone in an isolated area. Never wander off by yourself.
- Always maintain a line-of-sight.
- In the event PPE is worn and is ripped or torn, work shall stop and PPE shall be removed and replaced as soon as possible.
- Be alert to any unusual changes in your own condition; never ignore warning signs. Notify the Health and Safety Coordinator or Project Coordinator as to suspected exposures or accidents.

- A vehicle will be readily available for emergency use. All personnel involved in the waste excavation project shall be familiar with the most direct route to the nearest hospital.
- Copies of the HASP shall be readily accessible at the Site.
- Never climb over or under refuse or obstacles. Use safety harness/safety lines if it is necessary to enter any excavation area.
- Personnel not directly involved with the operation of heavy equipment should stand a safe distance away from the machinery.
- Personnel will insure that heavy equipment operators are aware of their presence and stay out of blind spots of equipment operators, if possible.

Special Procedures: No attempt will be made to enter excavations or any other confined spaces without the direct involvement of the Health and Safety Coordinator who must ensure that all appropriate and necessary confined space entry protocols and procedures are followed..

Standard operating procedures for minimizing worker contact with contaminants consist of the following:

- Practice contamination avoidance. Avoid unnecessary contact with waste materials.
- No eating, drinking or smoking in the area of waste excavation.
- Note wind direction. Personnel shall remain upwind whenever possible during excavation activities.
- Hands and face must be thoroughly washed before eating, drinking, etc.

6.0 PERSONAL PROTECTIVE EQUIPMENT

The following Level D personal protective equipment is the minimum PPE required for all tasks:

- Work Clothes including long sleeve shirts and long pants
- Safety Glasses
- Safety Vest
- Gloves
- Steel-toed Work Boots
- Ear Plugs (as necessary)
- Hard Hat

The operator will provide safety glasses, vests, gloves, ear plugs and hard hats to the workers at the excavation area. These materials will be stored at office trailer at the site entrance and will be distributed by the Health and Safety Coordinator.

7.0 MONITORING REQUIREMENTS

Ambient air quality will be monitored on a scheduled basis at the excavation work area and in the immediate vicinity of personnel who are conducted soil screening activities. Air quality will be monitored for Lower Explosive Limit (LEL), oxygen (O_2), hydrogen sulfide (H_2S) and total volatile organic compounds (VOCs). The monitoring shall be conducted by the Environmental Field Technician assigned to the project. All monitoring results will be recorded and the logs will be maintained by the operator until the project has been completed. The instrumentation

used for monitoring LEL, O_2 and H_2S shall be a GEM 500 multi-gas monitor or equal. VOCs shall be monitored by a photoionization detector (PID) as manufactured by Photovac, Hnu or other equal. The following monitoring will be conducted at the Site.

Instrument	Tasks	Frequency	Action Limits and Responses
LEL Meter	Excavation and soil screening	Excavation Areas - prior to starting work and at regular intervals (thirty minute minimum) or continuous as site activities/conditions warrant. Soil screening Area - prior to starting work and at two hour intervals.	>10%, Stop Work
O_2 Meter	Excavation and soil processing	Excavation Areas - prior to starting work and at regular intervals (thirty minute minimum) or continuous as site activities/conditions warrant. Soil screening Area - prior to starting work and at two hour intervals.	<19.5%, Stop Work
Hydrogen Sulfide Meter	Excavation and soil screening	Excavation Areas - prior to starting work and at regular intervals (30 minutes minimum) or continuous as site activities/conditions warrant. Soil screening Area - prior to starting work and at two hour intervals.	>5 ppm in breathing zone - Stop work
Photoionization Detector (PID)	Excavation and soil screening	Excavation Areas - prior to starting work and at regular intervals (30 minutes minimum) or continuous as site activities/conditions warrant. Soil screening Area - prior to starting work and at two hour intervals.	>5 ppm in breathing zone - Stop work

Air monitoring instruments will be regularly calibrated and are maintained by the manufacturer and/or the instrument rental company.

8.0 EMERGENCY PREPAREDNESS

The Project Coordinator or the Health and Safety Coordinator will perform the following emergency preparedness tasks before starting field activities associated with the buried waste excavation project.

- Meet with representatives of the Town of Dartmouth's emergency services (Police and Fire Departments) to review the Landfill closure and waste consolidation project and the potential hazards and emergency situations identified within this plan.
- Verify that operational personnel assigned to the reclamation project are equipped with 2-way radios so that the Health and Safety Coordinator, the Project

Coordinator or other facility management can be contacted in the event of an emergency situation.

- Have copies of the HASP with emergency telephone numbers and hospital route on-site at the facility's office trailer. Also emergency phone numbers will be posted within the cab of the heavy equipment dedicated to the excavation and consolidation of the waste.
- Inventory and check out on-site emergency equipment and supplies including fire extinguishers, first aid kits and eye wash stations.

Emergency Information

Ambulance:	**(Dartmouth Fire Department)**	**Phone: 911 (Emergency)**
Hospital:	**Saint Luke's Hospital** **101 Page Street, New Bedford**	**Phone: (508) 997-1515** **(Main Number)**

Directions to Hospital:
From Site, take right onto Old Fall River Road. Follow Old Fall River Road for 1.2 miles and take right turn onto Faunce Corner Road. Follow Faunce Corner Road for 1.8 miles and bear right onto I-195 east. Follow I-195 East for 1.6 miles and bear right onto Route 140 South. Follow Route 140 South for 1 miles and at lights travel straight onto Brownell Street. Follow Brownell Avenue for 0.6 miles and at next set of lights turn left onto Hawthorn Street. Follow Hawthorn Street for 0.8 miles and turn right onto Page Street. Emergency entrance on the right.

Dartmouth Police:	**Phone: 911 (Emergency)** **(508) 910-1700 (Business)**
Dartmouth Fire Department: **District 3**	**Phone: 911 (Emergency)** **(508) 994-6761 (Business)**
Dartmouth n Health Department:	**Phone: (508) 910-1804**
State Poison Center:	**Phone: (800) 682-9211**
Boston Environmental, Corp. Main Number: **338 Howard St., Brockton**	**Phone: (508) 427-6529**
Health and Safety Coordinator:	**TBD**
Project Coordinator:	**Phone: (508) 897-8062** **Michael Toomey, BEC**
Department of Environmental Protection:	**Phone: (508) 946-2700** **Emergency Response**
Environmental Consultant:	**Phone: (781)319-0100** **SITEC Environmental, Inc.**

The following emergency equipment will be stored and maintained at the work site by the Health and Safety Coordinator:

- Fire extinguishers on the heavy equipment and adjacent to the work area;
- First Aid Kits
- Emergency Eyewash
- Cellular Phones and/or two way radios shall be provided to Project Coordinator, Health and Safety Coordinator, the environmental Field Technician, the excavator operator and other personnel directly involved in the conduct of work at the site.

Emergency Situations and Procedures:
Waste excavation and consolidation activities present a potential risk to operational personnel. During routine operations, risk is minimized by establishing good work practices including monitoring the work zone, staying alert and using proper personal protective equipment. Unpredictable events such as physical injury, chemical exposure or fire could occur and must be anticipated. The following standard emergency procedures will be used by all operational personnel. The Health and Safety Coordinator shall be immediately notified of any on-site emergencies and shall be responsible for ensuring that the appropriate procedures are followed.

- **Personal Injury to an Individual in the Work Area:** Upon notification of an injury to operational personnel, a rescue team, to be assembled by the Health and Safety Coordinator, will enter the Exclusion Zone and do a rapid visual inspection of the area to determine if the injured person can be approached safely. Approach the injured person if safe to do so, check for life threatening injures and administer first aid if necessary. If the victim can be safely moved, transport to safe area beyond the Exclusion Zone. The victim will be transported to the nearest hospital or medical center if the extent of the injury warrants medical treatment. If necessary, emergency medical personnel and an ambulance will be summoned to stabilize and transport the victim. Emergency contact phone numbers are to be posted within the cab of the excavator and at the office located at the scale. If the injured person must leave the Site, the Health and Safety Coordinator will evaluate if the absence of the injured person increases the risk to remaining personnel. Field activities will cease until the cause of the injury has been identified and corrected. The Health and Safety Coordinator will document the incident on an accident report that will be maintained at the facility.

- **Fire/Explosion:** Fire extinguishers will be carried by all heavy equipment and will also be available at locations directly adjacent to the reclamation work area. Fire prevention will be practiced by keeping equipment clean and in proper working order and preventing the accumulation of flammable materials. Fire will also be prevented through the air monitoring program to be implemented at the work area for detecting the presence of flammable landfill gas. No flames or smoking will be permitted in the work area to prevent fire or explosion. In the event that a fire or explosion occurs, that cannot be readily extinguished with available fire extinguishers, the Dartmouth Fire Department will be summoned to respond to the incident. The Health and Safety Coordinator and/or the Project Coordinator will be responsible for making all appropriate notifications.

All necessary precautions must be implemented at the facility to prevent fire from breaking out at the Landfill. These precautions should include the timely and proper covering of all exposed waste at the end of the day and the enforcement of the ban on smoking at the site. Furthermore, all materials stored or stockpiled on-site must be kept in a manner to prevent fire hazards.

In the event of a fire, the workers assigned to the excavation operations will immediately stop working and withdraw from the area. The Health and Safety Coordinator or the Project Coordinator will make all appropriate notifications for emergency response and an investigation will be initiated to evaluate conditions, health and safety procedures and requires equipment.

- **Chemical Exposure:** If an individual is over exposed to a contaminant, he will be immediately removed from the work area. Precautions will be taken to avoid exposure of other individuals to the contamination. If the individual's clothing is contaminated, rinsing will be initiated and the clothing will be removed, if appropriate. If the individual's skin has been contacted by the contaminant, the skin will be rinsed with copious amounts of water. In the event of eye contact, an emergency eye wash will be used to rinse the eyes. The eye wash station will be positioned at the office trailer located at the site entrance. If appropriate, the victim will be transported to the nearest hospital or medical center. If appropriate, emergency medical personnel and an ambulance will be summoned to stabilize and transport the victim. All chemical exposures will be reported to the Health and Safety Coordinator who will then determine the appropriate courses of action to be taken. An investigation will be initiated and an Accident Report will be prepared. Follow-up action will be taken to correct and situation that causes the exposure.

- **Personal Protective Equipment Failure:** If field personnel are experiencing an equipment failure or alteration of protection equipment that affects the protection factor, that person and his/her buddy shall immediately leave the exclusion zone. Re-entry is not permitted until the equipment has been repaired or replaced.

- **Other Equipment Failure:** If safety related equipment (i.e. air monitoring equipment, combustible gas meter, oxygen meter, etc.) fails to operate properly, Site activities will cease until the equipment is repaired or replaced.

In all situations, when an on-Site emergency results in evacuation of the Exclusion Zone, operational personnel shall not re-enter until:

- The conditions resulting in the emergency have been corrected.

- The hazards have been reassessed.

- The Health and Safety Plan has been reviewed.

- Operational personnel have been briefed on any changes in the Health and Safety Plan.

9.0 ACKNOWLEDGEMENT OF TRAINING

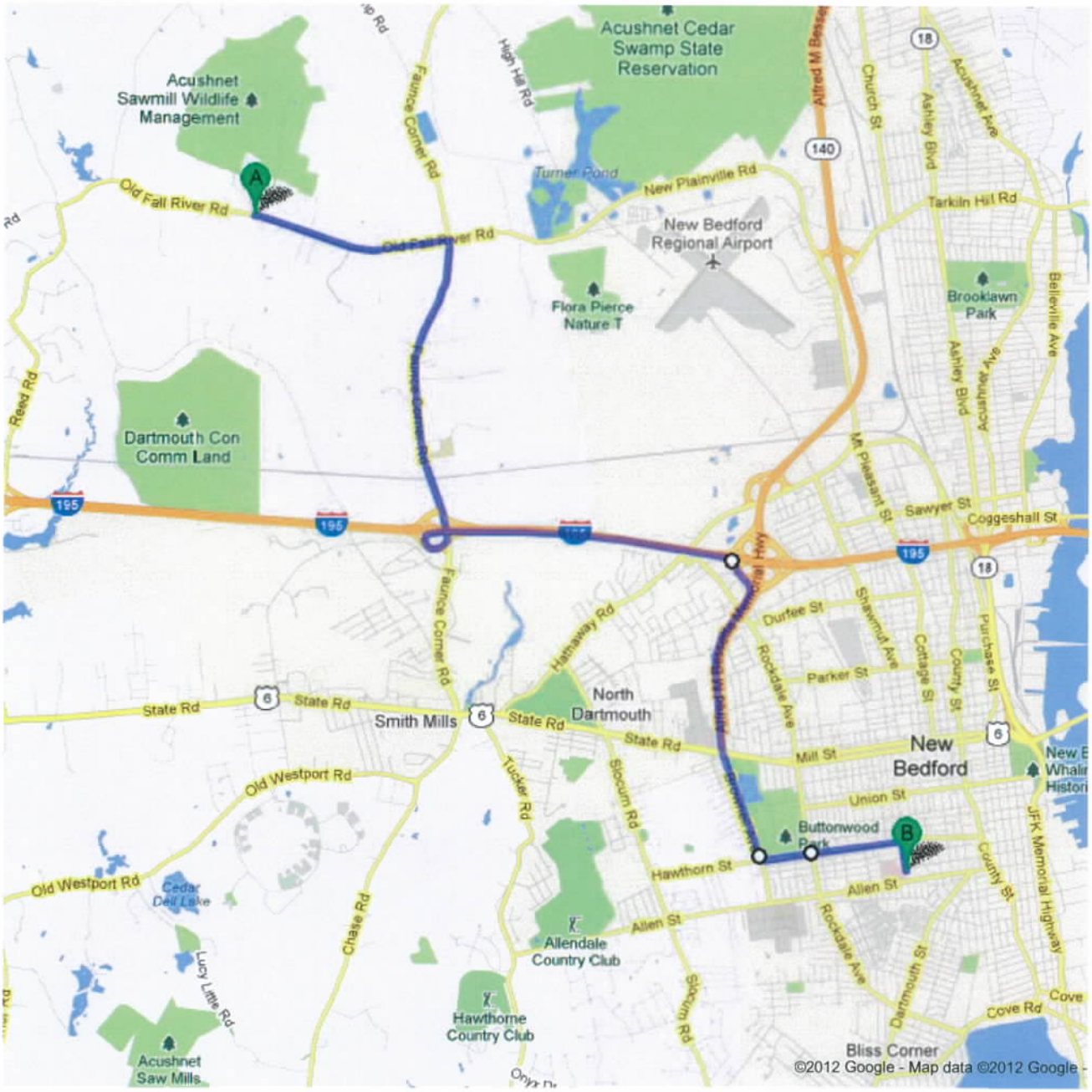
The following individuals have read this safety document and are familiar with its contents, site conditions and Health and Safety procedures (please sign below):

Signature	Date	Company

APPENDIX A

MAP TO SAINT LUKE'S HOSPITAL

Directions to "St Luke's Hospital"
Page St
7.7 mi – about **14 mins**



452 Old Fall River Rd, Dartmouth, MA 02747

	1. Head **north** on **Stonefield Ln** toward **Old Fall River Rd**	go 456 ft total 456 ft
	2. Turn right onto **Old Fall River Rd** About 2 mins	go 1.1 mi total 1.2 mi
	3. Turn right onto **Faunce Corner Rd** About 3 mins	go 1.8 mi total 3.0 mi
	4. Slight right to merge onto **I-195 E** toward **New Bedford/Cape Cod** About 2 mins	go 1.9 mi total 4.9 mi
	5. Take exit **13A** to merge onto **MA-140 S** toward **US-6/Dartmouth** About 2 mins	go 1.2 mi total 6.1 mi
	6. Take the **US 6 E** exit on the left toward **New Bedford/Fairhaven**	go 190 ft total 6.1 mi
	7. Turn left onto **Kempton St** About 2 mins	go 0.4 mi total 6.6 mi
	8. Turn right onto **Rockdale Ave** About 1 min	go 0.5 mi total 7.1 mi
	9. Turn left onto **Hawthorn St** About 1 min	go 0.5 mi total 7.6 mi
	10. Turn right onto **Page St** Destination will be on the right	go 0.2 mi total 7.8 mi

101 Page St, New Bedford, MA 02740

APPENDIX G

SAMPLE FIELD LOGS

SITEC Environmental, Inc.
769 Plain Street, Unit C
Marshfield, MA 02050
Phone: (781) 319-0100
FAX: (781) 834-4783

Boring Log

Boring/Well No.:

Project No:	***Soil Sampling Method:***
Project Name:	***Soil Sampling Device:***
City, State:	***Monitoring Well(MW):***
Field Technician:	***MW Construction:***
Drilling Contractor:	***Depth to Groundwater:***
Drilling Method:	***Field Screening:***
Borehole Depth:	
Borehole Diameter:	***Date:***

Depth (feet)	*Sample ID*	*Sample Interval (feet)*	*Penetration (blows/6 inches)*	*Sample Recovery Rec/Pen*	*PID (ppm)*	*Sample Description*	*MW Construction*	
							Pipe	Fill
0								
5								
10								
15								
20								
25								
30								

EXAMPLE

Native soil/backfill | Bentonite | Well Screen

Filter Sand | Solid Well Pipe/Riser | >< Groundwater Elevation

Notes:

Chain-of-Custody Record

PAGE ___ OF ___

COMPANY INFORMATION	COMPANY'S PROJECT INFORMATION	SHIPPING INFORMATION
Name:	Regulatory Protocol:	Carrier:
Address:	For the State of:	Airbill Number:
	Project Name:	Date Shipped:
	Project Number:	Quote #:
Telephone:	P.O. #	
Facsimile:	Sampler Name(s):	
Contact Name:		

(TAT IS IN BUSINESS DAYS) (IF OTHER NOTE BELOW)

CIRCLE TAT: 10 Day 5 Day 3 Day 48 Hr 24 Hr Other

SAMPLE CONTAINERS (NOTE 4)

PRESERVATIVE / CONTAINER TYPE / VOLUME

WHG LAB #	SAMPLE ID (NOTE 1)	COLLECTION DATE	COLLECTION TIME	COMPOSITE OR GRAB	MATRIX	ANALYSIS/REMARKS (NOTES 2, 3)	SAMPLER(S) INTIALS	NUMBER OF CONTAINERS					

Relinquished by: (*signature*)	DATE	TIME	Received by: (*signature*)
Relinquished by: (*signature*)	DATE	TIME	Received by: (*signature*)
Relinquished by: (*signature*)	DATE	TIME	Received for Laboratory by: (*signature*)

NOTES TO SAMPLER(S): (1) Limit Sample Identification to 6 characters, if possible; (2) Indicate designated Lab Q.C. sample and type (e.g.; MS/MSD/REP) and provide sufficient sample; (3) Field duplicates are separate sample; (4) e.g.; 40ml/glass/H_2SO_4

Notes to Lab:

EXAMPLE

SITEC ENVIRONMENTAL

Hazardous and Solid Waste Consultants
New Bedford • Marshfield

Phone: (508) 998-2125 • (781) 319-0100
Fax: (508) 998-7554 • (781) 834-4783
Internet: www.sitec-engineering.com

GROUNDWATER SAMPLING FIELD LOG

one sheet per sampling location

Date:	
Project No.:	
Project:	
Client:	
Sample Location ID:	

GENERAL INFORMATION

SITEC Personnel Present:		Location Activity Start Time: Location Activity End Time:
Weather:	Temperature: °F at	Comments:

WATER LEVEL / WELL DATA

M.P.: ___	Well Depth:_____ ft	Depth to Water:_____ ft	Casing/Well Diff:_____ ft	Casing/Ground Diff:_____ ft
Water Column Height:_____ ft Well Diameter:_____ in		Volume ☐ 0.14 gal/ft (1.5 in.) ☐ 0.16 gal/ft (2.0 in.)	Static Well Volume: _____ gal Volume to Purge: _____ gal	

PURGING DATA

Device: ☐ Submersible Pump ☐ Peristaltic Pump ☐ Bailer

Purge Data Collected: ☐ In-line ☐ From Container ☐ In-situ

Clock (m:ss)	Pump Dial	Purged (gallons)	Temp (°C)	Spec. Cond. (mS/cm)	pH	Diss. O_2 (mg/l)	ORP (+/- mv)	Turbidity (NTU)	Comments

SAMPLE COLLECTION DATA

Parameter(s)	Bottle(s)	Pres.	Check if Field Filtered	Collection Method
			☐ In-line ☐ Air Pump	☐ Submersible Pump ☐ Peristaltic Pump ☐ Bailer
			☐ In-line ☐ Air Pump	☐ Submersible Pump ☐ Peristaltic Pump ☐ Bailer
			☐ In-line ☐ Air Pump	☐ Submersible Pump ☐ Peristaltic Pump ☐ Bailer
			☐ In-line ☐ Air Pump	☐ Submersible Pump ☐ Peristaltic Pump ☐ Bailer
			☐ In-line ☐ Air Pump	☐ Submersible Pump ☐ Peristaltic Pump ☐ Bailer
			☐ In-line ☐ Air Pump	☐ Submersible Pump ☐ Peristaltic Pump ☐ Bailer
			☐ In-line ☐ Air Pump	☐ Submersible Pump ☐ Peristaltic Pump ☐ Bailer

_____ Title: _____

Signature of Sampler

EXAMPLE

APPENDIX H

REFERENCE DOCUMENTS ON COMPACT DISC

•Roy F. Weston, Inc., October 1, 2001, *Final Site Inspection Report for Cole Brook Pines Landfill, Dartmouth, MA.*

•Weston Solutions, Inc., November 30, 2004, *Draft Expanded Site Inspection Report for Cole Brook Pines Landfill, Dartmouth, MA.*

•Weston Solutions, Inc., January 28, 2005, *Final Expanded Site Inspection Report for Cole Brook Pines Landfill, Dartmouth, MA.*

•Brown & Caldwell, Inc., March 7, 2003, *Memorandum, Cole Brook Pines Landfill, Dartmouth, MA.*

•Haley & Aldrich, Inc., May 5, 2013, *Summary of Available Environmental Data*, Former Cole Brook Pines/Old Fall River Road Landfill, Dartmouth, MA.

•Haley & Aldrich, Inc., May 5, 2013, *Summary of Environmental Conditions*, Former Cole Brook Pines/Old Fall River Road Landfill, Dartmouth, MA.

•Haley & Aldrich, Inc., June 18, 2013, *Summary of Groundwater Assessment Findings*, Former Cole Brook Pines/Old Fall River Road Landfill, Dartmouth, MA.

•Massachusetts Department of Environmental Protection, March 28, 2014, Administrative Consent Order, #ACO-SE-14-4001, Old Fall River Road Landfill, Dartmouth, MA.

FINAL SITE INSPECTION PRIORITIZATION REPORT
FOR
COLD BROOK PINES LANDFILL
DARTMOUTH, MASSACHUSETTS

Prepared For:
U.S. Environmental Protection Agency
Region I
Office of Site Remediation and Restoration
1 Congress Street, Suite 1100
Boston, MA 02114-2023

CONTRACT NO. 68-W-00-097

CERCLIS NO. MAD981069990
TDD NO. 01-05-0054
PCS NO. 2553
DC NO. A-2186

Submitted By:
Roy F. Weston, Inc. (WESTON®)
Region I
Superfund Technical Assessment and Response Team 2000 (START)
37 Upton Drive
Wilmington, MA 01887

1 October 2001

Region I START 2000
Reviewed and Approved:

Ryan Manderbach Site Leader	10/01/01 Date
Paul H. Schrot Project Leader	10/01/01 Date
QA Review	10/1/01 Date

Work Order No. 2010-001-001-2553-70

DISCLAIMER

This report was prepared solely for the use and benefit of the U.S. Environmental Protection Agency Region I (EPA Region I), Office of Site Remediation and Restoration for the specific purposes set forth in the contract between the EPA Region I and the Roy F. Weston, Inc. (WESTON®), Superfund Technical Assessment and Response Team 2000 (START). Professional services performed and reports generated by START have been prepared for EPA Region I purposes as described in the START contract. The information, statements, and conclusions contained in the report were prepared in accordance with the statement of work, and contract terms and conditions. The report may be subject to differing interpretations or misinterpretation by third parties who did not participate in the planning, research or consultation processes. Any use of this document or the information contained herein by persons or entities other than the EPA Region I shall be at the sole risk and liability of said person or entity. START, therefore, expressly disclaims any liability to persons other than the EPA Region I who may use or rely upon this report in any way or for any purpose.

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INTRODUCTION

The Roy F. Weston, Inc. (WESTON®), Superfund Technical Assessment and Response Team 2000 (START) was requested by the U.S. Environmental Protection Agency Region I (EPA Region I), Office of Site Remediation and Restoration to perform a Site Inspection Prioritization (SIP) of the Cold Brook Pines Landfill (CBPL) property located at 460 Old Fall River Road in Dartmouth, Massachusetts (MA). Tasks were conducted in accordance with the SIP scope of work and technical specifications provided by EPA Region I. A Preliminary Assessment (PA) for the property was completed by the NUS Corporation/Field Investigation Team (NUS/FIT) in May 1983. NUS/FIT reported that solid wastes, including demolition materials and municipal wastes, and waste oil, had been disposed of on the property. A Screening Site Inspection (SSI) Report for the CBPL property was completed by WESTON®/Alternative Remedial Contracts Strategy (ARCS) in February 1991. According to the SSI Report, between approximately 1954 and 1974, a non-licensed solid waste landfill was operated on approximately 60 acres of the CBPL property. The majority of waste reportedly included demolition debris consisting of "...brick, wood, steel, and pipe...". ARCS personnel reported that miscellaneous solid waste piles were also scattered throughout the property. Analytical results of soil samples collected from potential source areas on the property by ARCS personnel documented the presence of volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), a pesticide, and metals. On the basis of the information provided in the SSI report, the CBPL SIP was initiated.

Background information used in the generation of this report was obtained through file searches conducted at the EPA Region I, the Massachusetts Department of Environmental Protection (MA DEP), telephone interviews with town officials, conversations with persons knowledgeable of the CBPL property and conversations with other Federal, State, and local agencies.

This package follows the guidelines developed under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, commonly referred to as Superfund. However, these documents do not necessarily fulfill the requirements of other EPA Region I regulations such as those under the Resource Conservation and Recovery Act (RCRA) or other Federal, State, or local regulations. SIPs are intended to provide a preliminary screening of sites to facilitate EPA Region I's assignment of site priorities. They are limited efforts and are not intended to supersede more detailed investigations.

SITE DESCRIPTION

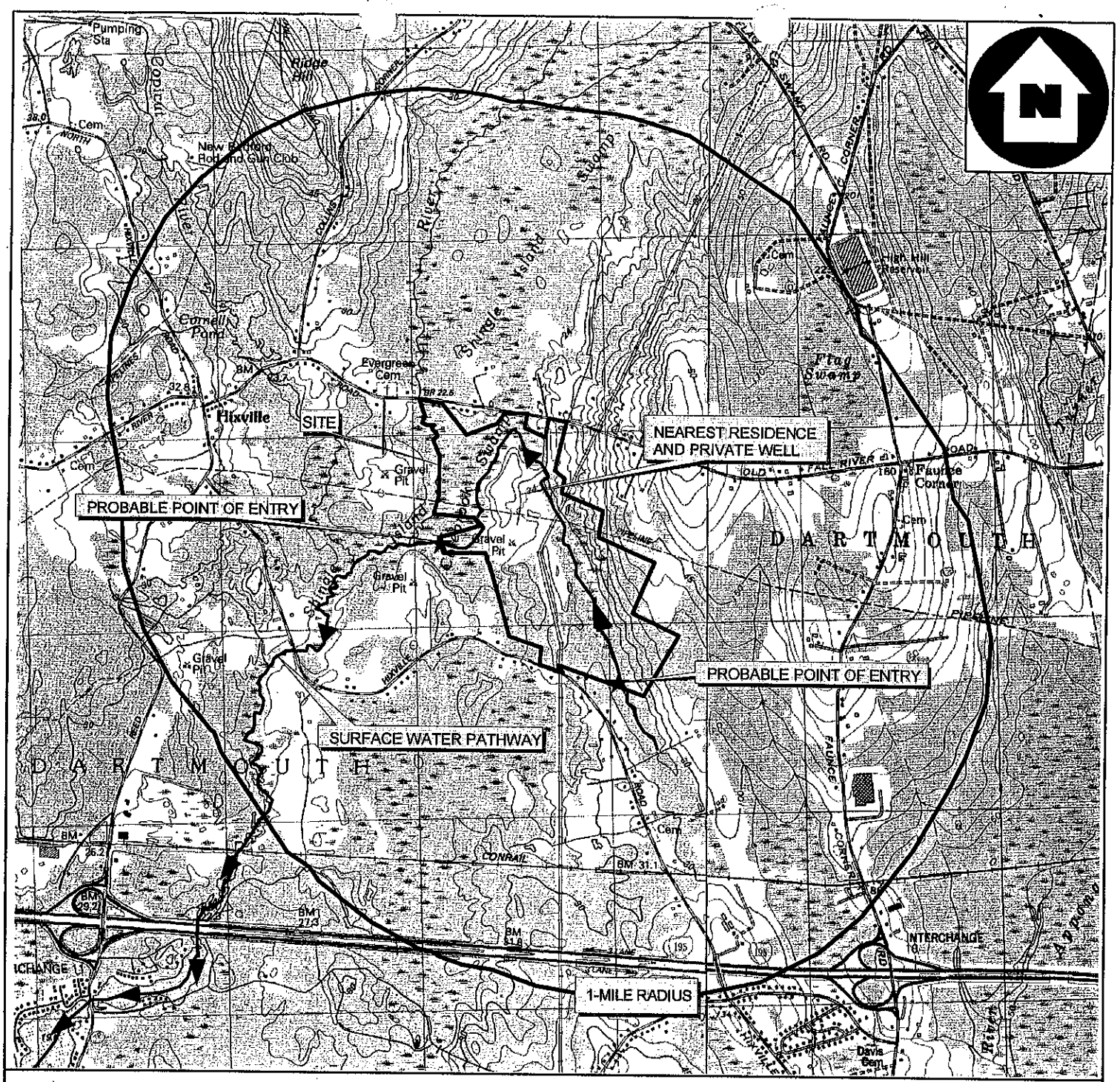
The CBPL property, also referred to historically as Cecil Smith's Landfill or Clean Communities Landfill, is located along Old Fall River Road in Dartmouth, Bristol County, MA (Figure 1) [4, pp. 1, 7; 29, p. 39]. The geographic coordinates of the property, as measured from its approximate center, are 41° 40′ 50.5″ north latitude and 71° 00′ 52.4″ west longitude [55]. The property is comprised of 238.1 acres and consists of six contiguous parcels identified on the Town of Dartmouth, MA Tax Assessor's Map No. 67 as Lot Nos. 5 (3.3 acres), 7 (23.9 acres), and 8 (97.9 acres) and Map No. 72 as Lot Nos. 6 (97.6 acres), 8 (0.9 acres), and 9 (14.5 acres) [1-2]. The property is currently owned by Shingle Island, Inc. [31].

Approximately 60 acres of the western portion of the parcel identified as Lot No. 6 on Map No. 72 consists of a former solid waste "dump" (i.e., a former solid waste landfill) operated between approximately 1954 and 1974 [64, Exhibit S]. The solid waste generally consisted of demolition debris. The remaining areas of the property consist of undeveloped woodlands and wetlands, unimproved access roads, former sand and gravel extraction areas, and miscellaneous solid waste piles. In general, the property is divided in an east/west direction by an Algonquin Gas (AG) pipeline easement and in a north/south direction by a New Bedford Gas and Electric (NBG&E) power line easement (Figure 2) [1-2; 4, p. 1; 6; 52; 64, Exhibit S].

The area surrounding the CBPL property comprises predominantly undeveloped residential properties with some light agricultural properties. Residential properties and one commercial property [currently occupied by Gosselin & Sons Landscape Materials (formerly occupied by a restaurant)] are located north of the CBPL property. Residential properties and undeveloped properties abut the CBPL property to the south, and undeveloped properties along Old Fall River Road abut the CBPL property to the east. The property is bordered to the west by residential properties, undeveloped wetlands and woodland, and the Shingle Island River. The property is bordered by Old Fall River Road to the north and Hixville Road to the south [1-2; 3, p. 7; 4, pp. 3, 8].

Public access to the CBPL property is unrestricted. The current main entrance to the site is an unimproved access road which extends southward from Old Fall River Road across the CBPL property to Hixville Road, with branches to the eastern and western portions of the property. The west branch of the access road provides access to the former solid waste landfill, while the east branch of the access road provides access to the southeastern portion of the property, where several piles of solid waste are located. Reportedly, local youths use the access road as a "short cut" to travel between Old Fall River Road and Hixville Road. Another unimproved access road (which is gated) extending south from Old Fall River Road is located in the northern portion of what is identified as Lot No. 9 on Map No. 72 [2; 3, pp. 10-11; 4, pp. 3, 7, 10-11].

The topography of the area surrounding the CBPL property gently slopes from east to west, with the western, northern, and portions of the eastern landfill toe located in low-lying wetland areas. Stormwater runoff from the property drains radially into Colebrook Swamp, located to the north, west, and east of the former solid waste landfill and into an unnamed stream (hereafter referred to as "Cole Brook"), located north, west, and east of the former solid waste landfill. The wetland areas located adjacent to the western and northern portions of the former solid waste landfill are depicted



BASE MAP IS A PORTION OF THE FOLLOWING 7.5 ' U.S.G.S. QUADRANGLE(S):
FALL RIVER, MA 1967, PHOTOREVISED 1979; AND NEW BEDFORD NORTH, MA 1979

1 0 1 Miles

1000 0 1000 2000 3000 4000 5000 6000 7000 Feet

1000 0 1000 2000 Meters

QUADRANGLE LOCATION

SITE LOCATION MAP

COLD BROOK PINES LANDFILL
OLD FALL RIVER ROAD
DARTMOUTH, MASSACHUSETTS

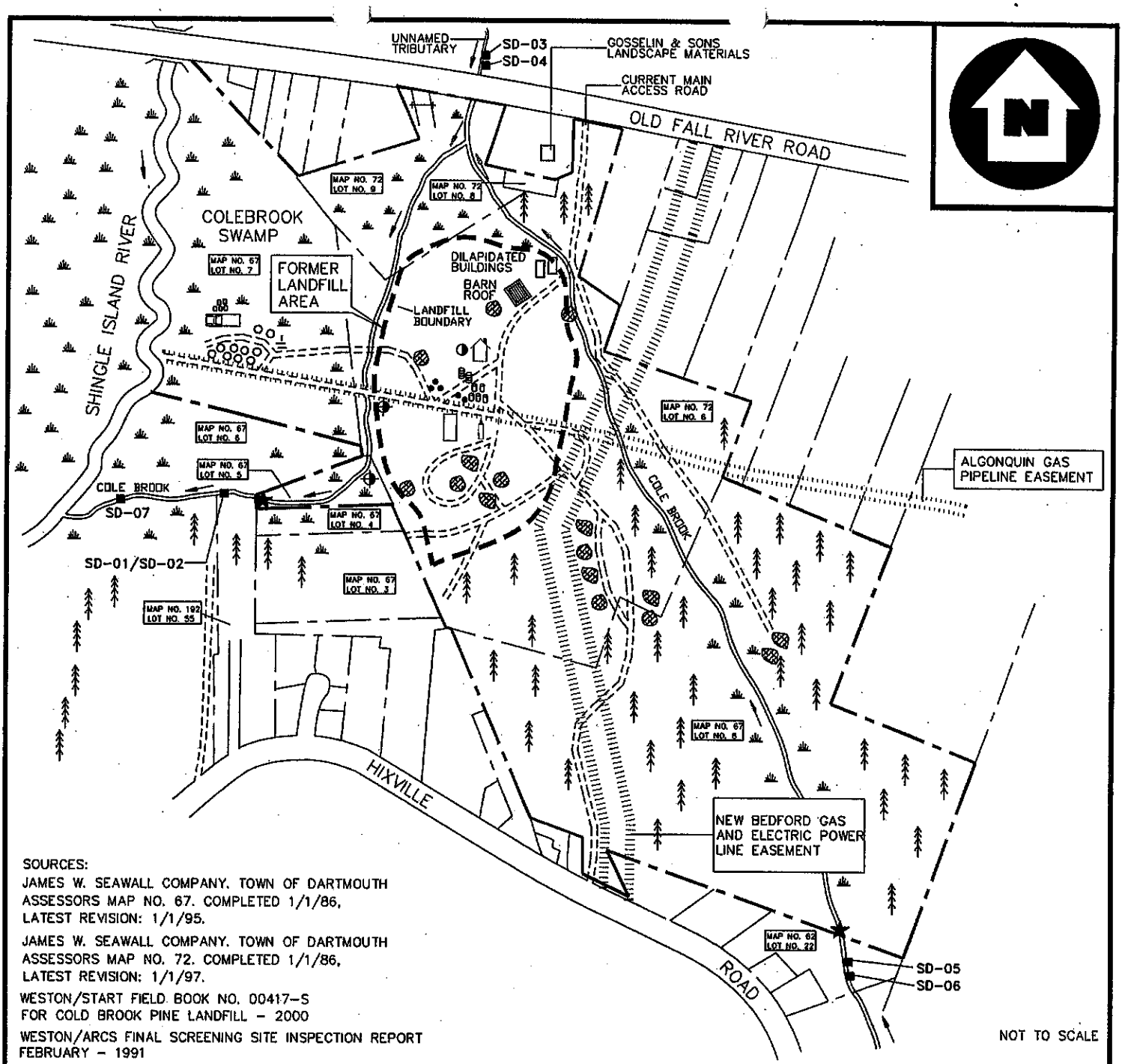
WESTON® MANAGERS DESIGNERS/CONSULTANTS

REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD NUMBER:	CREATED BY:	CREATED ON:
01-05-0054	P. SCHROT	04/04/2001

FILE LOCATION: E:\ARC_APRS\START1\COLDBROOKPINES.APR

FIGURE 1



SOURCES:
JAMES W. SEAWALL COMPANY. TOWN OF DARTMOUTH ASSESSORS MAP NO. 67. COMPLETED 1/1/86, LATEST REVISION: 1/1/95.
JAMES W. SEAWALL COMPANY. TOWN OF DARTMOUTH ASSESSORS MAP NO. 72. COMPLETED 1/1/86, LATEST REVISION: 1/1/97.
WESTON/START FIELD BOOK NO. 00417-S FOR COLD BROOK PINE LANDFILL - 2000
WESTON/ARCS FINAL SCREENING SITE INSPECTION REPORT FEBRUARY - 1991

LEGEND

- ★ PROBABLE POINT OF ENTRY TO SURFACE WATER
- SHINGLE ISLAND, INC. PROPERTY LINE
- LOT LINE
- ACCESS ROAD
- PRIVATE DRINKING WATER SUPPLY WELL (SCREENED INTERVAL UNKNOWN)
- DEBRIS
- TIRE
- CYLINDER
- 55-GALLON DRUM
- 5-GALLON PAIL
- METAL SPHERE
- WETLANDS
- WOODED AREA
- RESIDENCE
- FLOW DIRECTION
- ABANDONED AUTOMOBILE GASOLINE TANKS
- ABANDONED TRUCK
- MISCELLANEOUS SOLID WASTE PILE (OBSERVED BY WESTON/ARCS DURING 1990 ON-SITE RECONNAISSANCE)
- MONITORING WELL (SCREENED INTERVAL UNKNOWN)
- START SEDIMENT SAMPLE LOCATION

SITE SKETCH AND START SEDIMENT SAMPLE SKETCH

COLD BROOK PINES LANDFILL
OLD FALL RIVER ROAD
DARTMOUTH, MASSACHUSETTS

WESTON® MANAGERS DESIGNERS/CONSULTANTS
REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD #	DRAWN BY:	DATE
01-05-0054	P.H.S.	03/04/01

FILE NAME: S:\00050028\FIG_2.DWG

FIGURE 2

on the U.S. Geological Society (USGS) topographic map as Colebrook Swamp [52]. Cole Brook enters the CBPL property at the southeastern property boundary and flows north/northwesterly past the former solid waste landfill, where it turns southwesterly and flows through Colebrook Swamp and then joins the Shingle Island River [4, p. 8; 20; 52].

On 1 February 2000, as part of this SIP, START personnel conducted a reconnaissance of the CBPL property from the AG pipeline easement, which was entered via the main access road to the CBPL property.. The reconnaissance was conducted via the AG pipeline easement since on-site access for the property was not granted by the property owner, Mr. Cecil Smith, Jr. (Mr. Smith). Along the access road, START personnel observed the roof of a barn and several dilapidated buildings. The yard area surrounding the on-site residence contained the remains of an abandoned canteen truck and mobile home; a corrugated metal cylinder; fiberglass; wood; boat wreckage debris; and several rusted, empty 55-gallon drums. START personnel also observed 5-gallon plastic buckets, pieces of scrap metal, and five large metal spheres (suspected to be wrecking balls). Two piles of automobile tires (approximately 300) and a pile of automobile gasoline tanks (approximately 50) were observed north of the access road along the AG pipeline easement, on an island in Colebrook Swamp. It is unknown if stained soil existed on the property as snow cover prevented observation of the ground surface by START personnel [3, pp. 2-6].

OPERATIONAL AND REGULATORY HISTORY AND WASTE CHARACTERISTICS

An 1893 USGS topographic map depicts no structures or roads on the property [60]. USGS topographic maps completed in 1944 and in1951 depict an unimproved or private road connecting Old Fall River Road and Hixville Road; however, no buildings are depicted on the property [61-62].

Sometime in the 1940s, the property was purchased by Dr. Cecil B. Smith, Sr. (Dr. Smith). In 1954, on-site sand and gravel excavation operations began and portions of the property were used for disposal of solid waste, primarily demolition debris [4, p. 5; 64, Exhibit S]. The excavated areas resulting from the sand and gravel operations were likely used as the primary areas for waste disposal.

Beginning in the early 1960s, Dr. Smith permitted his son, Mr. Smith, to manage the on-site disposal of the demolition debris which generally consisted of, but was not limited to, brick, wood, steel, pipes, and general debris from building demolition. During this time, Mr. Smith also used the property for storage of salvageable material (principally scrap metals). The volume of demolition materials disposed of on the property is unknown; however, it is known that the disposal on the property was sporadic and depended on urban renewal activity in the nearby cities and towns [4, p. 5].

On 10 August 1973, a complaint by a group of residents of the Town of Dartmouth, known as the "Ecology Committee of Dartmouth", stated that "pools of waste oil" were observed on the property. In response to the complaint, members of the Town of Dartmouth Board of Health performed an inspection of the property. According to notes from the inspection, an excavation on the property was observed to be "filled with oil" [4, p. 6]. Information regarding the exact location and volume of the excavation could not be located in available file information.

Sometime in 1973, the Town of Dartmouth secured a court order against Mr. Smith. The order directed Mr. Smith to cease all disposal operations on the property [64, pp. 3, 11].

In 1974, inspections of the CBPL property by the Massachusetts Department of Public Health (MA DPH) "...revealed that oil and dredgings..." had been disposed of on the property [4, p. 6].

On 4 March 1975, Massachusetts Department of Environmental Quality Engineering (MA DEQE) personnel conducted an inspection of the property and reported violations of Massachusetts Solid Waste Disposal Regulations, including the following: equipment, cover material, fire protection, access facilities, unloading of refuse, control of wind-blown litter, spreading and compacting of refuse, depth of cover, special wastes, salvage operations, vector control, and operational records [4, p. 6].

On 13 March 1975, the Town of Dartmouth secured another court order against Mr. Smith. This court order directed Mr. Smith to install 1 foot of cover material over the entire solid waste landfill. The court order further prohibited Mr. Smith from conducting disposal operations on the property until operations were in accordance with State regulations [64, pp. 5, 11, Exhibit L; 66, Enclosure 3].

On 6 October 1975, the Town of Dartmouth Board of Health voted "...to assign the Sanitary Landfill area of Plat 86, portions of Lot #8 and #12, off of Old Fall River Road, North Dartmouth, Mass. for Cecil Smith". This assignment permitted (with certain restrictions) Mr. Smith to operate a sanitary landfill on 60 acres of the CBPL property [7, Appendix; 63, p. 7, Exhibit A]. Based on available information, it appears that Lot Nos. 8 and 12 on Plat No. 86 are currently contained within Lot No. 6 on Map No. 72 [1-2; 7, Appendix].

On 3 February 1976, MA DEQE conducted an inspection of the CBPL property and observed that "...certain portions of the site had not been completely covered or covered with the required one foot of material" [66, Enclosure 4].

On 26 April 1976, the Town of Dartmouth Board of Health granted the modification of the original site assignment to Clean Communities Corporation (Clean Communities). The modified assignment permitted (with certain restrictions) Clean Communities to operate a sanitary landfill on 60 acres of the CBPL property [63, p. 7, Exhibit B; 64, p. 8].

In October 1977, on behalf of Clean Communities, GHR Engineering Corporation (GHR) of New Bedford, MA excavated 34 test pits and installed five groundwater monitoring wells (designated A-1 through A-5) on the property as part of landfill preparation activities. The wells were "...installed along the western perimeter of the site" and "...between the assigned landfill area and the existing natural brook" [7, Appendix]. START personnel were unable to locate information in available files regarding the exact locations of the test pits and monitoring wells.

On 2 December 1977, GHR collected five groundwater samples from the five monitoring wells (A-1 through A-5) on the property. In addition, two surface water samples were collected from Cole Brook at points upstream and downstream of the former solid waste landfill area. The exact locations at which the surface water samples were collected could not be determined. Two metals

(copper and zinc) were detected in the groundwater and the surface water samples; nickel was also detected in the groundwater sample collected from monitoring well A-1 [4, pp. 6, 9, Attachment A; 15]. Analytical results of these groundwater samples and surface water samples are discussed in greater detail in the Groundwater Pathway and Surface Water Pathway sections, respectively, of this report.

On 16 December 1977, Dr. Smith transferred ownership of the entire property to Mr. Smith; and on 19 December 1977, Mr. Smith transferred ownership of the entire property to Shingle Island, Inc. Mr. Smith, as the principal of Shingle Island, Inc., subsequently leased the property to Southwestern Resource Recovery, Inc., who had a contract with Clean Communities to manage the property [4, p. 6].

On 3 May 1978, MA DEQE received plans and a report from GHR (dated March 1978) for operation of a sanitary landfill on the assigned 60-acre portion of the CBPL property [64, p. 10; 70].

On 21 October 1979, GHR submitted modified plans and a report to MA DEQE for operation of a 15-acre sanitary landfill within the assigned 60-acre portion of the CBPL property. These modified plans and report were essentially the same as those submitted on 3 May 1978 with the exception that no alterations of the site would occur within 100 feet of the wetlands [64, p. 10, Exhibit F; 70].

On 4 March 1980, MA DEQE approved the modified plans for operation of a sanitary landfill on 15 acres of the assigned 60-acre portion of the CBPL property, at a rate of 100 tons per day [67; 70]. The ultimate volume of the new landfill would be approximately 250 acre-feet [approximately 4.03E+05 cubic yards (yd^3)] [7].

On 28 March 1980, on behalf of Clean Communities and in accordance with the Massachusetts Environmental Policy Act (MEPA), GHR completed an "*Environmental Notification Form for Clean Communities Corporation.*" The Environmental Notification Form (ENF), along with revised plans, was subsequently submitted to the Massachusetts Executive Office of Environmental Affairs. The ENF was submitted so that the maximum landfill volume and rate could be increased over those specified in the plans approved by MA DEQE on 4 March 1980. The ENF provided a review of existing conditions at the CBPL property and provided plans to construct a new sanitary landfill on top of the existing solid waste landfill. The ENF stated that the proposal for the upgrading (reconstruction) of the existing solid waste landfill would include a gravel blanket-clay liner system to prevent any leachate generation and an extensive groundwater and surface water monitoring system to detect leachate. The ENF stated that the new landfill was proposed to operate at a rate of 600 to 700 tons per day with an ultimate volume of 500 acre-feet (approximately 8.1E+05 yd^3) [7].

On 16 May 1980, the Secretary of the Massachusetts Executive Office of Environmental Affairs approved the increase in tonnage from 100 tons per day to 700 tons per day with no Environmental Impact Report (EIR) provided that a leachate collection system was installed prior to operation of the landfill [69].

On 12 January 1981, MA DEQE approved revised plans for the increase in tonnage from 100 tons per day to 700 tons per day with no EIR provided a leachate collection system was installed prior to operation of the landfill [68].

On 10 July 1981, the Town of Dartmouth Conservation Commission issued a cease and desist order (regarding construction of the proposed sanitary landfill) to Shingle Island, Inc. This order cited the property owner for violations of the Wetlands Protection Act and local wetlands bylaws [8].

On 30 December 1981, GHR submitted a letter to MA DEQE certifying that the property had been improved such that the proposed sanitary landfill area had been graded and covered with a relatively impermeable clay liner material, and a protective cover of sandy soil had been placed over the clay liner. In addition, a leachate collection system was installed which included a collection trench fitted with perforated polyvinyl chloride (PVC) piping and an underground collection tank. The letter further stated that all required monitoring wells and a fire protection well were installed on the property [4, p. 3; 9]. Available file information did not specify whether these monitoring wells were those monitoring wells installed in October 1977 or whether these monitoring wells were subsequently installed on the property.

On 5 January 1982, GHR collected five groundwater samples from "observation wells" B-1, B-2, B-5, B-6, and B-7 on the property. Analysis of the samples revealed the presence of one VOC (benzene), one SVOC [bis(2-ethylhexyl)phthalate], and eight metals (calcium, copper, iron, magnesium, manganese, potassium, sodium, and zinc) [4, pp. 7, 10, Attachment B; 16]. Analytical results of these groundwater samples are discussed in greater detail in the Groundwater Pathway section of this report.

On 11 February 1982, the Town of Dartmouth Conservation Commission collected one leachate sample and one sediment sample from the property. Available file information did not specify the locations at which of the samples were collected. Laboratory analysis of the samples indicated the presence of polychlorinated biphenyls (PCBs) (identified as Aroclor-1254) in both samples. In addition, Aroclor-1242 was detected in both samples, but was not specifically quantified [4, pp. 7, 10, Attachment C; 21]. Analytical results of the leachate sample and the sediment sample are discussed in greater detail in the Waste/Source Sampling and Surface Water Pathway sections, respectively, of this report.

On 12 February 1982, GHR collected two groundwater samples from observation well Nos. 3 and 4 on the property. START personnel were unable to locate information in available files regarding the exact locations of the observation wells or when the wells were installed. In addition, GHR collected one leachate sample from "Seepage from rubble in [the] NE [northeast] corner of [the] old landfill." The exact location at which the sample was collected could not be determined from available file information. Laboratory analysis of the groundwater samples revealed the presence of 10 metals, including arsenic, calcium, copper, iron, magnesium, manganese, nickel, potassium, sodium, and zinc. A total of seven metals, including copper, iron, lead, manganese, nickel, sodium, and zinc, were detected in the leachate sample. No VOCs were detected in the leachate sample [4, pp. 7, 10, Attachment D; 65]. Analytical results of the leachate sample and the groundwater samples are discussed in greater detail in the Waste/Source Sampling and Groundwater Pathway sections, respectively, of this report.

On 1 February 1983, the CBPL property was added to the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database [29, p. 39].

On 1 March 1983, as part of a PA, NUS/FIT personnel conducted a perimeter survey of the CBPL property [48]. NUS/FIT reported that the majority of waste disposed of on the property included "...demolition materials from construction." Also reported to be disposed of on the property was "...a variety of municipal waste..." and waste oil. NUS/FIT completed the PA on 3 May 1983 [48].

On 21 December 1983, a court order placed a permanent injunction against conducting sanitary landfilling operations on the CBPL property [4, p. 6; 56, p. 2].

On 11 April 1987, the Town of Dartmouth Building Department reportedly issued to Mr. Smith a permit to build a residence on a foundation located within the former solid waste landfill. In addition, a private drinking water supply well and a septic system were installed in conjunction with the construction of the house [4, p. 7].

On 3 October 1988, a "Revised Order and Judgement After Remand" ruled that the landfilling of demolition materials was permissible on the former solid waste landfill portion of the CBPL property because it was determined to be a prior non-conforming use. The revised judgment defined the scope of the non-conforming use permitted at the property which included the following: landfilling operations were not to exceed 4,000 tons of demolition debris per year and the elevation of the landfill was not to exceed 10 feet above the existing ground elevations [4, p. 6; 56, p. 2].

On 15 August 1990, as part of the SSI, ARCS personnel conducted an on-site reconnaissance of the CBPL property. ARCS reported that the former solid waste landfill area is generally divided by the AG pipeline easement. ARCS personnel observed that the portion of the former solid waste landfill located north of the AG pipeline easement was covered by vegetation, with the exception of the access road and areas in the vicinity of the residence and a barn. In the vicinity of the residence and barn, ARCS personnel observed an "intact roof structure" and several abandoned automobiles. Reportedly, the landfill was only slightly elevated above the access road; however, adjacent to wetland areas, the change in elevation was approximately 10 to 15 feet. Miscellaneous demolition materials and other solid wastes were observed to be exposed on the top and on the sides of the landfill. The landfill cover appeared to be a silty-sand material with numerous holes and voids. In addition, sea shells were scattered on the top of the landfill [4, p. 3].

ARCS personnel reported that the portion of the former solid waste landfill located south of the AG pipeline easement was predominantly covered by short grass with miscellaneous solid waste piles scattered on the surface; this area did not appear to contain subsurface solid waste. However, immediately to the southwest of the AG pipeline easement, ARCS reported that solid waste did appear to be landfilled. This area was covered by weeds and brush with solid wastes, including several abandoned automobiles, empty fuel tanks, concrete blocks, wooden pallets, and miscellaneous automobile parts and tires, scattered on the surface. In addition, an underground concrete tank was observed on the southwestern edge of the former solid waste landfill area, adjacent to wetlands. The dimensions of the tank were approximately 5 feet wide by 10 feet long. ARCS personnel could not verify the exact function of the tank; however, START presumes that the tank was part of the proposed leachate collection system. In addition, an uncapped 2-inch PVC monitoring well was located in the vicinity of this tank [4, p. 3].

ARCS reported that the portion of the property located east/southeast of the former solid waste landfill area was used for the disposal of miscellaneous solid wastes, including "...wood wastes, white goods, recently burned miscellaneous solid waste, one empty rusted drum, automotive parts, tree stumps, tire piles, concrete rubble, empty storage tanks, and a tractor trailer full of tires" [4, p. 3].

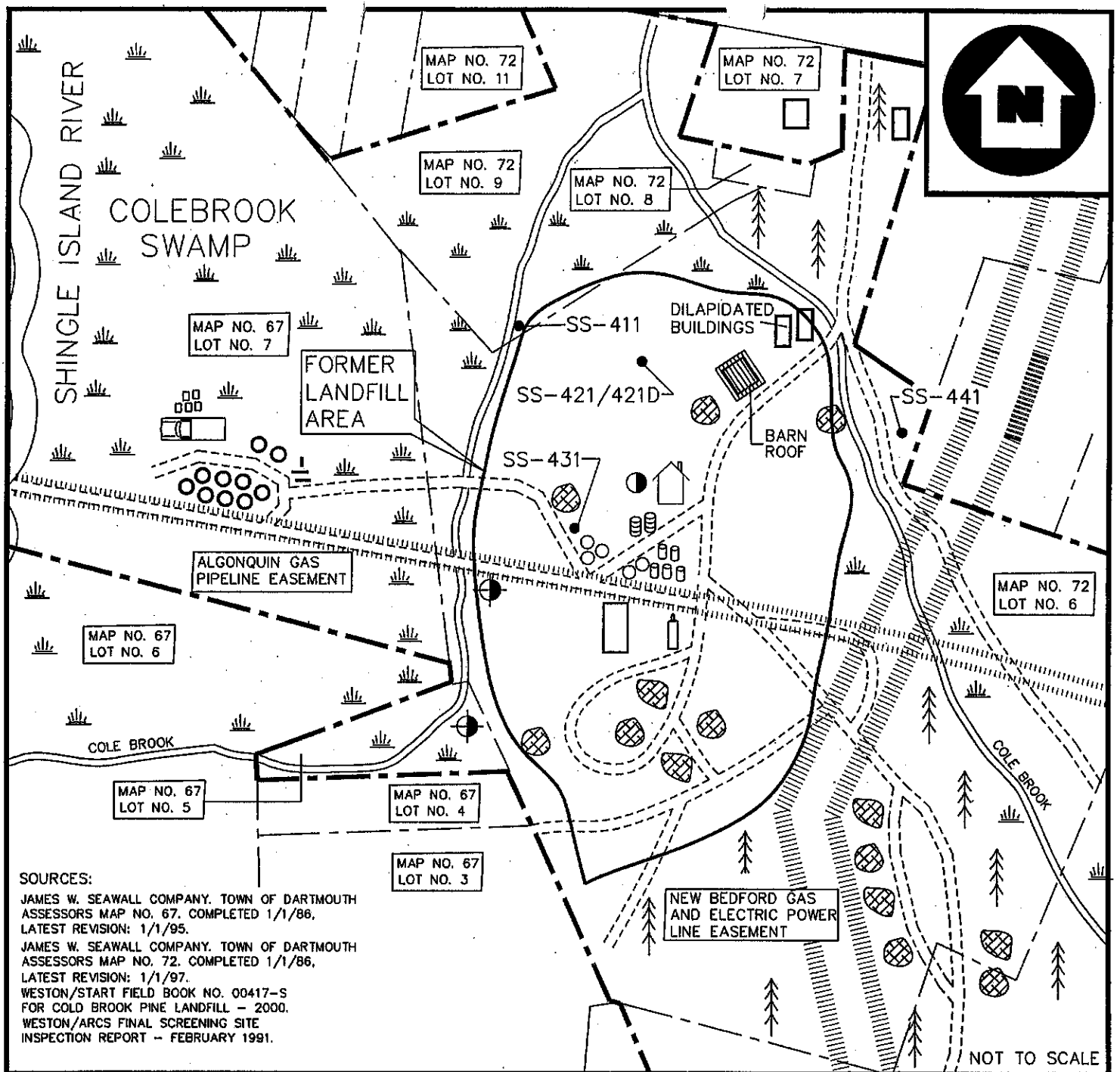
ARCS personnel reported observing oil-stained soil south of the AG pipeline easement "...near the miscellaneous automobile parts and fuel tanks and near a tire pile." Oil-stained soil was also observed adjacent to and north of the AG pipeline easement near an abandoned diesel engine [4, p. 5].

Also on 15 August 1990, ARCS personnel collected five surface soil samples (SS-411, SS-421, SS-421D, SS-431, and SS-441), including a duplicate, from the property (Figure 3). Four soil samples were collected at 6 inches below grade (SS-421, SS-421D, SS-431, and SS-441); one soil sample was collected at 12 inches below grade (SS-411). Sample SS-441 was collected east of the former solid waste landfill area (presumably upgradient of potential sources) to document reference conditions. The soil samples were analyzed through the EPA Contract Laboratory Program (CLP) for VOCs, SVOCs, pesticides/PCBs (pest/PCBs), metals, and cyanide [4, pp. 10-11; 28].

Three VOCs; 18 SVOCs; one pesticide; and six metals were detected in the samples at concentrations greater than three times the reference sample concentrations or greater than or equal to the reference sample's sample quantitation limit (SQL) (for organic analyses) or sample detection limit (SDL) (for inorganic analyses) [4, pp. 13-14, Attachment E]. Analytical results of these samples are discussed in greater detail in the Waste/Source Sampling section of this report.

On 4 April 1996, MA DEP (formerly MA DEQE) personnel secured a court order/search warrant to enter the CBPL property in response to anonymous complaints of the illegal disposal of solid waste, possibly including hazardous wastes, on the property and into adjacent wetlands. MA DEP's inspection revealed the presence of approximately 500 wooden pallets dumped in a wetland buffer zone located along the main access road. Additional piles of wooden pallets (totaling approximately 4,000 to 5,000 pallets) were observed in wetlands and/or wetland buffer zones. MA DEP observed approximately 100 to 200 automobile tires, miscellaneous wood wastes, construction and demolition (C&D) debris, several abandoned vehicles (including a 40-foot box trailer containing approximately 500 automobile tires), what appeared to be a boiler and associated suspected asbestos-containing material (ACM), empty "barrels" (likely drums), areas of ash (signifying open burning), and suspected petroleum spills on the property. MA DEP personnel noted the locations and conditions of the groundwater monitoring wells on the property. The monitoring wells were locked; however, the locks were entirely rusted [6].

MA DEP reported that pieces of perforated PVC pipe were scattered on the ground. MA DEP concluded that this PVC pipe was the remains of the proposed sanitary landfill's base clay liner and leachate collection system. Moreover, MA DEP reported that the proposed sanitary landfill never went into operation, but instead the leachate collection system (inclusive of the clay liner) was scraped off and removed [6].



SOURCES:
JAMES W. SEAWALL COMPANY. TOWN OF DARTMOUTH ASSESSORS MAP NO. 67. COMPLETED 1/1/86, LATEST REVISION: 1/1/95.
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WESTON/ARCS FINAL SCREENING SITE INSPECTION REPORT - FEBRUARY 1991.

LEGEND

- SHINGLE ISLAND, INC. PROPERTY LINE
- LOT LINE
- ACCESS ROAD
- WETLANDS
- WOODED AREA
- RESIDENCE
- ON-SITE PRIVATE RESIDENTIAL DRINKING WATER SUPPLY WELL (SCREENED INTERVAL UNKNOWN)
- 55-GALLON DRUM
- METAL SPHERE
- DEBRIS
- TIRES
- 5-GALLON PAIL
- ABANDONED AUTOMOBILE GASOLINE TANKS
- ABANDONED TRUCK
- MISCELLANEOUS SOLID WASTE PILE
- MONITORING WELL (SCREENED INTERVAL UNKNOWN)
- ARCS SOIL SAMPLE LOCATION

ARCS SOIL SAMPLE SKETCH

COLD BROOK PINES LANDFILL
OLD FALL RIVER ROAD
DARTMOUTH, MASSACHUSETTS

WESTON® MANAGERS DESIGNERS/CONSULTANTS
REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD #	DRAWN BY:	DATE
01-05-0054	J. SCHMIDL	5/4/00

FILE NAME: S:\000500028\FIG3.DWG

FIGURE 3

On 25 June 1996, based on their inspection conducted on 4 April 1996, MA DEP issued a Notice of Noncompliance (NON) letter to Mr. Smith [23].

On 3 December 1996, based on additional inspections of the property conducted on 12 April 1996 and 1 October 1996, MA DEP issued Release Tracking Number (RTN) 4-12656 and a Notice of Responsibility (NOR) letter to Mr. Smith. The NOR required Mr. Smith to employ a Licensed Site Professional (LSP) and complete an Immediate Response Action (IRA) pursuant to Massachusetts General Law (MGL), Chapter 21E [24].

In 1997, the CBPL property was reportedly under investigation by MA DEP's Regional Enforcement and Compliance Team (REACT) Strike Force. Reportedly, there had been illegal dumping of wastes, including hazardous wastes, in the former solid waste landfill area and the adjacent wetlands. Some of the waste disposed of in these areas included lead paint, asbestos, demolition debris, miscellaneous automobile parts, and waste oil. According to MA DEP's Regional Enforcement Department, the former solid waste landfill had been capped and was to be "piggy backed" by a another landfill, with the cap on the solid waste landfill acting as a liner for the new landfill. However, after not receiving the proper permits to operate the new landfill, Mr. Smith allegedly removed the cap materials and sold them [39].

On 24 July 2000, START personnel conducted an off-site, perimeter reconnaissance of the CBPL property in order to determine the accessibility of possible off-site surface water pathway sampling locations. START personnel interviewed neighbors and determined that the CBPL property was inactive, except for its use as a residence by one person, reportedly Mr. Smith's ex-wife. START further noted that Gosselin & Sons Landscape Materials uses the portion of the CBPL property near the main access road as a storage area for supplies, both in piles and inside tractor trailers [3, p. 7].

On 10 October 2000, START personnel collected five sediment samples (SD-01, SD-02, and SD-05 through SD-07) from Cole Brook and two sediment samples (SD-03 and SD-04) from an unnamed tributary of Cole Brook located north of the CBPL property, to determine if there has been a release of hazardous substances (associated with the CBPL property) to surface water (Figure 2). All the samples were collected off site, since START was not granted access to the property. The samples were analyzed through a Delivery of Analytical Services (DAS) laboratory for VOCs, SVOCs, pest/PCBs, Target Analyte List (TAL) metals, and cyanide, with the exception of SD-04 and SD-06 which were analyzed for TAL metals only [3, pp. 14-24; 58-59].

Three metals were detected in the sediment samples at concentrations greater than three times the appropriate reference concentration or greater than or equal to the appropriate reference sample's SDL [58-59]. Analytical results of the sediment samples collected by START personnel are discussed in greater detail in the Surface Water Pathway section of this report.

The CBPL property's compliance status is currently classified by MA DEP as Default Tier 1B in the Massachusetts Contingency Plan (MCP) process. A Tier 1B site/release requires a permit, but response actions may be performed under the supervision of an LSP without prior MA DEP approval. A site/release is classified as Default Tier 1B when a responsible party fails to provide a required submittal to MA DEP by a specified deadline. The site/release cleanup phase for the CBPL

property is classified as "No Phase", which indicates that a Phase report was not required or was not submitted [71].

Table 1 presents identified structures or areas on the CBPL property that are documented or potential sources of contamination, the containment factors associated with each source, and the relative location of each source.

Table 1

Source Evaluation for Cold Brook Pines Landfill

Source Area	Containment Factors	Spatial Location
Former Solid Waste Landfill	No maintained groundwater monitoring system is in place, and no liner is suspected. The landfill was graded and covered with a relatively impermeable clay liner material and a protective cover of sandy soil in the early 1980s. Portions of the cover material have since been removed, resulting in holes and voids.	Approximately 60 acres of the western portion of the parcel identified as Lot No. 6 on Map No. 72.
Suspected Leachate Collection Tank	None.	Southwestern edge of the former solid waste landfill area.
Contaminated Soil	None.	Throughout the property.
Miscellaneous Solid Waste Piles	None.	East/southeast of the former solid waste landfill area.

[3; 4; 6; 21; 23-24; 28; 56; 65]

Table 2 summarizes the types of potentially hazardous substances which have been disposed, used, or stored on the CBPL property.

Table 2

Hazardous Waste Quantity for Cold Brook Pines Landfill

Substance	Quantity or Volume/Area	Years of Use/Storage	Years of Disposal	Source Area
Miscellaneous solid waste[a]; waste oil; leachate contaminated with PCBs[b] and metals[b]; and soil contaminated with SVOCs[b], pesticides[b], and metals[b].	Approximately 60 acres	Approximately 1954 to present	Approximately 1954 to 1974	Former Solid Waste Landfill
Unknown	500 ft^3[c]	Early 1980s to present	NA	Suspected Leachate Collection Tank
Soil contaminated with VOCs[b], SVOCs[a], pesticides[a], and metals[a].	Unknown[d]	Unknown	Unknown	Contaminated Soil
Miscellaneous solid waste[e]	Unknown	Unknown	Unknown	Miscellaneous Solid Waste Piles

SVOCs = semivolatile organic compounds
PCBs = polychlorinated biphenyls
ft^3 = cubic feet
NA = not applicable
VOCs = volatile organic compounds

[a] Solid waste disposed of in the landfill reportedly includes, but is not limited to, demolition materials consisting of brick, wood, steel, pipes, and miscellaneous construction and demolition (C&D) debris.

[b] The specific substances are discussed in detail in the appropriate pathway sections of this report.

[c] During the 15 August 1990 on-site reconnaissance, ARCS personnel reported that the dimensions of an underground concrete tank on the southwestern edge of the former solid waste landfill area (presumably the leachate collection tank) were approximately 5 feet wide by 10 feet long. The depth of the tank is unknown. For the purposes of this investigation, START assumes that the tank is 10 feet deep, resulting in a volume of 500 cubic feet.

[d] Exact quantity of contaminated soil is unknown; however, it is assumed to be less than the total acreage of the property (238 acres).

[e] Miscellaneous solid waste piles have reportedly consisted of wood, drums, automotive parts, tree stumps, tires, concrete rubble, empty storage tanks, wooden pallets, abandoned vehicles, a boiler wrapped with suspected asbestos-containing material (ACM), ash (signifying open burning), fiber glass, boat wreckage debris, 5-gallon plastic buckets, pieces of scrap metal, and large metal spheres (suspected to be wrecking balls).

[3; 4; 6; 21; 23-24; 28; 56; 65]

No CERCLIS, Resource Conservation and Recovery Information System (RCRIS), or National Priorities List (NPL) sites are located within 1-radial mile of the CBPL property [29; 30].

WASTE/SOURCE SAMPLING

On 11 February 1982, the Town of Dartmouth Conservation Commission collected one leachate sample from the property. Available file information did not specify the exact location at which the sample was collected. START assumes that the leachate was generated from the former solid waste landfill. The sample was submitted to Camp Dresser & McKee, Inc. (CDM) of Boston, MA and analyzed for total PCBs (method unknown). Analytical results indicated the presence of PCBs (identified as Aroclor-1254) in the sample at a concentration of 0.5 parts per billion (ppb). In addition, Aroclor-1242 was detected, but was not specifically quantified [4, pp. 7, 10, Attachment C; 21].

On 12 February 1982, GHR collected a sample of "Seepage from rubble in [the] NE [northeast] corner of [the] old landfill." The exact location at which the sample was collected could not be determined from available file information. The sample was submitted to GHR Analytical Incorporated of Lakeville, MA and analyzed for metals, pH, and specific conductance. In addition, the leachate sample was submitted to Cambridge Analytical Associates, Inc. (CAA) of Watertown, MA and analyzed for VOCs by EPA Method 624. Analytical results of the sample revealed the presence of seven metals, including copper [0.06 parts per billion (ppm)], iron (17.6 ppm), lead (0.95 ppm), manganese (0.22 ppm), nickel (0.04 ppm), sodium (6.8 ppm), and zinc (0.76 ppm). No VOCs were detected in the sample [4, pp. 7, 10, Attachment D; 65].

On 15 August 1990, as part of the SSI, ARCS personnel collected five surface soil samples (SS-411, SS-421, SS-421D, SS-431, and SS-441), including a duplicate, from the property (Figure 3). Four soil samples were collected at 6 inches below grade (SS-421, SS-421D, SS-431, and SS-441); one soil sample was collected at 12 inches below grade (SS-411). Surface soil sample SS-441 was collected east of the former solid waste landfill area (presumably upgradient of potential sources) to document reference conditions. The samples were analyzed through EPA CLP for VOCs, SVOCs, pest/PCBs, metals, and cyanide [4, pp. 10-11; 28]. Table 3 summarizes the surface soil samples collected by ARCS personnel on 15 August 1990.

Table 3

Surface Soil Sample Summary: Cold Brook Pines Landfill
Samples Collected by ARCS on 15 August 1990

Sample Location No.	Traffic Report No.	Time (hours)	Remarks	Sample Depth (feet)	Sample Source
MATRIX: Surface Soil					
SS-411	AL596 MAH431	1400	Grab	1	Sample collected in the vicinity of Colebrook Swamp, west of the former solid waste landfill, approximately 600 feet west of the main access road.
SS-421	AL598 MAH433	1330	Grab	0.5	Sample collected from the top of the former solid waste landfill, approximately 200 feet west of the main access road.
SS-421D	AL599 MAH434	1330	Grab	0.5	Duplicate sample of SS-421 collected for quality control.
SS-431	AL597 MAH432	1415	Grab	0.5	Sample collected from an area of stained soil on top of the former solid waste landfill, 20 feet north of the AG pipeline easement and along the access road.
SS-441	AL600 MAH435	1430	Grab	0.5	Sample collected from an excavated embankment along the wooded area located east of the former solid waste landfill, as a reference sample.

[4, pp. 10-11; 28]

Table 4 is a summary of substances detected through CLP analyses of ARCS surface soil samples. For each sample location, a compound or element is listed if it is detected at greater than or equal to three times the reference sample concentration or greater than or equal to the reference sample's SQL (for organic analyses) or SDL (for inorganic analyses). Surface soil sample SS-441 was collected to document reference concentrations [4, p. 11; 28].

Table 4

Summary of Analytical Results
Surface Soil Sample Analysis for Cold Brook Pines Landfill
Samples Collected by ARCS on 15 August 1990

Sample Location No.	Substance	Concentration	Background Concentration	Comments
SS-411	**VOCs**			
	Methylene Chloride	84 J ppb	5 U ppb	17 × SQL
	Acetone	715 J ppb	10 ppb	72 × Ref.
	Butanone, 2-	76 J ppb	10 U ppb	7.6 × SQL
	INORGANICS			
	Calcium	12,600 J ppm	443 ppm	28.4 × Ref.
	Copper	32.3 J ppm	8.3 ppm	3.9 × Ref.
	Lead	66.6 J ppm	19.7 ppm	3.38 × Ref.
	Mercury	1.0 J ppm	0.25 ppm	4 × Ref.
	Zinc	220 J ppm	29.6 ppm	7.4 × Ref.
SS-421	**SVOCs**			
	Naphthalene	1,500 ppb	350 U ppb	4.3 × SQL
	Methylnaphthalene, 2-	830 ppb	350 U ppb	2.4 × SQL
	Acenaphthylene	1,800 ppb	350 U ppb	5.1 × SQL
	Acenaphthene	480 J ppb	350 U ppb	1.4 × SQL
	Fluorene	350 J ppb	350 U ppb	1 × SQL
	Phenanthrene	3,600 ppb	350 U ppb	10 × SQL
	Anthracene	1,000 ppb	350 U ppb	2.9 × SQL
	Fluoranthene	4,400 ppb	350 U ppb	13 × SQL
	Pyrene	7,600 ppb	350 U ppb	22 × SQL
	Benzo(a)anthracene	4,300 ppb	350 U ppb	12 × SQL
	Bis(2-ethylhexyl)phthalate	450 J ppb	350 U ppb	1.3 × SQL
	Chrysene	5,000 ppb	350 U ppb	14 × SQL
	Benzo(b)fluoranthene	4,100 ppb	350 U ppb	12 × SQL
	Benzo(k)fluoranthene	3,100 ppb	350 U ppb	8.6 × SQL
	Benzo(a)pyrene	4,300 ppb	350 U ppb	12 × SQL

Table 4

Summary of Analytical Results
Surface Soil Sample Analysis for Cold Brook Pines Landfill
Samples Collected by ARCS on 15 August 1990 (Continued)

Sample Location No.	Substance	Concentration	Background Concentration	Comments
SS-421 (Concluded)	**SVOCs**			
	Indeno(1,2,3-cd)pyrene	1,400 ppb	350 U ppb	4 × SQL
	Benzo(g,h,i)perylene	1,400 J ppb	350 U ppb	4 × SQL
	INORGANICS			
	Calcium	2,200 ppm	443 ppm	5.0 × Ref.
	Chromium	30.9 ppm	2.7 ppm	11 × Ref.
	Copper	129 ppm	8.3 ppm	16 × Ref.
	Lead	268 ppm	19.7 ppm	13.6 × Ref.
	Mercury	1.1 ppm	0.25 ppm	4.4 × Ref.
	Zinc	135 ppm	29.6 ppm	4.6 × Ref.
SS-421D	**SVOCs**			
	Naphthalene	2,500 ppb	350 U ppb	7.1 × SQL
	Methylnaphthalene, 2-	1,300 ppb	350 U ppb	3.7 × SQL
	Acenaphthylene	2,700 ppb	350 U ppb	7.7 × SQL
	Acenaphthene	700 J ppb	350 U ppb	2 × SQL
	Fluorene	620 J ppb	350 U ppb	1.8 × SQL
	Phenanthrene	6,000 ppb	350 U ppb	17 × SQL
	Anthracene	2,000 ppb	350 U ppb	5.7 × SQL
	Fluoranthene	9,000 ppb	350 U ppb	26 × SQL
	Benzo(a)anthracene	7,400 ppb	350 U ppb	21 × SQL
	Chrysene	8,000 ppb	350 U ppb	23 × SQL
	Benzo(b)fluoranthene	7,200 J ppb	350 U ppb	21 × SQL
	Benzo(k)fluoranthene	4,900 J ppb	350 U ppb	14 × SQL
	Benzo(a)pyrene	6,900 J ppb	350 U ppb	20 × SQL
	Indeno(1,2,3-cd)pyrene	2,100 J ppb	350 U ppb	6 × SQL

Table 4

Summary of Analytical Results
Surface Soil Sample Analysis for Cold Brook Pines Landfill
Samples Collected by ARCS on 15 August 1990 (Concluded)

Sample Location No.	Substance	Concentration	Background Concentration	Comments
SS-421D (Concluded)	**SVOCS (Concluded)**			
	Dibenz(a,h)anthracene	710 J ppb	350 U ppb	2.0 × SQL
	Benzo(g,h,i)perylene	2,100 J ppb	350 U ppb	6.0 × SQL
	PESTICIDES			
	Dieldrin	160 ppb	16 U ppb	10 × SQL
	INORGANICS			
	Calcium	1,930 ppm	443 ppm	4.36 × Ref.
	Chromium	34.2 ppm	2.7 ppm	13 × Ref.
	Copper	146 ppm	8.3 ppm	18 × Ref.
	Lead	267 ppm	19.7 ppm	13.6 × Ref.
	Mercury	0.92 ppm	0.25 ppm	3.7 × Ref.
	Zinc	141 ppm	29.6 ppm	4.76 × Ref.

VOCs = volatile organic compounds
SVOCs = semivolatile organic compounds
ppb = parts per billion
ppm = parts per million
Ref. = reference sample concentration
SQL = sample quantitation limit
SDL = sample detection limit
U = Indicates the compound was analyzed for, but not detected. The associated numerical value is the SQL or SDL.
J = Quantitation is approximate due to limitations identified during the quality control review.

[4, pp. 13-14, Attachment E]

Three VOCs were detected in the surface soil samples at concentrations greater than three times the reference sample (SS-441) concentration or greater than or equal to the reference sample's SQL. These VOCs were detected in sample SS-411 and included methylene chloride at 84 J ppb, acetone at 715 J ppb, and 2-butanone at 76 J ppb (a sample result qualified with a "J" is considered approximate because of limitations identified during the quality control review) [4, pp. 10-11, Attachment E]. Based on available file information, the use and/or disposal of VOCs on the CBPL property is unknown.

Eighteen SVOCs were detected in the surface soil samples at concentrations greater than three times the reference sample (SS-441) concentration or greater than or equal to the reference sample's SQL. Maximum concentrations of 16 of the 18 SVOCs were detected in sample SS-421D and included naphthalene at 2,500 ppb, 2-methylnaphthalene at 1,300 ppb, acenaphthylene at 2,700 ppb, acenaphthene at 700 J ppb, fluorene at 620 J ppb, phenanthrene at 6,000 ppb, anthracene at 2,000 ppb, fluoranthene at 9,000 ppb, benzo(a)anthracene at 7,400 ppb, chrysene at 8,000 ppb, benzo(b)fluoranthene at 7,200 J ppb, benzo(k)fluoranthene at 4,900 J ppb, benzo(a)pyrene at 6,900 J ppb, indeno(1,2,3-cd)pyrene at 2,100 J ppb, dibenz(a,h)anthracene at 710 J ppb, and benzo(g,h,i)perylene at 2,100 J ppb. Maximum concentrations of pyrene (7,600 ppb) and bis(2-ethylhexyl)phthalate (450 J ppb) were detected in sample SS-421 [4, pp. 10-11, Attachment E]. Except for bis(2-ethylhexyl)phthalate, 17 of these SVOCs are also referred to as polynuclear aromatic hydrocarbons (PAHs), which are common constituents of waste oil [73, pp. 4-15, 4-16]. Their presence in on-site surface soils is likely the result of waste oil disposal which reportedly occurred on site.

One pesticide (dieldrin) was detected in the surface soil samples at concentrations greater than three times the reference sample (SS-441) concentration or greater than or equal to the reference sample's SQL. Dieldrin was detected in sample SS-421D at 160 ppb [4, pp. 10-11, Attachment E]. Based on available file information, the use and/or disposal of pesticides on the CBPL property is unknown. No PCBs were detected above laboratory detection limits in any samples [4, pp. 10-11, Attachment E].

Six metals were detected in the surface soil samples at concentrations greater than three times the reference sample (SS-441) concentrations or greater than or equal to the reference sample's SDL. The following six metals were detected (with the maximum concentrations given in parentheses): calcium (12,600 J ppm in SS-411), chromium (34.2 ppm in SS-421D), copper (146 ppm in SS-421D), lead (268 ppm in SS-421), mercury (1.1 ppm in SS-421), and zinc (220 J ppm in SS-411) [4, pp. 10-11, Attachment E]. Based on available file information, the use and/or disposal of these metals on the CBPL property is unknown.

Cyanide was not detected above laboratory detection limits in any samples [4, pp. 10-11, Attachment E].

In August 1990, ARCS personnel collected surface soil samples from the property. As a result of ARCS sampling, an area of soil contamination (with three VOCs; 18 SVOCs; one pesticide; and six metals) has been documented. To date, no known actions have been completed to address this release to soil.

GROUNDWATER PATHWAY

Surficial soils in the Dartmouth, MA area are part of the Paxton-Woodbridge-Whitman soil association, which consists of nearly level to moderately steep soils that are well drained, moderately well drained, and very poorly drained. This soil association occurs on glaciated uplands [37]. The mean annual precipitation for Dartmouth, MA is 47.34 inches [35].

The surficial geology overlying bedrock in the vicinity of the CBPL property is mapped as compact, unsorted, silty, bouldery gravel (till). The surficial geology may include small beds and lenses of poorly sorted, stratified gravel, sand, silt, and, in some areas, is mantled with relatively thin deposits of silt, sand, and gravel [36]. According to GHR, the landfill was built primarily upon a deposit of highly permeable, coarse sand and gravel overlying granite-gneiss bedrock, located 10 to 25 feet below ground surface (bgs). In addition, the western portion of the landfill was constructed within an area of on-site wetlands [4, pp. 5, 7]. No bedrock formation mapped within 4-radial miles of the property exhibits karst characteristics [10].

According to MA DEP, the western portion of the property is designated as a Potential Drinking Water Source Area, which indicates that the western portion of the property is underlain by a Potentially Productive Aquifer (PPA). A PPA is an aquifer that could be used as source of drinking water [75-76]. The depth to groundwater beneath the CBPL property is unknown; however, based on the existence of nearby wetlands, START estimates that the water table is relatively shallow [20]. Groundwater flow direction beneath the property has not been determined; however, based on the location of Colebrook Swamp and Cole Brook, groundwater beneath the property most likely flows radially to the west, north, and east [52].

The following Massachusetts Cities and Towns are located within 4-radial miles of the CBPL property: Dartmouth (population 27,244); Fall River (population 92,703); New Bedford (population 99,922); Freetown (population 8,522); and Westport (population 13,852) [32; 51-54].

The Dartmouth Water Department is supplied with drinking water from a blended system of two surface water intakes and nine gravel-packed overburden wells. Six of the wells are located within 4-radial miles of the CBPL property and include the following: Violetta Wells B1, B2, and B3, located along Old Westport Road approximately 3.5 miles south of the property; and Wells A, B, and C, located at 298 Chase Road, near the intersection with Old Westport Road, approximately 3.9 miles south of the CBPL property. Neither surface water drinking water intake is located downstream of the property. The system serves approximately 28,000 people. Since none of the sources contribute greater than 40% of the total system, the service population is apportioned equally among the 11 sources [12; 13; 38; 44].

The Fall River Water Department obtains its drinking water from a surface water intake located on North Wattupa Pond, which is replenished by Copicut Reservoir. Neither water body is located downstream of the CBPL property. The remainder of the residents of Fall River are served by private drinking water supply wells [12; 14; 47]. According to MA DEP, Noquochoke Lake, which is located downstream of the CBPL property, is listed as an emergency public drinking water surface water supply for the Fall River Water Department; however, MA DEP reported that even in times of emergency, the water quality of the lake is too poor (due to septic issues) to be used for drinking water [52; 75].

The New Bedford Water Department obtains its drinking water from surface water intakes located on Great Quitticas Pond, Little Quitticas Pond, Assowampsett Pond, and Pocksha Pond. None of these surface water bodies are located downstream of the CBPL property. None of the residents of New Bedford are served by private drinking water supply wells [12; 46].

Approximately 95% of the Town of Freetown is served by private drinking water supply wells, with 5% of the population being served by the New Bedford Water Department [12].

The Town of Westport is supplied almost entirely by private drinking water wells, with only 1% of the population being served by public drinking water from Westport Aqueduct Well, West Harbor Well, and Bayside Well. The Town of Westport maintains a total of 45 public drinking water supply wells; however, none of the wells are located within 4-radial miles of the CBPL property [12]. Table 5 summarizes the populations which rely on public groundwater sources for drinking water within 4-radial miles of the property.

Table 5

Public Groundwater Supply Sources Within 4-Radial Miles of Cold Brook Pines Landfill

Distance/Direction from Cold Brook Pines Landfill	Source Name	Location of Source[a]	Estimated Population Served	Source Type[b]
3.5 miles South	Violetta Well B1	Dartmouth	2,545	Overburden
3.5 miles South	Violetta Well B2	Dartmouth	2,545	Overburden
3.5 miles South	Violetta Well B3	Dartmouth	2,545	Overburden
3.9 miles South	Well A	Dartmouth	2,545	Overburden
3.9 miles South	Well B	Dartmouth	2,545	Overburden
3.9 miles South	Well C	Dartmouth	2,545	Overburden

[a] Indicates Town in which well is located.
[b] Overburden, Bedrock, or Unknown.

[12; 13; 38]

The nearest private drinking water supply well is located on the property and was installed in 1987 to serve the on-site residence [4, p. 5]. The depth of the well is unknown. Several other residences located along Old Fall River Road, and several residences located along Hixville Road are also served by private drinking water supply wells [45].

Private groundwater supplies located within 4-radial miles of the property were estimated using equal distribution calculations of U.S. Census CENTRACTS data identifying population, households, and private water wells for "Block Groups" which lie within or partially within individual radial distance rings measured from the CBPL property. Approximately 5,077 people are served by private drinking water supplies within 4-radial miles of the property [14]. The total population which relies on groundwater within 4-radial miles of the property is estimated to be 20,347 persons and is summarized in the Table 6.

Table 6

Estimated Drinking Water Populations Served by Groundwater Sources Within 4-Radial Miles of Cold Brook Pines Landfill

Radial Distance from Cold Brook Pines Landfill (miles)	Estimated Population Served by Private Wells	Estimated Population Served by Public Wells	Total Estimated Population Served by Groundwater Sources Within the Ring
≥ 0.00 to 0.25	25	0	25
> 0.25 to 0.50	74	0	74
> 0.50 to 1.00	295	0	295
> 1.00 to 2.00	1,070	0	1,070
> 2.00 to 3.00	975	0	975
> 3.00 to 4.00	2,638	15,270	17,908
TOTAL	5,077	15,270	20,347

[12-14]

On 2 December 1977, GHR collected five groundwater samples from the five monitoring wells (A-1 through A-5) on the property. The exact locations of these monitoring wells could not be determined and it is unknown if a reference sample was collected for this sampling event. The samples were submitted to GHR's Environmental Services Division Laboratory and analyzed for a variety of water quality parameters, including pH, total hardness (as calcium carbonate), chemical oxygen demand (COD), nitrogen (as nitrate), copper, nickel, and zinc. Two metals, including copper and zinc, were detected in all the samples; maximum concentrations were detected in A-1 and included 10,400 ppb of copper and 9,500 ppb of zinc. In addition, nickel was detected at 1,600 ppb in the groundwater sample collected from well A-1 [4, pp. 6, 9, Attachment A; 15].

On 5 January 1982, GHR collected five groundwater samples from "observation wells" B-1, B-2, B-5, B-6, and B-7 on the property. START was unable to determine if these observation wells were the same as the monitoring wells sampled in 1977. In addition, the exact locations of these observation wells could not be determined and it is unknown if a reference sample was collected for this sampling event. The samples were submitted to Cambridge Analytical Associates, Inc. (CAA) of Watertown, Massachusetts and analyzed for VOCs by EPA Method 624, SVOCs by EPA Method 625, pesticides, and PCBs. In addition, the samples were submitted to GHR Analytical Incorporated of Lakeville, MA and analyzed for metals and for a variety of water quality parameters, including pH, alkalinity, COD, chloride, color, detergents, nitrogen (as nitrate), nitrogen (as ammonia), total phosphorus, total solids, total volatile solids, total dissolved solids, volatile dissolved solids, sulfate, sulfide, and specific conductance [4, pp. 7, 10, Attachment B; 16].

Maximum concentrations of organic contaminants detected included 13 ppb of benzene in B-1 and 59 ppb of bis(2-ethylhexyl)phthalate in B-5. Eight metals were detected in the groundwater samples,

the maximum concentrations of which included calcium (42,000 ppb in B-6), copper (80 ppb in B-6), iron (6,800 ppb in B-5), magnesium (13,000 ppb in B-6), manganese (6,200 ppb in B-5), potassium (2,400 ppb in B-6), sodium (8,800 ppb in B-6), and zinc (110 ppb in B-6). No pesticides or PCBs were detected in the samples [4, pp. 7, 10, Attachment B; 16]. Bis(2-ethylhexyl)phthalate was detected above reference concentrations in soil samples collected from the property by ARCS in 1990 [4, pp. 13-14, Attachment E]. Benzene, although it has not been detected in soil and/or source samples collected from the property, it is a common constituent of waste oil and could also be associated with miscellaneous automobile parts, particularly fuel tanks, which have been historically observed on the property. As a result, START assumes at least partial attribution of benzene and bis(2-ethylhexyl)phthalate to the property.

On 12 February 1982, GHR collected two groundwater samples from observation well Nos. 3 and 4 on the property. START personnel were unable to locate information in available files regarding the exact locations of the monitoring wells or when the wells were installed. The samples were submitted to GHR Analytical Incorporated of Lakeville, MA and analyzed for metals and for a variety of water quality parameters, including pH, alkalinity (as calcium carbonate), COD, chloride, color, detergents, nitrogen (as nitrate), nitrogen (as ammonia), total phosphates, total solids, total volatile solids, dissolved solids, volatile dissolved solids, sulfates, sulfides, and specific conductance [4, pp. 7, 10, Attachment D].

Analytical results of the groundwater samples revealed the presence of 10 metals, including arsenic, calcium, copper, iron, magnesium, manganese, nickel, potassium, sodium, and zinc. Maximum concentrations of eight of the nine metals were detected in the groundwater sample collected from observation well No. 3 and included 0.02 ppm of arsenic, 18.5 ppm of calcium, 0.94 ppm of copper, 2.5 ppm of iron, 9.8 ppm of magnesium, 0.42 ppm of manganese, 0.08 ppm of nickel, 2.3 ppm of potassium, 0.44 ppm of zinc. The maximum concentration of sodium (5,500 ppb) was detected in the groundwater sample collected from observation well No. 4 [4, pp. 7, 10, Attachment D].

No known groundwater sampling has been conducted on the property since 1982. START was not able to obtain access to the property and therefore, could not perform groundwater sampling as part of the CBPL SIP. Based on analytical results from groundwater samples collected from the CBPL property by GHR in January 1982, groundwater beneath the property has been impacted by a release of hazardous substances (one VOC and one SVOC) which appear to be at least partially attributable to on-site sources. It is not known whether the on-site private drinking water supply well has been impacted by the release. Based on the location and distance to the nearest public drinking water supply wells, no nearby drinking water sources are known or suspected to have been impacted from on-site sources.

SURFACE WATER PATHWAY

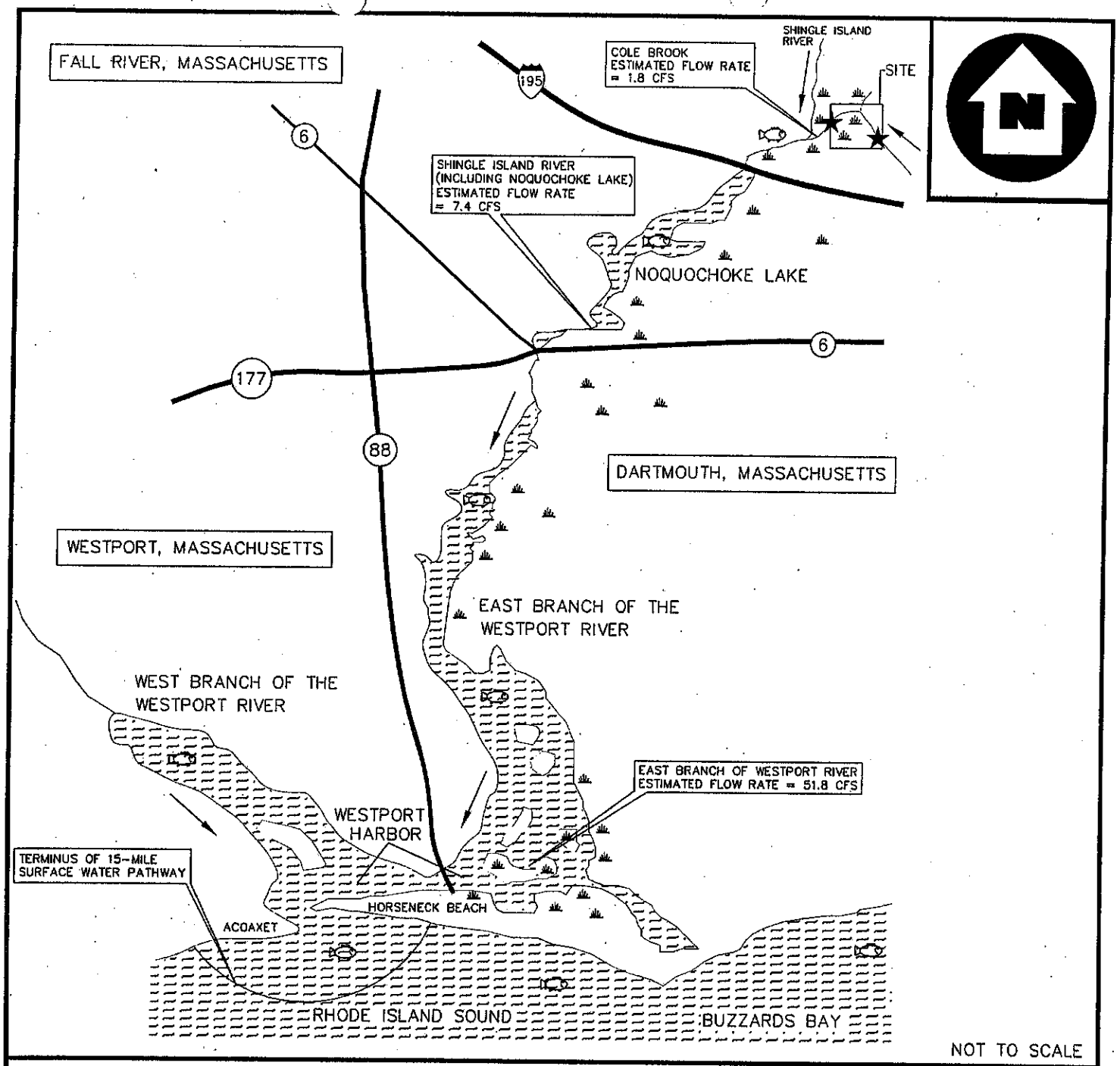
The CBPL property is located in the Buzzard's Bay Coastal Drainage Basin [33; 42]. The CBPL property is located in Flood Zone C (an area of minimal flooding, above the 100-year flood elevation) [34].

The topography of the area surrounding the CBPL property gently slopes from east to west, with the western, northern, and portions of the eastern former solid waste landfill toe located in low-lying wetland areas. Stormwater drains radially off the landfill into Colebrook Swamp, located to the north, west, and east of the former solid waste landfill [4, p. 8]. The southern portion of the CBPL property is drained by Cole Brook, which flows northwesterly past the landfill, where it turns southwesterly and flows through Colebrook Swamp and then joins the Shingle Island River [11].

The most upstream probable point of entry (PPE^1) to surface water is located along Cole Brook in the southeastern portion of the property, where runoff from potentially contaminated soil and/or miscellaneous solid waste piles could enter Cole Brook. From PPE^1, surface water flows northwest in Cole Brook for approximately 1 mile, after which Cole Brook turns sharply southwest. Surface water flows southwest for approximately 0.5 miles to the most downstream PPE (PPE^2), located along Cole Brook southwest of the former solid waste landfill. From PPE^2, Cole Brook flows west for approximately 0.2 miles before discharging into the Shingle Island River [3; 52].

From its confluence with Cole Brook, the Shingle Island River flows southwest for 1.8 miles before discharging into Noquochoke Lake, which flows southwest for approximately 1 mile and then discharges into the East Branch of the Westport River. The East Branch of the Westport River flows south for approximately 10.2 miles before emptying into Westport Harbor, which opens into Rhode Island Sound 1 mile farther south. The 15-mile downstream surface water pathway terminus extends from the mouth of Westport Harbor in a 0.8-mile radial arc from Horseneck Beach, Westport, MA to the Acoaxet section of Westport, MA (Figure 4). Since 1.5 miles of the surface water pathway is located on site, the target distance limit (TDL) for this watershed is 16.5 miles [51-54].

The flow rates of the surface water bodies along the downstream surface water pathway were estimated by multiplying the square mileage of their respective drainage basin areas by the USGS estimating factor of 1.8 cubic feet per second (cfs) per square mile (mi^2). This factor is an estimate and average of the intensity, rate, and frequency of overland flow in New England. The drainage basin areas for Cole Brook, Shingle Island River, and the East Branch of the Westport River were calculated to be 0.98 mi^2, 4.1 mi^2, and 28.75 mi^2, respectively. The estimated flow rate for Cole Brook is 1.8 cfs. The estimated flow rate for Shingle Island River is 7.4 cfs. The estimated flow rate for the East Branch of the Westport River is 51.8 cfs [26]. Table 7 describes surface water bodies along the 15-mile downstream pathway from the CBPL property.



LEGEND

- WETLANDS
- PROBABLE POINT OF ENTRY TO SURFACE WATER PATHWAY
- FISHERY
- FLOW DIRECTION
- SURFACE WATER
- CFS — CUBIC FEET PER SECOND
- ROUTE MARKER
  - INTERSTATE HIGHWAY
  - STATE ROUTE

SOURCE: U.S.G.S. QUADRANGLE(S), 7.5' SERIES:
WESTPORT, MA-RI (1977)
FALL RIVER EAST, MA (1979)

SURFACE WATER PATHWAY SKETCH

COLD BROOK PINES LANDFILL
OLD FALL RIVER ROAD
DARTMOUTH, MASSACHUSETTS

WESTON® MANAGERS DESIGNERS/CONSULTANTS
REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD #	DRAWN BY:	DATE
01-05-0054	SCHNEIDER	5/4/00

FILE NAME: S:\00050028\FIG4.DWG

FIGURE 4

Table 7

Surface Water Bodies Along the 15-Mile Downstream Pathway from Cold Brook Pines Landfill

Surface Water Body	Descriptor[a]	Length of Reach (miles)	Flow Characteristics (cfs)[b]	Length of Wetland Frontage (miles)
Cole Brook	Minimal stream	1.7	1.8	1.7
Shingle Island River (including Noquochoke Lake)	Minimal stream	2.8	7.4	3.3
East Branch of the Westport River	Small to moderate stream	10.2	51.8	17.9
Westport Harbor	Coastal tidal waters	1	NA	1
Buzzard's Bay	Coastal tidal waters	0.8	NA	0

[a] Minimal stream <10 cfs. Small to moderate stream 10-100 cfs. Coastal tidal waters (flow not applicable).
[b] Cubic feet per second.

Note: The target distance limit (TDL) for the watershed is 16.5 miles downstream of the most upstream PPE (i.e., 1.5 miles of the TDL is on site).

[17-20; 26; 27; 51-54]

There are no known surface water drinking water intakes located along the 15-mile downstream surface water pathway [38; 44-47]. According to MA DEP, Cole Brook is designated as a Public Surface Water Supply Protection Area. In addition, Noquochoke Lake is listed as an emergency public drinking water surface water supply for the Fall River Water Department; however, MA DEP reported that even in times of emergency, the water quality of the lake is too poor (due to septic issues) to be used for drinking water [52; 75].

The Massachusetts Surface Water Quality Standards do not specifically indicate the surface water body classification of Cole Brook or the Shingle Island River; therefore, a surface water body classification of B is defaulted to both water bodies, per the regulation [42]. The East Branch of the Westport River from Noquochoke Lake to Old County Road in Westport, Massachusetts is classified by MA DEP as a Class B warm water fishery (used for recreational boating and fishing); from Old County Road to its mouth, the East Branch of the Westport River is classified by MA DEP as a Class SB surface water body (used for shellfishing) [42]. The Shingle Island and Westport Rivers are classified as recreational fisheries, and Cole Brook is classified as one as well, due to its default classification [41].

Sensitive environments along the 15-mile downstream pathway include 23.9 miles of wetland frontage [27]. According to a September 1990 report from the Massachusetts Division of Fisheries

and Wildlife prepared for the CBPL property, there are one State-threatened animal species (marbled salamander) and one Federally-threatened animal species (piping plover) habitats located along the 15-mile downstream surface water pathway [50]. Table 8 summarizes sensitive environments located along the 15-mile downstream surface water pathway from the CBPL property.

Table 8

Sensitive Environments Along the 15-Mile Downstream Pathway from Cold Brook Pines Landfill

Sensitive Environment Name	Sensitive Environment Type	Surface Water Body	Downstream Distance from PPE (miles)	Flow Rate at Environment (cfs)[a]
Cole Brook	CWA-protected water body	Cole Brook	0	1.8
Cole Brook Wetlands	Wetlands (1.7 miles)	Cole Brook	0 to 1.7	1.8
Shingle Island River (including Noquochoke Lake) Wetlands	Wetlands (3.3 miles)	Shingle Island River (including Noquochoke Lake)	0.2 to 3	7.4
East Branch of the Westport River Wetlands	Wetlands (17.9 miles)	East Branch of the Westport River	3 to 13.2	51.8
Marbled Salamander Habitat	State-threatened species habitat	East Branch of the Westport River	3	51.8
Piping Plover Habitat	Federally-threatened species habitat	East Branch of the Westport River	3	51.8
Westport Harbor Wetlands	Wetlands (1 mile)	Westport Harbor	13.2 to 14.2	NA

[a] = cubic feet per second
PPE = probable point of entry
NA = not applicable

Note: The target distance limit (TDL) for the watershed is 16.5 miles downstream of the most upstream PPE (i.e., 1.5 miles of the TDL is on site).

[17-20; 26; 27; 50-54]

On 2 December 1977, GHR collected two surface water samples from Cole Brook at points upstream and downstream of the former solid waste landfill area. The exact locations at which the samples were collected were not available to START. The samples were submitted to GHR's Environmental Services Division Laboratory and analyzed for a variety of water quality parameters, including pH, total hardness (as calcium carbonate), COD, and nitrogen (as nitrate); and for metals, including copper, nickel, and zinc (methods unknown). Analytical results indicated that copper and zinc were detected upstream of the landfill at 0.15 ppm and 0.20 ppm, respectively. Copper and zinc were also detected downstream of the landfill at 0.35 ppm and 0.10 ppm, respectively [4, pp. 6, 9, Attachment A; 15].

On 11 February 1982, the Town of Dartmouth Conservation Commission collected one sediment sample from the property. Available file information did not specify the location at which of the sample was collected or if the sample was collected from a perennial surface water body. The sample was submitted to CDM and analyzed for total PCBs (method unknown). Analytical results indicated the presence of PCBs (identified as Aroclor-1254) at 22 ppb in the sample. In addition, Aroclor-1242 was present in the sample, but was not specifically quantified [4, pp. 7, 10, Attachment C; 21].

On 10 October 2000, START personnel collected five sediment samples (SD-01, SD-02, and SD-05 through SD-07) from Cole Brook and two sediment samples (SD-03 and SD-04) from an unnamed tributary of Cole Brook, located north of the CBPL property and north of Old Fall River Road, to determine if there has been a release of hazardous substances (associated with the CBPL property) to surface water. All the samples were collected off site. Samples SD-03 and SD-04 were collected along the unnamed tributary as upstream reference samples, and samples SD-05 and SD-06 were collected along Cole Brook as upstream reference samples. Samples SD-05 and SD-06 were collected along Cole Brook in the north/northeastern portion of a residential property (Map No. 62, Lot No. 22) located south of the CBPL property. Samples SD-01, SD-02, and SD-07 were collected along Cole Brook downstream of the property to establish potential impacts on targets downstream of the property. All the samples were analyzed through a DAS laboratory for VOCs, SVOCs, pest/PCBs, TAL metals, and cyanide, with the exception of SD-04 and SD-06 which were analyzed for TAL metals only [3, pp. 14-24; 58-59]. Table 9 summarizes the sediment samples collected by START personnel on 10 October 2000.

Table 9

Sediment Sample Summary: Cold Brook Pines Landfill
Samples Collected by START on 10 October 2000

Sample Location No.	Traffic Report No.	Time (hrs)	Remarks	Sample Depth (Feet)	Sample Source
MATRIX: Sediment					
SD-01	D03159	1240	Grab	0 to 0.5	Sample collected from Cole Brook, along the northern portion of a residential property (Map No. 192, Lot No. 55) located southwest and downstream of the CBPL property. Material was medium-to-dark brown, fine sand and silt, with trace rootlets. T = 8.3°C; Conductivity = 56.7 μS; pH = 8.3. FID = 0 units above background. Latitude = 41° 40′ 30.35058″ north. Longitude = 71° 00′ 56.46674″ west.
SD-02	D03160	1248	Grab	0 to 0.5	Duplicate sample of SD-01, collected for quality control.

Table 9

Sediment Sample Summary: Cold Brook Pines Landfill
Samples Collected by START on 10 October 2000 (Continued)

Sample Location No.	Traffic Report No.	Time (hrs)	Remarks	Sample Depth (Feet)	Sample Source
MATRIX: Sediment					
SD-03	D03161	1135	Grab	0 to 0.5	Sample collected from an unnamed tributary of Cole Brook located north of the CBPL property, as a reference sample. Sample was collected north of Old Fall River Road. Material was grey and light brown, medium-to-coarse sand, with some gravel. T = 11.5°C; Conductivity = 69.1 μS; pH = 6.8. FID = 0 units above background. Latitude = 41° 40′ 52.42026″ north. Longitude = 71° 00′ 40.68424″ west.
SD-04	D03162	1135	Grab	0 to 0.5	Sample collected from an unnamed tributary of Cole Brook located north of the CBPL property, as a reference sample (analyzed for TAL metals only). Sample collected north of Old Fall River Road. Material was grey and light brown, medium-to-coarse sand, with some gravel. T = 11.5°C; Conductivity = 69.1 μS; pH = 6.8. FID = 0 units above background. Latitude = 41° 40′ 52.47102″ north. Longitude = 71° 00′ 40.68324″ west.
SD-05	D03163	1040	Grab	0 to 0.5	Sample collected from Cole Brook, as a reference sample, along the north/ northeastern portion of a residential property (Map No. 62, Lot No. 22) located south and upstream of the CBPL property. Material was dark brown, fine sand and silt, with trace organic matter. T = 7.3°C; Conductivity = 43.3 μS; pH = 8.7. FID = 0 units above background. Latitude = 41° 40′ 06.31791″ north. Longitude = 71° 00′ 17.77431″ west.

Table 9

Sediment Sample Summary: Cold Brook Pines Landfill
Samples Collected by START on 10 October 2000 (Concluded)

Sample Location No.	Traffic Report No.	Time (hrs)	Remarks	Sample Depth (Feet)	Sample Source
MATRIX: Sediment					
SD-06	D03164	1040	Grab	0 to 0.5	Sample collected from Cole Brook, as a reference sample (analyzed for TAL metals only), along the north/northeastern portion of the residential property (Map No. 62, Lot No. 22) located south and upstream of the CBPL property. Material was dark brown, fine sand and silt, with trace organic matter. T = 7.3°C; Conductivity = 43.3 μS; pH = 8.7. FID = 0 units above background. Latitude = 41° 40′ 06.31377″ north. Longitude = 71° 00′ 17.79019″ west.
SD-07 (MS/MSD)	D03165	1145	Grab	0 to 0.5	Sample collected from Cole Brook, west and downstream of the CBPL property. Material was medium-to-dark brown, fine sand and silt, with trace rootlets. T = 7.9°C; Conductivity = 86.7 μS; pH = 7.6. FID = 0 units above background. Latitude = 41° 40′ 29.79699″ north. Longitude = 71° 01′ 05.63318″ west.

CBPL = Cold Brook Pines Landfill
MS/MSD = matrix spike/matrix spike duplicate
μS = micro Siemens
T = temperature
°C = degrees Celsius
hrs = hours
FID = flame ionization detector
° = degrees
′ = minutes
″ = seconds
TAL = target analyte list

[3; 72]

Complete analytical results of START sediment samples including quantitation and detection limits are presented in Attachment A. Sample results qualified with a "J" on analytical tables are considered approximate because of limitations identified during DAS data validation. In addition, organic sample results reported at concentrations below quantitation limits and confirmed by mass spectrometry are also qualified by a "J" and considered approximate.

Table 10 is a summary of substances detected through DAS analyses of START sediment samples. For each sample location, a compound or element is listed if it is detected at greater than or equal to three times the higher of the reference sample concentrations or greater than or equal to the reference sample's SQL (for organic analyses) or SDL (for inorganic analyses). Sediment samples SD-03 and SD-04 were collected from the unnamed tributary as upstream reference samples, and sediment samples SD-05 and SD-06 were collected as the upstream reference samples for Cole Brook.

Table 10

Summary of Analytical Results
Sediment Sample Analysis for Cold Brook Pines Landfill
Samples Collected by START on 10 October 2000

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration	Comments
SD-01	**INORGANICS**			
	Beryllium	1.4 ppm	0.35 J ppb	4 × Ref.
SD-02	**INORGANICS**			
	Beryllium	1.1 ppm	0.35 J ppm	3.1 × Ref.
SD-07	**INORGANICS**			
	Antimony	1.3 ppm	0.92 U ppm	1.4 × SDL
	Cadmium	0.12 J ppm	0.09 U ppm	1.3 × SDL

ppm = parts per million
Ref. = reference sample concentration
SDL = sample detection limit
U = Indicates the compound was analyzed for, but not detected. The associated numerical value is the SQL or SDL.
J = Quantitation is approximate due to limitations identified during the quality control review.

[59]

No VOCs were detected at concentrations greater than three times the appropriate reference sample concentrations or greater than or equal to the appropriate reference sample's SQL. It should be noted that one VOC (methyl acetate) was detected in three of the sediment samples, including the upstream reference sample for Cole Brook (SD-05) and the upstream reference sample for the unnamed tributary of Cole Brook (SD-03). There is potential that source areas exist upstream of the CBPL property [58].

No SVOCs were detected at concentrations greater than three times the appropriate reference sample concentrations or greater than or equal to the appropriate reference sample's SQL. It should be noted that several SVOCs were detected in the upstream reference sample collected along the unnamed

tributary of Cole Brook (SD-03). The reference sample, although collected upstream of the CBPL property, was collected in close proximity to Old Fall River Road and may have been influenced by runoff from the road. In addition, there is potential that source areas exist across (north of) Old Fall River Road [58].

No pest/PCBs or cyanide were detected above laboratory detection limits in any samples [58-59].

Three metals (antimony, beryllium, and cadmium) were detected in the sediment samples at concentrations greater than three times the appropriate reference sample concentrations or greater than or equal to the appropriate reference sample's SDL. Antimony was detected in sample SD-07 at 1.3 ppm; beryllium was detected in sample SD-01 at 1.4 ppm and in sample SD-02 at 1.1 ppm; and cadmium was detected in sample SD-07 at 0.12 J ppm (a sample result qualified with a "J" is considered approximate because of limitations identified during the quality control review) [59]. Based on available file information, the use and/or disposal of these metals on the CBPL property is unknown. Historically, analysis of soil and source samples collected from the property has not revealed the presence of these metals [4; 6; 15-16; 21; 48-49]. As a result, the metals detected in the sediment samples collected by START will not be attributed to the CBPL property.

START performed off-site sediment sampling as part of the CBPL SIP. Based on the analytical results, no release of hazardous substances to surface water has been documented. As a result, a Clean Water Act-protected water body, wetlands, and a fishery have not been impacted.

SOIL EXPOSURE PATHWAY

A single-family, one-story residence with one occupant is reportedly located on the property. Access to the property is unrestricted. According to employees of Gosselin & Sons Landscape Materials (Lot No. 7 on Map No. 72), Mr. Smith's ex-wife resides in the on-site residence. Information obtained from on-line white pages indicates that a "J A Smith" resides at 460 Old Fall River Road [74]. Reportedly, local youths use the access road as a "short cut" to travel between Old Fall River Road and Hixville Road [3, pp. 10-11].

There are no known employees on the property [3; 4, p. 7]. The nearest day-care facility is the "Country Road Pre School", located at 644 Old Fall River Road, approximately 0.5 miles west/northwest of the property [52; 57]. Based on available background information and on observations by START during the February 2000 reconnaissance, no terrestrial sensitive environments are believed to be located on the property [3]. An estimated 524 persons live within 1-radial mile of the property [14].

On 15 August 1990, ARCS personnel collected five surface soil samples (SS-411, SS-421, SS-421D, SS-431, and SS-441), including a duplicate, from potential source areas on the property. Four soil samples were collected at 6 inches below grade (SS-421, SS-421D, SS-431, and SS-441); one soil sample was collected at 12 inches below grade (SS-411). Surface soil sample SS-441 was collected east of the former solid waste landfill area (presumably upgradient of potential sources) to document reference conditions. The samples were analyzed through EPA CLP for VOCs, SVOCs, pest/PCBs, metals, and cyanide [4, pp. 10-11; 28]. Analytical results are discussed in detail in the Waste/Source Sampling section of this report.

On 1 February 2000, START conducted an off-site reconnaissance of the property from the AG pipeline easement. No soil staining or stressed vegetation noted in previous visits was observed due to snow cover. No sampling was conducted during the reconnaissance [3].

START was not able to obtain access to the property and therefore, could not perform surface soil sampling as part of the CBPL SIP. In 1990, surface soil samples were collected from the property by ARCS; no known additional soil sampling has been conducted since that time. Based on the analytical results of the ARCS soil samples, an area of contaminated soil (with three VOCs, 18 SVOCs, one pesticide, and six metals) has been documented. One single-family residence is located on the property In addition, local youths use the on-site access road as a "short cut" to travel between Old Fall River Road and Hixville Road. To date, no actions have been taken to address this area of contaminated soil.

AIR PATHWAY

A single-family, one-story residence with one occupant is reportedly located on the property. Access tp the property is unrestricted. According to employees of Gosselin & Sons Landscape Materials (Lot No. 7 on Map No. 72), Mr. Smith's ex-wife resides in the on-site residence. Information obtained from on-line white pages indicates that a "J A Smith" resides at 460 Old Fall River Road [74]. Reportedly, local youths use the access road as a "short cut" to travel between Old Fall River Road and Hixville Road [3, pp. 10-11].

There are no known employees on the property [3; 4, p. 7]. The nearest day-care facility is the "Country Road Pre School", located at 644 Old Fall River Road, approximately 0.5 miles west/northwest of the property [52; 57]. Based on available background information and on observations by START during the February 2000 reconnaissance, no terrestrial sensitive environments are believed to be located on the property [3]. Including the one on-site resident, there are an estimated 21,171 people located within 4-radial miles of the CBPL property [3; 14]. Table 11 summarizes the estimated population within 4-radial miles of the CBPL property.

Table 11

Estimated Population Within 4-Radial Miles of Cold Brook Pines Landfill

Radial Distance from Cold Brook Pines Landfill (miles)	Estimated Population
On a Source	1*
> 0.00 to 0.25	33
> 0.25 to 0.50	98
> 0.50 to 1.00	393
> 1.00 to 2.00	1,699
> 2.00 to 3.00	4,226
> 3.00 to 4.00	14,721
TOTAL	21,171

*Indicates one suspected on-site resident.

[3; 14]

Approximately 4,635 acres of wetlands are located within 4-radial miles of the property [17-20; 22]. Cole Brook, a Clean Water Act-protected water body, flows through the property [52]. There are two State-endangered and one State-threatened plant species habitats located within 1-radial mile of the CBPL property; however, available reference material does not indicate the exact locations of these habitats [50]. For the purposes of this SIP, and to provide a liberal pathway score, START will assume that the habitats are located between greater than 0.00- and 0.25-radial miles from the property. Table 12 summarizes the sensitive environments located within 4-radial miles of the CBPL property.

Table 12

Sensitive Environments Located Within 4-Radial Miles of Cold Brook Pines Landfill

Radial Distance from Cold Brook Pines Landfill (miles)	Sensitive Environment
On a source	Water body protected by the Clean Water Act
	15 acres wetlands
>0.00 to 0.25	30 acres wetlands
	Two State-endangered plant species
	One State-threatened plant species
>0.25 to 0.50	60 acres wetlands
>0.50 to 1.00	335 acres wetlands
>1.00 to 2.00	945 acres wetlands
>2.00 to 3.00	1,500 acres wetlands
>3.00 to 4.00	1,750 acres wetlands

[17-20; 22; 50; 52]

During the START off-site reconnaissance, ambient air was monitored using a flame ionization detector (FID). No readings above background levels were noted [3].

START did not collect ambient air samples as part of the CBPL SIP. No quantitative laboratory air samples are known to have been collected at the CBPL property to date. Based on available data, no release of hazardous substances to the ambient air from on-site sources is known or suspected to have occurred, and no impacts to nearby residential populations or sensitive environments are known or suspected.

SUMMARY

The Cold Brook Pines Landfill (CBPL) property, also referred to historically as Cecil Smith's Landfill or Clean Communities Landfill, is located along Old Fall River Road in Dartmouth, Bristol County, Massachusetts. The property is comprised of 238.1 acres and consists of six contiguous parcels identified on the Town of Dartmouth Tax Assessor's Map No. 67 as Lot Nos. 5 (3.3 acres), 7 (23.9 acres), and 8 (97.9 acres) and Map No. 72 as Lot Nos. 6 (97.6 acres), 8 (0.9 acres), and 9 (14.5 acres). The property is currently owned by Shingle Island, Inc.

Approximately 60 acres of the western portion of the parcel identified as Lot No. 6 on Map No. 72 consists of a former solid waste "dump" (i.e., a former solid waste landfill) operated between approximately 1954 and 1974. The remaining areas of the property consist of undeveloped woodlands and wetlands, unimproved access roads, former sand and gravel extraction areas, and miscellaneous solid waste piles. In general, the property is divided in an east/west direction by an Algonquin Gas (AG) pipeline easement and in a north/south direction by a New Bedford Gas and Electric (NBG&E) power line easement

The area surrounding the CBPL property comprises predominantly undeveloped residential properties with some light agricultural properties. Residential properties and one commercial property are located north of the CBPL property. Residential properties and undeveloped properties abut the CBPL property to the south, and undeveloped properties along Old Fall River Road abut the CBPL property to the east. The property is bordered to the west by residential properties, undeveloped wetlands and woodland, and the Shingle Island River. The property is bordered by Old Fall River Road to the north and Hixville Road to the south

Solid waste disposed of on the property generally consisted of demolition debris, including brick, wood, steel, pipes, and miscellaneous construction and demolition (C&D) debris. In the early-to-mid 1970s, inspections of the property by local and State officials revealed the presence of "pools of waste oil", an excavation "filled with oil", and disposal of "..oil and dredgings...".

In the late 1970s and the early 1980s, plans were proposed for the construction of a new sanitary landfill on top of the former solid waste landfill. Available information indicates that the former solid waste landfill was graded and covered with a relatively impermeable clay liner material, and a protective cover of sandy soil had been placed over the clay liner. These materials were to act as the cap for the solid waste landfill and the base liner for the new sanitary landfill. In the mid-1980s, court orders restricted conducting sanitary landfilling operations on the property; however, the landfilling of demolition materials was permissible on the 60-acre former solid waste landfill. Reportedly, after not receiving the proper permits to operate the new landfill, the property owner allegedly removed the cap materials and sold them.

On 15 August 1990, as part of a Screening Site Inspection (SSI), Roy F. Weston, Inc. (WESTON®) Alternative Remedial Contracts Strategy (ARCS) personnel conducted an on-site reconnaissance of the CBPL property. During the reconnaissance, ARCS personnel collected five surface soil samples from the property. Three volatile organic compounds (VOCs); 18 semivolatile organic compounds (SVOCs); one pesticide; and six metals were detected above reference sample concentrations.

On 1 February 2000, as part of a Site Inspection Prioritization (SIP), WESTON® Superfund Technical Assessment and Response Team (START) personnel conducted a reconnaissance of the CBPL property from the AG pipeline easement, as access to the CBPL property was not granted by the property owner.

On 10 October 2000, START personnel collected five off-site sediment samples from Cole Brook and two off-site sediment samples from an unnamed tributary of Cole Brook located north of the CBPL property, to determine if there has been a release of hazardous substances (associated with the CBPL property) to surface water. Three metals were detected in the sediment samples above reference concentrations.

The depth to groundwater beneath the CBPL property was not available to START. Groundwater flow direction beneath the property has not been determined; however, based on the location of Colebrook Swamp and Cole Brook, groundwater beneath the property most likely flows radially to the west, north, and east. The nearest documented groundwater sources for public drinking water are the Dartmouth Water Department's Violetta Wells B1, B2, and B3, located approximately 3.5 miles south of the property. The nearest private drinking water supply well is reportedly located on site and serves an on-site residence. The total population which relies on groundwater within 4-radial miles of the property is 20,347 persons. Based on analytical results from groundwater samples collected from the CBPL property in January 1982, groundwater beneath the property has been impacted by a release of hazardous substances (one VOC and one SVOC) which appears to be at least partially attributable to on-site sources.

The southern portion of the CBPL property is drained by Cole Brook, which flows northwesterly past the landfill, where it turns southwesterly and flows through Colebrook Swamp and then joins the Shingle Island River. From its confluence with Cole Brook, the Shingle Island River flows southwesterly for 1.8 miles before discharging into Noquochoke Lake, which flows southwesterly for approximately 1 mile and then discharges into the East Branch of the Westport River. The East Branch of the Westport River flows south for approximately 10.2 miles before emptying into Westport Harbor, which opens into Rhode Island Sound 1 mile farther south. Based on analytical results from off-site sediment samples collected by START in October 2000, a release of hazardous substances to off-site surface water has not been documented.

A single-family, one-story residence with one occupant is reportedly located on the property. Access to the property is unrestricted. Reportedly, local youths use the access road as a "short cut" to travel between Old Fall River Road and Hixville Road. There are no known employees on the property. An estimated 524 persons live within 1-radial mile of the property. Based on analytical results of surface soil samples collected from the property by ARCS in August 1990, an area of contaminated soil (with three VOCs, 18 SVOCs, one pesticide, and six metals) has been documented.

An estimated 21,171 persons live within 4-radial miles of the property. In addition, approximately 4,635 acres of wetlands are located within 4-radial miles of the property. No quantitative laboratory air samples are known to have been collected at the CBPL property to date. Based on available data, no release of hazardous substances to the ambient air from on-site sources is known or suspected to have occurred, and no impacts to nearby residential populations or sensitive environments are known or suspected.

COLD BROOK PINES LANDFILL
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ATTACHMENT A

COLD BROOK PINES LANDFILL

SEDIMENT SAMPLE
ANALYTICAL RESULTS
START

Samples Collected 10 October 2000

SITE: COLD BROOK PINES LANDFILL
CASE: 0379F SDG: D03159_O
LABORATORY: CEIMIC CORP

TABLE 1
VOLATILE SOIL ANALYSIS - LOW LEVEL
µg/kg

SAMPLE NUMBER:		D03159	D03160	D03161	D03163	D03165
SAMPLE LOCATION:		SD-01	SD-02	SD-03	SD-05	SD-07
LABORATORY NUMBER:		200745-01A	200745-02A	200745-03A	200745-04A	200745-05A
COMPOUND	CRQL					
Dichlorodifluoromethane	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
Chloromethane	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
Vinyl Chloride	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
Bromomethane	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
Chloroethane	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
Trichlorofluoromethane	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
1,1-Dichloroethene	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
1,1,2-Trichloro-1,2,2-trifluoroethane	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
Acetone	10	110 J TB	42 UJ	11 UJ	120 J TB	130 J TB
Carbon Disulfide	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
Methyl Acetate	10	28 UJ	42 UJ	35 J	260 J	44 J
Methylene Chloride	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
trans-1,2-Dichloroethene	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
Methyl tert-Butyl Ether	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
1,1-Dichloroethane	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
cis-1,2-Dichloroethene	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
2-Butanone	10	28 UJ	42 UJ	11 UJ	24 UJ	22 UJ
Chloroform	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
1,1,1-Trichloroethane	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
Cyclohexane	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
Carbon Tetrachloride	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
Benzene	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
1,2-Dichloroethane	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
Trichloroethene	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
Methylcyclohexane	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
1,2-Dichloropropane	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
Bromodichloromethane	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
cis-1,3-Dichloropropene	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
4-Methyl-2-Pentanone	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
Toluene	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
trans-1,3-Dichloropropene	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
1,1,2-Trichloroethane	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
Tetrachloroethene	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
2-Hexanone	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
Dibromochloromethane	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
1,2-Dibromoethane	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
Chlorobenzene	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
Ethylbenzene	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
Xylene (Total)	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
Styrene	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
Bromoform	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
Isopropylbenzene	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
1,1,2,2-Tetrachloroethane	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
1,3-Dichlorobenzene	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
1,4-Dichlorobenzene	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
1,2-Dichlorobenzene	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
1,2-Dibromo-3-chloropropane	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
1,2,4-Trichlorobenzene	10	28 UJ	42 UJ	11 UJ	23 UJ	22 UJ
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:		10/10/00	10/10/00	10/10/00	10/10/00	10/10/00
DATE ANALYZED:		10/14/00	10/14/00	10/15/00	10/15/00	10/15/00
% MOISTURE:		55	64	19	46	53

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: COLD BROOK PINES LANDFILL
CASE: 0379F SDG: D03159_O
LABORATORY: CEIMIC CORP

TABLE 2
VOLATILE AQUEOUS ANALYSIS
µg/L

SAMPLE NUMBER:		D03166	D03167
SAMPLE LOCATION:		RB-01	TB-01
LABORATORY NUMBER:		200745-06A	200745-07A
COMPOUND	CRQL		
Dichlorodifluoromethane	10	10 U	10 U
Chloromethane	10	10 U	10 U
Vinyl Chloride	10	10 U	10 U
Bromomethane	10	10 U	10 U
Chloroethane	10	10 U	10 U
Trichlorofluoromethane	10	10 U	10 U
1,1-Dichloroethene	10	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	10	10 U	10 U
Acetone	10	12	14
Carbon Disulfide	10	10 U	10 U
Methyl Acetate	10	10 U	10 U
Methylene Chloride	10	10 U	10 U
trans-1,2-Dichloroethene	10	10 U	10 U
Methyl tert-Butyl Ether	10	10 U	10 U
1,1-Dichloroethane	10	10 U	10 U
cis-1,2-Dichloroethene	10	10 U	10 U
2-Butanone	10	6 J	10 U
Chloroform	10	2 J	2 J
1,1,1-Trichloroethane	10	10 U	10 U
Cyclohexane	10	10 U	10 U
Carbon Tetrachloride	10	10 U	10 U
Benzene	10	10 U	10 U
1,2-Dichloroethane	10	10 U	10 U
Trichloroethene	10	10 U	10 U
Methylcyclohexane	10	10 U	10 U
1,2-Dichloropropane	10	10 U	10 U
Bromodichloromethane	10	10 U	10 U
cis-1,3-Dichloropropene	10	10 U	10 U
4-Methyl-2-Pentanone	10	10 U	10 U
Toluene	10	10 U	10 U
trans-1,3-Dichloropropene	10	10 U	10 U
1,1,2-Trichloroethane	10	10 U	10 U
Tetrachloroethene	10	10 U	10 U
2-Hexanone	10	10 U	10 U
Dibromochloromethane	10	10 U	10 U
1,2-Dibromoethane	10	10 U	10 U
Chlorobenzene	10	10 U	10 U
Ethylbenzene	10	10 U	10 U
Xylene (Total)	10	10 U	10 U
Styrene	10	10 U	10 U
Bromoform	10	10 U	10 U
Isopropylbenzene	10	10 U	10 U
1,1,2,2-Tetrachloroethane	10	10 U	10 U
1,3-Dichlorobenzene	10	10 U	10 U
1,4-Dichlorobenzene	10	10 U	10 U
1,2-Dichlorobenzene	10	10 U	10 U
1,2-Dibromo-3-chloropropane	10	10 UJ	10 UJ
1,2,4-Trichlorobenzene	10	10 U	10 U
DILUTION FACTOR:		1.0	1.0
DATE SAMPLED:		10/10/00	10/10/00
DATE ANALYZED:		10/13/00	10/13/00

SITE: COLD BROOK PINES LANDFILL
CASE: 0379F SDG: D03159_O
LABORATORY: CEIMIC CORP

TABLE 3
SEMIVOLATILE SOIL ANALYSIS
µg/kg

SAMPLE NUMBER:		D03159	D03160	D03161	D03163	D03165
SAMPLE LOCATION:		SD-01	SD-02	SD-03	SD-05	SD-07
LABORATORY NUMBER:		200745-01	200745-02	200745-03	200745-04	200745-05
COMPOUND	CRQL					
Phenol	330	720 U	920 U	400 U	610 U	3500 U
bis(2-Chloroethyl)Ether	330	720 U	920 U	400 U	610 U	3500 U
2-Chlorophenol	330	720 U	920 U	400 U	610 U	3500 U
2-Methylphenol	330	720 U	920 U	400 U	610 U	3500 U
2,2'-oxybis(1-Chloropropane)	330	720 UJ	920 UJ	400 UJ	610 UJ	3500 UJ
4-Methylphenol	330	720 U	920 U	400 U	610 U	3500 U
1,3-Dichlorobenzene	330	720 U	920 U	400 U	610 U	3500 U
1,4-Dichlorobenzene	330	720 U	920 U	400 U	610 U	3500 U
N-Nitroso-di-n-propylamine	330	720 U	920 U	400 U	610 U	3500 U
Hexachloroethane	330	720 U	920 U	400 U	610 U	3500 U
1,2-Dichlorobenzene	330	720 U	920 U	400 U	610 U	3500 U
Nitrobenzene	330	720 U	920 U	400 U	610 U	3500 U
Isophorone	330	720 U	920 U	400 U	610 U	3500 U
2-Nitrophenol	330	720 U	920 U	400 U	610 U	3500 U
2,4-Dimethylphenol	330	720 U	920 U	400 U	610 U	3500 U
bis(2-Chloroethoxy)methane	330	720 U	920 U	400 U	610 U	3500 U
2,4-Dichlorophenol	330	720 U	920 U	400 U	610 U	3500 U
Naphthalene	330	720 U	920 U	400 U	610 U	3500 U
4-Chloroaniline	330	720 U	920 U	400 U	610 U	3500 U
Hexachlorobutadiene	330	720 UJ	920 UJ	400 UJ	610 UJ	3500 UJ
4-Chloro-3-Methylphenol	330	720 U	920 U	400 U	610 U	3500 U
2-Methylnaphthalene	330	720 U	920 U	400 U	610 U	3500 U
Hexachlorocyclopentadiene	330	720 UJ	920 UJ	400 UJ	610 UJ	3500 UJ
2,4,6-Trichlorophenol	330	720 U	920 U	400 U	610 U	3500 U
1,2,4-Trichlorobenzene	330	720 U	920 U	400 U	610 U	3500 U
2,4,5-Trichlorophenol	830	1800 U	2300 U	1000 U	1500 U	8700 U
2-Chloronaphthalene	330	720 U	920 U	400 U	610 U	3500 U
2-Nitroaniline	830	1800 U	2300 U	1000 U	1500 U	8700 U
Dimethylphthalate	330	720 U	920 U	400 U	610 U	3500 U
Acenaphthylene	330	720 U	920 U	400 U	610 U	3500 U
3-Nitroaniline	830	1800 U	2300 U	1000 U	1500 U	8700 U
Acenaphthene	330	720 U	920 U	400 U	610 U	3500 U
2,4-Dinitrophenol	830	1800 UJ	2300 UJ	1000 UJ	1500 UJ	8700 UJ
4-Nitrophenol	830	1800 U	2300 U	1000 U	1500 U	8700 U
Dibenzofuran	330	720 U	920 U	400 U	610 U	3500 U
2,4-Dinitrotoluene	330	720 U	920 U	400 U	610 U	3500 U
Diethylphthalate	330	720 U	920 U	400 U	610 U	3500 U
Fluorene	330	720 U	920 U	400 U	610 U	3500 U
4-Chlorophenyl-phenylether	330	720 U	920 U	400 U	610 U	3500 U
4-Nitroaniline	830	1800 U	2300 U	1000 U	1500 U	8700 U
4,6-Dinitro-2-methylphenol	830	1800 U	2300 U	1000 U	1500 U	8700 U
N-Nitrosodiphenylamine (1)	330	720 U	920 U	400 U	610 U	3500 U
4-Bromophenyl-phenylether	330	720 U	920 U	400 U	610 U	3500 U
Hexachlorobenzene	330	720 UJ	920 UJ	400 UJ	610 UJ	3500 UJ
2,6-Dinitrotoluene	330	720 U	920 U	400 U	610 U	3500 U
Pentachlorophenol	830	1800 UJ	2300 UJ	1000 UJ	1500 UJ	8700 UJ
Phenanthrene	330	720 U	920 U	42 J	610 U	3500 U
Anthracene	330	720 U	920 U	400 U	610 U	3500 U
Carbazole	330	720 U	920 U	400 U	610 U	3500 U
Di-n-butylphthalate	330	85 J EB	920 U	400 U	610 U	3500 U
Fluoranthene	330	720 U	920 U	110 J	62 J	3500 U
Pyrene	330	100 J	920 U	96 J	610 U	3500 U
Butylbenzylphthalate	330	720 U	920 U	400 U	610 U	3500 U
3,3'-Dichlorobenzidine	330	720 U	920 U	400 U	610 U	3500 U
Benzo(a)anthracene	330	720 U	920 U	66 J	610 U	3500 U
Chrysene	330	720 U	920 U	71 J	610 U	3500 U
bis(2-Ethylhexyl)phthalate	330	100 J	920 U	400 U	610 U	3500 U
Di-n-octylphthalate	330	720 U	920 U	400 U	610 U	3500 U
Benzo(b)fluoranthene	330	720 U	920 U	56 J	610 U	3500 U
Benzo(k)fluoranthene	330	720 U	920 U	71 J	610 U	3500 U
Benzo(a)pyrene	330	720 U	920 U	75 J	610 U	3500 U
Indeno(1,2,3-cd)pyrene	330	720 U	920 U	400 U	610 U	3500 U
Dibenzo(a,h)anthracene	330	720 U	920 U	400 U	610 U	3500 U
Benzo(g,h,i)perylene	330	720 U	920 U	400 U	610 U	3500 U
DILUTION FACTOR:		1.0	1.0	1.0	1.0	5.0
DATE SAMPLED:		10/10/00	10/10/00	10/10/00	10/10/00	10/10/00
DATE EXTRACTED:		10/16/00	10/16/00	10/16/00	10/16/00	10/16/00
DATE ANALYZED:		10/24/00	10/24/00	10/24/00	10/24/00	10/24/00
% MOISTURE:		55	64	19	46	53

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: COLD BROOK PINES LANDFILL
CASE: 0379F SDG: D03159_O
LABORATORY: CEIMIC CORP

TABLE 4
SEMIVOLATILE AQUEOUS ANALYSIS
µg/L

SAMPLE NUMBER:	D03166
SAMPLE LOCATION:	RB-01
LABORATORY NUMBER:	200745-06

COMPOUND	CRQL	
Phenol	10	10 U
bis(2-Chloroethyl)Ether	10	10 U
2-Chlorophenol	10	10 U
2-Methylphenol	10	10 U
2,2'-oxybis(1-Chloropropane)	10	10 U
4-Methylphenol	10	10 U
1,3-Dichlorobenzene	10	10 U
1,4-Dichlorobenzene	10	10 U
N-Nitroso-di-n-propylamine	10	10 U
Hexachloroethane	10	10 U
1,2-Dichlorobenzene	10	10 U
Nitrobenzene	10	10 U
Isophorone	10	10 U
2-Nitrophenol	10	10 U
2,4-Dimethylphenol	10	10 U
bis(2-Chloroethoxy)methane	10	10 U
2,4-Dichlorophenol	10	10 U
Naphthalene	10	10 U
4-Chloroaniline	10	10 U
Hexachlorobutadiene	10	10 U
4-Chloro-3-methylphenol	10	10 U
2-Methylnaphthalene	10	10 U
Hexachlorocyclopentadiene	10	10 U
2,4,6-Trichlorophenol	10	10 U
1,2,4-Trichlorobenzene	10	10 U
2,4,5-Trichlorophenol	25	25 U
2-Chloronaphthalene	10	10 U
2-Nitroaniline	25	25 U
Dimethylphthalate	10	10 U
Acenaphthylene	10	10 U
3-Nitroaniline	25	25 U
Acenaphthene	10	10 U
2,4-Dinitrophenol	25	25 U
4-Nitrophenol	25	25 U
Dibenzofuran	10	10 U
2,4-Dinitrotoluene	10	10 U
Diethylphthalate	10	10 U
Fluorene	10	10 U
4-Chlorophenyl-phenylether	10	10 U
4-Nitroaniline	25	25 U
4,6-Dinitro-2-methylphenol	25	25 U
N-Nitrosodiphenylamine (1)	10	10 U
4-Bromophenyl-phenylether	10	10 U
Hexachlorobenzene	10	10 U
2,6-Dinitrotoluene	10	10 U
Pentachlorophenol	25	25 UJ
Phenanthrene	10	10 U
Anthracene	10	10 U
Carbazole	10	10 U
Di-n-butylphthalate	10	1 J
Fluoranthene	10	10 U
Pyrene	10	10 U
Butylbenzylphthalate	10	10 U
3,3'-Dichlorobenzidine	10	10 U
Benzo(a)anthracene	10	10 U
Chrysene	10	10 U
bis(2-Ethylhexyl)phthalate	10	10 U
Di-n-octylphthalate	10	10 U
Benzo(b)fluoranthene	10	10 U
Benzo(k)fluoranthene	10	10 U
Benzo(a)pyrene	10	10 U
Indeno(1,2,3-cd)pyrene	10	10 U
Dibenzo(a,h)anthracene	10	10 U
Benzo(g,h,i)perylene	10	10 U

DILUTION FACTOR:	1.0
DATE SAMPLED:	10/10/00
DATE EXTRACTED:	10/16/00
DATE ANALYZED:	10/17/00

SITE: COLD BROOK PINES LANDFILL
CASE: 0379F SDG: D03159_O
LABORATORY: CEIMIC CORP

TABLE 5
PESTICIDE/POLYCHLORINATED BIPHENYL SOIL ANALYSIS
µg/kg

SAMPLE NUMBER:		D03159	D03160	D03161	D03163	D03165
SAMPLE LOCATION:		SD-01	SD-02	SD-03	SD-05	SD-07
LABORATORY NUMBER:		200745-01	200745-02	200745-03	200745-04	200745-05
COMPOUND	CRQL					
alpha-BHC	1.7	3.8 U	4.7 U	2.1 U	3.1 U	3.6 U
beta-BHC	1.7	3.8 U	4.7 U	2.1 U	3.1 U	3.6 U
delta-BHC	1.7	3.8 U	4.7 U	2.1 U	3.1 U	3.6 U
gamma-BHC (Lindane)	1.7	3.8 U	4.7 U	2.1 U	3.1 U	3.6 UJ
Heptachlor	1.7	3.8 U	4.7 U	2.1 U	3.1 U	3.6 U
Aldrin	1.7	3.8 U	4.7 U	2.1 U	3.1 U	3.6 U
Heptachlor Epoxide	1.7	3.8 U	4.7 U	2.1 U	3.1 U	3.6 U
Endosulfan I	1.7	3.8 U	4.7 U	2.1 U	3.1 U	3.6 U
Dieldrin	3.3	7.3 U	9.1 U	4.0 U	6.1 U	7.0 U
4,4'-DDE	3.3	7.3 U	9.1 U	4.0 U	6.1 U	7.0 U
Endrin	3.3	7.3 U	9.1 U	4.0 U	6.1 U	7.0 U
Endosulfan II	3.3	7.3 U	9.1 U	4.0 U	6.1 U	7.0 U
4,4'-DDD	3.3	7.3 U	9.1 U	4.0 U	6.1 U	7.0 U
Endosulfan Sulfate	3.3	7.3 U	9.1 U	4.0 U	6.1 U	7.0 U
4,4'-DDT	3.3	7.3 U	9.1 U	4.0 U	6.1 U	7.0 U
Methoxychlor	17	38 U	47 U	21 U	31 U	36 U
Endrin Ketone	3.3	7.3 U	9.1 U	4.0 U	6.1 U	7.0 U
Endrin Aldehyde	3.3	7.3 U	9.1 U	4.0 U	6.1 U	7.0 U
alpha-Chlordane	1.7	3.8 U	4.7 U	2.1 U	3.1 U	3.6 U
gamma-Chlordane	1.7	3.8 U	4.7 U	2.1 U	3.1 U	3.6 U
Toxaphene	170	380 U	470 U	210 U	310 U	360 U
Aroclor-1016	33	73 U	91 U	40 U	61 U	70 U
Aroclor-1221	67	150 U	180 U	81 U	120 U	140 U
Aroclor-1232	33	73 U	91 U	40 U	61 U	70 U
Aroclor-1242	33	73 U	91 U	40 U	61 U	70 U
Aroclor-1248	33	73 U	91 U	40 U	61 U	70 U
Aroclor-1254	33	73 U	91 U	40 U	61 U	70 U
Aroclor-1260	33	73 U	91 U	40 U	61 U	70 U
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:		10/10/00	10/10/00	10/10/00	10/10/00	10/10/00
DATE EXTRACTED:		10/16/00	10/16/00	10/16/00	10/16/00	10/16/00
DATE ANALYZED:		10/21/00	10/21/00	10/21/00	10/21/00	10/21/00
% MOISTURE:		55	64	19	46	53

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: COLD BROOK PINES LANDFILL
CASE: 0379F SDG: D03159_O
LABORATORY: CEIMIC CORP

TABLE 6
PESTICIDE/POLYCHLORINATED BIPHENYL AQUEOUS ANALYSIS
µg/L

SAMPLE NUMBER:		D03166
SAMPLE LOCATION:		RB-01
LABORATORY NUMBER:		200745-06
COMPOUND	CRQL	
alpha-BHC	0.050	0.050 U
beta-BHC	0.050	0.050 U
delta-BHC	0.050	0.050 U
gamma-BHC (Lindane)	0.050	0.050 U
Heptachlor	0.050	0.050 U
Aldrin	0.050	0.050 U
Heptachlor Epoxide	0.050	0.050 U
Endosulfan I	0.050	0.050 U
Dieldrin	0.10	0.10 U
4,4'-DDE	0.10	0.10 U
Endrin	0.10	0.10 U
Endosulfan II	0.10	0.10 U
4,4'-DDD	0.10	0.10 U
Endosulfan Sulfate	0.10	0.10 U
4,4'-DDT	0.10	0.10 U
Methoxychlor	0.50	0.50 U
Endrin Ketone	0.10	0.10 U
Endrin Aldehyde	0.10	0.10 U
alpha-Chlordane	0.050	0.050 U
gamma-Chlordane	0.050	0.050 U
Toxaphene	5.0	5.0 U
Aroclor-1016	1.0	1.0 U
Aroclor-1221	2.0	2.0 U
Aroclor-1232	1.0	1.0 U
Aroclor-1242	1.0	1.0 U
Aroclor-1248	1.0	1.0 U
Aroclor-1254	1.0	1.0 U
Aroclor-1260	1.0	1.0 U
DILUTION FACTOR:		1.0
DATE SAMPLED:		10/10/00
DATE EXTRACTED:		10/16/00
DATE ANALYZED:		10/20/00

DATA SUMMARY KEY
INORGANIC DATA VALIDATION

J = The associated numerical value is an estimated quantity.

R = The result is rejected due to gross deficiencies in quality control criteria. The result is unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.

U = The compound was analyzed for but not detected. The associated numerical value is the SDL or the adjusted SDL.

UJ = The compound was analyzed for but not detected. The associated numerical value is the estimated SDL.

SITE: COLD BROOK PINES LANDFILL
CASE: 0379F SDG: D03159_I
LABORATORY: CEIMIC CORPORATION

TABLE 1
INORGANIC SOIL ANALYSES
mg/kg

SAMPLE NUMBER:			D03159	D03160	D03161	D03162	D03163	D03164	D03165	
SAMPLE LOCATION:			SD-01	SD-02	SD-03	SD-04	SD-05	SD-06	SD-07	
LABORATORY NUMBER:			200745-01	200745-02	200745-03	200745-09	200745-04	200745-10	200745-05	
PERCENT SOLIDS:			45.0	36.0	81.0	54.0	54.0	48.7	42.0	
INORGANIC ELEMENTS	METHOD	INSTRUMENT DETECTION LIMITS (mg/kg)								CONTRACT DETECTION LIMITS (mg/kg)
ALUMINUM	P	10.1	2560	3620	1780	2460	2890	4230	1210	40
ANTIMONY	P	0.52	1.1 U	1.1 U	0.48 U	0.88 U	0.71 U	0.92 U	1.3	12
ARSENIC	P	0.46	0.98 U	1.0 U	0.43 U	0.78 U	0.63 U	0.81 U	0.96 U	2
BARIUM	P	0.54	37.4 U	44.3 U	8.4 U	18.1 U	28.4 U	42.4 U	19.8 U	40
BERYLLIUM	P	0.14	1.4	1.1	0.24 J	0.24 U	0.35 J	0.34 J	0.30 U	1
CADMIUM	P	0.06	0.11 U	0.11 U	0.05 U	0.08 U	0.07 U	0.09 U	0.12 J	1
CALCIUM	P	67.2	2200 U	2290 U	325 U	731 U	942 U	1230 U	1350 U	1000
CHROMIUM	P	1.2	4.7 UJ	6.8 UJ	1.5 UJ	2.1 UJ	4.2 UJ	3.9 UJ	2.6 UJ	2
COBALT	P	0.84	1.8 U	1.8 U	1.4 UJ	1.4 U	1.1 U	1.5 U	2.2 UJ	10
COPPER	P	1.4	6.1 J	3.8 J	2.0 J	3.3 J	2.7 J	4.9 J	3.6 J	5
IRON	P	1.2	5750	5780	2650	4420	1190	1590	2260	20
LEAD	P	0.36	8.6	10.7	6.4	17.7	16.4	25.7	3.3	0.6
MAGNESIUM	P	25.8	189	276	467	736	413	597	291	1000
MANGANESE	P	0.54	173	192	53.9	196	19.7	25.4	64.2	3
MERCURY	AV	0.04	0.08 UJ	0.19 J	0.06 J	0.09 J	0.11 J	0.20 J	0.07 J	0.1
NICKEL	P	1.8	3.9 UJ	4.0 UJ	1.7 UJ	3.1 UJ	2.5 UJ	3.3 UJ	3.8 UJ	8
POTASSIUM	P	51.2	120 J	158 J	191	191	204	242	107 UJ	1000
SELENIUM	P	0.56	2.2 UJ	2.5 UJ	0.52 U	0.95 U	1.0 UJ	0.99 U	1.2 U	1
SILVER	P	1.04	2.2 U	2.3 U	0.97 U	1.8 U	1.4 U	1.8 U	2.2 U	2
SODIUM	P	13	109 U	132 U	58.4 U	120 U	72.7 U	106 U	126 U	1000
THALLIUM	P	0.60	1.3 U	1.3 U	0.56 U	1.0 U	0.82 U	1.1 U	1.3 U	2
VANADIUM	P	1.3	6.4	6.3	3.8	6.1	4.0	5.7	5.3	10
ZINC	P	0.92	5.5 U	5.0 U	10.9 U	37.1	10.9 U	15.9 U	8.8 UJ	4
CYANIDE	CA	0.02	0.04 UJ	0.05 UJ	0.02 UJ	NA	0.04 UJ	NA	0.05 UJ	0.5

ANALYTICAL METHOD
P - ICP/FLAME AA
AV - AUTOMATED COLD VAPOR
CA - MIDI-DISTILLATION SPECTROPHOTOMETRIC

NOTE:
J = QUANTITATION IS ESTIMATED DUE TO LIMITATIONS IDENTIFIED IN THE QUALITY CONTROL REVIEW (DATA REVIEW).
U = VALUE IS NON-DETECTED.
UJ = VALUE IS NON-DETECTED AND DETECTION LIMIT IS ESTIMATED.
R = VALUE IS REJECTED.
NA = NOT ANALYZED

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS

S:\00050028\D03159_MS..123

SITE: COLD BROOK PINES LANDFILL
CASE: 0379F SDG: D03159_I
LABORATORY: CEIMIC CORPORATION

TABLE 2
INORGANIC AQUEOUS ANALYSIS
µg/L

SAMPLE NUMBER:	D03166
SAMPLE LOCATION:	RB-01
LABORATORY NUMBER:	200745-06

INORGANIC ELEMENTS	METHOD	INSTRUMENT DETECTION LIMITS (µg/L)			CONTRACT DETECTION LIMITS (µg/L)
ALUMINUM	P	50.5	50.5	U	200
ANTIMONY	P	2.6	2.6	U	60
ARSENIC	P	2.3	2.3	U	10
BARIUM	P	2.7	6.4	U	200
BERYLLIUM	P	0.72	0.72	U	5
CADMIUM	P	0.25	0.25	U	5
CALCIUM	P	336	336	U	5000
CHROMIUM	P	6.2	6.2	UJ	10
COBALT	P	4.2	4.2	U	50
COPPER	P	6.8	6.8	U	25
IRON	P	6.1	24.4	U	100
LEAD	P	1.8	1.8	U	3
MAGNESIUM	P	129	129	U	5000
MANGANESE	P	2.7	2.7	U	15
MERCURY	AV	0.09	0.09	U	0.2
NICKEL	P	9.2	9.2	UJ	40
POTASSIUM	P	256	256	U	5000
SELENIUM	P	2.8	3.6	UJ	5
SILVER	P	5.2	5.2	U	10
SODIUM	P	62.9	150	U	5000
THALLIUM	P	3.0	3.0	U	10
VANADIUM	P	6.3	6.3	U	50
ZINC	P	4.6	13.0	U	20
CYANIDE	CA	0.20	0.20	UJ	10

ANALYTICAL METHOD
P - ICP/FLAME AA
AV - AUTOMATED COLD VAPOR
CA - MIDI-DISTILLATION SPECTROPHOTOMETRIC

NOTE:
J - QUANTITATION IS ESTIMATED DUE TO LIMITATIONS IDENTIFIED IN THE QUALITY CONTROL REVIEW (DATA REVIEW).
U - VALUE IS NON-DETECTED.
UJ - VALUE IS NON-DETECTED AND DETECTION LIMIT IS ESTIMATED.
R - VALUE IS REJECTED.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
ONE CONGRESS STREET SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023

November 30, 2004

Ms. Mary Robinson
383 Hixville Road
Dartmouth, MA 02474

Dear Ms. Robinson:

Enclosed is a copy of the Draft Expanded Site Investigation (ESI) Report for Cole Brook Pines Landfill site in Dartmouth, Massachusetts. You are invited to provide comments on this draft report. Comments should be submitted to both the Environmental Protection Agency and the Massachusetts Department of Environmental Protection at the following addresses:

Nancy Smith (Mail Code HBS)
US EPA
One Congress Street
Boston, MA 02114

Daniel Keefe
MA DEP
One Winter Street
Boston, MA 02108

Comments must be recieved on or before December 20th, 2004. Comments received after that date will be included in the EPA site file, but may not be addressed in the Final ESI report.

If you have any questions, I may be reached at (617) 918-1436.

Sincerely,

Nancy Smith
Site Assessment Manager
Office of Site Remediation and Restoration

Enclosure

cc: Daniel Keefe, MA DEP

DRAFT EXPANDED SITE INSPECTION REPORT
FOR
COLE BROOK PINES LANDFILL
DARTMOUTH, MASSACHUSETTS

Prepared For:
U.S. Environmental Protection Agency
Region I
Office of Site Remediation and Restoration
1 Congress Street, Suite 1100
Boston, MA 02114-2023

CONTRACT NO. 68-W-00-097

CERCLIS NO. MAD981069990
STATE ID NO. RTN 4-0012656
TDD NO. 04-05-0134
TASK NO. 8131
DC NO. A-4706

Submitted By:
Weston Solutions, Inc.
Region I
Superfund Technical Assessment and Response Team 2000 (START)
37 Upton Drive
Wilmington, MA 01887

29 November 2004

Region I START 2000
Reviewed and Approved:

Amy E. H. Gibney
Site Leader

11/29/04
Date

Scott Rose
Project Leader

11/29/04
Date

QA Review

11-29-04
Date

Work Order No. 20112-001-001-8131-50

DISCLAIMER

This report was prepared solely for the use and benefit of the U.S. Environmental Protection Agency Region I (EPA Region I), Office of Site Remediation and Restoration for the specific purposes set forth in the contract between the EPA Region I and the Weston Solutions, Inc., Superfund Technical Assessment and Response Team 2000 (START). Professional services performed and reports generated by START have been prepared for EPA Region I purposes as described in the START contract. The information, statements, and conclusions contained in the report were prepared in accordance with the statement of work, and contract terms and conditions. The report may be subject to differing interpretations or misinterpretation by third parties who did not participate in the planning, research or consultation processes. Any use of this document or the information contained herein by persons or entities other than the EPA Region I shall be at the sole risk and liability of said person or entity. START, therefore, expressly disclaims any liability to persons other than the EPA Region I who may use or rely upon this report in any way or for any purpose.

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START SOIL SAMPLE ANALYTICAL RESULTS
Samples Collected 27 and 28 January 2004

ATTACHMENT B - COLE BROOK PINES LANDFILL
START SOIL BORING/WELL CONSTRUCTION LOGS
Soil Borings Advanced 27 and 28 January 2004

ATTACHMENT C - COLE BROOK PINES LANDFILL
START GROUNDWATER SAMPLE ANALYTICAL RESULTS
Samples Collected 17 through 19 February 2004

ATTACHMENT D - COLE BROOK PINES LANDFILL
START DRINKING WATER SAMPLE ANALYTICAL RESULTS
Samples Collected 18 February 2004

ATTACHMENT E - COLE BROOK PINES LANDFILL
START SEDIMENT SAMPLE ANALYTICAL RESULTS
Samples Collected 13 April 2004

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Draft Expanded Site Inspection Report
Cole Brook Pines Landfill
Dartmouth, Massachusetts

CERCLIS No. MAD981069990
State ID No. RTN 4-0012656
TDD No. 04-05-0134
Work Order No. 20112-001-001-8131-50

INTRODUCTION

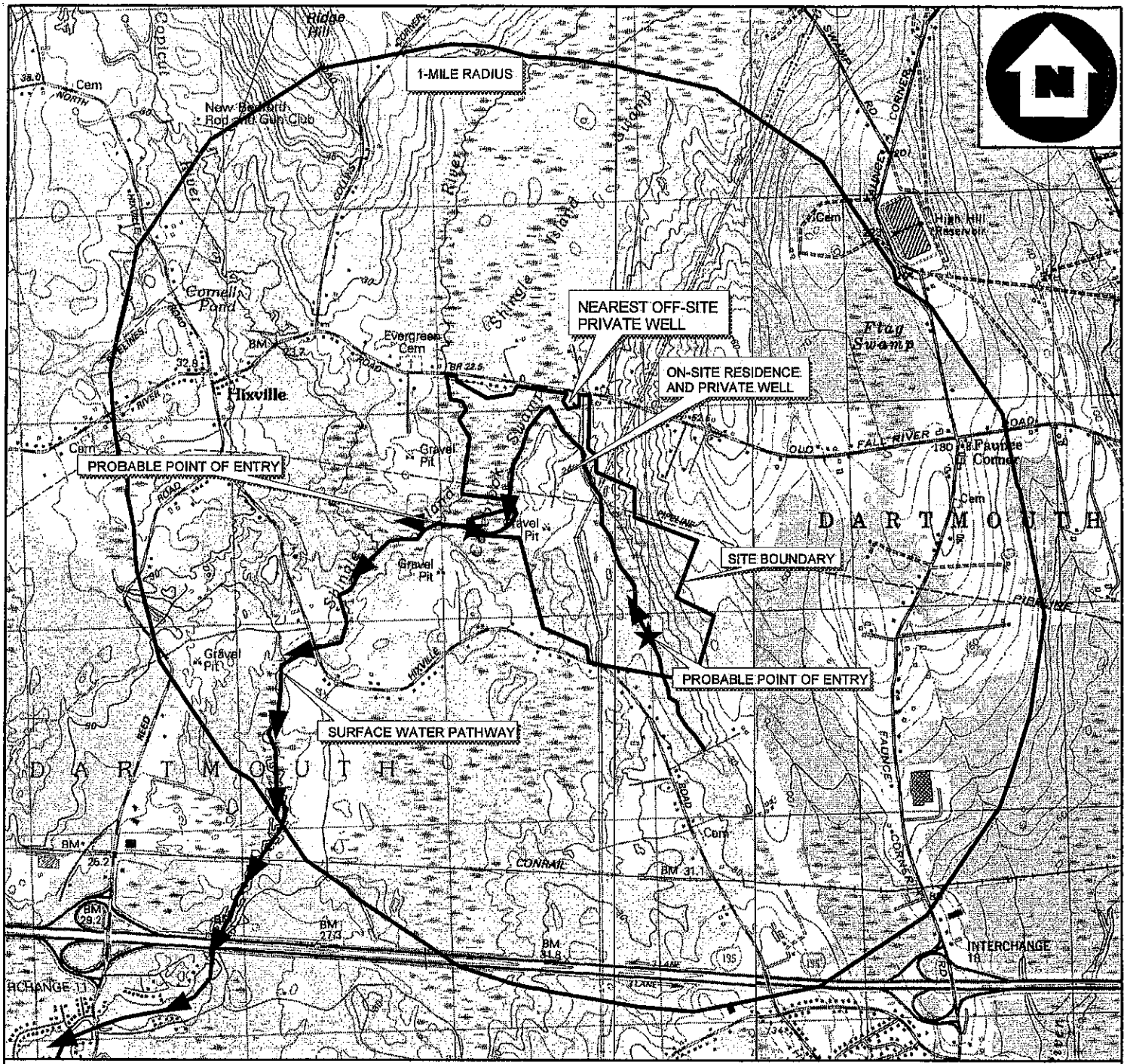
The Weston Solutions, Inc. (WESTON®) (formerly known as Roy F. Weston, Inc.), Superfund Technical Assessment and Response Team 2000 (START) was requested by the U.S. Environmental Protection Agency (EPA) Region I, Office of Site Remediation and Restoration to perform an Expanded Site Inspection (ESI) of the Cole Brook Pines Landfill (Cole Brook) property [previously listed in the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database as the Cold Brook Pines Landfill property] along Old Fall River Road in Dartmouth, Massachusetts. Tasks were conducted in accordance with the ESI scope of work and technical specifications provided by EPA Region I. A Final Site Inspection Prioritization (SIP) Report for the Cole Brook property was prepared by START on 1 October 2001. Analytical results of off-site sediment samples collected by START as part of the SIP indicated the presence of three metals above reference criteria; however, historical analysis of soil and source samples collected from the property had not revealed the presence of these metals. Based on the information provided in the Final SIP Report and the lack of on-site soil and groundwater sample data, the Cole Brook ESI was initiated.

Background information used in the generation of this report was obtained through file searches conducted at the EPA Region I and the Massachusetts Department of Environmental Protection (MA DEP), telephone interviews with town officials, conversations with persons knowledgeable of the Cole Brook property, and conversations with other Federal, State, and local agencies.

This package follows the guidelines developed under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, commonly referred to as Superfund. However, these documents do not necessarily fulfill the requirements of other EPA Region I regulations such as those under the Resource Conservation and Recovery Act (RCRA) or other Federal, State, or local regulations. ESIs are intended to provide a preliminary screening of sites to facilitate EPA Region I's assignment of site priorities. They are limited efforts and are not intended to supersede more detailed investigations.

SITE DESCRIPTION

The Cole Brook property, also referred to historically as the Cold Brook Pines Landfill, Cecil Smith's Landfill, and Clean Communities Landfill, is located along Old Fall River Road in Dartmouth, Bristol County, Massachusetts (Figure 1) [4, pp. 1, 7; 29, p. 39]. The geographic coordinates of the property, as measured from its approximate center, are 41° 40′ 50.5″ north latitude and 71° 00′ 52.4″ west longitude [55]. The property is comprised of 238.1 acres and consists of six contiguous parcels identified on the Town of Dartmouth, Massachusetts Tax Assessor's Map No. 67 as Lot Nos. 5 (3.3 acres), 7 (23.9 acres), and 8 (97.94 acres), and on Map No. 72 as Lot Nos. 6 (97.6 acres), 8 (0.9 acres), and 9 (14.5 acres) [1-2]. According to the Town of Dartmouth Tax Assessor, the property is currently owned by Ms. Mary Robinson [77].



BASE TOPOGRAPHIC MAP IS A PORTION OF 7.5' SERIES U.S.G.S. TOPOGRAPHIC QUADRANGLE(S).
THE FOLLOWING DIGITAL ORTHOPHOTO QUADS ARE DOWNLOADED FROM THE MASSGIS WEBSITE:
Q241826.sid; Q241822.sid; Q245826.sid; Q245822.sid

0.5 0 0.5 1 Miles

1000 0 1000 2000 3000 4000 5000 6000 Feet

0.5 0 0.5 1 Kilometers

QUADRANGLE LOCATION

NOTE: SITE BOUNDARY LINE IS APPROXIMATE.

SITE LOCATION MAP

COLE BROOK PINES LANDFILL
OLD FALL RIVER ROAD
DARTMOUTH, MASSACHUSETTS

WESTON SOLUTIONS
Restoring Resource Efficiency

REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

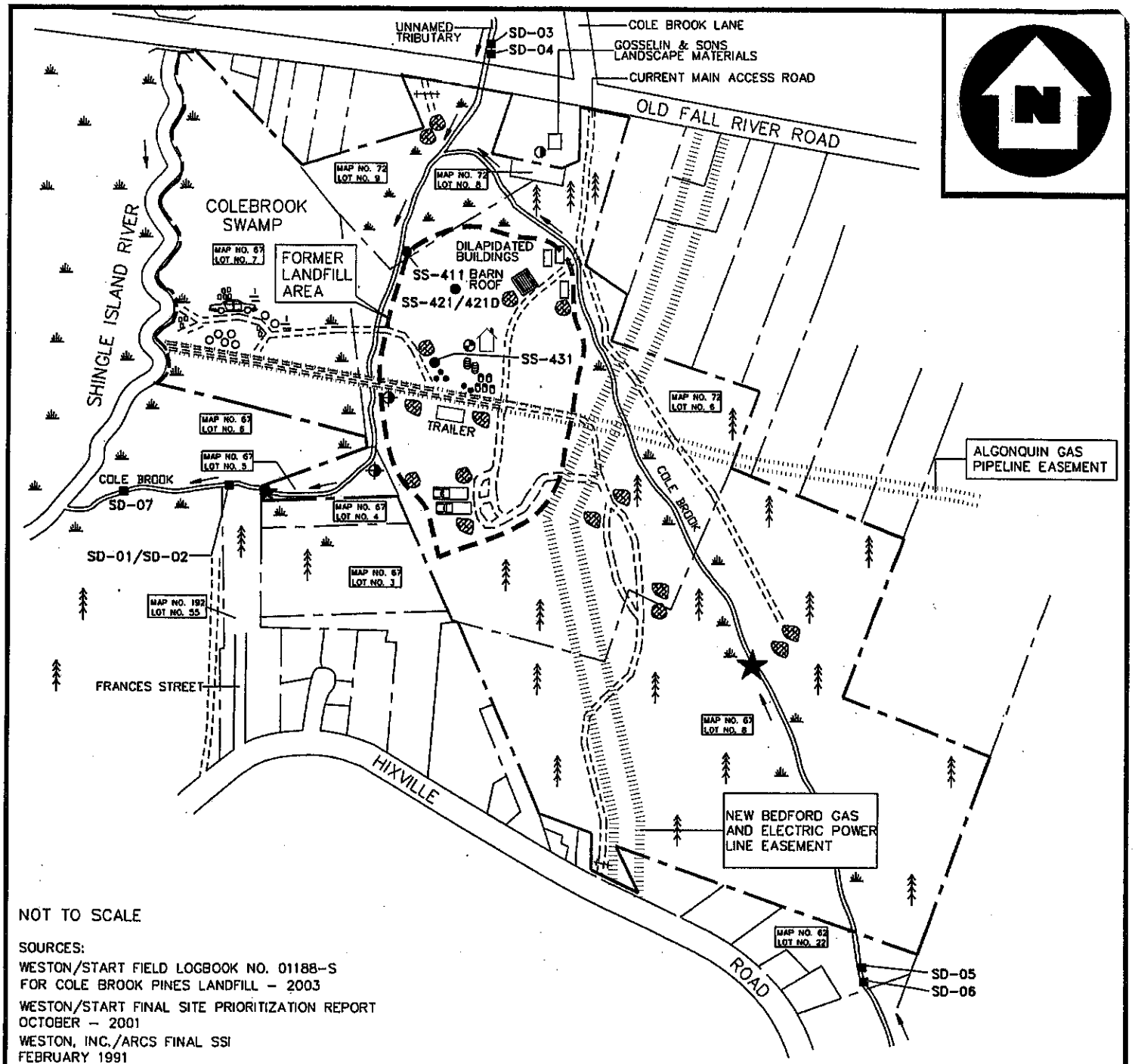
TDD #	DRAWN BY:	DATE:
04-05-0134	P. Schrot	10/22/2003
FILE NAME: E:\ARC_APRS\START2\Cole Brook Pines.apr (Layout: FIG1-TWP)		FIGURE 1

Approximately 60 acres of the western portion of the parcel identified as Lot No. 6 on Map No. 72 consists of a former solid waste "dump" (*i.e.*, a former solid waste landfill) operated between approximately 1954 and 1974 [64, Exhibit S]. The solid waste generally consisted of demolition debris. The remaining areas of the property consist of undeveloped woodlands and wetlands, unimproved access roads, former sand and gravel extraction areas, and miscellaneous solid waste piles. In general, the property is divided in an east/west direction by an Algonquin Gas (AG) pipeline easement and in a north/south direction by a New Bedford Gas and Electric (NBG&E) power line easement (Figures 2 and 2A) [1-2; 4, p. 1; 6; 52; 64, Exhibit S].

The area surrounding the Cole Brook property is occupied by predominantly undeveloped residential properties with some light agricultural properties. Residential properties and one commercial property [currently occupied by Gosselin & Sons Landscape Materials (formerly occupied by a restaurant)] are located north of the Cole Brook property. Residential properties and undeveloped properties abut the Cole Brook property to the south, and undeveloped properties along Old Fall River Road abut the Cole Brook property to the east. The property is bordered to the west by residential properties, undeveloped wetlands and woodland, and the Shingle Island River. The property is bordered by Old Fall River Road to the north and Hixville Road to the south [1-2; 4, pp. 3, 8].

Public access to the Cole Brook property is unrestricted. The current main entrance to the property is an unimproved access road that extends southward from Old Fall River Road across the Cole Brook property to Hixville Road, with branches to the eastern and western portions of the property. The west branch of the access road provides access to the former solid waste landfill, and the east branch of the access road provides access to the southeastern portion of the property, where several piles of solid waste are located. Reportedly, local youths use the access road as a "short cut" to travel between Old Fall River Road and Hixville Road. Another unimproved access road, which is gated, is located in the northern portion of Lot No. 9 on Map No. 72 and extends south from Old Fall River Road [2; 4, pp. 3, 7, 10-11].

The topography of the area surrounding the Cole Brook property gently slopes from east to west, with the western, northern, and portions of the eastern landfill toe located in low-lying wetland areas. Stormwater runoff from the property drains radially into Colebrook Swamp, located to the north, west, and east of the former solid waste landfill, and into an unnamed stream (hereafter referred to as "Cole Brook"), located north, west, and east of the former solid waste landfill. The wetland areas located adjacent to the western and northern portions of the former solid waste landfill are depicted on the U.S. Geological Society (USGS) topographic map as Colebrook Swamp [52]. Cole Brook enters the Cole Brook property at the southeastern property boundary and flows north/northwesterly past the former solid waste landfill, where it turns southwesterly and flows through Colebrook Swamp and then joins the Shingle Island River [4, p. 8; 20; 52].



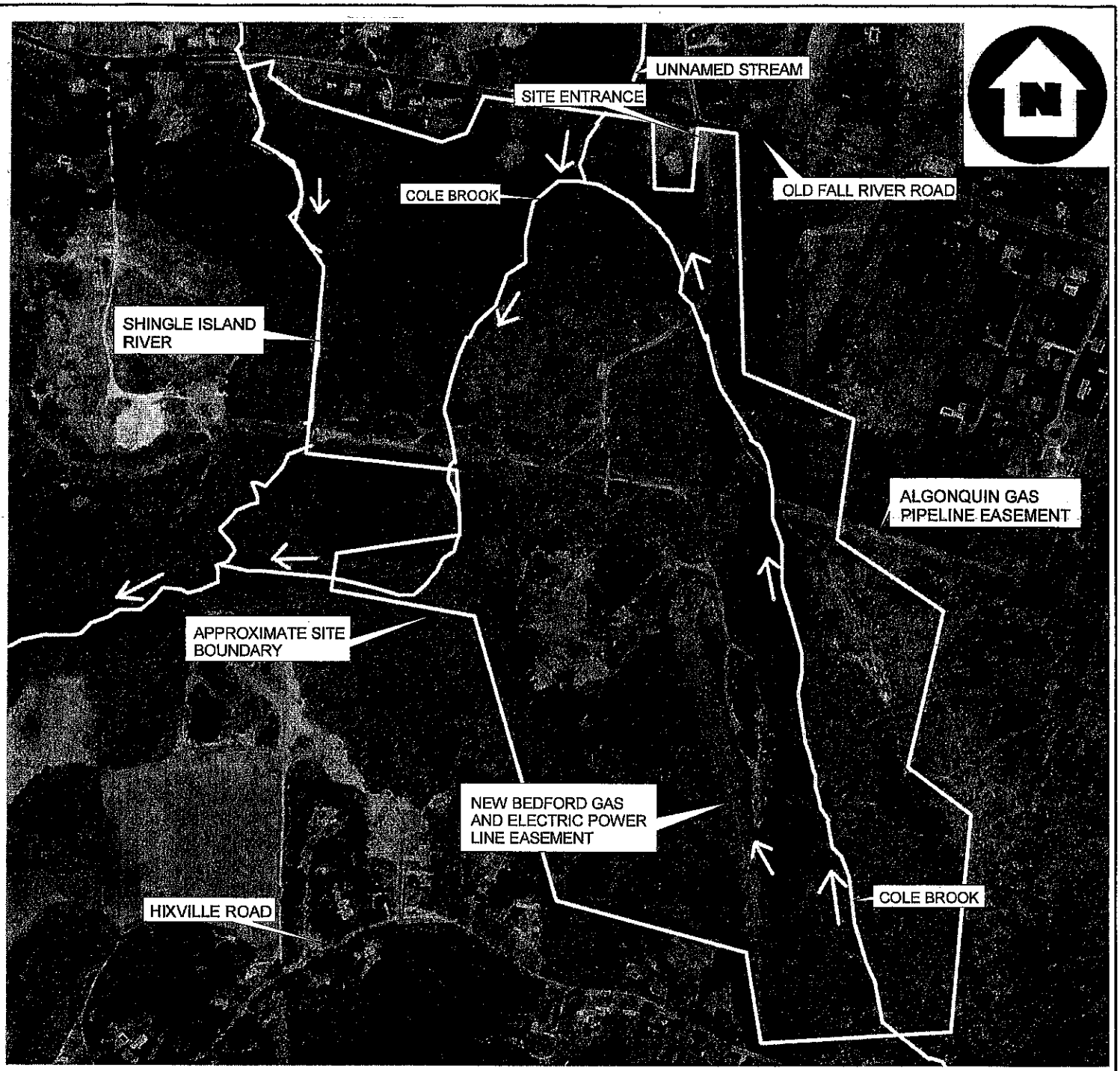
SITE SKETCH AND HISTORICAL SAMPLE SKETCH

COLE BROOK PINES LANDFILL
OLD FALL RIVER ROAD
DARTMOUTH, MASSACHUSETTS

WESTON SOLUTIONS®
REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD #	DRAWN BY:	DATE
04-05-0134	W. SHAW	10/22/03

FILE NAME:	
S:\04050134\Figures\FIG_2.DWG	FIGURE 2



BASE AERIAL PHOTOGRAPHS (APRIL 2001) ARE A PORTION OF THE FOLLOWING 1:5,000 SCALE BLACK AND WHITE DIGITAL ORTHOPHOTO QUADS DOWNLOADED FROM THE MASSGIS WEBSITE: 241826.sid; 241822.sid; 245826.sid; 245822.sid

NOTE: SITE BOUNDARY LINE IS APPROXIMATE.

→ = FLOW DIRECTION

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200 0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 Feet

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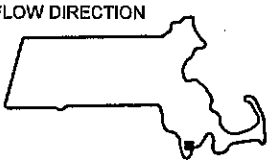


QUADRANGLE LOCATION

SITE LOCATION
AERIAL PHOTOGRAPH

COLE BROOK PINES LANDFILL
OLD FALL RIVER ROAD
DARTMOUTH, MASSACHUSETTS

WESTON SOLUTIONS
Restoring Resource Efficiency

REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD #	DRAWN BY:	DATE:
04-05-0134	P. Schrot	02/12/2004

FILE NAME: E:\ARC_APRS\START2\Cole Brook Pines.apr (Layout: Draft Report)

FIGURE 2A

On 11 June 2003, as part of the ESI, START and MA DEP personnel conducted an on-site reconnaissance of the Cole Brook property. START and MA DEP personnel toured the property and observed several abandoned groundwater monitoring wells, abandoned automobiles, tire piles, metal spheres (suspected to be buoys), piles of automobile gasoline tanks, and piles of solid waste similar to those observed during previous site investigations. The dilapidated buildings along the access road were being used to house farm animals and dogs. START personnel observed people feeding the animals and obtaining water for the animals from an on-site spigot. In the southern portion of the former landfill area, START and MA DEP personnel also observed standing water with a sheen in a gravel berm area [58, pp. 2-10].

OPERATIONAL AND REGULATORY HISTORY AND WASTE CHARACTERISTICS

An 1893 USGS topographic map depicts no structures or roads on the property [60]. USGS topographic maps completed in 1944 and in 1951 depict an unimproved or private road connecting Old Fall River Road and Hixville Road; however, no buildings are depicted on the property [61-62].

Sometime in the 1940s, the property was purchased by Dr. Cecil B. Smith, Sr. (Dr. Smith). In 1954, on-site sand and gravel excavation operations began, and portions of the property were used for disposal of solid waste, primarily demolition debris [4, p. 5; 64, Exhibit S].

Beginning in the early 1960s, Dr. Smith permitted his son, Mr. Cecil Smith, Jr. (Mr. Smith), to manage the on-site disposal of the demolition debris, which generally consisted of, but was not limited to, brick, wood, steel, pipes, and general debris from building demolition. During this time, Mr. Smith also used the property for storage of salvageable material (principally scrap metals). The volume of demolition materials disposed of on the property is unknown; however, it is known that the disposal on the property was sporadic and depended on urban renewal activity in the nearby cities and towns [4, p. 5].

On 10 August 1973, a complaint by a group of residents of the Town of Dartmouth, known as the "Ecology Committee of Dartmouth", stated that "pools of waste oil" were observed on the property. In response to the complaint, members of the Town of Dartmouth Board of Health (BOH) performed an inspection of the property. According to notes from the inspection, an excavation on the property was observed to be "filled with oil" [4, p. 6]. Information regarding the exact location and volume of the excavation could not be located in available file information.

Sometime in 1973, the Town of Dartmouth secured a court order against Mr. Smith. The order directed Mr. Smith to cease all disposal operations on the property [64, pp. 3, 11].

In 1974, inspections of the Cole Brook property by the Massachusetts Department of Public Health (MA DPH) "...revealed that oil and dredgings..." had been disposed of on the property [4, p. 6].

On 4 March 1975, Massachusetts Department of Environmental Quality Engineering (MA DEQE) personnel conducted an inspection of the property and reported violations of Massachusetts Solid Waste Disposal Regulations concerning the following: equipment, cover material, fire protection, access facilities, unloading of refuse, control of wind-blown litter, spreading and compacting of refuse, depth of cover, special wastes, salvage operations, vector control, and operational records [4, p. 6].

On 13 March 1975, the Town of Dartmouth secured another court order against Mr. Smith. This court order directed Mr. Smith to install 1 foot of cover material over the entire solid waste landfill. The court order further prohibited Mr. Smith from conducting disposal operations on the property until operations were in accordance with State regulations [64, pp. 5, 11, Exhibit L; 66, Enclosure 3].

On 6 October 1975, the Town of Dartmouth BOH voted "...to assign the Sanitary Landfill area of Plat 86, portions of Lot #8 and #12, off of Old Fall River Road, North Dartmouth, Mass. for Cecil Smith". This assignment permitted (with certain restrictions) Mr. Smith to operate a sanitary landfill on 60 acres of the Cole Brook property [7, Appendix; 63, p. 7, Exhibit A]. Based on available information, it appears that Lot Nos. 8 and 12 on Plat No. 86 are currently contained within Lot No. 6 on Map No. 72 [1-2; 7, Appendix].

On 3 February 1976, MA DEQE conducted an inspection of the Cole Brook property and observed that "...certain portions of the site had not been completely covered or covered with the required one foot of material" [66, Enclosure 4].

On 26 April 1976, the Town of Dartmouth BOH granted the modification of the original site assignment to Clean Communities Corporation (Clean Communities). The modified assignment permitted (with certain restrictions) Clean Communities to operate a sanitary landfill on 60 acres of the Cole Brook property [63, p. 7, Exhibit B; 64, p. 8].

In October 1977, on behalf of Clean Communities, GHR Engineering Corporation (GHR) of New Bedford, Massachusetts excavated 34 test pits and installed five groundwater monitoring wells (designated A-1 through A-5) on the property as part of landfill preparation activities. The wells were "...installed along the western perimeter of the site" and "...between the assigned landfill area and the existing natural brook" [7, Appendix]. START personnel were unable to locate information in available files regarding the exact locations of the test pits and monitoring wells.

On 2 December 1977, GHR collected five groundwater samples from the five monitoring wells (A-1 through A-5) on the property. In addition, two surface water samples were collected from Cole Brook at points upstream and downstream of the former solid waste landfill area. The exact locations at which the surface water samples were collected could not be determined. Two metals (copper and zinc) were detected in the groundwater and the surface water samples; and nickel was also detected in the groundwater sample collected from monitoring well A-1 [4, pp. 6, 9, Attachment A; 15]. Analytical results of these groundwater samples and surface water samples are discussed in greater detail in the Groundwater Pathway and Surface Water Pathway sections, respectively, of this report.

On 16 December 1977, Dr. Smith transferred ownership of the entire property to Mr. Smith; and on 19 December 1977, Mr. Smith transferred ownership of the entire property to Shingle Island, Inc. Mr. Smith, as the principal of Shingle Island, Inc., subsequently leased the property to Southwestern Resource Recovery, Inc., who had a contract with Clean Communities to manage the property [4, p. 6].

On 3 May 1978, MA DEQE received plans and a report from GHR (dated March 1978) for operation of a sanitary landfill on the assigned 60-acre portion of the Cole Brook property [64, p. 10; 70].

On 21 October 1979, GHR submitted modified plans and a report to MA DEQE for operation of a 15-acre sanitary landfill within the assigned 60-acre portion of the Cole Brook property. These modified plans and report were essentially the same as those submitted on 3 May 1978 with the exception that no alterations of the site would occur within 100 feet of the wetlands [64, p. 10, Exhibit F; 70].

On 4 March 1980, MA DEQE approved the modified plans for operation of a sanitary landfill on 15 acres of the assigned 60-acre portion of the Cole Brook property, at a rate of 100 tons per day [67; 70]. The ultimate volume of the new landfill would be approximately 250 acre-feet [approximately 4.03E+05 cubic yards (yd^3)] [7].

On 28 March 1980, on behalf of Clean Communities and in accordance with the Massachusetts Environmental Policy Act (MEPA), GHR completed an "*Environmental Notification Form for Clean Communities Corporation.*" The Environmental Notification Form (ENF), along with revised plans, was subsequently submitted to the Massachusetts Executive Office of Environmental Affairs. The ENF was submitted so that the maximum landfill volume and rate could be increased over those specified in the plans approved by MA DEQE on 4 March 1980. The ENF provided a review of existing conditions at the Cole Brook property and provided plans to construct a new sanitary landfill on top of the existing solid waste landfill. The ENF stated that the proposal for the upgrading (reconstruction) of the existing solid waste landfill would include a gravel blanket-clay liner system to prevent any leachate generation and an extensive groundwater and surface water monitoring system to detect leachate. The ENF stated that the new landfill was proposed to operate at a rate of 600 to 700 tons per day with an ultimate volume of 500 acre-feet (approximately 8.1E+05 yd^3) [7].

On 16 May 1980, the Secretary of the Massachusetts Executive Office of Environmental Affairs approved the increase in tonnage from 100 tons per day to 700 tons per day with no Environmental Impact Report (EIR), provided that a leachate collection system was installed prior to operation of the landfill [69].

On 12 January 1981, MA DEQE approved revised plans for the increase in tonnage from 100 tons per day to 700 tons per day with no EIR, provided that a leachate collection system was installed prior to operation of the landfill [68].

On 10 July 1981, the Town of Dartmouth Conservation Commission issued a cease and desist order (regarding construction of the proposed sanitary landfill) to Shingle Island, Inc. This order cited the property owner for violations of the Wetlands Protection Act and local wetlands bylaws [8].

On 30 December 1981, GHR submitted a letter to MA DEQE certifying that the property had been improved such that the proposed sanitary landfill area had been graded and covered with a relatively impermeable clay liner material, and a protective cover of sandy soil had been placed over the clay liner. In addition, a leachate collection system was installed, which included a collection trench fitted with perforated polyvinyl chloride (PVC) piping and an underground collection tank. The letter further stated that all required monitoring wells and a fire protection well were installed on the property [9]. Available file information did not specify whether these monitoring wells were those monitoring wells installed in October 1977 or whether these monitoring wells were subsequently installed on the property.

On 5 January 1982, GHR collected five groundwater samples from "observation wells" B-1, B-2, B-5, B-6, and B-7 on the property. START was unable to determine if these observations wells were the same as the monitoring wells sampled in 1977. Analysis of the samples revealed the presence of one volatile organic compound (VOC) (benzene), one semivolatile organic compound (SVOC) [bis(2-ethylhexyl)phthalate], and eight metals (calcium, copper, iron, magnesium, manganese, potassium, sodium, and zinc) [4, pp. 7, 10, Attachment B; 16]. Analytical results of these groundwater samples are discussed in greater detail in the Groundwater Pathway section of this report.

On 11 February 1982, the Town of Dartmouth Conservation Commission collected one leachate sample and one sediment sample from the property. Available file information did not specify the locations at which the samples were collected. Laboratory analysis of the samples indicated the presence of polychlorinated biphenyls (PCBs) (identified as Aroclor-1254) in both samples. In addition, Aroclor-1242 was detected in both samples, but was not specifically quantified [4, pp. 7, 10, Attachment C; 21]. Analytical results of the leachate sample and the sediment sample are discussed in greater detail in the Waste/Source Sampling and Surface Water Pathway sections, respectively, of this report.

On 12 February 1982, GHR collected two groundwater samples from observation well Nos. 3 and 4 on the property. START personnel were unable to locate information in available files regarding the exact locations of the observation wells or when the wells were installed. In addition, GHR collected one leachate sample from "Seepage from rubble in [the] NE [northeast] corner of [the] old landfill." The exact location at which the sample was collected could not be determined from available file information. Laboratory analysis of the groundwater samples revealed the presence of 10 metals, including arsenic, calcium, copper, iron, magnesium, manganese, nickel, potassium, sodium, and zinc. A total of seven metals, including copper, iron, lead, manganese, nickel, sodium, and zinc, were detected in the leachate sample. No VOCs were detected in the leachate sample [4, pp. 7, 10, Attachment D; 65]. Analytical results of the leachate sample and the groundwater samples are discussed in greater detail in the Waste/Source Sampling and Groundwater Pathway sections, respectively, of this report.

On 1 February 1983, the Cole Brook property was added to the CERCLIS database [29].

On 1 March 1983, as part of a Preliminary Assessment (PA) conducted on behalf of EPA, NUS Corporation/Field Investigation Team (NUS/FIT) personnel conducted a perimeter survey of the Cole Brook property [48]. NUS/FIT reported that the majority of waste disposed of on the property included "...demolition materials from construction." Also reported to be disposed of on the property was "...a variety of municipal waste..." and waste oil. NUS/FIT completed the PA on 3 May 1983 [48].

On 21 December 1983, a court order placed a permanent injunction against conducting sanitary landfilling operations on the Cole Brook property [56, p. 2].

On 11 April 1987, the Town of Dartmouth Building Department reportedly issued to Mr. Smith a permit to build a residence on a foundation located within the former solid waste landfill. In addition, a private drinking water supply well and a septic system were installed in conjunction with the construction of the house [4, p. 7].

On 3 October 1988, a "Revised Order and Judgement After Remand" ruled that the landfilling of demolition materials was permissible on the former solid waste landfill portion of the Cole Brook property because it was determined to be a prior non-conforming use. The revised judgment defined the scope of the non-conforming use permitted at the property, which included the following: landfilling operations were not to exceed 4,000 tons of demolition debris per year, and the elevation of the landfill was not to exceed 10 feet above the existing ground elevations [4, p. 6; 56, p. 2].

On 15 August 1990, as part of a Screening Site Inspection (SSI) conducted on behalf of EPA, WESTON Alternative Remedial Contracts Strategy (ARCS) personnel conducted an on-site reconnaissance of the Cole Brook property. ARCS reported that the former solid waste landfill area is generally divided by the AG pipeline easement. ARCS personnel observed that the portion of the former solid waste landfill located north of the AG pipeline easement was covered by vegetation, with the exception of the access road and areas in the vicinity of the residence and a barn. In the vicinity of the residence and barn, ARCS personnel observed an "intact roof structure" and several abandoned automobiles. Reportedly, the landfill was only slightly elevated above the access road; however, adjacent to wetland areas, the change in elevation was approximately 10 to 15 feet. Miscellaneous demolition materials and other solid wastes were observed to be exposed on the top and on the sides of the landfill. The landfill cover appeared to be a silty-sand material with numerous holes and voids. In addition, sea shells were scattered on the top of the landfill [4, p. 3].

ARCS personnel reported that the portion of the former solid waste landfill located south of the AG pipeline easement was predominantly covered by short grass with miscellaneous solid waste piles scattered on the surface; this area did not appear to contain subsurface solid waste. However, immediately to the southwest of the AG pipeline easement, ARCS reported that solid waste did appear to be landfilled. This area was covered by weeds and brush with solid wastes, including several abandoned automobiles, empty fuel tanks, concrete blocks, wooden pallets, and miscellaneous automobile parts and tires, scattered on the surface. In addition, an underground concrete tank was observed on the southwestern edge of the former solid waste landfill area, adjacent to wetlands. The dimensions of the tank were approximately 5 feet wide by 10 feet long. ARCS personnel could not verify the exact function of the tank; however, START presumes that the tank was part of the proposed leachate collection system. In addition, an uncapped 2-inch-diameter PVC monitoring well was located in the vicinity of this tank [4, p. 3].

ARCS personnel reported that the portion of the property located east/southeast of the former solid waste landfill area was used for the disposal of miscellaneous solid wastes, including "...wood wastes, white goods, recently burned miscellaneous solid waste, one empty rusted drum, automotive parts, tree stumps, tire piles, concrete rubble, empty storage tanks, and a tractor trailer full of tires" [4, p. 3].

ARCS personnel reported observing oil-stained soil south of the AG pipeline easement "...near the miscellaneous automobile parts and fuel tanks and near a tire pile." Oil-stained soil was also observed adjacent to and north of the AG pipeline easement near an abandoned diesel engine [4, p. 5].

Also on 15 August 1990, ARCS personnel collected five surface soil samples (SS-411, SS-421, SS-421D, SS-431, and SS-441), including a duplicate, from the property (Figure 2). Four soil samples were collected at 6 inches below grade (SS-421, SS-421D, SS-431, and SS-441); one soil sample

was collected at 12 inches below grade (SS-411). Sample SS-441 was collected east of the former solid waste landfill area (presumably upgradient of potential sources) to document reference conditions. The soil samples were analyzed through the EPA Contract Laboratory Program (CLP) for VOCs, SVOCs, pesticides, PCBs, metals, and cyanide [4, pp. 10-11; 28].

For each sample location, a compound or element is defined as being above reference criteria if it is detected at a concentration greater than or equal to three times the higher of its respective matrix reference sample. However, if the compound or element is not detected in the reference samples, the reference sample's sample quantitation limit (SQL) (for organic analyses) or sample detection limit (SDL) (for inorganic analyses) is used as the reference value.

Three VOCs; 18 SVOCs; one pesticide; and six metals were detected in the samples at concentrations above reference criteria [4, pp. 13-14, Attachment E]. Analytical results of these samples are discussed in greater detail in the Waste/Source Sampling section of this report.

On 4 April 1996, MA DEP (formerly MA DEQE) personnel secured a court order/search warrant to enter the Cole Brook property in response to anonymous complaints of the illegal disposal of solid waste, possibly including hazardous wastes, on the property and into adjacent wetlands. MA DEP's inspection revealed the presence of approximately 500 wooden pallets in a wetland buffer zone located along the main access road. Additional piles of wooden pallets (totaling approximately 4,000 to 5,000 pallets) were observed in wetlands and/or wetland buffer zones. MA DEP observed approximately 100 to 200 automobile tires, miscellaneous wood wastes, construction and demolition (C&D) debris, several abandoned vehicles (including a 40-foot box trailer containing approximately 500 automobile tires), what appeared to be a boiler and associated suspected asbestos-containing material (ACM), empty "barrels" (likely drums), areas of ash (signifying open burning), and suspected petroleum spills on the property. MA DEP personnel noted the locations and conditions of the groundwater monitoring wells on the property. The monitoring wells were locked; however, the locks were entirely rusted [6].

MA DEP reported that pieces of perforated PVC pipe were scattered on the ground. MA DEP concluded that this PVC pipe was the remains of the proposed sanitary landfill's base clay liner and leachate collection system. Moreover, MA DEP reported that the proposed sanitary landfill never went into operation, but instead the leachate collection system (inclusive of the clay liner) was scraped off and removed [6].

On 25 June 1996, based on their inspection conducted on 4 April 1996, MA DEP issued a Notice of Noncompliance (NON) letter to Mr. Smith [23].

On 3 December 1996, based on additional inspections of the property conducted on 12 April 1996 and 1 October 1996, MA DEP issued Release Tracking Number (RTN) 4-12656 and a Notice of Responsibility (NOR) letter to Mr. Smith. The NOR required Mr. Smith to employ a Licensed Site Professional (LSP) and complete an Immediate Response Action (IRA) pursuant to Massachusetts General Law (MGL), Chapter 21E [24].

In 1997, the Cole Brook property was reportedly under investigation by MA DEP's Regional Enforcement and Compliance Team (REACT) Strike Force. Reportedly, there had been illegal dumping of wastes, including hazardous wastes, in the former solid waste landfill area and the

adjacent wetlands. Some of the waste disposed of in these areas included lead paint, asbestos, demolition debris, miscellaneous automobile parts, and waste oil. According to MA DEP's Regional Enforcement Department, the former solid waste landfill had been capped and was to be "piggy backed" by another landfill, with the cap on the solid waste landfill acting as a liner for the new landfill. However, after not receiving the proper permits to operate the new landfill, Mr. Smith allegedly removed the cap materials and sold them [39].

On 1 February 2000, as part of the SIP conducted on behalf of EPA, START personnel conducted an on-site reconnaissance of the Cole Brook property from the AG pipeline easement, which was entered via the main access road to the Cole Brook property. The reconnaissance was conducted via the AG pipeline easement since on-site access for the property was not granted by Mr. Smith. Along the access road, START personnel observed the roof of a barn and several dilapidated buildings. The yard area surrounding the on-site residence contained the remains of an abandoned canteen truck and mobile home; a corrugated metal cylinder; fiberglass; wood; boat wreckage debris; and several rusted, empty 55-gallon drums. START personnel also observed 5-gallon plastic buckets, pieces of scrap metal, and five large metal spheres (suspected to be buoys). Two piles of automobile tires (approximately 300) and a pile of automobile gasoline tanks (approximately 50) were observed north of the access road along the AG pipeline easement, on an island in Colebrook Swamp. It is unknown if stained soil existed on the property as snow cover prevented observation of the ground surface by START personnel [3, p. 5].

On 24 July 2000, START personnel conducted an off-site, perimeter reconnaissance to determine the accessibility of possible off-site surface water pathway sampling locations. START personnel interviewed neighbors and determined that the Cole Brook property was inactive, except for its use as a residence by one person, reportedly Mr. Smith's ex-wife. START further noted that Gosselin & Sons Landscape Materials uses the portion of the Cole Brook property near the main access road as a storage area for supplies, both in piles and inside tractor trailers [3, p. 12].

On 10 October 2000, START personnel collected five sediment samples (SD-01, SD-02, and SD-05 through SD-07) from Cole Brook and two sediment samples (SD-03 and SD-04) from an unnamed tributary of Cole Brook located north of the Cole Brook property, to determine if there has been a release of hazardous substances (associated with the Cole Brook property) to surface water (Figure 2). All the samples were collected off site because START was not granted access to the Cole Brook property. The samples were analyzed through a Delivery of Analytical Services (DAS) laboratory for VOCs, SVOCs, pesticides, PCBs, metals, and cyanide, with the exception of SD-04 and SD-06, which were analyzed for metals only [3, p. 12].

Three metals were detected in the sediment samples at concentrations greater than three times the appropriate reference concentration or greater than or equal to the appropriate reference sample's SDL [3, p. 33]. Analytical results of the sediment samples collected by START personnel are discussed in greater detail in the Surface Water Pathway section of this report.

On 2 February 2001, Ms. Robinson purchased the Cole Brook property from Shingle Island, Inc. [77].

In February 2002, St. Germain & Associates, Inc. (St. Germain) of Scarborough, Maine, on behalf of New England Waste Services (NEWS) of Auburn, Massachusetts (a division of Casella Waste

Systems, Inc. of Rutland, Vermont), initiated an Environmental Investigation of the landfill portion of the Cole Brook property. The Environmental Investigation was conducted as part of a proposal to cap and close the existing landfill on the property [78, p. 1].

On 7 February 2002, as part of the Environmental Investigation, St. Germain personnel collected five surface water samples (SW-01 through SW-05) and five sediment samples (SED-01 through SED-05) from five unreported locations along Cole Brook and an unnamed tributary leading into Cole Brook. Six SVOCs and one metal were detected in the sediment samples [78, p. 4]. Analytical results of the surface water and sediment samples are discussed in greater detail in the Surface Water Pathway section of this report.

On 8 and 11 February 2002, as part of the Environmental Investigation, Frank Corporation Environmental Services of New Bedford, Massachusetts excavated 42 test pits (TP-1 through TP-42) throughout the property. Twenty-three test pits were located south of the AG pipeline easement, and 19 test pits were located north of the AG easement. St. Germain personnel monitored and logged the test pit excavations. One soil sample was collected from each test pit, as well as from four pre-existing test pits (TP-A through TP-D) located north of the AG easement [78, pp. 4-5]. No additional information regarding the locations of the test pits is available to START. Analytical results of soil samples collected from the test pits are discussed in greater detail in the Waste/Source Sampling section of this report.

Between 19 and 25 February 2002, as part of the Environmental Investigation, Guild Drilling Company, Inc. (Guild) of East Providence, Rhode Island advanced nine soil borings at the Cole Brook property for the purpose of installing groundwater monitoring wells to assess the groundwater quality above the bedrock aquifer. Guild installed nine groundwater monitoring wells (MW-1S, MW-1D, MW-2, MW-3, MW-4, MW-5S, MW-5D, MW-6S, and MW-6D) in the soil borings [78, p. 5]. The groundwater monitoring wells are discussed in greater detail in the Groundwater Pathway section of this report.

Subsequently, on an unreported date, St. Germain personnel collected groundwater samples from each groundwater monitoring well and a drinking water sample from the drinking water supply well that serves the on-site residence [78, pp. 5-6]. Analytical results of the groundwater and drinking water are discussed in greater detail in the Groundwater Pathway section of this report.

In March 2002, St. Germain completed an Environmental Investigation Summary Report of the landfill portion of the Cole Brook property [78, p. 3]. The Environmental Investigation Summary Report was not available for START to review.

On 12 December 2002, NEWS and Ms. Robinson submitted a "Proposal for Final Closure, Cold Brook Pines Landfill" (Closure Plan Proposal) to the Town of Dartmouth. The Closure Plan Proposal detailed the site history, the environmental site assessment completed by St. Germain, the closure plan, and a benefit analyses of the proposed landfill closure [78, pp. 1-16].

On 7 March 2003, Brown and Caldwell Environmental and Engineering Consultants (Brown and Caldwell), retained by the Town of Dartmouth to review the Closure Plan Proposal, submitted a memorandum to the Town of Dartmouth BOH regarding the Cole Brook property. In the memorandum, Brown and Caldwell summarized the regulatory status of the property within the MA

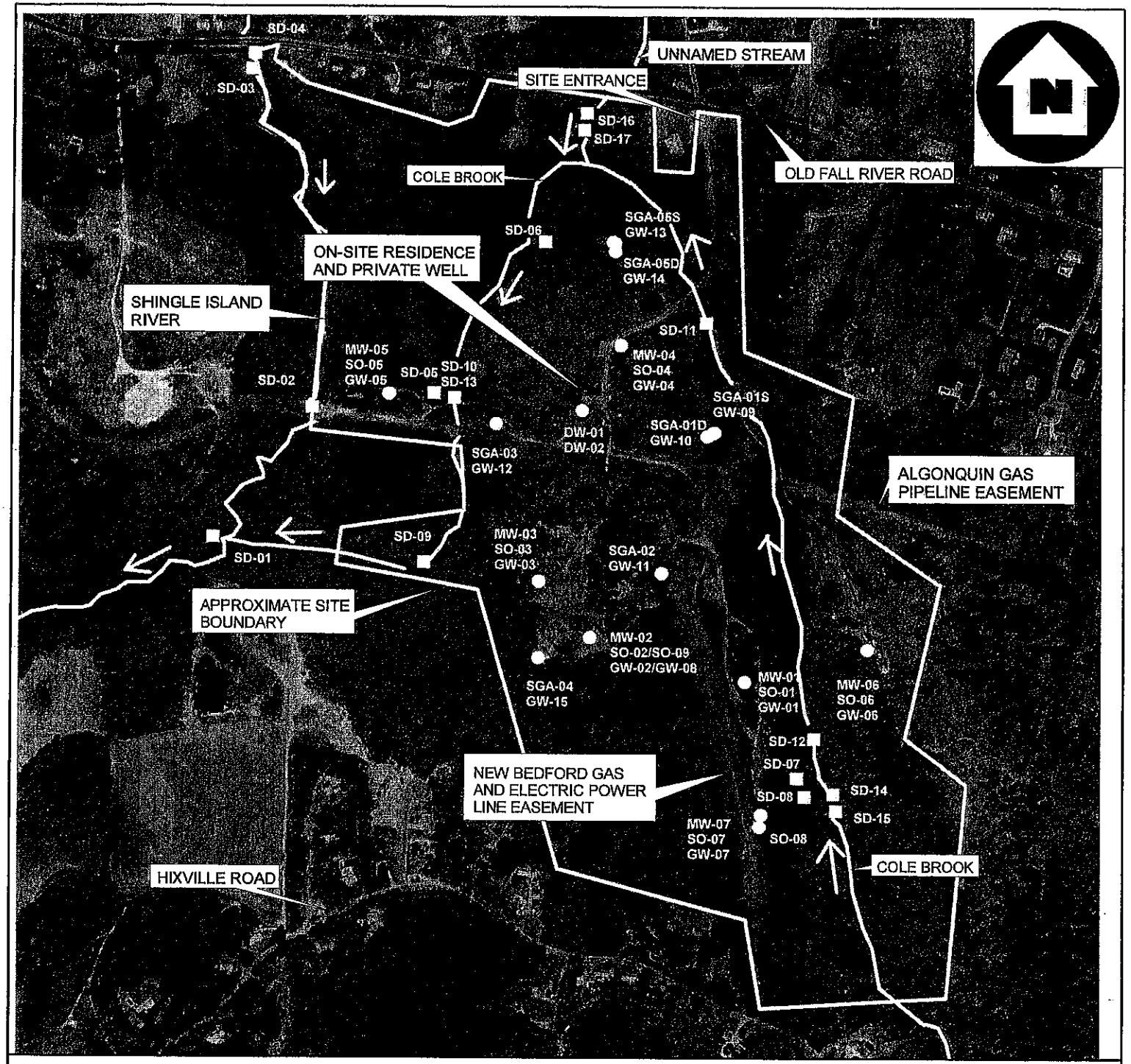
DEP Bureau of Waste Site Cleanup and the site history, and identified the following three potential key issues that should be resolved before the initiation of the closure of the former landfill: clarification of property ownership, the presence of existing environmental contamination, and legal ramifications of the Superior Court Order issued on 3 October 1988 [89].

On 7 March 2003, Brown and Caldwell submitted a memorandum to the Town of Dartmouth BOH regarding the Closure Plan Proposal. In the memorandum, Brown and Caldwell stated that the basic plan to consolidate, shape, and cover the old waste in the former landfill was sound, but the proposal provided little detail regarding the following six aspects of the Closure Plan Proposal: current site characterization; previous on-site investigations; the anticipated regulatory structure within MA DEP guidelines; proposed shaping and grading of the landfill (anticipated traffic, materials, and material quantity); anticipated landfill engineering and site design; and anticipated economic benefits, operations, and post-closure plans. Specifically, Brown and Caldwell noted that the Closure Plan Proposal described some isolated environmental sampling results, but lacked any conclusions that would aid in determining the level of existing contamination on site [90].

On 24 March 2003, the Town of Dartmouth BOH submitted a letter to NEWS in response to the Closure Plan Proposal. In the letter, the BOH required the following information prior to any additional landfill closure activities at the Cole Brook property: clarification of property ownership; a Town Counsel determination regarding the siting of the amount of waste required to accommodate the proposed grading; a determination from EPA and MA DEP that the site may be safely closed as a landfill without first conducting hazardous waste cleanup activities; and additional site information, including test pit logs and soil and water quality sampling results [91]. No additional information regarding the Closure Plan Proposal is available to START.

On 11 June 2003, as part of the ESI, START and MA DEP personnel conducted an on-site reconnaissance of the Cole Brook property [58, pp. 2-10]. Based on observations made during the on-site reconnaissance, START assumes that operations in the landfill Closure Plan Proposal were never conducted at the property. The on-site reconnaissance is discussed in greater detail in the Site Description section of this report.

On 26 through 29 January 2004, 17 through 19 February 2004, and 13 April 2004, as part of the ESI, START personnel oversaw the installation of seven overburden groundwater monitoring wells (MW-01 through MW-07); collected nine surface soil/source samples (SO-01 through SO-09) from potential source areas on the Cole Brook property; collected 15 groundwater samples (GW-01 through GW-15) from groundwater monitoring wells MW-01 through MW-07 and from seven groundwater monitoring wells (SGA-01S, SGA-01D, SGA-02, SGA-03, SGA-04, SGA-05S, and SGA-05D) previously installed by Guild and St. Germain to determine if there has been a release of hazardous substances, associated with sources on the Cole Brook property, to groundwater; collected two drinking water samples (DW-01 and DW-02) from the on-site drinking water supply well to determine if there has been a release of hazardous substances, associated with sources on the Cole Brook property, to drinking water; and collected 17 sediment samples (SD-01 through SD-17) from an unnamed tributary, Cole Brook, Shingle Island River, and on-site wetlands to determine if there has been a release of hazardous substances, associated with sources on the Cole Brook property, to surface water (Figures 3 and 3A) [58, pp. 12-48; 59, pp. 2-27].



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→ = FLOW DIRECTION

0.1 0 0.1 0.2 0.3 0.4 0.5 Miles

300 0 300 600 900 1200 1500 1800 2100 2400 2700 3000 3300 Feet

0.5 0 0.5 Kilometers

QUADRANGLE LOCATION

START ESI SAMPLE LOCATIONS
AERIAL PHOTOGRAPH

COLE BROOK PINES LANDFILL
OLD FALL RIVER ROAD
DARTMOUTH, MASSACHUSETTS

WESTON SOLUTIONS
Restoring Resource Efficiency

REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD #	DRAWN BY:	DATE:
04-05-0134	A. GIBNEY	06/03/04

FILE NAME: E:\ARC_APRS\START2\Cole Brook Pines.apr (Layout: Samples)

FIGURE 3A

Soil/source samples SO-01 though SO-09, groundwater samples GW-01 through GW-15, drinking water samples DW-01 and DW-02, and sediment samples SD-01 through SD-17 were analyzed for VOCs, SVOCs, pesticides, PCBs, metals, and cyanide, with the exception of samples SO-08, SD-04, SD-08, SD-15, and SD-17, which were analyzed for metals only [58, pp. 12-48; 59, pp. 2-27; 80-88].

Soil/source samples SO-07 and SO-08 are the reference samples for the soil/source samples; groundwater sample GW-07 is the reference sample for the groundwater samples; and sediment samples SD-03, SD-04, SD-07, SD-08, and SD-14 through SD-17 are the reference samples for the sediment samples. For the drinking water sample analyses, EPA Maximum Contaminant Levels (MCLs) and Massachusetts Contingency Plan (MCP) Massachusetts Oil and Hazardous Material List (MOHML) Reportable Category RCGW-1 groundwater standards are used as the reference values. If no MCL or RCGW-1 standard is available, applicable inorganic sample results are compared to EPA-established National Secondary Drinking Water Regulations (NSDWRs). NSDWRs are guidelines used to regulate contaminants in drinking water that may cause cosmetic or aesthetic effects [95]. Compounds or elements have exceeded reference criteria if they occurred at a concentration greater than or equal to the MCL, RCGW-1 standard, or NSDWR and are designated by their approximate relative concentration above these values.

One VOC, 11 SVOCs, and nine inorganic substances (metals and cyanide) were detected in the soil/source samples; one VOC, one SVOC, 16 metals, and cyanide were detected in the groundwater samples; and one pesticide and two metals were detected in the sediment samples at concentrations above reference criteria. No substances were detected above reference criteria in the drinking water samples [80-88]. Sampling activities and analytical results of the START samples are discussed in greater detail in the Waste/Source Sampling, Groundwater Pathway, and Surface Water Pathway sections of this report.

Table 1 presents identified structures or areas on the Cole Brook property that are documented or potential sources of contamination, the containment factors associated with each source, and the relative location of each source.

Table 1

Source Evaluation for Cole Brook Pines Landfill

Source Area	Containment Factors	Spatial Location
Former Solid Waste Landfill	None	Central Portion of the Property
Contaminated Soil	None	Throughout the Property
Miscellaneous Solid Waste Piles	None	Throughout the Property

[3; 4; 6; 21; 23-24; 28; 56; 65]

Table 2 summarizes the types of potentially hazardous substances that have been disposed, used, or stored on the Cole Brook property.

Table 2

Hazardous Waste Quantity for Cole Brook Pines Landfill

Substance	Quantity or Volume/Area	Years of Use/Storage	Years of Disposal	Source Area
Miscellaneous solid waste[1]; waste oil; leachate contaminated with PCBs and metals; and soil contaminated with SVOCs, pesticides, and metals.	Approximately 60 acres	Approximately 1954 to present	Approximately 1954 to 1974	Former Solid Waste Landfill
Soil contaminated with VOCs, SVOCs, pesticides, and metals.	Approximately 25 acres[2]	Unknown	Unknown	Contaminated Soil
Miscellaneous Solid Waste[3]	Unknown	Unknown	Unknown	Miscellaneous Solid Waste Piles

VOCs = Volatile Organic Compounds.
SVOCs = Semivolatile Organic Compounds.
PCBs = Polychlorinated Biphenyls.

1 Solid waste disposed of in the landfill reportedly includes, but is not limited to, demolition materials consisting of brick, wood, steel, pipes, and miscellaneous construction and demolition debris.

2 Based on the presence of hazardous substances in START soil samples collected from areas outside of the former solid waste landfill area, START estimates that approximately 25 acres of the Cole Brook property comprise a potential contaminated soil source.

3 Miscellaneous solid waste piles have reportedly consisted of wood, empty drums, automotive parts, tree stumps, tires, concrete rubble, empty storage tanks, wooden pallets, abandoned vehicles, a boiler wrapped with suspected asbestos-containing material, ash (signifying open burning), fiberglass, boat wreckage debris, 5-gallon plastic buckets, pieces of scrap metal, and large metal spheres.

[3; 4; 6; 21; 23-24; 28; 56; 65; 80-82]

There is one property located within 1 radial mile of the Cole Brook property that is listed in both CERCLIS and on the National Priorities List (NPL) [29]. Additionally, there is one property located within 1 radial mile of the Cole Brook property that is listed in the Resource Conservation and Recovery Act Information (RCRA Info) database [72].

The Cole Brook property is not listed as a RCRA notifier [30]. The Cole Brook property's compliance status is currently classified by MA DEP as Tier 1D in the MCP process. A Tier 1D site/release requires a permit, but response actions may be performed under the supervision of an LSP without prior MA DEP approval. A site/release is classified as Tier 1D when a responsible party fails to provide a required submittal to MA DEP by a specified deadline. The site/release cleanup phase for the Cole Brook property is classified as "No Phase", which indicates that a Phase report was not required or was not submitted [71].

WASTE/SOURCE SAMPLING

On 11 February 1982, the Town of Dartmouth Conservation Commission collected one leachate sample from the property. Available file information did not specify the exact location at which the sample was collected. START assumes that the leachate was generated from the former solid waste landfill. The sample was submitted to Camp Dresser & McKee, Inc. (CDM) of Boston, Massachusetts and analyzed for total PCBs (method unknown). Analytical results indicated the presence of PCBs (identified as Aroclor-1254) in the sample at a concentration of 0.5 parts per billion (ppb). In addition, Aroclor-1242 was detected, but was not specifically quantified [4, pp. 7, 10, Attachment C; 21].

On 12 February 1982, GHR collected a sample of "Seepage from rubble in [the] NE [northeast] corner of [the] old landfill." The exact location at which the sample was collected could not be determined from available file information. The sample was submitted to GHR Analytical Incorporated of Lakeville, Massachusetts and analyzed for metals, pH, and specific conductance. In addition, the leachate sample was submitted to Cambridge Analytical Associates, Inc. (CAA) of Watertown, Massachusetts and analyzed for VOCs by EPA Method 624. Analytical results of the sample revealed the presence of seven metals, including copper [0.06 parts per million (ppm)], iron (17.6 ppm), lead (0.95 ppm), manganese (0.22 ppm), nickel (0.04 ppm), sodium (6.8 ppm), and zinc (0.76 ppm). No VOCs were detected in the sample [4, pp. 7, 10, Attachment D; 65].

On 15 August 1990, as part of the SSI, ARCS personnel collected five surface soil samples (SS-411, SS-421, SS-421D, SS-431, and SS-441), including a duplicate, from the property (Figure 2). Surface soil sample SS-411 was collected in the vicinity of Colebrook Swamp, west of the former solid waste landfill, approximately 600 feet west of the main access road. Surface soil sample SS-421, and duplicate sample SS-421D, were collected from the top of the former solid waste landfill, approximately 200 feet west of the main access road. Surface soil sample SS-431 was collected from an area of stained soil on top of the former solid waste landfill, 20 feet north of the AG pipeline easement and along the access road. Surface soil sample SS-441 was collected from an excavated embankment along the wooded area located east of the former solid waste landfill, as a reference sample. Four soil samples were collected at 6 inches below grade (SS-421, SS-421D, SS-431, and SS-441); one soil sample was collected at 12 inches below grade (SS-411). The samples were analyzed through an EPA CLP laboratory for VOCs, SVOCs, pesticides, PCBs, metals, and cyanide [4, pp. 10-11; 28].

Three VOCs were detected in the surface soil samples at concentrations above reference criteria. These VOCs were detected in sample SS-411 and included methylene chloride at 84 J ppb, acetone at 715 J ppb, and 2-butanone at 76 J ppb. Sample results qualified with a "J" are considered approximate because of limitations identified during data validation [4, pp. 10-11, Attachment E].

Eighteen SVOCs were detected in the surface soil samples at concentrations above reference criteria. Maximum concentrations of 16 of the 18 SVOCs were detected in sample SS-421D and included the following substances: naphthalene (2,500 ppb); 2-methylnaphthalene (1,300 ppb); acenaphthylene (2,700 ppb); acenaphthene (700 J ppb); fluorene (620 J ppb); phenanthrene (6,000 ppb); anthracene (2,000 ppb); fluoranthene (9,000 ppb); benzo(a)anthracene (7,400 ppb); chrysene (8,000 ppb); benzo(b)fluoranthene (7,200 J ppb); benzo(k)fluoranthene (4,900 J ppb);

benzo(a)pyrene (6,900 J ppb); indeno(1,2,3-cd)pyrene (2,100 J ppb); dibenzo(a,h)anthracene (710 J ppb); and benzo(g,h,i)perylene (2,100 J ppb). Maximum concentrations of pyrene (7,600 ppb) and bis(2-ethylhexyl)phthalate (450 J ppb) were detected in sample SS-421 [4, pp. 10-11, Attachment E]. Except for bis(2-ethylhexyl)phthalate, these SVOCs are also referred to as polynuclear aromatic hydrocarbons (PAHs), which are common constituents of waste oil [73, pp. 4-15, 4-16].

One pesticide (dieldrin) was detected in the surface soil samples at concentrations above reference criteria. Dieldrin was detected in sample SS-421D at 160 ppb [4, pp. 10-11, Attachment E].

No PCBs were detected above laboratory detection limits in any samples [4, pp. 10-11, Attachment E].

Six metals were detected in the surface soil samples at concentrations above reference criteria. The following six metals were detected (maximum concentrations in parentheses): calcium (12,600 J ppm in SS-411), chromium (34.2 ppm in SS-421D), copper (146 ppm in SS-421D), lead (268 ppm in SS-421), mercury (1.1 ppm in SS-421), and zinc (220 J ppm in SS-411) [4, pp. 10-11, Attachment E].

On 8 and 11 February 2002, as part of the Environmental Investigation, Frank Corporation Environmental Services excavated 42 test pits (TP-1 through TP-42) throughout the property. Twenty-three test pits were located south of the AG pipeline easement, and 19 test pits were located north of the AG easement. St. Germain personnel monitored and logged the test pit excavations. One soil sample was collected from each test pit, as well as from four existing test pits (TP-A through TP-D) located north of the AG easement. Each soil sample was screened using a photoionization detector (PID), and representative soil samples from four test pits (TP-18, TP-26, TP-30, and TP-38) were submitted for VOC, SVOC, conductivity, PCB, extractable petroleum hydrocarbon (EPH), volatile petroleum hydrocarbon (VPH), and 13 RCRA metals analyses. Analytical results indicated the presence of the following substances in TP-18: benzo(a)anthracene (8.6 ppm), benzo(b)fluoranthene (7.7 ppm), chrysene (10 ppm), and lead (6,800 ppm) [3, pp. 4 and 5]. No additional information regarding the test-pitting activities or sample locations is available to START.

On 27 and 28 January 2004, as part of the ESI, START personnel collected nine surface soil/source samples (SO-01 through SO-09) from potential source areas on the Cole Brook property. Soil/source samples were collected from a depth between 0 and 2 feet below ground surface (bgs). Sample SO-01 was collected southeast of the former landfill area, adjacent to a propane tank and several solid waste piles. Samples SO-02 and SO-09 were collected in the southeast portion of the former landfill area, adjacent to a gravel berm area and several solid waste piles. Sample SO-03 was collected in the south/central portion of the former landfill area, adjacent to several solid waste piles. Sample SO-04 was collected in the northeast portion of the former landfill area, adjacent to several dilapidated buildings and solid waste piles. Sample SO-05 was collected west of the former landfill area, adjacent to several tires, abandoned vehicles, and gasoline tanks. Sample SO-06 was collected southeast of the former landfill area, adjacent to several miscellaneous waste piles. Samples SO-07 and SO-08 were collected southeast of the former landfill area and south of sample SO-01. Sample SO-09 was a duplicate sample of SO-02 and was collected for quality control. Samples SO-07 and

SO-08 were collected upgradient of potential source areas, to establish reference concentrations for soil sample comparisons. All the surface soil/source samples were collected using a hand auger [58, pp. 12-36].

All the surface soil/source samples were analyzed through a DAS laboratory for VOCs and through EPA CLP laboratories for SVOCs, pesticides, PCBs, metals, and cyanide, with the exception of sample SO-08, which was analyzed for metals only [58, pp. 12-36; 80-82]. Table 3 summarizes the soil/source samples collected by START on 27 and 28 January 2004.

Table 3

Sample Summary: Cole Brook Pines Landfill
Soil/Source Samples Collected by START on 27 and 28 January 2004

Sample Location No.	Traffic Report No.	Date/ Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Soil/Source					
SO-01 (MS/MSD)	D14313 A1BL8 MA1BL8	01/28/04 1155	Grab	12 to 24 Inches	Soil/source sample collected from a soil boring advanced southeast of the former landfill area, adjacent to a propane tank and several solid waste piles (41° 40' 24.12" N, 71° 00' 31.42" W). Material is dry, brown-to-grey, coarse-to-fine SAND and GRAVEL, little silt. FID and PID = 0.
SO-02	D14314 A1BL9 MA1BL9	01/27/04 1400	Grab	12 to 24 Inches	Soil/source sample collected from a soil boring advanced in the southeast portion of the former landfill area, adjacent to a gravel berm area and several solid waste piles (41° 40' 26.28" N, 71° 00' 41.09" W). Material is moist, grey-to-brown, coarse-to-fine SAND and GRAVEL, little silt. PID and FID = 0.
SO-03	D14315 A1BM0 MA1BM0	01/27/04 1230	Grab	12 to 24 Inches	Soil/source sample collected from a soil boring advanced in the south/central portion of the former landfill area, adjacent to several solid waste piles (41° 40' 28.95" N, 71° 00' 44.29" W). Material is dry, brown, coarse-to-fine SAND and GRAVEL, some clay, little silt. PID and FID = 0.

Table 3

Sample Summary: Cole Brook Pines Landfill
Soil/Source Samples Collected by START on 27 and 28 January 2004 (Continued)

Sample Location No.	Traffic Report No.	Date/ Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Soil/Source (Continued)					
SO-04	D14316 A1BM1 MA1BM1	01/28/04 1500	Grab	12 to 24 Inches	Soil/source sample collected from a soil boring advanced in the northeast portion of the former landfill area, adjacent to several dilapidated buildings and solid waste piles (41° 40' 40.11" N, 71° 00' 39.09" W). Material is dry, dark brown, coarse-to-fine SAND, some fine gravel, little silt, brick fragments. PID and FID = 0.
SO-05	D14317 A1BM2 MA1BM2	01/27/04 1050	Grab	0 to 24 Inches	Soil/source sample collected from a soil boring advanced west of the former landfill area, adjacent to several tires, abandoned vehicles, and gasoline tanks (41° 40' 37.86" N, 71° 00' 53.79" W). Material is dry, light brown SILT. PID = 0, FID = not operable.
SO-06	D14318 A1BM3 MA1BM3	01/28/04 1330	Grab	12 to 24 Inches	Soil/source sample collected from a soil boring advanced southeast of the former landfill area, adjacent to several miscellaneous waste piles (41° 40' 25.64" N, 71° 00' 23.61" W). Material is dry, brown, coarse-to-fine SAND and GRAVEL. PID and FID = 0.
SO-07	D14319 A1BM4 MA1BM4	01/28/04 0945	Grab	12 to 24 Inches	Soil/source sample collected as a reference sample from a soil boring advanced southeast of the former landfill area and south of sample SO-01 (41° 40' 17.78" N, 71° 00' 30.37" W). Material is dry, brown, coarse-to-fine SAND, some fine gravel, little silt. PID and FID = NR.
SO-08	MA1BM5	01/28/04 0940	Grab	12 to 24 Inches	Soil/source sample collected as a reference sample, for metals analysis only, from a soil boring advanced southeast of the former landfill area and south of sample SO-01 (41° 40' 17.78" N, 71° 00' 30.40" W). Material is dry, brown, coarse-to-fine SAND, some fine gravel, little silt. PID and FID = NR.

Table 3

Sample Summary: Cole Brook Pines Landfill
Soil/Source Samples Collected by START on 27 and 28 January 2004 (Concluded)

Sample Location No.	Traffic Report No.	Date/ Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Soil/Source (Concluded)					
SO-09	D14320 A1BM6 MA1BM6	01/27/04 1400	Grab	12 to 24 Inches	Duplicate of sample SO-02, collected for quality control.

Note: All FID and PID readings are reported in units above background.

°	= Degrees.	N	= North Latitude.
'	= Minutes.	W	= West Longitude.
"	= Seconds.	No.	= Number.
FID	= Flame Ionization Detector.	PID	= Photoionization Detector.
MS/MSD	= Matrix Spike/Matrix Spike Duplicate.	NR	= Not Recorded.

[58]

Complete analytical results of START soil/source samples including quantitation and detection limits are presented in Attachment A. Sample results qualified with a "J" on analytical tables are considered approximate because of limitations identified during DAS and CLP data validation. In addition, organic sample results reported at concentrations below quantitation limits and confirmed by mass spectrometry are also qualified by a "J" and considered approximate [80-82].

Table 4 is a summary of organic compounds and inorganic substances detected through DAS and CLP analyses of START soil/source samples. For each sample location, a compound or element is listed if it is detected at a concentration greater than or equal to three times the reference sample's concentration. However, if the compound or element is not detected in the reference sample, the reference sample's SQL (for organic analyses) or SDL (for inorganic analyses) is used as the reference value. These compounds or elements are listed if they occurred at a concentration greater than or equal to the reference sample's SQL or SDL and are designated by their approximate relative concentration above the reference criteria values. Soil/source samples SO-07 and SO-08 were collected to document reference concentrations for samples SO-01 through SO-06, and SO-09.

Analytical results of the soil/source samples are compared to MA DEP MOHML Reportable Category RCS-1 soil standards, established under the MCP. RCS-1 soil standards were applied to all the results because all the START soil/source samples were collected within 500 feet of a residential property, or were collected from lots zoned for residential use [11; 60; 92, p. 1,550, Subpart J]. Compounds/elements listed in bold text in Table 4 were detected at concentrations that meet or exceed their respective MOHML RCS-1 soil standards.

Table 4

Summary of Analytical Results
Soil/Source Samples Collected by START on 27 and 28 January 2004
at Cole Brook Pines Landfill

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration	Comments	RCS-1 Standard
SO-01	**VOCs**				
	2-Hexanone	11 ppb	10 U ppb	1.1 × SQL	NL
	INORGANICS				
	Barium	46.8 ppm	8.8 ppm	5.3 × Ref	1,000 ppm
	Calcium	1,860 ppm	309 ppm	6.0 × Ref	NL
	Magnesium	2,620 ppm	696 ppm	3.8 × Ref	NL
	Potassium	1,250 ppm	300 ppm	4.2 × Ref	NL
SO-03	**SVOCs**				
	bis(2-Ethylhexyl)phthalate	240 J ppb	40 J ppb	6.0 × Ref	1E+05 ppb
SO-04	**SVOCs**				
	Phenanthrene	1,500 ppb	350 U ppb	4.3 × SQL	1E+05 ppb
	Anthracene	370 J ppb	350 U ppb	1.1 × SQL	1E+06 ppb
	Fluoranthene	1,700 ppb	350 U ppb	4.9 × SQL	1E+06 ppb
	Pyrene	1,600 ppb	350 U ppb	4.6 × SQL	7E+05 ppb
	Benzo(a)anthracene	840 ppb	350 U ppb	2.4 × SQL	700 ppb
	Chrysene	820 ppb	350 U ppb	2.3 × SQL	7,000 ppb
	Benzo(b)fluoranthene	600 ppb	350 U ppb	1.7 × SQL	700 ppb
	Benzo(k)fluoranthene	720 ppb	350 U ppb	2.1 × SQL	7,000 ppb
	Benzo(a)pyrene	790 ppb	350 U ppb	2.3 × SQL	700 ppb
	Indeno(1,2,3-cd)pyrene	470 ppb	350 U ppb	1.3 × SQL	700 ppb
	INORGANICS				
	Barium	884 ppm	8.8 ppm	100 × Ref	1,000 ppm
	Calcium	4,050 ppm	309 ppm	13.1 × Ref	NL

Table 4

Summary of Analytical Results
Soil/Source Samples Collected by START on 27 and 28 January 2004
at Cole Brook Pines Landfill (Concluded)

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration	Comments	RCS-1. Standard
SO-04 (Conc.)	**INORGANICS (Concluded)**				
	Lead	97.4 ppm	3.8 ppm	25.6 × Ref	300 ppm
	Mercury	0.21 J ppm	0.047 UJ ppm	4.5 × SDL	20 ppm
	Zinc	337 ppm	11.0 ppm	30.6 × Ref	2,500 ppm
	Cyanide	0.14 J ppm	0.032 UJ ppm	4.4 × SDL	100 ppm
SO-05	**SVOCs**				
	bis(2-Ethylhexyl)phthalate	360 J ppb	40 J ppb	9.0 × Ref	1E+05 ppm
SO-06	**INORGANICS**				
	Selenium	0.71 J ppm	0.41 U ppm	1.7 × SDL	400 ppm

Note: Substances listed in bold text were detected at concentrations that meet or exceed their respective MOHML RCS-1 soil standards.

Ref = Reference concentration.
J = Quantitation is approximate due to limitations identified during the quality control review.
U = Indicates the substance was analyzed for, but was not detected. The associated numerical value is the SQL or SDL.
UJ = Indicates the substance was analyzed for, but was not detected. The associated numerical value is the estimated SQL or SDL.
ppb = Parts per billion.
ppm = Parts per million.
VOCs = Volatile Organic Compounds.
SVOCs = Semivolatile Organic Compounds.
SQL = Sample Quantitation Limit.
SDL = Sample Detection Limit.
NL = Not Listed.
Conc. = Concluded.
RCS-1 = Massachusetts Contingency Plan Reportable Category S-1 soil standard.

[80-82; 92]

One VOC (2-hexanone) was detected in START soil/source samples at a concentration above reference criteria. 2-Hexanone was detected at 11 ppb in soil/source sample SO-01 [80]. No MOHML RCS-1 soil standard is available for 2-hexanone [92, Subpart J].

Eleven SVOCs were detected in START soil/source samples at concentrations above reference criteria. Maximum concentrations of SVOCs detected include the following: phenanthrene (1,500 ppb in SO-04); anthracene (370 J ppb in SO-04); fluoranthene (1,700 ppb in SO-04); pyrene (1,600 ppb in SO-04); benzo(a)anthracene (840 ppb in SO-04); chrysene (820 ppb in SO-04); bis(2-ethylhexyl)phthalate (360 J ppb in SO-05); benzo(b)fluoranthene (600 ppb in SO-04); benzo(k)fluoranthene (720 ppb in SO-04); benzo(a)pyrene (790 ppb in SO-04); and indeno(1,2,3-cd)pyrene (470 ppb in SO-04) [81]. Two SVOCs [benzo(a)anthracene and benzo(a)pyrene] were detected in START soil/source samples at concentrations that met or exceeded their MOHML RCS-1 soil standards of 700 ppb (for both substances) [81; 92, Subpart J].

No pesticides or PCBs were detected in the soil/source samples collected by START [81].

Nine inorganic substances were detected in START soil/source samples at concentrations above reference criteria. Maximum concentrations of inorganic substances detected include the following: barium (884 ppm in SO-04), calcium (4,050 ppm in SO-04), lead (97.4 ppm in SO-04), magnesium (2,620 ppm in SO-01), mercury (0.21 J ppm in SO-04), potassium (1,250 ppm in SO-01), selenium (0.71 J ppm in SO-06), zinc (337 ppm in SO-04), and cyanide (0.14 J ppm in SO-04) [82]. None of the inorganic substances were detected in START soil/source samples at concentrations that met or exceeded their respective MOHML RCS-1 soil standards [82; 92, Subpart J]. No MOHML RCS-1 soil standards are available for calcium, magnesium, and potassium [92, Subpart J].

START performed soil/source sampling as part of the Cole Brook ESI. Analytical results of START soil/source samples indicate that soil on the Cole Brook property contains one VOC, 11 SVOCs, eight metals, and cyanide at concentrations above reference criteria [80-82]. Of these substances, two SVOCs were detected in the soil/source samples at concentrations that met or exceeded their respective MOHML RCS-1 soil standards [81; 92, Subpart J].

GROUNDWATER PATHWAY

Surficial soils in the Dartmouth, Massachusetts area are part of the Paxton-Woodbridge-Whitman soil association, which consists of nearly level to moderately steep soils that are well drained, moderately well drained, and very poorly drained. This soil association occurs on glaciated uplands [37]. The mean annual precipitation for New Bedford, Massachusetts (the adjacent town to the west) is 43.1 inches [35].

The surficial geology in the vicinity of the Cole Brook property is mapped as compact, unsorted, silty, bouldery gravel (till). The surficial geology may include small beds and lenses of poorly sorted, stratified gravel, sand, silt, and, in some areas, is mantled with relatively thin deposits of silt, sand, and gravel [36]. According to GHR, the landfill was built primarily upon a deposit of highly permeable, coarse sand and gravel overlying granite-gneiss bedrock, located 10 to 25 feet bgs. In addition, the western portion of the landfill was constructed within an area of on-site wetlands [4, pp. 5, 7]. No bedrock formation mapped within 4 radial miles of the property exhibits karst characteristics [10].

According to MA DEP, the western portion of the property is designated as a Potential Drinking Water Source Area, which indicates that the western portion of the property is underlain by a Potentially Productive Aquifer (PPA). A PPA is an aquifer that could be used as source of drinking

water [75-76]. Based on soil boring logs generated during the installation of groundwater monitoring wells in January 2004, the depth to groundwater beneath the Cole Brook property is 2 to 7.5 feet bgs [31]. Groundwater flow direction beneath the property has not been determined; however, based on the location of Colebrook Swamp and Cole Brook, groundwater beneath the property most likely flows radially to the west, north, and east [52].

The following Massachusetts Cities and Towns are located within 4 radial miles of the Cole Brook property: Dartmouth (population 30,666); Fall River (population 91,938); New Bedford (population 93,768); Freetown (population 8,472); and Westport (population 14,183) [32; 51-54].

The Dartmouth Water Department is supplied with drinking water from a blended system of one surface water intake and 11 gravel-packed overburden wells. Six of the wells are located within 4 radial miles of the Cole Brook property and include the following: Violetta Wells 1, 2, and 3 (referred to by the Dartmouth Water Department as V1, V2, and V3), located along Old Westport Road approximately 3.5 miles south of the property; Wells B and C, located at 298 Chase Road, near the intersection with Old Westport Road, approximately 3.9 miles south of the Cole Brook property; and Route No. 6/GP Well No. 4, located along Route 6, approximately 2.5 miles south of the property. The surface water drinking water intake is not located downstream of the property. The system serves approximately 31,000 people. Since none of the sources contribute greater than 40% of the total system, the service population of 31,000 is apportioned equally among the 12 sources [13; 38; 40; 44].

The Fall River Water Department obtains its drinking water from a surface water intake located on North Wattupa Pond, which is replenished by Copicut Reservoir. Neither water body is located downstream of the Cole Brook property. The remainder of the residents of Fall River are served by private drinking water supply wells [14; 47]. According to MA DEP, Noquochoke Lake, which is located downstream of the Cole Brook property, is listed as an emergency public drinking water surface water supply for the Fall River Water Department; however, MA DEP reported that even in times of emergency, the water quality of the lake is too poor (due to septic issues) to be used for drinking water [52; 75].

The New Bedford Water Department obtains its drinking water from surface water intakes located on Great Quitticas Pond, Little Quitticas Pond, Assowampsett Pond, and Pocksha Pond. None of these surface water bodies are located downstream of the Cole Brook property. None of the residents of New Bedford are served by private drinking water supply wells [46].

Approximately 95% of the Town of Freetown is served by private drinking water supply wells, with 5% of the population being served by the New Bedford Water Department [12].

The Town of Westport is supplied almost entirely by private drinking water wells. Approximately 1% of the population is served by public drinking water from Westport Aqueduct Well, West Harbor Well, and Bayside Well, none of which are located within 4 radial miles of the Cole Brook property [45].

Additionally, five non-transient, non-community drinking water supply wells are located in the Town of Westport and within 4 radial miles of the Cole Brook property. The Westport Plaza Well is located along Route 6, approximately 3.5 miles southwest of the property, and serves approximately

50 people. The Westport Country Day Well is located along Route 6, approximately 2.9 miles southwest of the property, and serves approximately 35 people. Well No. 1 is located along Route 6, approximately 3.2 miles southwest of the property, and serves approximately 35 people. The Alice A. Macomber Primary School Well is located along Gifford Road, approximately 3.8 miles southwest of the property, and serves approximately 270 people. The St. George School Well is located along Route 177, approximately 3.2 miles southwest of the property, and serves approximately 200 people [40]. Table 5 summarizes public groundwater supply sources within 4 radial miles of the Cole Brook property.

Table 5

Public Groundwater Supply Sources Within 4 Radial Miles of Cole Brook Pines Landfill

Distance/ Direction from Cole Brook Pines Landfill	Source Name	Location of Source[a]	Estimated Population Served	Source Type[b]
2.5 miles South	Route No. 6/GP Well No. 4	Dartmouth	2,583	Overburden
2.9 miles Southwest	Westport Country Day School	Westport	35	Unknown
3.2 miles Southwest	St. George School	Westport	200	Unknown
3.2 miles Southwest	Well No. 1	Westport	35	Unknown
3.5 miles Southwest	Westport Plaza	Westport	50	Unknown
3.5 miles South	Violetta Well 1	Dartmouth	2,583	Overburden
3.5 miles South	Violetta Well 2	Dartmouth	2,583	Overburden
3.5 miles South	Violetta Well 3	Dartmouth	2,583	Overburden
3.8 miles Southwest	Alice A. Macomber Primary School	Westport	270	Unknown
3.9 miles South	Well B	Dartmouth	2,583	Overburden
3.9 miles South	Well C	Dartmouth	2,583	Overburden

[a] Indicates Town in which well is located.
[b] Overburden, Bedrock, or Unknown.

[13; 38; 40; 44; 45]

The nearest private drinking water supply well is located on the property and was installed in 1987 to serve the on-site residence [4, p. 5]. The well is reportedly installed in bedrock to a depth of 180 feet bgs [78, p. 6]. The nearest off-site private drinking water supply well is located on the Gosselin & Sons Landscape Materials property, located north of and adjacent to the Cole Brook property. Residences located along Old Fall River Road (west of 360 Old Fall River Road), and several residences located along Hixville Road, are served by private drinking water supply wells [93].

Private groundwater supplies located within 4 radial miles of the property were estimated using equal distribution calculations of U.S. Census CENTRACTS data identifying population, households, and

private water wells for "Block Groups" which lie within or partially within individual radial distance rings measured from the Cole Brook property. An estimated 5,077 people are served by private drinking water supplies within 4 radial miles of the property [14]. The total population that relies on groundwater within 4 radial miles of the property is estimated to be 21,165 persons and is summarized in Table 6.

Table 6

Estimated Drinking Water Populations Served by Groundwater Sources Within 4 Radial Miles of Cole Brook Pines Landfill

Radial Distance from Cole Brook Pines Landfill (miles)	Estimated Population Served by Private Wells	Estimated Population Served by Public Wells	Total Estimated Population Served by Groundwater Sources Within the Ring
≥ 0.00 to 0.25	25	0	25
> 0.25 to 0.50	74	0	74
> 0.50 to 1.00	295	0	295
> 1.00 to 2.00	1,070	0	1,070
> 2.00 to 3.00	975	2,618	3,593
> 3.00 to 4.00	2,638	13,470	16,108
TOTAL	5,077	16,088	21,165

[13; 14; 38; 40; 44; 45]

On 2 December 1977, GHR collected five groundwater samples from the five monitoring wells (A-1 through A-5) on the property. The exact locations of these monitoring wells could not be determined, and it is unknown if a reference sample was collected for this sampling event. The samples were submitted to GHR's Environmental Services Division Laboratory and analyzed for a variety of water quality parameters, including pH, total hardness (as calcium carbonate), chemical oxygen demand (COD), nitrogen (as nitrate), copper, nickel, and zinc. Two metals, including copper and zinc, were detected in all the samples; maximum concentrations were detected in A-1 and included 10,400 ppb of copper and 9,500 ppb of zinc. In addition, nickel was detected at 1,600 ppb in the groundwater sample collected from well A-1 [4, pp. 6, 9, Attachment A; 15].

On 5 January 1982, GHR collected five groundwater samples from "observation wells" B-1, B-2, B-5, B-6, and B-7 on the property. START was unable to determine from available file information if these observation wells were the same as the monitoring wells sampled in 1977. In addition, the exact locations of these observation wells could not be determined, and it is unknown if a reference sample was collected for this sampling event. The samples were submitted to CAA of Watertown, Massachusetts and analyzed for VOCs by EPA Method 624, SVOCs by EPA Method 625, pesticides, and PCBs. In addition, the samples were submitted to GHR Analytical Incorporated of Lakeville, Massachusetts and analyzed for metals and for a variety of water quality parameters, including pH, alkalinity, COD, chloride, color, detergents, nitrogen (as nitrate), nitrogen (as

ammonia), total phosphorus, total solids, total volatile solids, total dissolved solids, volatile dissolved solids, sulfate, sulfide, and specific conductance [4, pp. 7, 10, Attachment B; 16].

Maximum concentrations of organic contaminants detected included 13 ppb of benzene in B-1 and 59 ppb of bis(2-ethylhexyl)phthalate in B-5. Eight metals were detected in the groundwater samples, including the following (maximum concentrations in parentheses): calcium (42,000 ppb in B-6), copper (80 ppb in B-6), iron (6,800 ppb in B-5), magnesium (13,000 ppb in B-6), manganese (6,200 ppb in B-5), potassium (2,400 ppb in B-6), sodium (8,800 ppb in B-6), and zinc (110 ppb in B-6). No pesticides or PCBs were detected in the samples [4, pp. 7, 10, Attachment B; 16].

On 12 February 1982, GHR collected two groundwater samples from observation well Nos. 3 and 4 on the property. START personnel were unable to locate information in available files regarding the exact locations of the monitoring wells or when the wells were installed. The samples were submitted to GHR Analytical Incorporated of Lakeville, Massachusetts and analyzed for metals and for a variety of water quality parameters, including pH, alkalinity (as calcium carbonate), COD, chloride, color, detergents, nitrogen (as nitrate), nitrogen (as ammonia), total phosphates, total solids, total volatile solids, dissolved solids, volatile dissolved solids, sulfates, sulfides, and specific conductance [4, pp. 7, 10, Attachment D].

Analytical results of the groundwater samples revealed the presence of 10 metals, including arsenic, calcium, copper, iron, magnesium, manganese, nickel, potassium, sodium, and zinc. Maximum concentrations of nine of the 10 metals were detected in the groundwater sample collected from observation well No. 3 and included arsenic (0.02 ppm), calcium (18.5 ppm), copper (0.94 ppm), iron (2.5 ppm), magnesium (9.8 ppm), manganese (0.42 ppm), nickel (0.08 ppm), potassium (2.3 ppm), and zinc (0.44 ppm). The maximum concentration of sodium (5.5 ppm) was detected in the groundwater sample collected from observation well No. 4 [4, pp. 7, 10, Attachment D].

Between 19 and 25 February 2002, Guild personnel advanced nine soil borings at the Cole Brook property for the purpose of installing groundwater monitoring wells to assess the groundwater quality near the bedrock aquifer. The soil borings were located in six general locations, referred to as MW-1 through MW-6, around the perimeter of the former landfill. At three locations (MW-1, MW-5, and MW-6), Guild installed deep monitoring wells (MW-1D, MW-5D, and MW-6D) and shallow monitoring wells (MW-1S, MW-5S, and MW-6S) in the soil borings. The deep monitoring wells were installed at the top of bedrock, and the shallow monitoring wells were installed to a depth of less than 20 feet bgs. Due to the shallow depth to bedrock in the remaining soil borings at the other six locations, only shallow groundwater monitoring wells were installed at locations MW-2, MW-3, and MW-4 [78, pp. 5 and 6].

Subsequently, St. Germain personnel collected groundwater samples from each groundwater monitoring well and a drinking water sample from the drinking water supply well that serves the on-site residence. The groundwater and drinking water samples were submitted for VOC, SVOC, PCB, EPH, VPH, iron, manganese, alkalinity, COD, chloride, nitrate, sulfate, total dissolved solids (TDS), and 13 RCRA metals analyses. Analytical results indicated the presence of the following substances in unspecified groundwater samples (maximum concentrations in parentheses): lead (0.0492 ppm), iron (31 ppm), and manganese (0.97 ppm). Additionally, analytical results of the groundwater sample collected from groundwater monitoring well MW-2 (SGA-02) indicated the presence of

arsenic and beryllium at 0.15 ppm and 0.0048 ppm, respectively [78, pp. 5-6]. No additional information regarding the groundwater and drinking water sampling is available to START.

On 26 through 29 January 2004, as part of the ESI, START personnel oversaw the installation of seven overburden groundwater monitoring wells (MW-01 through MW-07) by Environmental Drilling, Inc. on the Cole Brook property. MW-01 was installed southeast of the former landfill area, adjacent to a propane tank and several solid waste piles. MW-02 was installed in the southeast portion of the former landfill area, adjacent to a gravel berm area and several solid waste piles. MW-03 was installed in the south/central portion of the former landfill area, adjacent to several solid waste piles. MW-04 was installed in the northeast portion of the former landfill area, adjacent to several dilapidated buildings and solid waste piles. MW-05 was installed west of the former landfill area, adjacent to several tires, abandoned vehicles, and gasoline tanks. MW-06 was installed southeast of the former landfill area. MW-07, the reference well, was installed southeast of the former landfill area. Monitoring wells MW-01 through MW-07 were screened in overburden and range in depth from 12 to 15 feet bgs [58, pp. 12-36]. Soil boring/well construction logs are presented in Attachment B.

During groundwater monitoring well installation activities, START personnel located seven of the nine groundwater monitoring wells installed by Guild. START personnel observed monitoring wells MW-1S, MW-1D, MW-2, MW-3, MW-4, MW-5S, and MW-5D (hereafter referred to as SGA-01S, SGA-01D, SGA-02, SGA-03, SGA-04, SGA-05S, and SGA-05D, respectively) [58, pp. 30-34]. Information regarding the groundwater monitoring wells on the Cole Brook property is summarized in Table 7.

Table 7

Groundwater Monitoring Wells Located on the Cole Brook Pines Landfill Property

Groundwater Monitoring Well Name	Driller/ Date Installed	Total Depth*	Depth to Groundwater* (Measured 02/12/04)	Screened Interval*	Latitude/ Longitude
MW-01	EDI/ 01/28/04	15.79	2.49	15.79 to 5.79	41° 40' 24.12" N 70° 00' 31.42" W
MW-02	EDI/ 01/27/04	16.00	7.10	16.00 to 6.00	41° 40' 26.28" N 71° 00' 41.09" W
MW-03	EDI/ 01/27/04	15.81	6.01	15.81 to 5.81	41° 40' 28.95" N 71° 00' 44.29" W
MW-04	EDI/ 01/28/04	15.65	5.01	15.65 to 5.65	41° 40' 40.11" N 71° 00' 39.09" W
MW-05	EDI/ 01/27/04	15.69	5.51	15.69 to 5.69	41° 40' 37.86" N 71° 00' 53.79" W
MW-06	EDI/ 01/28/04	15.00	5.07	15.00 to 5.00	41° 40' 25.64" N 71° 00' 23.61" W

Table 7

Groundwater Monitoring Wells Located on the Cole Brook Pines Landfill Property (Concluded)

Groundwater Monitoring Well Name	Driller/ Date Installed	Total Depth*	Depth to Groundwater* (Measured 02/12/04)	Screened Interval*	Latitude/ Longitude
MW-07	EDI/ 01/28/04	17.81	9.21	17.81 to 7.81	41° 40' 17.78" N 71° 00' 30.37" W
SGA-01S	Guild/ 02/02	14.21**	4.28	14.21 to 4.21***	41° 40' 35.94" N 71° 00' 33.27" W
SGA-01D	Guild/ 02/02	53.10**	5.23	53.10 to 43.10***	41° 40' 35.95" N 71° 00' 33.22" W
SGA-02	Guild/ 02/02	14.40**	4.01	14.40 to 4.40***	41° 40' 29.31" N 71° 00' 36.56" W
SGA-03	Guild/ 02/02	20.92**	5.90	20.92 to 10.92***	41° 40' 36.42" N 71° 00' 46.98" W
SGA-04	Guild/ 02/02	21.20**	3.32	21.20 to 11.20***	41° 40' 25.52" N 71° 00' 44.97" W
SGA-05S	Guild/ 02/02	12.70**	2.64	12.70 to 2.70***	41° 40' 45.02" N 71° 00' 39.58" W
SGA-05D	Guild/ 02/02	40.13**	2.34	40.13 to 30.13***	41° 40' 44.95" N 71° 00' 39.41" W

* = Feet Below Top of Inner Casing.

** = No well installation logs were available for the monitoring wells installed by Guild. On 12 February 2004, START personnel developed the monitoring wells installed by Guild and measured the total depths of each well. START assumed the depth to the bottom of each well after development to be the total depth of each well.

*** = No well installation logs were available for the monitoring wells installed by Guild. All wells installed by Guild were reportedly constructed with 8 to 17 feet of screen. For purposes of determining the best location to collect the groundwater sample, START assumed that 10 feet of screen was placed in each well and that the screened interval originates at the bottom of each well.

EDI = Environmental Drilling, Inc.
Guild = Guild Drilling Company, Inc.
° = Degrees.
' = Minutes.
" = Seconds.
N = North Latitude.
W = West Longitude.

[58; 78]

On 17 through 19 February 2004, as part of the ESI, START personnel collected 15 groundwater samples (GW-01 through GW-15), including one replicate, from 14 monitoring wells on the Cole Brook property, to determine if there has been a release of hazardous substances associated with the

Cole Brook property to groundwater (Figures 3 and 3A) [58, pp. 46-48; 59, pp. 2-17]. Groundwater sample GW-01 was collected from monitoring well MW-01. Groundwater sample GW-02, and replicate sample GW-08, were collected from monitoring well MW-02. Groundwater sample GW-03 was collected from monitoring well MW-03. Groundwater sample GW-04 was collected from monitoring well MW-04. Groundwater sample GW-05 was collected from monitoring well MW-05. Groundwater sample GW-06 was collected from monitoring well MW-06. Groundwater sample GW-07 was collected from monitoring well MW-07. Groundwater sample GW-09 was collected from monitoring well SGA-01S. Groundwater sample GW-10 was collected from monitoring well SGA-01D. Groundwater sample GW-11 was collected from monitoring well SGA-02. Groundwater sample GW-12 was collected from monitoring well SGA-03. Groundwater sample GW-13 was collected from monitoring well SGA-05S. Groundwater sample GW-14 was collected from monitoring well SGA-05D. Groundwater sample GW-15 was collected from monitoring well SGA-04. All the groundwater samples were analyzed through EPA CLP laboratories for VOCs, SVOCs, pesticides, PCBs, metals, and cyanide. Groundwater sample GW-11 was analyzed for both total metals and dissolved metals. Both analyses were performed to ensure that metals concentration data would be obtained from the samples despite high turbidity in the samples [58, pp. 46-48; 59, pp. 2-17; 83-85]. Table 8 summarizes the groundwater samples collected by START on 17 through 19 February 2004.

Table 8

Sample Summary: Cole Brook Pines Landfill
Groundwater Samples Collected by START on 17 through 19 February 2004

Sample Location No.	Traffic Report No.	Date/ Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Groundwater					
GW-01 (MS/MSD)	A1CN0 MA1CN0	02/17/04 1330	Grab	10.79*	Grab groundwater sample collected from monitoring well MW-01, installed southeast of the former landfill area, adjacent to a propane tank and several solid waste piles (41° 40' 24.12" N, 70° 00' 31.42" W). Last water quality readings before sample was collected: Temp = 4.14 °C; Spec. Cond = 42 µS/cm; pH = 5.95; ORP = 272.2 mv; DO = 198.2%; Turb = 13 NTU. FID in headspace upon opening well = 0.8; PID in headspace upon opening well = 0.0.

Table 8

Sample Summary: Cole Brook Pines Landfill
Groundwater Samples Collected by START on 17 through 19 February 2004 (Continued)

Sample Location No.	Traffic Report No.	Date/ Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Groundwater (Continued)					
GW-02	A1CN1 MA1CN1	02/18/04 1335	Grab	11.00*	Grab groundwater sample collected from monitoring well MW-02, installed in the southeast portion of the former landfill area, adjacent to a gravel berm area and several solid waste piles (41° 40" 26.28" N, 71° 00" 41.09" W): Last water quality readings before sample was collected: Temp = 3.40 °C; Spec. Cond = 34 µS/cm; pH = 5.28; ORP = 323.9 mv; DO = 96.1%; Turb = 75 NTU. FID and PID in headspace upon opening well = 0.0.
GW-03	A1CN2 MA1CN2	02/18/04 1610	Grab	10.81*	Grab groundwater sample collected from monitoring well MW-03, installed in the south/central portion of the former landfill area, adjacent to several solid waste piles (41° 40' 28.95" N, 71° 00' 44.29" W). Last water quality readings before sample was collected: Temp = 5.05 °C; Spec. Cond = 289 µS/cm; pH = 4.58; ORP = 438 mv; DO = 80.4%; Turb = 7.5 NTU. FID in headspace upon opening well = NR; PID in headspace upon opening well = 0.0.
GW-04	A1CN3 MA1CN3	02/17/04 1610	Grab	10.70*	Grab groundwater sample collected from monitoring well MW-04, installed in the northeast portion of the former landfill area, adjacent to several dilapidated buildings and solid waste piles (41° 40' 40.11" N, 71°00' 39.09" W). Last water quality readings before sample was collected: Temp = 2.83 °C; Spec. Cond = 255 µS/cm; pH = 6.58; ORP = -105 mv; DO = 1.0%; Turb = 3.8 NTU. FID in headspace upon opening well = NR; PID in headspace upon opening well = 0.0.

Table 8

Sample Summary: Cole Brook Pines Landfill
Groundwater Samples Collected by START on 17 through 19 February 2004 (Continued)

Sample Location No.	Traffic Report No.	Date/ Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Groundwater (Continued)					
GW-05	A1CN4 MA1CN4	02/19/04 1055	Grab	10.69*	Grab groundwater sample collected from monitoring well MW-05, installed west of the former landfill area, adjacent to several tires, abandoned vehicles, and gasoline tanks (41° 40' 37.86" N, 71° 00' 53.79" W). Last water quality readings before sample was collected: Temp = 6.33 °C; Spec. Cond = 42 µS/cm; pH = 5.10; ORP = 324.9 mv; DO = 84.2%; Turb = 0.58 NTU. FID in headspace upon opening well = NR; PID in headspace upon opening well = 0.0.
GW-06	A1CN5 MA1CN5	02/18/04 1035	Grab	10.00*	Grab groundwater sample collected from monitoring well MW-06, installed southeast of the former landfill area (41° 40' 25.64" N, 71° 00' 23.61" W). Last water quality readings before sample was collected: Temp = 3.95 °C; Spec. Cond = 84 µS/cm; pH = 6.13; ORP = 283.3 mv; DO = 107.3%; Turb = 10.4 NTU. FID in headspace upon opening well = NR; PID in headspace upon opening well = 0.8.
GW-07	A1CN6 MA1CN6	02/18/04 1230	Grab	12.81*	Grab groundwater sample collected from monitoring well MW-07, installed southeast of the former landfill area, to establish reference concentrations for groundwater samples (41° 40' 17.78" N, 71° 00' 30.37" W). Last water quality readings before sample was collected: Temp = 5.70 °C; Spec. Cond = 32 µS/cm; pH = 5.36; ORP = 270.1 mv; DO = 69.5%; Turb = 17 NTU. FID in headspace upon opening well = NR; PID in headspace upon opening well = 0.0.
GW-08	A1CN7 MA1CN7	02/18/04 1335	Grab	11.00*	Replicate of sample GW-02, collected for quality control.

Table 8

Sample Summary: Cole Brook Pines Landfill
Groundwater Samples Collected by START on 17 through 19 February 2004 (Continued)

Sample Location No.	Traffic Report No.	Date/ Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Groundwater (Continued)					
GW-09	A1CN8 MA1CN8	02/17/04 1230	Grab	9.2*	Grab groundwater sample collected from monitoring well SGA-01S, located east of the former landfill area (41° 40' 35.94" N, 71° 00' 33.27" W). Last water quality readings before sample was collected: Temp = 4.71 °C; Spec. Cond = 72 µS/cm; pH = 4.97; ORP = 72.9 mv; DO = 1.9%; Turb = 4.5 NTU. FID in headspace upon opening well = 0.0; PID in headspace upon opening well = 3.3.
GW-10	A1CN9 MA1CN9	02/17/04 1545	Grab	48.10*	Grab groundwater sample collected from monitoring well SGA-01D, located east of the former landfill area (41° 40' 35.95" N, 71° 00' 33.22" W). Last water quality readings before sample was collected: Temp = 8.54 °C; Spec. Cond = 179 µS/cm; pH = 6.84; ORP = 3.12.2 mv; DO = 42.2%; Turb = 429 NTU. FID in headspace upon opening well = 0.0; PID in headspace upon opening well = 13.2.
GW-11	A1CP0 MA1CP0 MA17F6	02/19/04 1315	Grab	9.40*	Grab groundwater sample collected from monitoring well SGA-02, located in the southeast portion of the former landfill area (41° 40' 29.31' N, 71° 00' 36.56" W). Last water quality readings before sample was collected: Temp = 4.28 °C; Spec. Cond = 59 µS/cm; pH = 7.12; ORP = 341.8 mv; DO = 125.4%; Turb = ERR2. FID and PID in headspace upon opening well = NR.

Table 8

Sample Summary: Cole Brook Pines Landfill
Groundwater Samples Collected by START on 17 through 19 February 2004 (Continued)

Sample Location No.	Traffic Report No.	Date/ Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Groundwater (Continued)					
GW-12	A1CP1 MA1CP1	02/18/04 1655	Grab	15.92*	Grab groundwater sample collected from monitoring well SGA-03, located in the western portion of the former landfill area (41° 40' 36.42" N, 71° 00' 46.98" W). Last water quality readings before sample was collected: Temp = 5.84 °C; Spec. Cond = 333 µS/cm; pH = 6.74; ORP = 187.7 mv; DO = 4.5%; Turb = 3.17 NTU. FID in headspace upon opening well = NR; PID in headspace upon opening well = 0.0.
GW-13	A1CP2 MA1CP2	02/17/04 1515	Grab	7.70*	Grab groundwater sample collected from monitoring well SGA-05S, located north of the former landfill area (41° 40' 45.02" N, 71° 00' 39.58" W). Last water quality readings before sample was collected: Temp = 7.77 °C; Spec. Cond = 242 µS/cm; pH = 6.50; ORP = 16.9 mv; DO = 3.2%; Turb = 2.8 NTU. FID in headspace upon opening well = 18.2; PID in headspace upon opening well = 1.5.
GW-14	A1CP3 MA1CP3	02/17/04 1125	Grab	35.00*	Grab groundwater sample collected from monitoring well SGA-05D, located north of the former landfill area (41° 40' 44.95" N, 71° 00' 39.41" W). Last water quality readings before sample was collected: Temp = 8.63 °C; Spec. Cond = 182 µS/cm; pH = 6.29; ORP = 261.2 mv; DO = 24.2%; Turb = 9.1 NTU. FID in headspace upon opening well = 3.7; PID in headspace upon opening well = 1.8.

Table 8

Sample Summary: Cole Brook Pines Landfill
Groundwater Samples Collected by START on 17 through 19 February 2004 (Concluded)

Sample Location No.	Traffic Report No.	Date/ Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Groundwater (Concluded)					
GW-15	A1CP4 MA1CP4	02/18/04 1305	Grab	15.92*	Grab groundwater sample collected from monitoring well SGA-04, located southwest of the former landfill area (41° 40' 25.52" N, 71° 00' 44.97" W). Last water quality readings before sample was collected: Temp = 8.44 °C; Spec. Cond = 43 µS/cm; pH = 5.94; ORP = 311.5 mv; DO = 135.6%; Turb = 1.12 NTU. FID in headspace upon opening well = NR; PID in headspace upon opening well = 0.0.

*	= Feet Below Top of Inner Well Casing.	mv	= Millivolts.
°	= Degrees.	NR	= Not Recorded.
'	= Minutes.	Spec. Cond	= Specific Conductivity.
"	= Seconds.	Turb	= Turbidity.
ORP	= Oxidation Reduction Potential.	FID	= Flame Ionization Detector.
No.	= Number.	PID	= Photoionization Detector.
DO	= Dissolved Oxygen.	N	= North Latitude.
NTU	= Nephelometric Turbidity Units.	W	= West Longitude.
µS/cm	= MicroSiemens per Centimeter.	Temp	= Temperature.
GPS	= Global Positioning System.	MS/MSD	= Matrix Spike/Matrix Spike Duplicate.
°C	= Degrees Celsius.	ERR2	= Error 2; Turbidity was too high to obtain a reading.

[58; 59]

Complete analytical results of START groundwater samples including quantitation and detection limits are presented in Attachment C. Sample results qualified with a "J" on analytical tables are considered approximate because of limitations identified during CLP data validation. In addition, organic sample results reported at concentrations below quantitation limits and confirmed by mass spectrometry are also qualified by a "J" and considered approximate [83-85].

Table 9 is a summary of organic compounds and inorganic substances detected through CLP analyses of START groundwater samples. Groundwater sample GW-07 was used to document reference concentrations due to its (presumed) upgradient location. For a sample location, a compound or element is listed if it is detected at a concentration greater than or equal to three times the reference sample's concentration. However, if the compound or element is not detected in the reference sample, the reference sample's SQL (for organic analyses) or SDL (for inorganic analyses) is used as the reference concentration. These compounds or elements are listed if they occurred at

a concentration greater than or equal to the reference sample's SQL or SDL and are designated by their approximate relative concentration above the reference criteria values.

Analytical results of START groundwater samples are compared to MOHML Reportable Category RCGW-1 groundwater standards, established under the MCP. RCGW-1 groundwater standards were applied to all the results because a portion of the Cole Brook property is located within a current or potential drinking water source area [92, p. 1,550, Subpart J; 93-94]. Compounds/elements listed in bold text in Table 9 were detected at concentrations that meet or exceed their respective MOHML RCGW-1 groundwater standards.

Table 9

Summary of Analytical Results
Groundwater Samples Collected by START on 17 through 19 February 2004
at Cole Brook Pines Landfill

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration	Comments	RCGW-1 Standard
GW-01	**SVOCs**				
	Caprolactam	22 ppb	10 U ppb	2.2 × SQL	NL
	INORGANICS				
	Chromium	85.3 J ppb	0.69 UJ ppb	123 × SDL	100 ppb
	Cobalt	4.1 ppb	0.64 J ppb	6.4 × Ref	5,000 ppb
	Copper	22.4 J ppb	2.4 UJ ppb	9.3 × SDL	10,000 ppb
	Nickel	121 J ppb	40.0 UJ ppb	3.0 × SDL	80 ppb
GW-03	**INORGANICS**				
	Aluminum	14,100 ppb	1,420 ppb	9.9 × Ref	NL
	Beryllium	6.9 ppb	0.09 J ppb	76.7 × Ref	4 ppb
	Calcium	21,100 ppb	1,200 ppb	17.6 × Ref	NL
	Cobalt	47.8 ppb	0.64 J ppb	74.7 × Ref	5,000 ppb
	Copper	6.0 J ppb	2.4 UJ ppb	2.5 × SDL	10,000 ppb
	Magnesium	8,380 ppb	718 ppb	11.7 × Ref	NL
	Manganese	1,880 ppb	228 ppb	8.2 × Ref	NL
	Nickel	91.0 J ppb	40.0 UJ ppb	2.3 × SDL	80 ppb
	Zinc	316 ppb	60.0 UJ ppb	5.3 × SDL	900 ppb

Table 9

Summary of Analytical Results
Groundwater Samples Collected by START on 17 through 19 February 2004
at Cole Brook Pines Landfill (Continued)

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration	Comments	RCGW-1 Standard
GW-04	**INORGANICS**				
	Barium	258 ppb	37.3 ppb	6.9 × Ref	200 ppb
	Calcium	41,300 ppb	1,200 ppb	34.4 × Ref	NL
	Copper	12.1 J ppb	2.4 UJ ppb	5.0 × SDL	10,000 ppb
	Iron	14,500 J ppb	641 J ppb	22.6 × Ref	NL
	Lead	103 ppb	10.0 U ppb	10.3 × SDL	20 ppb
	Magnesium	3,230 ppb	718 ppb	4.5 × Ref	NL
	Zinc	322 ppb	60.0 UJ ppb	5.4 × SDL	900 ppb
GW-05	**SVOCs**				
	Caprolactam	16 ppb	10 U ppb	1.6 × SQL	NL
GW-06	**SVOCs**				
	Caprolactam	41 ppb	10 U ppb	4.1 × SQL	NL
	INORGANICS				
	Calcium	6,560 ppb	1,200 ppb	5.5 × Ref	NL
	Magnesium	2,330 ppb	718 ppb	3.2 × Ref	NL
GW-09	**INORGANICS**				
	Vanadium	1.6 ppb	0.52 J ppb	3.1 × Ref	50 ppb
	Cyanide	189 ppb	10.00 U ppb	18.9 × SDL	10 ppb
GW-10	**INORGANICS**				
	Barium	113 ppb	37.3 ppb	3.0 × Ref	200 ppb
	Calcium	13,100 ppb	1,200 ppb	10.9 × Ref	NL
	Chromium	191 J ppb	0.69 UJ ppb	277 × SDL	100 ppb
	Cobalt	4.1 ppb	0.64 J ppb	6.4 × Ref	5,000 ppb

Table 9

Summary of Analytical Results
Groundwater Samples Collected by START on 17 through 19 February 2004
at Cole Brook Pines Landfill (Continued)

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration	Comments	RCGW-1 Standard
GW-10 (Concluded)	**INORGANICS (Concluded)**				
	Copper	41.5 J ppb	2.4 UJ ppb	17.3 × SDL	10,000 ppb
	Iron	3,030 J ppb	641 J ppb	4.7 × Ref	NL
	Magnesium	8,050 ppb	718 ppb	11.2 × Ref	NL
	Nickel	91.4 J ppb	40.0 UJ ppb	2.3 × SDL	80 ppb
	Potassium	4,700 J ppb	793 J ppb	5.9 × Ref	NL
	Sodium	14,400 ppb	3,180 ppb	4.5 × Ref	NL
	Vanadium	5.8 ppb	0.52 J ppb	11.2 × Ref	50 ppb
GW-11	**INORGANICS**				
	Aluminum	41,700 ppb	1,420 ppb	29.4 × Ref	NL
	Barium	378 ppb	37.3 ppb	10.1 × Ref	200 ppb
	Beryllium	3.1 ppb	0.09 J ppb	34.4 × Ref	4 ppb
	Calcium	11,900 ppb	1,200 ppb	9.9 × Ref	NL
	Chromium	12.0 J ppb	0.69 UJ ppb	17.4 × SDL	100 ppb
	Cobalt	7.5 ppb	0.64 J ppb	11.7 × Ref	5,000 ppb
	Copper	36.1 J ppb	2.4 UJ ppb	15.0 × SDL	10,000 ppb
	Iron	28,200 J ppb	641 J ppb	44.0 × Ref	NL
	Lead	30.9 ppb	10.0 U ppb	3.1 × SDL	20 ppb
	Magnesium	11,100 ppb	718 ppb	15.5 × Ref	NL
	Manganese	742 ppb	228 ppb	3.3 × Ref	NL
	Potassium	6,730 J ppb	793 J ppb	8.5 × Ref	NL
	Sodium	19,100 ppb	3,180 ppb	6.0 × Ref	NL
	Vanadium	36.3 ppb	0.52 J ppb	69.8 × Ref	50 ppb
	Zinc	66.4 ppb	60.0 UJ ppb	1.1 × SDL	900 ppb

Table 9

Summary of Analytical Results
Groundwater Samples Collected by START on 17 through 19 February 2004
at Cole Brook Pines Landfill (Continued)

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration	Comments	RCGW-1 Standard
GW-12	**SVOCs**				
	Caprolactam	16 ppb	10 U ppb	1.6 × SQL	NL
	INORGANICS				
	Calcium	72,600 ppb	1,200 ppb	60.5 × Ref	NL
	Chromium	41.2 J ppb	0.69 UJ ppb	59.7 × SDL	100 ppb
	Copper	8.2 J ppb	2.4 UJ ppb	3.4 × SDL	10,000 ppb
	Magnesium	5,230 ppb	718 ppb	7.3 × Ref	NL
GW-13	**INORGANICS**				
	Calcium	41,600 ppb	1,200 ppb	34.7 × Ref	NL
	Iron	2,950 J ppb	641 J ppb	4.6 × Ref	NL
	Magnesium	3,770 ppb	718 ppb	5.3 × Ref	NL
	Vanadium	3.7 ppb	0.52 J ppb	7.1 × Ref	50 ppb
	Cyanide	56.00 ppb	10.00 U ppb	5.6 × SDL	10 ppb
GW-14	**VOCs**				
	Trichloroethane, 1,1,1-	33 ppb	10 U ppb	3.3 × SQL	200 ppb
	SVOCs				
	Caprolactam	10 ppb	10 U ppb	1.0 × SQL	NL
	INORGANICS				
	Calcium	12,800 ppb	1,200 ppb	10.7 × Ref	NL
	Magnesium	6,450 ppb	718 ppb	9.0 × Ref	NL
	Potassium	3,260 J ppb	793 J ppb	4.1 × Ref	NL

Table 9

Summary of Analytical Results
Groundwater Samples Collected by START on 17 through 19 February 2004
at Cole Brook Pines Landfill (Concluded)

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration	Comments	RCGW-1 Standard
GW-14 (Concluded)	**INORGANICS (Concluded)**				
	Sodium	10,400 ppb	3,180 ppb	3.3 × Ref	NL

Note: Substances listed in bold text were detected at concentrations that meet or exceed their respective MOHML RCGW-1 groundwater standards.

Ref = Reference concentration.
J = Quantitation is approximate due to limitations identified during the quality control review.
U = Indicates the substance was analyzed for, but was not detected. The associated numerical value is the SQL or SDL.
UJ = Indicates the substance was analyzed for, but was not detected. The associated numerical value is the estimated SQL or SDL.
ppb = Parts per billion.
VOCs = Volatile Organic Compounds.
SVOCs = Semivolatile Organic Compounds.
SQL = Sample Quantitation Limit.
SDL = Sample Detection Limit.
NL = Not Listed.
RCGW-1 = Massachusetts Contingency Plan Reportable Category GW-1 groundwater standard.

[83-85; 92]

One VOC [1,1,1-trichloroethane (TCA)] was detected in START groundwater samples at a concentration above reference criteria. TCA was detected at 33 ppb in groundwater sample GW-14 [83]. TCA was detected at a concentration below its RCGW-1 standard of 200 ppb [83; 92, Subpart J]. TCA is not documented as having been used and/or disposed of on the Cole Brook property. In addition, TCA was not detected in START soil/source samples [80]. Therefore, the presence of TCA in START groundwater sample GW-14 will not be considered attributable to the Cole Brook property.

One SVOC (caprolactam) was detected in START groundwater samples at concentrations above reference criteria. Caprolactam was detected at a maximum concentration of 41 ppb in groundwater sample GW-06 [83]. No RCGW-1 standard is available for caprolactam [92, Subpart J]. Caprolactam is not documented as having been used and/or disposed of on the Cole Brook property. In addition, caprolactam was not detected in START soil/source samples [81]. Therefore, the presence of caprolactam in START groundwater samples will not be considered attributable to the Cole Brook property.

No pesticides or PCBs were detected in START groundwater samples [83].

Seventeen inorganic substances were detected in START groundwater samples at concentrations above reference criteria. Maximum concentrations of the inorganic substances detected include the following: aluminum (41,700 ppb in GW-11), barium (378 ppb in GW-11), beryllium (6.9 ppb in GW-03), calcium (72,600 ppb in GW-12), chromium (191 J ppb in GW-10), cobalt (47.8 ppb in GW-03), copper (41.5 J ppb in GW-10), iron (28,200 ppb in GW-11), lead (103 ppb in GW-04), magnesium (11,100 ppb in GW-11), manganese (1,880 ppb in GW-03), nickel (121 J ppb in GW-01), potassium (6,730 J ppb in GW-11), sodium (19,100 ppb in GW-11), vanadium (36.3 ppb in GW-11), zinc (322 ppb in GW-04), and cyanide (56.00 ppb in GW-13) [84; 85]. The following inorganic substances were detected in START groundwater samples at concentrations that exceeded their respective MOHML RCGW-1 groundwater standard (in parentheses): barium (200 ppb), beryllium (4 ppb), chromium (100 ppb), lead (20 ppb), nickel (80 ppb), and cyanide (10 ppb) [84; 85; 92, Subpart J]. No MOHML RCGW-1 groundwater standards are available for aluminum, calcium, magnesium, manganese, iron, sodium, and potassium [92, Subpart J]. Aluminum, beryllium, cobalt, and vanadium are not documented to have been used and/or disposed of on the Cole Brook property, and were not detected above reference criteria in START soil/source samples [82]. Therefore, their presence in START groundwater samples will not be considered attributable to the Cole Brook property. Barium, calcium, lead, magnesium, potassium, zinc, and cyanide were detected at concentrations above reference criteria in soil/source samples collected by START from the Cole Brook property on 27 and 28 January 2004 [82]. In addition, chromium and copper have been detected in surface soil samples collected from the former landfill area; and iron, manganese, nickel, and sodium have been detected in a leachate sample collected from the former landfill [4, pp. 7, 10, 13-14, Attachment D, Attachment E; 65]. Therefore, the presence of barium, calcium, chromium, copper, iron, lead, magnesium, manganese, nickel, potassium, sodium, zinc, and cyanide in START groundwater samples will be considered at least partially attributable to the Cole Brook property.

Groundwater sample GW-11 was analyzed for total metals and dissolved metals. Both analyses were performed to ensure that metals concentration data would be obtained from the samples despite high turbidity in the samples. The sample analyzed for dissolved metals was filtered at the laboratory prior to analysis [58, pp. 46-48; 59, pp. 2-17; 84-85]. Analytical results indicated that all substances detected in the sample analyzed for total metals were also detected in the sample analyzed for dissolved metals. Substances detected during dissolved metals analysis were detected at lower concentrations than during total metals analysis [84-85]. No inorganic substances were detected during dissolved metals analysis at concentrations that exceeded their respective MOHML RCGW-1 groundwater standard [84; 85; 92, Subpart J].

On 18 February 2004, as part of the ESI, START personnel collected two drinking water samples (DW-01 and DW-02), including one replicate, from the residential drinking water supply well on the Cole Brook property, to determine if there has been a release of hazardous substances, associated with the Cole Brook property, to drinking water (Figures 3 and 3A) [59, pp. 6-13]. The drinking water samples were analyzed through EPA CLP laboratories for low-level VOCs, low-level SVOCs, low-level pesticides, low-level PCBs, metals, and cyanide [59, pp. 6-13; 84; 86]. Table 10 summarizes the drinking water samples collected by START on 18 February 2004.

Table 10

Sample Summary: Cole Brook Pines Landfill
Drinking Water Samples Collected by START on 18 February 2004

Sample Location No.	Traffic Report No.	Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Drinking Water					
DW-01 (MS/MSD)	A1CP6 MA1CP6	0945	Grab	NA	Grab drinking water sample collected from an outside spigot connected to the on-site private groundwater drinking water supply well (41° 40' 37.02" N, 71° 00' 41.54" W). Last water quality readings before sample was collected: Temp = 8.2 °C; Spec. Cond = 117.0 µS/cm; pH = 8.23; Turb = 0.7 NTU. FID = inoperable; PID in headspace upon opening spigot = 0.0.
DW-02	A1CP7 MA1CP7	0945	Grab	NA	Replicate of sample DW-01, collected for quality control.

Note: All FID and PID readings are reported in units above background.

°	= Degrees.	PID	= Photoionization Detector.
'	= Minutes.	FID	= Flame Ionization Detector.
"	= Seconds.	Temp	= Temperature.
No.	= Number.	mv	= Millivolts.
NA	= Not Applicable.	Turb	= Turbidity
NR	= Not Recorded.	NTU	= Nephelometric Turbidity Units.
N	= North Latitude.	µS/cm	= MicroSiemens per Centimeter.
W	= West Longitude.	Spec. Cond	= Specific Conductivity.
°C	= Degrees Celsius.	MS/MSD	= Matrix Spike/Matrix Spike Duplicate.

[59]

Complete analytical results of START drinking water samples including quantitation and detection limits are presented in Attachment D. Sample results qualified with a "J" on analytical tables are considered approximate because of limitations identified during CLP data validation. In addition, organic sample results reported at concentrations below quantitation limits and confirmed by mass spectrometry are also qualified by a "J" and considered approximate [84; 86].

Table 11 is a summary of organic compounds and inorganic elements detected through CLP analyses of START drinking water samples. EPA MCLs and MCP RCGW-1 drinking water standards are used as the reference values for the drinking water samples, for comparison purposes only. If no MCL or RCGW-1 standard is available, applicable inorganic sample results are compared to EPA-established NSDWRs. NSDWRs are guidelines used to regulate contaminants in drinking water that may cause cosmetic or aesthetic effects [95]. Compounds or elements have exceeded reference criteria if they occurred at a concentration greater than or equal to the their respective MCL, RCGW-1 standard, or NSDWR.

Table 11

Summary of Analytical Results
Drinking Water Samples Collected by START on 18 February 2004
at Cole Brook Pines Landfill

Sample Location	Compound/ Element	Sample Concentration	EPA Maximum Contaminant Level	MA DEP MCP RCGW-1 Standard	EPA NSDWR
DW-01	**INORGANICs**				
	Calcium	15,700 ppb	NA	NA	NA
	Copper	6.8 ppb	1,300 ppb	10,000 ppb	1,000 ppb
	Iron	29.2 ppb	NA	NA	300 ppb
	Magnesium	2,700 ppb	NA	NA	NA
	Potassium	1,410 J ppb	NA	NA	NA
	Sodium	11,700 ppb	NA	NA	NA
DW-02	**VOCs**				
	Methylene Chloride	0.24 J ppb	NA	5 ppb	NA
	INORGANICs				
	Calcium	15,700 ppb	NA	NA	NA
	Copper	7.6 ppb	1,300 ppb	10,000 ppb	1,000 ppb
	Iron	23.0 ppb	NA	NA	300 ppb
	Magnesium	2,740 ppb	NA	NA	NA
	Potassium	1,430 J ppb	NA	NA	NA
	Sodium	11,800 ppb	NA	NA	NA

J = Quantitation is approximate due to limitations identified during the quality control review.
ppb = Parts per billion.
NA = Not Available.
VOCs = Volatile Organic Compounds.
EPA = U.S. Environmental Protection Agency.
MA DEP = Massachusetts Department of Environmental Protection.
MCP = Massachusetts Contingency Plan.
NSDWR = National Secondary Drinking Water Regulation.
RCGW-1 = Massachusetts Contingency Plan Reportable Category GW-1 groundwater standard.

[84; 86; 92; 95]

No VOCs were detected in START drinking water samples above reference criteria. Methylene chloride was detected in drinking water sample DW-02 at a concentration below its MCP RCGW-1 standard [86; 92]. Non-detected results for acetone and 2-butanone were rejected in drinking water sample DW-02 due to poor laboratory instrument calibration sensitivity [86].

No SVOCs, pesticides, or PCBs were detected in START drinking water samples [86].

No inorganic substances were detected in START drinking water samples above reference criteria. Calcium, copper, iron, magnesium, potassium, and sodium were detected in the drinking water samples at concentrations below applicable EPA MCLs, MCP RCGW-1 standards, and NSDWRs [84; 95].

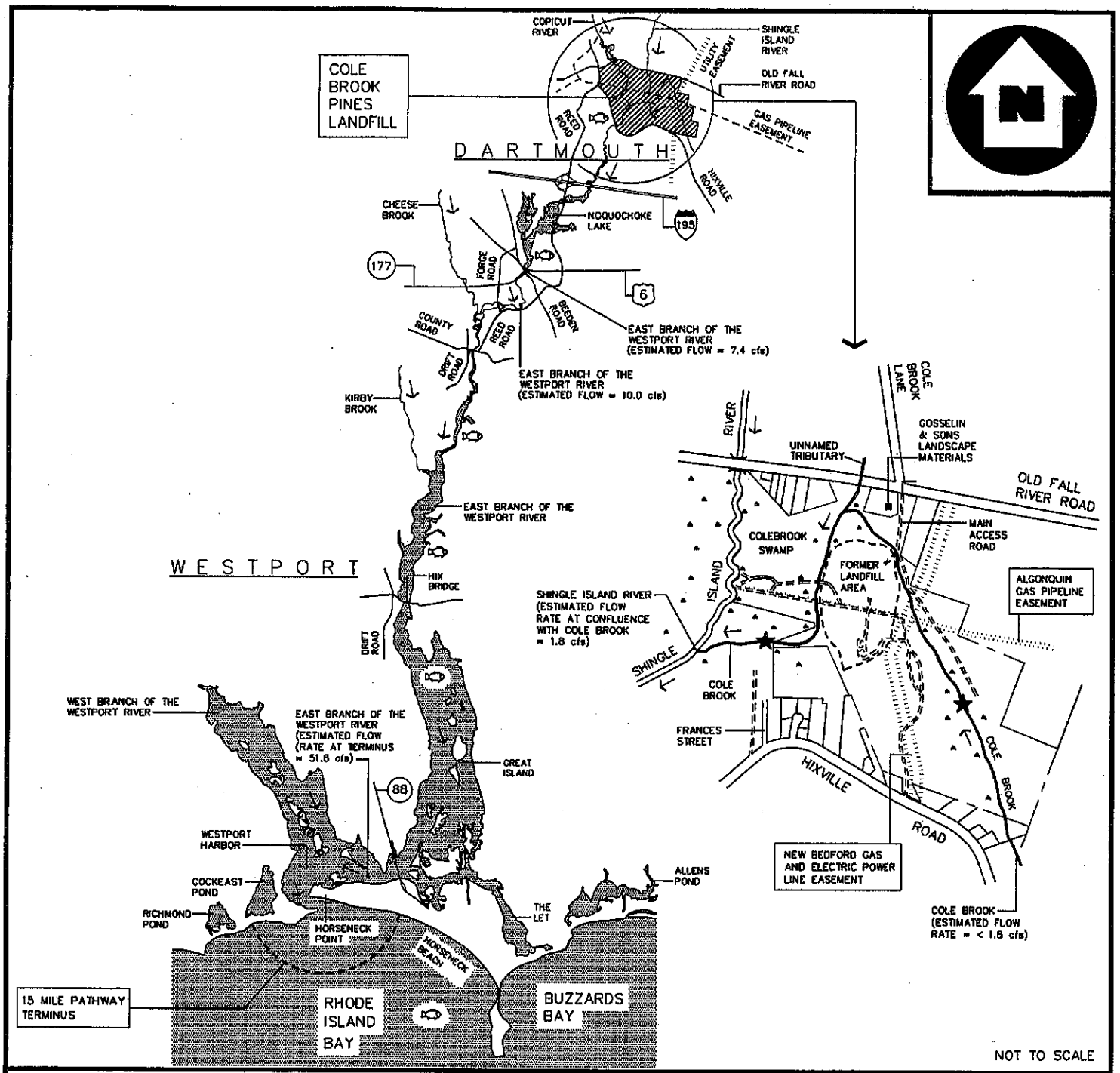
START collected groundwater and drinking water samples as part of the Cole Brook ESI. Based on analytical results of the groundwater samples, the overburden aquifer beneath the Cole Brook property has been impacted by a release of 12 metals and cyanide considered to be at least partially attributable to the Cole Brook property. Of these contaminants, six inorganic substances (barium, beryllium, chromium, lead, nickel, and cyanide) were detected at concentrations that met or exceeded their respective MOHML RCGW-1 groundwater standards [83-85; 92, Subpart J]. No hazardous substances were detected in START drinking water samples above reference criteria [84; 86]. Based on the lack of hazardous substances in the on-site drinking water supply well, no impacts to nearby groundwater drinking water supply sources are known or suspected. To date, no actions have been taken to address the release of hazardous substances to the aquifer beneath the property.

SURFACE WATER PATHWAY

The Cole Brook property is located in the Buzzard's Bay Coastal Drainage Basin [33; 42]. The Cole Brook property is located in Flood Zone C (an area of minimal flooding, above the 100-year flood elevation) [34].

The topography of the area surrounding the Cole Brook property gently slopes from east to west, with the western, northern, and portions of the eastern former solid waste landfill toe located in low-lying wetland areas. Stormwater drains radially off the landfill into Colebrook Swamp, located to the north, west, and east of the former solid waste landfill [4, p. 8]. The southern portion of the Cole Brook property is drained by Cole Brook, which flows northwesterly past the landfill, where it turns southwesterly and flows through Colebrook Swamp and then joins the Shingle Island River [60].

The most upstream probable point of entry (PPE^1) to surface water is located along Cole Brook in the southeastern portion of the property, where runoff from potentially contaminated soil and/or miscellaneous solid waste piles could enter Cole Brook. From PPE^1, Cole Brook flows northwest for approximately 1 mile, after which Cole Brook turns sharply southwest (Figure 4). Cole Brook flows southwest for approximately 0.5 miles to the most downstream PPE (PPE^2), located along Cole Brook southwest of the former solid waste landfill. From PPE^2, Cole Brook flows west for approximately 0.2 miles before discharging into the Shingle Island River [3; 52].



LEGEND

★ PROBABLE POINT OF ENTRY TO SURFACE WATER PATHWAY

↘ FLOW DIRECTION

FISHERY

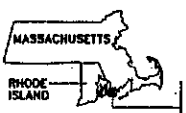
ROUTE MARKER

INTERSTATE ROUTE

U.S. ROUTE

STATE ROUTE

SOURCE: U.S.G.S 7.5 MINUTE SERIES QUADRANGLE(S):-
FALL RIVER, MASSACHUSETTS-RHODE ISLAND 1985
WESTPORT, MASSACHUSETTS-RHODE ISLAND 1977



INSET OF SURFACE WATER PATHWAY AREA

SURFACE WATER PATHWAY SKETCH

COLE BROOK PINES LANDFILL
OLD FALL RIVER ROAD
DARTMOUTH, RHODE ISLAND

WESTON SOLUTIONS®

REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD #	DRAWN BY:	DATE
04-05-0134	W. SHAW	2/27/04

FILE NAME: S:\04050134\Figures\FIG_4.DWG

FIGURE 4

From its confluence with Cole Brook, the Shingle Island River flows southwest for 1.8 miles before discharging into Noquochoke Lake. Noquochoke Lake flows southwest for approximately 1 mile and then discharges into the East Branch of the Westport River. The East Branch of the Westport River flows south for approximately 10.2 miles before emptying into Westport Harbor, which flows west for approximately 1 mile and discharges into Buzzards Bay. The 15-mile downstream surface water pathway terminus extends from the mouth of Westport Harbor to a 0.8-mile radial arc extending from Horseneck Beach, Westport, Massachusetts to the Acoaxet section of Westport, Massachusetts. Since 1.5 miles of the surface water pathway is located on the Cole Brook property, the downstream surface water pathway is 16.5 miles long [51-54].

No USGS gaging stations are located along the downstream surface water pathway for the Cole Brook property [43]. The flow rates of the surface water bodies along the downstream surface water pathway were estimated by multiplying the square mileage of their respective drainage basin areas by the USGS estimating factor of 1.8 cubic feet per second (cfs) per square mile (mi^2). This factor is an estimate and average of the intensity, rate, and frequency of overland flow in New England [74]. The drainage basin areas for Cole Brook, Shingle Island River, and the East Branch of the Westport River were calculated to be 0.98 mi^2, 4.10 mi^2, and 28.75 mi^2, respectively. Therefore, the estimated flow rates at the termini of Cole Brook, Shingle Island River, and the East Branch of Westport River are 1.8 cfs, 7.4 cfs, and 51.8 cfs, respectively. Through interpolation, at 0.6 miles downstream of the terminus of the Shingle Island River, the flow rate of the East Branch of the Westport River is estimated to be 10.0 cfs [26]. Table 12 describes surface water bodies along the 15-mile downstream surface water pathway from the Cole Brook property.

Table 12

Surface Water Bodies Along the 15-Mile Downstream Pathway from Cole Brook Pines Landfill

Surface Water Body	Descriptor[a]	Length of Reach (miles)	Flow Characteristics (cfs)[b]	Length of Wetlands (miles)
Cole Brook	Minimal Stream	1.7	< 1.8	2.6
Shingle Island River (including Noquochoke Lake)	Minimal Stream	2.8	> 1.8 to 7.4	3.1
East Branch of the Westport River (Reach 1)	Minimal Stream	0.6	> 7.4 to 10.0	1.0
East Branch of the Westport River (Reach 2)	Small to Moderate	9.6	> 10.0 to 51.8	6.5

Table 12

Surface Water Bodies Along the 15-Mile Downstream Pathway from Cole Brook Pines Landfill (Concluded)

Surface Water Body	Descriptor[a]	Length of Reach (miles)	Flow Characteristics (cfs)[b]	Length of Wetlands (miles)
Westport Harbor	Coastal Tidal Waters	1.0	NA	0.3
Buzzards Bay	Coastal Tidal Waters	0.8	NA	0.0

[a] Minimal stream <10 cfs. Small to moderate stream 10-100 cfs. Coastal tidal waters (flow not applicable).
[b] Cubic feet per second.

[18; 20; 26; 27; 52; 54]

There are no known surface water drinking water intakes located along the 15-mile downstream surface water pathway [38; 44-47]. According to MA DEP, Cole Brook is designated as a Public Surface Water Supply Protection Area. In addition, Noquochoke Lake is listed as an emergency public drinking water surface water supply for the Fall River Water Department; however, MA DEP reported that even in times of emergency, the water quality of the lake is too poor (due to septic issues) to be used for drinking water [75].

The Massachusetts Surface Water Quality Standards do not specifically indicate the surface water body classification of Cole Brook or the Shingle Island River; therefore, a surface water body classification of B is defaulted to both water bodies, per the regulation [42]. The East Branch of the Westport River from Noquochoke Lake to Old County Road in Westport, Massachusetts is classified by MA DEP as a Class B warm water fishery; from Old County Road to its mouth, the East Branch of the Westport River is classified by MA DEP as a Class SB surface water body. Class B waters are designated as suitable for primary and secondary contact recreation and are suitable as habitats for fish, other aquatic life, and wildlife. Class SB waters are Class B waters that are also designated as suitable for shellfish harvesting with depuration. Both Class B and Class SB shall have consistently good aesthetic value [42]. Shingle Island River and the East Branch of the Westport River are stocked with trout and are therefore classified as recreational fisheries [41].

Sensitive environments along the 15-mile downstream surface water pathway include two fisheries, a Clean Water Act (CWA)-protected water body, and approximately 23.9 miles of wetland frontage [18; 20; 26; 27; 52; 54]. Additionally, according to a Threatened and Endangered Species Report, prepared by EPA on 24 February 2004 for the Cole Brook property, there are seven State-listed endangered plant species habitats, six State-listed threatened plant species habitats, four State-listed threatened animal species habitats, two State-listed threatened and Federally-listed threatened/endangered animal species habitats, and one State-listed endangered and Federally-listed threatened animal species habitat located along the 15-mile downstream surface water pathway [50]. Table 13 summarizes sensitive environments located along the 15-mile downstream surface water pathway from the Cole Brook property.

Table 13

Sensitive Environments Along the 15-Mile Downstream Pathway from Cole Brook Pines Landfill

Sensitive Environment Name	Sensitive Environment Type	Surface Water Body	Downstream Distance from PPE[1] (miles)	Flow Rate at Environment (cfs)[a]
Cole Brook	CWA-protected Water Body	Cole Brook	0 to 1.7	< 1.8
Wetlands	Wetlands (2.6 miles)	Cole Brook	0 to 1.7	< 1.8
Wetlands	Wetlands (3.1 miles)	Shingle Island River	1.7 to 4.5	< 1.8 to 7.4
Wetlands	Wetlands (1.0 miles)	East Branch of the Westport River (Reach 1)	4.5 to 5.1	> 7.4 to 10.0
Wetlands	Wetlands (6.5 miles)	East Branch of the Westport River (Reach 2)	5.1 to 14.7	>10.0 to 51.8
Wetlands	Wetlands (0.3 miles)	Westport Harbor	14.7 to 15.7	NA
Wetlands	Wetlands (0.0 miles)	Buzzards Bay	15.7 to 16.5	NA
State-listed Endangered Plant Species Habitat	State-listed Endangered Plant Species Habitat	Cole Brook	1.4	< 1.8
State-listed Threatened Plant Species Habitat	State-listed Threatened Plant Species Habitat	Cole Brook	1.4	< 1.8
State-listed Endangered Plant Species Habitat	State-listed Endangered Plant Species Habitat	Cole Brook	1.5	< 1.8
State-listed Threatened Plant Species Habitat	State-listed Endangered Plant Species Habitat	Cole Brook	1.5	< 1.8
State-listed Threatened Plant Species Habitat	State-listed Threatened Plant Species Habitat	Shingle Island River	1.8	> 1.8 to 7.4
State-listed Endangered Plant Species Habitat	State-listed Endangered Plant Species Habitat	Shingle Island River	1.8	> 1.8 to 7.4
State-listed Threatened Plant Species Habitat	State-listed Threatened Plant Species Habitat	Shingle Island River	2.0	> 1.8 to 7.4
State-listed Endangered Plant Species Habitat	State-listed Endangered Plant Species Habitat	Shingle Island River	2.7	> 1.8 to 7.4
State-listed Threatened Animal Species Habitat	State-listed Threatened Animal Species Habitat	Shingle Island River	2.7	> 1.8 to 7.4
State-listed Threatened Plant Species Habitat	State-listed Threatened Plant Species Habitat	Shingle Island River	3.1	> 1.8 to 7.4

Table 13

Sensitive Environments Along the 15-Mile Downstream Pathway from Cole Brook Pines Landfill (Concluded)

Sensitive Environment Name	Sensitive Environment Type	Surface Water Body	Downstream Distance from PPE[1] (miles)	Flow Rate at Environment (cfs)[a]
State-listed Endangered Plant Species Habitat	State-listed Endangered Plant Species Habitat	Shingle Island River	3.3	> 1.8 to 7.4
State-listed Threatened Animal Species Habitat	State-listed Threatened Animal Species Habitat	Shingle Island River	3.9	> 1.8 to 7.4
State-listed Threatened Animal Species Habitat	State-listed Threatened Animal Species Habitat	Shingle Island River	4.2	> 1.8 to 7.4
State-listed Threatened Animal Species Habitat	State-listed Threatened Animal Species Habitat	East Branch of the Westport River (Reach 2)	6.9	> 7.4 to 10.0
State-listed Endangered Plant Species Habitat	State-listed Endangered Plant Species Habitat	East Branch of the Westport River (Reach 2)	11.1	> 7.4 to 10.0
State-listed Endangered Plant Species Habitat	State-listed Endangered Plant Species Habitat	East Branch of the Westport River (Reach 2)	11.6	> 7.4 to 10.0
State-listed Threatened Plant Species Habitat	State-listed Threatened Plant Species Habitat	East Branch of the Westport River (Reach 2)	12.1	> 7.4 to 10.0
State-listed Threatened and Federally-listed Threatened/Endangered Animal Species Habitat	State-listed Threatened and Federally-listed Threatened/Endangered Animal Species Habitat	East Branch of the Westport River (Reach 2)	12.1	> 7.4 to 10.0
State-listed Endangered Animal Species Habitat	State-listed Endangered Animal Species Habitat	East Branch of the Westport River (Reach 2)	12.4	> 7.4 to 10.0
State-listed Threatened and Federally-listed Threatened/Endangered Animal Species Habitat	State-listed Threatened and Federally-listed Threatened/Endangered Animal Species Habitat	East Branch of the Westport River (Reach 2)	12.9	> 7.4 to 10.0

Note: The U.S. Environmental Protection Agency (EPA) does not report the exact location of threatened or endangered species habitats along the downstream surface water pathway. Based on the approximate distance of each habitat from the site provided by EPA, START has estimated the approximate surface water bodies, distance from PPE[1], and flow rates that apply to each habitat.

cfs = Cubic feet per second
PPE[1] = Probable Point of Entry No. 1
CWA = Clean Water Act

[18; 20; 26; 27; 50; 52; 54]

On 2 December 1977, GHR collected two surface water samples from Cole Brook at points upstream and downstream of the former solid waste landfill area. The exact locations at which the samples were collected were not available to START. The samples were submitted to GHR's Environmental Services Division Laboratory and analyzed for a variety of water quality parameters, including pH, total hardness (as calcium carbonate), COD, and nitrogen (as nitrate); and for metals, including copper, nickel, and zinc. Analytical results indicated that copper and zinc were detected upstream of the landfill at 0.15 ppm and 0.20 ppm, respectively. Copper and zinc were also detected downstream of the landfill at 0.35 ppm and 0.10 ppm, respectively [4, pp. 6, 9, Attachment A; 15].

On 11 February 1982, the Town of Dartmouth Conservation Commission collected one sediment sample from the property. Available file information did not specify the location at which the sample was collected or if the sample was collected from a perennial surface water body. The sample was submitted to CDM and analyzed for total PCBs (method unknown). Analytical results indicated the presence of PCBs (identified as Aroclor-1254) at 22 ppb in the sample. In addition, Aroclor-1242 was present in the sample, but was not specifically quantified [4, pp. 7, 10, Attachment C; 21].

On 10 October 2000, as part of the SIP, START personnel collected five sediment samples (SD-01, SD-02, and SD-05 through SD-07) from Cole Brook and two sediment samples (SD-03 and SD-04) from an unnamed tributary of Cole Brook, located north of the Cole Brook property and north of Old Fall River Road. All the samples were collected off site. Samples SD-03 and SD-04 were collected along the unnamed tributary as upstream reference samples, and samples SD-05 and SD-06 were collected along Cole Brook as upstream reference samples. Samples SD-05 and SD-06 were collected along Cole Brook in the north/northeastern portion of a residential property (Map No. 62, Lot No. 22) located south of the Cole Brook property. Samples SD-01, SD-02, and SD-07 were collected along Cole Brook downstream of the property to establish potential impacts to sensitive environments downstream of the property. All the samples were analyzed through a DAS laboratory for VOCs, SVOCs, pesticides, PCBs, metals, and cyanide, with the exception of SD-04 and SD-06, which were analyzed for metals only [3, p. 29].

No VOCs were detected at concentrations above reference criteria. It should be noted that one VOC (methyl acetate) was detected in three of the sediment samples, including a sample collected from Cole Brook (SD-07), an upstream reference sample for Cole Brook (SD-05), and the upstream reference sample for the unnamed tributary of Cole Brook (SD-03) [3, p. 32].

No SVOCs were detected at concentrations above reference criteria. It should be noted that several SVOCs were detected in the upstream reference sample collected along the unnamed tributary of Cole Brook (SD-03). The reference sample, although collected upstream of the Cole Brook property, was collected in close proximity to Old Fall River Road and may have been influenced by runoff from the road [3, pp. 32-33].

No pesticides, PCBs, or cyanide were detected above laboratory detection limits in any samples [3, p. 33].

Three metals (antimony, beryllium, and cadmium) were detected in the sediment samples at concentrations above reference criteria. Antimony was detected in sample SD-07 at 1.3 ppm;

beryllium was detected in sample SD-01 at 1.4 ppm and in sample SD-02 at 1.1 ppm; and cadmium was detected in sample SD-07 at 0.12 J ppm [3, p. 33]. Sample results qualified with a "J" are considered approximate because of limitations identified during data validation. Based on available file information, the use and/or disposal of these metals on the Cole Brook property is unknown. Historically, analysis of soil and source samples collected from the property has not revealed the presence of these metals [4, pp. 13-14; 65; 82]. As a result, the metals detected in the sediment samples collected by START will not be attributed to the Cole Brook property.

On 7 February 2002, as part of the Environmental Investigation, St. Germain personnel collected five surface water samples (SW-01 through SW-05) and five sediment samples (SED-01 through SED-05) from five locations along Cole Brook and an unnamed tributary leading into Cole Brook. The surface water samples were submitted for VOC, SVOC, conductivity, PCB, EPH, VPH, 13 RCRA metals, iron, manganese, alkalinity, COD, chloride, nitrate, sulfate, and TDS analyses. The sediment samples were submitted for VOC, SVOC, conductivity, PCB, EPH, VPH, and 13 RCRA metals analyses. Analytical results indicated the presence of beryllium in samples SED-01 and SED-05 (1.2 ppm), and the following additional substances in sample SED-01: benzo(a)anthracene (12 ppm); benzo(b)fluoranthene (9.8 ppm); benzo(a)pyrene (12 ppm); indeno(1,2,3-cd)pyrene (89 ppm); benzo(k)fluoranthene (9.8 ppm); and chrysene (13 ppm) [78, p. 4]. No additional information regarding the surface water or sediment samples is available to START.

On 13 April 2004, as part of the ESI, START personnel collected 17 sediment samples (SD-01 through SD-17), including one duplicate, from 16 locations along an unnamed tributary, Cole Brook, and Shingle Island River, and from on-site wetlands, to determine if there has been a release of hazardous substances, associated with the Cole Brook property, to the surface water pathway (Figures 3 and 3A). Sediment sample SD-01 was collected from the Shingle Island River at its confluence with Cole Brook. Sediment sample SD-02 was collected from Shingle Island River, where the Algonquin Gas Easement abuts the River. Sediment samples SD-03 and SD-04 were collected from Shingle Island River, downstream of where the Shingle Island River crosses under Old Fall River Road. Sediment sample SD-05 was collected from wetlands in Cole Brook Swamp, adjacent to several tires, abandoned vehicles, and gasoline tanks. Sediment sample SD-06 was collected from wetlands adjacent to Cole Brook, north of the former landfill area. Sediment samples SD-07 and SD-08 were collected from wetlands adjacent to Cole Brook, southeast of the former landfill area and upstream of on-site source areas. Sediment sample SD-09 was collected from Cole Brook, southwest of the former landfill area and upstream of on-site source areas. Sediment samples SD-10 and SD-13 were collected from Cole Brook, west of the former landfill area. Sediment sample SD-11 was collected from Cole Brook, along the northeast edge of the former landfill area and adjacent to a solid waste pile. Sediment sample SD-12 was collected from Cole Brook, southeast of the former landfill area adjacent to a solid waste pile. Sediment samples SD-14 and SD-15 were collected from Cole Brook, southeast of the former landfill area and upstream of on-site source areas. Sediment samples SD-16 and SD-17 were collected from a tributary to Cole Brook, downstream of where it crosses under Old Fall River Road [59, pp. 19-27]. All the sediment samples were analyzed through DAS laboratories for VOCs, SVOCs, pesticides, PCBs, metals, and cyanide, with the exception of samples SD-04, SD-08, SD-15, and SD-17, which were analyzed for metals only [59, pp. 19-27; 87; 88]. Table 14 summarizes the sediment samples collected by START on 13 April 2004.

Table 14

Sample Summary: Cole Brook Pines Landfill
Sediment Samples Collected by START on 13 April 2004

Sample Location No.	Traffic Report No.	Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Sediment					
SD-01 (MS/MSD)	D15294	0845	Grab	0 to 6 Inches	Grab sediment sample collected from the Shingle Island River at its confluence with Cole Brook (GPS unit inoperable). Material is light brown, fine SAND and SILT. Aqueous parameters: pH = 9.48; Temp = 6.9 °C; Spec. Cond = 36.0 μS; Turb = 13 NTU; FID and PID = 0.0.
SD-02	D15295	1000	Grab	0 to 6 Inches	Grab sediment sample collected from the Shingle Island River, where the Algonquin Gas Easement abuts the River (GPS unit inoperable). Material is light brown, coarse-to-medium SAND, trace silt. Aqueous parameters: pH = 8.91; Temp = 7.2 °C; Spec. Cond = 44.6 μS; Turb = 5.2; FID and PID = 0.0.
SD-03	D15296	1030	Grab	0 to 6 Inches	Grab sediment sample collected from Shingle Island River, downstream of where the Shingle Island River crosses under Old Fall River Road, as a reference sample for the Shingle Island River (GPS unit inoperable). Material is light gray, medium SAND. Aqueous parameters: pH = 7.85; Temp = 7.2 °C; Spec. Cond = 44.5 μS; Turb = 4.9 NTU; FID and PID = 0.0.
SD-04	D15297	1035	Grab	0 to 6 Inches	Grab sediment sample collected from from Shingle Island River, downstream of where the Shingle Island River crosses under Old Fall River Road, as a reference sample for the Shingle Island River, for metals analysis only (GPS unit inoperable). Material is light-to-medium gray, medium SAND. Aqueous parameters: pH = 7.85; Temp = 7.2 °C; Spec. Cond = 44.5 μS; Turb = 4.9 NTU; FID and PID = 0.0.
SD-05	D15298	0935	Grab	0 to 6 Inches	Grab sediment sample collected from wetlands in Colebrook Swamp, adjacent to several tires, abandoned vehicles, and gasoline tanks (GPS unit inoperable). Material is black SILT. FID and PID = 0.0.

Table 14

Sample Summary: Cole Brook Pines Landfill
Sediment Samples Collected by START on 13 April 2004 (Continued)

Sample Location No.	Traffic Report No.	Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Sediment (Continued)					
SD-06	D15299	0830	Grab	0 to 6 Inches	Grab sediment sample collected from wetlands adjacent to Cole Brook, north of the former landfill area (GPS unit inoperable). Material is black SILT and fine SAND. FID and PID = 0.0.
SD-07	D15390	1205	Grab	0 to 6 Inches	Grab sediment sample collected from wetlands adjacent to Cole Brook, southeast of the former landfill area and upstream of on-site source areas, as a reference sample for the on-site wetlands (GPS unit inoperable). Material is dark brown-to-black SILT. FID and PID = 0.0.
SD-08	D15301	1210	Grab	0 to 6 Inches	Grab sediment sample collected from wetlands adjacent to Cole Brook, southeast of the former landfill area and upstream of on-site source areas, as a reference sample for the on-site wetlands, for metals analysis only (GPS unit inoperable). Material is dark brown-to-black SILT. FID and PID = 0.0.
SD-09	D15302	0915	Grab	0 to 6 Inches	Grab sediment sample collected from Cole Brook, southwest of the former landfill area (GPS unit inoperable). Material is black SILT. Aqueous parameters: pH = 8.5; Temp = 6.7 °C; Spec. Cond = 77.9 μS; Turb = 6.5 NTU; FID and PID = 0.0.
SD-10	D15303	1020	Grab	0 to 6 Inches	Grab sediment sample collected from Cole Brook, west of the former landfill area (GPS unit inoperable). Material is dark brown, coarse-to-medium SAND, some silt, little fine gravel. Aqueous parameters: pH = 7.64; Temp = 6.6 °C; Spec. Cond = 69.4 μS; Turb = 5.6 NTU; FID and PID = 0.0.

Table 14

Sample Summary: Cole Brook Pines Landfill
Sediment Samples Collected by START on 13 April 2004 (Continued)

Sample Location No.	Traffic Report No.	Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Sediment (Continued)					
SD-11	D15304	1100	Grab	0 to 6 Inches	Grab sediment sample collected from Cole Brook, along the northeast edge of the former landfill area and adjacent to a solid waste pile (GPS unit inoperable). Material is dark brown, coarse-to-fine SAND, some silt, little fine gravel. Aqueous parameters: pH = 7.66; Temp = 7.0 °C; Spec. Cond = 55.5 μS; Turb = 4.3 NTU; FID and PID = 0.0.
SD-12	D15305	1145	Grab	0 to 6 Inches	Grab sediment sample collected from Cole Brook, southeast of the former landfill area adjacent to a solid waste pile (GPS unit inoperable). Material is dark brown-to-black SILT. Aqueous parameters: pH = 7.08; Temp = 6.9 °C; Spec. Cond = 113.8 μS; Turb = 4.6 NTU; FID and PID = 0.0.
SD-13	D15306	1020	Grab	0 to 6 Inches	Duplicate of sample SD-10, collected for quality control.
SD-14	D15307	1200	Grab	0 to 6 Inches	Grab sediment sample collected from Cole Brook, southeast of the former landfill area and upstream of on-site source areas, as a reference sample for Cole Brook (GPS unit inoperable). Material is light-gray SILT and dark brown-to-black PEAT. Aqueous parameters: pH = 9.11; Temp = 6.8 °C; Spec. Cond = 58.3 μS; Turb = 17 NTU; FID and PID = 0.0.
SD-15	D15308	1210	Grab	0 to 6 Inches	Grab sediment sample collected from Cole Brook, southeast of the former landfill area and upstream of on-site source areas, as a reference sample for Cole Brook, for metals analysis only (GPS unit inoperable). Material is light-gray SILT and dark brown-to-black PEAT. Aqueous parameters: pH = 9.11; Temp = 6.8 °C; Spec. Cond = 58.3 μS; Turb = 17 NTU; FID and PID = 0.0.

Table 14

Sample Summary: Cole Brook Pines Landfill
Sediment Samples Collected by START on 13 April 2004 (Concluded)

Sample Location No.	Traffic Report No.	Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Sediment (Concluded)					
SD-16	D15309	1055	Grab	0 to 6 Inches	Grab sediment sample collected from a tributary to Cole Brook, approximately 100 feet downstream of where it crosses under Old Fall River Road, as a reference sample for Cole Brook, to document potential contamination in Cole Brook from sources along the tributary (GPS unit inoperable). Material is dark brown SILT. Aqueous parameters: pH = 7.55; Temp = 5.7 °C; Spec. Cond = 85.4 μS; Turb = 21 NTU; FID and PID = 0.0.
SD-17	D15310	1107	Grab	0 to 6 Inches	Grab sediment sample collected from a tributary to Cole Brook, approximately 100 feet downstream of where it crosses under Old Fall River Road, as a reference sample to document potential contamination in Cole Brook from sources along the tributary, for metals analysis only (GPS unit inoperable). Material is dark brown-to-black SILT. Aqueous parameters: pH = 7.55; Temp = 5.7 °C; Spec. Cond = 85.4 μS; Turb = 21 NTU; FID and PID = 0.0.

Note: All FID and PID readings are reported in units above background.

°	= Degrees.	PID	= Photoionization Detector.
'	= Minutes.	FID	= Flame Ionization Detector.
"	= Seconds.	°C	= Degrees Celsius.
No.	= Number.	MS/MSD	= Matrix Spike/Matrix Spike Duplicate.
NR	= Not Recorded.	NTU	= Nephelometric Turbidity Units.
N	= North Latitude.	μS	= MicroSiemens.
W	= West Longitude.	Spec. Cond	= Specific Conductivity.
Temp	= Temperature.	Turb	= Turbidity.
GPS	= Global Positioning System.		

[59]

Complete analytical results of START sediment samples including quantitation and detection limits are presented in Attachment E. Sample results qualified with a "J" on analytical tables are considered approximate because of limitations identified during DAS data validation. In addition, organic sample results reported at concentrations below quantitation limits and confirmed by mass spectrometry are also qualified by a "J" and considered approximate [87; 88].

Table 15 is a summary of organic compounds and inorganic elements detected through DAS analyses of START sediment samples. For each sample location, a compound or element is listed if it is detected at a concentration greater than or equal to three times the higher of the reference sample concentrations. However, if the compound or element is not detected in the reference sample, the reference sample's SQL (for organic analyses) or SDL (for inorganic analyses) is used as the reference concentration. These compounds or elements are listed if they occurred at a concentration greater than or equal to the reference sample's SQL or SDL and are designated by their approximate relative concentration above the reference criteria values. Sediment samples SD-03 and SD-04 were collected to document reference concentrations for sediment samples collected from the Shingle Island River (SD-01 and SD-02); sediment samples SD-07 and SD-08 were collected to document reference conditions for sediment samples collected from on-site wetlands (SD-05 and SD-06); sediment samples SD-14 and SD-15 were collected to document reference conditions for sediment samples collected from Cole Brook (SD-09 through SD-13); and sediment samples SD-16 and SD-17 were collected to document reference conditions for sediment samples collected from Cole Brook downstream of its convergence with the unnamed tributary (SD-09, SD-10, and SD-13).

Analytical results of the sediment samples are compared to MCP Freshwater Sediment Screening Threshold Effect Concentrations (TECs). TECs are not enforceable and have been provided for informational purposes only. Substances listed in bold text in Table 15 were detected at concentrations that exceeded their respective TECs.

Table 15

Summary of Analytical Results
Sediment Samples Collected by START on 13 April 2004
at Cole Brook Pines Landfill

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration	Comments	MA DEP TEC
SD-06	**PESTICIDES**				
	4,4'-DDE	5.8 J ppb	1.7 J ppb	3.4 × Ref	3.16 ppb
	INORGANICS				
	Manganese	47.7 ppm	9.8 ppm	4.9 × Ref	NL
	Iron	7,570 ppm	1,230 ppm	6.2 × Ref	NL

Table 15

Summary of Analytical Results
Sediment Samples Collected by START on 13 April 2004
at Cole Brook Pines Landfill (Concluded)

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration	Comments	MA DEP TEC
SD-09	**INORGANICS**				
	Manganese	419 ppm	98.6 ppm	4.2 × Ref	NL

Note: Substances listed in bold text were detected at concentrations that meet or exceed their respective TECs.

J = Quantitation is approximate due to limitations identified during the quality control review.
Ref = Reference concentration.
ppm = parts per million.
ppb = parts per billion.
MA DEP = Massachusetts Department of Environmental Protection.
TEC = Threshold Effect Concentration.
NL = Not listed.

[87; 88; 96]

No VOCs were detected in START sediment samples at concentrations above reference criteria. Non-detected results for sediment samples SD-05 through SD-07, SD-09, SD-12, and SD-14 were rejected (R), and positive results in all samples were estimated (J) due to low percent solid content in the samples. The following three VOCs were detected in the sediment samples at concentrations below reference criteria (maximum concentrations in parentheses): acetone (1,200 J ppb in SD-09), methyl acetate (110 J ppb in SD-06), and 2-butanone (140 J ppb in SD-09) [87]. No TECs are available for acetone, methyl acetate, or 2-butanone [96].

No SVOCs were detected in START sediment samples at concentrations above their respective SQLs [87].

One pesticide (4,4'-DDE) was detected in START sediment samples at a concentration above reference criteria. 4,4'-DDE was detected at a concentration of 5.8 J ppb in sediment sample SD-06 [87]. 4,4'-DDE was detected at a concentration that exceeded its TEC of 3.16 ppb [87; 96]. The result for alpha-chlordane in sediment sample SD-16 was rejected because target compound identification criteria were not met during data validation [87]. 4,4'-DDE is not documented as having been used and/or disposed of on the Cole Brook property. In addition, 4,4'-DDE was not detected in START soil/source samples [81]. Therefore, the presence of 4,4'-DDE in START sediment sample SD-06 will not be considered attributable to the Cole Brook property.

Two inorganic substances (iron and manganese) were detected in START sediment samples at concentrations above reference criteria. Iron was detected at a concentration of 7,570 ppm in sediment sample SD-06, and manganese was detected at a maximum concentration of 419 ppm in

sediment sample SD-09 [88]. No TECs are available for iron or manganese [96]. Iron and manganese were detected in a leachate sample collected from the former landfill [4, pp. 7, 10, 13-14, Attachment D, Attachment E; 65]. Therefore, the presence of iron and manganese in START sediment samples will be considered at least partially attributable to the Cole Brook property.

START collected sediment samples as part of the Cole Brook ESI. Based on analytical results of START sediment samples, a CWA-protected water body has been impacted by the presence of two inorganic substances (iron and manganese) considered to be at least partially attributable to the Cole Brook property. To date, no actions have been taken to address the release of iron and manganese.

SOIL EXPOSURE PATHWAY

A single-family, one-story residence with two tenants is located on the property [3, p. 2; 79]. Access to the property is unrestricted. Reportedly, local youths use the access road as a "short cut" to travel between Old Fall River Road and Hixville Road [3, p. 2].

There are no known employees on the property [3, p. 4; 4, p. 7]. During the 11 June 2003 on-site reconnaissance and subsequent sampling activities, START personnel observed that portions of the Cole Brook property were used to house farm animals and that people drive or walk through the property to use the on-site spigot to obtain drinking water for the animals [58, p. 10]. The nearest day-care facility is the "Country Road Pre School", located at 644 Old Fall River Road, approximately 0.5 miles west/northwest of the property [52; 57]. Based on available background information and on observations by START during the 1 February 2000 and 11 June 2003 on-site reconnaissances, no terrestrial sensitive environments are believed to be located on the property [3, p. 33; 58, pp. 2-10]. An estimated 524 persons live within 1 radial mile of the property [14].

On 15 August 1990, ARCS personnel collected five surface soil samples (SS-411, SS-421, SS-421D, SS-431, and SS-441), including a duplicate, from the property (Figure 3). Four soil samples were collected at 6 inches below grade (SS-421, SS-421D, SS-431, and SS-441); one soil sample was collected at 12 inches below grade (SS-411). Sample SS-441 was collected east of the former solid waste landfill area (presumably upgradient of potential sources) to document reference conditions. The soil samples were analyzed through the EPA CLP for VOCs, SVOCs, pesticides, PCBs, metals, and cyanide [4, pp. 10-11; 28].

Three VOCs, 18 SVOCs, one pesticide, and six metals were detected in the samples at concentrations above reference criteria [4, pp. 13-14, Attachment E]. Analytical results of these samples are discussed in greater detail in the Waste/Source Sampling section of this report.

On 1 February 2000, as part of the SIP, START personnel conducted an on-site reconnaissance of the property from the AG pipeline easement. No soil staining or stressed vegetation noted in previous visits was observed due to snow cover. No samples were collected during the on-site reconnaissance [3, p. 34].

On 11 June 2003, as part of the ESI, START and MA DEP personnel conducted an on-site reconnaissance of the property. No stressed vegetation was observed. In the southern portion of the former landfill area, START and MA DEP personnel observed standing water with a sheen in a gravel berm area. No samples were collected during the on-site reconnaissance [58, pp. 2-11].

On 26 through 28 January 2004, as part of the ESI, START personnel collected nine surface soil samples (SO-01 through SO-09) from eight locations on the property (Figure 3). All the surface soil samples were analyzed through DAS laboratories for VOCs and through CLP laboratories for SVOCs, pesticides, PCBs, metals, and cyanide, with the exception of SO-08, which was analyzed for metals only [58, pp. 12-36, 80-82]. Analytical results indicated the presence of one VOC, 10 SVOCs, and nine inorganic substances (metals and cyanide) at concentrations above reference criteria [80-82]. These results are discussed in greater detail in the Waste/Source Sampling section of this report.

START performed surface soil sampling as part of the Cole Brook ESI. Analytical results of START surface soil samples indicate that surface soil on the Cole Brook property is contaminated with one VOC, 10 SVOCs, eight metals, and cyanide at concentrations above reference criteria [80-82]. Of these contaminants, two SVOCs were detected at concentrations that met or exceeded MOHML RCS-1 soil standards [81; 92, Subpart J]. Impacts to nearby residential populations are unknown. To date, no actions have been taken to address the area of contaminated soil on the property.

AIR PATHWAY

A single-family, one-story residence with two tenants is located on the property [3, p. 2; 79]. Access to the property is unrestricted. Reportedly, local youths use the access road as a "short cut" to travel between Old Fall River Road and Hixville Road [3, p. 2].

There are no known employees on the property [3, p. 33; 4, p. 7]. During the 11 June 2003 on-site reconnaissance and subsequent sampling activities, START personnel observed that portions of the Cole Brook property were used to house farm animals and that people drive or walk through the property to use the on-site spigot to obtain drinking water for the animals [58, p. 10]. The nearest day-care facility is the "Country Road Pre School", located at 644 Old Fall River Road, approximately 0.5 miles west/northwest of the property [52; 57]. Based on available background information and on observations by START during the 1 February 2000 and 11 June 2003 on-site reconnaissances, no terrestrial sensitive environments are believed to be located on the property [3, p. 33; 58, pp. 2-11]. Including two on-site residents, an estimated 21,172 people are located within 4 radial miles of the Cole Brook property [3, p. 12; 14]. Table 16 summarizes the estimated population within 4 radial miles of the Cole Brook property.

Table 16

Estimated Population Within 4 Radial Miles of Cole Brook Pines Landfill

Radial Distance from Cole Brook Pines Landfill (miles)	Estimated Population
On a Source	2 *
> 0.00 to 0.25	33
> 0.25 to 0.50	98

Table 16

Estimated Population Within 4 Radial Miles of Cole Brook Pines Landfill (Concluded)

Radial Distance from Cole Brook Pines Landfill (miles)	Estimated Population
> 0.50 to 1.00	393
> 1.00 to 2.00	1,699
> 2.00 to 3.00	4,226
> 3.00 to 4.00	14,721
TOTAL	21,172

* Includes two tenants in the on-site residence.

[3; 14]

Approximately 4,635 acres of wetlands are located within 4 radial miles of the property [17-20; 22]. Cole Brook, a CWA-protected water body, flows through the property [52]. Additionally, according to a Threatened and Endangered Species Report prepared by EPA on 24 February 2004 for the Cole Brook property, there are five State-listed endangered plant species habitats, eight State-listed threatened plant species habitats, and five State-listed threatened animal species habitats located within 4 radial miles of the Cole Brook property [50]. Table 17 summarizes the sensitive environments located within 4 radial miles of the Cole Brook property.

Table 17

Sensitive Environments Located Within 4 Radial Miles of Cole Brook Pines Landfill

Radial Distance from Cole Brook Pines Landfill (miles)	Sensitive Environment/Species (status)
On a Source	Water Body protected by the Clean Water Act
	15 acres of wetlands
> 0.00 to 0.25	30 acres of wetlands
> 0.25 to 0.50	60 acres of wetlands
> 0.50 to 1.00	335 acres of wetlands
> 1.00 to 2.00	945 acres of wetlands
	Three State-listed endangered plant species habitats
	Three State-listed threatened plant species habitats

Table 17

Sensitive Environments Located Within 4 Radial Miles of Cole Brook Pines Landfill (Concluded)

Radial Distance from Cole Brook Pines Landfill (miles)	Sensitive Environment/Species (status)
> 2.00 to 3.00	1,500 acres of wetlands
	One State-listed endangered plant species habitat
	Three State-listed threatened plant species habitats
	One State-listed threatened animal species habitat
> 3.00 to 4.00	1,750 acres of wetlands
	One State-listed endangered plant species habitat
	Two State-listed threatened plant species habitats
	Four State-listed threatened animal species habitats

[17-20; 22; 52; 50]

During the 1 February 2000 START on-site reconnaissance, ambient air was monitored using a flame ionization detector (FID). No readings above background levels were noted [3, p. 36].

During the 11 June 2003 START on-site reconnaissance, ambient air was monitored using an FID, a PID, a combustible gas indicator/oxygen detector, and a radiation meter. No readings above background levels in ambient air were noted [58, pp. 2-11].

START did not collect ambient air samples as part of the Cole Brook ESI. No quantitative laboratory air samples are known to have been collected at the Cole Brook property to date. Based on available data, no release of hazardous substances to the ambient air from on-site sources is known or suspected to have occurred, and no impacts to nearby residential populations or sensitive environments are known or suspected.

SUMMARY

The Cole Brook Pines Landfill (Cole Brook) property, also referred to historically as the Cold Brook Pines Landfill, Cecil Smith's Landfill, and Clean Communities Landfill, is located along Old Fall River Road in Dartmouth, Bristol County, Massachusetts. The geographic coordinates of the property, as measured from its approximate center, are 41° 40′ 50.5″ north latitude and 71° 00′ 52.4″ west longitude. The property is comprised of 238.1 acres and consists of six contiguous parcels identified on the Town of Dartmouth, Massachusetts Tax Assessor's Map No. 67 as Lot Nos. 5, 7, and 8, and on Map No. 72 as Lot Nos. 6, 8, and 9. Residential properties and one commercial property are located north of the Cole Brook property. Residential properties and undeveloped properties abut the Cole Brook property to the south, and undeveloped properties along Old Fall River Road abut the Cole Brook property to the east. The property is bordered to the west by residential properties, undeveloped wetlands and woodland, and the Shingle Island River. The property is bordered by Old Fall River Road to the north and Hixville Road to the south. The Cole Brook property is privately owned.

Approximately 60 acres of the western portion of the parcel identified as Lot No. 6 on Map No. 72 consists of a former solid waste landfill operated between approximately 1954 and 1974. The solid waste generally consisted of demolition debris. The remaining areas of the property consist of undeveloped woodlands and wetlands, unimproved access roads, former sand and gravel extraction areas, and miscellaneous solid waste piles.

In 1973, a complaint by a group of residents of the Town of Dartmouth stated that "pools of waste oil" were observed on the property. In response to the complaint, members of the Town of Dartmouth Board of Health performed an inspection of the property and observed that an excavation on the property was "filled with oil." In 1975 and 1976, Massachusetts Department of Environmental Quality Engineering (MA DEQE) personnel conducted inspections of the property and reported several violations of Massachusetts Solid Waste Disposal Regulations. In 1982, the Town of Dartmouth Conservation Commission collected one leachate sample from the property. Laboratory analysis of the sample indicated the presence of two polychlorinated biphenyls. On 1 March 1983, as part of a Preliminary Assessment, NUS Corporation/Field Investigation Team personnel conducted a perimeter survey of the Cole Brook property and reported that the majority of waste disposed of on the property included demolition materials from construction, a variety of municipal waste, and waste oil. On 15 August 1990, as part of a Screening Site Inspection, Roy F. Weston, Inc. [now known as Weston Solutions, Inc.] (WESTON®) Alternative Remedial Contracts Strategy personnel collected five surface soil samples from the property. Analytical results of the surface soil samples indicated the presence of three volatile organic compounds (VOCs), 18 semivolatile organic compounds (SVOCs), and six metals above reference concentrations. On 27 and 28 January 2004, as part of an Expanded Site Inspection (ESI), WESTON Superfund Technical Assessment and Response Team 2000 (START) personnel collected eight surface soil/source samples from potential source areas on the Cole Brook property. Analytical results of the surface soil samples indicated the presence of one VOC, 11 SVOCs, and nine inorganic substances (metals and cyanide) above reference concentrations.

Groundwater beneath the Cole Brook property occurs at approximately 2 to 7.5 feet below ground surface. Groundwater flow direction beneath the property has not been determined; however, based on the location of Colebrook Swamp and Cole Brook, groundwater beneath the property most likely

flows radially to the west, north, and east. The estimated population served by public and private groundwater drinking water supply wells within 4 radial miles of the Cole Brook property is approximately 21,165. The nearest public groundwater drinking water supply well is located 2.5 miles south of the property; the location of the nearest private groundwater drinking water supply well is located on the property. On 17 through 19 February 2004, as part of the ESI, START personnel collected 15 groundwater samples from 14 monitoring wells on the Cole Brook property and two drinking water samples from the on-site drinking water supply well. Analytical results of the groundwater samples indicated the presence of 12 metals and cyanide considered to be at least partially attributable to the Cole Brook property. Six inorganic substances were detected at concentrations that exceed Massachusetts Contingency Plan (MCP) Massachusetts Oil and Hazardous Material List (MOHML) Reportable Category RCGW-1 groundwater standards. No hazardous substances were detected in the drinking water samples at concentrations that exceed MCP MOHML or Federal drinking water standards. Based on the lack of hazardous substances in the on-site drinking water supply well, no impacts to nearby groundwater drinking water supply sources are known or suspected.

Stormwater runoff on the Cole Brook property enters Cole Brook as it flows northwest and, subsequently, southwest through the property. Additional surface water bodies located along the 15-mile downstream surface water pathway include the Shingle Island River, the East Branch of the Westport River, Westport Harbor, and Buzzards Bay. Sensitive environments located along the 15-mile downstream surface water pathway include a Clean Water Act (CWA)-protected water body, approximately 23.9 miles of wetland frontage, seven State-listed endangered plant species habitats, six State-listed threatened plant species habitats, four State-listed threatened animal species habitats, two State-listed threatened and Federally-listed threatened/endangered animal species habitats, and one State-listed endangered and Federally-listed threatened animal species habitat. On 13 April 2004, as part of the ESI, START personnel collected 17 sediment samples from 16 locations along an unnamed tributary, Cole Brook, the Shingle Island River, and from on-site wetlands. Based on analytical results of the sediment samples, on-site wetlands have been impacted by a release of two metals considered to be at least partially attributable to the Cole Brook property. As a result, a CWA-protected water body has been impacted.

There are no workers at the Cole Brook property; however, portions of the Cole Brook property are used to house farm animals, and people drive or walk through the property to use the on-site spigot to obtain drinking water for the animals. There are no on-site terrestrial sensitive environments. No schools or day-care facilities are located within 200 feet of the property. The nearest day-care facility is located approximately 0.5 miles west-northwest of the Cole Brook property. A single-family, one-story residence with two tenants is located on the property. Access to the property is unrestricted. Reportedly, local youths use the access road as a "short cut" to travel between Old Fall River Road and Hixville Road. An estimated 524 residents live within 1 radial mile of the Cole Brook property. Analytical results of surface soil/source samples collected from the property by START personnel on 27 and 28 January 2004 indicated the presence of one VOC, 11 SVOCs, and nine inorganic substances (metals and cyanide).

An estimated 21,172 people reside within 4 radial miles of the Cole Brook property. There are approximately 4,635 acres of wetlands, five State-listed endangered plant species habitats, eight State-listed threatened plant species habitats, five State-listed threatened animal species habitats, and

one CWA-protected water body located within 4 radial miles of the Cole Brook property. No laboratory quantitative air samples are known to have been collected from the property. Impacts to nearby residential populations or sensitive environments are unknown.

The Cole Brook property is currently listed with the Massachusetts Department of Environmental Protection (MA DEP) as a "Tier 1D" property. A site/release is classified as Tier 1D when a responsible party fails to provide a required submittal to MA DEP by a specified deadline. The site/release cleanup phase for the Cole Brook property is classified as "No Phase", which indicates that a Phase report was not required or was not submitted.

COLE BROOK PINES LANDFILL
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ATTACHMENT A
COLE BROOK PINES LANDFILL
START SOIL SAMPLE ANALYTICAL RESULTS
Samples Collected 27 and 28 January 2004

SITE: COLE BROOK PINES LANDFILL
CASE: 0662F SDG: D14313
LABORATORY: ENVIROSYSTEMS, INC.

TABLE 1
VOLATILE SOIL ANALYSES
µg/kg

SAMPLE NUMBER:		D14313	D14314	D14315	D14316	D14317
SAMPLE LOCATION:		SO-01	SO-02	SO-03	SO-04	SO-05
LABORATORY NUMBER:		04010430	04010431	04010432	04010433	04010434
COMPOUND	CRQL					
Dichlorodifluoromethane	10	10 U	10 U	10 U	10 U	10 U
Chloromethane	10	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	10	10 U	10 U	10 U	10 U	10 U
Bromomethane	10	10 U	10 U	10 U	10 U	10 U
Chloroethane	10	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	10	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	10	10 U	10 U	10 U	10 U	10 U
Acetone	10	14 U	10 UJ	110	37	68
Carbon Disulfide	10	10 U	10 U	10 U	10 U	10 U
Methyl Acetate	10	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	10	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	10	10 U	10 U	10 U	10 U	10 U
Methyl tert-Butyl Ether	10	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
1,1-Dichloroethane	10	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	10	10 U	10 U	10 U	10 U	10 U
2-Butanone	10	10 U	1 J	3 J	8	1 J
Chloroform	10	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	10	10 U	10 U	10 U	10 U	10 U
Cyclohexane	10	10 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	10	10 U	10 U	10 U	10 U	10 U
Benzene	10	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10	10 U	10 U	10 U	10 U	10 U
Trichloroethene	10	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	10	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	10	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone	10	10 U	10 U	10 U	10 U	10 U
Toluene	10	10 U	10 U	10 U	6 J	10 U
trans-1,3-Dichloropropene	10	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	10	10 U	10 U	10 U	10 U	10 U
2-Hexanone	10	11	10 U	10 U	10 U	10 U
Dibromochloromethane	10	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	10	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	10	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	10	10 U	10 U	10 U	10 U	10 U
Xylene (Total)	10	10 U	10 U	10 U	10 U	10 U
Styrene	10	10 U	10 U	10 U	10 U	10 U
Bromoform	10	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	10	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	10	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	10	10 U	10 U	10 U	10 U	10 U
1,2-Dibromo-3-chloropropane	10	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10	10 U	10 U	10 U	10 U	10 U
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:		01/28/04	01/27/04	01/27/04	01/28/04	01/27/04
DATE ANALYZED:		02/04/04	02/04/04	02/04/04	02/04/04	02/04/04
% MOISTURE:		11	11	15	24	15

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: COLE BROOK PINES LANDFILL
CASE: 0662F SDG: D14313
LABORATORY: ENVIROSYSTEMS, INC.

TABLE 1
VOLATILE SOIL ANALYSES
µg/kg

SAMPLE NUMBER:		D14318	D14319	D14320
SAMPLE LOCATION:		SO-06	SO-07	SO-09
LABORATORY NUMBER:		04010435	04010436	04010437
COMPOUND	CRQL			
Dichlorodifluoromethane	10	10 U	10 U	10 U
Chloromethane	10	10 U	10 U	10 U
Vinyl Chloride	10	10 U	10 U	10 U
Bromomethane	10	10 U	10 U	10 U
Chloroethane	10	10 U	10 U	10 U
Trichlorofluoromethane	10	10 U	10 U	10 U
1,1-Dichloroethene	10	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	10	10 U	10 U	10 U
Acetone	10	18	54	10 UJ
Carbon Disulfide	10	10 U	10 U	10 U
Methyl Acetate	10	10 U	10 U	10 U
Methylene Chloride	10	10 U	10 U	10 U
trans-1,2-Dichloroethene	10	10 U	10 U	10 U
Methyl tert-Butyl Ether	10	10 UJ	10 UJ	10 UJ
1,1-Dichloroethane	10	10 U	10 U	10 U
cis-1,2-Dichloroethene	10	10 U	10 U	10 U
2-Butanone	10	3 J	5	10 U
Chloroform	10	10 U	10 U	10 U
1,1,1-Trichloroethane	10	10 U	10 U	10 U
Cyclohexane	10	10 U	10 U	10 U
Carbon Tetrachloride	10	10 U	10 U	10 U
Benzene	10	10 U	10 U	10 U
1,2-Dichloroethane	10	10 U	10 U	10 U
Trichloroethene	10	10 U	10 U	10 U
Methylcyclohexane	10	10 U	10 U	10 U
1,2-Dichloropropane	10	10 U	10 U	10 U
Bromodichloromethane	10	10 U	10 U	10 U
cis-1,3-Dichloropropene	10	10 U	10 U	10 U
4-Methyl-2-Pentanone	10	10 U	10 U	10 U
Toluene	10	10 U	10 U	10 U
trans-1,3-Dichloropropene	10	10 U	10 U	10 U
1,1,2-Trichloroethane	10	10 U	10 U	10 U
Tetrachloroethene	10	10 U	10 U	10 U
2-Hexanone	10	10 U	10 U	10 U
Dibromochloromethane	10	10 U	10 U	10 U
1,2-Dibromoethane	10	10 U	10 U	10 U
Chlorobenzene	10	10 U	10 U	10 U
Ethylbenzene	10	10 U	10 U	10 U
Xylene (Total)	10	10 U	10 U	10 U
Styrene	10	10 U	10 U	10 U
Bromoform	10	10 U	10 U	10 U
Isopropylbenzene	10	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10	10 U	10 U	10 U
1,3-Dichlorobenzene	10	10 U	10 U	10 U
1,4-Dichlorobenzene	10	10 U	10 U	10 U
1,2-Dichlorobenzene	10	10 U	10 U	10 U
1,2-Dibromo-3-chloropropane	10	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10	10 U	10 U	10 U
DILUTION FACTOR:		1.0	1.0	1.0
DATE SAMPLED:		01/28/04	01/28/04	01/27/04
DATE ANALYZED:		02/04/04	02/04/04	02/04/04
% MOISTURE:		15	7	11

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: COLE BROOK PINES LANDFILL
CASE: 32552 SDG: A1BL8
LABORATORY: CEIMIC CORPORATION

TABLE 1
SEMIVOLATILE SOIL ANALYSES
µg/kg

SAMPLE NUMBER:		A1BL8	A1BL9	A1BM0	A1BM1	A1BM2	A1BM3
SAMPLE LOCATION:		SO-01	SO-02	SO-03	SO-04	SO-05	SO-06
LABORATORY NUMBER:		040070-01	040070-02	040070-03	040070-04	040070-05	040070-06
COMPOUND	CRQL						
Benzaldehyde	330	350 U	370 U	410 U	440 U	390 U	390 U
Phenol	330	350 U	370 U	410 U	440 U	390 U	390 U
bis(2-Chloroethyl)Ether	330	350 U	370 U	410 U	440 U	390 U	390 U
2-Chlorophenol	330	350 U	370 U	410 U	440 U	390 U	390 U
2-Methylphenol	330	350 U	370 U	410 U	440 U	390 U	390 U
2,2'-oxybis(1-Chloropropane)	330	350 U	370 U	410 U	440 U	390 U	390 U
Acetophenone	330	350 U	370 U	410 U	440 U	390 U	390 U
4-Methylphenol	330	350 U	370 U	410 U	440 U	390 U	390 U
N-Nitroso-di-n-propylamine	330	350 U	370 U	410 U	440 U	390 U	390 U
Hexachloroethane	330	350 U	370 U	410 U	440 U	390 U	390 U
Nitrobenzene	330	350 U	370 U	410 U	440 U	390 U	390 U
Isophorone	330	350 U	370 U	410 U	440 U	390 U	390 U
2-Nitrophenol	330	350 U	370 U	410 U	440 U	390 U	390 U
2,4-Dimethylphenol	330	350 U	370 U	410 U	440 U	390 U	390 U
bis(2-Chloroethoxy)methane	330	350 U	370 U	410 U	440 U	390 U	390 U
2,4-Dichlorophenol	330	350 U	370 U	410 U	440 U	390 U	390 U
Naphthalene	330	350 U	370 U	410 U	50 J	390 U	390 U
4-Chloroaniline	330	350 U	370 U	410 U	440 U	390 U	390 U
Hexachlorobutadiene	330	350 U	370 U	410 U	440 U	390 U	390 U
Caprolactam	330	350 U	370 U	410 U	440 U	390 U	390 U
4-Chloro-3-methylphenol	330	350 U	370 U	410 U	440 U	390 U	390 U
2-Methylnaphthalene	330	350 U	370 U	410 U	440 U	390 U	390 U
Hexachlorocyclopentadiene	330	350 UJ	370 UJ	410 UJ	440 UJ	390 UJ	390 UJ
2,4,6-Trichlorophenol	330	350 U	370 U	410 U	440 U	390 U	390 U
2,4,5-Trichlorophenol	830	880 U	920 U	1000 U	1100 U	970 U	980 U
1,1'-Biphenyl	330	350 U	370 U	410 U	440 U	390 U	390 U
2-Chloronaphthalene	330	350 U	370 U	410 U	440 U	390 U	390 U
2-Nitroaniline	830	880 U	920 U	1000 U	1100 U	970 U	980 U
Dimethylphthalate	330	350 U	370 U	410 U	440 U	390 U	390 U
2,6-Dinitrotoluene	330	350 U	370 U	410 U	440 U	390 U	390 U
Acenaphthylene	330	350 U	370 U	410 U	440 U	390 U	390 U
3-Nitroaniline	830	880 U	920 U	1000 U	1100 U	970 U	980 U
Acenaphthene	330	350 U	370 U	410 U	170 J	390 U	390 U
2,4-Dinitrophenol	830	880 U	920 U	1000 U	1100 U	970 U	980 U
4-Nitrophenol	830	880 UJ	920 UJ	1000 UJ	1100 UJ	970 UJ	980 UJ
Dibenzofuran	330	350 U	370 U	410 U	81 J	390 U	390 U
2,4-Dinitrotoluene	330	350 U	370 U	410 U	440 U	390 U	390 U
Diethylphthalate	330	350 U	370 U	410 U	440 U	390 U	390 U
Fluorene	330	350 U	370 U	410 U	170 J	390 U	390 U
4-Chlorophenyl-phenylether	330	350 U	370 U	410 U	440 U	390 U	390 U
4-Nitroaniline	830	880 U	920 U	1000 U	1100 U	970 U	980 U
4,6-Dinitro-2-methylphenol	830	880 U	920 U	1000 U	1100 U	970 U	980 U
N-Nitrosodiphenylamine (1)	330	350 U	370 U	410 U	440 U	390 U	390 U
4-Bromophenyl-phenylether	330	350 U	370 U	410 U	440 U	390 U	390 U
Hexachlorobenzene	330	350 U	370 U	410 U	440 U	390 U	390 U
Atrazine	330	350 U	370 U	410 U	440 U	390 U	390 U
Pentachlorophenol	830	880 U	920 U	1000 U	1100 U	970 U	980 U
Phenanthrene	330	350 U	370 U	410 U	1500	390 U	390 U
Anthracene	330	350 U	370 U	410 U	370 J	390 U	390 U
Carbazole	330	350 U	370 U	410 U	210 J	390 U	390 U
Di-n-butylphthalate	330	350 U	370 U	410 U	440 U	390 U	390 U
Fluoranthene	330	350 U	370 U	410 U	1700	390 U	390 U
Pyrene	330	350 U	370 U	410 U	1600	390 U	390 U
Butylbenzylphthalate	330	350 U	370 U	410 U	440 U	390 U	390 U
3,3'-Dichlorobenzidine	330	350 U	370 U	410 U	440 U	390 U	390 U
Benzo(a)anthracene	330	350 U	370 U	410 U	840	390 U	390 U
Chrysene	330	350 U	370 U	410 U	820	390 U	390 U
bis(2-Ethylhexyl)phthalate	330	69 J	60 J	240 J	54 J	360 J	63 J
Di-n-octylphthalate	330	350 U	370 U	410 U	440 U	390 U	390 U
Benzo(b)fluoranthene	330	350 U	370 U	410 U	600	390 U	390 U
Benzo(k)fluoranthene	330	350 U	370 U	410 U	720	390 U	390 U
Benzo(a)pyrene	330	350 U	370 U	410 U	790	390 U	390 U
Indeno(1,2,3-cd)pyrene	330	350 U	370 U	410 U	470	390 U	390 U
Dibenzo(a,h)anthracene	330	350 U	370 U	410 U	55 J	390 U	390 U
Benzo(g,h,i)perylene	330	350 U	370 U	410 U	440 U	390 U	390 U
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:		01/28/04	01/27/04	01/27/04	01/28/04	01/27/04	01/28/04
DATE EXTRACTED:		02/02/04	02/02/04	02/02/04	02/02/04	02/02/04	02/02/04
DATE ANALYZED:		02/04/04	02/04/04	02/04/04	02/04/04	02/05/04	02/05/04
% MOISTURE:		7	10	20	27	16	16

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: COLE BROOK PINES LANDFILL
CASE: 32552 SDG: A1BL8
LABORATORY: CEIMIC CORPORATION

TABLE 1
SEMIVOLATILE SOIL ANALYSES
µg/kg

SAMPLE NUMBER:		A1BM4	A1BM6
SAMPLE LOCATION:		SO-07	SO-09
LABORATORY NUMBER:		040070-07	040070-08
COMPOUND	CRQL		
Benzaldehyde	330	350 U	380 U
Phenol	330	350 U	380 U
bis(2-Chloroethyl)Ether	330	350 U	380 U
2-Chlorophenol	330	350 U	380 U
2-Methylphenol	330	350 U	380 U
2,2'-oxybis(1-Chloropropane)	330	350 U	380 U
Acetophenone	330	350 U	380 U
4-Methylphenol	330	350 U	380 U
N-Nitroso-di-n-propylamine	330	350 U	380 U
Hexachloroethane	330	350 U	380 U
Nitrobenzene	330	350 U	380 U
Isophorone	330	350 U	380 U
2-Nitrophenol	330	350 U	380 U
2,4-Dimethylphenol	330	350 U	380 U
bis(2-Chloroethoxy)methane	330	350 U	380 U
2,4-Dichlorophenol	330	350 U	380 U
Naphthalene	330	350 U	380 U
4-Chloroaniline	330	350 U	380 U
Hexachlorobutadiene	330	350 U	380 U
Caprolactam	330	350 U	380 U
4-Chloro-3-methylphenol	330	350 U	380 U
2-Methylnaphthalene	330	350 U	380 U
Hexachlorocyclopentadiene	330	350 UJ	380 UJ
2,4,6-Trichlorophenol	330	350 U	380 U
2,4,5-Trichlorophenol	830	880 U	950 U
1,1'-Biphenyl	330	350 U	380 U
2-Chloronaphthalene	330	350 U	380 U
2-Nitroaniline	830	880 U	950 U
Dimethylphthalate	330	350 U	380 U
2,6-Dinitrotoluene	330	350 U	380 U
Acenaphthylene	330	350 U	380 U
3-Nitroaniline	830	880 U	950 U
Acenaphthene	330	350 U	380 U
2,4-Dinitrophenol	830	880 U	950 U
4-Nitrophenol	830	880 UJ	950 UJ
Dibenzofuran	330	350 U	380 U
2,4-Dinitrotoluene	330	350 U	380 U
Diethylphthalate	330	350 U	380 U
Fluorene	330	350 U	380 U
4-Chlorophenyl-phenylether	330	350 U	380 U
4-Nitroaniline	830	880 U	950 U
4,6-Dinitro-2-methylphenol	830	880 U	950 U
N-Nitrosodiphenylamine (1)	330	350 U	380 U
4-Bromophenyl-phenylether	330	350 U	380 U
Hexachlorobenzene	330	350 U	380 U
Atrazine	330	350 U	380 U
Pentachlorophenol	830	880 U	950 U
Phenanthrene	330	350 U	380 U
Anthracene	330	350 U	380 U
Carbazole	330	350 U	380 U
Di-n-butylphthalate	330	350 U	380 U
Fluoranthene	330	350 U	380 U
Pyrene	330	350 U	380 U
Butylbenzylphthalate	330	350 U	380 U
3,3'-Dichlorobenzidine	330	350 U	380 U
Benzo(a)anthracene	330	350 U	380 U
Chrysene	330	350 U	380 U
bis(2-Ethylhexyl)phthalate	330	40 J	55 J
Di-n-octylphthalate	330	350 U	380 U
Benzo(b)fluoranthene	330	350 U	380 U
Benzo(k)fluoranthene	330	350 U	380 U
Benzo(a)pyrene	330	350 U	380 U
Indeno(1,2,3-cd)pyrene	330	350 U	380 U
Dibenzo(a,h)anthracene	330	350 U	380 U
Benzo(g,h,i)perylene	330	350 U	380 U
DILUTION FACTOR:		1.0	1.0
DATE SAMPLED:		01/28/04	01/27/04
DATE EXTRACTED:		02/02/04	02/02/04
DATE ANALYZED:		02/05/04	02/05/04
% MOISTURE:		6	13

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: COLE BROOK PINES LANDFILL
CASE: 32552 SDG: A1BL8
LABORATORY: CEIMIC CORPORATION

TABLE 3
PESTICIDE/POLYCHLORINATED BIPHENYL SOIL ANALYSES
µg/kg

SAMPLE NUMBER:		A1BL8	A1BL9	A1BM0	A1BM1	A1BM2	A1BM3
SAMPLE LOCATION:		SO-01	SO-02	SO-03	SO-04	SO-05	SO-06
LABORATORY NUMBER:		040070-01	040070-02	040070-03	040070-04	040070-05	040070-06
COMPOUND	CRQL						
alpha-BHC	1.7	1.8 U	1.9 U	2.1 U	2.3 U	2.0 U	2.0 U
beta-BHC	1.7	1.8 U	1.9 U	2.1 U	2.3 U	2.0 U	2.0 U
delta-BHC	1.7	1.8 U	1.9 U	2.1 U	2.3 U	2.0 U	2.0 U
gamma-BHC (Lindane)	1.7	1.8 UJ	1.9 U	2.1 U	2.3 U	2.0 U	2.0 U
Heptachlor	1.7	1.8 UJ	1.9 U	2.1 U	2.3 U	2.0 U	2.0 U
Aldrin	1.7	1.8 U	1.9 U	2.1 U	2.3 U	2.0 U	2.0 U
Heptachlor Epoxide	1.7	1.8 U	1.9 U	2.1 U	2.3 U	2.0 U	2.0 U
Endosulfan I	1.7	1.8 U	1.9 U	2.1 U	2.3 U	2.0 U	2.0 U
Dieldrin	3.3	3.5 U	3.6 U	4.1 U	4.5 U	3.9 U	3.9 U
4,4'-DDE	3.3	3.5 U	3.6 U	4.1 U	4.5 U	3.9 U	3.9 U
Endrin	3.3	3.5 U	3.6 U	4.1 U	4.5 U	3.9 U	3.9 U
Endosulfan II	3.3	3.5 U	3.6 U	4.1 U	4.5 U	3.9 U	3.9 U
4,4'-DDD	3.3	3.5 U	3.6 U	4.1 U	4.5 U	3.9 U	3.9 U
Endosulfan Sulfate	3.3	3.5 U	3.6 U	4.1 U	4.5 U	3.9 U	3.9 U
4,4'-DDT	3.3	3.5 U	3.6 U	4.1 U	4.5 U	3.9 U	3.9 U
Methoxychlor	17	18 U	19 U	21 U	23 U	20 U	20 U
Endrin Ketone	3.3	3.5 U	3.6 U	4.1 U	R	3.9 U	3.9 U
Endrin Aldehyde	3.3	3.5 U	3.6 U	4.1 U	4.5 U	3.9 U	3.9 U
alpha-Chlordane	1.7	1.8 U	1.9 U	2.1 U	2.3 U	2.0 U	2.0 U
gamma-Chlordane	1.7	1.8 U	1.9 U	2.1 U	2.3 U	2.0 U	2.0 U
Toxaphene	170	180 U	190 U	210 U	230 U	200 U	200 U
Aroclor-1016	33	35 U	36 U	41 U	45 U	39 U	39 U
Aroclor-1221	67	71 U	74 U	83 U	91 U	80 U	80 U
Aroclor-1232	33	35 U	36 U	41 U	45 U	39 U	39 U
Aroclor-1242	33	35 U	36 U	41 U	45 U	39 U	39 U
Aroclor-1248	33	35 U	36 U	41 U	45 U	39 U	39 U
Aroclor-1254	33	35 U	36 U	41 U	45 U	39 U	39 U
Aroclor-1260	33	35 U	36 U	41 U	45 U	39 U	39 U
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:		01/28/04	01/27/04	01/27/04	01/28/04	01/27/04	01/28/04
DATE EXTRACTED:		02/02/04	02/02/04	02/02/04	02/02/04	02/02/04	02/02/04
DATE ANALYZED:		02/06/04	02/06/04	02/06/04	02/10/04	02/06/04	02/06/04
% MOISTURE:		7	10	20	27	16	16

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: COLE BROOK PINES LANDFILL
CASE: 32552 SDG: A1BL8
LABORATORY: CEIMIC CORPORATION

TABLE 3
PESTICIDE/POLYCHLORINATED BIPHENYL SOIL ANALYSES
µg/kg

SAMPLE NUMBER:		A1BM4	A1BM6
SAMPLE LOCATION:		SO-07	SO-09
LABORATORY NUMBER:		040070-07	040070-08
COMPOUND	CRQL		
alpha-BHC	1.7	1.8 U	1.9 U
beta-BHC	1.7	1.8 U	1.9 U
delta-BHC	1.7	1.8 U	1.9 U
gamma-BHC (Lindane)	1.7	1.8 U	1.9 U
Heptachlor	1.7	1.8 U	1.9 U
Aldrin	1.7	1.8 U	1.9 U
Heptachlor Epoxide	1.7	1.8 U	1.9 U
Endosulfan I	1.7	1.8 U	1.9 U
Dieldrin	3.3	3.5 U	3.7 U
4,4'-DDE	3.3	3.5 U	3.7 U
Endrin	3.3	3.5 U	3.7 U
Endosulfan II	3.3	3.5 U	3.7 U
4,4'-DDD	3.3	3.5 U	3.7 U
Endosulfan Sulfate	3.3	3.5 U	3.7 U
4,4'-DDT	3.3	3.5 U	3.7 U
Methoxychlor	17	18 U	19 U
Endrin Ketone	3.3	3.5 U	3.7 U
Endrin Aldehyde	3.3	3.5 U	3.7 U
alpha-Chlordane	1.7	1.8 U	1.9 U
gamma-Chlordane	1.7	1.8 U	1.9 U
Toxaphene	170	180 U	190 U
Aroclor-1016	33	35 U	37 U
Aroclor-1221	67	71 U	76 U
Aroclor-1232	33	35 U	37 U
Aroclor-1242	33	35 U	37 U
Aroclor-1248	33	35 U	37 U
Aroclor-1254	33	35 U	37 U
Aroclor-1260	33	35 U	37 U
DILUTION FACTOR:		1.0	1.0
DATE SAMPLED:		01/28/04	01/27/04
DATE EXTRACTED:		02/02/04	02/02/04
DATE ANALYZED:		02/06/04	02/06/04
% MOISTURE:		6	13

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: COLE BROOK PINES LANDFILL
CASE: 32552 SDG: MA1BL8
LABORATORY: COMPUCHEM

TABLE 1
INORGANIC SOIL ANALYSES
mg/kg

SAMPLE NUMBER:			MA1BL8	MA1BL9	MA1BM0	MA1BM1	MA1BM2	MA1BM3	MA1BM4	
SAMPLE LOCATION:			SO-01	SO-02	SO-03	SO-04	SO-05	SO-06	SO-07	
LABORATORY NUMBER:			211201	211202	211203	211204	211205	211206	211207	
PERCENT SOLIDS:			88.0	86.6	85.8	75.9	84.0	85.9	92.8	
INORGANIC ANALYTES	METHOD	INSTRUMENT DETECTION LIMITS (mg/kg)								CONTRACT DETECTION LIMITS (mg/kg)
ALUMINUM	P	4.2	4580	1900	4430	5200	4070	6790	6250	40
ANTIMONY	P	0.42	0.48 U	0.44 U	0.47 U	0.55 U	0.48 U	0.46 U	0.43 U	12
ARSENIC	P	0.42	0.48 U	0.44 U	2.7 U	2.1 U	1.2 U	1.2 U	1.4 U	2
BARIUM	P	0.06	46.8	8.0	12.8	884	9.2	16.5	8.8	40
BERYLLIUM	P	0.04	0.17 U	0.11 U	0.21 U	0.18 U	0.23 U	0.18 U	0.15 U	1
CADMIUM	P	0.04	0.045 U	0.042 U	0.044 U	0.089 UJ	0.045 U	0.044 U	0.041 U	1
CALCIUM	P	10.5	1860	432	372	4050	742	387	191 U	1000
CHROMIUM	P	0.12	3.6 U	3.0 U	7.8	12.1	5.0	5.2	8.4	2
COBALT	P	0.12	3.3	0.93 U	1.9	2.2	2.4	2.9	1.6	10
COPPER	P	0.16	13.1	3.4 U	5.0	14.7	4.8	6.1	7.1	5
IRON	P	2.2	6820	2560	7560	6890	6720	7990	6350	20
LEAD	P	0.26	1.7	1.7	5.1	97.4	4.6	4.9	3.8	0.6
MAGNESIUM	P	2.3	2620	582	1160	1840	1310	1600	696	1000
MANGANESE	P	0.04	84.6	58.6	92.5	111	129	100	56.1	3
MERCURY	CV	0.05	0.057 UJ	0.055 UJ	0.051 UJ	0.21 J	0.052 UJ	0.053 UJ	0.045 UJ	0.1
NICKEL	P	0.20	2.5	1.3 U	3.9	7.0	4.7	3.3	3.9	8
POTASSIUM	P	6.1	1250	329	609	364	396	490	198	1000
SELENIUM	P	0.40	0.45 U	0.42 U	0.44 U	0.52 U	0.45 U	0.71 J	0.41 U	1
SILVER	P	0.10	0.14 UJ	0.18 UJ	0.14 UJ	0.16 UJ	0.22 UJ	0.31 UJ	0.18 UJ	2
SODIUM	P	45.3	54.9 UJ	48.0 U	71.8 UJ	59.1 U	51.3 U	49.3 U	46.0 U	1000
THALLIUM	P	0.66	0.75 UJ	0.70 UJ	0.73 UJ	0.86 UJ	0.75 UJ	0.72 UJ	0.67 UJ	2
VANADIUM	P	0.12	13.1	3.7	10.0	13.4	6.8	15.4	9.1	10
ZINC	P	0.40	16.2	6.0 U	17.1	337	17.3	16.4	11.0	4
CYANIDE	CA	0.03	0.034 UJ	0.034 UJ	0.035 UJ	0.14 J	0.036 UJ	0.034 UJ	0.032 UJ	0.5

ANALYTICAL METHOD
P - ICP
CV - COLD VAPOR
CA - MIDI-DISTILLATION SPECTROPHOTOMETRIC

NOTE:
J = QUANTITATION IS ESTIMATED DUE TO LIMITATIONS IDENTIFIED IN THE QUALITY CONTROL REVIEW (DATA REVIEW).
U = VALUE IS NON-DETECTED.
UJ = VALUE IS NON-DETECTED AND DETECTION LIMIT IS ESTIMATED.
R = VALUE IS REJECTED.
NA = NOT ANALYZED.

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: COLE BROOK PINES LANDFILL
CASE: 32552 SDG: MA1BL8
LABORATORY: COMPUCHEM

TABLE 1
INORGANIC SOIL ANALYSES
mg/kg

SAMPLE NUMBER:			MA1BM5	MA1BM6	
SAMPLE LOCATION:			SO-08	SO-09	
LABORATORY NUMBER:			211208	211209	
PERCENT SOLIDS:			97.3	87.6	
INORGANIC ANALYTES	METHOD	INSTRUMENT DETECTION LIMITS (mg/kg)			CONTRACT DETECTION LIMITS (mg/kg)
ALUMINUM	P	4.2	2730	1870	40
ANTIMONY	P	0.42	0.40 U	0.46 U	12
ARSENIC	P	0.42	0.96 U	0.46 U	2
BARIUM	P	0.06	7.1	7.7	40
BERYLLIUM	P	0.04	0.14 U	0.11 U	1
CADMIUM	P	0.04	0.038 U	0.043 U	1
CALCIUM	P	10.5	309	433	1000
CHROMIUM	P	0.12	4.9	2.6 U	2
COBALT	P	0.12	1.4	1.0 U	10
COPPER	P	0.16	2.6 U	2.8 U	5
IRON	P	2.2	3100	2670	20
LEAD	P	0.26	2.6	1.6	0.6
MAGNESIUM	P	2.3	670	578	1000
MANGANESE	P	0.04	103	59.9	3
MERCURY	CV	0.05	0.047 UJ	0.05 UJ	0.1
NICKEL	P	0.20	1.8	1.3 U	8
POTASSIUM	P	6.1	300	312	1000
SELENIUM	P	0.40	0.38 U	0.43 U	1
SILVER	P	0.10	0.19 UJ	0.11 UJ	2
SODIUM	P	45.3	73.3 UJ	70.0 UJ	1000
THALLIUM	P	0.66	0.62 UJ	0.72 UJ	2
VANADIUM	P	0.12	3.9	3.9	10
ZINC	P	0.40	8.4	7.2 U	4
CYANIDE	CA	0.03	NA	0.034 UJ	0.5

ANALYTICAL METHOD
P - ICP
CV - COLD VAPOR
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NOTE:
J = QUANTITATION IS ESTIMATED DUE TO LIMITATIONS IDENTIFIED IN THE QUALITY CONTROL REVIEW (DATA REVIEW).
U = VALUE IS NON-DETECTED.
UJ = VALUE IS NON-DETECTED AND DETECTION LIMIT IS ESTIMATED.
R = VALUE IS REJECTED.
NA = NOT ANALYZED.

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

ATTACHMENT B
COLE BROOK PINES LANDFILL
START SOIL BORING/WELL CONSTRUCTION LOGS
Soil Borings Advanced 27 and 28 January 2004

WESTON SOLUTIONS
REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

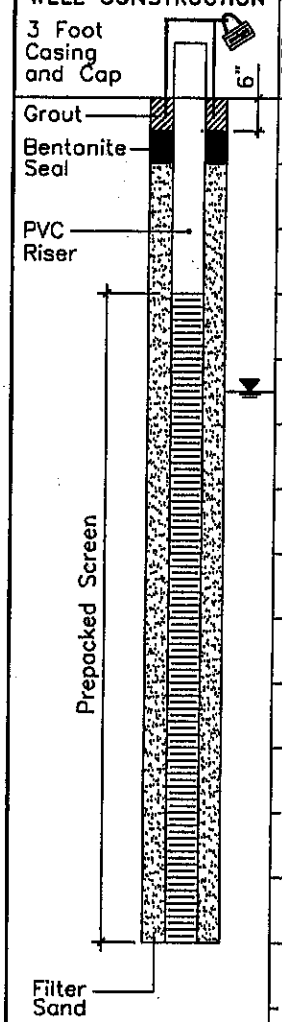
BORING/WELL INSTALLATION LOG
WELL ID: MW-01

PROJECT: Cole Brook Pines Landfill, Dartmouth, Massachusetts
CLIENT: U.S. EPA Region 1
BORING CONTRACTOR: Environmental Drillers, Inc. RIG: Diedrich D-120 ATV

SHEET NO. 1 OF 1
JOB NO.20112-001-001-8131
ELEVATION (ground) unknown
DATE STARTED 1/28/04
DATE FINISHED 1/28/04
DRILLER S. Preston
INSPECTOR S. Rose

GROUNDWATER					CAS.	SAMP.	CORE	TUBE
DATE	TIME	WATER ELEVATION	DATUM	TYPE				
1/28/04	1155	4.5 Feet bgs	TOC	DIA.				
				WT.	NA	NA		
				FALL	NA	NA		

WELL CONSTRUCTION



DEPTH (FEET)	SAMPLE NO.	REC. (in)	BLOW COUNT	CLASSIFICATION	BURM. (Note 1)	FID/PID HS (Note 2)	LAB. SAMPLE (Note 3)
0			N/A	Dry, brown-gray, coarse-to-fine SAND and GRAVEL, little silt. 2.0'		0.0	SO-01
2							
4							
6		13	4, 4, 4, 4	Wet, brown, coarse SAND, little fine gravel. 7.0'		0.0	
8							
10		21	4, 4, 4, 4	Wet, brown, fine SAND, little fine gravel, trace silt. 12.0'		0.0	
12				13.0' (END OF BOREHOLE)			
14							

WELL CONSTRUCTION MATERIALS:

3' long, 0.5" diameter PVC Riser, 3' below ground surface (bgs) with locking cap.

10' long, 0.5" diameter prepacked well screen (3-13').

TOC = Top of PVC casing.

NOTES:

1. Burmeister Soil Classification System.
2. Headspace - Photoionization Detector (PID), and Flame Ionization Detector (FID) recorded no readings above background levels = 0 units
3. Soil sample SO-01 collected from 1-2 foot interval at 1155 hrs. (MS/MSD) via hand auger.
4. Below Ground Surface (bgs)

SAMPLING METHOD:

All cores were collected using 2 foot long split-spoons, with the exception of the 0-2 foot interval, which was collected using a hand auger.

S:\0304013 4\Figures\Soil Borings\MW-01.DWG

WESTON SOLUTIONS
REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

BORING/WELL INSTALLATION LOG
WELL ID: MW-02

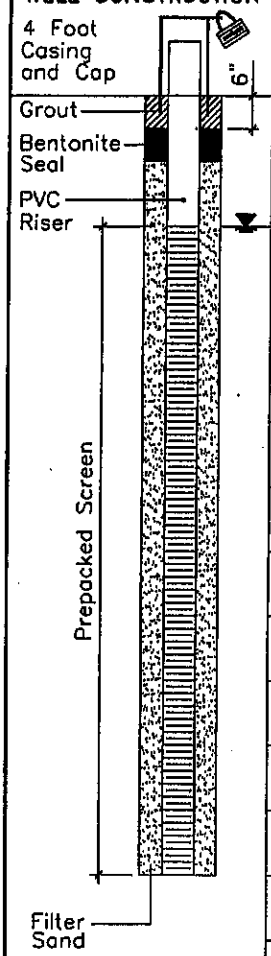
PROJECT: Cole Brook Pines Landfill, Dartmouth, Massachusetts	SHEET NO. 1 OF 1
CLIENT: U.S. EPA Region 1	JOB NO.20112-001-001-8131
BORING CONTRACTOR: Environmental Drillers, Inc. RIG: Diedrich D-120 ATV	ELEVATION (ground) unknown
	DATE STARTED 1/27/04
	DATE FINISHED 1/27/04
	DRILLER S. Preston
	INSPECTOR S. Rose

GROUNDWATER

DATE	TIME	WATER ELEVATION	DATUM
1/27/04	1400	2.0 Feet (bgs)	TOC

	CAS.	SAMP.	CORE	TUBE
TYPE				
DIA.				
WT.	NA	NA		
FALL	NA	NA		

WELL CONSTRUCTION



DEPTH (FEET)	SAMPLE NO.	REC. (in)	BLOW COUNT	CLASSIFICATION	BURM. (Note 1)	FID/PID HS (Note 2)	LAB. SAMPLE (Note 3)
0			N/A	Moist, gray-brown, coarse-to-fine SAND and GRAVEL, little silt. 2.0'		0.0	SO-02/ SO-09
2							
4							
6		12	20, 30, 13, 20	Wet, brown, coarse-to-fine SAND and GRAVEL, little silt. 7.0'		0.0	
8							
10		16	30, 33, 36, 43	Top 4 inches – Same lithology as above. Bot. 12 inches – Wet, brown SILT, little fine sand. 12.0' (END OF BOREHOLE)		0.0	
12							
14							

WELL CONSTRUCTION MATERIALS:

2' long, 0.5" diameter PVC Riser, 2' below ground surface (bgs) with locking cap.

10' long, 0.5" diameter prepacked well screen (2-12').

TOC = Top of PVC casing.

NOTES:

1. Burmeister Soil Classification System.
2. Headspace – Photoionization Detector (PID), and Flame Ionization Detector (FID) recorded no readings above background levels = 0 units
3. Soil sample SO-02/SO-09 collected from 1-2 foot interval at 1400 hours via hand auger.
4. Below Ground Surface (bgs)

SAMPLING METHOD:

All cores were collected using 2 foot long split-spoons, with the exception of the 0-2 foot interval, which was collected using a hand auger.

S:\04050134\Figures\Soil Borings\MW-02.DWG

WESTON SOLUTIONS®
REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

BORING/WELL INSTALLATION LOG
WELL ID: MW-03

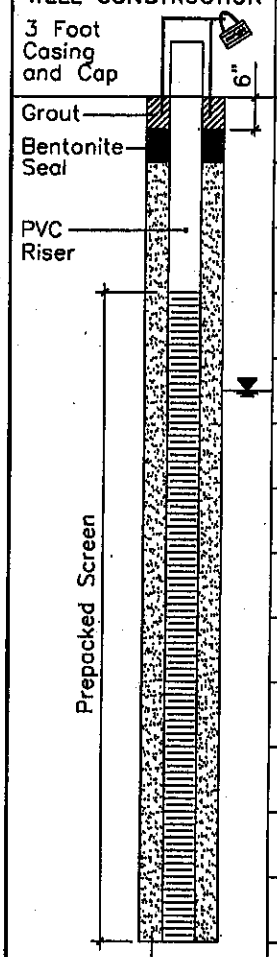
PROJECT: Cole Brook Pines Landfill, Dartmouth, Massachusetts	SHEET NO. 1 OF 1
CLIENT: U.S. EPA Region 1	JOB NO.20110-001-001-8131
BORING CONTRACTOR: Environmental Drillers, Inc. RIG: Diedrich D-120 ATV	ELEVATION (ground) unknown
	DATE STARTED 1/27/04
	DATE FINISHED 1/27/04
	DRILLER S. Preston
	INSPECTOR S. Rose

GROUNDWATER

DATE	TIME	WATER ELEVATION	DATUM
1/28/04	1155	4.5 Feet bgs	TOC

	CAS.	SAMP.	CORE	TUBE
TYPE				
DIA.				
WT.	NA	NA		
FALL	NA	NA		

WELL CONSTRUCTION



DEPTH (FEET)	SAMPLE NO.	REC. (in)	BLOW COUNT	CLASSIFICATION	BURM. (Note 1)	FID/PID HS (Note 2)	LAB. SAMPLE (Note 3)
0			N/A	Dry, brown, coarse-to-fine SAND and GRAVEL, some clay, little silt. 2.0'		0.0	SO-03
2							
4							
6		12	26, 30, 26, 26	Wet, brown, coarse-to-fine SAND and GRAVEL. 7.0'		0.0	
8							
10		12	7, 6, 6, 6	Same lithology as above. 12.0'		0.0	
12				13.0' (END OF BOREHOLE)			
14							

WELL CONSTRUCTION MATERIALS:

3' long, 0.5" diameter PVC Riser, 3' below ground surface (bgs) with locking cap.

10' long, 0.5" diameter prepacked well screen (3-13').

TOC = Top of PVC casing.

NOTES:

1. Burmeister Soil Classification System.
2. Headspace - Photoionization Detector (PID), and Flame Ionization Detector (FID) recorded no readings above background levels = 0 units
3. Soil sample SO-03 collected from 1-2 foot interval at 1230 hours via hand auger.
4. Below Ground Surface (bgs)

SAMPLING METHOD:

All cores were collected using 2 foot long split-spoons, with the exception of the 0-2 foot interval, which was collected using a hand auger.

S:\0405134\Figures\Soil Borings\MW-03.DWG

WESTON SOLUTIONS
REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

BORING/WELL INSTALLATION LOG
WELL ID: MW-04

PROJECT: Cole Brook Pines Landfill, Dartmouth, Massachusetts
CLIENT: U.S. EPA Region 1
BORING CONTRACTOR: Environmental Drillers, Inc. RIG: Diedrich D-120 ATV

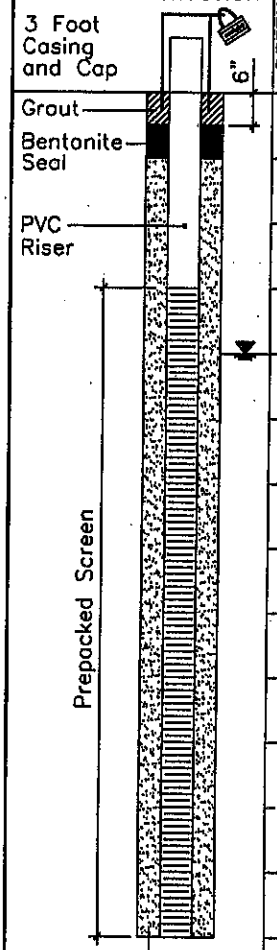
SHEET NO. 1 OF 1
JOB NO.20112-001-001-8131
ELEVATION (ground) unknown
DATE STARTED 1/28/04
DATE FINISHED 1/28/04
DRILLER S. Preston
INSPECTOR S. Rose

GROUNDWATER

DATE	TIME	WATER ELEVATION	DATUM
1/28/04	1500	4.0 Feet bgs	TOC

	CAS.	SAMP.	CORE	TUBE
TYPE				
DIA.				
WT.	NA	NA		
FALL	NA	NA		

WELL CONSTRUCTION



DEPTH (FEET)	SAMPLE NO.	REC. (in)	BLOW COUNT	CLASSIFICATION	BURM. (Note 1)	FID/PID HS (Note 2)	LAB. SAMPLE (Note 3)
0			N/A	Dry, dark brown, coarse-to-fine SAND, some fine gravel, little silt with brick fragments. 2.0'		0.0	SO-04
2							
4							
6		10	2, 4, 7, 8	Top 4 inches – Wet, black, coarse-to-fine SAND, little silt with brick fragments. Bot. 6 inches – Wet, gray, coarse SAND, some silt. 7.0'		0.0	
8							
10		12	4, 12, 15, 10	Top 6 inches – Same lithology as top 4 inches above. Bot. 6 inches – Same lithology as bot. 6 inches above. 12.0'		0.0	
12				13.0' (END OF BOREHOLE)			
14							

WELL CONSTRUCTION MATERIALS:

3' long, 0.5" diameter PVC Riser, 3' below ground surface (bgs) with locking cap.

10' long, 0.5" diameter prepacked well screen (3-13').

TOC = Top of PVC casing.

NOTES:

1. Burmeister Soil Classification System.
2. Headspace – Photoionization Detector (PID), and Flame Ionization Detector (FID) recorded no readings above background levels = 0 units
3. Soil sample SO-04 collected from 1-2 foot interval at 1500 hours via hand auger.
4. Below Ground Surface (bgs)

SAMPLING METHOD:

All cores were collected using 2 foot long split-spoons, with the exception of the 0-2 foot interval, which was collected using a hand auger.

S:\0405013 4\Figures\Soil Borings\MW-04.DWG

WESTON SOLUTIONS
REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

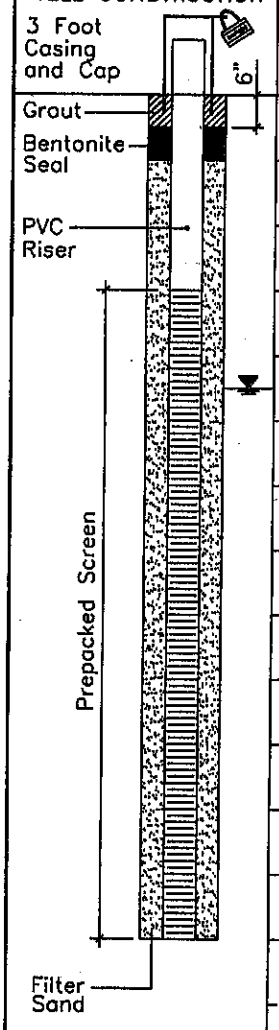
BORING/WELL INSTALLATION LOG
WELL ID: MW-05

PROJECT: Cole Brook Pines Landfill, Dartmouth, Massachusetts
CLIENT: U.S. EPA Region 1
BORING CONTRACTOR: Environmental Drillers, Inc. RIG: Diedrich D-120 ATV

SHEET NO. 1 OF 1
JOB NO.20112-001-001-8131
ELEVATION (ground) unknown
DATE STARTED 1/27/04
DATE FINISHED 1/27/04
DRILLER S. Preston
INSPECTOR S. Rose

GROUNDWATER					CAS.	SAMP.	CORE	TUBE
DATE	TIME	WATER ELEVATION	DATUM	TYPE				
1/27/04	1050	4.5 Feet bgs	TOC	DIA.				
				WT.	NA	NA		
				FALL	NA	NA		

WELL CONSTRUCTION



DEPTH (FEET)	SAMPLE NO.	REC. (in)	BLOW COUNT	CLASSIFICATION	BURM. (Note 1)	PID HS (Note 2)	LAB. SAMPLE (Note 3)
0			N/A	Dry, light brown SILT. 2.0'		0.0	SO-05
2							
4							
6		9	4, 6, 8, 8	Top 5 and Bot. 2 inches – Wet, brown, fine GRAVEL. Mid 2 inches – Wet, brown SILT. 7.0'		0.0	
8							
10		2	7, 6, 10, 7	Wet, brown, fine SAND and SILT. 12.0'		0.0	
12				13.0' (END OF BOREHOLE)			
14							

WELL CONSTRUCTION MATERIALS:

3' long, 0.5" diameter PVC Riser, 3' below ground surface (bgs) with locking cap.

10' long, 0.5" diameter prepacked well screen (3-13').

TOC = Top of PVC casing.

NOTES:

1. Burmeister Soil Classification System.
2. Headspace – Photoionization Detector (PID), recorded no readings above background levels = 0 units
3. Soil sample SO-05 collected from 1-2 foot interval at 1050 hours via hand auger.
4. Below Ground Surface (bgs)

SAMPLING METHOD:

All cores were collected using 2 foot long split-spoons, with the exception of the 0-2 foot interval, which was collected using a hand auger.

S:\0405013\4\Figures\Soil Borings\MW-05.DWG

WESTON SOLUTIONS®
REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

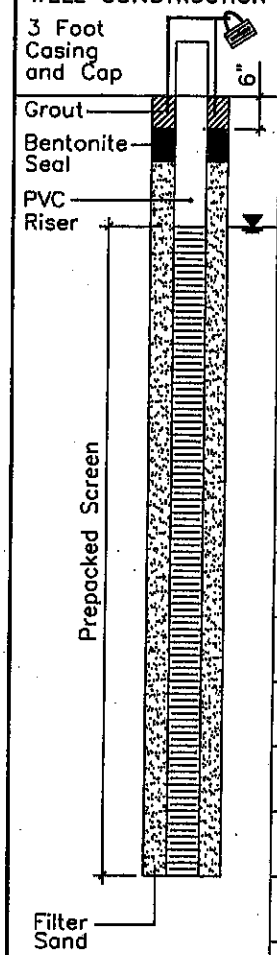
BORING/WELL INSTALLATION LOG
WELL ID: MW-06

PROJECT: Cole Brook Pines Landfill, Dartmouth, Massachusetts
CLIENT: U.S. EPA Region 1
BORING CONTRACTOR: Environmental Drillers, Inc. RIG: Diedrich D-120 ATV

SHEET NO. 1 OF 1
JOB NO.20112-001-001-8131
ELEVATION (ground) unknown
DATE STARTED 1/28/04
DATE FINISHED 1/28/04
DRILLER S. Preston
INSPECTOR S. Rose

GROUNDWATER					CAS.	SAMP.	CORE	TUBE
DATE	TIME	WATER ELEVATION	DATUM	TYPE				
1/28/04	1330	3.5 Feet (bgs)	TOC	DIA.				
				WT.	NA	NA		
				FALL	NA	NA		

WELL CONSTRUCTION



DEPTH (FEET)	SAMPLE NO.	REC. (in)	BLOW COUNT	CLASSIFICATION	BURM. (Note 1)	FID/PID HS (Note 2)	LAB. SAMPLE (Note 3)
0			N/A	Dry, brown, coarse-to-fine SAND and GRAVEL. 2.0'		0.0	SO-06
2							
4							
6		11	20, 30, 20, 15	Wet, brown, coarse-to-fine SAND and GRAVEL. 7.0'		0.0	
8							
10		12	4, 4, 4, 4	Top 6 inches – Same lithology as above. Bot. 6 inches – Wet, brown SILT. 12.0' (END OF BOREHOLE)		0.0	
12							
14							

WELL CONSTRUCTION MATERIALS:

2' long, 0.5" diameter PVC Riser, 2' below ground surface (bgs) with locking cap.

10' long, 0.5" diameter prepacked well screen (2-12').

TOC = Top of PVC casing.

NOTES:

1. Burmeister Soil Classification System.
2. Headspace – Photoionization Detector (PID), and Flame Ionization Detector (FID) recorded no readings above background levels = 0 units
3. Soil sample SO-06 collected from 1-2 foot interval at 1330 hours via hand auger.
4. Below Ground Surface (bgs).

SAMPLING METHOD:

All cores were collected using 2 foot long split-spoons, with the exception of the 0-2 foot interval, which was collected using a hand auger.

S:\04050134\Figures\Soil Borings\MW-06.DWG

WESTON SOLUTIONS®
REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

BORING/WELL INSTALLATION LOG
WELL ID: MW-07

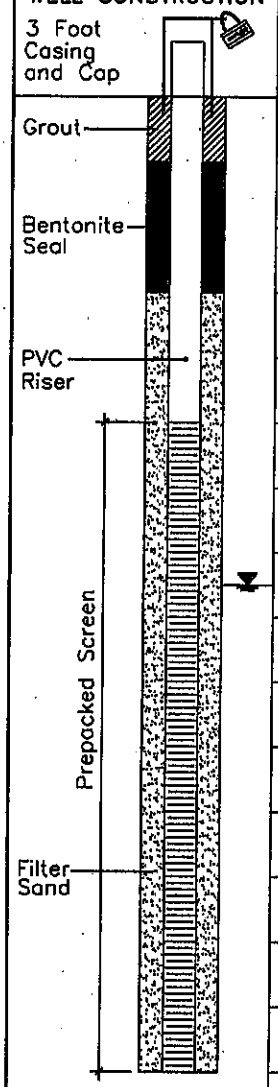
PROJECT: Cole Brook Pines Landfill, Dartmouth, Massachusetts	SHEET NO. 1 OF 1
CLIENT: U.S. EPA Region 1	JOB NO.20112-001-001-8131
BORING CONTRACTOR: Environmental Drillers, Inc. RIG: Diedrich D-120 ATV	ELEVATION (ground) unknown
	DATE STARTED 1/28/04
	DATE FINISHED 1/28/04
	DRILLER S. Preston
	INSPECTOR S. Rose

GROUNDWATER

DATE	TIME	WATER ELEVATION	DATUM
1/28/04	0945	7.5 Feet (bgs)	TOC

	CAS.	SAMP.	CORE	TUBE
TYPE				
DIA.				
WT.	NA	NA		
FALL	NA	NA		

WELL CONSTRUCTION



DEPTH (FEET)	SAMPLE NO.	REC. (in)	BLOW COUNT	CLASSIFICATION	BURM. (Note 1)	FID/PID HS (Note 2)	LAB. SAMPLE (Note 3)
0			N/A	Dry, brown, coarse-to-fine SAND, some fine gravel, little silt. 2.0'		Not recorded	SO-07
2							
4							
6		12	20, 13, 43, 144/4"	Same lithology as above, except bottom 2 inches, moist. 7.0'		Not recorded	
8				Refusal at 7 feet, moved 4 feet east then augered to 10 feet.			
10		5	7, 9, 9, 13	Wet, brown-gray, coarse-to-fine SAND and GRAVEL, little silt. 12.0'		Not recorded	
12							
14				15.0' (END OF BOREHOLE)			

WELL CONSTRUCTION MATERIALS:

5' long, 0.5" diameter PVC Riser, 5' below ground surface (bgs) with locking cap.

10' long, 0.5" diameter prepacked well screen (5-15').

TOC = Top of PVC casing.

NOTES:

1. Burmeister Soil Classification System.
2. Headspace - Photoionization Detector (PID), and Flame Ionization Detector (FID) no readings above background levels recorded.
3. Soil sample SO-07 collected from 1-2 foot interval at 0945 hours via hand auger.
4. Below Ground Surface (bgs).

SAMPLING METHOD:

All cores were collected using 2 foot long split-spoons, with the exception of the 0-2 foot interval, which was collected using a hand auger.

S:\05040134\Figures\Soil Borings\MW-07.DWG

ATTACHMENT C
COLE BROOK PINES LANDFILL
START GROUNDWATER SAMPLE ANALYTICAL RESULTS
Samples Collected 17 through 19 February 2004

SITE: COLE BROOK PINES LANDFILL
CASE: 32598 SDG: A1C01
LABORATORY: CEIMIC CORPORATION

TABLE 1
VOLATILE AQUEOUS ANALYSES
µg/L

SAMPLE NUMBER:		A1CN0	A1CN1
SAMPLE LOCATION:		GW-01	GW-02
LABORATORY NUMBER:		040130-05	040130-06
COMPOUND	CRQL		
Dichlorodifluoromethane	10	10 U	10 U
Chloromethane	10	10 UJ	10 UJ
Vinyl Chloride	10	10 UJ	10 UJ
Bromomethane	10	10 U	10 U
Chloroethane	10	10 U	10 U
Trichlorofluoromethane	10	10 U	10 U
1,1-Dichloroethene	10	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	10	10 U	10 U
Acetone	10	10 U	10 U
Carbon Disulfide	10	10 U	10 U
Methyl Acetate	10	10 U	10 U
Methylene Chloride	10	11 UJ	10 UJ
trans-1,2-Dichloroethene	10	10 U	10 U
Methyl tert-Butyl Ether	10	10 U	10 U
1,1-Dichloroethane	10	10 U	10 U
cis-1,2-Dichloroethene	10	10 U	10 U
2-Butanone	10	10 U	10 U
Chloroform	10	10 U	10 U
1,1,1-Trichloroethane	10	10 U	10 U
Cyclohexane	10	10 U	10 U
Carbon Tetrachloride	10	10 U	10 U
Benzene	10	10 U	10 U
1,2-Dichloroethane	10	10 U	10 U
Trichloroethene	10	10 U	10 U
Methylcyclohexane	10	10 U	10 U
1,2-Dichloropropane	10	10 U	10 U
Bromodichloromethane	10	10 U	10 U
cis-1,3-Dichloropropene	10	10 U	10 U
4-Methyl-2-Pentanone	10	10 U	10 U
Toluene	10	10 U	10 U
trans-1,3-Dichloropropene	10	10 U	10 U
1,1,2-Trichloroethane	10	10 U	10 U
Tetrachloroethene	10	10 U	10 U
2-Hexanone	10	10 U	10 U
Dibromochloromethane	10	10 U	10 U
1,2-Dibromoethane	10	10 U	10 U
Chlorobenzene	10	10 U	10 U
Ethylbenzene	10	10 U	10 U
Xylene (Total)	10	10 U	10 U
Styrene	10	10 U	10 U
Bromoform	10	10 U	10 U
Isopropylbenzene	10	10 U	10 U
1,1,2,2-Tetrachloroethane	10	10 U	10 U
1,3-Dichlorobenzene	10	10 U	10 U
1,4-Dichlorobenzene	10	10 U	10 U
1,2-Dichlorobenzene	10	10 U	10 U
1,2-Dibromo-3-chloropropane	10	R	R
1,2,4-Trichlorobenzene	10	10 U	10 U
DILUTION FACTOR:		1.0	1.0
DATE SAMPLED:		02/17/04	02/18/04
DATE ANALYZED:		02/26/04	02/26/04

SITE: COLE BROOK PINES LANDFILL
CASE: 32598 SDG: A1C01
LABORATORY: CEIMIC CORPORATION

TABLE 1
VOLATILE AQUEOUS ANALYSES
µg/L

SAMPLE NUMBER:		A1CN2	A1CN3	A1CN4	A1CN5	A1CN6
SAMPLE LOCATION:		GW-03	GW-04	GW-05	GW-06	GW-07
LABORATORY NUMBER:		040130-20	040130-07	040130-21	040130-08	040130-09
COMPOUND	CRQL					
Dichlorodifluoromethane	10	10 U	10 U	10 U	10 U	10 U
Chloromethane	10	10 U	10 UJ	10 U	10 UJ	10 UJ
Vinyl Chloride	10	10 U	10 UJ	10 U	10 UJ	10 UJ
Bromomethane	10	10 U	10 U	10 U	10 U	10 U
Chloroethane	10	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	10	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	10	10 U	10 U	10 U	10 U	10 U
Acetone	10	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	10	10 U	10 U	10 U	10 U	10 U
Methyl Acetate	10	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	10	11 UJ	10 UJ	12 UJ	10 UJ	10 UJ
trans-1,2-Dichloroethene	10	10 U	10 U	10 U	10 U	10 U
Methyl tert-Butyl Ether	10	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	10	10 U	10 U	10 U	10 U	10 U
2-Butanone	10	10 U	10 U	10 U	10 U	10 U
Chloroform	10	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	10	10 U	10 U	10 U	10 U	10 U
Cyclohexane	10	10 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	10	10 U	10 U	10 U	10 U	10 U
Benzene	10	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10	10 U	10 U	10 U	10 U	10 U
Trichloroethene	10	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	10	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	10	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone	10	10 U	10 U	10 U	10 U	10 U
Toluene	10	10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	10	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	10	10 U	10 U	10 U	10 U	10 U
2-Hexanone	10	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	10	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	10	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	10	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	10	10 U	10 U	10 U	10 U	10 U
Xylene (Total)	10	10 U	10 U	10 U	10 U	10 U
Styrene	10	10 U	10 U	10 U	10 U	10 U
Bromoform	10	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	10	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	10	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	10	10 U	10 U	10 U	10 U	10 U
1,2-Dibromo-3-chloropropane	10	R	R	R	R	R
1,2,4-Trichlorobenzene	10	10 U	10 U	10 U	10 U	10 U
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:		02/18/04	02/17/04	02/19/04	02/18/04	02/18/04
DATE ANALYZED:		02/27/04	02/26/04	02/27/04	02/26/04	02/26/04

SITE: COLE BROOK PINES LANDFILL
CASE: 32598 SDG: A1C01
LABORATORY: CEIMIC CORPORATION

TABLE 1
VOLATILE AQUEOUS ANALYSES
µg/L

SAMPLE NUMBER:		A1CN7	A1CN8	A1CN9	A1CP0	A1CP1
SAMPLE LOCATION:		GW-08	GW-09	GW-10	GW-11	GW-12
LABORATORY NUMBER:		040130-10	040130-11	040130-12	040130-22	040130-23
COMPOUND	CRQL					
Dichlorodifluoromethane	10	10 U	10 U	10 U	10 U	10 U
Chloromethane	10	10 UJ	10 UJ	10 UJ	10 U	10 U
Vinyl Chloride	10	10 UJ	10 UJ	10 UJ	10 U	10 U
Bromomethane	10	10 U	10 U	10 U	10 U	10 U
Chloroethane	10	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	10	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	10	10 U	10 U	10 U	10 U	10 U
Acetone	10	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	10	10 U	10 U	10 U	10 U	10 U
Methyl Acetate	10	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	10	10 UJ	14 UJ	12 UJ	15 UJ	11 UJ
trans-1,2-Dichloroethene	10	10 U	10 U	10 U	10 U	10 U
Methyl tert-Butyl Ether	10	10 U	10 U	2 J	10 U	10 U
1,1-Dichloroethane	10	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	10	10 U	10 U	10 U	10 U	10 U
2-Butanone	10	10 U	10 U	10 U	10 U	10 U
Chloroform	10	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	10	10 U	10 U	10 U	10 U	10 U
Cyclohexane	10	10 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	10	10 U	10 U	10 U	10 U	10 U
Benzene	10	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10	10 U	10 U	10 U	10 U	10 U
Trichloroethene	10	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	10	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	10	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone	10	10 U	10 U	10 U	10 U	10 U
Toluene	10	10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	10	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	10	10 U	10 U	10 U	10 U	10 U
2-Hexanone	10	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	10	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	10	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	10	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	10	10 U	10 U	10 U	10 U	10 U
Xylene (Total)	10	10 U	10 U	10 U	10 U	10 U
Styrene	10	10 U	10 U	10 U	10 U	10 U
Bromoform	10	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	10	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	10	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	10	10 U	10 U	10 U	10 U	10 U
1,2-Dibromo-3-chloropropane	10	R	R	R	R	R
1,2,4-Trichlorobenzene	10	10 U	10 U	10 U	10 U	10 U
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:		02/18/04	02/17/04	02/17/04	02/19/04	02/18/04
DATE ANALYZED:		02/26/04	02/26/04	02/26/04	02/27/04	02/27/04

SITE: COLE BROOK PINES LANDFILL
CASE: 32598 SDG: A1C01
LABORATORY: CEIMIC CORPORATION

TABLE 1
VOLATILE AQUEOUS ANALYSES
µg/L

SAMPLE NUMBER:		A1CP2	A1CP3	A1CP4
SAMPLE LOCATION:		GW-13	GW-14	GW-15
LABORATORY NUMBER:		040130-13	040130-14	040130-15
COMPOUND	CRQL			
Dichlorodifluoromethane	10	10 U	10 U	10 U
Chloromethane	10	10 UJ	10 UJ	10 UJ
Vinyl Chloride	10	10 UJ	10 UJ	10 UJ
Bromomethane	10	10 U	10 U	10 U
Chloroethane	10	10 U	10 U	10 U
Trichlorofluoromethane	10	10 U	10 U	10 U
1,1-Dichloroethene	10	10 U	4 J	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	10	10 U	10 U	10 U
Acetone	10	10 U	10 U	10 U
Carbon Disulfide	10	10 U	10 U	10 U
Methyl Acetate	10	10 U	10 U	10 U
Methylene Chloride	10	11 UJ	12 UJ	13 UJ
trans-1,2-Dichloroethene	10	10 U	10 U	10 U
Methyl tert-Butyl Ether	10	10 U	10 U	10 U
1,1-Dichloroethane	10	10 U	10 U	10 U
cis-1,2-Dichloroethene	10	10 U	10 U	10 U
2-Butanone	10	10 U	10 U	10 U
Chloroform	10	10 U	10 U	10 U
1,1,1-Trichloroethane	10	10 U	33	10 U
Cyclohexane	10	10 U	10 U	10 U
Carbon Tetrachloride	10	10 U	10 U	10 U
Benzene	10	10 U	10 U	10 U
1,2-Dichloroethane	10	10 U	10 U	10 U
Trichloroethene	10	10 U	10 U	10 U
Methylcyclohexane	10	10 U	10 U	10 U
1,2-Dichloropropane	10	10 U	10 U	10 U
Bromodichloromethane	10	10 U	10 U	10 U
cis-1,3-Dichloropropene	10	10 U	10 U	10 U
4-Methyl-2-Pentanone	10	10 U	10 U	10 U
Toluene	10	10 U	10 U	10 U
trans-1,3-Dichloropropene	10	10 U	10 U	10 U
1,1,2-Trichloroethane	10	10 U	10 U	10 U
Tetrachloroethene	10	10 U	10 U	10 U
2-Hexanone	10	10 U	10 U	10 U
Dibromochloromethane	10	10 U	10 U	10 U
1,2-Dibromoethane	10	10 U	10 U	10 U
Chlorobenzene	10	10 U	10 U	10 U
Ethylbenzene	10	10 U	10 U	10 U
Xylene (Total)	10	10 U	10 U	10 U
Styrene	10	10 U	10 U	10 U
Bromoform	10	10 U	10 U	10 U
Isopropylbenzene	10	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10	10 U	10 U	10 U
1,3-Dichlorobenzene	10	10 U	10 U	10 U
1,4-Dichlorobenzene	10	10 U	10 U	10 U
1,2-Dichlorobenzene	10	10 U	10 U	10 U
1,2-Dibromo-3-chloropropane	10	R	R	R
1,2,4-Trichlorobenzene	10	10 U	10 U	10 U
DILUTION FACTOR:		1.0	1.0	1.0
DATE SAMPLED:		02/17/04	02/17/04	02/18/04
DATE ANALYZED:		02/26/04	02/26/04	02/26/04

SITE: COLE BROOK PINES LANDFILL
CASE: 32598 SDG: A1C01
LABORATORY: CEIMIC CORPORATION

TABLE 2
SEMIVOLATILE AQUEOUS ANALYSES
µg/L

SAMPLE NUMBER:		A1CN0	A1CN1	A1CN2	A1CN3	A1CN4
SAMPLE LOCATION:		GW-01	GW-02	GW-03	GW-04	GW-05
LABORATORY NUMBER:		040130-05	040130-06	040130-20	040130-07	040130-21
COMPOUND	CRQL					
Benzaldehyde	10	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Phenol	10	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)Ether	10	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	10	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	10	10 U	10 U	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)	10	10 U	10 U	10 U	10 U	10 U
Acetophenone	10	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	10	10 U	10 U	10 U	10 U	10 U
N-Nitroso-di-n-propylamine	10	10 U	10 U	10 U	10 U	10 U
Hexachloroethane	10	10 U	10 U	10 U	10 U	10 U
Nitrobenzene	10	10 U	10 U	10 U	10 U	10 U
Isophorone	10	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol	10	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	10	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	10	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	10	10 U	10 U	10 U	10 U	10 U
Naphthalene	10	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	10	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	10	10 U	10 U	10 U	10 U	10 U
Caprolactam	10	22	10 U	10 U	10 U	16
4-Chloro-3-methylphenol	10	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	10	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	10	10 U	10 U	10 U	10 U	10 UJ
2,4,6-Trichlorophenol	10	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	25	25 U	25 U	25 U	25 U	25 U
1,1'-Biphenyl	10	10 U	10 U	10 U	10 U	10 U
2-Chloronaphthalene	10	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	25	25 U	25 U	25 U	25 U	25 U
Dimethylphthalate	10	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	10	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	10	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline	25	25 U	25 U	25 U	25 U	25 U
Acenaphthene	10	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	25	25 U	25 U	25 U	25 U	25 U
4-Nitrophenol	25	25 U	25 U	25 U	25 U	25 U
Dibenzofuran	10	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene	10	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	10	10 U	10 U	10 U	10 U	10 U
Fluorene	10	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenylether	10	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	25	25 U	25 U	25 U	25 U	25 U
4,6-Dinitro-2-methylphenol	25	25 U	25 U	25 U	25 U	25 U
N-Nitrosodiphenylamine (1)	10	10 U	10 U	10 U	10 U	10 U
4-Bromophenyl-phenylether	10	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	10	10 U	10 U	10 U	10 U	10 U
Atrazine	10	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol	25	25 U	25 U	25 U	25 U	25 U
Phenanthrene	10	10 U	10 U	10 U	10 U	10 U
Anthracene	10	10 U	10 U	10 U	10 U	10 U
Carbazole	10	10 U	10 U	10 U	10 U	10 U
Di-n-butylphthalate	10	10 U	10 U	10 U	10 U	10 U
Fluoranthene	10	10 U	10 U	10 U	10 U	10 U
Pyrene	10	10 U	10 U	10 U	10 U	10 U
Butylbenzylphthalate	10	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	10	10 U	10 U	10 U	10 U	10 U
Benzo(a)anthracene	10	10 U	10 U	10 U	10 U	10 U
Chrysene	10	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	10	10 U	10 U	10 U	10 U	10 U
Di-n-octylphthalate	10	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	10	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	10	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	10	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	10	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene	10	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	10	10 U	10 U	10 U	10 U	10 U
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:		02/17/04	02/18/04	02/18/04	02/17/04	02/19/04
DATE EXTRACTED:		02/23/04	02/23/04	02/24/04	02/23/04	02/25/04
DATE ANALYZED:		02/25/04	02/25/04	02/26/04	02/25/04	02/27/04

SITE: COLE BROOK PINES LANDFILL
CASE: 32598 SDG: A1C01
LABORATORY: CEIMIC CORPORATION

TABLE 2
SEMIVOLATILE AQUEOUS ANALYSES
µg/L

SAMPLE NUMBER:		A1CN5	A1CN6	A1CN7	A1CN8	A1CN9	A1CP0
SAMPLE LOCATION:		GW-06	GW-07	GW-08	GW-09	GW-10	GW-11
LABORATORY NUMBER:		040130-08	040130-09	040130-10	040130-11	040130-12	040130-22
COMPOUND	CRQL						
Benzaldehyde	10	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Phenol	10	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)Ether	10	10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	10	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	10	10 U	10 U	10 U	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)	10	10 U	10 U	10 U	10 U	10 U	10 U
Acetophenone	10	10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	10	10 U	10 U	10 U	10 U	10 U	10 U
N-Nitroso-di-n-propylamine	10	10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane	10	10 U	10 U	10 U	10 U	10 U	10 U
Nitrobenzene	10	10 U	10 U	10 U	10 U	10 U	10 U
Isophorone	10	10 U	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol	10	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	10	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	10	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	10	10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene	10	10 U	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	10	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	10	10 U	10 U	10 U	10 U	10 U	10 U
Caprolactam	10	41	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	10	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	10	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	10	10 U	10 U	10 U	10 U	10 U	10 UJ
2,4,6-Trichlorophenol	10	10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	25	25 U	25 U	25 U	25 U	25 U	25 U
1,1'-Biphenyl	10	10 U	10 U	10 U	10 U	10 U	10 U
2-Chloronaphthalene	10	10 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	25	25 U	25 U	25 U	25 U	25 U	25 U
Dimethylphthalate	10	10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	10	10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	10	10 U	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline	25	25 U	25 U	25 U	25 U	25 U	25 U
Acenaphthene	10	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	25	25 U	25 U	25 U	25 U	25 U	25 U
4-Nitrophenol	25	25 U	25 U	25 U	25 U	25 U	25 U
Dibenzofuran	10	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene	10	10 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	10	10 U	10 U	10 U	10 U	10 U	10 U
Fluorene	10	10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenylether	10	10 U	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	25	25 U	25 U	25 U	25 U	25 U	25 U
4,6-Dinitro-2-methylphenol	25	25 U	25 U	25 U	25 U	25 U	25 U
N-Nitrosodiphenylamine (1)	10	10 U	10 U	10 U	10 U	10 U	10 U
4-Bromophenyl-phenylether	10	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	10	10 U	10 U	10 U	10 U	10 U	10 U
Atrazine	10	10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol	25	25 U	25 U	25 U	25 U	25 U	25 U
Phenanthrene	10	10 U	10 U	10 U	10 U	10 U	10 U
Anthracene	10	10 U	10 U	10 U	10 U	10 U	10 U
Carbazole	10	10 U	10 U	10 U	10 U	10 U	10 U
Di-n-butylphthalate	10	10 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene	10	10 U	10 U	10 U	10 U	10 U	10 U
Pyrene	10	10 U	10 U	10 U	10 U	10 U	10 U
Butylbenzylphthalate	10	10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	10	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)anthracene	10	10 U	10 U	10 U	10 U	10 U	10 U
Chrysene	10	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	10	10 U	10 U	10 U	10 U	10 U	10 U
Di-n-octylphthalate	10	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	10	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	10	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	10	10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	10	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene	10	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	10	10 U	10 U	10 U	10 U	10 U	10 U
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:		02/18/04	02/18/04	02/18/04	02/17/04	02/17/04	02/19/04
DATE EXTRACTED:		02/23/04	02/24/04	02/24/04	02/24/04	02/24/04	02/25/04
DATE ANALYZED:		02/25/04	02/26/04	02/26/04	02/26/04	02/26/04	02/27/04

SITE: COLE BROOK PINES LANDFILL
CASE: 32598 SDG: A1C01
LABORATORY: CEIMIC CORPORATION

TABLE 2
SEMIVOLATILE AQUEOUS ANALYSES
µg/L

SAMPLE NUMBER:		A1CP1	A1CP2	A1CP3	A1CP4
SAMPLE LOCATION:		GW-12	GW-13	GW-14	GW-15
LABORATORY NUMBER:		040130-23	040130-13	040130-14	040130-15
COMPOUND	CRQL				
Benzaldehyde	10	10 UJ	10 UJ	10 UJ	10 UJ
Phenol	10	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)Ether	10	10 U	10 U	10 U	10 U
2-Chlorophenol	10	10 U	10 U	10 U	10 U
2-Methylphenol	10	10 U	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)	10	10 U	10 U	10 U	10 U
Acetophenone	10	10 U	10 U	10 U	10 U
4-Methylphenol	10	10 U	10 U	10 U	10 U
N-Nitroso-di-n-propylamine	10	10 U	10 U	10 U	10 U
Hexachloroethane	10	10 U	10 U	10 U	10 U
Nitrobenzene	10	10 U	10 U	10 U	10 U
Isophorone	10	10 U	10 U	10 U	10 U
2-Nitrophenol	10	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	10	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	10	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	10	10 U	10 U	10 U	10 U
Naphthalene	10	10 U	10 U	10 U	10 U
4-Chloroaniline	10	10 U	10 U	10 U	10 U
Hexachlorobutadiene	10	10 U	10 U	10 U	10 U
Caprolactam	10	16	10 U	10	10 U
4-Chloro-3-methylphenol	10	10 U	10 U	10 U	10 U
2-Methylnaphthalene	10	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	10	10 UJ	10 U	10 U	10 U
2,4,6-Trichlorophenol	10	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	25	25 U	25 U	25 U	25 U
1,1'-Biphenyl	10	10 U	10 U	10 U	10 U
2-Chloronaphthalene	10	10 U	10 U	10 U	10 U
2-Nitroaniline	25	25 U	25 U	25 U	25 U
Dimethylphthalate	10	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	10	10 U	10 U	10 U	10 U
Acenaphthylene	10	10 U	10 U	10 U	10 U
3-Nitroaniline	25	25 U	25 U	25 U	25 U
Acenaphthene	10	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	25	25 U	25 U	25 U	25 U
4-Nitrophenol	25	25 U	25 U	25 U	25 U
Dibenzofuran	10	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene	10	10 U	10 U	10 U	10 U
Diethylphthalate	10	10 U	10 U	10 U	10 U
Fluorene	10	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenylether	10	10 U	10 U	10 U	10 U
4-Nitroaniline	25	25 U	25 U	25 U	25 U
4,6-Dinitro-2-methylphenol	25	25 U	25 U	25 U	25 U
N-Nitrosodiphenylamine (1)	10	10 U	10 U	10 U	10 U
4-Bromophenyl-phenylether	10	10 U	10 U	10 U	10 U
Hexachlorobenzene	10	10 U	10 U	10 U	10 U
Atrazine	10	10 U	10 U	10 U	10 U
Pentachlorophenol	25	25 U	25 U	25 U	25 U
Phenanthrene	10	10 U	10 U	10 U	10 U
Anthracene	10	10 U	10 U	10 U	10 U
Carbazole	10	10 U	10 U	10 U	10 U
Di-n-butylphthalate	10	10 U	10 U	10 U	10 U
Fluoranthene	10	10 U	10 U	10 U	10 U
Pyrene	10	10 U	10 U	10 U	10 U
Butylbenzylphthalate	10	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	10	10 U	10 U	10 U	10 U
Benzo(a)anthracene	10	10 U	10 U	10 U	10 U
Chrysene	10	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	10	10 U	10 U	10 U	10 U
Di-n-octylphthalate	10	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	10	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	10	10 U	10 U	10 U	10 U
Benzo(a)pyrene	10	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	10	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene	10	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	10	10 U	10 U	10 U	10 U
DILUTION FACTOR:		1.0	1.0	1.0	1.0
DATE SAMPLED:		02/18/04	02/17/04	02/17/04	02/18/04
DATE EXTRACTED:		02/25/04	02/24/04	02/24/04	02/24/04
DATE ANALYZED:		02/27/04	02/26/04	02/26/04	02/26/04

SITE: COLE BROOK PINES LANDFILL
CASE: 32598 SDG: A1C01
LABORATORY: CEIMIC CORPORATION

TABLE 3
PESTICIDE/POLYCHLORINATED BIPHENYL AQUEOUS ANALYSES
µg/L

SAMPLE NUMBER:		A1CN0	A1CN1	A1CN2	A1CN3	A1CN4
SAMPLE LOCATION:		GW-01	GW-02	GW-03	GW-04	GW-05
LABORATORY NUMBER:		040130-05	040130-06	040130-20	040130-07	040130-21
COMPOUND	CRQL					
alpha-BHC	0.050	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
beta-BHC	0.050	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
delta-BHC	0.050	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
gamma-BHC (Lindane)	0.050	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Heptachlor	0.050	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Aldrin	0.050	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Heptachlor Epoxide	0.050	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Endosulfan I	0.050	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Dieldrin	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDE	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endrin	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endosulfan II	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDD	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endosulfan Sulfate	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDT	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Methoxychlor	0.50	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Endrin Ketone	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endrin Aldehyde	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
alpha-Chlordane	0.050	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
gamma-Chlordane	0.050	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Toxaphene	5.0	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Aroclor-1016	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1221	2.0	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Aroclor-1232	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1242	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1248	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1254	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1260	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:		02/17/04	02/18/04	02/18/04	02/17/04	02/19/04
DATE EXTRACTED:		02/23/04	02/23/04	02/24/04	02/23/04	02/24/04
DATE ANALYZED:		02/25/04	02/25/04	02/26/04	02/25/04	02/26/04

SITE: COLE BROOK PINES LANDFILL
CASE: 32598 SDG: A1C01
LABORATORY: CEIMIC CORPORATION

TABLE 3
PESTICIDE/POLYCHLORINATED BIPHENYL AQUEOUS ANALYSES
µg/L

SAMPLE NUMBER:		A1CN5	A1CN6	A1CN7	A1CN8	A1CN9	A1CP0
SAMPLE LOCATION:		GW-06	GW-07	GW-08	GW-09	GW-10	GW-11
LABORATORY NUMBER:		040130-08	040130-09	040130-10	040130-11	040130-12	040130-22
COMPOUND	CRQL						
alpha-BHC	0.050	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
beta-BHC	0.050	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
delta-BHC	0.050	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
gamma-BHC (Lindane)	0.050	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Heptachlor	0.050	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Aldrin	0.050	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Heptachlor Epoxide	0.050	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Endosulfan I	0.050	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Dieldrin	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDE	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endrin	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endosulfan II	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDD	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endosulfan Sulfate	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDT	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Methoxychlor	0.50	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Endrin Ketone	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endrin Aldehyde	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
alpha-Chlordane	0.050	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
gamma-Chlordane	0.050	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Toxaphene	5.0	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Aroclor-1016	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1221	2.0	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Aroclor-1232	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1242	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1248	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1254	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1260	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:		02/18/04	02/18/04	02/18/04	02/17/04	02/17/04	02/19/04
DATE EXTRACTED:		02/23/04	02/23/04	02/23/04	02/23/04	02/23/04	02/24/04
DATE ANALYZED:		02/25/04	02/26/04	02/26/04	02/26/04	02/26/04	02/26/04

SITE: COLE BROOK PINES LANDFILL
CASE: 32598 SDG: A1C01
LABORATORY: CEIMIC CORPORATION

TABLE 3
PESTICIDE/POLYCHLORINATED BIPHENYL AQUEOUS ANALYSES
µg/L

SAMPLE NUMBER:		A1CP1	A1CP2	A1CP3	A1CP4
SAMPLE LOCATION:		GW-12	GW-13	GW-14	GW-15
LABORATORY NUMBER:		040130-23	040130-13	040130-14	040130-15
COMPOUND	CRQL				
alpha-BHC	0.050	0.050 UJ	0.050 U	0.050 U	0.050 U
beta-BHC	0.050	0.050 UJ	0.050 U	0.050 U	0.050 U
delta-BHC	0.050	0.050 UJ	0.050 U	0.050 U	0.050 U
gamma-BHC (Lindane)	0.050	0.050 UJ	0.050 U	0.050 U	0.050 U
Heptachlor	0.050	0.050 UJ	0.050 U	0.050 U	0.050 U
Aldrin	0.050	0.050 UJ	0.050 U	0.050 U	0.050 U
Heptachlor Epoxide	0.050	0.050 UJ	0.050 U	0.050 U	0.050 U
Endosulfan I	0.050	0.050 UJ	0.050 U	0.050 U	0.050 U
Dieldrin	0.10	0.10 UJ	0.10 U	0.10 U	0.10 U
4,4'-DDE	0.10	0.10 UJ	0.10 U	0.10 U	0.10 U
Endrin	0.10	0.10 UJ	0.10 U	0.10 U	0.10 U
Endosulfan II	0.10	0.10 UJ	0.10 U	0.10 U	0.10 U
4,4'-DDD	0.10	0.10 UJ	0.10 U	0.10 U	0.10 U
Endosulfan Sulfate	0.10	0.10 UJ	0.10 U	0.10 U	0.10 U
4,4'-DDT	0.10	0.10 UJ	0.10 U	0.10 U	0.10 U
Methoxychlor	0.50	0.50 UJ	0.50 U	0.50 U	0.50 U
Endrin Ketone	0.10	0.10 UJ	0.10 U	0.10 U	0.10 U
Endrin Aldehyde	0.10	0.10 UJ	0.10 U	0.10 U	0.10 U
alpha-Chlordane	0.050	0.050 UJ	0.050 U	0.050 U	0.050 U
gamma-Chlordane	0.050	0.050 UJ	0.050 U	0.050 U	0.050 U
Toxaphene	5.0	5.0 UJ	5.0 U	5.0 U	5.0 U
Aroclor-1016	1.0	1.0 UJ	1.0 U	1.0 U	1.0 U
Aroclor-1221	2.0	2.0 UJ	2.0 U	2.0 U	2.0 U
Aroclor-1232	1.0	1.0 UJ	1.0 U	1.0 U	1.0 U
Aroclor-1242	1.0	1.0 UJ	1.0 U	1.0 U	1.0 U
Aroclor-1248	1.0	1.0 UJ	1.0 U	1.0 U	1.0 U
Aroclor-1254	1.0	1.0 UJ	1.0 U	1.0 U	1.0 U
Aroclor-1260	1.0	1.0 UJ	1.0 U	1.0 U	1.0 U
DILUTION FACTOR:		1.0	1.0	1.0	1.0
DATE SAMPLED:		02/18/04	02/17/04	02/17/04	02/18/04
DATE EXTRACTED:		02/24/04	02/23/04	02/23/04	02/23/04
DATE ANALYZED:		02/26/04	02/26/04	02/26/04	02/26/04

SITE: COLE BROOK PINES LANDFILL
CASE: 32598 SDG: A1C01
LABORATORY: CEIMIC CORPORATION

TABLE 3
PESTICIDE/POLYCHLORINATED BIPHENYL AQUEOUS ANALYSES
µg/L

SAMPLE NUMBER:		A1CP1	A1CP2	A1CP3	A1CP4
SAMPLE LOCATION:		GW-12	GW-13	GW-14	GW-15
LABORATORY NUMBER:		040130-23	040130-13	040130-14	040130-15
COMPOUND	CRQL				
alpha-BHC	0.050	0.050 UJ	0.050 U	0.050 U	0.050 U
beta-BHC	0.050	0.050 UJ	0.050 U	0.050 U	0.050 U
delta-BHC	0.050	0.050 UJ	0.050 U	0.050 U	0.050 U
gamma-BHC (Lindane)	0.050	0.050 UJ	0.050 U	0.050 U	0.050 U
Heptachlor	0.050	0.050 UJ	0.050 U	0.050 U	0.050 U
Aldrin	0.050	0.050 UJ	0.050 U	0.050 U	0.050 U
Heptachlor Epoxide	0.050	0.050 UJ	0.050 U	0.050 U	0.050 U
Endosulfan I	0.050	0.050 UJ	0.050 U	0.050 U	0.050 U
Dieldrin	0.10	0.10 UJ	0.10 U	0.10 U	0.10 U
4,4'-DDE	0.10	0.10 UJ	0.10 U	0.10 U	0.10 U
Endrin	0.10	0.10 UJ	0.10 U	0.10 U	0.10 U
Endosulfan II	0.10	0.10 UJ	0.10 U	0.10 U	0.10 U
4,4'-DDD	0.10	0.10 UJ	0.10 U	0.10 U	0.10 U
Endosulfan Sulfate	0.10	0.10 UJ	0.10 U	0.10 U	0.10 U
4,4'-DDT	0.10	0.10 UJ	0.10 U	0.10 U	0.10 U
Methoxychlor	0.50	0.50 UJ	0.50 U	0.50 U	0.50 U
Endrin Ketone	0.10	0.10 UJ	0.10 U	0.10 U	0.10 U
Endrin Aldehyde	0.10	0.10 UJ	0.10 U	0.10 U	0.10 U
alpha-Chlordane	0.050	0.050 UJ	0.050 U	0.050 U	0.050 U
gamma-Chlordane	0.050	0.050 UJ	0.050 U	0.050 U	0.050 U
Toxaphene	5.0	5.0 UJ	5.0 U	5.0 U	5.0 U
Aroclor-1016	1.0	1.0 UJ	1.0 U	1.0 U	1.0 U
Aroclor-1221	2.0	2.0 UJ	2.0 U	2.0 U	2.0 U
Aroclor-1232	1.0	1.0 UJ	1.0 U	1.0 U	1.0 U
Aroclor-1242	1.0	1.0 UJ	1.0 U	1.0 U	1.0 U
Aroclor-1248	1.0	1.0 UJ	1.0 U	1.0 U	1.0 U
Aroclor-1254	1.0	1.0 UJ	1.0 U	1.0 U	1.0 U
Aroclor-1260	1.0	1.0 UJ	1.0 U	1.0 U	1.0 U
DILUTION FACTOR:		1.0	1.0	1.0	1.0
DATE SAMPLED:		02/18/04	02/17/04	02/17/04	02/18/04
DATE EXTRACTED:		02/24/04	02/23/04	02/23/04	02/23/04
DATE ANALYZED:		02/26/04	02/26/04	02/26/04	02/26/04

SITE: COLE BROOK PINES LANDFILL
CASE: 32598 SDG: MA1C07
LABORATORY: BONNER ANALYTICAL TESTING CO.

TABLE 1
INORGANIC AQUEOUS ANALYSES
µg/L

SAMPLE NUMBER:			MA1CN0	MA1CN1	MA1CN3	MA1CN5	MA1CN6	MA1CN7	MA1CN8	
SAMPLE LOCATION:			GW-01	GW-02	GW-04	GW-06	GW-07	GW-08	GW-09	
LABORATORY NUMBER:			BT97561	BT97562	BT97563	BT97564	BT97565	BT97566	BT97567	
INORGANIC ANALYTES	METHOD	METHOD DETECTION LIMITS (µg/L)								CONTRACT QUANTITATION LIMITS (µg/L)
ALUMINUM	P	8.3	123 U	3740	43.7 U	273	1420	3070	1020	200
ANTIMONY	P	5.0	60.0 U	60.0 U	60.0 U	60.0 U	60.0 U	60.0 U	60.0 U	60
ARSENIC	P	2.9	15.0 UJ	15.0 UJ	15.0 UJ	15.0 UJ	15.0 UJ	15.0 UJ	15.0 UJ	15
BARIUM	P	0.50	9.9 J	25.4	258	11.5 J	37.3	22.8	10.5 J	200
BERYLLIUM	P	0.020	5.0 UJ	0.24 J	5.0 UJ	5.0 UJ	0.09 J	0.17 J	5.0 UJ	5
CADMIUM	P	0.30	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5
CALCIUM	P	21.4	2280	1200	41300	6560	1200	1160	2760	5000
CHROMIUM	P	0.40	85.3 J	0.45 UJ	1.2 UJ	0.57 UJ	0.69 UJ	10.0 UJ	0.83 UJ	10
COBALT	P	0.60	4.1	50.0 U	50.0 U	50.0 U	0.64 J	50.0 U	50.0 U	50
COPPER	P	0.50	22.4 J	2.3 UJ	12.1 J	1.3 UJ	2.4 UJ	1.4 UJ	1.5 UJ	25
IRON	P	7.1	543 J	1040 J	14500 J	227 J	641 J	820 J	1240 J	100
LEAD	P	3.7	10.0 U	10.0 U	103	10.0 U	10.0 U	10.0 U	10.0 U	10
MAGNESIUM	P	3.8	815	584	3230	2330	718	509	1540	5000
MANGANESE	P	0.20	202	131	236	123	228	124	17.0	15
MERCURY	CV	0.040	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2
NICKEL	P	1.1	121 J	40.0 UJ	4.8 J	40.0 UJ	40.0 UJ	40.0 UJ	40.0 UJ	40
POTASSIUM	P	9.4	961 J	1250 J	1480 J	1130 J	793 J	1160 J	574 J	5000
SELENIUM	P	4.3	35.0 U	35.0 U	35.0 U	35.0 U	35.0 U	35.0 U	35.0 U	35
SILVER	P	0.90	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10
SODIUM	P	199	4580	3740	4830	6350	3180	3900	6310	5000
THALLIUM	P	2.9	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U	25
VANADIUM	P	0.40	50.0 U	1.2	1.2	50.0 U	0.52 J	0.65 J	1.6	50
ZINC	P	1.2	60.0 UJ	4.1 UJ	322	6.8 UJ	60.0 UJ	11.3 UJ	7.9 J	60
CYANIDE	AS	2.0	2.6 J	2.2 J	10.00 U	10.00 U	10.00 U	10.00 U	189	10

ANALYTICAL METHOD
P - ICP
CV - COLD VAPOR
AS - SEMI AUTOMATED SPECTROPHOTOMETRIC

NOTE:
J - QUANTITATION IS ESTIMATED DUE TO LIMITATIONS IDENTIFIED IN THE QUALITY CONTROL REVIEW (DATA REVIEW).
U - VALUE IS NON-DETECTED.
UJ - VALUE IS NON-DETECTED AND DETECTION LIMIT IS ESTIMATED.
R - VALUE IS REJECTED.

SITE: COLE BROOK PINES LANDFILL
CASE: 32598 SDG: MA1C07
LABORATORY: BONNER ANALYTICAL TESTING CO.

TABLE 1
INORGANIC AQUEOUS ANALYSES
µg/L

SAMPLE NUMBER:			MA1CN9	MA1CP2	MA1CP3	MA1CP4	
SAMPLE LOCATION:			GW-10	GW-13	GW-14	GW-15	
LABORATORY NUMBER:			BT97568	BT97569	BT97570	BT97571	
INORGANIC ANALYTES	METHOD	METHOD DETECTION LIMITS (µg/L)					CONTRACT QUANTITATION LIMITS (µg/L)
ALUMINUM	P	8.3	1580	10.6 UJ	100 U	200 U	200
ANTIMONY	P	5.0	60.0 U	60.0 U	60.0 U	60.0 U	60
ARSENIC	P	2.9	15.0 UJ	15.0 UJ	15.0 UJ	15.0 UJ	15
BARIUM	P	0.50	113	18.4	47.8	7.4 J	200
BERYLLIUM	P	0.020	0.07 J	5.0 UJ	5.0 UJ	5.0 UJ	5
CADMIUM	P	0.30	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5
CALCIUM	P	21.4	13100	41600	12800	2870	5000
CHROMIUM	P	0.40	191 J	1.0 UJ	0.52 UJ	10.0 UJ	10
COBALT	P	0.60	4.1	50.0 U	50.0 U	50.0 U	50
COPPER	P	0.50	41.5 J	1.2 UJ	1.3 UJ	0.74 UJ	25
IRON	P	7.1	3030 J	2950 J	110 J	100 UJ	100
LEAD	P	3.7	10.0 U	10.0 U	10.0 U	10.0 U	10
MAGNESIUM	P	3.8	8050	3770	6450	1280	5000
MANGANESE	P	0.20	184	358	221	15.0 UJ	15
MERCURY	CV	0.040	0.20 U	0.20 U	0.20 U	0.20 U	0.2
NICKEL	P	1.1	91.4 J	40.0 UJ	40.0 UJ	40.0 UJ	40
POTASSIUM	P	9.4	4700 J	1800 J	3260 J	950 J	5000
SELENIUM	P	4.3	35.0 U	35.0 U	35.0 U	35.0 U	35
SILVER	P	0.90	10.0 U	10.0 U	10.0 U	10.0 U	10
SODIUM	P	199	14400	8490	10400	3810	5000
THALLIUM	P	2.9	25.0 U	25.0 U	25.0 U	25.0 U	25
VANADIUM	P	0.40	5.8	3.7	50.0 U	50.0 U	50
ZINC	P	1.2	5.6 J	8.7 J	60.0 UJ	60.0 UJ	60
CYANIDE	AS	2.0	3.9 J	56.00	4.2 J	10.00 U	10

ANALYTICAL METHOD
P - ICP
CV - COLD VAPOR
AS - SEMI AUTOMATED SPECTROPHOTOMETRIC

NOTE:
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U - VALUE IS NON-DETECTED.
UJ - VALUE IS NON-DETECTED AND DETECTION LIMIT IS ESTIMATED.
R - VALUE IS REJECTED.

SITE: COLE BROOK PINES LANDFILL
CASE: 32598 SDG: MA17F6
LABORATORY: BONNER ANALYTICAL TESTING CO.

TABLE 1
INORGANIC AQUEOUS ANALYSES
µg/L

SAMPLE NUMBER:			MA17F6	MA1CN2	MA1CN4	MA1CP0	MA1CP1	
SAMPLE LOCATION:			GW-11	GW-03	GW-05	GW-11	GW-12	
LABORATORY NUMBER:			BT97582	BT97584	BT97585	BT97586	BT97587	
			Dissolved	Total	Total	Total	Total	
INORGANIC ANALYTES	METHOD	METHOD DETECTION LIMITS (µg/L)						CONTRACT QUANTITATION LIMITS (µg/L)
ALUMINUM	P	8.3	17200 J	14100	261	41700	200 U	200
ANTIMONY	P	5.0	6.2 UJ	60.0 U	60.0 U	8.3 UJ	60.0 U	60
ARSENIC	P	2.9	15.0 UJ	7.0	15.0 U	15.0 U	15.0 U	15
BARIUM	P	0.50	155 J	17.1	24.1	378	18.1	200
BERYLLIUM	P	0.020	1.8 J	6.9	0.14 J	3.1	5.0 UJ	5
CADMIUM	P	0.30	0.51 J	2.2	5.0 U	1.6	5.0 U	5
CALCIUM	P	21.4	7360 J	21100	1380	11900	72600	5000
CHROMIUM	P	0.40	5.1 J	2.0 UJ	0.89 UJ	12.0 J	41.2 J	10
COBALT	P	0.60	1.8 J	47.8	0.69 J	7.5	50.0 U	50
COPPER	P	0.50	11.5 J	6.0 J	0.65 UJ	36.1 J	8.2 J	25
IRON	P	7.1	10000 J	74.3 UJ	83.3 UJ	28200 J	276 J	100
LEAD	P	3.7	14.2 J	10.0 UJ	10.0 UJ	30.9	10.0 UJ	10
MAGNESIUM	P	3.8	4650 J	8380	729	11100	5230	5000
MANGANESE	P	0.20	383 J	1880	403	742	318	15
MERCURY	CV	0.040	0.20 UJ	0.20 U	0.20 U	0.20 U	0.20 U	0.2
NICKEL	P	1.1	3.6 J	91.0 J	2.0 J	9.5 J	20.6 J	40
POTASSIUM	P	9.4	2210 J	1720 J	458 J	6730 J	2250 J	5000
SELENIUM	P	4.3	35.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	35.0 UJ	35
SILVER	P	0.90	10.0 UJ	10.0 U	10.0 U	10.0 U	10.0 U	10
SODIUM	P	199	17400 J	2950	3420	19100	4610	5000
THALLIUM	P	2.9	25.0 UJ	25.0 U	25.0 U	25.0 U	25.0 U	25
VANADIUM	P	0.40	9.3 J	50.0 U	50.0 U	36.3	0.48 J	50
ZINC	P	1.2	30.6 J	316	25.6	66.4	60.0 UJ	60
CYANIDE	AS	2.0	NA	10.00 U	10.00 U	10.00 U	10.00 U	10

ANALYTICAL METHOD
P - ICP
CV - COLD VAPOR
AS - SEMI AUTOMATED SPECTROPHOTOMETRIC

NOTE:
J - QUANTITATION IS ESTIMATED DUE TO LIMITATIONS IDENTIFIED IN THE QUALITY CONTROL REVIEW (DATA REVIEW).
U - VALUE IS NON-DETECTED.
UJ - VALUE IS NON-DETECTED AND DETECTION LIMIT IS ESTIMATED.
R - VALUE IS REJECTED.
NA - NOT ANALYZED.

ATTACHMENT D
COLE BROOK PINES LANDFILL
START DRINKING WATER SAMPLE ANALYTICAL RESULTS
Samples Collected 18 February 2004

SITE: COLE BROOK PINES LANDFILL
CASE: 32598 SDG: A1C03
LABORATORY: A4 SCIENTIFIC, INC.

TABLE 1
VOLATILE AQUEOUS ANALYSES
µg/L

SAMPLE NUMBER:		A1CP6		A1CP7	
SAMPLE LOCATION:		DW-01		DW-02	
LABORATORY NUMBER:		4518.006		4518.007	
COMPOUND	CRQL				
Dichlorodifluoromethane	0.50	0.50	U	0.50	U
Chloromethane	0.50	0.50	UJ	0.50	U
Vinyl Chloride	0.50	0.50	U	0.50	U
Bromomethane	0.50	0.50	U	0.50	U
Chloroethane	0.50	0.50	UJ	0.50	U
Trichlorofluoromethane	0.50	0.50	UJ	0.50	U
1,1-Dichloroethene	0.50	0.50	U	0.50	U
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	0.50	UJ	0.50	U
Acetone	5.0	5.0	UJ		R
Carbon Disulfide	0.50	0.50	U	0.50	U
Methyl Acetate	0.50	0.50	UJ	0.50	U
Methylene Chloride	0.50	0.50	U	0.24	J
trans-1,2-Dichloroethene	0.50	0.50	U	0.50	U
Methyl tert-Butyl Ether	0.50	0.50	UJ	0.50	U
1,1-Dichloroethane	0.50	0.50	UJ	0.50	U
cis-1,2-Dichloroethene	0.50	0.50	U	0.50	U
2-Butanone	5.0	5.0	UJ		R
Bromochloromethane	0.50	0.50	UJ	0.50	U
Chloroform	0.50	0.50	U	0.50	U
1,1,1-Trichloroethane	0.50	0.50	U	0.50	U
Cyclohexane	0.50	0.50	UJ	0.50	U
Carbon Tetrachloride	0.50	0.50	UJ	0.50	U
Benzene	0.50	0.50	U	0.50	U
1,2-Dichloroethane	0.50	0.50	U	0.50	U
Trichloroethene	0.50	0.50	U	0.50	U
Methylcyclohexane	0.50	0.50	U	0.50	U
1,2-Dichloropropane	0.50	0.50	UJ	0.50	U
Bromodichloromethane	0.50	0.50	U	0.50	U
cis-1,3-Dichloropropene	0.50	0.50	U	0.50	U
4-Methyl-2-Pentanone	5.0	5.0	UJ	5.0	U
Toluene	0.50	0.50	U	0.50	U
trans-1,3-Dichloropropene	0.50	0.50	U	0.50	U
1,1,2-Trichloroethane	0.50	0.50	U	0.50	U
Tetrachloroethene	0.50	0.50	UJ	0.50	U
2-Hexanone	5.0	5.0	UJ	5.0	U
Dibromochloromethane	0.50	0.50	UJ	0.50	U
1,2-Dibromoethane	0.50	0.50	U	0.50	U
Chlorobenzene	0.50	0.50	U	0.50	U
Ethylbenzene	0.50	0.50	U	0.50	U
Xylene (Total)	0.50	0.50	U	0.50	U
Styrene	0.50	0.50	U	0.50	U
Bromoform	0.50	0.50	U	0.50	U
Isopropylbenzene	0.50	0.50	U	0.50	U
1,1,2,2-Tetrachloroethane	0.50	0.50	U	0.50	U
1,3-Dichlorobenzene	0.50	0.50	U	0.50	U
1,4-Dichlorobenzene	0.50	0.50	U	0.50	U
1,2-Dichlorobenzene	0.50	0.50	U	0.50	U
1,2-Dibromo-3-chloropropane	0.50	0.50	UJ	0.50	U
1,2,4-Trichlorobenzene	0.50	0.50	U	0.50	U
1,2,3-Trichlorobenzene	0.50	0.50	U	0.50	U
DILUTION FACTOR:		1.0		1.0	
DATE SAMPLED:		02/18/04		02/18/04	
DATE ANALYZED:		02/22/04		02/25/04	

SITE: COLE BROOK PINES LANDFILL
CASE: 32598 SDG: A1C03
LABORATORY: A4 SCIENTIFIC, INC.

TABLE 2
SEMIVOLATILE AQUEOUS ANALYSES
µg/L

SAMPLE NUMBER:		A1CP6	A1CP7
SAMPLE LOCATION:		DW-01	DW-02
LABORATORY NUMBER:		4518.006	4518.007
COMPOUND	CRQL		
Benzaldehyde	5.0	5.0 U	5.0 U
Phenol	5.0	5.0 U	5.0 U
bis(2-Chloroethyl)Ether	5.0	5.0 U	5.0 U
2-Chlorophenol	5.0	5.0 U	5.0 U
2-Methylphenol	5.0	5.0 U	5.0 U
2,2'-oxybis(1-Chloropropane)	5.0	5.0 U	5.0 U
Acetophenone	5.0	5.0 U	5.0 U
4-Methylphenol	5.0	5.0 U	5.0 U
N-Nitroso-di-n-propylamine	5.0	5.0 UJ	5.0 U
Hexachloroethane	5.0	5.0 U	5.0 U
Nitrobenzene	5.0	5.0 U	5.0 U
Isophorone	5.0	5.0 U	5.0 U
2-Nitrophenol	5.0	5.0 U	5.0 U
2,4-Dimethylphenol	5.0	5.0 U	5.0 U
bis(2-Chloroethoxy)methane	5.0	5.0 U	5.0 U
2,4-Dichlorophenol	5.0	5.0 U	5.0 U
Naphthalene	5.0	5.0 U	5.0 U
4-Chloroaniline	5.0	5.0 U	5.0 U
Hexachlorobutadiene	5.0	5.0 U	5.0 U
Caprolactam	5.0	5.0 UJ	5.0 UJ
4-Chloro-3-methylphenol	5.0	5.0 U	5.0 U
2-Methylnaphthalene	5.0	5.0 U	5.0 U
Hexachlorocyclopentadiene	5.0	5.0 U	5.0 U
2,4,6-Trichlorophenol	5.0	5.0 U	5.0 U
2,4,5-Trichlorophenol	20	20 U	20 U
1,1'-Biphenyl	5.0	5.0 U	5.0 U
2-Chloronaphthalene	5.0	5.0 U	5.0 U
2-Nitroaniline	20	20 U	20 U
Dimethylphthalate	5.0	5.0 U	5.0 U
2,6-Dinitrotoluene	5.0	5.0 U	5.0 U
Acenaphthylene	5.0	5.0 U	5.0 U
3-Nitroaniline	20	20 U	20 U
Acenaphthene	5.0	5.0 UJ	5.0 U
2,4-Dinitrophenol	20	20 U	20 U
4-Nitrophenol	20	20 U	20 U
Dibenzofuran	5.0	5.0 U	5.0 U
2,4-Dinitrotoluene	5.0	5.0 U	5.0 U
Diethylphthalate	5.0	5.0 U	5.0 U
Fluorene	5.0	5.0 U	5.0 U
4-Chlorophenyl-phenylether	5.0	5.0 U	5.0 U
4-Nitroaniline	20	20 U	20 U
4,6-Dinitro-2-methylphenol	20	20 U	20 U
N-Nitrosodiphenylamine (1)	5.0	5.0 U	5.0 U
4-Bromophenyl-phenylether	5.0	5.0 U	5.0 U
Hexachlorobenzene	5.0	5.0 U	5.0 U
Atrazine	5.0	5.0 U	5.0 U
Pentachlorophenol	5.0	5.0 U	5.0 U
Phenanthrene	5.0	5.0 U	5.0 U
Anthracene	5.0	5.0 U	5.0 U
Carbazole	5.0	5.0 U	5.0 U
Di-n-butylphthalate	5.0	5.0 U	5.0 U
Fluoranthene	5.0	5.0 U	5.0 U
Pyrene	5.0	5.0 U	5.0 U
Butylbenzylphthalate	5.0	5.0 U	5.0 U
3,3'-Dichlorobenzidine	5.0	5.0 U	5.0 U
Benzo(a)anthracene	5.0	5.0 U	5.0 U
Chrysene	5.0	5.0 U	5.0 U
bis(2-Ethylhexyl)phthalate	5.0	5.0 U	5.0 U
Di-n-octylphthalate	5.0	5.0 U	5.0 U
Benzo(b)fluoranthene	5.0	5.0 U	5.0 U
Benzo(k)fluoranthene	5.0	5.0 U	5.0 U
Benzo(a)pyrene	5.0	5.0 U	5.0 U
Indeno(1,2,3-cd)pyrene	5.0	5.0 U	5.0 U
Dibenzo(a,h)anthracene	5.0	5.0 U	5.0 U
Benzo(g,h,i)perylene	5.0	5.0 U	5.0 U
DILUTION FACTOR:		1.0	1.0
DATE SAMPLED:		02/18/04	02/18/04
DATE EXTRACTED:		02/20/04	02/20/04
DATE ANALYZED:		02/23/04	02/23/04

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS

SITE: COLE BROOK PINES LANDFILL
CASE: 32598 SDG: A1C03
LABORATORY: A4 SCIENTIFIC, INC.

TABLE 3
PESTICIDE/POLYCHLORINATED BIPHENYL AQUEOUS ANALYSES
µg/L

SAMPLE NUMBER:		A1CP6	A1CP7
SAMPLE LOCATION:		DW-01	DW-02
LABORATORY NUMBER:		4518.006	4518.007
COMPOUND	CRQL		
alpha-BHC	0.010	0.010 U	0.010 U
beta-BHC	0.010	0.010 U	0.010 U
delta-BHC	0.010	0.010 U	0.010 U
gamma-BHC (Lindane)	0.010	0.010 U	0.010 U
Heptachlor	0.010	0.010 U	0.010 U
Aldrin	0.010	0.010 U	0.010 U
Heptachlor Epoxide	0.010	0.010 U	0.010 U
Endosulfan I	0.010	0.010 U	0.010 U
Dieldrin	0.020	0.020 U	0.020 U
4,4'-DDE	0.020	0.020 U	0.020 U
Endrin	0.020	0.020 U	0.020 U
Endosulfan II	0.020	0.020 U	0.020 U
4,4'-DDD	0.020	0.020 U	0.020 U
Endosulfan Sulfate	0.020	0.020 U	0.020 U
4,4'-DDT	0.020	0.020 U	0.020 U
Methoxychlor	0.10	0.10 U	0.10 U
Endrin Ketone	0.020	0.020 U	0.020 U
Endrin Aldehyde	0.020	0.020 U	0.020 U
alpha-Chlordane	0.010	0.010 U	0.010 U
gamma-Chlordane	0.010	0.010 U	0.010 U
Toxaphene	1.0	1.0 U	1.0 U
Aroclor-1016	0.20	0.20 U	0.20 U
Aroclor-1221	0.40	0.40 U	0.40 U
Aroclor-1232	0.20	0.20 U	0.20 U
Aroclor-1242	0.20	0.20 U	0.20 U
Aroclor-1248	0.20	0.20 U	0.20 U
Aroclor-1254	0.20	0.20 U	0.20 U
Aroclor-1260	0.20	0.20 U	0.20 U
DILUTION FACTOR:		1.0	1.0
DATE SAMPLED:		02/18/04	02/18/04
DATE EXTRACTED:		02/20/04	02/20/04
DATE ANALYZED:		02/23/04	02/23/04

SITE: COLE BROOK PINES LANDFILL
CASE: 32598 SDG: MA1C07
LABORATORY: BONNER ANALYTICAL TESTING CO.

TABLE 1
INORGANIC AQUEOUS ANALYSES
µg/L

SAMPLE NUMBER:			MA1CP6	MA1CP7	
SAMPLE LOCATION:			DW-01	DW-02	
LABORATORY NUMBER:			BT97572	BT97573	
INORGANIC ANALYTES	METHOD	METHOD DETECTION LIMITS (µg/L)			CONTRACT QUANTITATION LIMITS (µg/L)
ALUMINUM	P	8.3	200 U	200 U	200
ANTIMONY	P	5.0	60.0 U	60.0 U	60
ARSENIC	P	2.9	15.0 U	15.0 U	15
BARIUM	P	0.50	200 UJ	200 UJ	200
BERYLLIUM	P	0.020	5.0 UJ	5.0 UJ	5
CADMIUM	P	0.30	5.0 UJ	5.0 UJ	5
CALCIUM	P	21.4	15700	15700	5000
CHROMIUM	P	0.40	10.0 U	10.0 U	10
COBALT	P	0.60	50.0 U	50.0 U	50
COPPER	P	0.50	6.8	7.6	25
IRON	P	7.1	29.2	23.0	100
LEAD	P	3.7	10.0 U	10.0 U	10
MAGNESIUM	P	3.8	2700	2740	5000
MANGANESE	P	0.20	15.0 UJ	15.0 UJ	15
MERCURY	CV	0.040	0.20 U	0.20 U	0.2
NICKEL	P	1.1	40.0 U	40.0 U	40
POTASSIUM	P	9.4	1410 J	1430 J	5000
SELENIUM	P	4.3	35.0 U	35.0 U	35
SILVER	P	0.90	10.0 U	10.0 U	10
SODIUM	P	199	11700	11800	5000
THALLIUM	P	2.9	25.0 U	25.0 U	25
VANADIUM	P	0.40	50.0 U	50.0 U	50
ZINC	P	1.2	60.0 UJ	60.0 UJ	60
CYANIDE	AS	2.0	10.00 U	10.00 U	10

ANALYTICAL METHOD
P - ICP
CV - COLD VAPOR
AS - SEMI AUTOMATED SPECTROPHOTOMETRIC

NOTE:
J - QUANTITATION IS ESTIMATED DUE TO LIMITATIONS IDENTIFIED IN THE QUALITY CONTROL REVIEW (DATA REVIEW).
U - VALUE IS NON-DETECTED.
UJ - VALUE IS NON-DETECTED AND DETECTION LIMIT IS ESTIMATED.
R - VALUE IS REJECTED.

ATTACHMENT E
COLE BROOK PINES LANDFILL
START SEDIMENT SAMPLE ANALYTICAL RESULTS
Samples Collected on 13 April 2004

SITE: COLE BROOK PINES LANDFILL
CASE: 0680F SDG: D15294
LABORATORY: COMPUCHEM

TABLE 1
VOLATILE SOIL ANALYSES - LOW LEVEL
µg/kg

SAMPLE NUMBER:		D15294	D15295	D15296	D15298	D15299
SAMPLE LOCATION:		SD-01	SD-02	SD-03	SD-05	SD-06
LABORATORY NUMBER:		266501	266502	266503	266504	266505
COMPOUND	CRQL					
Dichlorodifluoromethane	10	10 UJ	10 UJ	10 UJ	R	R
Chloromethane	10	10 U	10 U	10 U	R	R
Vinyl Chloride	10	10 U	10 U	10 U	R	R
Bromomethane	10	10 U	10 U	10 U	R	R
Chloroethane	10	10 UJ	10 UJ	10 UJ	R	R
Trichlorofluoromethane	10	10 U	10 U	10 U	R	R
1,1-Dichloroethene	10	10 U	10 U	10 U	R	R
1,1,2-Trichloro-1,2,2-trifluoroethane	10	10 U	10 U	10 U	R	R
Acetone	10	45	18 U	10 U	240 J	380 J
Carbon Disulfide	10	10 U	10 U	10 U	R	R
Methyl Acetate	10	10 U	10 U	1 J	R	110 J
Methylene Chloride	10	10 U	10 U	10 U	R	R
trans-1,2-Dichloroethene	10	10 U	10 U	10 U	R	R
Methyl tert-Butyl Ether	10	10 U	10 U	10 U	R	R
1,1-Dichloroethane	10	10 U	10 U	10 U	R	R
cis-1,2-Dichloroethene	10	10 U	10 U	10 U	R	R
2-Butanone	10	7 J	3 J	10 U	29 J	28 J
Chloroform	10	10 U	10 U	10 U	R	R
1,1,1-Trichloroethane	10	10 U	10 U	10 U	R	R
Cyclohexane	10	10 U	10 U	10 U	R	R
Carbon Tetrachloride	10	10 U	10 U	10 U	R	R
Benzene	10	10 U	10 U	10 U	R	R
1,2-Dichloroethane	10	10 U	10 U	10 U	R	R
Trichloroethene	10	10 U	10 U	10 U	R	R
Methylcyclohexane	10	10 U	10 U	10 U	R	R
1,2-Dichloropropane	10	10 U	10 U	10 U	R	R
Bromodichloromethane	10	10 U	10 U	10 U	R	R
cis-1,3-Dichloropropene	10	10 U	10 U	10 U	R	R
4-Methyl-2-Pentanone	10	10 U	10 U	10 U	R	R
Toluene	10	10 U	10 U	10 U	R	R
trans-1,3-Dichloropropene	10	10 U	10 U	10 U	R	R
1,1,2-Trichloroethane	10	10 U	10 U	10 U	R	R
Tetrachloroethene	10	10 U	10 U	10 U	R	R
2-Hexanone	10	10 U	10 U	10 U	R	R
Dibromochloromethane	10	10 U	10 U	10 U	R	R
1,2-Dibromoethane	10	10 U	10 U	10 U	R	R
Chlorobenzene	10	10 U	10 U	10 U	R	R
Ethylbenzene	10	10 U	10 U	10 U	R	R
Xylene (Total)	10	10 U	10 U	10 U	R	R
Styrene	10	10 U	10 U	10 U	R	R
Bromoform	10	10 U	10 U	10 U	R	R
Isopropylbenzene	10	10 U	10 U	10 U	R	R
1,1,2,2-Tetrachloroethane	10	10 U	10 U	10 U	R	R
1,3-Dichlorobenzene	10	10 U	10 U	10 U	R	R
1,4-Dichlorobenzene	10	10 U	10 U	10 U	R	R
1,2-Dichlorobenzene	10	10 U	10 U	10 U	R	R
1,2-Dibromo-3-chloropropane	10	10 U	10 U	10 U	R	R
1,2,4-Trichlorobenzene	10	10 U	10 U	10 U	R	R
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:		04/13/04	04/13/04	04/13/04	04/13/04	04/13/04
DATE ANALYZED:		04/16/04	04/16/04	04/16/04	04/19/04	04/16/04
% MOISTURE:		38	39	27	78	76

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: COLE BROOK PINES LANDFILL
CASE: 0680F SDG: D15294
LABORATORY: COMPUCHEM

TABLE 1
VOLATILE SOIL ANALYSES - LOW LEVEL
µg/kg

SAMPLE NUMBER:		D15300	D15302	D15303	D15304	D15305
SAMPLE LOCATION:		SD-07	SD-09	SD-10	SD-11	SD-12
LABORATORY NUMBER:		266506	266507	266508	266509	266510
COMPOUND	CRQL					
Dichlorodifluoromethane	10	R	R	10 UJ	10 UJ	R
Chloromethane	10	R	R	10 UJ	10 UJ	R
Vinyl Chloride	10	R	R	10 U	10 U	R
Bromomethane	10	R	R	10 U	10 U	R
Chloroethane	10	R	R	10 UJ	10 UJ	R
Trichlorofluoromethane	10	R	R	10 U	10 U	R
1,1-Dichloroethene	10	R	R	10 U	10 U	R
1,1,2-Trichloro-1,2,2-trifluoroethane	10	R	R	10 U	10 U	R
Acetone	10	R	1200 J	45 J	19	270 J
Carbon Disulfide	10	R	R	10 U	10 U	R
Methyl Acetate	10	R	R	3 J	1 J	13 J
Methylene Chloride	10	R	R	10 U	10 U	R
trans-1,2-Dichloroethene	10	R	R	10 U	10 U	R
Methyl tert-Butyl Ether	10	R	R	10 U	10 U	R
1,1-Dichloroethane	10	R	R	10 U	10 U	R
cis-1,2-Dichloroethene	10	R	R	10 U	10 U	R
2-Butanone	10	16 J	140 J	6 J	10 U	38 J
Chloroform	10	R	R	10 U	10 U	R
1,1,1-Trichloroethane	10	R	R	10 U	10 U	R
Cyclohexane	10	R	R	10 U	10 U	R
Carbon Tetrachloride	10	R	R	10 U	10 U	R
Benzene	10	R	R	10 U	10 U	R
1,2-Dichloroethane	10	R	R	10 U	10 U	R
Trichloroethene	10	R	R	10 U	10 U	R
Methylcyclohexane	10	R	R	10 U	10 U	R
1,2-Dichloropropane	10	R	R	10 U	10 U	R
Bromodichloromethane	10	R	R	10 U	10 U	R
cis-1,3-Dichloropropene	10	R	R	10 U	10 U	R
4-Methyl-2-Pentanone	10	R	R	10 UJ	10 U	R
Toluene	10	R	R	10 U	10 U	R
trans-1,3-Dichloropropene	10	R	R	10 U	10 U	R
1,1,2-Trichloroethane	10	R	R	10 U	10 U	R
Tetrachloroethene	10	R	R	10 U	10 U	R
2-Hexanone	10	R	R	10 UJ	10 U	R
Dibromochloromethane	10	R	R	10 U	10 U	R
1,2-Dibromoethane	10	R	R	10 U	10 U	R
Chlorobenzene	10	R	R	10 U	10 U	R
Ethylbenzene	10	R	R	10 U	10 U	R
Xylene (Total)	10	R	R	10 U	10 U	R
Styrene	10	R	R	10 U	10 U	R
Bromoform	10	R	R	10 U	10 U	R
Isopropylbenzene	10	R	R	10 U	10 U	R
1,1,2,2-Tetrachloroethane	10	R	R	10 U	10 U	R
1,3-Dichlorobenzene	10	R	R	10 U	10 U	R
1,4-Dichlorobenzene	10	R	R	10 U	10 U	R
1,2-Dichlorobenzene	10	R	R	10 U	10 U	R
1,2-Dibromo-3-chloropropane	10	R	R	10 U	10 U	R
1,2,4-Trichlorobenzene	10	R	R	10 U	10 U	R
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:		04/13/04	04/13/04	04/13/04	04/13/04	04/13/04
DATE ANALYZED:		04/19/04	04/20/04	04/19/04	04/20/04	04/20/04
% MOISTURE:		82	90	44	22	80

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: COLE BROOK PINES LANDFILL
CASE: 0680F SDG: D15294
LABORATORY: COMPUCHEM

TABLE 1
VOLATILE SOIL ANALYSES - LOW LEVEL
µg/kg

SAMPLE NUMBER:		D15306	D15307
SAMPLE LOCATION:		SD-13	SD-14
LABORATORY NUMBER:		266511	266512
COMPOUND	CRQL		
Dichlorodifluoromethane	10	10 UJ	R
Chloromethane	10	10 UJ	R
Vinyl Chloride	10	10 U	R
Bromomethane	10	10 U	R
Chloroethane	10	10 UJ	R
Trichlorofluoromethane	10	10 U	R
1,1-Dichloroethene	10	10 U	R
1,1,2-Trichloro-1,2,2-trifluoroethane	10	10 U	R
Acetone	10	25 J	590 J
Carbon Disulfide	10	10 U	R
Methyl Acetate	10	1 J	24 J
Methylene Chloride	10	10 U	R
trans-1,2-Dichloroethene	10	10 U	R
Methyl tert-Butyl Ether	10	10 U	R
1,1-Dichloroethane	10	10 U	R
cis-1,2-Dichloroethene	10	10 U	R
2-Butanone	10	10 UJ	110 J
Chloroform	10	10 U	R
1,1,1-Trichloroethane	10	10 U	R
Cyclohexane	10	10 U	R
Carbon Tetrachloride	10	10 U	R
Benzene	10	10 U	R
1,2-Dichloroethane	10	10 U	R
Trichloroethene	10	10 U	R
Methylcyclohexane	10	10 U	R
1,2-Dichloropropane	10	10 U	R
Bromodichloromethane	10	10 U	R
cis-1,3-Dichloropropene	10	10 U	R
4-Methyl-2-Pentanone	10	10 UJ	R
Toluene	10	10 U	R
trans-1,3-Dichloropropene	10	10 U	R
1,1,2-Trichloroethane	10	10 U	R
Tetrachloroethene	10	10 U	R
2-Hexanone	10	10 UJ	R
Dibromochloromethane	10	10 U	R
1,2-Dibromoethane	10	10 U	R
Chlorobenzene	10	10 U	R
Ethylbenzene	10	10 U	R
Xylene (Total)	10	10 U	R
Styrene	10	10 U	R
Bromoform	10	10 U	R
Isopropylbenzene	10	10 U	R
1,1,2,2-Tetrachloroethane	10	10 U	R
1,3-Dichlorobenzene	10	10 U	R
1,4-Dichlorobenzene	10	10 U	R
1,2-Dichlorobenzene	10	10 U	R
1,2-Dibromo-3-chloropropane	10	10 U	R
1,2,4-Trichlorobenzene	10	10 U	R
DILUTION FACTOR:		1.0	1.0
DATE SAMPLED:		04/13/04	04/13/04
DATE ANALYZED:		04/20/04	04/20/04
% MOISTURE:		35	86

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

'SITE: COLE BROOK PINES LANDFILL
CASE: 0680F SDG: D15294
LABORATORY: COMPUCHEM

TABLE 2
VOLATILE SOIL ANALYSIS - MEDIUM LEVEL
µg/kg

SAMPLE NUMBER:	D15309
SAMPLE LOCATION:	SD-16
LABORATORY NUMBER:	266513

COMPOUND	CRQL		
Dichlorodifluoromethane	1300	12000	UJ
Chloromethane	1300	12000	UJ
Vinyl Chloride	1300	12000	U
Bromomethane	1300	12000	U
Chloroethane	1300	12000	U
Trichlorofluoromethane	1300	12000	U
1,1-Dichloroethene	1300	12000	U
1,1,2-Trichloro-1,2,2-trifluoroethane	1300	12000	U
Acetone	1300	12000	UJ
Carbon Disulfide	1300	12000	U
Methyl Acetate	1300	12000	U
Methylene Chloride	1300	12000	U
trans-1,2-Dichloroethene	1300	12000	U
Methyl tert-Butyl Ether	1300	12000	U
1,1-Dichloroethane	1300	12000	U
cis-1,2-Dichloroethene	1300	12000	U
2-Butanone	1300	12000	U
Chloroform	1300	12000	U
1,1,1-Trichloroethane	1300	12000	U
Cyclohexane	1300	12000	U
Carbon Tetrachloride	1300	12000	U
Benzene	1300	12000	U
1,2-Dichloroethane	1300	12000	U
Trichloroethene	1300	12000	U
Methylcyclohexane	1300	12000	U
1,2-Dichloropropane	1300	12000	U
Bromodichloromethane	1300	12000	U
cis-1,3-Dichloropropene	1300	12000	U
4-Methyl-2-Pentanone	1300	12000	U
Toluene	1300	12000	U
trans-1,3-Dichloropropene	1300	12000	U
1,1,2-Trichloroethane	1300	12000	U
Tetrachloroethene	1300	12000	U
2-Hexanone	1300	12000	U
Dibromochloromethane	1300	12000	U
1,2-Dibromoethane	1300	12000	U
Chlorobenzene	1300	12000	U
Ethylbenzene	1300	12000	U
Xylene (Total)	1300	12000	U
Styrene	1300	12000	U
Bromoform	1300	12000	U
Isopropylbenzene	1300	12000	U
1,1,2,2-Tetrachloroethane	1300	12000	U
1,3-Dichlorobenzene	1300	12000	U
1,4-Dichlorobenzene	1300	12000	U
1,2-Dichlorobenzene	1300	12000	U
1,2-Dibromo-3-chloropropane	1300	12000	U
1,2,4-Trichlorobenzene	1300	12000	U

DILUTION FACTOR:	1.0
DATE SAMPLED:	04/13/04
DATE ANALYZED:	04/22/04
% MOISTURE:	89

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

'SITE: COLE BROOK PINES LANDFILL
CASE: 0680F SDG: D15294
LABORATORY: COMPUCHEM

TABLE 3
SEMIVOLATILE SOIL ANALYSES
µg/kg

SAMPLE NUMBER:		D15294	D15295	D15296	D15298	D15299	D15300
SAMPLE LOCATION:		SD-01	SD-02	SD-03	SD-05	SD-06	SD-07
LABORATORY NUMBER:		266501	266502	266503	266504	266505	266506
COMPOUND	CRQL						
Benzaldehyde	330	520 UJ	490 UJ	420 UJ	660 UJ	660 UJ	660 UJ
Phenol	330	520 U	490 U	420 U	660 U	660 U	660 U
bis(2-Chloroethyl)Ether	330	520 U	490 U	420 U	660 U	660 U	660 U
2-Chlorophenol	330	520 U	490 U	420 U	660 U	660 U	660 U
2-Methylphenol	330	520 U	490 U	420 U	660 U	660 U	660 U
2,2'-oxybis(1-Chloropropane)	330	520 U	490 U	420 U	660 U	660 U	660 U
Acetophenone	330	520 U	490 U	420 U	660 U	660 U	660 U
4-Methylphenol	330	520 U	490 U	420 U	660 U	660 U	660 U
N-Nitroso-di-n-propylamine	330	520 U	490 U	420 U	660 U	660 U	660 U
Hexachloroethane	330	520 U	490 U	420 U	660 U	660 U	660 U
Nitrobenzene	330	520 U	490 U	420 U	660 U	660 U	660 U
Isophorone	330	520 U	490 U	420 U	660 U	660 U	660 U
2-Nitrophenol	330	520 U	490 U	420 U	660 U	660 U	660 U
2,4-Dimethylphenol	330	520 U	490 U	420 U	660 U	660 U	660 U
bis(2-Chloroethoxy)methane	330	520 U	490 U	420 U	660 U	660 U	660 U
2,4-Dichlorophenol	330	520 U	490 U	420 U	660 U	660 U	660 U
Naphthalene	330	520 U	490 U	420 U	660 U	660 U	660 U
4-Chloroaniline	330	520 U	490 U	420 U	660 U	660 U	660 U
Hexachlorobutadiene	330	520 UJ	490 UJ	420 UJ	660 UJ	660 UJ	660 UJ
Caprolactam	330	520 U	490 U	420 U	660 U	660 U	660 U
4-Chloro-3-methylphenol	330	520 U	490 U	420 U	660 U	660 U	660 U
2-Methylnaphthalene	330	520 U	490 U	420 U	660 U	660 U	660 U
Hexachlorocyclopentadiene	330	520 U	490 U	420 U	660 U	660 U	660 U
2,4,6-Trichlorophenol	330	520 U	490 U	420 U	660 U	660 U	660 U
2,4,5-Trichlorophenol	830	1300 U	1200 U	1100 U	1700 U	1700 U	1700 U
1,1'-Biphenyl	330	520 U	490 U	420 U	660 U	660 U	660 U
2-Chloronaphthalene	330	520 U	490 U	420 U	660 U	660 U	660 U
2-Nitroaniline	830	1300 U	1200 U	1100 U	1700 U	1700 U	1700 U
Dimethylphthalate	330	520 U	490 U	420 U	660 U	660 U	660 U
2,6-Dinitrotoluene	330	520 U	490 U	420 U	660 U	660 U	660 U
Acenaphthylene	330	520 U	490 U	420 U	660 U	660 U	660 U
3-Nitroaniline	830	1300 UJ	1200 UJ	1100 UJ	1700 UJ	1700 UJ	1700 UJ
Acenaphthene	330	520 UJ	490 U	420 U	660 U	660 U	660 U
2,4-Dinitrophenol	830	1300 UJ	1200 UJ	1100 UJ	1700 UJ	1700 UJ	1700 UJ
4-Nitrophenol	830	1300 UJ	1200 UJ	1100 UJ	1700 UJ	1700 UJ	1700 UJ
Dibenzofuran	330	520 U	490 U	420 U	660 U	660 U	660 U
2,4-Dinitrotoluene	330	520 U	490 U	420 U	660 U	660 U	660 U
Diethylphthalate	330	520 U	490 U	420 U	660 U	660 U	660 U
Fluorene	330	520 U	490 U	420 U	660 U	660 U	660 U
4-Chlorophenyl-phenylether	330	520 U	490 U	420 U	660 U	660 U	660 U
4-Nitroaniline	830	1300 UJ	1200 UJ	1100 UJ	1700 UJ	1700 UJ	1700 UJ
4,6-Dinitro-2-methylphenol	830	1300 UJ	1200 UJ	1100 UJ	1700 UJ	1700 UJ	1700 UJ
N-Nitrosodiphenylamine (1)	330	520 U	490 U	420 U	660 U	660 U	660 U
4-Bromophenyl-phenylether	330	520 U	490 U	420 U	660 U	660 U	660 U
Hexachlorobenzene	330	520 U	490 U	420 U	660 U	660 U	660 U
Atrazine	330	520 U	490 U	420 U	660 U	660 U	660 U
Pentachlorophenol	830	1300 UJ	1200 UJ	1100 UJ	1700 UJ	1700 UJ	1700 UJ
Phenanthrene	330	520 U	490 U	420 U	660 U	660 U	660 U
Anthracene	330	520 U	490 U	420 U	660 U	660 U	660 U
Carbazole	330	520 U	490 U	420 U	660 U	660 U	660 U
Di-n-butylphthalate	330	520 U	490 U	420 U	660 U	660 U	660 U
Fluoranthene	330	520 U	490 U	420 U	660 U	190 J	660 U
Pyrene	330	520 U	490 U	420 U	660 U	180 J	660 U
Butylbenzylphthalate	330	520 U	490 U	420 U	660 U	660 U	660 U
3,3'-Dichlorobenzidine	330	520 U	490 U	420 U	660 U	660 U	660 U
Benzo(a)anthracene	330	520 U	490 U	420 U	660 U	660 U	660 U
Chrysene	330	520 U	490 U	420 U	660 U	660 U	660 U
bis(2-Ethylhexyl)phthalate	330	520 U	490 U	420 U	660 U	660 U	660 U
Di-n-octylphthalate	330	520 U	490 U	420 U	660 U	660 U	660 U
Benzo(b)fluoranthene	330	520 U	490 U	420 U	660 U	660 U	660 U
Benzo(k)fluoranthene	330	520 U	490 U	420 U	660 U	660 U	660 U
Benzo(a)pyrene	330	520 U	490 U	420 U	660 U	660 U	660 U
Indeno(1,2,3-cd)pyrene	330	520 U	490 U	420 U	660 U	660 U	660 U
Dibenzo(a,h)anthracene	330	520 U	490 U	420 U	660 U	660 U	660 U
Benzo(g,h,i)perylene	330	520 U	490 U	420 U	660 U	660 U	660 U
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:		04/13/04	04/13/04	04/13/04	04/13/04	04/13/04	04/13/04
DATE EXTRACTED:		04/15/04	04/15/04	04/15/04	04/15/04	04/15/04	04/15/04
DATE ANALYZED:		04/17/04	04/17/04	04/17/04	04/17/04	04/17/04	04/17/04
% MOISTURE:		36	33	21	81	74	85

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

'SITE: COLE BROOK PINES LANDFILL
CASE: 0680F SDG: D15294
LABORATORY: COMPUCHEM

TABLE 3
SEMIVOLATILE SOIL ANALYSES
µg/kg

SAMPLE NUMBER:		D15302	D15303	D15304	D15305	D15306	D15307
SAMPLE LOCATION:		SD-09	SD-10	SD-11	SD-12	SD-13	SD-14
LABORATORY NUMBER:		266507	266508	266509	266510	266511	266512
COMPOUND	CRQL						
Benzaldehyde	330	660 UJ	430 UJ	420 UJ	660 UJ	500 UJ	660 UJ
Phenol	330	660 U	430 U	420 U	660 U	500 U	660 U
bis(2-Chloroethyl)Ether	330	660 U	430 U	420 U	660 U	500 U	660 U
2-Chlorophenol	330	660 U	430 U	420 U	660 U	500 U	660 U
2-Methylphenol	330	660 U	430 U	420 U	660 U	500 U	660 U
2,2'-oxybis(1-Chloropropane)	330	660 U	430 U	420 U	660 U	500 U	660 U
Acetophenone	330	660 U	430 U	420 U	660 U	500 U	660 U
4-Methylphenol	330	660 U	430 U	420 U	660 U	500 U	660 U
N-Nitroso-di-n-propylamine	330	660 U	430 U	420 U	660 U	500 U	660 U
Hexachloroethane	330	660 U	430 U	420 U	660 U	500 U	660 U
Nitrobenzene	330	660 U	430 U	420 U	660 U	500 U	660 U
Isophorone	330	660 U	430 U	420 U	660 U	500 U	660 U
2-Nitrophenol	330	660 U	430 U	420 U	660 U	500 U	660 U
2,4-Dimethylphenol	330	660 U	430 U	420 U	660 U	500 U	660 U
bis(2-Chloroethoxy)methane	330	660 U	430 U	420 U	660 U	500 U	660 U
2,4-Dichlorophenol	330	660 U	430 U	420 U	660 U	500 U	660 U
Naphthalene	330	660 U	430 U	420 U	660 U	500 U	660 U
4-Chloroaniline	330	660 U	430 U	420 U	660 U	500 U	660 U
Hexachlorobutadiene	330	660 UJ	430 UJ	420 UJ	660 UJ	500 UJ	660 UJ
Caprolactam	330	660 U	430 U	420 U	660 U	500 U	660 U
4-Chloro-3-methylphenol	330	660 U	430 U	420 U	660 U	500 U	660 U
2-Methylnaphthalene	330	660 U	430 U	420 U	660 U	500 U	660 U
Hexachlorocyclopentadiene	330	660 U	430 U	420 U	660 U	500 U	660 U
2,4,6-Trichlorophenol	330	660 U	430 U	420 U	660 U	500 U	660 U
2,4,5-Trichlorophenol	830	1700 U	1100 U	1100 U	1700 U	1300 U	1700 U
1,1'-Biphenyl	330	660 U	430 U	420 U	660 U	500 U	660 U
2-Chloronaphthalene	330	660 U	430 U	420 U	660 U	500 U	660 U
2-Nitroaniline	830	1700 U	1100 U	1100 U	1700 U	1300 U	1700 U
Dimethylphthalate	330	660 U	430 U	420 U	660 U	500 U	660 U
2,6-Dinitrotoluene	330	660 U	430 U	420 U	660 U	500 U	660 U
Acenaphthylene	330	660 U	430 U	420 U	660 U	500 U	660 U
3-Nitroaniline	830	1700 UJ	1100 UJ	1100 UJ	1700 UJ	1300 UJ	1700 UJ
Acenaphthene	330	660 U	430 U	420 U	660 U	500 U	660 U
2,4-Dinitrophenol	830	1700 UJ	1100 UJ	1100 UJ	1700 UJ	1300 UJ	1700 UJ
4-Nitrophenol	830	1700 UJ	1100 UJ	1100 UJ	1700 UJ	1300 UJ	1700 UJ
Dibenzofuran	330	660 U	430 U	420 U	660 U	500 U	660 U
2,4-Dinitrotoluene	330	660 U	430 U	420 U	660 U	500 U	660 U
Diethylphthalate	330	660 U	430 U	420 U	660 U	500 U	660 U
Fluorene	330	660 U	430 U	420 U	660 U	500 U	660 U
4-Chlorophenyl-phenylether	330	660 U	430 U	420 U	660 U	500 U	660 U
4-Nitroaniline	830	1700 UJ	1100 UJ	1100 UJ	1700 UJ	1300 UJ	1700 UJ
4,6-Dinitro-2-methylphenol	830	1700 UJ	1100 UJ	1100 UJ	1700 UJ	1300 UJ	1700 UJ
N-Nitrosodiphenylamine (1)	330	660 U	430 U	420 U	660 U	500 U	660 U
4-Bromophenyl-phenylether	330	660 U	430 U	420 U	660 U	500 U	660 U
Hexachlorobenzene	330	660 U	430 U	420 U	660 U	500 U	660 U
Atrazine	330	660 U	430 U	420 U	660 U	500 U	660 U
Pentachlorophenol	830	1700 UJ	1100 UJ	1100 UJ	1700 UJ	1300 UJ	1700 UJ
Phenanthrene	330	660 U	430 U	420 U	660 U	500 U	660 U
Anthracene	330	660 U	430 U	420 U	660 U	500 U	660 U
Carbazole	330	660 U	430 U	420 U	660 U	500 U	660 U
Di-n-butylphthalate	330	660 U	430 U	420 U	660 U	500 U	660 U
Fluoranthene	330	660 U	430 U	420 U	660 U	500 U	660 U
Pyrene	330	660 U	430 U	420 U	660 U	500 U	660 U
Butylbenzylphthalate	330	660 U	430 U	420 U	660 U	500 U	660 U
3,3'-Dichlorobenzidine	330	660 U	430 U	420 U	660 U	500 U	660 U
Benzo(a)anthracene	330	660 U	430 U	420 U	660 U	500 U	660 U
Chrysene	330	660 U	430 U	420 U	660 U	500 U	660 U
bis(2-Ethylhexyl)phthalate	330	660 U	430 U	420 U	660 U	500 U	660 U
Di-n-octylphthalate	330	660 U	430 U	420 U	660 U	500 U	660 U
Benzo(b)fluoranthene	330	660 U	430 U	420 U	660 U	500 U	660 U
Benzo(k)fluoranthene	330	660 U	430 U	420 U	660 U	500 U	660 U
Benzo(a)pyrene	330	660 U	430 U	420 U	660 U	500 U	660 U
Indeno(1,2,3-cd)pyrene	330	660 U	430 U	420 U	660 U	500 U	660 U
Dibenzo(a,h)anthracene	330	660 U	430 U	420 U	660 U	500 U	660 U
Benzo(g,h,i)perylene	330	660 U	430 U	420 U	660 U	500 U	660 U
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:		04/13/04	04/13/04	04/13/04	04/13/04	04/13/04	04/13/04
DATE EXTRACTED:		04/15/04	04/15/04	04/15/04	04/15/04	04/15/04	04/15/04
DATE ANALYZED:		04/17/04	04/17/04	04/17/04	04/17/04	04/17/04	04/17/04
% MOISTURE:		89	23	21	80	34	86

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

'SITE: COLE BROOK PINES LANDFILL
CASE: 0680F SDG: D15294
LABORATORY: COMPUCHEM

TABLE 3
SEMIVOLATILE SOIL ANALYSES
µg/kg

SAMPLE NUMBER:	D15309
SAMPLE LOCATION:	SD-16
LABORATORY NUMBER:	266513

COMPOUND	CRQL		
Benzaldehyde	330	180	J
Phenol	330	660	U
bis(2-Chloroethyl)Ether	330	660	U
2-Chlorophenol	330	660	U
2-Methylphenol	330	660	U
2,2'-oxybis(1-Chloropropane)	330	660	U
Acetophenone	330	660	U
4-Methylphenol	330	660	U
N-Nitroso-di-n-propylamine	330	660	U
Hexachloroethane	330	660	U
Nitrobenzene	330	660	U
Isophorone	330	660	U
2-Nitrophenol	330	660	U
2,4-Dimethylphenol	330	660	U
bis(2-Chloroethoxy)methane	330	660	U
2,4-Dichlorophenol	330	660	U
Naphthalene	330	660	U
4-Chloroaniline	330	660	UJ
Hexachlorobutadiene	330	660	U
Caprolactam	330	660	U
4-Chloro-3-methylphenol	330	660	U
2-Methylnaphthalene	330	660	U
Hexachlorocyclopentadiene	330	660	U
2,4,6-Trichlorophenol	330	660	U
2,4,5-Trichlorophenol	830	1700	U
1,1'-Biphenyl	330	660	U
2-Chloronaphthalene	330	660	U
2-Nitroaniline	830	1700	U
Dimethylphthalate	330	660	U
2,6-Dinitrotoluene	330	660	U
Acenaphthylene	330	660	U
3-Nitroaniline	830	1700	UJ
Acenaphthene	330	660	U
2,4-Dinitrophenol	830	1700	UJ
4-Nitrophenol	830	1700	U
Dibenzofuran	330	660	U
2,4-Dinitrotoluene	330	660	U
Diethylphthalate	330	660	U
Fluorene	330	660	U
4-Chlorophenyl-phenylether	330	660	U
4-Nitroaniline	830	1700	U
4,6-Dinitro-2-methylphenol	830	1700	U
N-Nitrosodiphenylamine (1)	330	660	U
4-Bromophenyl-phenylether	330	660	U
Hexachlorobenzene	330	660	U
Atrazine	330	660	U
Pentachlorophenol	830	1700	U
Phenanthrene	330	660	U
Anthracene	330	660	U
Carbazole	330	660	UJ
Di-n-butylphthalate	330	660	U
Fluoranthene	330	660	U
Pyrene	330	660	U
Butylbenzylphthalate	330	660	UJ
3,3'-Dichlorobenzidine	330	660	UJ
Benzo(a)anthracene	330	660	U
Chrysene	330	660	U
bis(2-Ethylhexyl)phthalate	330	660	UJ
Di-n-octylphthalate	330	660	U
Benzo(b)fluoranthene	330	660	U
Benzo(k)fluoranthene	330	660	U
Benzo(a)pyrene	330	660	U
Indeno(1,2,3-cd)pyrene	330	660	U
Dibenzo(a,h)anthracene	330	660	U
Benzo(g,h,i)perylene	330	660	U

DILUTION FACTOR:	1.0
DATE SAMPLED:	04/13/04
DATE EXTRACTED:	04/15/04
DATE ANALYZED:	04/17/04
% MOISTURE:	89

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

'SITE: COLE BROOK PINES LANDFILL
CASE: 0680F SDG: D15294
LABORATORY: COMPUCHEM

TABLE 4
PESTICIDE/POLYCHLORINATED BIPHENYL SOIL ANALYSES
µg/kg

SAMPLE NUMBER:		D15294	D15295	D15296	D15298	D15299	D15300
SAMPLE LOCATION:		SD-01	SD-02	SD-03	SD-05	SD-06	SD-07
LABORATORY NUMBER:		266501	266502	266503	266504	266505	266506
COMPOUND	CRQL						
alpha-BHC	1.7	2.7 U	2.5 U	2.2 U	3.4 U	3.4 U	3.4 U
beta-BHC	1.7	2.7 U	2.5 U	2.2 U	3.4 U	3.4 U	3.4 U
delta-BHC	1.7	2.7 U	2.5 U	2.2 U	3.4 U	3.4 U	3.4 U
gamma-BHC (Lindane)	1.7	2.7 U	2.5 U	2.2 U	3.4 U	3.4 U	3.4 U
Heptachlor	1.7	2.7 U	2.5 U	2.2 U	3.4 U	3.4 U	3.4 U
Aldrin	1.7	2.7 U	2.5 U	2.2 U	3.4 U	3.4 U	3.4 U
Heptachlor Epoxide	1.7	2.7 U	2.5 U	2.2 U	3.4 U	3.4 U	3.4 U
Endosulfan I	1.7	2.7 U	2.5 U	2.2 U	3.4 U	3.4 U	3.4 U
Dieldrin	3.3	5.2 U	4.9 U	4.2 U	6.6 U	6.6 U	6.6 U
4,4'-DDE	3.3	5.2 U	4.9 U	4.2 U	6.6 U	5.8 J	1.7 J
Endrin	3.3	5.2 U	4.9 U	4.2 U	6.6 U	6.6 U	6.6 U
Endosulfan II	3.3	5.2 U	4.9 U	4.2 U	6.6 U	6.6 U	6.6 U
4,4'-DDD	3.3	5.2 U	4.9 U	4.2 U	6.6 U	6.6 U	6.6 U
Endosulfan Sulfate	3.3	5.2 U	4.9 U	4.2 U	6.6 U	6.6 U	6.6 U
4,4'-DDT	3.3	5.2 U	4.9 U	4.2 U	6.6 U	6.6 U	6.6 U
Methoxychlor	17	27 U	25 U	22 U	34 U	34 U	34 U
Endrin Ketone	3.3	5.2 U	4.9 U	4.2 U	6.6 U	6.6 U	6.6 U
Endrin Aldehyde	3.3	5.2 U	4.9 U	4.2 U	6.6 U	6.6 U	6.6 U
alpha-Chlordane	1.7	2.7 U	2.5 U	2.2 U	3.4 U	3.4 U	3.4 U
gamma-Chlordane	1.7	2.7 U	2.5 U	2.2 U	3.4 U	3.4 U	3.4 U
Toxaphene	170	270 U	250 U	220 U	340 U	340 U	340 U
Aroclor-1016	33	52 U	49 U	42 U	66 U	66 U	66 U
Aroclor-1221	67	100 U	100 U	85 U	130 U	130 U	130 U
Aroclor-1232	33	52 U	49 U	42 U	66 U	66 U	66 U
Aroclor-1242	33	52 U	49 U	42 U	66 U	66 U	66 U
Aroclor-1248	33	52 U	49 U	42 U	66 U	66 U	66 U
Aroclor-1254	33	52 U	49 U	42 U	66 U	66 U	66 U
Aroclor-1260	33	52 U	49 U	42 U	66 U	66 U	66 U
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:		04/13/04	04/13/04	04/13/04	04/13/04	04/13/04	04/13/04
DATE EXTRACTED:		04/15/04	04/15/04	04/15/04	04/15/04	04/15/04	04/15/04
DATE ANALYZED:		04/19/04	04/19/04	04/19/04	04/19/04	04/20/04	04/20/04
% MOISTURE:		36	33	21	81	74	85

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: COLE BROOK PINES LANDFILL
CASE: 0680F SDG: D15294
LABORATORY: COMPUCHEM

TABLE 4
PESTICIDE/POLYCHLORINATED BIPHENYL SOIL ANALYSES
µg/kg

SAMPLE NUMBER:		D15302	D15303	D15304	D15305	D15306	D15307
SAMPLE LOCATION:		SD-09	SD-10	SD-11	SD-12	SD-13	SD-14
LABORATORY NUMBER:		266507	266508	266509	266510	266511	266512
COMPOUND	CRQL						
alpha-BHC	1.7	3.4 U	2.2 U	2.2 U	3.4 U	2.6 U	3.4 U
beta-BHC	1.7	3.4 U	2.2 U	2.2 U	3.4 U	2.6 U	3.4 U
delta-BHC	1.7	3.4 U	2.2 U	2.2 U	3.4 U	2.6 U	3.4 U
gamma-BHC (Lindane)	1.7	3.4 U	2.2 U	2.2 U	3.4 U	2.6 U	3.4 U
Heptachlor	1.7	3.4 U	2.2 U	2.2 U	3.4 U	2.6 U	3.4 U
Aldrin	1.7	3.4 U	2.2 U	2.2 U	3.4 U	2.6 U	3.4 U
Heptachlor Epoxide	1.7	3.4 U	2.2 U	2.2 U	3.4 U	2.6 U	3.4 U
Endosulfan I	1.7	3.4 U	2.2 U	2.2 U	3.4 U	2.6 U	3.4 U
Dieldrin	3.3	6.6 U	4.3 U	4.2 U	6.6 U	5.0 U	6.6 U
4,4'-DDE	3.3	6.6 U	3.8 J	4.2 U	6.6 U	3.8 J	6.6 U
Endrin	3.3	6.6 U	4.3 U	4.2 U	6.6 U	5.0 U	6.6 U
Endosulfan II	3.3	6.6 U	4.3 U	4.2 U	6.6 U	5.0 U	6.6 U
4,4'-DDD	3.3	6.6 U	11	4.2 U	6.6 U	10 J	6.6 U
Endosulfan Sulfate	3.3	6.6 U	4.3 U	4.2 U	6.6 U	1.9 J	6.6 U
4,4'-DDT	3.3	6.6 U	4.3 U	4.2 U	6.6 U	5.0 U	6.6 U
Methoxychlor	17	34 U	22 U	22 U	34 U	26 U	34 U
Endrin Ketone	3.3	6.6 U	4.3 U	4.2 U	6.6 U	5.0 U	6.6 U
Endrin Aldehyde	3.3	6.6 U	4.3 U	4.2 U	6.6 U	5.0 U	6.6 U
alpha-Chlordane	1.7	3.4 U	2.2 U	2.2 U	3.4 U	2.6 U	3.4 U
gamma-Chlordane	1.7	3.4 U	2.2 U	2.2 U	3.4 U	2.6 U	3.4 U
Toxaphene	170	340 U	220 U	220 U	340 U	260 U	340 U
Aroclor-1016	33	66 U	43 U	42 U	66 U	50 U	66 U
Aroclor-1221	67	130 U	87 U	85 U	130 U	100 U	130 U
Aroclor-1232	33	66 U	43 U	42 U	66 U	50 U	66 U
Aroclor-1242	33	66 U	43 U	42 U	66 U	50 U	66 U
Aroclor-1248	33	66 U	43 U	42 U	66 U	50 U	66 U
Aroclor-1254	33	66 U	43 U	42 U	66 U	50 U	66 U
Aroclor-1260	33	66 U	43 U	42 U	66 U	50 U	66 U
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0	1.0
DATE SAMPLED:		04/13/04	04/13/04	04/13/04	04/13/04	04/13/04	04/13/04
DATE EXTRACTED:		04/15/04	04/15/04	04/15/04	04/15/04	04/15/04	04/15/04
DATE ANALYZED:		04/20/04	04/20/04	04/20/04	04/20/04	04/20/04	04/20/04
% MOISTURE:		89	23	21	80	34	86

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

'SITE: COLE BROOK PINES LANDFILL
CASE: 0680F SDG: D15294
LABORATORY: COMPUCHEM

TABLE 4
PESTICIDE/POLYCHLORINATED BIPHENYL SOIL ANALYSES
µg/kg

SAMPLE NUMBER:		D15309
SAMPLE LOCATION:		SD-16
LABORATORY NUMBER:		266513
COMPOUND	CRQL	
alpha-BHC	1.7	3.4 U
beta-BHC	1.7	3.4 U
delta-BHC	1.7	3.4 U
gamma-BHC (Lindane)	1.7	3.4 U
Heptachlor	1.7	3.4 U
Aldrin	1.7	3.4 U
Heptachlor Epoxide	1.7	3.4 U
Endosulfan I	1.7	3.4 U
Dieldrin	3.3	6.6 U
4,4'-DDE	3.3	7.8 J
Endrin	3.3	6.6 U
Endosulfan II	3.3	6.6 U
4,4'-DDD	3.3	6.3 J
Endosulfan Sulfate	3.3	6.6 U
4,4'-DDT	3.3	3.0 J
Methoxychlor	17	34 U
Endrin Ketone	3.3	6.6 U
Endrin Aldehyde	3.3	6.6 U
alpha-Chlordane	1.7	R
gamma-Chlordane	1.7	3.4 U
Toxaphene	170	340 U
Aroclor-1016	33	66 U
Aroclor-1221	67	130 U
Aroclor-1232	33	66 U
Aroclor-1242	33	66 U
Aroclor-1248	33	66 U
Aroclor-1254	33	66 U
Aroclor-1260	33	66 U
DILUTION FACTOR:		1.0
DATE SAMPLED:		04/13/04
DATE EXTRACTED:		04/15/04
DATE ANALYZED:		04/20/04
% MOISTURE:		89

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: COLE BROOK PINES LANDFILL
CASE: 0681F SDG: D15294
LABORATORY: SENTINEL, INC.

TABLE 1
INORGANIC SOIL ANALYSES
mg/kg

SAMPLE NUMBER:			D15294	D15295	D15296	D15297	D15298	D15299	D15300	
SAMPLE LOCATION:			SD-01	SD-02	SD-03	SD-04	SD-05	SD-06	SD-07	
LABORATORY NUMBER:			02161	02162	02163	02164	02165	02166	02167	
PERCENT SOLIDS:			61.7	62.3	74.2	67.9	18.5	27.2	17.2	
INORGANIC ANALYTES	METHOD	METHOD DETECTION LIMITS (mg/kg)								CONTRACT QUANTITATION LIMITS (mg/kg)
ALUMINUM	P	1.3	719	693	922	895	4100	5630	6580	20
ANTIMONY	P	0.37	9.7 U	0.41 UJ	8.1 U	0.79 UJ	1.0 UJ	12.0 U	12.0 U	6
ARSENIC	P	0.41	1.6 UJ	1.1 UJ	1.3 UJ	1.5 UJ	1.3 UJ	3.2 J	2.1 J	1.5
BARIUM	P	0.065	7.1	4.6	4.8	6.5	40.3	71.6	97.8	20
BERYLLIUM	P	0.015	0.10	0.15	0.07	0.07	1.1	0.74	3.7	0.5
CADMIUM	P	0.031	0.81 U	0.53 U	0.67 U	0.74 U	0.15	0.25	0.36	0.5
CALCIUM	P	4.2	445 J	184 J	281 J	350 J	2060 J	4120 J	4590 J	500
CHROMIUM	P	0.11	0.74	0.61	0.91	1.0	3.2	5.3	3.3	1
COBALT	P	0.095	8.1 U	0.19 J	0.43	0.33	1.4	2.2	1.5	5
COPPER	P	0.13	1.7 U	0.52 U	0.74 U	0.96 U	5.5	10.2	8.9	2.5
IRON	P	0.98	1500	616	1260	1180	2070	7570	1230	10
LEAD	P	0.21	3.8 J	1.1 UJ	2.5 J	2.8 J	19.4	55.4	18.2	1
MAGNESIUM	P	4.8	142	120	297	259	312	722	702	500
MANGANESE	P	0.14	16.7	12.7	20.5	21.8	20.2	47.7	9.7	1.5
MERCURY	CV	0.013	0.16 U	0.11 U	0.13 U	0.15 U	0.19 J	0.17 J	0.15 J	0.1
NICKEL	P	0.18	0.56 UJ	0.57 UJ	0.96 U	0.89 U	2.7 U	4.6	4.7	4
POTASSIUM	P	2.5	114 U	87.0 U	123	114 U	195	360	213	500
SELENIUM	P	0.54	5.7 U	3.7 U	4.7 U	5.2 U	2.9	2.9	4.2	3.5
SILVER	P	0.19	1.6 UJ	1.1 UJ	1.3 UJ	1.5 UJ	2.0 UJ	2.0 UJ	2.0 UJ	1
SODIUM	P	22.8	810 UJ	75.2 J	65.4 J	49.0 J	218 J	315 J	640 J	500
THALLIUM	P	0.31	4.1 U	2.6 U	3.4 U	3.7 U	5.0 U	5.0 U	5.0 UJ	2.5
VANADIUM	P	0.088	1.4	1.2	1.4	1.6	8.6	17.2	15.3	5
ZINC	P	0.17	3.7 J	3.8 J	5.6 J	5.5 J	9.4 J	38.3 J	20.4 J	6
CYANIDE	AS	0.074	4.1 U	2.6 U	3.4 U	NA	5.0 U	5.0 U	5.0 U	0.5

ANALYTICAL METHOD
P - ICP
CV - COLD VAPOR
AS - SEMI AUTOMATED SPECTROPHOTOMETRIC

NOTE:
J = QUANTITATION IS ESTIMATED DUE TO LIMITATIONS IDENTIFIED IN THE QUALITY CONTROL REVIEW (DATA REVIEW).
U = VALUE IS NON-DETECTED.
UJ = VALUE IS NON-DETECTED AND DETECTION LIMIT IS ESTIMATED.
R = VALUE IS REJECTED.
NA = NOT ANALYZED.

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: COLE BROOK PINES LANDFILL
CASE: 0681F SDG: D15294
LABORATORY: SENTINEL, INC.

TABLE 1
INORGANIC SOIL ANALYSES
mg/kg

SAMPLE NUMBER:			D15301	D15302	D15303	D15304	D15305	D15306	D15307	
SAMPLE LOCATION:			SD-08	SD-09	SD-10	SD-11	SD-12	SD-13	SD-14	
LABORATORY NUMBER:			02168	02169	02170	02171	02172	02173	02174	
PERCENT SOLIDS:			12.3	13.3	64.3	77.6	20.2	73.0	13.7	
INORGANIC ANALYTES	METHOD	METHOD DETECTION LIMITS (mg/kg)								CONTRACT QUANTITATION LIMITS (mg/kg)
ALUMINUM	P	1.3	5820	2490	2650	2240	3860	2120	5510	20
ANTIMONY	P	0.37	12.0 U	12.0 U	9.3 U	7.7 U	12.0 U	8.2 U	12.0 U	6
ARSENIC	P	0.41	2.7 J	2.0 UJ	1.6 UJ	1.3 UJ	2.0 UJ	1.4 UJ	1.3 UJ	1.5
BARIUM	P	0.065	103	78.0	16.4	6.1	53.2	10.7	88.0	20
BERYLLIUM	P	0.015	3.3	0.73	0.18	0.12	0.94	0.15	0.83	0.5
CADMIUM	P	0.031	0.36	0.20	0.07 J	0.64 U	1.0 U	0.68 U	0.11 J	0.5
CALCIUM	P	4.2	3880 J	7820 J	939 J	284 J	4240 J	559 J	6900 J	500
CHROMIUM	P	0.11	2.7	3.0	2.0	1.6	6.1	1.7	2.5	1
COBALT	P	0.095	1.3	1.9	1.6	0.82	1.5	1.3	1.4	5
COPPER	P	0.13	7.5	6.5	2.8 U	1.3 U	8.0	2.0 U	11.6	2.5
IRON	P	0.98	1010	2400	2910	2200	1800	2470	2140	10
LEAD	P	0.21	24.7	11.9	8.6	6.2	9.0	5.8	7.9	1
MAGNESIUM	P	4.8	638	885	489	434	727	457	1100	500
MANGANESE	P	0.14	9.8	419	64.1	21.0	29.0	48.7	19.0	1.5
MERCURY	CV	0.013	0.15 J	0.05 J	0.16 U	0.13 U	0.03 J	0.14 U	0.13 J	0.1
NICKEL	P	0.18	3.9	2.1 U	2.2 U	1.3 U	3.3 U	2.0 U	3.2 U	4
POTASSIUM	P	2.5	227	140 U	175	194	197	165	199	500
SELENIUM	P	0.54	3.5	3.1	5.4 U	4.5 U	1.9 J	4.8 U	3.3	3.5
SILVER	P	0.19	2.0 UJ	2.0 UJ	1.6 UJ	1.3 UJ	2.0 UJ	1.4 UJ	2.0 UJ	1
SODIUM	P	22.8	579 J	264 J	106 J	87.0 J	360 J	80.8 J	381 J	500
THALLIUM	P	0.31	5.0 UJ	5.0 UJ	3.9 UJ	3.2 UJ	5.0 UJ	3.4 UJ	5.0 UJ	2.5
VANADIUM	P	0.088	16.4	7.1	3.7	3.4	12.0	2.8	9.6	5
ZINC	P	0.17	16.8 J	19.7 J	16.5 J	7.7 J	8.6 J	12.7 J	22.5 J	6
CYANIDE	AS	0.074	NA	5.0 U	3.9 U	3.2 U	5.0 U	3.4 U	5.0 U	0.5

ANALYTICAL METHOD
P - ICP
CV - COLD VAPOR
AS - SEMI AUTOMATED SPECTROPHOTOMETRIC

NOTE:
J = QUANTITATION IS ESTIMATED DUE TO LIMITATIONS IDENTIFIED IN THE QUALITY CONTROL REVIEW (DATA REVIEW).
U = VALUE IS NON-DETECTED.
UJ = VALUE IS NON-DETECTED AND DETECTION LIMIT IS ESTIMATED.
R = VALUE IS REJECTED.
NA = NOT ANALYZED.

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

SITE: COLE BROOK PINES LANDFILL
CASE: 0681F SDG: D15294
LABORATORY: SENTINEL, INC.

TABLE 1
INORGANIC SOIL ANALYSES
mg/kg

SAMPLE NUMBER:			D15308	D15309	D15310	
SAMPLE LOCATION:			SD-15	SD-16	SD-17	
LABORATORY NUMBER:			02175	02176	02177	
PERCENT SOLIDS:			17.7	11.9	14.4	
INORGANIC ANALYTES	METHOD	METHOD DETECTION LIMITS (mg/kg)				CONTRACT QUANTITATION LIMITS (mg/kg)
ALUMINUM	P	1.3	7020	4010	6890	20
ANTIMONY	P	0.37	12.0 U	12.0 U	12.0 UJ	6
ARSENIC	P	0.41	2.1 J	2.5 J	2.5 J	1.5
BARIUM	P	0.065	106	132	152	20
BERYLLIUM	P	0.015	2.0	2.1	0.93	0.5
CADMIUM	P	0.031	0.16	0.94	1.2	0.5
CALCIUM	P	4.2	4510 J	9510 J	8570 J	500
CHROMIUM	P	0.11	6.5	11.5	17.3	1
COBALT	P	0.095	0.93	3.9	7.7	5
COPPER	P	0.13	21.8	17.9	22.2	2.5
IRON	P	0.98	2020	5540	12800	10
LEAD	P	0.21	11.5	118	170	1
MAGNESIUM	P	4.8	795	2130	2600	500
MANGANESE	P	0.14	12.3	52.2	98.6	1.5
MERCURY	CV	0.013	0.26	0.10 J	0.13 J	0.1
NICKEL	P	0.18	3.5 U	10.8	14.5	4
POTASSIUM	P	2.5	221	375	720	500
SELENIUM	P	0.54	5.8	3.7	3.2	3.5
SILVER	P	0.19	2.0 UJ	2.0 UJ	2.0 UJ	1
SODIUM	P	22.8	687 J	486 J	452 J	500
THALLIUM	P	0.31	5.0 UJ	5.0 UJ	5.0 UJ	2.5
VANADIUM	P	0.088	9.4	16.3	23.0	5
ZINC	P	0.17	5.7 J	68.7 J	130 J	6
CYANIDE	AS	0.074	NA	5.0 U	NA	0.5

ANALYTICAL METHOD
P - ICP
CV - COLD VAPOR
AS - SEMI AUTOMATED SPECTROPHOTOMETRIC

NOTE:
J = QUANTITATION IS ESTIMATED DUE TO LIMITATIONS IDENTIFIED IN THE QUALITY CONTROL REVIEW (DATA REVIEW).
U = VALUE IS NON-DETECTED.
UJ = VALUE IS NON-DETECTED AND DETECTION LIMIT IS ESTIMATED.
R = VALUE IS REJECTED.
NA = NOT ANALYZED.

NOTE: RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

FINAL EXPANDED SITE INSPECTION REPORT
FOR
COLE BROOK PINES LANDFILL
EXPANDED SITE INSPECTION
DARTMOUTH, MASSACHUSETTS

Prepared For:
U.S. Environmental Protection Agency
Region I
Office of Site Remediation and Restoration
1 Congress Street, Suite 1100
Boston, MA 02114-2023

CONTRACT NO. 68-W-00-097

CERCLIS NO. MAD981069990
STATE ID NO. RTN 4-0012656
TDD NO. 04-05-0134
TASK NO. 8131
DC NO. A-4998

Submitted By:
Weston Solutions, Inc.
Region I
Superfund Technical Assessment and Response Team 2000 (START)
37 Upton Drive
Wilmington, MA 01887

28 January 2005

Region I START 2000
Reviewed and Approved:

Amy E. H. Gibney Site Leader	01/28/05 Date
Scott Rose Project Leader	1/28/05 Date
QA Review	1/28/05 Date

Work Order No. 20112-001-001-8131-70

DISCLAIMER

This report was prepared solely for the use and benefit of the U.S. Environmental Protection Agency Region I (EPA Region I), Office of Site Remediation and Restoration for the specific purposes set forth in the contract between the EPA Region I and the Weston Solutions, Inc., Superfund Technical Assessment and Response Team 2000 (START). Professional services performed and reports generated by START have been prepared for EPA Region I purposes as described in the START contract. The information, statements, and conclusions contained in the report were prepared in accordance with the statement of work, and contract terms and conditions. The report may be subject to differing interpretations or misinterpretation by third parties who did not participate in the planning, research or consultation processes. Any use of this document or the information contained herein by persons or entities other than the EPA Region I shall be at the sole risk and liability of said person or entity. START, therefore, expressly disclaims any liability to persons other than the EPA Region I who may use or rely upon this report in any way or for any purpose.

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ATTACHMENT C - COLE BROOK PINES LANDFILL
START GROUNDWATER SAMPLE ANALYTICAL RESULTS
Samples Collected 17 through 19 February 2004

ATTACHMENT D - COLE BROOK PINES LANDFILL
START DRINKING WATER SAMPLE ANALYTICAL RESULTS
Samples Collected 18 February 2004

ATTACHMENT E - COLE BROOK PINES LANDFILL
START SEDIMENT SAMPLE ANALYTICAL RESULTS
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Final Expanded Site Inspection Report
Cole Brook Pines Landfill
Dartmouth, Massachusetts

CERCLIS No. MAD981069990
State ID No. RTN 4-0012656
TDD No. 04-05-0134
Work Order No. 20112-001-001-8131-70

INTRODUCTION

The Weston Solutions, Inc. (WESTON®) (formerly known as Roy F. Weston, Inc.), Superfund Technical Assessment and Response Team 2000 (START) was requested by the U.S. Environmental Protection Agency (EPA) Region I, Office of Site Remediation and Restoration to perform an Expanded Site Inspection (ESI) of the Cole Brook Pines Landfill (Cole Brook) property [previously listed in the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database as the Cold Brook Pines Landfill property] along Old Fall River Road in Dartmouth, Massachusetts. Tasks were conducted in accordance with the ESI scope of work and technical specifications provided by EPA Region I. A Final Site Inspection Prioritization (SIP) Report for the Cole Brook property was prepared by START on 1 October 2001. Analytical results of off-site sediment samples collected by START as part of the SIP indicated the presence of three metals above reference criteria; however, historical analysis of soil and source samples collected from the property had not revealed the presence of these metals. Based on the information provided in the Final SIP Report and the lack of on-site soil and groundwater sample data, the Cole Brook ESI was initiated.

At the request of the Massachusetts Department of Environmental Protection (MA DEP), EPA initiated an ESI of the Cole Brook property to identify potential source(s) of contamination on the property, to identify the extent of potential soil, groundwater, and sediment contamination on the property, and to identify potentially impacted nearby residential populations and sensitive environments. This ESI was designed to complete these goals.

Background information used in the generation of this report was obtained through file searches conducted at the EPA Region I and MA DEP, telephone interviews with town officials, conversations with persons knowledgeable of the Cole Brook property, and conversations with other Federal, State, and local agencies.

This package follows the guidelines developed under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, commonly referred to as Superfund. However, these documents do not necessarily fulfill the requirements of other EPA Region I regulations such as those under the Resource Conservation and Recovery Act (RCRA) or other Federal, State, or local regulations. ESIs are intended to provide a preliminary screening of sites to facilitate EPA Region I's assignment of site priorities. They are limited efforts and are not intended to supersede more detailed investigations.

The street address, coordinates, and contaminant locations presented in this report identify the general area in which the site is located. They represent one or more locations EPA considers to be part of the site based upon the screening information collected or generated in the course of this or previous investigation(s). The EPA site assessment program is designed to identify "releases or threatened releases" of hazardous substances, and the focus of this investigation is on the release(s)

or potential release(s), rather than precisely delineated site boundaries. A site is defined under the EPA Site Assessment program as where a hazardous substance has been "deposited, stored, placed, or otherwise come to be located." EPA anticipates that the preliminary description of site boundaries will be refined as more information is developed regarding where the contamination has come to be located.

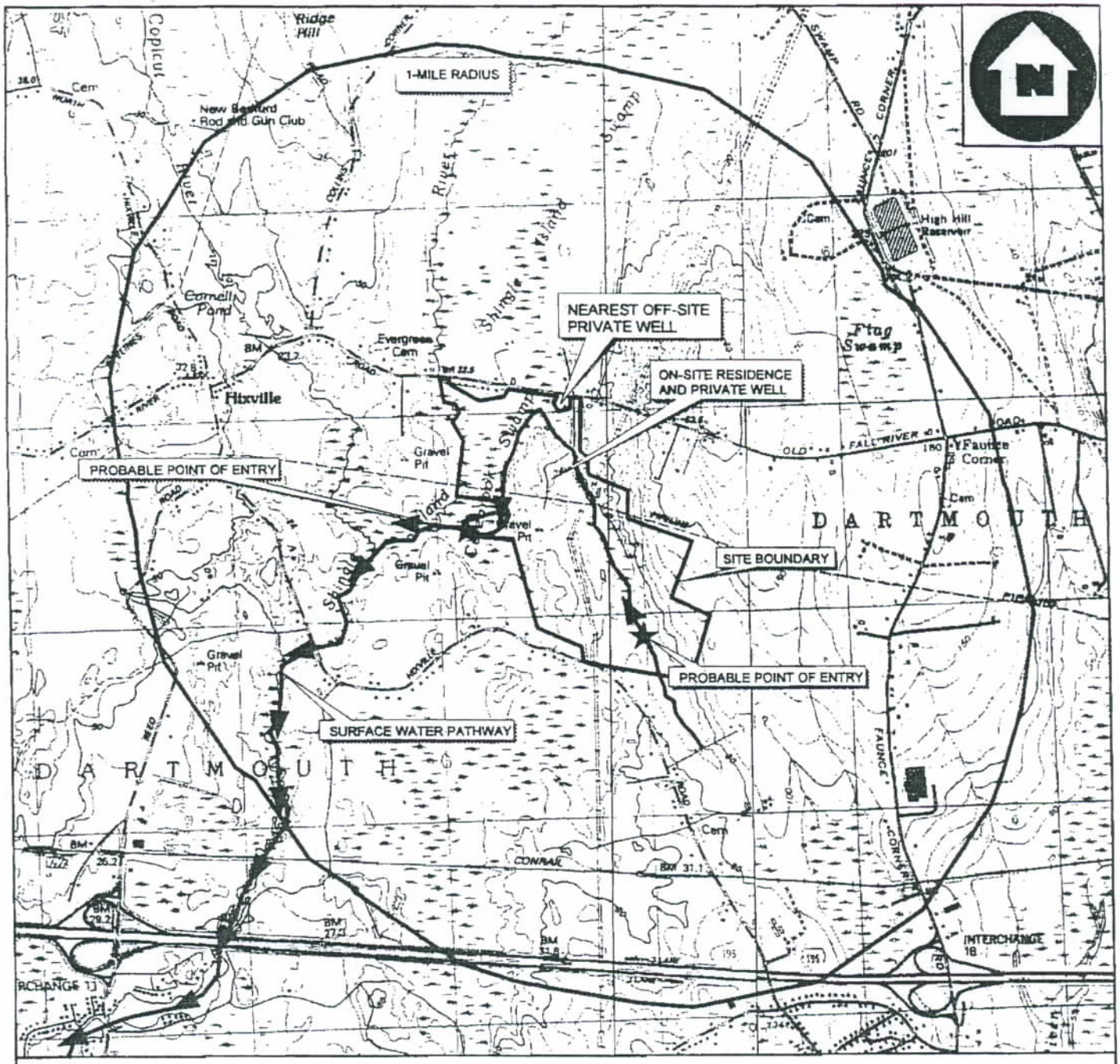
SITE DESCRIPTION

The Cole Brook property, also referred to historically as the Cold Brook Pines Landfill, Cecil Smith's Landfill, and Clean Communities Landfill, is located along Old Fall River Road in Dartmouth, Bristol County, Massachusetts (Figure 1) [4, pp. 1, 7; 29, p. 39]. The geographic coordinates of the property, as measured from its approximate center, are 41° 40′ 50.5″ north latitude and 71° 00′ 52.4″ west longitude [55]. The property is comprised of 238.1 acres and consists of six contiguous parcels identified on the Town of Dartmouth, Massachusetts Tax Assessor's Map No. 67 as Lot Nos. 5 (3.3 acres), 7 (23.9 acres), and 8 (97.94 acres), and on Map No. 72 as Lot Nos. 6 (97.6 acres), 8 (0.9 acres), and 9 (14.5 acres) [1-2]. According to the Town of Dartmouth Tax Assessor, the property is currently owned by Ms. Mary Robinson [77].

Approximately 60 acres of the western portion of the parcel identified as Lot No. 6 on Map No. 72 consists of a former solid waste "dump" (*i.e.*, a former solid waste landfill) operated between approximately 1954 and 1974 [64, Exhibit S]. The solid waste generally consisted of demolition debris. The remaining areas of the property consist of undeveloped woodlands and wetlands, unimproved access roads, former sand and gravel extraction areas, and miscellaneous solid waste piles. In general, the property is divided in an east/west direction by an Algonquin Gas (AG) pipeline easement and in a north/south direction by a New Bedford Gas and Electric (NBG&E) power line easement (Figures 2 and 2A) [1-2; 4, p. 1; 6; 52; 64, Exhibit S].

The area surrounding the Cole Brook property is occupied by predominantly undeveloped residential properties with some light agricultural properties. Residential properties and one commercial property [currently occupied by Gosselin & Sons Landscape Materials (formerly occupied by a restaurant)] are located north of the Cole Brook property. Residential properties and undeveloped properties abut the Cole Brook property to the south, and undeveloped properties along Old Fall River Road abut the Cole Brook property to the east. The property is bordered to the west by residential properties, undeveloped wetlands and woodland, and the Shingle Island River. The property is bordered by Old Fall River Road to the north and Hixville Road to the south [1-2; 4, pp. 3, 8].

Public access to the Cole Brook property is unrestricted. The current main entrance to the property is an unimproved access road that extends southward from Old Fall River Road across the Cole Brook property to Hixville Road, with branches to the eastern and western portions of the property.



BASE TOPOGRAPHIC MAP IS A PORTION OF 7.5' SERIES U.S.G.S. TOPOGRAPHIC QUADRANGLE(S).
THE FOLLOWING DIGITAL ORTHOPHOTO QUADS ARE DOWNLOADED FROM THE MASSGIS WEBSITE:
Q241828.sid; Q241822.sid; Q245826.sid; Q245822.sid

0.5 0 0.5 1 Miles

1000 0 1000 2000 3000 4000 5000 6000 Feet

0.5 0 0.5 1 Kilometers

QUADRANGLE LOCATION

NOTE: SITE BOUNDARY LINE IS APPROXIMATE.

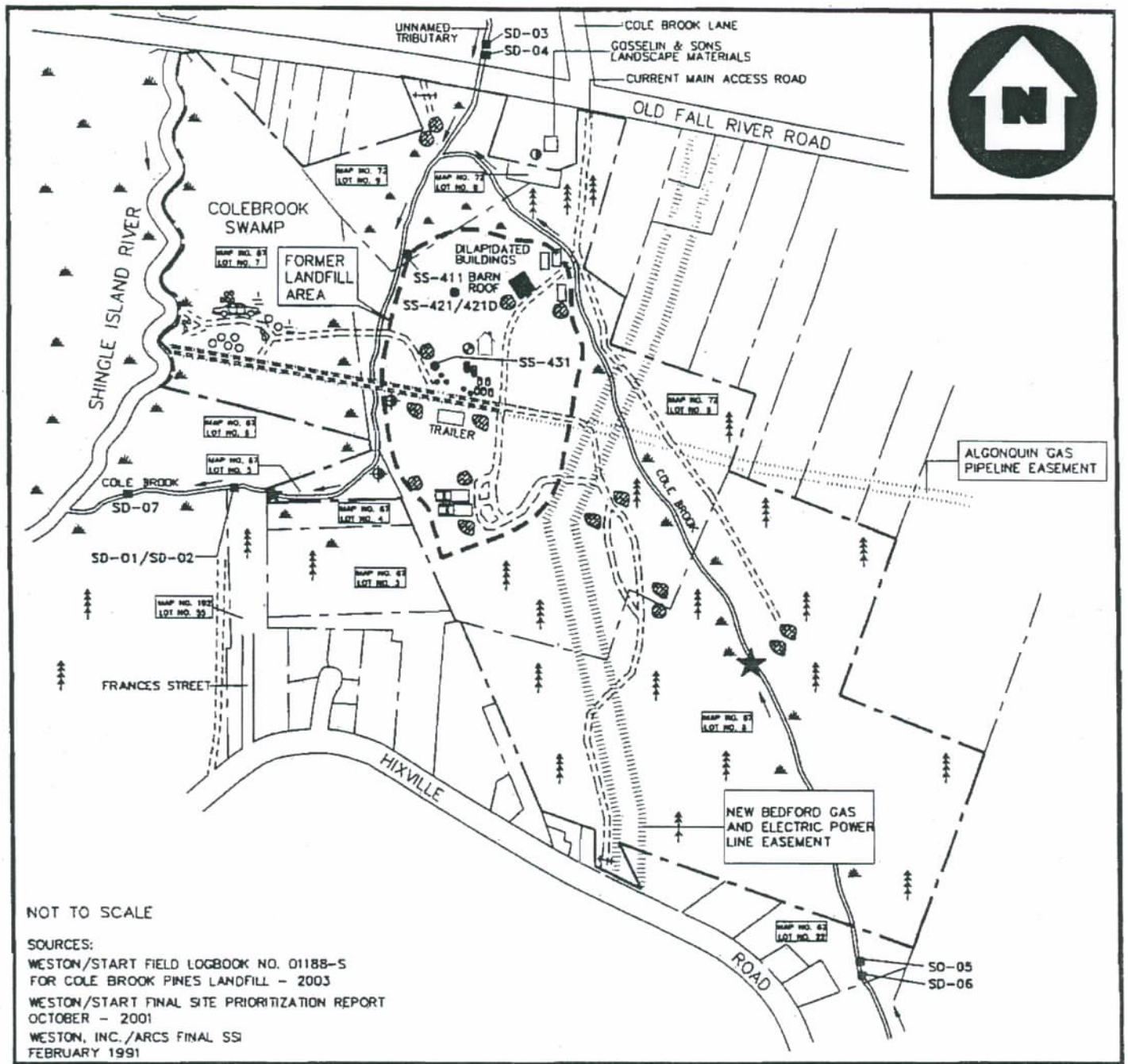
SITE LOCATION MAP

COLE BROOK PINES LANDFILL
OLD FALL RIVER ROAD
DARTMOUTH, MASSACHUSETTS

WESTON SOLUTIONS
Restoring Resource Efficiency

REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD #	DRAWN BY:	DATE
04-05-0134	P. Schrot	10/22/2003
FILE NAME E:\ARC_APRS\START2\Cole Brook Pines.apr (Layout: FIG1-TWP)		FIGURE 1



NOT TO SCALE

SOURCES:
WESTON/START FIELD LOGBOOK NO. 01188-S FOR COLE BROOK PINES LANDFILL - 2003
WESTON/START FINAL SITE PRIORITIZATION REPORT OCTOBER - 2001
WESTON, INC./ARCS FINAL SSI FEBRUARY 1991

LEGEND

- PROBABLE POINT OF ENTRY TO SURFACE WATER
- COLE BROOK PINES LANDFILL PROPERTY/SITE BOUNDARY
- PROPERTY/LOT LINE
- UNPAVED ROAD
- PRIVATE DRINKING WATER SUPPLY WELL (SCREENED IN BEDROCK)
- DEBRIS
- TIRE
- CYLINDER
- 55-GALLON DRUM
- 5-GALLON PAIL
- METAL SPHERE
- WETLANDS
- WOODED AREA
- RESIDENCE
- FLOW DIRECTION
- ABANDONED AUTOMOBILE
- ABANDONED TRUCK
- ABANDONED AUTOMOBILE GASOLINE TANKS
- MISCELLANEOUS SOLID WASTE PILE (OBSERVED DURING VARIOUS HISTORICAL ON-SITE RECONNAISSANCES)
- MONITORING WELL (SCREENED INTERVAL UNKNOWN)
- START SEDIMENT SAMPLE LOCATION (2001 SIP)
- ARCS SOIL SAMPLE LOCATION (1990 SSI)

SITE SKETCH AND HISTORICAL SAMPLE SKETCH

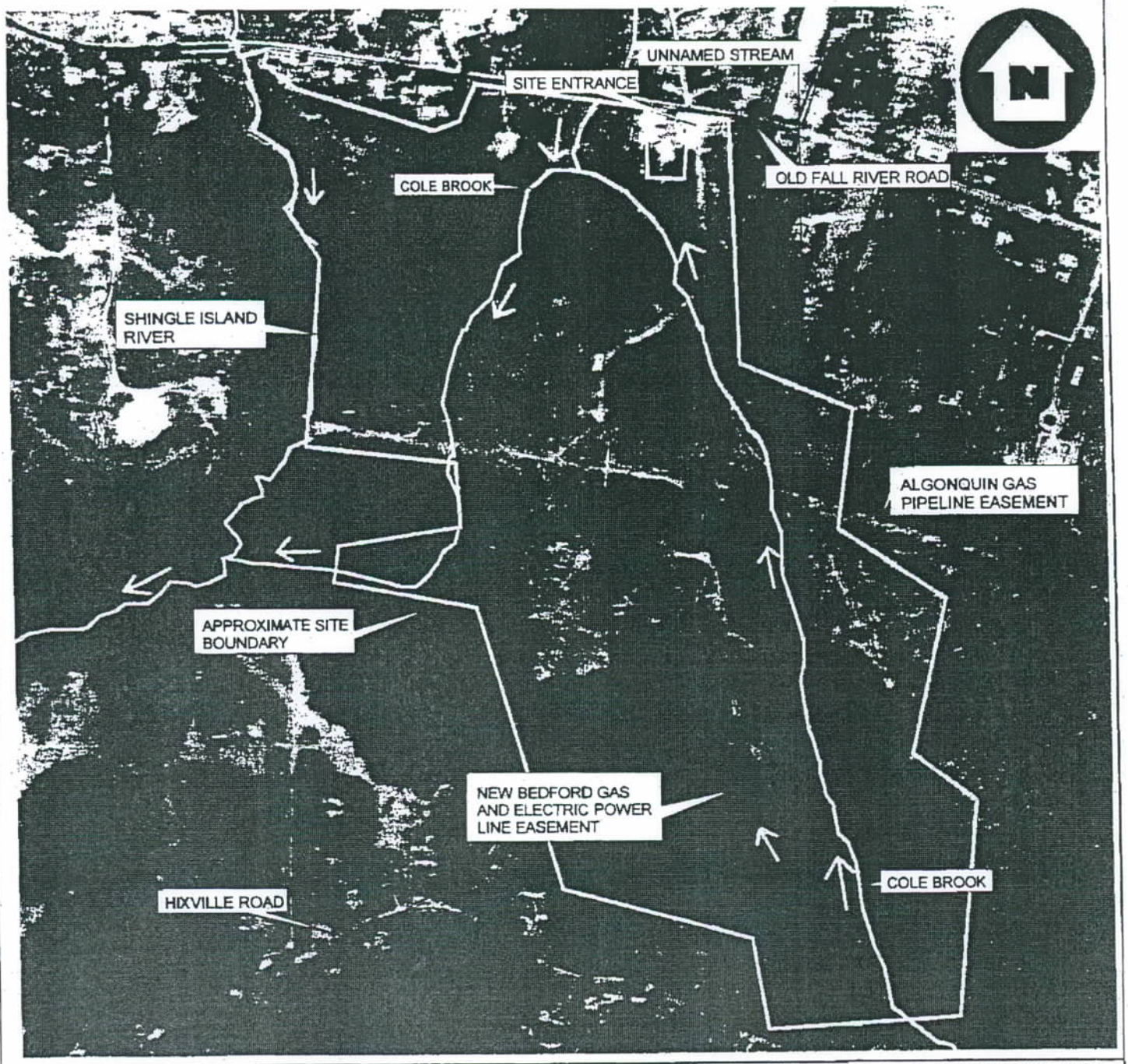
COLE BROOK PINES LANDFILL
OLD FALL RIVER ROAD
DARTMOUTH, MASSACHUSETTS

WESTON SOLUTIONS
REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD #	DRAWN BY:	DATE
04-05-0134	W. SHAW	10/22/03

FILE NAME: S:\04050134\Figures\FIG_2.DWG

FIGURE 2



BASE AERIAL PHOTOGRAPHS (APRIL 2001) ARE A PORTION OF THE FOLLOWING 1:5,000 SCALE BLACK AND WHITE DIGITAL ORTHOPHOTO QUADS DOWNLOADED FROM THE MASSGIS WEBSITE: 241826.sid; 241822.sid; 245826.sid; 245822.sid

NOTE: SITE BOUNDARY LINE IS APPROXIMATE.

→ = FLOW DIRECTION

0.09 0 0.09 0.18 0.27 0.36 0.45 Miles

200 0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 Feet

0.5 0 0.5 Kilometers

QUADRANGLE LOCATION

SITE LOCATION
AERIAL PHOTOGRAPH

COLE BROOK PINES LANDFILL
OLD FALL RIVER ROAD
DARTMOUTH, MASSACHUSETTS

WESTON SOLUTIONS
Restoring Resource Efficiency

REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD #	DRAWN BY	DATE
04-05-0134	P. Schrot	02/12/2004

FILE NAME: E:\ARC_APRS\START2\Cole Brook Pines2.apr (Layout: Draft Report)

FIGURE 2A

The west branch of the access road provides access to the former solid waste landfill, and the east branch of the access road provides access to the southeastern portion of the property, where several piles of solid waste are located. Reportedly, local youths use the access road as a "short cut" to travel between Old Fall River Road and Hixville Road. Another unimproved access road, which is gated, is located in the northern portion of Lot No. 9 on Map No. 72 and extends south from Old Fall River Road [2; 4, pp. 3, 7, 10-11].

The topography of the area surrounding the Cole Brook property gently slopes from east to west, with the western, northern, and portions of the eastern landfill toe located in low-lying wetland areas. Stormwater runoff from the property drains radially into Colebrook Swamp, located to the north, west, and east of the former solid waste landfill, and into an unnamed stream (hereafter referred to as "Cole Brook"), located north, west, and east of the former solid waste landfill. The wetland areas located adjacent to the western and northern portions of the former solid waste landfill are depicted on the U.S. Geological Society (USGS) topographic map as Colebrook Swamp [52]. Cole Brook enters the Cole Brook property at the southeastern property boundary and flows north/northwesterly past the former solid waste landfill, where it turns southwesterly and flows through Colebrook Swamp and then joins the Shingle Island River [4, p. 8; 20; 52].

On 11 June 2003, as part of the ESI, START and MA DEP personnel conducted an on-site reconnaissance of the Cole Brook property. START and MA DEP personnel toured the property and observed several abandoned groundwater monitoring wells, abandoned automobiles, tire piles, metal spheres (suspected to be buoys), piles of automobile gasoline tanks, and piles of solid waste similar to those observed during previous site investigations. The dilapidated buildings along the access road were being used to house farm animals and dogs. START personnel observed people feeding the animals and obtaining water for the animals from an on-site spigot. In the southern portion of the former landfill area, START and MA DEP personnel also observed standing water with a sheen in a gravel berm area [58, pp. 2-10].

OPERATIONAL AND REGULATORY HISTORY AND WASTE CHARACTERISTICS

An 1893 USGS topographic map depicts no structures or roads on the property [60]. USGS topographic maps completed in 1944 and in 1951 depict an unimproved or private road connecting Old Fall River Road and Hixville Road; however, no buildings are depicted on the property [61-62].

Sometime in the 1940s, the property was purchased by Dr. Cecil B. Smith, Sr. (Dr. Smith). In 1954, on-site sand and gravel excavation operations began, and portions of the property were used for disposal of solid waste, primarily demolition debris [4, p. 5; 64, Exhibit S].

Beginning in the early 1960s, Dr. Smith permitted his son, Mr. Cecil Smith, Jr. (Mr. Smith), to manage the on-site disposal of the demolition debris, which generally consisted of, but was not limited to, brick, wood, steel, pipes, and general debris from building demolition. During this time, Mr. Smith also used the property for storage of salvageable material (principally scrap metals). The volume of demolition materials disposed of on the property is unknown; however, it is known that the disposal on the property was sporadic and depended on urban renewal activity in the nearby cities and towns [4, p. 5].

On 10 August 1973, a complaint by a group of residents of the Town of Dartmouth, known as the "Ecology Committee of Dartmouth", stated that "pools of waste oil" were observed on the property. In response to the complaint, members of the Town of Dartmouth Board of Health (BOH) performed an inspection of the property. According to notes from the inspection, an excavation on the property was observed to be "filled with oil" [4, p. 6]. Information regarding the exact location and volume of the excavation could not be located in available file information.

Sometime in 1973, the Town of Dartmouth secured a court order against Mr. Smith. The order directed Mr. Smith to cease all disposal operations on the property [64, pp. 3, 11].

In 1974, inspections of the Cole Brook property by the Massachusetts Department of Public Health (MA DPH) "...revealed that oil and dredgings..." had been disposed of on the property [4, p. 6].

On 4 March 1975, Massachusetts Department of Environmental Quality Engineering (MA DEQE) personnel conducted an inspection of the property and reported violations of Massachusetts Solid Waste Disposal Regulations concerning the following: equipment, cover material, fire protection, access facilities, unloading of refuse, control of wind-blown litter, spreading and compacting of refuse, depth of cover, special wastes, salvage operations, vector control, and operational records [4, p. 6].

On 13 March 1975, the Town of Dartmouth secured another court order against Mr. Smith. This court order directed Mr. Smith to install 1 foot of cover material over the entire solid waste landfill. The court order further prohibited Mr. Smith from conducting disposal operations on the property until operations were in accordance with State regulations [64, pp. 5, 11, Exhibit L; 66, Enclosure 3].

On 6 October 1975, the Town of Dartmouth BOH voted "...to assign the Sanitary Landfill area of Plat 86, portions of Lot #8 and #12, off of Old Fall River Road, North Dartmouth, Mass. for Cecil Smith". This assignment permitted (with certain restrictions) Mr. Smith to operate a sanitary landfill on 60 acres of the Cole Brook property [7, Appendix; 63, p. 7, Exhibit A]. Based on available information, it appears that Lot Nos. 8 and 12 on Plat No. 86 are currently contained within Lot No. 6 on Map No. 72 [1-2; 7, Appendix].

On 3 February 1976, MA DEQE conducted an inspection of the Cole Brook property and observed that "...certain portions of the site had not been completely covered or covered with the required one foot of material" [66, Enclosure 4].

On 26 April 1976, the Town of Dartmouth BOH granted the modification of the original site assignment to Clean Communities Corporation (Clean Communities). The modified assignment permitted (with certain restrictions) Clean Communities to operate a sanitary landfill on 60 acres of the Cole Brook property [63, p. 7, Exhibit B; 64, p. 8].

In October 1977, on behalf of Clean Communities, GHR Engineering Corporation (GHR) of New Bedford, Massachusetts excavated 34 test pits and installed five groundwater monitoring wells (designated A-1 through A-5) on the property as part of landfill preparation activities. The wells were "...installed along the western perimeter of the site" and "...between the assigned landfill area

and the existing natural brook" [7, Appendix]. START personnel were unable to locate information in available files regarding the exact locations of the test pits and monitoring wells.

On 2 December 1977, GHR collected five groundwater samples from the five monitoring wells (A-1 through A-5) on the property. In addition, two surface water samples were collected from Cole Brook at points upstream and downstream of the former solid waste landfill area. The exact locations at which the surface water samples were collected could not be determined. Two metals (copper and zinc) were detected in the groundwater and the surface water samples; and nickel was also detected in the groundwater sample collected from monitoring well A-1 [4, pp. 6, 9, Attachment A; 15]. Analytical results of these groundwater samples and surface water samples are discussed in greater detail in the Groundwater Pathway and Surface Water Pathway sections, respectively, of this report.

On 16 December 1977, Dr. Smith transferred ownership of the entire property to Mr. Smith; and on 19 December 1977, Mr. Smith transferred ownership of the entire property to Shingle Island, Inc. Mr. Smith, as the principal of Shingle Island, Inc., subsequently leased the property to Southwestern Resource Recovery, Inc., who had a contract with Clean Communities to manage the property [4, p. 6].

On 3 May 1978, MA DEQE received plans and a report from GHR (dated March 1978) for operation of a sanitary landfill on the assigned 60-acre portion of the Cole Brook property [64, p. 10; 70].

On 21 October 1979, GHR submitted modified plans and a report to MA DEQE for operation of a 15-acre sanitary landfill within the assigned 60-acre portion of the Cole Brook property. These modified plans and report were essentially the same as those submitted on 3 May 1978 with the exception that no alterations of the site would occur within 100 feet of the wetlands [64, p. 10, Exhibit F; 70].

On 4 March 1980, MA DEQE approved the modified plans for operation of a sanitary landfill on 15 acres of the assigned 60-acre portion of the Cole Brook property, at a rate of 100 tons per day [67; 70]. The ultimate volume of the new landfill would be approximately 250 acre-feet [approximately 4.03E+05 cubic yards (yd^3)] [7].

On 28 March 1980, on behalf of Clean Communities and in accordance with the Massachusetts Environmental Policy Act (MEPA), GHR completed an "*Environmental Notification Form for Clean Communities Corporation.*" The Environmental Notification Form (ENF), along with revised plans, was subsequently submitted to the Massachusetts Executive Office of Environmental Affairs. The ENF was submitted so that the maximum landfill volume and rate could be increased over those specified in the plans approved by MA DEQE on 4 March 1980. The ENF provided a review of existing conditions at the Cole Brook property and provided plans to construct a new sanitary landfill on top of the existing solid waste landfill. The ENF stated that the proposal for the upgrading (reconstruction) of the existing solid waste landfill would include a gravel blanket-clay liner system to prevent any leachate generation and an extensive groundwater and surface water monitoring system to detect leachate. The ENF stated that the new landfill was proposed to operate at a rate of 600 to 700 tons per day with an ultimate volume of 500 acre-feet (approximately 8.1E+05 yd^3) [7].

On 16 May 1980, the Secretary of the Massachusetts Executive Office of Environmental Affairs approved the increase in tonnage from 100 tons per day to 700 tons per day with no Environmental Impact Report (EIR), provided that a leachate collection system was installed prior to operation of the landfill [69].

On 12 January 1981, MA DEQE approved revised plans for the increase in tonnage from 100 tons per day to 700 tons per day with no EIR, provided that a leachate collection system was installed prior to operation of the landfill [68].

On 10 July 1981, the Town of Dartmouth Conservation Commission issued a cease and desist order (regarding construction of the proposed sanitary landfill) to Shingle Island, Inc. This order cited the property owner for violations of the Wetlands Protection Act and local wetlands bylaws [8].

On 30 December 1981, GHR submitted a letter to MA DEQE certifying that the property had been improved such that the proposed sanitary landfill area had been graded and covered with a relatively impermeable clay liner material, and a protective cover of sandy soil had been placed over the clay liner. In addition, a leachate collection system was installed, which included a collection trench fitted with perforated polyvinyl chloride (PVC) piping and an underground collection tank. The letter further stated that all required monitoring wells and a fire protection well were installed on the property [9]. Available file information did not specify whether these monitoring wells were those monitoring wells installed in October 1977 or whether these monitoring wells were subsequently installed on the property.

On 5 January 1982, GHR collected five groundwater samples from "observation wells" B-1, B-2, B-5, B-6, and B-7 on the property. START was unable to determine if these observations wells were the same as the monitoring wells sampled in 1977. Analysis of the samples revealed the presence of one volatile organic compound (VOC) (benzene), one semivolatile organic compound (SVOC) [bis(2-ethylhexyl)phthalate], and eight metals (calcium, copper, iron, magnesium, manganese, potassium, sodium, and zinc) [4, pp. 7, 10, Attachment B; 16]. Analytical results of these groundwater samples are discussed in greater detail in the Groundwater Pathway section of this report.

On 11 February 1982, the Town of Dartmouth Conservation Commission collected one leachate sample and one sediment sample from the property. Available file information did not specify the locations at which the samples were collected. Laboratory analysis of the samples indicated the presence of polychlorinated biphenyls (PCBs) (identified as Aroclor-1254) in both samples. In addition, Aroclor-1242 was detected in both samples, but was not specifically quantified [4, pp. 7, 10, Attachment C; 21]. Analytical results of the leachate sample and the sediment sample are discussed in greater detail in the Waste/Source Sampling and Surface Water Pathway sections, respectively, of this report.

On 12 February 1982, GHR collected two groundwater samples from observation well Nos. 3 and 4 on the property. START personnel were unable to locate information in available files regarding the exact locations of the observation wells or when the wells were installed. In addition, GHR collected one leachate sample from "Seepage from rubble in [the] NE [northeast] corner of [the] old landfill." The exact location at which the sample was collected could not be determined from

available file information. Laboratory analysis of the groundwater samples revealed the presence of 10 metals, including arsenic, calcium, copper, iron, magnesium, manganese, nickel, potassium, sodium, and zinc. A total of seven metals, including copper, iron, lead, manganese, nickel, sodium, and zinc, were detected in the leachate sample. No VOCs were detected in the leachate sample [4, pp. 7, 10, Attachment D; 65]. Analytical results of the leachate sample and the groundwater samples are discussed in greater detail in the Waste/Source Sampling and Groundwater Pathway sections, respectively, of this report.

On 1 February 1983, the Cole Brook property was added to the CERCLIS database [29].

On 1 March 1983, as part of a Preliminary Assessment (PA) conducted on behalf of EPA, NUS Corporation/Field Investigation Team (NUS/FIT) personnel conducted a perimeter survey of the Cole Brook property [48]. NUS/FIT reported that the majority of waste disposed of on the property included "...demolition materials from construction." Also reported to be disposed of on the property was "...a variety of municipal waste..." and waste oil. NUS/FIT completed the PA on 3 May 1983 [48].

On 21 December 1983, a court order placed a permanent injunction against conducting sanitary landfilling operations on the Cole Brook property [56, p. 2].

On 11 April 1987, the Town of Dartmouth Building Department reportedly issued to Mr. Smith a permit to build a residence on a foundation located within the former solid waste landfill. In addition, a private drinking water supply well and a septic system were installed in conjunction with the construction of the house [4, p. 7].

On 3 October 1988, a "Revised Order and Judgement After Remand" ruled that the landfilling of demolition materials was permissible on the former solid waste landfill portion of the Cole Brook property because it was determined to be a prior non-conforming use. The revised judgment defined the scope of the non-conforming use permitted at the property, which included the following: landfilling operations were not to exceed 4,000 tons of demolition debris per year, and the elevation of the landfill was not to exceed 10 feet above the existing ground elevations [4, p. 6; 56, p. 2].

On 15 August 1990, as part of a Screening Site Inspection (SSI) conducted on behalf of EPA, WESTON Alternative Remedial Contracts Strategy (ARCS) personnel conducted an on-site reconnaissance of the Cole Brook property. ARCS reported that the former solid waste landfill area is generally divided by the AG pipeline easement. ARCS personnel observed that the portion of the former solid waste landfill located north of the AG pipeline easement was covered by vegetation, with the exception of the access road and areas in the vicinity of the residence and a barn. In the vicinity of the residence and barn, ARCS personnel observed an "intact roof structure" and several abandoned automobiles. Reportedly, the landfill was only slightly elevated above the access road; however, adjacent to wetland areas, the change in elevation was approximately 10 to 15 feet. Miscellaneous demolition materials and other solid wastes were observed to be exposed on the top and on the sides of the landfill. The landfill cover appeared to be a silty-sand material with numerous holes and voids. In addition, sea shells were scattered on the top of the landfill [4, p. 3].

ARCS personnel reported that the portion of the former solid waste landfill located south of the AG pipeline easement was predominantly covered by short grass with miscellaneous solid waste piles

scattered on the surface; this area did not appear to contain subsurface solid waste. However, immediately to the southwest of the AG pipeline easement, ARCS reported that solid waste did appear to be landfilled. This area was covered by weeds and brush with solid wastes, including several abandoned automobiles, empty fuel tanks, concrete blocks, wooden pallets, and miscellaneous automobile parts and tires, scattered on the surface. In addition, an underground concrete tank was observed on the southwestern edge of the former solid waste landfill area, adjacent to wetlands. The dimensions of the tank were approximately 5 feet wide by 10 feet long. ARCS personnel could not verify the exact function of the tank; however, START presumes that the tank was part of the proposed leachate collection system. In addition, an uncapped 2-inch-diameter PVC monitoring well was located in the vicinity of this tank [4, p. 3].

ARCS personnel reported that the portion of the property located east/southeast of the former solid waste landfill area was used for the disposal of miscellaneous solid wastes, including "...wood wastes, white goods, recently burned miscellaneous solid waste, one empty rusted drum, automotive parts, tree stumps, tire piles, concrete rubble, empty storage tanks, and a tractor trailer full of tires" [4, p. 3].

ARCS personnel reported observing oil-stained soil south of the AG pipeline easement "...near the miscellaneous automobile parts and fuel tanks and near a tire pile." Oil-stained soil was also observed adjacent to and north of the AG pipeline easement near an abandoned diesel engine [4, p. 5].

Also on 15 August 1990, ARCS personnel collected five surface soil samples (SS-411, SS-421, SS-421D, SS-431, and SS-441), including a duplicate, from the property (Figure 2). Four soil samples were collected at 6 inches below grade (SS-421, SS-421D, SS-431, and SS-441); one soil sample was collected at 12 inches below grade (SS-411). Sample SS-441 was collected east of the former solid waste landfill area (presumably upgradient of potential sources) to document reference conditions. The soil samples were analyzed through the EPA Contract Laboratory Program (CLP) for VOCs, SVOCs, pesticides, PCBs, metals, and cyanide [4, pp. 10-11; 28].

For each sample location, a compound or element is defined as being above reference criteria if it is detected at a concentration greater than or equal to three times the higher of its respective matrix reference sample. However, if the compound or element is not detected in the reference samples, the reference sample's sample quantitation limit (SQL) (for organic analyses) or sample detection limit (SDL) (for inorganic analyses) is used as the reference value.

Three VOCs; 18 SVOCs; one pesticide; and six metals were detected in the samples at concentrations above reference criteria [4, pp. 13-14, Attachment E]. Analytical results of these samples are discussed in greater detail in the Waste/Source Sampling section of this report.

On 4 April 1996, MA DEP (formerly MA DEQE) personnel secured a court order/search warrant to enter the Cole Brook property in response to anonymous complaints of the illegal disposal of solid waste, possibly including hazardous wastes, on the property and into adjacent wetlands. MA DEP's inspection revealed the presence of approximately 500 wooden pallets in a wetland buffer zone located along the main access road. Additional piles of wooden pallets (totaling approximately 4,000 to 5,000 pallets) were observed in wetlands and/or wetland buffer zones. MA DEP observed

approximately 100 to 200 automobile tires, miscellaneous wood wastes, construction and demolition (C&D) debris, several abandoned vehicles (including a 40-foot box trailer containing approximately 500 automobile tires), what appeared to be a boiler and associated suspected asbestos-containing material (ACM), empty "barrels" (likely drums), areas of ash (signifying open burning), and suspected petroleum spills on the property. MA DEP personnel noted the locations and conditions of the groundwater monitoring wells on the property. The monitoring wells were locked; however, the locks were entirely rusted [6].

MA DEP reported that pieces of perforated PVC pipe were scattered on the ground. MA DEP concluded that this PVC pipe was the remains of the proposed sanitary landfill's base clay liner and leachate collection system. Moreover, MA DEP reported that the proposed sanitary landfill never went into operation, but instead the leachate collection system (inclusive of the clay liner) was scraped off and removed [6].

On 25 June 1996, based on their inspection conducted on 4 April 1996, MA DEP issued a Notice of Noncompliance (NON) letter to Mr. Smith [23].

On 3 December 1996, based on additional inspections of the property conducted on 12 April 1996 and 1 October 1996, MA DEP issued Release Tracking Number (RTN) 4-12656 and a Notice of Responsibility (NOR) letter to Mr. Smith. The NOR required Mr. Smith to employ a Licensed Site Professional (LSP) and complete an Immediate Response Action (IRA) pursuant to Massachusetts General Law (MGL), Chapter 21E [24].

In 1997, the Cole Brook property was reportedly under investigation by MA DEP's Regional Enforcement and Compliance Team (REACT) Strike Force. Reportedly, there had been illegal dumping of wastes, including hazardous wastes, in the former solid waste landfill area and the adjacent wetlands. Some of the waste disposed of in these areas included lead paint, asbestos, demolition debris, miscellaneous automobile parts, and waste oil. According to MA DEP's Regional Enforcement Department, the former solid waste landfill had been capped and was to be "piggy backed" by another landfill, with the cap on the solid waste landfill acting as a liner for the new landfill. However, after not receiving the proper permits to operate the new landfill, Mr. Smith allegedly removed the cap materials and sold them [39].

On 1 February 2000, as part of the SIP conducted on behalf of EPA, START personnel conducted an on-site reconnaissance of the Cole Brook property from the AG pipeline easement, which was entered via the main access road to the Cole Brook property. The reconnaissance was conducted via the AG pipeline easement since on-site access for the property was not granted by Mr. Smith. Along the access road, START personnel observed the roof of a barn and several dilapidated buildings. The yard area surrounding the on-site residence contained the remains of an abandoned canteen truck and mobile home; a corrugated metal cylinder; fiberglass; wood; boat wreckage debris; and several rusted, empty 55-gallon drums. START personnel also observed 5-gallon plastic buckets, pieces of scrap metal, and five large metal spheres (suspected to be buoys). Two piles of automobile tires (approximately 300) and a pile of automobile gasoline tanks (approximately 50) were observed north of the access road along the AG pipeline easement, on an island in Colebrook Swamp. It is unknown if stained soil existed on the property as snow cover prevented observation of the ground surface by START personnel [3, p. 5].

On 24 July 2000, START personnel conducted an off-site, perimeter reconnaissance to determine the accessibility of possible off-site surface water pathway sampling locations. START personnel interviewed neighbors and determined that the Cole Brook property was inactive, except for its use as a residence by one person, reportedly Mr. Smith's ex-wife. START further noted that Gosselin & Sons Landscape Materials uses the portion of the Cole Brook property near the main access road as a storage area for supplies, both in piles and inside tractor trailers [3, p. 12].

On 10 October 2000, START personnel collected five sediment samples (SD-01, SD-02, and SD-05 through SD-07) from Cole Brook and two sediment samples (SD-03 and SD-04) from an unnamed tributary of Cole Brook located north of the Cole Brook property, to determine if there has been a release of hazardous substances (associated with the Cole Brook property) to surface water (Figure 2). All the samples were collected off site because START was not granted access to the Cole Brook property. The samples were analyzed through a Delivery of Analytical Services (DAS) laboratory for VOCs, SVOCs, pesticides, PCBs, metals, and cyanide, with the exception of SD-04 and SD-06, which were analyzed for metals only [3, p. 12].

Three metals were detected in the sediment samples at concentrations greater than three times the appropriate reference concentration or greater than or equal to the appropriate reference sample's SDL [3, p. 33]. Analytical results of the sediment samples collected by START personnel are discussed in greater detail in the Surface Water Pathway section of this report.

On 2 February 2001, Ms. Robinson purchased the Cole Brook property from Shingle Island, Inc. [77].

In February 2002, St. Germain & Associates, Inc. (St. Germain) of Scarborough, Maine, on behalf of New England Waste Services (NEWS) of Auburn, Massachusetts (a division of Casella Waste Systems, Inc. of Rutland, Vermont), initiated an Environmental Investigation of the landfill portion of the Cole Brook property. The Environmental Investigation was conducted as part of a proposal to cap and close the existing landfill on the property [78, p. 1].

On 7 February 2002, as part of the Environmental Investigation, St. Germain personnel collected five surface water samples (SW-01 through SW-05) and five sediment samples (SED-01 through SED-05) from five unreported locations along Cole Brook and an unnamed tributary leading into Cole Brook. Six SVOCs and one metal were detected in the sediment samples [78, p. 4]. Analytical results of the surface water and sediment samples are discussed in greater detail in the Surface Water Pathway section of this report.

On 8 and 11 February 2002, as part of the Environmental Investigation, Frank Corporation Environmental Services of New Bedford, Massachusetts excavated 42 test pits (TP-1 through TP-42) throughout the property. Twenty-three test pits were located south of the AG pipeline easement, and 19 test pits were located north of the AG easement. St. Germain personnel monitored and logged the test pit excavations. One soil sample was collected from each test pit, as well as from four pre-existing test pits (TP-A through TP-D) located north of the AG easement [78, pp. 4-5]. No additional information regarding the locations of the test pits is available to START. Analytical results of soil samples collected from the test pits are discussed in greater detail in the Waste/Source Sampling section of this report.

Between 19 and 25 February 2002, as part of the Environmental Investigation, Guild Drilling Company, Inc. (Guild) of East Providence, Rhode Island advanced nine soil borings at the Cole Brook property for the purpose of installing groundwater monitoring wells to assess the groundwater quality above the bedrock aquifer. Guild installed nine groundwater monitoring wells (MW-1S, MW-1D, MW-2, MW-3, MW-4, MW-5S, MW-5D, MW-6S, and MW-6D) in the soil borings [78, p. 5]. The groundwater monitoring wells are discussed in greater detail in the Groundwater Pathway section of this report.

Subsequently, on an unreported date, St. Germain personnel collected groundwater samples from each groundwater monitoring well and a drinking water sample from the drinking water supply well that serves the on-site residence [78, pp. 5-6]. Analytical results of the groundwater and drinking water are discussed in greater detail in the Groundwater Pathway section of this report.

In March 2002, St. Germain completed an Environmental Investigation Summary Report of the landfill portion of the Cole Brook property [78, p. 3]. The Environmental Investigation Summary Report was not available for START to review.

On 12 December 2002, NEWS and Ms. Robinson submitted a "Proposal for Final Closure, Cold Brook Pines Landfill" (Closure Plan Proposal) to the Town of Dartmouth. The Closure Plan Proposal detailed the site history, the environmental site assessment completed by St. Germain, the closure plan, and a benefit analyses of the proposed landfill closure [78, pp. 1-16].

On 7 March 2003, Brown and Caldwell Environmental and Engineering Consultants (Brown and Caldwell), retained by the Town of Dartmouth to review the Closure Plan Proposal, submitted a memorandum to the Town of Dartmouth BOH regarding the Cole Brook property. In the memorandum, Brown and Caldwell summarized the regulatory status of the property within the MA DEP Bureau of Waste Site Cleanup and the site history, and identified the following three potential key issues that should be resolved before the initiation of the closure of the former landfill: clarification of property ownership, the presence of existing environmental contamination, and legal ramifications of the Superior Court Order issued on 3 October 1988 [89].

On 7 March 2003, Brown and Caldwell submitted a memorandum to the Town of Dartmouth BOH regarding the Closure Plan Proposal. In the memorandum, Brown and Caldwell stated that the basic plan to consolidate, shape, and cover the old waste in the former landfill was sound, but the proposal provided little detail regarding the following six aspects of the Closure Plan Proposal: current site characterization; previous on-site investigations; the anticipated regulatory structure within MA DEP guidelines; proposed shaping and grading of the landfill (anticipated traffic, materials, and material quantity); anticipated landfill engineering and site design; and anticipated economic benefits, operations, and post-closure plans. Specifically, Brown and Caldwell noted that the Closure Plan Proposal described some isolated environmental sampling results, but lacked any conclusions that would aid in determining the level of existing contamination on site [90].

On 24 March 2003, the Town of Dartmouth BOH submitted a letter to NEWS in response to the Closure Plan Proposal. In the letter, the BOH required the following information prior to any additional landfill closure activities at the Cole Brook property: clarification of property ownership; a Town Counsel determination regarding the siting of the amount of waste required to accommodate

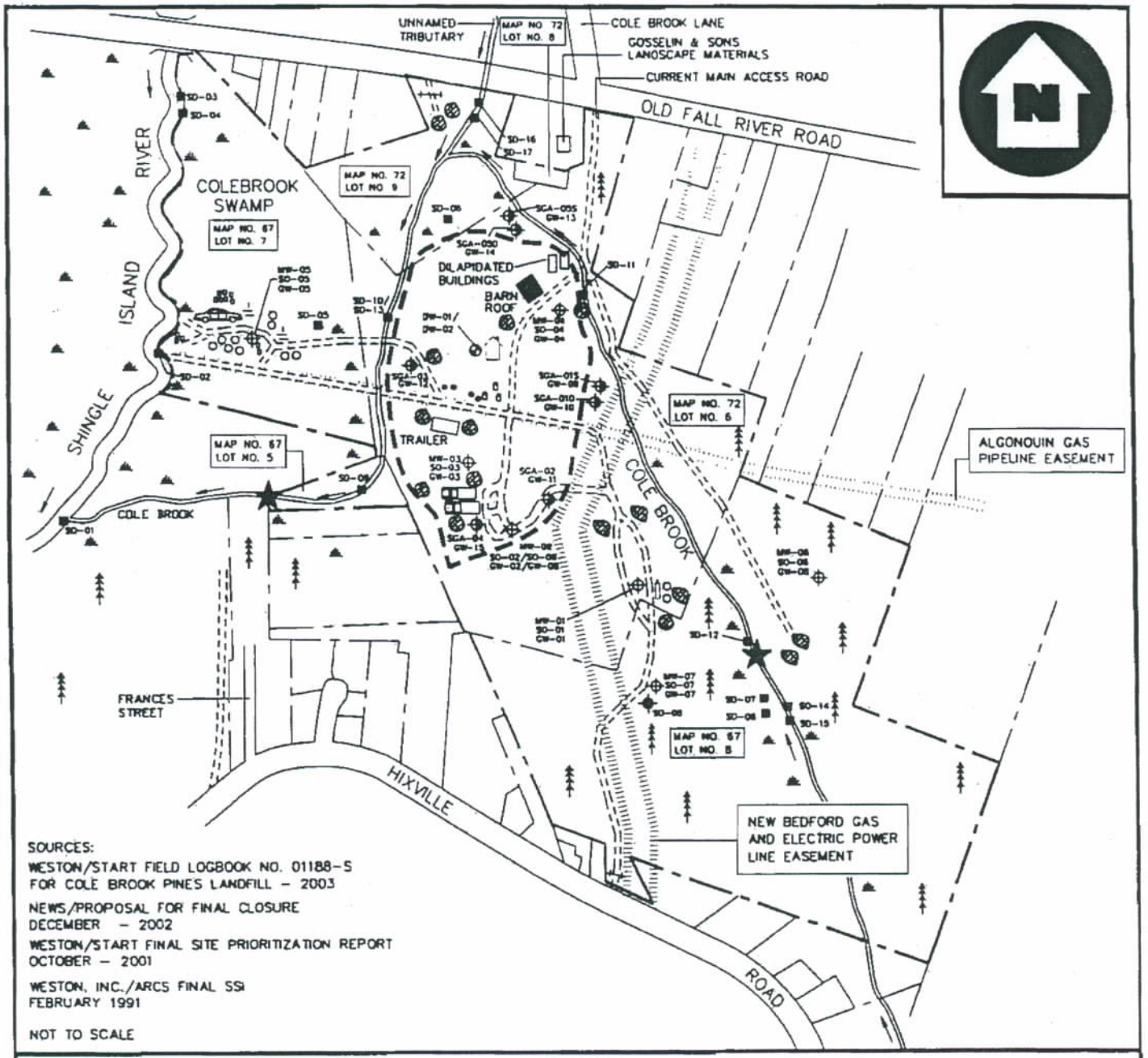
the proposed grading; a determination from EPA and MA DEP that the site may be safely closed as a landfill without first conducting hazardous waste cleanup activities; and additional site information, including test pit logs and soil and water quality sampling results [91]. No additional information regarding the Closure Plan Proposal is available to START.

On 11 June 2003, as part of the ESI, START and MA DEP personnel conducted an on-site reconnaissance of the Cole Brook property [58, pp. 2-10]. Based on observations made during the on-site reconnaissance, START assumes that operations in the landfill Closure Plan Proposal were never conducted at the property. The on-site reconnaissance is discussed in greater detail in the Site Description section of this report.

On 26 through 29 January 2004, 17 through 19 February 2004, and 13 April 2004, as part of the ESI, START personnel oversaw the installation of seven overburden groundwater monitoring wells (MW-01 through MW-07); collected nine surface soil/source samples (SO-01 through SO-09) from potential source areas on the Cole Brook property; collected 15 groundwater samples (GW-01 through GW-15) from groundwater monitoring wells MW-01 through MW-07 and from seven groundwater monitoring wells (SGA-01S, SGA-01D, SGA-02, SGA-03, SGA-04, SGA-05S, and SGA-05D) previously installed by Guild and St. Germain to determine if there has been a release of hazardous substances, associated with sources on the Cole Brook property, to groundwater; collected two drinking water samples (DW-01 and DW-02) from the on-site drinking water supply well to determine if there has been a release of hazardous substances, associated with sources on the Cole Brook property, to drinking water; and collected 17 sediment samples (SD-01 through SD-17) from an unnamed tributary, Cole Brook, Shingle Island River, and on-site wetlands to determine if there has been a release of hazardous substances, associated with sources on the Cole Brook property, to surface water (Figures 3 and 3A) [58, pp. 12-48; 59, pp. 2-27].

Soil/source samples SO-01 though SO-09, groundwater samples GW-01 through GW-15, drinking water samples DW-01 and DW-02, and sediment samples SD-01 through SD-17 were analyzed for VOCs, SVOCs, pesticides, PCBs, metals, and cyanide, with the exception of samples SO-08, SD-04, SD-08, SD-15, and SD-17, which were analyzed for metals only [58, pp. 12-48; 59, pp. 2-27; 80-88].

Soil/source samples SO-07 and SO-08 are the reference samples for the soil/source samples; groundwater sample GW-07 is the reference sample for the groundwater samples; and sediment samples SD-03, SD-04, SD-07, SD-08, and SD-14 through SD-17 are the reference samples for the sediment samples. For the drinking water sample analyses, EPA Maximum Contaminant Levels (MCLs) and Massachusetts Contingency Plan (MCP) Massachusetts Oil and Hazardous Material List (MOHML) Reportable Category RCGW-1 groundwater standards are used as the reference values. If no MCL or RCGW-1 standard is available, applicable inorganic sample results are compared to EPA-established National Secondary Drinking Water Regulations (NSDWRs). NSDWRs are guidelines used to regulate contaminants in drinking water that may cause cosmetic or aesthetic effects [95]. Compounds or elements have exceeded reference criteria if they occurred at a concentration greater than or equal to the MCL, RCGW-1 standard, or NSDWR and are designated by their approximate relative concentration above these values.



SOURCES:
WESTON/START FIELD LOGBOOK NO. 01188-S FOR COLE BROOK PINES LANDFILL – 2003
NEWS/PROPOSAL FOR FINAL CLOSURE DECEMBER – 2002
WESTON/START FINAL SITE PRIORITIZATION REPORT OCTOBER – 2001
WESTON, INC./ARCS FINAL SSI FEBRUARY 1991

NOT TO SCALE

LEGEND

- PROBABLE POINT OF ENTRY TO SURFACE WATER
- FORMER LANDFILL AREA
- COLE BROOK PINES LANDFILL PROPERTY SITE BOUNDARY
- PROPERTY/LOT LINE
- UNPAVED ROAD
- PRIVATE DRINKING WATER SUPPLY WELL, START DRINKING WATER SAMPLE (SCREENED IN BEDROCK)
- DEBRIS
- TIRE
- CYLINDER
- FLOW DIRECTION
- 5-GALLON PAIL
- METAL SPHERE
- WETLANDS
- RESIDENCE
- MONITORING WELL, (SCREENED INTERVAL UNKNOWN), START GROUNDWATER SAMPLE
- WOODED AREA
- ABANDONED AUTOMOBILE
- ABANDONED SCHOOL BUS
- START SEDIMENT SAMPLE
- ABANDONED AUTOMOBILE GASOLINE TANKS
- MISCELLANEOUS SOLID WASTE PILE (OBSERVED DURING VARIOUS HISTORICAL ON-SITE RECONNAISSANCES)
- START SOIL BORINGS, MONITORING WELL (SCREENED IN OVERBURDEN), SOIL/SOURCE SAMPLE, AND GROUNDWATER SAMPLE
- START SOIL BORING, SOIL/SOURCE SAMPLE (NO MONITORING WELL INSTALLED)

START ESI SAMPLE LOCATION SKETCH

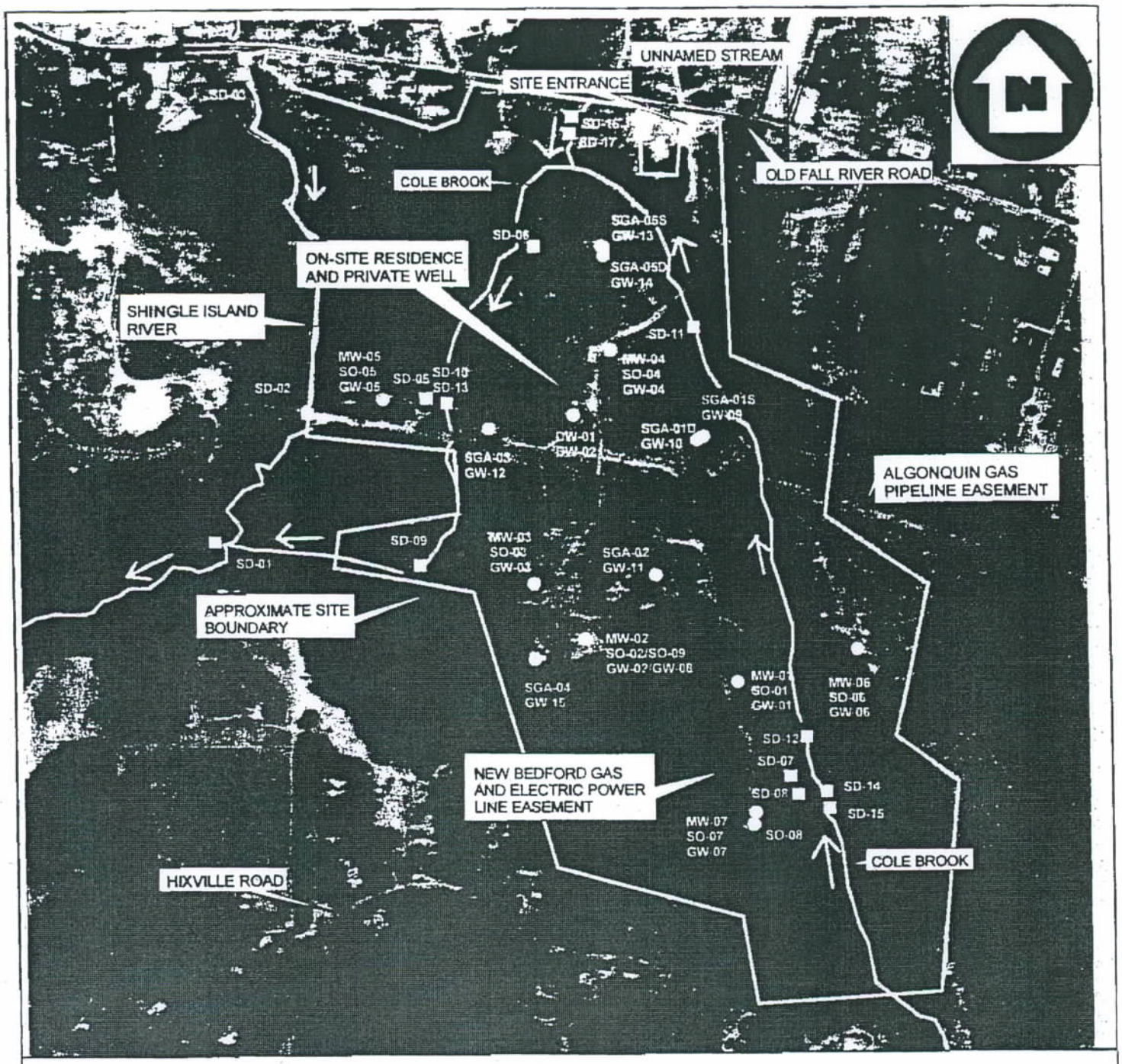
COLE BROOK PINES LANDFILL
OLD FALL RIVER ROAD
DARTMOUTH, MASSACHUSETTS

WESTON SOLUTIONS
REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD #	DRAWN BY:	DATE
04-05-0134	W. SHAW	10/22/03

FILE NAME: S:\04050134\Figures\FIG_3.DWG

FIGURE 3



BASE AERIAL PHOTOGRAPHS (APRIL 2001) ARE A PORTION OF THE FOLLOWING 1:5,000 SCALE BLACK AND WHITE DIGITAL ORTHOPHOTO QUADS DOWNLOADED FROM THE MASSGIS WEBSITE:
241826.sid; 241822.sid; 245826.sid; 245822.sid

NOTE: SITE BOUNDARY LINE IS APPROXIMATE.
→ = FLOW DIRECTION

0.1 0 0.1 0.2 0.3 0.4 0.5 Miles

300 0 300 600 900 1200 1500 1800 2100 2400 2700 3000 3300 Feet

0.5 0 0.5 Kilometers

QUADRANGLE LOCATION

START ESI SAMPLE LOCATIONS
AERIAL PHOTOGRAPH

COLE BROOK PINES LANDFILL
OLD FALL RIVER ROAD
DARTMOUTH, MASSACHUSETTS

WESTON SOLUTIONS
Restoring Resource Efficiency

REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD #	DRAWN BY:	DATE:
04-05-0134	A. GIBNEY	06/03/04
FILE NAME: E:\ARC_APRS\START2\Cole Brook Pines.apr (Layout: Samples)		FIGURE 3A

One VOC. 11 SVOCs. and nine inorganic substances (metals and cyanide) were detected in the soil/source samples: one VOC. one SVOC. 16 metals. and cyanide were detected in the groundwater samples: and one pesticide and two metals were detected in the sediment samples at concentrations above reference criteria. No substances were detected above reference criteria in the drinking water samples [80-88]. Sampling activities and analytical results of the START samples are discussed in greater detail in the Waste/Source Sampling. Groundwater Pathway, and Surface Water Pathway sections of this report.

Table 1 presents identified structures or areas on the Cole Brook property that are documented or potential sources of contamination, the containment factors associated with each source, and the relative location of each source.

Table 1

Source Evaluation for Cole Brook Pines Landfill

Source Area	Containment Factors	Spatial Location
Former Solid Waste Landfill	None	Central Portion of the Property
Contaminated Soil	None	Throughout the Property
Miscellaneous Solid Waste Piles	None	Throughout the Property

[3; 4; 6; 21; 23-24; 28; 56; 65]

Table 2 summarizes the types of potentially hazardous substances that have been disposed, used, or stored on the Cole Brook property.

Table 2

Hazardous Waste Quantity for Cole Brook Pines Landfill

Substance	Quantity or Volume/Area	Years of Use/Storage	Years of Disposal	Source Area
Miscellaneous solid waste[1]; waste oil; leachate contaminated with PCBs and metals; and soil contaminated with SVOCs, pesticides, and metals.	Approximately 60 acres	Approximately 1954 to present	Approximately 1954 to 1974	Former Solid Waste Landfill
Soil contaminated with VOCs, SVOCs, pesticides, and metals.	Approximately 25 acres[2]	Unknown	Unknown	Contaminated Soil
Miscellaneous Solid Waste[3]	Unknown	Unknown	Unknown	Miscellaneous Solid Waste Piles

VOCs = Volatile Organic Compounds.
SVOCs = Semivolatile Organic Compounds.
PCBs = Polychlorinated Biphenyls.

1 Solid waste disposed of in the landfill reportedly includes, but is not limited to, demolition materials consisting of brick, wood, steel, pipes, and miscellaneous construction and demolition debris.

2 Based on the presence of hazardous substances in START soil samples collected from areas outside of the former solid waste landfill area, START estimates that approximately 25 acres of the Cole Brook property comprise a potential contaminated soil source.

3 Miscellaneous solid waste piles have reportedly consisted of wood, empty drums, automotive parts, tree stumps, tires, concrete rubble, empty storage tanks, wooden pallets, abandoned vehicles, a boiler wrapped with suspected asbestos-containing material, ash (signifying open burning), fiberglass, boat wreckage debris, 5-gallon plastic buckets, pieces of scrap metal, and large metal spheres.

[3; 4; 6; 21; 23-24; 28; 56; 65; 80-82]

There is one property located within 1 radial mile of the Cole Brook property that is listed in both CERCLIS and on the National Priorities List (NPL) [29]. Additionally, there is one property located within 1 radial mile of the Cole Brook property that is listed in the Resource Conservation and Recovery Act Information (RCRA Info) database [72].

The Cole Brook property is not listed as a RCRA notifier [30]. The Cole Brook property's compliance status is currently classified by MA DEP as Tier 1D in the MCP process. A Tier 1D site/release requires a permit, but response actions may be performed under the supervision of an LSP without prior MA DEP approval. A site/release is classified as Tier 1D when a responsible party fails to provide a required submittal to MA DEP by a specified deadline. The site/release cleanup phase for the Cole Brook property is classified as "No Phase", which indicates that a Phase report was not required or was not submitted [71].

WASTE/SOURCE SAMPLING

On 11 February 1982, the Town of Dartmouth Conservation Commission collected one leachate sample from the property. Available file information did not specify the exact location at which the sample was collected. START assumes that the leachate was generated from the former solid waste landfill. The sample was submitted to Camp Dresser & McKee, Inc. (CDM) of Boston, Massachusetts and analyzed for total PCBs (method unknown). Analytical results indicated the presence of PCBs (identified as Aroclor-1254) in the sample at a concentration of 0.5 parts per billion (ppb). In addition, Aroclor-1242 was detected, but was not specifically quantified [4, pp. 7, 10, Attachment C; 21].

On 12 February 1982, GHR collected a sample of "Seepage from rubble in [the] NE [northeast] corner of [the] old landfill." The exact location at which the sample was collected could not be determined from available file information. The sample was submitted to GHR Analytical Incorporated of Lakeville, Massachusetts and analyzed for metals, pH, and specific conductance. In addition, the leachate sample was submitted to Cambridge Analytical Associates, Inc. (CAA) of Watertown, Massachusetts and analyzed for VOCs by EPA Method 624. Analytical results of the sample revealed the presence of seven metals, including copper [0.06 parts per million (ppm)], iron (17.6 ppm), lead (0.95 ppm), manganese (0.22 ppm), nickel (0.04 ppm), sodium (6.8 ppm), and zinc (0.76 ppm). No VOCs were detected in the sample [4, pp. 7, 10, Attachment D; 65].

On 15 August 1990, as part of the SSI, ARCS personnel collected five surface soil samples (SS-411, SS-421, SS-421D, SS-431, and SS-441), including a duplicate, from the property (Figure 2). Surface soil sample SS-411 was collected in the vicinity of Colebrook Swamp, west of the former solid waste landfill, approximately 600 feet west of the main access road. Surface soil sample SS-421, and duplicate sample SS-421D, were collected from the top of the former solid waste landfill, approximately 200 feet west of the main access road. Surface soil sample SS-431 was collected from an area of stained soil on top of the former solid waste landfill, 20 feet north of the AG pipeline easement and along the access road. Surface soil sample SS-441 was collected from an excavated embankment along the wooded area located east of the former solid waste landfill, as a reference sample. Four soil samples were collected at 6 inches below grade (SS-421, SS-421D, SS-431, and SS-441); one soil sample was collected at 12 inches below grade (SS-411). The samples were analyzed through an EPA CLP laboratory for VOCs, SVOCs, pesticides, PCBs, metals, and cyanide [4, pp. 10-11; 28].

Three VOCs were detected in the surface soil samples at concentrations above reference criteria. These VOCs were detected in sample SS-411 and included methylene chloride at 84 J ppb, acetone at 715 J ppb, and 2-butanone at 76 J ppb. Sample results qualified with a "J" are considered approximate because of limitations identified during data validation [4, pp. 10-11, Attachment E].

Eighteen SVOCs were detected in the surface soil samples at concentrations above reference criteria. Maximum concentrations of 16 of the 18 SVOCs were detected in sample SS-421D and included the following substances: naphthalene (2,500 ppb); 2-methylnaphthalene (1,300 ppb); acenaphthylene (2,700 ppb); acenaphthene (700 J ppb); fluorene (620 J ppb); phenanthrene (6,000 ppb); anthracene (2,000 ppb); fluoranthene (9,000 ppb); benzo(a)anthracene (7,400 ppb); chrysene (8,000 ppb); benzo(b)fluoranthene (7,200 J ppb); benzo(k)fluoranthene (4,900 J ppb);

benzo(a)pyrene (6,900 J ppb); indeno(1,2,3-cd)pyrene (2,100 J ppb); dibenzo(a,h)anthracene (710 J ppb); and benzo(g,h,i)perylene (2,100 J ppb). Maximum concentrations of pyrene (7,600 ppb) and bis(2-ethylhexyl)phthalate (450 J ppb) were detected in sample SS-421 [4, pp. 10-11, Attachment E]. Except for bis(2-ethylhexyl)phthalate, these SVOCs are also referred to as polynuclear aromatic hydrocarbons (PAHs), which are common constituents of waste oil [73, pp. 4-15, 4-16].

One pesticide (dieldrin) was detected in the surface soil samples at concentrations above reference criteria. Dieldrin was detected in sample SS-421D at 160 ppb [4, pp. 10-11, Attachment E].

No PCBs were detected above laboratory detection limits in any samples [4, pp. 10-11, Attachment E].

Six metals were detected in the surface soil samples at concentrations above reference criteria. The following six metals were detected (maximum concentrations in parentheses): calcium (12,600 J ppm in SS-411), chromium (34.2 ppm in SS-421D), copper (146 ppm in SS-421D), lead (268 ppm in SS-421), mercury (1.1 ppm in SS-421), and zinc (220 J ppm in SS-411) [4, pp. 10-11, Attachment E].

On 8 and 11 February 2002, as part of the Environmental Investigation, Frank Corporation Environmental Services excavated 42 test pits (TP-1 through TP-42) throughout the property. Twenty-three test pits were located south of the AG pipeline easement, and 19 test pits were located north of the AG easement. St. Germain personnel monitored and logged the test pit excavations. One soil sample was collected from each test pit, as well as from four existing test pits (TP-A through TP-D) located north of the AG easement. Each soil sample was screened using a photoionization detector (PID), and representative soil samples from four test pits (TP-18, TP-26, TP-30, and TP-38) were submitted for VOC, SVOC, conductivity, PCB, extractable petroleum hydrocarbon (EPH), volatile petroleum hydrocarbon (VPH), and 13 RCRA metals analyses. Analytical results indicated the presence of the following substances in TP-18: benzo(a)anthracene (8.6 ppm), benzo(b)fluoranthene (7.7 ppm), chrysene (10 ppm), and lead (6,800 ppm) [3, pp. 4 and 5]. No additional information regarding the test-pitting activities or sample locations is available to START.

On 27 and 28 January 2004, as part of the ESI, START personnel collected nine surface soil/source samples (SO-01 through SO-09) from potential source areas on the Cole Brook property. Soil/source samples were collected from a depth between 0 and 2 feet below ground surface (bgs). Sample SO-01 was collected southeast of the former landfill area, adjacent to a propane tank and several solid waste piles. Samples SO-02 and SO-09 were collected in the southeast portion of the former landfill area, adjacent to a gravel berm area and several solid waste piles. Sample SO-03 was collected in the south/central portion of the former landfill area, adjacent to several solid waste piles. Sample SO-04 was collected in the northeast portion of the former landfill area, adjacent to several dilapidated buildings and solid waste piles. Sample SO-05 was collected west of the former landfill area, adjacent to several tires, abandoned vehicles, and gasoline tanks. Sample SO-06 was collected southeast of the former landfill area, adjacent to several miscellaneous waste piles. Samples SO-07 and SO-08 were collected southeast of the former landfill area and south of sample SO-01. Sample SO-09 was a duplicate sample of SO-02 and was collected for quality control. Samples SO-07 and SO-08 were collected upgradient of potential source areas, to establish reference concentrations for

soil sample comparisons. All the surface soil/source samples were collected using a hand auger [58, pp. 12-36].

All the surface soil/source samples were analyzed through a DAS laboratory for VOCs and through EPA CLP laboratories for SVOCs, pesticides, PCBs, metals, and cyanide, with the exception of sample SO-08, which was analyzed for metals only [58, pp. 12-36; 80-82]. Table 3 summarizes the soil/source samples collected by START on 27 and 28 January 2004.

Table 3

Sample Summary: Cole Brook Pines Landfill
Soil/Source Samples Collected by START on 27 and 28 January 2004

Sample Location No.	Traffic Report No.	Date/ Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Soil/Source					
SO-01 (MS/MSD)	D14313 A1BL8 MA1BL8	01/28/04 1155	Grab	12 to 24 Inches	Soil/source sample collected from a soil boring advanced southeast of the former landfill area, adjacent to a propane tank and several solid waste piles (41° 40' 24.12" N, 71° 00' 31.42" W). Material is dry, brown-to-grey, coarse-to-fine SAND and GRAVEL, little silt. FID and PID = 0.
SO-02	D14314 A1BL9 MA1BL9	01/27/04 1400	Grab	12 to 24 Inches	Soil/source sample collected from a soil boring advanced in the southeast portion of the former landfill area, adjacent to a gravel berm area and several solid waste piles (41° 40' 26.28" N, 71° 00' 41.09" W). Material is moist, grey-to-brown, coarse-to-fine SAND and GRAVEL, little silt. PID and FID = 0.
SO-03	D14315 A1BM0 MA1BM0	01/27/04 1230	Grab	12 to 24 Inches	Soil/source sample collected from a soil boring advanced in the south/central portion of the former landfill area, adjacent to several solid waste piles (41° 40' 28.95" N, 71° 00' 44.29" W). Material is dry, brown, coarse-to-fine SAND and GRAVEL, some clay, little silt. PID and FID = 0.

Table 3

Sample Summary: Cole Brook Pines Landfill
Soil/Source Samples Collected by START on 27 and 28 January 2004 (Continued)

Sample Location No.	Traffic Report No.	Date/ Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Soil/Source (Continued)					
SO-04	D14316 A1BM1 MA1BM1	01/28/04 1500	Grab	12 to 24 Inches	Soil/source sample collected from a soil boring advanced in the northeast portion of the former landfill area, adjacent to several dilapidated buildings and solid waste piles (41° 40' 40.11" N, 71° 00' 39.09" W). Material is dry, dark brown, coarse-to-fine SAND, some fine gravel, little silt, brick fragments. PID and FID = 0.
SO-05	D14317 A1BM2 MA1BM2	01/27/04 1050	Grab	0 to 24 Inches	Soil/source sample collected from a soil boring advanced west of the former landfill area, adjacent to several tires, abandoned vehicles, and gasoline tanks (41° 40' 37.86" N, 71° 00' 53.79" W). Material is dry, light brown SILT. PID = 0; FID = not operable.
SO-06	D14318 A1BM3 MA1BM3	01/28/04 1330	Grab	12 to 24 Inches	Soil/source sample collected from a soil boring advanced southeast of the former landfill area, adjacent to several miscellaneous waste piles (41° 40' 25.64" N, 71° 00' 23.61" W). Material is dry, brown, coarse-to-fine SAND and GRAVEL. PID and FID = 0.
SO-07	D14319 A1BM4 MA1BM4	01/28/04 0945	Grab	12 to 24 Inches	Soil/source sample collected as a reference sample from a soil boring advanced southeast of the former landfill area and south of sample SO-01 (41° 40' 17.78" N, 71° 00' 30.37" W). Material is dry, brown, coarse-to-fine SAND, some fine gravel, little silt. PID and FID = NR.
SO-08	MA1BM5	01/28/04 0940	Grab	12 to 24 Inches	Soil/source sample collected as a reference sample, for metals analysis only, from a soil boring advanced southeast of the former landfill area and south of sample SO-01 (41° 40' 17.78" N, 71° 00' 30.40" W). Material is dry, brown, coarse-to-fine SAND, some fine gravel, little silt. PID and FID = NR.

Table 3

Sample Summary: Cole Brook Pines Landfill
Soil/Source Samples Collected by START on 27 and 28 January 2004 (Concluded)

Sample Location No.	Traffic Report No.	Date/ Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Soil/Source (Concluded)					
SO-09	D14320 A1BM6 MA1BM6	01/27/04 1400	Grab	12 to 24 Inches	Duplicate of sample SO-02, collected for quality control.

Note: All FID and PID readings are reported in units above background.

°	= Degrees.	N	= North Latitude.
'	= Minutes.	W	= West Longitude.
"	= Seconds.	No.	= Number.
FID	= Flame Ionization Detector.	PID	= Photoionization Detector.
MS/MSD	= Matrix Spike/Matrix Spike Duplicate.	NR	= Not Recorded.

[58]

Complete analytical results of START soil/source samples including quantitation and detection limits are presented in Attachment A. Sample results qualified with a "J" on analytical tables are considered approximate because of limitations identified during DAS and CLP data validation. In addition, organic sample results reported at concentrations below quantitation limits and confirmed by mass spectrometry are also qualified by a "J" and considered approximate [80-82].

Table 4 is a summary of organic compounds and inorganic substances detected through DAS and CLP analyses of START soil/source samples. For each sample location, a compound or element is listed if it is detected at a concentration greater than or equal to three times the reference sample's concentration. However, if the compound or element is not detected in the reference sample, the reference sample's SQL (for organic analyses) or SDL (for inorganic analyses) is used as the reference value. These compounds or elements are listed if they occurred at a concentration greater than or equal to the reference sample's SQL or SDL and are designated by their approximate relative concentration above the reference criteria values. Soil/source samples SO-07 and SO-08 were collected to document reference concentrations for samples SO-01 through SO-06, and SO-09.

Analytical results of the soil/source samples are compared to MA DEP MOHML Reportable Category RCS-1 soil standards, established under the MCP. RCS-1 soil standards were applied to all the results because all the START soil/source samples were collected within 500 feet of a residential property, or were collected from lots zoned for residential use [11; 60; 92, p. 1,550, Subpart J]. Compounds/elements listed in bold text in Table 4 were detected at concentrations that meet or exceed their respective MOHML RCS-1 soil standards.

Table 4

Summary of Analytical Results
Soil/Source Samples Collected by START on 27 and 28 January 2004
at Cole Brook Pines Landfill

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration	Comments	RCS-1 Standard
SO-01	**VOCs**				
	2-Hexanone	11 ppb	10 U ppb	1.1 × SQL	NL
	INORGANICS				
	Barium	46.8 ppm	8.8 ppm	5.3 × Ref	1,000 ppm
	Calcium	1,860 ppm	309 ppm	6.0 × Ref	NL
	Magnesium	2,620 ppm	696 ppm	3.8 × Ref	NL
	Potassium	1,250 ppm	300 ppm	4.2 × Ref	NL
SO-03	**SVOCs**				
	bis(2-Ethylhexyl)phthalate	240 J ppb	40 J ppb	6.0 × Ref	1E+05 ppb
SO-04	**SVOCs**				
	Phenanthrene	1,500 ppb	350 U ppb	4.3 × SQL	1E+05 ppb
	Anthracene	370 J ppb	350 U ppb	1.1 × SQL	1E+06 ppb
	Fluoranthene	1,700 ppb	350 U ppb	4.9 × SQL	1E+06 ppb
	Pyrene	1,600 ppb	350 U ppb	4.6 × SQL	7E+05 ppb
	Benzo(a)anthracene	840 ppb	350 U ppb	2.4 × SQL	700 ppb
	Chrysene	820 ppb	350 U ppb	2.3 × SQL	7,000 ppb
	Benzo(b)fluoranthene	600 ppb	350 U ppb	1.7 × SQL	700 ppb
	Benzo(k)fluoranthene	720 ppb	350 U ppb	2.1 × SQL	7,000 ppb
	Benzo(a)pyrene	790 ppb	350 U ppb	2.3 × SQL	700 ppb
	Indeno(1,2,3-cd)pyrene	470 ppb	350 U ppb	1.3 × SQL	700 ppb
	INORGANICS				
	Barium	884 ppm	8.8 ppm	100 × Ref	1,000 ppm
	Calcium	4,050 ppm	309 ppm	13.1 × Ref	NL

Table 4

Summary of Analytical Results
Soil/Source Samples Collected by START on 27 and 28 January 2004
at Cole Brook Pines Landfill (Concluded)

Sample Location	Compound/ Element	Sample Concentration			Reference Concentration			Comments	RCS-1 Standard	
SO-04 (Conc.)	**INORGANICS (Concluded)**									
	Lead	97.4		ppm	3.8		ppm	25.6 × Ref	300	ppm
	Mercury	0.21	J	ppm	0.047	UJ	ppm	4.5 × SDL	20	ppm
	Zinc	337		ppm	11.0		ppm	30.6 × Ref	2,500	ppm
	Cyanide	0.14	J	ppm	0.032	UJ	ppm	4.4 × SDL	100	ppm
SO-05	**SVOCs**									
	bis(2-Ethylhexyl)phthalate	360	J	ppb	40	J	ppb	9.0 × Ref	1E+05	ppm
SO-06	**INORGANICS**									
	Selenium	0.71	J	ppm	0.41	U	ppm	1.7 × SDL	400	ppm

Note: Substances listed in bold text were detected at concentrations that meet or exceed their respective MOHML RCS-1 soil standards.

Ref = Reference concentration.
J = Quantitation is approximate due to limitations identified during the quality control review.
U = Indicates the substance was analyzed for, but was not detected. The associated numerical value is the SQL or SDL.
UJ = Indicates the substance was analyzed for, but was not detected. The associated numerical value is the estimated SQL or SDL.
ppb = Parts per billion.
ppm = Parts per million.
VOCs = Volatile Organic Compounds.
SVOCs = Semivolatile Organic Compounds.
SQL = Sample Quantitation Limit.
SDL = Sample Detection Limit.
NL = Not Listed.
Conc. = Concluded.
RCS-1 = Massachusetts Contingency Plan Reportable Category S-1 soil standard.

[80-82; 92]

One VOC (2-hexanone) was detected in START soil/source samples at a concentration above reference criteria. 2-Hexanone was detected at 11 ppb in soil/source sample SO-01 [80]. No MOHML RCS-1 soil standard is available for 2-hexanone [92, Subpart J].

Eleven SVOCs were detected in START soil/source samples at concentrations above reference criteria. Maximum concentrations of SVOCs detected include the following: phenanthrene (1,500 ppb in SO-04); anthracene (370 J ppb in SO-04); fluoranthene (1,700 ppb in SO-04); pyrene (1,600 ppb in SO-04); benzo(a)anthracene (840 ppb in SO-04); chrysene (820 ppb in SO-04); bis(2-ethylhexyl)phthalate (360 J ppb in SO-05); benzo(b)fluoranthene (600 ppb in SO-04); benzo(k)fluoranthene (720 ppb in SO-04); benzo(a)pyrene (790 ppb in SO-04); and indeno(1,2,3-cd)pyrene (470 ppb in SO-04) [81]. Two SVOCs [benzo(a)anthracene and benzo(a)pyrene] were detected in START soil/source samples at concentrations that met or exceeded their MOHML RCS-1 soil standards of 700 ppb (for both substances) [81; 92, Subpart J].

No pesticides or PCBs were detected in the soil/source samples collected by START [81].

Nine inorganic substances were detected in START soil/source samples at concentrations above reference criteria. Maximum concentrations of inorganic substances detected include the following: barium (884 ppm in SO-04), calcium (4,050 ppm in SO-04), lead (97.4 ppm in SO-04), magnesium (2,620 ppm in SO-01), mercury (0.21 J ppm in SO-04), potassium (1,250 ppm in SO-01), selenium (0.71 J ppm in SO-06), zinc (337 ppm in SO-04), and cyanide (0.14 J ppm in SO-04) [82]. None of the inorganic substances were detected in START soil/source samples at concentrations that met or exceeded their respective MOHML RCS-1 soil standards [82; 92, Subpart J]. No MOHML RCS-1 soil standards are available for calcium, magnesium, and potassium [92, Subpart J].

START performed soil/source sampling as part of the Cole Brook ESI. Analytical results of START soil/source samples indicate that soil on the Cole Brook property contains one VOC, 11 SVOCs, eight metals, and cyanide at concentrations above reference criteria [80-82]. Of these substances, two SVOCs were detected in the soil/source samples at concentrations that met or exceeded their respective MOHML RCS-1 soil standards [81; 92, Subpart J].

GROUNDWATER PATHWAY

Surficial soils in the Dartmouth, Massachusetts area are part of the Paxton-Woodbridge-Whitman soil association, which consists of nearly level to moderately steep soils that are well drained, moderately well drained, and very poorly drained. This soil association occurs on glaciated uplands [37]. The mean annual precipitation for New Bedford, Massachusetts (the adjacent town to the west) is 43.1 inches [35].

The surficial geology in the vicinity of the Cole Brook property is mapped as compact, unsorted, silty, bouldery gravel (till). The surficial geology may include small beds and lenses of poorly sorted, stratified gravel, sand, silt, and, in some areas, is mantled with relatively thin deposits of silt, sand, and gravel [36]. According to GHR, the landfill was built primarily upon a deposit of highly permeable, coarse sand and gravel overlying granite-gneiss bedrock, located 10 to 25 feet bgs. In addition, the western portion of the landfill was constructed within an area of on-site wetlands [4, pp. 5, 7]. No bedrock formation mapped within 4 radial miles of the property exhibits karst characteristics [10].

According to MA DEP, the western portion of the property is designated as a Potential Drinking Water Source Area, which indicates that the western portion of the property is underlain by a Potentially Productive Aquifer (PPA). A PPA is an aquifer that could be used as source of drinking

water [75-76]. Based on soil boring logs generated during the installation of groundwater monitoring wells in January 2004, the depth to groundwater beneath the Cole Brook property is 2 to 7.5 feet bgs [31]. Groundwater flow direction beneath the property has not been determined; however, based on the location of Colebrook Swamp and Cole Brook, groundwater beneath the property most likely flows radially to the west, north, and east [52].

The following Massachusetts Cities and Towns are located within 4 radial miles of the Cole Brook property: Dartmouth (population 30,666); Fall River (population 91,938); New Bedford (population 93,768); Freetown (population 8,472); and Westport (population 14,183) [32; 51-54].

The Dartmouth Water Department is supplied with drinking water from a blended system of one surface water intake and 11 gravel-packed overburden wells. Six of the wells are located within 4 radial miles of the Cole Brook property and include the following: Violetta Wells 1, 2, and 3 (referred to by the Dartmouth Water Department as V1, V2, and V3), located along Old Westport Road approximately 3.5 miles south of the property; Wells B and C, located at 298 Chase Road, near the intersection with Old Westport Road, approximately 3.9 miles south of the Cole Brook property; and Route No. 6/GP Well No. 4, located along Route 6, approximately 2.5 miles south of the property. The surface water drinking water intake is not located downstream of the property. The system serves approximately 31,000 people. Since none of the sources contribute greater than 40% of the total system, the service population of 31,000 is apportioned equally among the 12 sources [13; 38; 40; 44].

The Fall River Water Department obtains its drinking water from a surface water intake located on North Wattupa Pond, which is replenished by Copicut Reservoir. Neither water body is located downstream of the Cole Brook property. The remainder of the residents of Fall River are served by private drinking water supply wells [14; 47]. According to MA DEP, Noquochoke Lake, which is located downstream of the Cole Brook property, is listed as an emergency public drinking water surface water supply for the Fall River Water Department; however, MA DEP reported that even in times of emergency, the water quality of the lake is too poor (due to septic issues) to be used for drinking water [52; 75].

The New Bedford Water Department obtains its drinking water from surface water intakes located on Great Quitticas Pond, Little Quitticas Pond, Assowampsett Pond, and Pocksha Pond. None of these surface water bodies are located downstream of the Cole Brook property. None of the residents of New Bedford are served by private drinking water supply wells [46].

Approximately 95% of the Town of Freetown is served by private drinking water supply wells, with 5% of the population being served by the New Bedford Water Department [12].

The Town of Westport is supplied almost entirely by private drinking water wells. Approximately 1% of the population is served by public drinking water from Westport Aqueduct Well, West Harbor Well, and Bayside Well, none of which are located within 4 radial miles of the Cole Brook property [45].

Additionally, five non-transient, non-community drinking water supply wells are located in the Town of Westport and within 4 radial miles of the Cole Brook property. The Westport Plaza Well is located along Route 6, approximately 3.5 miles southwest of the property, and serves approximately

50 people. The Westport Country Day Well is located along Route 6, approximately 2.9 miles southwest of the property, and serves approximately 35 people. Well No. 1 is located along Route 6, approximately 3.2 miles southwest of the property, and serves approximately 35 people. The Alice A. Macomber Primary School Well is located along Gifford Road, approximately 3.8 miles southwest of the property, and serves approximately 270 people. The St. George School Well is located along Route 177, approximately 3.2 miles southwest of the property, and serves approximately 200 people [40]. Table 5 summarizes public groundwater supply sources within 4 radial miles of the Cole Brook property.

Table 5

Public Groundwater Supply Sources Within 4 Radial Miles of Cole Brook Pines Landfill

Distance/ Direction from Cole Brook Pines Landfill	Source Name	Location of Source[a]	Estimated Population Served	Source Type[b]
2.5 miles South	Route No. 6/GP Well No. 4	Dartmouth	2,583	Overburden
2.9 miles Southwest	Westport Country Day School	Westport	35	Unknown
3.2 miles Southwest	St. George School	Westport	200	Unknown
3.2 miles Southwest	Well No. 1	Westport	35	Unknown
3.5 miles Southwest	Westport Plaza	Westport	50	Unknown
3.5 miles South	Violetta Well 1	Dartmouth	2,583	Overburden
3.5 miles South	Violetta Well 2	Dartmouth	2,583	Overburden
3.5 miles South	Violetta Well 3	Dartmouth	2,583	Overburden
3.8 miles Southwest	Alice A. Macomber Primary School	Westport	270	Unknown
3.9 miles South	Well B	Dartmouth	2,583	Overburden
3.9 miles South	Well C	Dartmouth	2,583	Overburden

[a] Indicates Town in which well is located.
[b] Overburden, Bedrock, or Unknown.

[13; 38; 40; 44; 45]

The nearest private drinking water supply well is located on the property and was installed in 1987 to serve the on-site residence [4, p. 5]. The well is reportedly installed in bedrock to a depth of 180 feet bgs [78, p. 6]. The nearest off-site private drinking water supply well is located on the Gosselin & Sons Landscape Materials property, located north of and adjacent to the Cole Brook property. Residences located along Old Fall River Road (west of 360 Old Fall River Road), and several residences located along Hixville Road, are served by private drinking water supply wells [93].

Private groundwater supplies located within 4 radial miles of the property were estimated using equal distribution calculations of U.S. Census CENTRACTS data identifying population, households, and private water wells for "Block Groups" which lie within or partially within individual radial distance rings measured from the Cole Brook property. An estimated 5,077 people are served by private drinking water supplies within 4 radial miles of the property [14]. The total population that relies on groundwater within 4 radial miles of the property is estimated to be 21,165 persons and is summarized in Table 6.

Table 6

Estimated Drinking Water Populations Served by Groundwater Sources Within 4 Radial Miles of Cole Brook Pines Landfill

Radial Distance from Cole Brook Pines Landfill (miles)	Estimated Population Served by Private Wells	Estimated Population Served by Public Wells	Total Estimated Population Served by Groundwater Sources Within the Ring
≥ 0.00 to 0.25	25	0	25
> 0.25 to 0.50	74	0	74
> 0.50 to 1.00	295	0	295
> 1.00 to 2.00	1,070	0	1,070
> 2.00 to 3.00	975	2,618	3,593
> 3.00 to 4.00	2,638	13,470	16,108
TOTAL	5,077	16,088	21,165

[13; 14; 38; 40; 44; 45]

On 2 December 1977, GHR collected five groundwater samples from the five monitoring wells (A-1 through A-5) on the property. The exact locations of these monitoring wells could not be determined, and it is unknown if a reference sample was collected for this sampling event. The samples were submitted to GHR's Environmental Services Division Laboratory and analyzed for a variety of water quality parameters, including pH, total hardness (as calcium carbonate), chemical oxygen demand (COD), nitrogen (as nitrate), copper, nickel, and zinc. Two metals, including copper and zinc, were detected in all the samples; maximum concentrations were detected in A-1 and included 10,400 ppb of copper and 9,500 ppb of zinc. In addition, nickel was detected at 1,600 ppb in the groundwater sample collected from well A-1 [4, pp. 6, 9, Attachment A; 15].

On 5 January 1982, GHR collected five groundwater samples from "observation wells" B-1, B-2, B-5, B-6, and B-7 on the property. START was unable to determine from available file information if these observation wells were the same as the monitoring wells sampled in 1977. In addition, the exact locations of these observation wells could not be determined, and it is unknown if a reference sample was collected for this sampling event. The samples were submitted to CAA of Watertown, Massachusetts and analyzed for VOCs by EPA Method 624, SVOCs by EPA Method 625, pesticides, and PCBs. In addition, the samples were submitted to GHR Analytical Incorporated of Lakeville, Massachusetts and analyzed for metals and for a variety of water quality parameters,

including pH. alkalinity, COD, chloride, color, detergents, nitrogen (as nitrate), nitrogen (as ammonia), total phosphorus, total solids, total volatile solids, total dissolved solids, volatile dissolved solids, sulfate, sulfide, and specific conductance [4, pp. 7, 10, Attachment B; 16].

Maximum concentrations of organic contaminants detected included 13 ppb of benzene in B-1 and 59 ppb of bis(2-ethylhexyl)phthalate in B-5. Eight metals were detected in the groundwater samples, including the following (maximum concentrations in parentheses): calcium (42,000 ppb in B-6), copper (80 ppb in B-6), iron (6,800 ppb in B-5), magnesium (13,000 ppb in B-6), manganese (6,200 ppb in B-5), potassium (2,400 ppb in B-6), sodium (8,800 ppb in B-6), and zinc (110 ppb in B-6). No pesticides or PCBs were detected in the samples [4, pp. 7, 10, Attachment B; 16].

On 12 February 1982, GHR collected two groundwater samples from observation well Nos. 3 and 4 on the property. START personnel were unable to locate information in available files regarding the exact locations of the monitoring wells or when the wells were installed. The samples were submitted to GHR Analytical Incorporated of Lakeville, Massachusetts and analyzed for metals and for a variety of water quality parameters, including pH, alkalinity (as calcium carbonate), COD, chloride, color, detergents, nitrogen (as nitrate), nitrogen (as ammonia), total phosphates, total solids, total volatile solids, dissolved solids, volatile dissolved solids, sulfates, sulfides, and specific conductance [4, pp. 7, 10, Attachment D].

Analytical results of the groundwater samples revealed the presence of 10 metals, including arsenic, calcium, copper, iron, magnesium, manganese, nickel, potassium, sodium, and zinc. Maximum concentrations of nine of the 10 metals were detected in the groundwater sample collected from observation well No. 3 and included arsenic (0.02 ppm), calcium (18.5 ppm), copper (0.94 ppm), iron (2.5 ppm), magnesium (9.8 ppm), manganese (0.42 ppm), nickel (0.08 ppm), potassium (2.3 ppm), and zinc (0.44 ppm). The maximum concentration of sodium (5.5 ppm) was detected in the groundwater sample collected from observation well No. 4 [4, pp. 7, 10, Attachment D].

Between 19 and 25 February 2002, Guild personnel advanced nine soil borings at the Cole Brook property for the purpose of installing groundwater monitoring wells to assess the groundwater quality near the bedrock aquifer. The soil borings were located in six general locations, referred to as MW-1 through MW-6, around the perimeter of the former landfill. At three locations (MW-1, MW-5, and MW-6), Guild installed deep monitoring wells (MW-1D, MW-5D, and MW-6D) and shallow monitoring wells (MW-1S, MW-5S, and MW-6S) in the soil borings. The deep monitoring wells were installed at the top of bedrock, and the shallow monitoring wells were installed to a depth of less than 20 feet bgs. Due to the shallow depth to bedrock in the remaining soil borings at the other six locations, only shallow groundwater monitoring wells were installed at locations MW-2, MW-3, and MW-4 [78, pp. 5 and 6].

Subsequently, St. Germain personnel collected groundwater samples from each groundwater monitoring well and a drinking water sample from the drinking water supply well that serves the on-site residence. The groundwater and drinking water samples were submitted for VOC, SVOC, PCB, EPH, VPH, iron, manganese, alkalinity, COD, chloride, nitrate, sulfate, total dissolved solids (TDS), and 13 RCRA metals analyses. Analytical results indicated the presence of the following substances in unspecified groundwater samples (maximum concentrations in parentheses): lead (0.0492 ppm), iron (31 ppm), and manganese (0.97 ppm). Additionally, analytical results of the groundwater

sample collected from groundwater monitoring well MW-2 (SGA-02) indicated the presence of arsenic and beryllium at 0.15 ppm and 0.0048 ppm, respectively [78, pp. 5-6]. No additional information regarding the groundwater and drinking water sampling is available to START.

On 26 through 29 January 2004, as part of the ESI, START personnel oversaw the installation of seven overburden groundwater monitoring wells (MW-01 through MW-07) by Environmental Drilling, Inc. on the Cole Brook property. MW-01 was installed southeast of the former landfill area, adjacent to a propane tank and several solid waste piles. MW-02 was installed in the southeast portion of the former landfill area, adjacent to a gravel berm area and several solid waste piles. MW-03 was installed in the south/central portion of the former landfill area, adjacent to several solid waste piles. MW-04 was installed in the northeast portion of the former landfill area, adjacent to several dilapidated buildings and solid waste piles. MW-05 was installed west of the former landfill area, adjacent to several tires, abandoned vehicles, and gasoline tanks. MW-06 was installed southeast of the former landfill area. MW-07, the reference well, was installed southeast of the former landfill area. Monitoring wells MW-01 through MW-07 were screened in overburden and range in depth from 12 to 15 feet bgs [58, pp. 12-36]. Soil boring/well construction logs are presented in Attachment B.

During groundwater monitoring well installation activities, START personnel located seven of the nine groundwater monitoring wells installed by Guild. START personnel observed monitoring wells MW-1S, MW-1D, MW-2, MW-3, MW-4, MW-5S, and MW-5D (hereafter referred to as SGA-01S, SGA-01D, SGA-02, SGA-03, SGA-04, SGA-05S, and SGA-05D, respectively) [58, pp. 30-34]. Information regarding the groundwater monitoring wells on the Cole Brook property is summarized in Table 7.

Table 7

Groundwater Monitoring Wells Located on the Cole Brook Pines Landfill Property

Groundwater Monitoring Well Name	Driller/ Date Installed	Total Depth*	Depth to Groundwater* (Measured 02/12/04)	Screened Interval*	Latitude/ Longitude
MW-01	EDI/ 01/28/04	15.79	2.49	15.79 to 5.79	41° 40' 24.12" N 71° 00' 31.42" W
MW-02	EDI/ 01/27/04	16.00	7.10	16.00 to 6.00	41° 40" 26.28" N 71° 00" 41.09" W
MW-03	EDI/ 01/27/04	15.81	6.01	15.81 to 5.81	41° 40' 28.95" N 71° 00' 44.29" W
MW-04	EDI/ 01/28/04	15.65	5.01	15.65 to 5.65	41° 40' 40.11" N 71°00' 39.09" W
MW-05	EDI/ 01/27/04	15.69	5.51	15.69 to 5.69	41° 40' 37.86" N 71° 00' 53.79" W
MW-06	EDI/ 01/28/04	15.00	5.07	15.00 to 5.00	41° 40' 25.64" N 71° 00' 23.61" W

Table 7

Groundwater Monitoring Wells Located on the Cole Brook Pines Landfill Property (Concluded)

Groundwater Monitoring Well Name	Driller/ Date Installed	Total Depth*	Depth to Groundwater* (Measured 02/12/04)	Screened Interval*	Latitude/ Longitude
MW-07	EDI/ 01/28/04	17.81	9.21	17.81 to 7.81	41° 40' 17.78" N 71° 00' 30.37" W
SGA-01S	Guild/ 02/02	14.21**	4.28	14.21 to 4.21***	41° 40' 35.94" N 71° 00' 33.27" W
SGA-01D	Guild/ 02/02	53.10**	5.23	53.10 to 43.10***	41° 40' 35.95" N 71° 00' 33.22" W
SGA-02	Guild/ 02/02	14.40**	4.01	14.40 to 4.40***	41° 40' 29.31' N 71° 00' 36.56" W
SGA-03	Guild/ 02/02	20.92**	5.90	20.92 to 10.92***	41° 40' 36.42" N 71° 00' 46.98" W
SGA-04	Guild/ 02/02	21.20**	3.32	21.20 to 11.20***	41° 40' 25.52" N 71° 00' 44.97" W
SGA-05S	Guild/ 02/02	12.70**	2.64	12.70 to 2.70***	41° 40' 45.02" N 71° 00' 39.58" W
SGA-05D	Guild/ 02/02	40.13**	2.34	40.13 to 30.13***	41° 40' 44.95" N 71° 00' 39.41" W

* = Feet Below Top of Inner Casing.

** = No well installation logs were available for the monitoring wells installed by Guild. On 12 February 2004, START personnel developed the monitoring wells installed by Guild and measured the total depths of each well. START assumed the depth to the bottom of each well after development to be the total depth of each well.

*** = No well installation logs were available for the monitoring wells installed by Guild. All wells installed by Guild were reportedly constructed with 8 to 17 feet of screen. For purposes of determining the best location to collect the groundwater sample, START assumed that 10 feet of screen was placed in each well and that the screened interval originates at the bottom of each well.

EDI = Environmental Drilling, Inc.
Guild = Guild Drilling Company, Inc.
° = Degrees.
' = Minutes.
" = Seconds.
N = North Latitude.
W = West Longitude.

[58; 78]

On 17 through 19 February 2004, as part of the ESI, START personnel collected 15 groundwater samples (GW-01 through GW-15), including one replicate, from 14 monitoring wells on the Cole Brook property, to determine if there has been a release of hazardous substances associated with the

Cole Brook property to groundwater (Figures 3 and 3A) [58, pp. 46-48; 59, pp. 2-17]. Groundwater sample GW-01 was collected from monitoring well MW-01. Groundwater sample GW-02, and replicate sample GW-08, were collected from monitoring well MW-02. Groundwater sample GW-03 was collected from monitoring well MW-03. Groundwater sample GW-04 was collected from monitoring well MW-04. Groundwater sample GW-05 was collected from monitoring well MW-05. Groundwater sample GW-06 was collected from monitoring well MW-06. Groundwater sample GW-07 was collected from monitoring well MW-07. Groundwater sample GW-09 was collected from monitoring well SGA-01S. Groundwater sample GW-10 was collected from monitoring well SGA-01D. Groundwater sample GW-11 was collected from monitoring well SGA-02. Groundwater sample GW-12 was collected from monitoring well SGA-03. Groundwater sample GW-13 was collected from monitoring well SGA-05S. Groundwater sample GW-14 was collected from monitoring well SGA-05D. Groundwater sample GW-15 was collected from monitoring well SGA-04. All the groundwater samples were analyzed through EPA CLP laboratories for VOCs, SVOCs, pesticides, PCBs, metals, and cyanide. Groundwater sample GW-11 was analyzed for both total metals and dissolved metals. Both analyses were performed to ensure that metals concentration data would be obtained from the samples despite high turbidity in the samples [58, pp. 46-48; 59, pp. 2-17; 83-85]. Table 8 summarizes the groundwater samples collected by START on 17 through 19 February 2004.

Table 8

Sample Summary: Cole Brook Pines Landfill
Groundwater Samples Collected by START on 17 through 19 February 2004

Sample Location No.	Traffic Report No.	Date/ Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Groundwater					
GW-01 (MS/MSD)	A1CN0 MA1CN0	02/17/04 1330	Grab	10.79*	Grab groundwater sample collected from monitoring well MW-01, installed southeast of the former landfill area, adjacent to a propane tank and several solid waste piles (41° 40' 24.12" N, 71° 00' 31.42" W). Last water quality readings before sample was collected: Temp = 4.14 °C; Spec. Cond = 42 µS/cm; pH = 5.95; ORP = 272.2 mv; DO = 198.2%; Turb = 13 NTU. FID in headspace upon opening well = 0.8; PID in headspace upon opening well = 0.0.

Table 8

Sample Summary: Cole Brook Pines Landfill
Groundwater Samples Collected by START on 17 through 19 February 2004 (Continued)

Sample Location No.	Traffic Report No.	Date/ Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Groundwater (Continued)					
GW-02	A1CN1 MA1CN1	02/18/04 1335	Grab	11.00*	Grab groundwater sample collected from monitoring well MW-02, installed in the southeast portion of the former landfill area, adjacent to a gravel berm area and several solid waste piles (41° 40" 26.28" N, 71° 00" 41.09" W). Last water quality readings before sample was collected: Temp = 3.40 °C; Spec. Cond = 34 µS/cm; pH = 5.28; ORP = 323.9 mv; DO = 96.1%; Turb = 75 NTU. FID and PID in headspace upon opening well = 0.0.
GW-03	A1CN2 MA1CN2	02/18/04 1610	Grab	10.81*	Grab groundwater sample collected from monitoring well MW-03, installed in the south/central portion of the former landfill area, adjacent to several solid waste piles (41° 40' 28.95" N, 71° 00' 44.29" W). Last water quality readings before sample was collected: Temp = 5.05 °C; Spec. Cond = 289 µS/cm; pH = 4.58; ORP = 438 mv; DO = 80.4%; Turb = 7.5 NTU. FID in headspace upon opening well = NR; PID in headspace upon opening well = 0.0.
GW-04	A1CN3 MA1CN3	02/17/04 1610	Grab	10.70*	Grab groundwater sample collected from monitoring well MW-04, installed in the northeast portion of the former landfill area, adjacent to several dilapidated buildings and solid waste piles (41° 40' 40.11" N, 71°00' 39.09" W). Last water quality readings before sample was collected: Temp = 2.83 °C; Spec. Cond = 255 µS/cm; pH = 6.58; ORP = -105 mv; DO = 1.0%; Turb = 3.8 NTU. FID in headspace upon opening well = NR; PID in headspace upon opening well = 0.0.

Table 8

Sample Summary: Cole Brook Pines Landfill
Groundwater Samples Collected by START on 17 through 19 February 2004 (Continued)

Sample Location No.	Traffic Report No.	Date/ Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Groundwater (Continued)					
GW-05	A1CN4 MA1CN4	02/19/04 1055	Grab	10.69*	Grab groundwater sample collected from monitoring well MW-05, installed west of the former landfill area, adjacent to several tires, abandoned vehicles, and gasoline tanks (41° 40' 37.86" N, 71° 00' 53.79" W). Last water quality readings before sample was collected: Temp = 6.33 °C; Spec. Cond = 42 µS/cm; pH = 5.10; ORP = 324.9 mv; DO = 84.2%; Turb = 0.58 NTU. FID in headspace upon opening well = NR; PID in headspace upon opening well = 0.0.
GW-06	A1CN5 MA1CN5	02/18/04 1035	Grab	10.00*	Grab groundwater sample collected from monitoring well MW-06, installed southeast of the former landfill area (41° 40' 25.64" N, 71° 00' 23.61" W). Last water quality readings before sample was collected: Temp = 3.95 °C; Spec. Cond = 84 µS/cm; pH = 6.13; ORP = 283.3 mv; DO = 107.3%; Turb = 10.4 NTU. FID in headspace upon opening well = NR; PID in headspace upon opening well = 0.8.
GW-07	A1CN6 MA1CN6	02/18/04 1230	Grab	12.81*	Grab groundwater sample collected from monitoring well MW-07, installed southeast of the former landfill area, to establish reference concentrations for groundwater samples (41° 40' 17.78" N, 71° 00' 30.37" W). Last water quality readings before sample was collected: Temp = 5.70 °C; Spec. Cond = 32 µS/cm; pH = 5.36; ORP = 270.1 mv; DO = 69.5%; Turb = 17 NTU. FID in headspace upon opening well = NR; PID in headspace upon opening well = 0.0.
GW-08	A1CN7 MA1CN7	02/18/04 1335	Grab	11.00*	Replicate of sample GW-02, collected for quality control.

Table 8

Sample Summary: Cole Brook Pines Landfill
Groundwater Samples Collected by START on 17 through 19 February 2004 (Continued)

Sample Location No.	Traffic Report No.	Date/ Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Groundwater (Continued)					
GW-09	A1CN8 MA1CN8	02/17/04 1230	Grab	9.2*	Grab groundwater sample collected from monitoring well SGA-01S, located east of the former landfill area. (41° 40' 35.94" N, 71° 00' 33.27" W). Last water quality readings before sample was collected: Temp = 4.71 °C; Spec. Cond = 72 µS/cm; pH = 4.97; ORP = 72.9 mv; DO = 1.9%; Turb = 4.5 NTU. FID in headspace upon opening well = 0.0; PID in headspace upon opening well = 3.3.
GW-10	A1CN9 MA1CN9	02/17/04 1545	Grab	48.10*	Grab groundwater sample collected from monitoring well SGA-01D, located east of the former landfill area (41° 40' 35.95" N, 71° 00' 33.22" W). Last water quality readings before sample was collected: Temp = 8.54 °C; Spec. Cond = 179 µS/cm; pH = 6.84; ORP = 3.12.2 mv; DO = 42.2%; Turb = 429 NTU. FID in headspace upon opening well = 0.0; PID in headspace upon opening well = 13.2.
GW-11	A1CP0 MA1CP0 MA17F6	02/19/04 1315	Grab	9.40*	Grab groundwater sample collected from monitoring well SGA-02, located in the southeast portion of the former landfill area (41° 40' 29.31' N, 71° 00' 36.56" W). Last water quality readings before sample was collected: Temp = 4.28 °C; Spec. Cond = 59 µS/cm; pH = 7.12; ORP = 341.8 mv; DO = 125.4%; Turb = ERR2. FID and PID in headspace upon opening well = NR.

Table 8

Sample Summary: Cole Brook Pines Landfill
Groundwater Samples Collected by START on 17 through 19 February 2004 (Continued)

Sample Location No.	Traffic Report No.	Date/ Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Groundwater (Continued)					
GW-12	A1CP1 MA1CP1	02/18/04 1655	Grab	15.92*	Grab groundwater sample collected from monitoring well SGA-03, located in the western portion of the former landfill area (41° 40' 36.42" N, 71° 00' 46.98" W). Last water quality readings before sample was collected: Temp = 5.84 °C; Spec. Cond = 333 µS/cm; pH = 6.74; ORP = 187.7 mv; DO = 4.5%; Turb = 3.17 NTU. FID in headspace upon opening well = NR; PID in headspace upon opening well = 0.0.
GW-13	A1CP2 MA1CP2	02/17/04 1515	Grab	7.70*	Grab groundwater sample collected from monitoring well SGA-05S, located north of the former landfill area (41° 40' 45.02" N, 71° 00' 39.58" W). Last water quality readings before sample was collected: Temp = 7.77 °C; Spec. Cond = 242 µS/cm; pH = 6.50; ORP = 16.9 mv; DO = 3.2%; Turb = 2.8 NTU. FID in headspace upon opening well = 18.2; PID in headspace upon opening well = 1.5.
GW-14	A1CP3 MA1CP3	02/17/04 1125	Grab	35.00*	Grab groundwater sample collected from monitoring well SGA-05D, located north of the former landfill area (41° 40' 44.95" N, 71° 00' 39.41" W). Last water quality readings before sample was collected: Temp = 8.63 °C; Spec. Cond = 182 µS/cm; pH = 6.29; ORP = 261.2 mv; DO = 24.2%; Turb = 9.1 NTU. FID in headspace upon opening well = 3.7; PID in headspace upon opening well = 1.8.

Table 8

Sample Summary: Cole Brook Pines Landfill
Groundwater Samples Collected by START on 17 through 19 February 2004 (Concluded)

Sample Location No.	Traffic Report No.	Date/ Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Groundwater (Concluded)					
GW-15	A1CP4 MA1CP4	02/18/04 1305	Grab	15.92*	Grab groundwater sample collected from monitoring well SGA-04, located southwest of the former landfill area (41° 40' 25.52" N, 71° 00' 44.97" W). Last water quality readings before sample was collected: Temp = 8.44 °C; Spec. Cond = 43 µS/cm; pH = 5.94; ORP = 311.5 mv; DO = 135.6%; Turb = 1.12 NTU. FID in headspace upon opening well = NR; PID in headspace upon opening well = 0.0.

*	= Feet Below Top of Inner Well Casing.	mv	= Millivolts.
°	= Degrees.	NR	= Not Recorded.
'	= Minutes.	Spec. Cond	= Specific Conductivity.
"	= Seconds.	Turb	= Turbidity.
ORP	= Oxidation Reduction Potential.	FID	= Flame Ionization Detector.
No.	= Number.	PID	= Photoionization Detector.
DO	= Dissolved Oxygen.	N	= North Latitude.
NTU	= Nephelometric Turbidity Units.	W	= West Longitude.
µS/cm	= MicroSiemens per Centimeter.	Temp	= Temperature.
GPS	= Global Positioning System.	MS/MSD	= Matrix Spike/Matrix Spike Duplicate.
°C	= Degrees Celsius.	ERR2	= Error 2; Turbidity was too high to obtain a reading.

[58; 59]

Complete analytical results of START groundwater samples including quantitation and detection limits are presented in Attachment C. Sample results qualified with a "J" on analytical tables are considered approximate because of limitations identified during CLP data validation. In addition, organic sample results reported at concentrations below quantitation limits and confirmed by mass spectrometry are also qualified by a "J" and considered approximate [83-85].

Table 9 is a summary of organic compounds and inorganic substances detected through CLP analyses of START groundwater samples. Groundwater sample GW-07 was used to document reference concentrations due to its (presumed) upgradient location. For a sample location, a compound or element is listed if it is detected at a concentration greater than or equal to three times the reference sample's concentration. However, if the compound or element is not detected in the reference sample, the reference sample's SQL (for organic analyses) or SDL (for inorganic analyses) is used as the reference concentration. These compounds or elements are listed if they occurred at

a concentration greater than or equal to the reference sample's SQL or SDL and are designated by their approximate relative concentration above the reference criteria values.

Analytical results of START groundwater samples are compared to MOHML Reportable Category RCGW-1 groundwater standards, established under the MCP. RCGW-1 groundwater standards were applied to all the results because a portion of the Cole Brook property is located within a current or potential drinking water source area [92, p. 1,550, Subpart J; 93-94]. Compounds/elements listed in bold text in Table 9 were detected at concentrations that meet or exceed their respective MOHML RCGW-1 groundwater standards.

Table 9

Summary of Analytical Results
Groundwater Samples Collected by START on 17 through 19 February 2004
at Cole Brook Pines Landfill

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration	Comments	RCGW-1 Standard
GW-01	**SVOCs**				
	Caprolactam	22 ppb	10 U ppb	2.2 × SQL	NL
	INORGANICS				
	Chromium	85.3 J ppb	0.69 UJ ppb	123 × SDL	100 ppb
	Cobalt	4.1 ppb	0.64 J ppb	6.4 × Ref	5,000 ppb
	Copper	22.4 J ppb	2.4 UJ ppb	9.3 × SDL	10,000 ppb
	Nickel	121 J ppb	40.0 UJ ppb	3.0 × SDL	80 ppb
GW-03	**INORGANICS**				
	Aluminum	14,100 ppb	1,420 ppb	9.9 × Ref	NL
	Beryllium	6.9 ppb	0.09 J ppb	76.7 × Ref	4 ppb
	Calcium	21,100 ppb	1,200 ppb	17.6 × Ref	NL
	Cobalt	47.8 ppb	0.64 J ppb	74.7 × Ref	5,000 ppb
	Copper	6.0 J ppb	2.4 UJ ppb	2.5 × SDL	10,000 ppb
	Magnesium	8,380 ppb	718 ppb	11.7 × Ref	NL
	Manganese	1,880 ppb	228 ppb	8.2 × Ref	NL
	Nickel	91.0 J ppb	40.0 UJ ppb	2.3 × SDL	80 ppb
	Zinc	316 ppb	60.0 UJ ppb	5.3 × SDL	900 ppb

Table 9

Summary of Analytical Results
Groundwater Samples Collected by START on 17 through 19 February 2004
at Cole Brook Pines Landfill (Continued)

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration	Comments	RCGW-1 Standard
GW-04	**INORGANICS**				
	Barium	258 ppb	37.3 ppb	6.9 × Ref	200 ppb
	Calcium	41,300 ppb	1,200 ppb	34.4 × Ref	NL
	Copper	12.1 J ppb	2.4 UJ ppb	5.0 × SDL	10,000 ppb
	Iron	14,500 J ppb	641 J ppb	22.6 × Ref	NL
	Lead	103 ppb	10.0 U ppb	10.3 × SDL	20 ppb
	Magnesium	3,230 ppb	718 ppb	4.5 × Ref	NL
	Zinc	322 ppb	60.0 UJ ppb	5.4 × SDL	900 ppb
GW-05	**SVOCs**				
	Caprolactam	16 ppb	10 U ppb	1.6 × SQL	NL
GW-06	**SVOCs**				
	Caprolactam	41 ppb	10 U ppb	4.1 × SQL	NL
	INORGANICS				
	Calcium	6,560 ppb	1,200 ppb	5.5 × Ref	NL
	Magnesium	2,330 ppb	718 ppb	3.2 × Ref	NL
GW-09	**INORGANICS**				
	Vanadium	1.6 ppb	0.52 J ppb	3.1 × Ref	50 ppb
	Cyanide	189 ppb	10.00 U ppb	18.9 × SDL	10 ppb
GW-10	**INORGANICS**				
	Barium	113 ppb	37.3 ppb	3.0 × Ref	200 ppb
	Calcium	13,100 ppb	1,200 ppb	10.9 × Ref	NL
	Chromium	191 J ppb	0.69 UJ ppb	277 × SDL	100 ppb
	Cobalt	4.1 ppb	0.64 J ppb	6.4 × Ref	5,000 ppb

Table 9

Summary of Analytical Results
Groundwater Samples Collected by START on 17 through 19 February 2004
at Cole Brook Pines Landfill (Continued)

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration	Comments	RCGW-1 Standard
GW-10 (Concluded)	**INORGANICS (Concluded)**				
	Copper	41.5 J ppb	2.4 UJ ppb	17.3 × SDL	10,000 ppb
	Iron	3,030 J ppb	641 J ppb	4.7 × Ref	NL
	Magnesium	8,050 ppb	718 ppb	11.2 × Ref	NL
	Nickel	91.4 J ppb	40.0 UJ ppb	2.3 × SDL	80 ppb
	Potassium	4,700 J ppb	793 J ppb	5.9 × Ref	NL
	Sodium	14,400 ppb	3,180 ppb	4.5 × Ref	NL
	Vanadium	5.8 ppb	0.52 J ppb	11.2 × Ref	50 ppb
GW-11	**INORGANICS**				
	Aluminum	41,700 ppb	1,420 ppb	29.4 × Ref	NL
	Barium	378 ppb	37.3 ppb	10.1 × Ref	200 ppb
	Beryllium	3.1 ppb	0.09 J ppb	34.4 × Ref	4 ppb
	Calcium	11,900 ppb	1,200 ppb	9.9 × Ref	NL
	Chromium	12.0 J ppb	0.69 UJ ppb	17.4 × SDL	100 ppb
	Cobalt	7.5 ppb	0.64 J ppb	11.7 × Ref	5,000 ppb
	Copper	36.1 J ppb	2.4 UJ ppb	15.0 × SDL	10,000 ppb
	Iron	28,200 J ppb	641 J ppb	44.0 × Ref	NL
	Lead	30.9 ppb	10.0 U ppb	3.1 × SDL	20 ppb
	Magnesium	11,100 ppb	718 ppb	15.5 × Ref	NL
	Manganese	742 ppb	228 ppb	3.3 × Ref	NL
	Potassium	6,730 J ppb	793 J ppb	8.5 × Ref	NL
	Sodium	19,100 ppb	3,180 ppb	6.0 × Ref	NL
	Vanadium	36.3 ppb	0.52 J ppb	69.8 × Ref	50 ppb
	Zinc	66.4 ppb	60.0 UJ ppb	1.1 × SDL	900 ppb

Table 9

Summary of Analytical Results
Groundwater Samples Collected by START on 17 through 19 February 2004
at Cole Brook Pines Landfill (Continued)

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration	Comments	RCGW-1 Standard
GW-12	**SVOCs**				
	Caprolactam	16 ppb	10 U ppb	1.6 × SQL	NL
	INORGANICS				
	Calcium	72,600 ppb	1,200 ppb	60.5 × Ref	NL
	Chromium	41.2 J ppb	0.69 UJ ppb	59.7 × SDL	100 ppb
	Copper	8.2 J ppb	2.4 UJ ppb	3.4 × SDL	10,000 ppb
	Magnesium	5,230 ppb	718 ppb	7.3 × Ref	NL
GW-13	**INORGANICS**				
	Calcium	41,600 ppb	1,200 ppb	34.7 × Ref	NL
	Iron	2,950 J ppb	641 J ppb	4.6 × Ref	NL
	Magnesium	3,770 ppb	718 ppb	5.3 × Ref	NL
	Vanadium	3.7 ppb	0.52 J ppb	7.1 × Ref	50 ppb
	Cyanide	56.00 ppb	10.00 U ppb	5.6 × SDL	10 ppb
GW-14	**VOCs**				
	Trichloroethane, 1,1,1-	33 ppb	10 U ppb	3.3 × SQL	200 ppb
	SVOCs				
	Caprolactam	10 ppb	10 U ppb	1.0 × SQL	NL
	INORGANICS				
	Calcium	12,800 ppb	1,200 ppb	10.7 × Ref	NL
	Magnesium	6,450 ppb	718 ppb	9.0 × Ref	NL
	Potassium	3,260 J ppb	793 J ppb	4.1 × Ref	NL

Table 9

Summary of Analytical Results
Groundwater Samples Collected by START on 17 through 19 February 2004
at Cole Brook Pines Landfill (Concluded)

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration	Comments	RCGW-1 Standard
GW-14 (Concluded)	**INORGANICS (Concluded)**				
	Sodium	10,400 ppb	3,180 ppb	3.3 × Ref	NL

Note: Substances listed in bold text were detected at concentrations that meet or exceed their respective MOHML RCGW-1 groundwater standards.

Ref = Reference concentration.
J = Quantitation is approximate due to limitations identified during the quality control review.
U = Indicates the substance was analyzed for, but was not detected. The associated numerical value is the SQL or SDL.
UJ = Indicates the substance was analyzed for, but was not detected. The associated numerical value is the estimated SQL or SDL.
ppb = Parts per billion.
VOCs = Volatile Organic Compounds.
SVOCs = Semivolatile Organic Compounds.
SQL = Sample Quantitation Limit.
SDL = Sample Detection Limit.
NL = Not Listed.
RCGW-1 = Massachusetts Contingency Plan Reportable Category GW-1 groundwater standard.

[83-85; 92]

One VOC [1,1,1-trichloroethane (TCA)] was detected in START groundwater samples at a concentration above reference criteria. TCA was detected at 33 ppb in groundwater sample GW-14 [83]. TCA was detected at a concentration below its RCGW-1 standard of 200 ppb [83; 92, Subpart J]. TCA is not documented as having been used and/or disposed of on the Cole Brook property. In addition, TCA was not detected in START soil/source samples [80]. Therefore, the presence of TCA in START groundwater sample GW-14 will not be considered attributable to the Cole Brook property.

One SVOC (caprolactam) was detected in START groundwater samples at concentrations above reference criteria. Caprolactam was detected at a maximum concentration of 41 ppb in groundwater sample GW-06 [83]. No RCGW-1 standard is available for caprolactam [92, Subpart J]. Caprolactam is not documented as having been used and/or disposed of on the Cole Brook property. In addition, caprolactam was not detected in START soil/source samples [81]. Therefore, the presence of caprolactam in START groundwater samples will not be considered attributable to the Cole Brook property.

No pesticides or PCBs were detected in START groundwater samples [83].

Seventeen inorganic substances were detected in START groundwater samples at concentrations above reference criteria. Maximum concentrations of the inorganic substances detected include the following: aluminum (41,700 ppb in GW-11), barium (378 ppb in GW-11), beryllium (6.9 ppb in GW-03), calcium (72,600 ppb in GW-12), chromium (191 J ppb in GW-10), cobalt (47.8 ppb in GW-03), copper (41.5 J ppb in GW-10), iron (28,200 ppb in GW-11), lead (103 ppb in GW-04), magnesium (11,100 ppb in GW-11), manganese (1,880 ppb in GW-03), nickel (121 J ppb in GW-01), potassium (6,730 J ppb in GW-11), sodium (19,100 ppb in GW-11), vanadium (36.3 ppb in GW-11), zinc (322 ppb in GW-04), and cyanide (56.00 ppb in GW-13) [84; 85]. The following inorganic substances were detected in START groundwater samples at concentrations that exceeded their respective MOHML RCGW-1 groundwater standard (in parentheses): barium (200 ppb), beryllium (4 ppb), chromium (100 ppb), lead (20 ppb), nickel (80 ppb), and cyanide (10 ppb) [84; 85; 92, Subpart J]. No MOHML RCGW-1 groundwater standards are available for aluminum, calcium, magnesium, manganese, iron, sodium, and potassium [92, Subpart J]. Aluminum, beryllium, cobalt, and vanadium are not documented to have been used and/or disposed of on the Cole Brook property, and were not detected above reference criteria in START soil/source samples [82]. Therefore, their presence in START groundwater samples will not be considered attributable to the Cole Brook property. Barium, calcium, lead, magnesium, potassium, zinc, and cyanide were detected at concentrations above reference criteria in soil/source samples collected by START from the Cole Brook property on 27 and 28 January 2004 [82]. In addition, chromium and copper have been detected in surface soil samples collected from the former landfill area; and iron, manganese, nickel, and sodium have been detected in a leachate sample collected from the former landfill [4, pp. 7, 10, 13-14, Attachment D, Attachment E; 65]. Therefore, the presence of barium, calcium, chromium, copper, iron, lead, magnesium, manganese, nickel, potassium, sodium, zinc, and cyanide in START groundwater samples will be considered at least partially attributable to the Cole Brook property.

Groundwater sample GW-11 was analyzed for total metals and dissolved metals. Both analyses were performed to ensure that metals concentration data would be obtained from the samples despite high turbidity in the samples. The sample analyzed for dissolved metals was filtered at the laboratory prior to analysis [58, pp. 46-48; 59, pp. 2-17; 84-85]. Analytical results indicated that all substances detected in the sample analyzed for total metals were also detected in the sample analyzed for dissolved metals. Substances detected during dissolved metals analysis were detected at lower concentrations than during total metals analysis [84-85]. No inorganic substances were detected during dissolved metals analysis at concentrations that exceeded their respective MOHML RCGW-1 groundwater standard [84; 85; 92, Subpart J].

On 18 February 2004, as part of the ESI, START personnel collected two drinking water samples (DW-01 and DW-02), including one replicate, from the residential drinking water supply well on the Cole Brook property, to determine if there has been a release of hazardous substances, associated with the Cole Brook property, to drinking water (Figures 3 and 3A) [59, pp. 6-13]. The drinking water samples were analyzed through EPA CLP laboratories for low-level VOCs, low-level SVOCs, low-level pesticides, low-level PCBs, metals, and cyanide [59, pp. 6-13; 84; 86]. Table 10 summarizes the drinking water samples collected by START on 18 February 2004.

Table 10

Sample Summary: Cole Brook Pines Landfill
Drinking Water Samples Collected by START on 18 February 2004

Sample Location No.	Traffic Report No.	Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Drinking Water					
DW-01 (MS/MSD)	A1CP6 MA1CP6	0945	Grab	NA	Grab drinking water sample collected from an outside spigot connected to the on-site private groundwater drinking water supply well (41° 40' 37.02" N, 71° 00' 41.54" W). Last water quality readings before sample was collected: Temp = 8.2 °C; Spec. Cond = 117.0 µS/cm; pH = 8.23; Turb = 0.7 NTU. FID = inoperable; PID in headspace upon opening spigot = 0.0.
DW-02	A1CP7 MA1CP7	0945	Grab	NA	Replicate of sample DW-01, collected for quality control.

Note: All FID and PID readings are reported in units above background.

°	= Degrees.	PID	= Photoionization Detector.
'	= Minutes.	FID	= Flame Ionization Detector.
"	= Seconds.	Temp	= Temperature.
No.	= Number.	mv	= Millivolts.
NA	= Not Applicable.	Turb	= Turbidity
NR	= Not Recorded.	NTU	= Nephelometric Turbidity Units.
N	= North Latitude.	µS/cm	= MicroSiemens per Centimeter.
W	= West Longitude.	Spec. Cond	= Specific Conductivity.
°C	= Degrees Celsius.	MS/MSD	= Matrix Spike/Matrix Spike Duplicate.

[59]

Complete analytical results of START drinking water samples including quantitation and detection limits are presented in Attachment D. Sample results qualified with a "J" on analytical tables are considered approximate because of limitations identified during CLP data validation. In addition, organic sample results reported at concentrations below quantitation limits and confirmed by mass spectrometry are also qualified by a "J" and considered approximate [84; 86].

Table 11 is a summary of organic compounds and inorganic elements detected through CLP analyses of START drinking water samples. EPA MCLs and MCP RCGW-1 drinking water standards are used as the reference values for the drinking water samples, for comparison purposes only. If no MCL or RCGW-1 standard is available, applicable inorganic sample results are compared to EPA-established NSDWRs. NSDWRs are guidelines used to regulate contaminants in drinking water that may cause cosmetic or aesthetic effects [95]. Compounds or elements have exceeded reference criteria if they occurred at a concentration greater than or equal to the their respective MCL, RCGW-1 standard, or NSDWR.

Table 11

Summary of Analytical Results
Drinking Water Samples Collected by START on 18 February 2004
at Cole Brook Pines Landfill

Sample Location	Compound/ Element	Sample Concentration	EPA Maximum Contaminant Level	MA DEP MCP RCGW-1 Standard	EPA NSDWR
DW-01	**INORGANICs**				
	Calcium	15,700 ppb	NA	NA	NA
	Copper	6.8 ppb	1,300 ppb	10,000 ppb	1,000 ppb
	Iron	29.2 ppb	NA	NA	300 ppb
	Magnesium	2,700 ppb	NA	NA	NA
	Potassium	1,410 J ppb	NA	NA	NA
	Sodium	11,700 ppb	NA	NA	NA
DW-02	**VOCs**				
	Methylene Chloride	0.24 J ppb	NA	5 ppb	NA
	INORGANICs				
	Calcium	15,700 ppb	NA	NA	NA
	Copper	7.6 ppb	1,300 ppb	10,000 ppb	1,000 ppb
	Iron	23.0 ppb	NA	NA	300 ppb
	Magnesium	2,740 ppb	NA	NA	NA
	Potassium	1,430 J ppb	NA	NA	NA
	Sodium	11,800 ppb	NA	NA	NA

J = Quantitation is approximate due to limitations identified during the quality control review.
ppb = Parts per billion.
NA = Not Available.
VOCs = Volatile Organic Compounds.
EPA = U.S. Environmental Protection Agency.
MA DEP = Massachusetts Department of Environmental Protection.
MCP = Massachusetts Contingency Plan.
NSDWR = National Secondary Drinking Water Regulation.
RCGW-1 = Massachusetts Contingency Plan Reportable Category GW-1 groundwater standard.

[84; 86; 92; 95]

No VOCs were detected in START drinking water samples above reference criteria. Methylene chloride was detected in drinking water sample DW-02 at a concentration below its MCP RCGW-1 standard [86; 92]. Non-detected results for acetone and 2-butanone were rejected in drinking water sample DW-02 due to poor laboratory instrument calibration sensitivity [86].

No SVOCs, pesticides, or PCBs were detected in START drinking water samples [86].

No inorganic substances were detected in START drinking water samples above reference criteria. Calcium, copper, iron, magnesium, potassium, and sodium were detected in the drinking water samples at concentrations below applicable EPA MCLs, MCP RCGW-1 standards, and NSDWRs [84; 95].

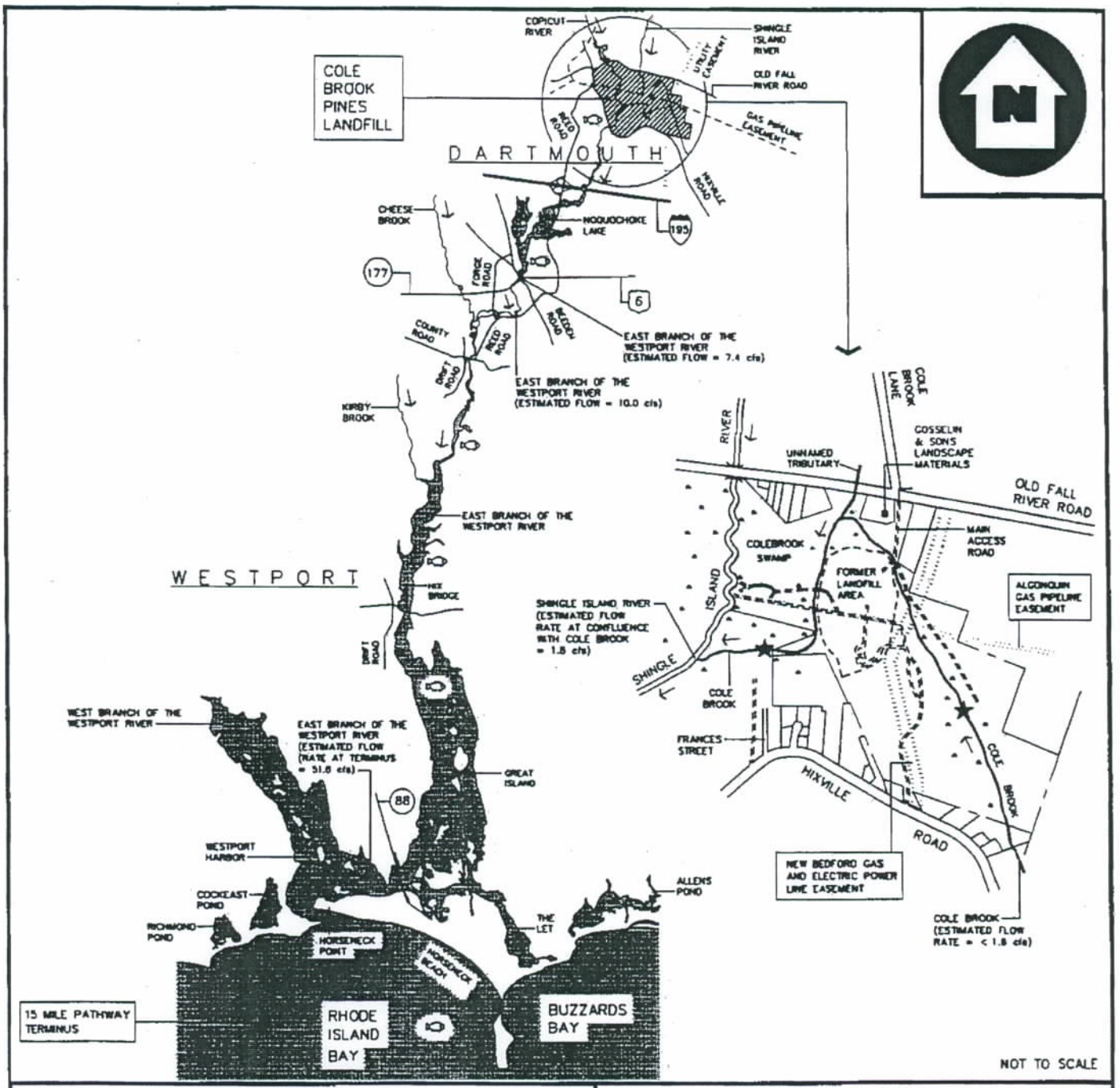
START collected groundwater and drinking water samples as part of the Cole Brook ESI. Based on analytical results of the groundwater samples, the overburden aquifer beneath the Cole Brook property has been impacted by a release of 12 metals and cyanide considered to be at least partially attributable to the Cole Brook property. Of these contaminants, six inorganic substances (barium, beryllium, chromium, lead, nickel, and cyanide) were detected at concentrations that met or exceeded their respective MOHML RCGW-1 groundwater standards [83-85; 92, Subpart J]. No hazardous substances were detected in START drinking water samples above reference criteria [84; 86]. Based on the lack of hazardous substances in the on-site drinking water supply well, no impacts to nearby groundwater drinking water supply sources are known or suspected. To date, no actions have been taken to address the release of hazardous substances to the aquifer beneath the property.

SURFACE WATER PATHWAY

The Cole Brook property is located in the Buzzard's Bay Coastal Drainage Basin [33; 42]. The Cole Brook property is located in Flood Zone C (an area of minimal flooding, above the 100-year flood elevation) [34].

The topography of the area surrounding the Cole Brook property gently slopes from east to west, with the western, northern, and portions of the eastern former solid waste landfill toe located in low-lying wetland areas. Stormwater drains radially off the landfill into Colebrook Swamp, located to the north, west, and east of the former solid waste landfill [4, p. 8]. The southern portion of the Cole Brook property is drained by Cole Brook, which flows northwesterly past the landfill, where it turns southwesterly and flows through Colebrook Swamp and then joins the Shingle Island River [60].

The most upstream probable point of entry (PPE^1) to surface water is located along Cole Brook in the southeastern portion of the property, where runoff from potentially contaminated soil and/or miscellaneous solid waste piles could enter Cole Brook. From PPE^1, Cole Brook flows northwest for approximately 1 mile, after which Cole Brook turns sharply southwest (Figure 4). Cole Brook flows southwest for approximately 0.5 miles to the most downstream PPE (PPE^2), located along Cole Brook southwest of the former solid waste landfill. From PPE^2, Cole Brook flows west for approximately 0.2 miles before discharging into the Shingle Island River [3; 52].



LEGEND

★ PROBABLE POINT OF ENTRY TO SURFACE WATER PATHWAY

FLOW DIRECTION

FISHERY

ROUTE MARKER

INTERSTATE ROUTE

U.S. ROUTE

STATE ROUTE

SOURCE: U.S.G.S 7.5 MINUTE SERIES QUADRANGLE(S):-
FALL RIVER, MASSACHUSETTS-RHODE ISLAND 1985
WESTPORT, MASSACHUSETTS-RHODE ISLAND 1977

INSET OF SURFACE WATER PATHWAY AREA

SURFACE WATER PATHWAY SKETCH

COLE BROOK PINES LANDFILL
OLD FALL RIVER ROAD
DARTMOUTH, RHODE ISLAND

WESTON SOLUTIONS®

REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD #	DRAWN BY:	DATE
04-05-0134	W. SHAW	2/27/04

FILE NAME: S:\04050134\Figures\FIG_4.DWG

FIGURE 4

From its confluence with Cole Brook, the Shingle Island River flows southwest for 1.8 miles before discharging into Noquochoke Lake. Noquochoke Lake flows southwest for approximately 1 mile and then discharges into the East Branch of the Westport River. The East Branch of the Westport River flows south for approximately 10.2 miles before emptying into Westport Harbor, which flows west for approximately 1 mile and discharges into Buzzards Bay. The 15-mile downstream surface water pathway terminus extends from the mouth of Westport Harbor to a 0.8-mile radial arc extending from Horseneck Beach, Westport, Massachusetts to the Acoaxet section of Westport, Massachusetts. Since 1.5 miles of the surface water pathway is located on the Cole Brook property, the downstream surface water pathway is 16.5 miles long [51-54].

No USGS gaging stations are located along the downstream surface water pathway for the Cole Brook property [43]. The flow rates of the surface water bodies along the downstream surface water pathway were estimated by multiplying the square mileage of their respective drainage basin areas by the USGS estimating factor of 1.8 cubic feet per second (cfs) per square mile (mi^2). This factor is an estimate and average of the intensity, rate, and frequency of overland flow in New England [74]. The drainage basin areas for Cole Brook, Shingle Island River, and the East Branch of the Westport River were calculated to be 0.98 mi^2, 4.10 mi^2, and 28.75 mi^2, respectively. Therefore, the estimated flow rates at the termini of Cole Brook, Shingle Island River, and the East Branch of Westport River are 1.8 cfs, 7.4 cfs, and 51.8 cfs, respectively. Through interpolation, at 0.6 miles downstream of the terminus of the Shingle Island River, the flow rate of the East Branch of the Westport River is estimated to be 10.0 cfs [26]. Table 12 describes surface water bodies along the 15-mile downstream surface water pathway from the Cole Brook property.

Table 12

Surface Water Bodies Along the 15-Mile Downstream Surface Water Pathway from Cole Brook Pines Landfill

Surface Water Body	Descriptor[a]	Length of Reach (miles)	Flow Characteristics (cfs)[b]	Length of Wetlands (miles)
Cole Brook	Minimal Stream	1.7	< 1.8	2.6
Shingle Island River (including Noquochoke Lake)	Minimal Stream	2.8	> 1.8 to 7.4	3.1
East Branch of the Westport River (Reach 1)	Minimal Stream	0.6	> 7.4 to 10.0	1.0
East Branch of the Westport River (Reach 2)	Small to Moderate	9.6	> 10.0 to 51.8	6.5

Table 12

Surface Water Bodies Along the 15-Mile Downstream Surface Water Pathway from Cole Brook Pines Landfill (Concluded)

Surface Water Body	Descriptor[a]	Length of Reach (miles)	Flow Characteristics (cfs)[b]	Length of Wetlands (miles)
Westport Harbor	Coastal Tidal Waters	1.0	NA	0.3
Buzzards Bay	Coastal Tidal Waters	0.8	NA	0.0

[a] Minimal stream <10 cfs. Small to moderate stream 10-100 cfs. Coastal tidal waters (flow not applicable).
[b] Cubic feet per second.

[18; 20; 26; 27; 52; 54]

There are no known surface water drinking water intakes located along the 15-mile downstream surface water pathway [38; 44-47]. According to MA DEP, Cole Brook is designated as a Public Surface Water Supply Protection Area. In addition, Noquochoke Lake is listed as an emergency public drinking water surface water supply for the Fall River Water Department; however, MA DEP reported that even in times of emergency, the water quality of the lake is too poor (due to septic issues) to be used for drinking water [75].

The Massachusetts Surface Water Quality Standards do not specifically indicate the surface water body classification of Cole Brook or the Shingle Island River; therefore, a surface water body classification of B is defaulted to both water bodies, per the regulation [42]. The East Branch of the Westport River from Noquochoke Lake to Old County Road in Westport, Massachusetts is classified by MA DEP as a Class B warm water fishery; from Old County Road to its mouth, the East Branch of the Westport River is classified by MA DEP as a Class SB surface water body. Class B waters are designated as suitable for primary and secondary contact recreation and are suitable as habitats for fish, other aquatic life, and wildlife. Class SB waters are Class B waters that are also designated as suitable for shellfish harvesting with depuration. Both Class B and Class SB shall have consistently good aesthetic value [42]. Shingle Island River and the East Branch of the Westport River are stocked with trout and are therefore classified as recreational fisheries [41].

Sensitive environments along the 15-mile downstream surface water pathway include two fisheries, a Clean Water Act (CWA)-protected water body, and approximately 23.9 miles of wetland frontage [18; 20; 26; 27; 52; 54]. Additionally, according to a Threatened and Endangered Species Report, prepared by EPA on 24 February 2004 for the Cole Brook property, there are seven State-listed endangered plant species habitats, six State-listed threatened plant species habitats, four State-listed threatened animal species habitats, two State-listed threatened and Federally-listed threatened/endangered animal species habitats, and one State-listed endangered and Federally-listed threatened animal species habitat located along the 15-mile downstream surface water pathway [50]. Table 13 summarizes sensitive environments located along the 15-mile downstream surface water pathway from the Cole Brook property.

Table 13

Sensitive Environments Along the 15-Mile Downstream Surface Water Pathway from Cole Brook Pines Landfill

Sensitive Environment Name	Sensitive Environment Type	Surface Water Body	Downstream Distance from PPE[1] (miles)	Flow Rate at Environment (cfs)[a]
Cole Brook	CWA-protected Water Body	Cole Brook	0 to 1.7	< 1.8
Wetlands	Wetlands (2.6 miles)	Cole Brook	0 to 1.7	< 1.8
Wetlands	Wetlands (3.1 miles)	Shingle Island River	1.7 to 4.5	< 1.8 to 7.4
Wetlands	Wetlands (1.0 miles)	East Branch of the Westport River (Reach 1)	4.5 to 5.1	> 7.4 to 10.0
Wetlands	Wetlands (6.5 miles)	East Branch of the Westport River (Reach 2)	5.1 to 14.7	>10.0 to 51.8
Wetlands	Wetlands (0.3 miles)	Westport Harbor	14.7 to 15.7	NA
Wetlands	Wetlands (0.0 miles)	Buzzards Bay	15.7 to 16.5	NA
State-listed Endangered Plant Species Habitat	State-listed Endangered Plant Species Habitat	Cole Brook	1.4	< 1.8
State-listed Threatened Plant Species Habitat	State-listed Threatened Plant Species Habitat	Cole Brook	1.4	< 1.8
State-listed Endangered Plant Species Habitat	State-listed Endangered Plant Species Habitat	Cole Brook	1.5	< 1.8
State-listed Threatened Plant Species Habitat	State-listed Endangered Plant Species Habitat	Cole Brook	1.5	< 1.8
State-listed Threatened Plant Species Habitat	State-listed Threatened Plant Species Habitat	Shingle Island River	1.8	> 1.8 to 7.4
State-listed Endangered Plant Species Habitat	State-listed Endangered Plant Species Habitat	Shingle Island River	1.8	> 1.8 to 7.4
State-listed Threatened Plant Species Habitat	State-listed Threatened Plant Species Habitat	Shingle Island River	2.0	> 1.8 to 7.4
State-listed Endangered Plant Species Habitat	State-listed Endangered Plant Species Habitat	Shingle Island River	2.7	> 1.8 to 7.4
State-listed Threatened Animal Species Habitat	State-listed Threatened Animal Species Habitat	Shingle Island River	2.7	> 1.8 to 7.4
State-listed Threatened Plant Species Habitat	State-listed Threatened Plant Species Habitat	Shingle Island River	3.1	> 1.8 to 7.4

Table 13

Sensitive Environments Along the 15-Mile Downstream Surface Water Pathway from Cole Brook Pines Landfill (Concluded)

Sensitive Environment Name	Sensitive Environment Type	Surface Water Body	Downstream Distance from PPE[1] (miles)	Flow Rate at Environment (cfs)[a]
State-listed Endangered Plant Species Habitat	State-listed Endangered Plant Species Habitat	Shingle Island River	3.3	> 1.8 to 7.4
State-listed Threatened Animal Species Habitat	State-listed Threatened Animal Species Habitat	Shingle Island River	3.9	> 1.8 to 7.4
State-listed Threatened Animal Species Habitat	State-listed Threatened Animal Species Habitat	Shingle Island River	4.2	> 1.8 to 7.4
State-listed Threatened Animal Species Habitat	State-listed Threatened Animal Species Habitat	East Branch of the Westport River (Reach 2)	6.9	> 7.4 to 10.0
State-listed Endangered Plant Species Habitat	State-listed Endangered Plant Species Habitat	East Branch of the Westport River (Reach 2)	11.1	> 7.4 to 10.0
State-listed Endangered Plant Species Habitat	State-listed Endangered Plant Species Habitat	East Branch of the Westport River (Reach 2)	11.6	> 7.4 to 10.0
State-listed Threatened Plant Species Habitat	State-listed Threatened Plant Species Habitat	East Branch of the Westport River (Reach 2)	12.1	> 7.4 to 10.0
State-listed Threatened and Federally-listed Threatened/Endangered Animal Species Habitat	State-listed Threatened and Federally-listed Threatened/Endangered Animal Species Habitat	East Branch of the Westport River (Reach 2)	12.1	> 7.4 to 10.0
State-listed Endangered Animal Species Habitat	State-listed Endangered Animal Species Habitat	East Branch of the Westport River (Reach 2)	12.4	> 7.4 to 10.0
State-listed Threatened and Federally-listed Threatened/Endangered Animal Species Habitat	State-listed Threatened and Federally-listed Threatened/Endangered Animal Species Habitat	East Branch of the Westport River (Reach 2)	12.9	> 7.4 to 10.0

Note: The U.S. Environmental Protection Agency (EPA) does not report the exact location of threatened or endangered species habitats along the downstream surface water pathway. Based on the approximate distance of each habitat from the site provided by EPA, START has estimated the approximate surface water bodies, distance from PPE[1], and flow rates that apply to each habitat.

cfs = Cubic feet per second
PPE[1] = Probable Point of Entry No. 1
CWA = Clean Water Act

[18; 20; 26; 27; 50; 52; 54]

On 2 December 1977, GHR collected two surface water samples from Cole Brook at points upstream and downstream of the former solid waste landfill area. The exact locations at which the samples were collected were not available to START. The samples were submitted to GHR's Environmental Services Division Laboratory and analyzed for a variety of water quality parameters, including pH, total hardness (as calcium carbonate), COD, and nitrogen (as nitrate); and for metals, including copper, nickel, and zinc. Analytical results indicated that copper and zinc were detected upstream of the landfill at 0.15 ppm and 0.20 ppm, respectively. Copper and zinc were also detected downstream of the landfill at 0.35 ppm and 0.10 ppm, respectively [4, pp. 6, 9, Attachment A; 15].

On 11 February 1982, the Town of Dartmouth Conservation Commission collected one sediment sample from the property. Available file information did not specify the location at which the sample was collected or if the sample was collected from a perennial surface water body. The sample was submitted to CDM and analyzed for total PCBs (method unknown). Analytical results indicated the presence of PCBs (identified as Aroclor-1254) at 22 ppb in the sample. In addition, Aroclor-1242 was present in the sample, but was not specifically quantified [4, pp. 7, 10, Attachment C; 21].

On 10 October 2000, as part of the SIP, START personnel collected five sediment samples (SD-01, SD-02, and SD-05 through SD-07) from Cole Brook and two sediment samples (SD-03 and SD-04) from an unnamed tributary of Cole Brook, located north of the Cole Brook property and north of Old Fall River Road. All the samples were collected off site. Samples SD-03 and SD-04 were collected along the unnamed tributary as upstream reference samples, and samples SD-05 and SD-06 were collected along Cole Brook as upstream reference samples. Samples SD-05 and SD-06 were collected along Cole Brook in the north/northeastern portion of a residential property (Map No. 62, Lot No. 22) located south of the Cole Brook property. Samples SD-01, SD-02, and SD-07 were collected along Cole Brook downstream of the property to establish potential impacts to sensitive environments downstream of the property. All the samples were analyzed through a DAS laboratory for VOCs, SVOCs, pesticides, PCBs, metals, and cyanide, with the exception of SD-04 and SD-06, which were analyzed for metals only [3, p. 29].

No VOCs were detected at concentrations above reference criteria. It should be noted that one VOC (methyl acetate) was detected in three of the sediment samples, including a sample collected from Cole Brook (SD-07), an upstream reference sample for Cole Brook (SD-05), and the upstream reference sample for the unnamed tributary of Cole Brook (SD-03) [3, p. 32].

No SVOCs were detected at concentrations above reference criteria. It should be noted that several SVOCs were detected in the upstream reference sample collected along the unnamed tributary of Cole Brook (SD-03). The reference sample, although collected upstream of the Cole Brook property, was collected in close proximity to Old Fall River Road and may have been influenced by runoff from the road [3, pp. 32-33].

No pesticides, PCBs, or cyanide were detected above laboratory detection limits in any samples [3, p. 33].

Three metals (antimony, beryllium, and cadmium) were detected in the sediment samples at concentrations above reference criteria. Antimony was detected in sample SD-07 at 1.3 ppm;

beryllium was detected in sample SD-01 at 1.4 ppm and in sample SD-02 at 1.1 ppm: and cadmium was detected in sample SD-07 at 0.12 J ppm [3, p. 33]. Sample results qualified with a "J" are considered approximate because of limitations identified during data validation. Based on available file information, the use and/or disposal of these metals on the Cole Brook property is unknown. Historically, analysis of soil and source samples collected from the property has not revealed the presence of these metals [4, pp. 13-14; 65; 82]. As a result, the metals detected in the sediment samples collected by START will not be attributed to the Cole Brook property.

On 7 February 2002, as part of the Environmental Investigation, St. Germain personnel collected five surface water samples (SW-01 through SW-05) and five sediment samples (SED-01 through SED-05) from five locations along Cole Brook and an unnamed tributary leading into Cole Brook. The surface water samples were submitted for VOC, SVOC, conductivity, PCB, EPH, VPH, 13 RCRA metals, iron, manganese, alkalinity, COD, chloride, nitrate, sulfate, and TDS analyses. The sediment samples were submitted for VOC, SVOC, conductivity, PCB, EPH, VPH, and 13 RCRA metals analyses. Analytical results indicated the presence of beryllium in samples SED-01 and SED-05 (1.2 ppm), and the following additional substances in sample SED-01: benzo(a)anthracene (12 ppm); benzo(b)fluoranthene (9.8 ppm); benzo(a)pyrene (12 ppm); indeno(1,2,3-cd)pyrene (89 ppm); benzo(k)fluoranthene (9.8 ppm); and chrysene (13 ppm) [78, p. 4]. No additional information regarding the surface water or sediment samples is available to START.

On 13 April 2004, as part of the ESI, START personnel collected 17 sediment samples (SD-01 through SD-17), including one duplicate, from 16 locations along an unnamed tributary, Cole Brook, and Shingle Island River, and from on-site wetlands, to determine if there has been a release of hazardous substances, associated with the Cole Brook property, to the surface water pathway (Figures 3 and 3A). Sediment sample SD-01 was collected from the Shingle Island River at its confluence with Cole Brook. Sediment sample SD-02 was collected from Shingle Island River, where the Algonquin Gas Easement abuts the River. Sediment samples SD-03 and SD-04 were collected from Shingle Island River, downstream of where the Shingle Island River crosses under Old Fall River Road. Sediment sample SD-05 was collected from wetlands in Cole Brook Swamp, adjacent to several tires, abandoned vehicles, and gasoline tanks. Sediment sample SD-06 was collected from wetlands adjacent to Cole Brook, north of the former landfill area. Sediment samples SD-07 and SD-08 were collected from wetlands adjacent to Cole Brook, southeast of the former landfill area and upstream of on-site source areas. Sediment sample SD-09 was collected from Cole Brook, southwest of the former landfill area and upstream of on-site source areas. Sediment samples SD-10 and SD-13 were collected from Cole Brook, west of the former landfill area. Sediment sample SD-11 was collected from Cole Brook, along the northeast edge of the former landfill area and adjacent to a solid waste pile. Sediment sample SD-12 was collected from Cole Brook, southeast of the former landfill area adjacent to a solid waste pile. Sediment samples SD-14 and SD-15 were collected from Cole Brook, southeast of the former landfill area and upstream of on-site source areas. Sediment samples SD-16 and SD-17 were collected from a tributary to Cole Brook, downstream of where it crosses under Old Fall River Road [59, pp. 19-27]. All the sediment samples were analyzed through DAS laboratories for VOCs, SVOCs, pesticides, PCBs, metals, and cyanide, with the exception of samples SD-04, SD-08, SD-15, and SD-17, which were analyzed for metals only [59, pp. 19-27; 87; 88]. Table 14 summarizes the sediment samples collected by START on 13 April 2004.

Table 14

Sample Summary: Cole Brook Pines Landfill
Sediment Samples Collected by START on 13 April 2004

Sample Location No.	Traffic Report No.	Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Sediment					
SD-01 (MS/MSD)	D15294	0845	Grab	0 to 6 Inches	Grab sediment sample collected from the Shingle Island River at its confluence with Cole Brook (GPS unit inoperable). Material is light brown, fine SAND and SILT. Aqueous parameters: pH = 9.48; Temp = 6.9 °C; Spec. Cond = 36.0 µS; Turb = 13 NTU; FID and PID = 0.0.
SD-02	D15295	1000	Grab	0 to 6 Inches	Grab sediment sample collected from the Shingle Island River, where the Algonquin Gas Easement abuts the River (GPS unit inoperable). Material is light brown, coarse-to-medium SAND, trace silt. Aqueous parameters: pH = 8.91; Temp = 7.2 °C; Spec. Cond = 44.6 µS; Turb = 5.2; FID and PID = 0.0.
SD-03	D15296	1030	Grab	0 to 6 Inches	Grab sediment sample collected from Shingle Island River, downstream of where the Shingle Island River crosses under Old Fall River Road, as a reference sample for the Shingle Island River (GPS unit inoperable). Material is light gray, medium SAND. Aqueous parameters: pH = 7.85; Temp = 7.2 °C; Spec. Cond = 44.5 µS; Turb = 4.9 NTU; FID and PID = 0.0.
SD-04	D15297	1035	Grab	0 to 6 Inches	Grab sediment sample collected from from Shingle Island River, downstream of where the Shingle Island River crosses under Old Fall River Road, as a reference sample for the Shingle Island River, for metals analysis only (GPS unit inoperable). Material is light-to-medium gray, medium SAND. Aqueous parameters: pH = 7.85; Temp = 7.2 °C; Spec. Cond = 44.5 µS; Turb = 4.9 NTU; FID and PID = 0.0.
SD-05	D15298	0935	Grab	0 to 6 Inches	Grab sediment sample collected from wetlands in Colebrook Swamp, adjacent to several tires, abandoned vehicles, and gasoline tanks (GPS unit inoperable). Material is black SILT. FID and PID = 0.0.

Table 14

Sample Summary: Cole Brook Pines Landfill
Sediment Samples Collected by START on 13 April 2004 (Continued)

Sample Location No.	Traffic Report No.	Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Sediment (Continued)					
SD-06	D15299	0830	Grab	0 to 6 Inches	Grab sediment sample collected from wetlands adjacent to Cole Brook, north of the former landfill area (GPS unit inoperable). Material is black SILT and fine SAND. FID and PID = 0.0.
SD-07	D15390	1205	Grab	0 to 6 Inches	Grab sediment sample collected from wetlands adjacent to Cole Brook, southeast of the former landfill area and upstream of on-site source areas, as a reference sample for the on-site wetlands (GPS unit inoperable).. Material is dark brown-to-black SILT. FID and PID = 0.0.
SD-08	D15301	1210	Grab	0 to 6 Inches	Grab sediment sample collected from wetlands adjacent to Cole Brook, southeast of the former landfill area and upstream of on-site source areas, as a reference sample for the on-site wetlands, for metals analysis only (GPS unit inoperable). Material is dark brown-to-black SILT. FID and PID = 0.0.
SD-09	D15302	0915	Grab	0 to 6 Inches	Grab sediment sample collected from Cole Brook, southwest of the former landfill area (GPS unit inoperable). Material is black SILT. Aqueous parameters: pH = 8.5; Temp = 6.7 °C; Spec. Cond = 77.9 µS; Turb = 6.5 NTU; FID and PID = 0.0.
SD-10	D15303	1020	Grab	0 to 6 Inches	Grab sediment sample collected from Cole Brook, west of the former landfill area (GPS unit inoperable). Material is dark brown, coarse-to-medium SAND, some silt, little fine gravel. Aqueous parameters: pH = 7.64; Temp = 6.6 °C; Spec. Cond = 69.4 µS; Turb = 5.6 NTU; FID and PID = 0.0.

Table 14

Sample Summary: Cole Brook Pines Landfill
Sediment Samples Collected by START on 13 April 2004 (Continued)

Sample Location No.	Traffic Report No.	Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Sediment (Continued)					
SD-11	D15304	1100	Grab	0 to 6 Inches	Grab sediment sample collected from Cole Brook, along the northeast edge of the former landfill area and adjacent to a solid waste pile (GPS unit inoperable). Material is dark brown, coarse-to-fine SAND, some silt, little fine gravel. Aqueous parameters: pH = 7.66; Temp = 7.0 °C; Spec. Cond = 55.5 µS; Turb = 4.3 NTU; FID and PID = 0.0.
SD-12	D15305	1145	Grab	0 to 6 Inches	Grab sediment sample collected from Cole Brook, southeast of the former landfill area adjacent to a solid waste pile (GPS unit inoperable). Material is dark brown-to-black SILT. Aqueous parameters: pH = 7.08; Temp = 6.9 °C; Spec. Cond = 113.8 µS; Turb = 4.6 NTU; FID and PID = 0.0.
SD-13	D15306	1020	Grab	0 to 6 Inches	Duplicate of sample SD-10, collected for quality control.
SD-14	D15307	1200	Grab	0 to 6 Inches	Grab sediment sample collected from Cole Brook, southeast of the former landfill area and upstream of on-site source areas, as a reference sample for Cole Brook (GPS unit inoperable). Material is light-gray SILT and dark brown-to-black PEAT. Aqueous parameters: pH = 9.11; Temp = 6.8 °C; Spec. Cond = 58.3 µS; Turb = 17 NTU; FID and PID = 0.0.
SD-15	D15308	1210	Grab	0 to 6 Inches	Grab sediment sample collected from Cole Brook, southeast of the former landfill area and upstream of on-site source areas, as a reference sample for Cole Brook, for metals analysis only (GPS unit inoperable). Material is light-gray SILT and dark brown-to-black PEAT. Aqueous parameters: pH = 9.11; Temp = 6.8 °C; Spec. Cond = 58.3 µS; Turb = 17 NTU; FID and PID = 0.0.

Table 14

Sample Summary: Cole Brook Pines Landfill
Sediment Samples Collected by START on 13 April 2004 (Concluded)

Sample Location No.	Traffic Report No.	Time (hours)	Remarks	Sample Depth	Sample Source
MATRIX: Sediment (Concluded)					
SD-16	D15309	1055	Grab	0 to 6 Inches	Grab sediment sample collected from a tributary to Cole Brook, approximately 100 feet downstream of where it crosses under Old Fall River Road, as a reference sample for Cole Brook, to document potential contamination in Cole Brook from sources along the tributary (GPS unit inoperable). Material is dark brown SILT. Aqueous parameters: pH = 7.55; Temp = 5.7 °C; Spec. Cond = 85.4 µS; Turb = 21 NTU; FID and PID = 0.0.
SD-17	D15310	1107	Grab	0 to 6 Inches	Grab sediment sample collected from a tributary to Cole Brook, approximately 100 feet downstream of where it crosses under Old Fall River Road, as a reference sample to document potential contamination in Cole Brook from sources along the tributary, for metals analysis only (GPS unit inoperable). Material is dark brown-to-black SILT. Aqueous parameters: pH = 7.55; Temp = 5.7 °C; Spec. Cond = 85.4 µS; Turb = 21 NTU; FID and PID = 0.0.

Note: All FID and PID readings are reported in units above background.

°	= Degrees.	PID	= Photoionization Detector.
'	= Minutes.	FID	= Flame Ionization Detector.
"	= Seconds.	°C	= Degrees Celsius.
No.	= Number.	MS/MSD	= Matrix Spike/Matrix Spike Duplicate.
NR	= Not Recorded.	NTU	= Nephelometric Turbidity Units.
N	= North Latitude.	µS	= MicroSiemens.
W	= West Longitude.	Spec. Cond	= Specific Conductivity.
Temp	= Temperature.	Turb	= Turbidity.
GPS	= Global Positioning System.		

[59]

Complete analytical results of START sediment samples including quantitation and detection limits are presented in Attachment E. Sample results qualified with a "J" on analytical tables are considered approximate because of limitations identified during DAS data validation. In addition, organic sample results reported at concentrations below quantitation limits and confirmed by mass spectrometry are also qualified by a "J" and considered approximate [87; 88].

Table 15 is a summary of organic compounds and inorganic elements detected through DAS analyses of START sediment samples. For each sample location, a compound or element is listed if it is detected at a concentration greater than or equal to three times the higher of the reference sample concentrations. However, if the compound or element is not detected in the reference sample, the reference sample's SQL (for organic analyses) or SDL (for inorganic analyses) is used as the reference concentration. These compounds or elements are listed if they occurred at a concentration greater than or equal to the reference sample's SQL or SDL and are designated by their approximate relative concentration above the reference criteria values. Sediment samples SD-03 and SD-04 were collected to document reference concentrations for sediment samples collected from the Shingle Island River (SD-01 and SD-02); sediment samples SD-07 and SD-08 were collected to document reference conditions for sediment samples collected from on-site wetlands (SD-05 and SD-06); sediment samples SD-14 and SD-15 were collected to document reference conditions for sediment samples collected from Cole Brook (SD-09 through SD-13); and sediment samples SD-16 and SD-17 were collected to document reference conditions for sediment samples collected from Cole Brook downstream of its convergence with the unnamed tributary (SD-09, SD-10, and SD-13).

Analytical results of the sediment samples are compared to MCP Freshwater Sediment Screening Threshold Effect Concentrations (TECs). TECs are not enforceable and have been provided for informational purposes only. Substances listed in bold text in Table 15 were detected at concentrations that exceeded their respective TECs.

Table 15

Summary of Analytical Results
Sediment Samples Collected by START on 13 April 2004
at Cole Brook Pines Landfill

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration	Comments	MA DEP TEC
SD-06	**PESTICIDES**				
	4,4'-DDE	5.8 J ppb	1.7 J ppb	3.4 × Ref	3.16 ppb
	INORGANICS				
	Manganese	47.7 ppm	9.8 ppm	4.9 × Ref	NL
	Iron	7,570 ppm	1,230 ppm	6.2 × Ref	NL

Table 15

Summary of Analytical Results
Sediment Samples Collected by START on 13 April 2004
at Cole Brook Pines Landfill (Concluded)

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration	Comments	MA DEP TEC
SD-09	**INORGANICS**				
	Manganese	419 ppm	98.6 ppm	4.2 × Ref	NL

Note: Substances listed in bold text were detected at concentrations that meet or exceed their respective TECs.

J = Quantitation is approximate due to limitations identified during the quality control review.
Ref = Reference concentration.
ppm = parts per million.
ppb = parts per billion.
MA DEP = Massachusetts Department of Environmental Protection.
TEC = Threshold Effect Concentration.
NL = Not listed.

[87; 88; 96]

No VOCs were detected in START sediment samples at concentrations above reference criteria. Non-detected results for sediment samples SD-05 through SD-07, SD-09, SD-12, and SD-14 were rejected (R), and positive results in all samples were estimated (J) due to low percent solid content in the samples. The following three VOCs were detected in the sediment samples at concentrations below reference criteria (maximum concentrations in parentheses): acetone (1,200 J ppb in SD-09), methyl acetate (110 J ppb in SD-06), and 2-butanone (140 J ppb in SD-09) [87]. No TECs are available for acetone, methyl acetate, or 2-butanone [96].

No SVOCs were detected in START sediment samples at concentrations above their respective SQLs [87].

One pesticide (4,4'-DDE) was detected in START sediment samples at a concentration above reference criteria. 4,4'-DDE was detected at a concentration of 5.8 J ppb in sediment sample SD-06 [87]. 4,4'-DDE was detected at a concentration that exceeded its TEC of 3.16 ppb [87; 96]. The result for alpha-chlordane in sediment sample SD-16 was rejected because target compound identification criteria were not met during data validation [87]. 4,4'-DDE is not documented as having been used and/or disposed of on the Cole Brook property. In addition, 4,4'-DDE was not detected in START soil/source samples [81]. Therefore, the presence of 4,4'-DDE in START sediment sample SD-06 will not be considered attributable to the Cole Brook property.

Two inorganic substances (iron and manganese) were detected in START sediment samples at concentrations above reference criteria. Iron was detected at a concentration of 7,570 ppm in sediment sample SD-06, and manganese was detected at a maximum concentration of 419 ppm in sediment sample SD-09 [88]. No TECs are available for iron or manganese [96]. Iron and

manganese were detected in a leachate sample collected from the former landfill [4, pp. 7, 10, 13-14, Attachment D, Attachment E; 65]. Therefore, the presence of iron and manganese in START sediment samples will be considered at least partially attributable to the Cole Brook property.

START collected sediment samples as part of the Cole Brook ESI. Based on analytical results of START sediment samples, a CWA-protected water body has been impacted by the presence of two inorganic substances (iron and manganese) considered to be at least partially attributable to the Cole Brook property. To date, no actions have been taken to address the release of iron and manganese.

SOIL EXPOSURE PATHWAY

A single-family, one-story residence with two tenants is located on the property [3, p. 2; 79]. Access to the property is unrestricted. Reportedly, local youths use the access road as a "short cut" to travel between Old Fall River Road and Hixville Road [3, p. 2].

There are no known employees on the property [3, p. 4; 4, p. 7]. During the 11 June 2003 on-site reconnaissance and subsequent sampling activities, START personnel observed that portions of the Cole Brook property were used to house farm animals and that people drive or walk through the property to use the on-site spigot to obtain drinking water for the animals [58, p. 10]. The nearest day-care facility is the "Country Road Pre School", located at 644 Old Fall River Road, approximately 0.5 miles west/northwest of the property [52; 57]. Based on available background information and on observations by START during the 1 February 2000 and 11 June 2003 on-site reconnaissances, no terrestrial sensitive environments are believed to be located on the property [3, p. 33; 58, pp. 2-10]. An estimated 524 persons live within 1 radial mile of the property [14].

On 15 August 1990, ARCS personnel collected five surface soil samples (SS-411, SS-421, SS-421D, SS-431, and SS-441), including a duplicate, from the property (Figure 3). Four soil samples were collected at 6 inches below grade (SS-421, SS-421D, SS-431, and SS-441); one soil sample was collected at 12 inches below grade (SS-411). Sample SS-441 was collected east of the former solid waste landfill area (presumably upgradient of potential sources) to document reference conditions. The soil samples were analyzed through the EPA CLP for VOCs, SVOCs, pesticides, PCBs, metals, and cyanide [4, pp. 10-11; 28].

Three VOCs, 18 SVOCs, one pesticide, and six metals were detected in the samples at concentrations above reference criteria [4, pp. 13-14, Attachment E]. Analytical results of these samples are discussed in greater detail in the Waste/Source Sampling section of this report.

On 1 February 2000, as part of the SIP, START personnel conducted an on-site reconnaissance of the property from the AG pipeline easement. No soil staining or stressed vegetation noted in previous visits was observed due to snow cover. No samples were collected during the on-site reconnaissance [3, p. 34].

On 11 June 2003, as part of the ESI, START and MA DEP personnel conducted an on-site reconnaissance of the property. No stressed vegetation was observed. In the southern portion of the former landfill area, START and MA DEP personnel observed standing water with a sheen in a gravel berm area. No samples were collected during the on-site reconnaissance [58, pp. 2-11].

On 26 through 28 January 2004, as part of the ESI, START personnel collected nine surface soil samples (SO-01 through SO-09) from eight locations on the property (Figure 3). All the surface soil samples were analyzed through DAS laboratories for VOCs and through CLP laboratories for SVOCs, pesticides, PCBs, metals, and cyanide, with the exception of SO-08, which was analyzed for metals only [58, pp. 12-36, 80-82]. Analytical results indicated the presence of one VOC, 10 SVOCs, and nine inorganic substances (metals and cyanide) at concentrations above reference criteria [80-82]. These results are discussed in greater detail in the Waste/Source Sampling section of this report.

START performed surface soil sampling as part of the Cole Brook ESI. Analytical results of START surface soil samples indicate that surface soil on the Cole Brook property is contaminated with one VOC, 10 SVOCs, eight metals, and cyanide at concentrations above reference criteria [80-82]. Of these contaminants, two SVOCs were detected at concentrations that met or exceeded MOHML RCS-1 soil standards [81; 92, Subpart J]. Impacts to nearby residential populations are unknown. To date, no actions have been taken to address the area of contaminated soil on the property.

AIR PATHWAY

A single-family, one-story residence with two tenants is located on the property [3, p. 2; 79]. Access to the property is unrestricted. Reportedly, local youths use the access road as a "short cut" to travel between Old Fall River Road and Hixville Road [3, p. 2].

There are no known employees on the property [3, p. 33; 4, p. 7]. During the 11 June 2003 on-site reconnaissance and subsequent sampling activities, START personnel observed that portions of the Cole Brook property were used to house farm animals and that people drive or walk through the property to use the on-site spigot to obtain drinking water for the animals [58, p. 10]. The nearest day-care facility is the "Country Road Pre School", located at 644 Old Fall River Road, approximately 0.5 miles west/northwest of the property [52; 57]. Based on available background information and on observations by START during the 1 February 2000 and 11 June 2003 on-site reconnaissances, no terrestrial sensitive environments are believed to be located on the property [3, p. 33; 58, pp. 2-11]. Including two on-site residents, an estimated 21,172 people are located within 4 radial miles of the Cole Brook property [3, p. 12; 14]. Table 16 summarizes the estimated population within 4 radial miles of the Cole Brook property.

Table 16

Estimated Population Within 4 Radial Miles of Cole Brook Pines Landfill

Radial Distance from Cole Brook Pines Landfill (miles)	Estimated Population
On a Source	2 *
> 0.00 to 0.25	33
> 0.25 to 0.50	98

Table 16

Estimated Population Within 4 Radial Miles of Cole Brook Pines Landfill (Concluded)

Radial Distance from Cole Brook Pines Landfill (miles)	Estimated Population
> 0.50 to 1.00	393
> 1.00 to 2.00	1,699
> 2.00 to 3.00	4,226
> 3.00 to 4.00	14,721
TOTAL	21,172

* Includes two tenants in the on-site residence.

[3; 14]

Approximately 4,635 acres of wetlands are located within 4 radial miles of the property [17-20; 22]. Cole Brook, a CWA-protected water body, flows through the property [52]. Additionally, according to a Threatened and Endangered Species Report prepared by EPA on 24 February 2004 for the Cole Brook property, there are five State-listed endangered plant species habitats, eight State-listed threatened plant species habitats, and five State-listed threatened animal species habitats located within 4 radial miles of the Cole Brook property [50]. Table 17 summarizes the sensitive environments located within 4 radial miles of the Cole Brook property.

Table 17

Sensitive Environments Located Within 4 Radial Miles of Cole Brook Pines Landfill

Radial Distance from Cole Brook Pines Landfill (miles)	Sensitive Environment/Species (status)
On a Source	Water Body protected by the Clean Water Act
	15 acres of wetlands
> 0.00 to 0.25	30 acres of wetlands
> 0.25 to 0.50	60 acres of wetlands
> 0.50 to 1.00	335 acres of wetlands
> 1.00 to 2.00	945 acres of wetlands
	Three State-listed endangered plant species habitats
	Three State-listed threatened plant species habitats

Table 17

Sensitive Environments Located Within 4 Radial Miles of Cole Brook Pines Landfill (Concluded)

Radial Distance from Cole Brook Pines Landfill (miles)	Sensitive Environment/Species (status)
> 2.00 to 3.00	1,500 acres of wetlands
	One State-listed endangered plant species habitat
	Three State-listed threatened plant species habitats
	One State-listed threatened animal species habitat
> 3.00 to 4.00	1,750 acres of wetlands
	One State-listed endangered plant species habitat
	Two State-listed threatened plant species habitats
	Four State-listed threatened animal species habitats

[17-20; 22; 52; 50]

During the 1 February 2000 START on-site reconnaissance, ambient air was monitored using a flame ionization detector (FID). No readings above background levels were noted [3, p. 36].

During the 11 June 2003 START on-site reconnaissance, ambient air was monitored using an FID, a PID, a combustible gas indicator/oxygen detector, and a radiation meter. No readings above background levels in ambient air were noted [58, pp. 2-11].

START did not collect ambient air samples as part of the Cole Brook ESI. No quantitative laboratory air samples are known to have been collected at the Cole Brook property to date. Based on available data, no release of hazardous substances to the ambient air from on-site sources is known or suspected to have occurred, and no impacts to nearby residential populations or sensitive environments are known or suspected.

SUMMARY

The Cole Brook Pines Landfill (Cole Brook) property, also referred to historically as the Cold Brook Pines Landfill, Cecil Smith's Landfill, and Clean Communities Landfill, is located along Old Fall River Road in Dartmouth, Bristol County, Massachusetts. The geographic coordinates of the property, as measured from its approximate center, are 41° 40′ 50.5″ north latitude and 71° 00′ 52.4″ west longitude. The property is comprised of 238.1 acres and consists of six contiguous parcels identified on the Town of Dartmouth, Massachusetts Tax Assessor's Map No. 67 as Lot Nos. 5, 7, and 8, and on Map No. 72 as Lot Nos. 6, 8, and 9. Residential properties and one commercial property are located north of the Cole Brook property. Residential properties and undeveloped properties abut the Cole Brook property to the south, and undeveloped properties along Old Fall River Road abut the Cole Brook property to the east. The property is bordered to the west by residential properties, undeveloped wetlands and woodland, and the Shingle Island River. The property is bordered by Old Fall River Road to the north and Hixville Road to the south. The Cole Brook property is privately owned.

Approximately 60 acres of the western portion of the parcel identified as Lot No. 6 on Map No. 72 consists of a former solid waste landfill operated between approximately 1954 and 1974. The solid waste generally consisted of demolition debris. The remaining areas of the property consist of undeveloped woodlands and wetlands, unimproved access roads, former sand and gravel extraction areas, and miscellaneous solid waste piles.

In 1973, a complaint by a group of residents of the Town of Dartmouth stated that "pools of waste oil" were observed on the property. In response to the complaint, members of the Town of Dartmouth Board of Health performed an inspection of the property and observed that an excavation on the property was "filled with oil." In 1975 and 1976, Massachusetts Department of Environmental Quality Engineering (MA DEQE) personnel conducted inspections of the property and reported several violations of Massachusetts Solid Waste Disposal Regulations. In 1982, the Town of Dartmouth Conservation Commission collected one leachate sample from the property. Laboratory analysis of the sample indicated the presence of two polychlorinated biphenyls. On 1 March 1983, as part of a Preliminary Assessment, NUS Corporation/Field Investigation Team personnel conducted a perimeter survey of the Cole Brook property and reported that the majority of waste disposed of on the property included demolition materials from construction, a variety of municipal waste, and waste oil. On 15 August 1990, as part of a Screening Site Inspection, Roy F. Weston, Inc. [now known as Weston Solutions, Inc.] (WESTON®) Alternative Remedial Contracts Strategy personnel collected five surface soil samples from the property. Analytical results of the surface soil samples indicated the presence of three volatile organic compounds (VOCs), 18 semivolatile organic compounds (SVOCs), and six metals above reference concentrations. On 27 and 28 January 2004, as part of an Expanded Site Inspection (ESI), WESTON Superfund Technical Assessment and Response Team 2000 (START) personnel collected eight surface soil/source samples from potential source areas on the Cole Brook property. Analytical results of the surface soil samples indicated the presence of one VOC, 11 SVOCs, and nine inorganic substances (metals and cyanide) above reference concentrations.

Groundwater beneath the Cole Brook property occurs at approximately 2 to 7.5 feet below ground surface. Groundwater flow direction beneath the property has not been determined; however, based on the location of Colebrook Swamp and Cole Brook, groundwater beneath the property most likely

flows radially to the west, north, and east. The estimated population served by public and private groundwater drinking water supply wells within 4 radial miles of the Cole Brook property is approximately 21,165. The nearest public groundwater drinking water supply well is located 2.5 miles south of the property; the location of the nearest private groundwater drinking water supply well is located on the property. On 17 through 19 February 2004, as part of the ESI, START personnel collected 15 groundwater samples from 14 monitoring wells on the Cole Brook property and two drinking water samples from the on-site drinking water supply well. Analytical results of the groundwater samples indicated the presence of 12 metals and cyanide considered to be at least partially attributable to the Cole Brook property. Six inorganic substances were detected at concentrations that exceed Massachusetts Contingency Plan (MCP) Massachusetts Oil and Hazardous Material List (MOHML) Reportable Category RCGW-1 groundwater standards. No hazardous substances were detected in the drinking water samples at concentrations that exceed MCP MOHML or Federal drinking water standards. Based on the lack of hazardous substances in the on-site drinking water supply well, no impacts to nearby groundwater drinking water supply sources are known or suspected.

Stormwater runoff on the Cole Brook property enters Cole Brook as it flows northwest and, subsequently, southwest through the property. Additional surface water bodies located along the 15-mile downstream surface water pathway include the Shingle Island River, the East Branch of the Westport River, Westport Harbor, and Buzzards Bay. Sensitive environments located along the 15-mile downstream surface water pathway include a Clean Water Act (CWA)-protected water body, approximately 23.9 miles of wetland frontage, seven State-listed endangered plant species habitats, six State-listed threatened plant species habitats, four State-listed threatened animal species habitats, two State-listed threatened and Federally-listed threatened/endangered animal species habitats, and one State-listed endangered and Federally-listed threatened animal species habitat. On 13 April 2004, as part of the ESI, START personnel collected 17 sediment samples from 16 locations along an unnamed tributary, Cole Brook, the Shingle Island River, and from on-site wetlands. Based on analytical results of the sediment samples, on-site wetlands have been impacted by a release of two metals considered to be at least partially attributable to the Cole Brook property. As a result, a CWA-protected water body has been impacted.

There are no workers at the Cole Brook property; however, portions of the Cole Brook property are used to house farm animals, and people drive or walk through the property to use the on-site spigot to obtain drinking water for the animals. There are no on-site terrestrial sensitive environments. No schools or day-care facilities are located within 200 feet of the property. The nearest day-care facility is located approximately 0.5 miles west-northwest of the Cole Brook property. A single-family, one-story residence with two tenants is located on the property. Access to the property is unrestricted. Reportedly, local youths use the access road as a "short cut" to travel between Old Fall River Road and Hixville Road. An estimated 524 residents live within 1 radial mile of the Cole Brook property. Analytical results of surface soil/source samples collected from the property by START personnel on 27 and 28 January 2004 indicated the presence of one VOC, 11 SVOCs, and nine inorganic substances (metals and cyanide).

An estimated 21,172 people reside within 4 radial miles of the Cole Brook property. There are approximately 4,635 acres of wetlands, five State-listed endangered plant species habitats, eight State-listed threatened plant species habitats, five State-listed threatened animal species habitats, and

one CWA-protected water body located within 4 radial miles of the Cole Brook property. No laboratory quantitative air samples are known to have been collected from the property. Impacts to nearby residential populations or sensitive environments are unknown.

The Cole Brook property is currently listed with the Massachusetts Department of Environmental Protection (MA DEP) as a "Tier 1D" property. A site/release is classified as Tier 1D when a responsible party fails to provide a required submittal to MA DEP by a specified deadline. The site/release cleanup phase for the Cole Brook property is classified as "No Phase", which indicates that a Phase report was not required or was not submitted.

COLE BROOK PINES LANDFILL
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COLE BROOK PINES LANDFILL
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ATTACHMENT A
COLE BROOK PINES LANDFILL
START SOIL SAMPLE ANALYTICAL RESULTS
Samples Collected 27 and 28 January 2004

Not Included

ATTACHMENT B
COLE BROOK PINES LANDFILL
START SOIL BORING/WELL CONSTRUCTION LOGS
Soil Borings Advanced 27 and 28 January 2004

WESTON SOLUTIONS
REGION 1 SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

BORING/WELL INSTALLATION LOG
WELL ID: MW-01

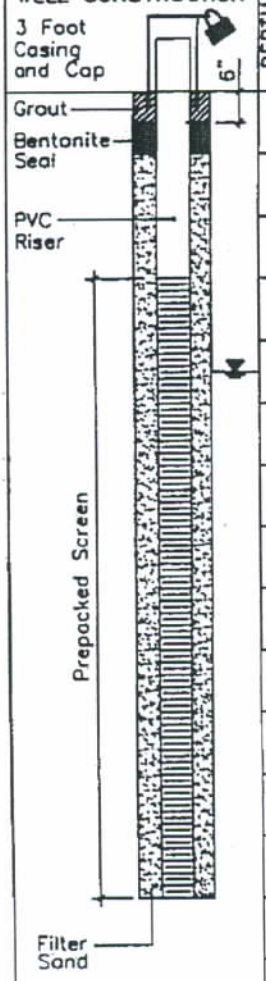
PROJECT: Cole Brook Pines Landfill, Dartmouth, Massachusetts	SHEET NO. 1 OF 1
CLIENT: U.S. EPA Region 1	JOB NO.20112-001-001-8131
BORING CONTRACTOR: Environmental Drillers, Inc. RIG: Diedrich D-120 ATV	ELEVATION (ground) unknown
	DATE STARTED 1/28/04
	DATE FINISHED 1/28/04
	DRILLER S. Preston
	INSPECTOR S. Rose

GROUNDWATER

DATE	TIME	WATER ELEVATION	DATUM
1/28/04	1155	4.5 Feet bgs	TOC

	CAS.	SAMP.	CORE	TUBE
TYPE				
DIA.				
WT.	NA	NA		
FALL	NA	NA		

WELL CONSTRUCTION



DEPTH (FEET)	SAMPLE NO.	REC. (in)	BLOW COUNT	CLASSIFICATION	BURM. (Note 1)	FID/PID HS (Note 2)	LAB. SAMPLE (Note 3)
0			N/A	Dry, brown-gray, coarse-to-fine SAND and GRAVEL, little silt. 2.0'		0.0	SO-01
2							
4							
6		13	4, 4, 4, 4	Wet, brown, coarse SAND, little fine gravel. 7.0'		0.0	
8							
10		21	4, 4, 4, 4	Wet, brown, fine SAND, little fine gravel, trace silt. 12.0'		0.0	
12				13.0' (END OF BOREHOLE)			
14							

WELL CONSTRUCTION MATERIALS:

3' long, 0.5" diameter PVC Riser, 3' below ground surface (bgs) with locking cap.

10' long, 0.5" diameter prepacked well screen (3-13').

TOC = Top of PVC casing.

NOTES:

1. Burmeister Soil Classification System.
2. Headspace - Photoionization Detector (PID), and Flame Ionization Detector (FID) recorded no readings above background levels = 0 units
3. Soil sample SO-01 collected from 1-2 foot interval at 1155 hrs. (MS/MSD) via hand auger.
4. Below Ground Surface (bgs)

SAMPLING METHOD:

All cores were collected using 2 foot long split-spoons, with the exception of the 0-2 foot interval, which was collected using a hand auger.

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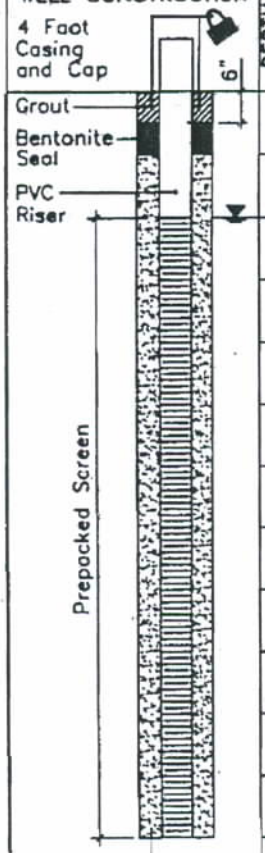
WESTON SOLUTIONS
REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

BORING/WELL INSTALLATION LOG
WELL ID: MW-02

PROJECT: Cole Brook Pines Landfill, Dartmouth, Massachusetts	SHEET NO. 1 OF 1
CLIENT: U.S. EPA Region 1	JOB NO.20112-001-001-8131
BORING CONTRACTOR: Environmental Drillers, Inc. RIG: Diedrich D-120 ATV	ELEVATION (ground) unknown
	DATE STARTED 1/27/04
	DATE FINISHED 1/27/04
	DRILLER S. Preston
	INSPECTOR S. Rose

GROUNDWATER					CAS.	SAMP.	CORE	TUBE
DATE	TIME	WATER ELEVATION	DATUM	TYPE				
1/27/04	1400	2.0 Feet (bgs)	TOC	DIA.				
				WT.	NA	NA		
				FALL	NA	NA		

WELL CONSTRUCTION



DEPTH (FEET)	SAMPLE NO.	REC. (in)	BLOW COUNT	CLASSIFICATION	BURM. (Note 1)	FID/PID HS (Note 2)	LAB. SAMPLE (Note 3)
0			N/A	Moist, gray-brown, coarse-to-fine SAND and GRAVEL, little silt. 2.0'		0.0	SO-02/ SO-09
2							
4							
6		12	20, 30, 13, 20	Wet, brown, coarse-to-fine SAND and GRAVEL, little silt. 7.0'		0.0	
8							
10		16	30, 33, 36, 43	Top 4 inches - Same lithology as above. Bot. 12 inches - Wet, brown SILT, little fine sand. 12.0' (END OF BOREHOLE)		0.0	
12							
14							

WELL CONSTRUCTION MATERIALS:

2' long, 0.5" diameter PVC Riser, 2' below ground surface (bgs) with locking cap.

10' long, 0.5" diameter prepacked well screen (2-12').

TOC = Top of PVC casing.

NOTES:

1. Burmeister Soil Classification System.
2. Headspace - Photoionization Detector (PID), and Flame Ionization Detector (FID) recorded no readings above background levels = 0 units
3. Soil sample SO-02/SO-09 collected from 1-2 foot interval at 1400 hours via hand auger.
4. Below Ground Surface (bgs)

SAMPLING METHOD:

All cores were collected using 2 foot long split-spoons, with the exception of the 0-2 foot interval, which was collected using a hand auger.

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WESTON SOLUTIONS, INC.
REGION 1 SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

BORING/WELL INSTALLATION LOG
WELL ID: MW-03

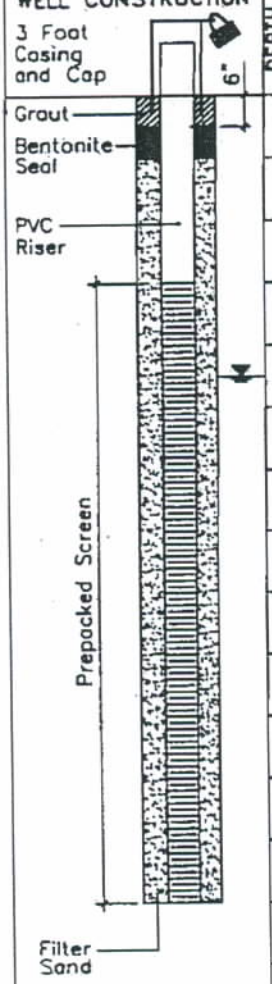
PROJECT: Cole Brook Pines Landfill, Dartmouth, Massachusetts	SHEET NO. 1 OF 1
CLIENT: U.S. EPA Region 1	JOB NO.20110-001-001-8131
BORING CONTRACTOR: Environmental Drillers, Inc. RIG: Diedrich D-120 ATV	ELEVATION (ground) unknown
	DATE STARTED 1/27/04
	DATE FINISHED 1/27/04
	DRILLER S. Preston
	INSPECTOR S. Rose

GROUNDWATER

DATE	TIME	WATER ELEVATION	DATUM
1/28/04	1155	4.5 Feet bgs	TOC

	CAS.	SAMP.	CORE	TUBE
TYPE				
DIA.				
WT.	NA	NA		
FALL	NA	NA		

WELL CONSTRUCTION



DEPTH (FEET)	SAMPLE NO.	REC. (in)	BLOW COUNT	CLASSIFICATION	BURM. (Note 1)	FID/PID HS (Note 2)	LAB. SAMPLE (Note 3)
0			N/A	Dry, brown, coarse-to-fine SAND and GRAVEL, some clay, little silt. 2.0'		0.0	S0-03
2							
4							
6		12	26, 30, 26, 26	Wet, brown, coarse-to-fine SAND and GRAVEL. 7.0'		0.0	
8							
10		12	7, 6, 6, 6	Same lithology as above. 12.0'		0.0	
12				13.0' (END OF BOREHOLE)			
14							

WELL CONSTRUCTION MATERIALS:

3' long, 0.5" diameter PVC Riser, 3' below ground surface (bgs) with locking cap.

10' long, 0.5" diameter prepacked well screen (3-13').

TOC = Top of PVC casing.

NOTES:

1. Burmeister Soil Classification System.
2. Headspace - Photoionization Detector (PID), and Flame Ionization Detector (FID) recorded no readings above background levels = 0 units
3. Soil sample S0-03 collected from 1-2 foot interval at 1230 hours via hand auger.
4. Below Ground Surface (bgs)

SAMPLING METHOD:

All cores were collected using 2 foot long split-spoons, with the exception of the 0-2 foot interval, which was collected using a hand auger.

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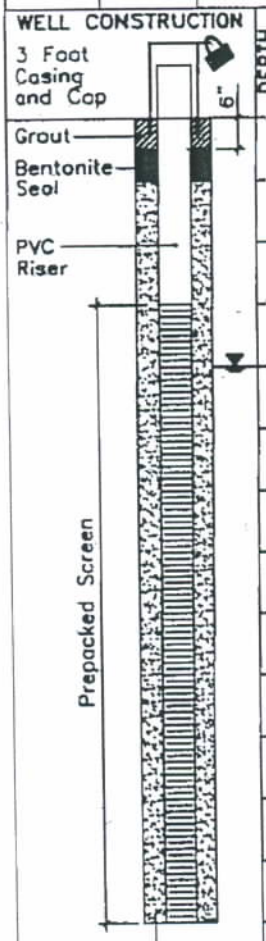
WESTON SOLUTIONS
REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

BORING/WELL INSTALLATION LOG
WELL ID: MW-04

PROJECT: Cole Brook Pines Landfill, Dartmouth, Massachusetts
SHEET NO. 1 OF 1
CLIENT: U.S. EPA Region 1
JOB NO.20112-001-001-8131
BORING CONTRACTOR: Environmental Drillers, Inc. RIG: Diedrich D-120 ATV
ELEVATION (ground) unknown
DATE STARTED 1/28/04
DATE FINISHED 1/28/04
DRILLER S. Preston
INSPECTOR S. Rose

GROUNDWATER					CAS.	SAMP.	CORE	TUBE
DATE	TIME	WATER ELEVATION	DATUM	TYPE				
1/28/04	1500	4.0 Feet bgs	TOC	DIA.				
				WT.	NA	NA		
				FALL	NA	NA		

WELL CONSTRUCTION



DEPTH (FEET)	SAMPLE NO.	REC. (in)	BLOW COUNT	CLASSIFICATION	BURM. (Note 1)	FID/PID HS (Note 2)	LAB. SAMPLE (Note 3)
0			N/A	Dry, dark brown, coarse-to-fine SAND, some fine gravel, little silt with brick fragments. 2.0'		0.0	SO-04
2							
4							
6		10	2, 4, 7, 8	Top 4 inches - Wet, black, coarse-to-fine SAND, little silt with brick fragments. Bot. 6 inches - Wet, gray, coarse SAND, some silt. 7.0'		0.0	
8							
10		12	4, 12, 15, 10	Top 6 inches - Same lithology as top 4 inches above. Bot. 6 inches - Same lithology as bot. 6 inches above. 12.0'		0.0	
12				13.0' (END OF BOREHOLE)			
14							

WELL CONSTRUCTION MATERIALS:

3' long, 0.5" diameter PVC Riser, 3' below ground surface (bgs) with locking cap.

10' long, 0.5" diameter prepacked well screen (3-13').

TOC = Top of PVC casing.

NOTES:

1. Burmeister Soil Classification System.
2. Headspace - Photoionization Detector (PID), and Flame Ionization Detector (FID) recorded no readings above background levels = 0 units
3. Soil sample SO-04 collected from 1-2 foot interval at 1500 hours via hand auger.
4. Below Ground Surface (bgs)

SAMPLING METHOD:

All cores were collected using 2 foot long split-spoons, with the exception of the 0-2 foot interval, which was collected using a hand auger.

S:\04050134\Figures\Soil Borings\MW-04.DWG

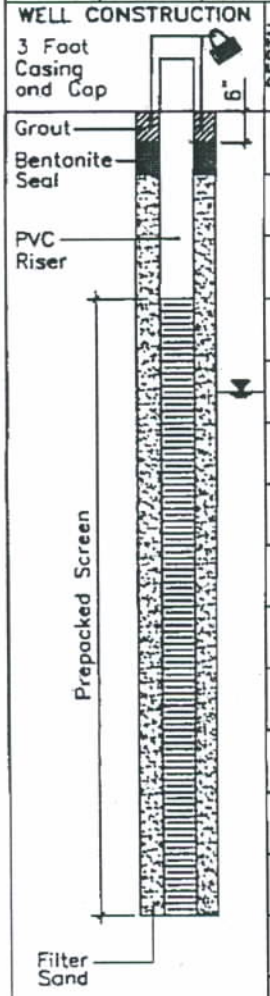
WESTON SOLUTIONS
REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

BORING/WELL INSTALLATION LOG
WELL ID: MW-05

PROJECT: Cole Brook Pines Landfill, Dartmouth, Massachusetts	SHEET NO. 1 OF 1
CLIENT: U.S. EPA Region 1	JOB NO.20112-001-001-8131
BORING CONTRACTOR: Environmental Drillers, Inc. RIG: Diedrich D-120 ATV	ELEVATION (ground) unknown
	DATE STARTED 1/27/04
	DATE FINISHED 1/27/04
	DRILLER S. Preston
	INSPECTOR S. Rose

GROUNDWATER					CAS.	SAMP.	CORE	TUBE
DATE	TIME	WATER ELEVATION	DATUM	TYPE				
1/27/04	1050	4.5 Feet bgs	TOC	DIA.				
				WT.	NA	NA		
				FALL	NA	NA		

WELL CONSTRUCTION



DEPTH (FEET)	SAMPLE NO.	REC. (in)	BLOW COUNT	CLASSIFICATION	BURM. (Note 1)	PID HS (Note 2)	LAB. SAMPLE (Note 3)
0			N/A	Dry, light brown SILT. 2.0'		0.0	SO-05
2							
4							
6		9	4, 6, 8, 8	Top 5 and Bot. 2 inches – Wet, brown, fine GRAVEL. Mid 2 inches – Wet, brown SILT. 7.0'		0.0	
8							
10		2	7, 6, 10, 7	Wet, brown, fine SAND and SILT. 12.0'		0.0	
12				13.0' (END OF BOREHOLE)			
14							

WELL CONSTRUCTION MATERIALS:

3' long, 0.5" diameter PVC Riser, 3' below ground surface (bgs) with locking cap.

10' long, 0.5" diameter prepacked well screen (3-13').

TOC = Top of PVC casing.

NOTES:

1. Burmeister Soil Classification System.
2. Headspace – Photoionization Detector (PID), recorded no readings above background levels = 0 units
3. Soil sample SO-05 collected from 1-2 foot interval at 1050 hours via hand auger.
4. Below Ground Surface (bgs)

SAMPLING METHOD:

All cores were collected using 2 foot long split-spoons, with the exception of the 0-2 foot interval, which was collected using a hand auger.

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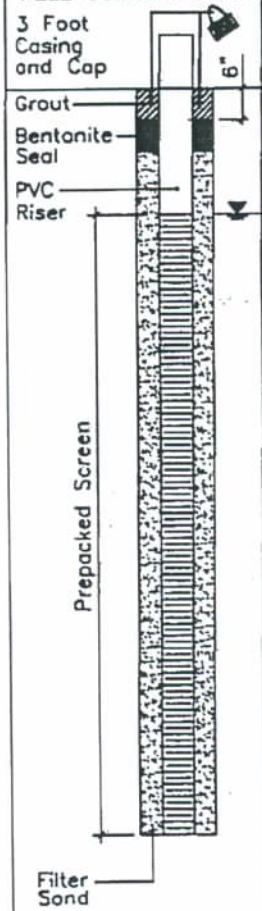
WESTON SOLUTIONS
REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

BORING/WELL INSTALLATION LOG
WELL ID: MW-06

PROJECT: Cole Brook Pines Landfill, Dartmouth, Massachusetts	SHEET NO. 1 OF 1
CLIENT: U.S. EPA Region 1	JOB NO.20112-001-001-8131
BORING CONTRACTOR: Environmental Drillers, Inc. RIG: Diedrich D-120 ATV	ELEVATION (ground) unknown
	DATE STARTED 1/28/04
	DATE FINISHED 1/28/04
	DRILLER S. Preston
	INSPECTOR S. Rose

GROUNDWATER					CAS.	SAMP.	CORE	TUBE
DATE	TIME	WATER ELEVATION	DATUM	TYPE				
1/28/04	1330	3.5 Feet (bgs)	TOC	DIA.				
				WT.	NA	NA		
				FALL	NA	NA		

WELL CONSTRUCTION



DEPTH (FEET)	SAMPLE NO.	REC. (in)	BLOW COUNT	CLASSIFICATION	BURM. (Note 1)	FID/PID HS (Note 2)	LAB. SAMPLE (Note 3)
0			N/A	Dry, brown, coarse-to-fine SAND and GRAVEL. 2.0'		0.0	SO-06
2							
4							
6		11	20, 30, 20, 15	Wet, brown, coarse-to-fine SAND and GRAVEL. 7.0'		0.0	
8							
10		12	4, 4, 4, 4	Top 6 inches - Same lithology as above. Bot. 6 inches - Wet, brown SILT. 12.0' (END OF BOREHOLE)		0.0	
12							
14							

WELL CONSTRUCTION MATERIALS:

2' long, 0.5" diameter PVC Riser, 2' below ground surface (bgs) with locking cap.

10' long, 0.5" diameter prepacked well screen (2-12').

TOC = Top of PVC casing.

NOTES:

1. Burmeister Soil Classification System.
2. Headspace - Photoionization Detector (PID), and Flame Ionization Detector (FID) recorded no readings above background levels = 0 units
3. Soil sample SO-06 collected from 1-2 foot interval at 1330 hours via hand auger.
4. Below Ground Surface (bgs).

SAMPLING METHOD:

All cores were collected using 2 foot long split-spoons, with the exception of the 0-2 foot interval, which was collected using a hand auger.

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WESTON SOLUTIONS
REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

BORING/WELL INSTALLATION LOG
WELL ID: MW-07

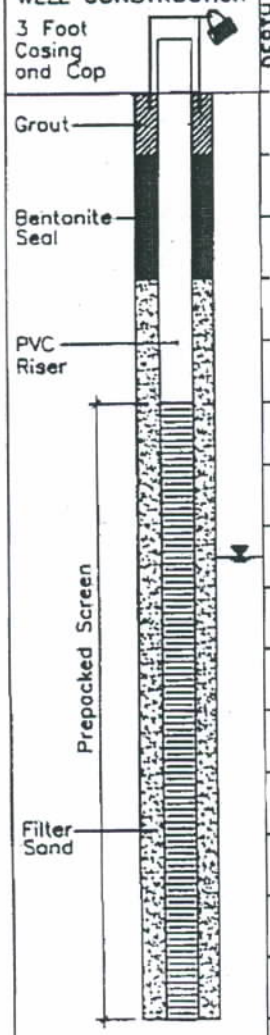
PROJECT: Cole Brook Pines Landfill, Dartmouth, Massachusetts	SHEET NO. 1 OF 1
CLIENT: U.S. EPA Region 1	JOB NO.20112-001-001-8131
BORING CONTRACTOR: Environmental Drillers, Inc. RIG: Diedrich D-120 ATV	ELEVATION (ground) unknown
	DATE STARTED 1/28/04
	DATE FINISHED 1/28/04
	DRILLER S. Preston
	INSPECTOR S. Rose

GROUNDWATER

DATE	TIME	WATER ELEVATION	DATUM
1/28/04	0945	7.5 Feet (bgs)	TOC

	CAS.	SAMP.	CORE	TUBE
TYPE				
DIA.				
WT.	NA	NA		
FALL	NA	NA		

WELL CONSTRUCTION



DEPTH (FEET)	SAMPLE NO.	REC. (in)	BLOW COUNT	CLASSIFICATION	BURM. (Note 1)	FID/PID HS (Note 2)	LAB. SAMPLE (Note 3)
0			N/A	Dry, brown, coarse-to-fine SAND, some fine gravel, little silt. 2.0'		Not recorded	SO-07
2							
4							
6		12	20, 13, 43, 144/4"	Same lithology as above, except bottom 2 inches, moist. 7.0'		Not recorded	
8				Refusal at 7 feet, moved 4 feet east then augered to 10 feet.			
10		5	7, 9, 9, 13	Wet, brown-gray, coarse-to-fine SAND and GRAVEL, little silt. 12.0'		Not recorded	
12							
14				15.0' (END OF BOREHOLE)			

WELL CONSTRUCTION MATERIALS:

5' long, 0.5" diameter PVC Riser, 5' below ground surface (bgs) with locking cap.

10' long, 0.5" diameter prepacked well screen (5-15').

TOC = Top of PVC casing.

NOTES:

1. Burmeister Soil Classification System.
2. Headspace - Photoionization Detector (PID), and Flame Ionization Detector (FID) no readings above background levels recorded.
3. Soil sample SO-07 collected from 1-2 foot interval at 0945 hours via hand auger.
4. Below Ground Surface (bgs).

SAMPLING METHOD:

All cores were collected using 2 foot long split-spoons, with the exception of the 0-2 foot interval, which was collected using a hand auger.

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ATTACHMENT C
COLE BROOK PINES LANDFILL
START GROUNDWATER SAMPLE ANALYTICAL RESULTS
Samples Collected 17 through 19 February 2004

Not Included

ATTACHMENT D
COLE BROOK PINES LANDFILL
START DRINKING WATER SAMPLE ANALYTICAL RESULTS
Samples Collected 18 February 2004

Not Included

ATTACHMENT E
COLE BROOK PINES LANDFILL
START SEDIMENT SAMPLE ANALYTICAL RESULTS
Samples Collected on 13 April 2004

Not Included

48 Leona Drive, Suite C
Middleborough, Massachusetts 02346

Tel: (508) 923-0879
Fax: (508) 923-0894

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SCANNED

BROWN AND CALDWELL

MEMORANDUM

TO: Wendy Henderson, Dartmouth Board of Health
Virginia Valiela, Hank Van Laarhoven
Greater New Bedford Regional Refuse District

FROM: Samuel G. Chapin, P.E.

DATE: March 7, 2003

RE: Cold Brook Pines Landfill Site

In addition to reviewing the proposal by New England Waste Services of Massachusetts, Inc. to provide closure of the Cold Brook Pines landfill site on Old Fall River Road in Dartmouth, Massachusetts, this office has at your request researched the history and regulatory status of the site. We performed a file review at the Massachusetts Department of Environmental Protection, Southeast Regional Office, and made a Freedom of Information Act request of the US EPA Region 1 office in Boston.

The file at MA DEP is not extensive - reportedly, most of the older material has somehow been separated from the file and is missing. Recent MA DEP correspondence in the file, however, is nonetheless informative. From the EPA we received copies of the 1991 Final Screening Site Inspection Report and the 2001 Final Site Inspection Prioritization Report prepared by Roy F. Weston Inc., which include substantial information on the early history of the site.

Present Regulatory Status:
The MA DEP has assigned two Release Tracking Numbers (RTN) to the site, 4-00973 and 4-12656. As of correspondence to the US EPA dated April 2002, MA DEP has classified the site as a Default Tier 1B site "because it is not in compliance with the Massachusetts Department of Environmental Protection, Bureau of Waste Site Cleanup requirements." The same correspondence states that "no project manager is currently assigned to this site and the site is not progressing through the Massachusetts privatized site cleanup program. The Department recommends that the...site should remain on CERCLIS for further investigation as an EPA Lead site".

The US EPA decided in October 2001, on the basis of the 2001 Final Site Inspection Prioritization Report, that the site has a low priority for further assessment under CERCLA and states, "This site is being addressed by the state program, and is therefore being coded as a 'state lead' site. No further actions will be taken by the federal Superfund Site Assessment program pending completion of the state program actions."

Apparently, the US EPA and the MA DEP are trying to pass the buck to each other on regulating this site as a hazardous waste disposal site. In any event, the site does have an identity in the state Waste Site Cleanup program, and the DEP would have to determine whether closure of the site would proceed under that program or the solid waste program.

Site History:

For informational purposes, the portion of the 2001 Final Site Inspection Prioritization Report presenting site history is attached. Following is a brief history of the site, as presented in the documents reviewed. The owners of the property, Dr. Cecil B. Smith Sr. and his son, Cecil B. Smith, Jr., have apparently never cooperated with efforts by any regulatory agency to assess or remediate the site.

mid 1950s	Sand and gravel removal operations on site, storage of salvageable material, and sporadic use as a construction and demolition waste landfill.
1973	Waste oil was found by the Dartmouth Board of Health and a cease-and-desist order was issued.
1974-1975	"Oil and dredgings" and solid waste disposal violations found by Massachusetts Department of Public Health/Department of Environmental Quality Engineering (DEQE),
1975	Town issues order to cover existing landfill with soil and to stop disposal operations until operations are in accordance with state regulations. A site assignment for 60 acres of landfill issued by the Board of Health, and apparently appealed on zoning issues.
1976	DEQE determines that the required cover has not been installed.
1977	Clean Communities Corporation begins some environmental monitoring and some test pit excavation.
1980	Clean Communities Corporation receives an approval from DEQE and the Executive Office of Environmental Affairs, MEPA Unit for a 600-700 ton per day landfill with a liner and leachate collection system. (At least some parts of this landfill were apparently built but never put in service.)
1981	Dartmouth Conservation Commission issues cease-and-desist order regarding landfill construction in wetlands. DEQE receives letter certifying that cap/liner and leachate collection system installed.
1983	A court order places a permanent injunction against landfill operations on the property. US EPA adds site to CERCLIS database and first US EPA field investigations take place.
1987	A permit for moving a dwelling to and drilling a well on the location of the landfill is issued by Dartmouth Building Department.
1988	Revised Order issued by Superior Court determines C&D landfill to be allowed only on old landfill area as a prior non-conforming use, at 4,000 tons/year and not to exceed 10 feet in elevation.
1994	DEP writes to owner citing 1975 site assignment and requesting either that owner apply for a permit to operate or close and cap the facility. The letter is hand delivered by a sheriff's deputy after repeated certified mailings are refused.

1996	DEP issues Notice of Noncompliance to owner with solid waste and wetlands violations, stating conditions were first assessed by air, then entry was gained via a search warrant after permission was refused. DEP then issues Notice of Responsibility to owner Cecil Smith under M.G.L. c.21E and 310 CMR 40.000.
2000	Internal DEP correspondence indicates site was discussed as repository for Central Artery soils.
2001	US EPA decides that the site warrants further assessment under CERCLA but has a low priority, and will let state program handle site. US EPA "Remedial Site Assessment Decision" is attached.
2002	DEP states in letter to US EPA that the site is classified Default Tier 1B "because it is not in compliance with the Massachusetts Department of Environmental Protection, Bureau of Waste Site Cleanup requirements", and that "no project manager is currently assigned to this site and the site is not progressing through the Massachusetts privatized site cleanup program". Letter is attached.

While at the DEP office, I told Bob Johnson of the DEP I was performing a file review on the Cold Brook Landfill site. He informed me that a lot of the file material is missing, but that he knows quite a lot about the history of the site. I told Bob we may call him for further information or if the proposed closure progresses. Internal DEP correspondence in the file indicates Bob was the DEP contact person for some years.

Other Potential Key Issues:

1. **Property Ownership**
   Reportedly, title to the property is not clear, which would complicate cleanup and closure efforts. Based on referenced reports and personal communications, ownership history of the property apparently is as follows:

   1940s - Dr. Cecil B. Smith Sr.

   1977 - Mr. Cecil B. Smith Jr.

   1977 - Shingle Island, Inc., Cecil B. Smith, principal

   Sometime after 1996 - Mary Robinson, for the sum of one dollar.

2. **Existing Environmental Contamination**
   Soil, sediment, and groundwater sampling in the past has revealed some contamination. Some metals, volatile organic compounds, and semi-volatile organic compounds have been detected on site. The reports reviewed indicate there was waste disposal and contamination in areas other than the landfill area proposed to be closed and capped. Little to no effort has been made to characterize the severity or extent of the contamination, beyond the US EPA decision to consider the site low priority. A consultant hired by the closure project proponent prepared a "Preliminary Environmental Site Assessment", but this report (by St. Germain & Associates, Inc.) was not available for review. Additional investigations may be necessary for the MA DEP to determine what closure activities may be appropriate.

3. **Superior Court Order**

On October 3, 1988, the Bristol Superior Court issued a Revised Order and Judgment After Remand in a case of the Town of Dartmouth, et. al. (which included a non-profit incorporated citizen's group known as Precinct One North Dartmouth, or POND) vs. Clean Communities Corporation, et. al. The Order allowed demolition debris to be disposed in a small area of the property as a prior non-conforming use, but only at 4,000 tons/year and not to exceed 10 feet in elevation. The Order states "With the exception of the above mentioned site, a permanent injunction is entered as to the remainder of the sixty-acre site on Old Fall River Rd., Dartmouth, restraining and enjoining defendants, their agents, employees, from conducting sanitary landfill-related operations on the site." Whether this would affect the ability of the New England Waste Services of Massachusetts, Inc. proposal to proceed would appear to be a legal question.

BOARD OF HEALTH
TOWN OF DARTMOUTH
TOWN OFFICE BUILDING
SOUTH DARTMOUTH, MASSACHUSETTS 02748

OCtober 7, 1975

The Dartmouth Board of Health, at its meeting of October 6, 1975, voted unanimously to assign the Sanitary Landfill area of Plat 86, portions of Lot #8 and #12, off of Old Fall River Road, North Dartmouth, Mass. for Cecil Smith.

Enclosed are the stipulations required by this Board.

State Department of Public Health has final approval of designated site.

Very truly yours,

Herbert Harrop
William Burnley
Jesse S. Talgoy

DARTMOUTH BOARD OF HEALTH

DBH:mb
Encl:

BOARD OF HEALTH

TOWN OF DARTMOUTH

TOWN OFFICE BUILDING

SOUTH DARTMOUTH, MASSACHUSETTS 02748

The following stipulations will be applicable on the assignment by the Dartmouth Board of Health for Cecil Smith Landfill Operation off of Old Fall River Road, North Dartmouth, Mass.:

1. 60 acres of land to be used for the landfill operation.
2. Three to five acres to be used at one time only.
3. Bond of $120,000.00 to be posted.
4. No oil, liquid, garbage, rubbish or tires to be disposed of at this site.
5. To be used only for demolition materials.
6. Area has been cleaned as per Court Order.
7. Site to be covered every night with bulldozer on premises at all times.
8. 600 feet buffer zones.
9. No dumping within 400 feet of any waterways.
10. Sanitary Landfill site to be approved by the State Department of Public Health.
11. No approach from Hixville Road.
12. This site will be inspected no less than once per week.

Herbert Harrop
William Brumley Jr
James S. Tolley Jr

DARTMOUTH BOARD OF HEALTH

WRIGHT & MOEHRKE
PROFESSIONAL CORPORATION
COUNSELLORS AT LAW
283 DARTMOUTH STREET
BOSTON, MASSACHUSETTS 02116
(617) 266-5700
TELECOPIER (617) 266-5237

ACTION OF BOARD

JUN 13 1988

June 6, 1988

Manuel Branco, Superintendent
Department of Public Works
759 Russells Mills Road
Dartmouth, Massachusetts 02748

RECEIVED
JUN 8 1988
DARTMOUTH
BOARD OF HEALTH

Re: Clean Communities Corporation

Dear Mr. Branco:

As you know I represent Clean Communities Corporation. Clean Communities has previously offered to construct a sanitary landfill off Old Fall River Road in Dartmouth under a cooperative agreement which would confer a number of substantial host community benefits on the Town of Dartmouth. The proposed landfill would be constructed using state-of-the-art technology on approximately 60 acres of the 220 acre site which was assigned for a landfill by the Board of Health of the Town of Dartmouth in April, 1976.

Clean Communities would like to operate the landfill at a level of 700 tons per day. It is willing to agree with the town to mutually acceptable hours of operation and traffic routes for disposal vehicles using the landfill. Clean would fund an independent study by the town to aid it in determining which routes are most appropriate for access.

Clean has offered to pay the Town of Dartmouth a host community fee of approximately $1,000,000 per year based on an anticipated volume of 700 tons per day at a host community fee rate of $5.00 per ton. This rate is approximately three times that currently required by state law. Assuming that same volume, Clean also offers free disposal for all residents of the Town of Dartmouth and disposal at 50% of market rates for commercial accounts within the town. It would also provide for a new refuse truck of approximately a $100,000 value to the Department of Public Works each year during the life of the facility.

Clean is willing to enter into appropriate agreements with the town to ensure that the facility meets the highest standards to protect the public health, safety and the environment. In this regard, it will ensure that its technology exceeds the design parameters for the proposed Crapo Hill site.

Clean is also willing to enter into agreements with the town relative to financial security for closure and post closure monitoring of the site. It would provide for operations using a

leachate liner and collection system. Clean would make yearly grants of $25,000 to the town for independent environmental monitoring of the facility.

Clean Communities would consider constructing a resource recovery facility in association with Combustion Engineering, Inc. The facility would have a value for real estate tax purposes of approximately $125,000,000. The resource recovery facility would enable the landfill to have a substantially longer disposal life.

Clean is currently involved in litigation with the Town of Dartmouth relative to proper zoning for the site and other issues. If the litigation is not resolved in Clean Communities' favor or if the town would not be willing to compromise the litigation to enable the facility to be operated, Clean would consider seeking an amendment to the zoning by-laws of the town which would allow the facility to be operated. In the alternative, it would consider filing an application with the Zoning Board of Appeals to expand its existing non-conforming use under G.L. c. 40A, §6.

Clean would very much like the opportunity to appear before the Department of Public Works to explain to the DPW and interested members of the public the nature of its proposed operations and the proposed host community benefits to the Town of Dartmouth. Simply put, this proposal could mean the difference between expenditures of $1,000,000 per year for any other waste disposal option and revenues in excess of $1,000,000 from that offered by Clean. I ask that you schedule a public meeting as soon as is convenient so that Clean may do so.

Inasmuch as questions arose at the last open forum as to the appropriateness of discussing the pending litigation, I suggest that the ground rules for any meeting with the DPW preclude questions or discussion relative to that litigation. Clean will agree to make no mention of the merits of the litigation so that it would not be necessary for the town to bear the expense of having litigation counsel present during the public meeting.

Very truly yours,

Anton T. Moehrke

ATM/clc
Federal Express
cc: Board of Selectmen
Board of Health
Conservation Commission
Richard T. Moses, Special Town Counsel

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Middleborough, Massachusetts 02346

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BOARD OF HEALTH

BROWN AND CALDWELL

MEMORANDUM

TO: **Wendy Henderson, Dartmouth Board of Health**
Virginia Valiela, Hank Van Laarhoven
Greater New Bedford Regional Refuse District

FROM: **Samuel G. Chapin, P.E.**

DATE: **March 7, 2003**

RE: **Cold Brook Pines Landfill Closure Proposal**

We have reviewed the proposal by New England Waste Services of Massachusetts, Inc. to provide closure of the Cold Brook Pines landfill site on Old Fall River Road in Dartmouth, Massachusetts. The proposal offers the following:

- To remove waste material from in and near wetlands, and from the area south of an Algonquin Gas pipeline easement that crosses the property, and to re-deposit the waste within a 14 acre main landfill area north of the pipeline easement.
- To provide over half a million tons of various "DEP approved precapping grading and shaping materials" to fill and contour the landfill for capping purposes.
- To provide a DEP approved final cover system over the newly filled and shaped landfill area to achieve closure of the site.

In general, the basic concept of consolidating, shaping, and covering the old waste on the site is sound, but the proposal provides little detail on numerous aspects of the project. We wish to offer the following specific comments:

1. **Site Characterization:** The proposal makes reference to Site Screening and Inspection Reports prepared by Roy F. Weston Inc. for the US EPA, and a Preliminary Environmental Site Assessment performed by St. Germain & Associates, Inc. for the project proponent. The proposal describes some environmental sampling and provides some isolated results, but no summary conclusions are provided that would help determine the level of existing contamination on the site, and therefore provide some indication if additional remediation activities will be required.

The aforementioned reports were not included in the proposal, and the reasons for the US EPA to have examined the site were not stated. It may be important to understand the US EPA's reason for commissioning Roy F. Weston's work.

2. **On-site Investigations:** Reference is also made in the proposal to on-site activities performed by St. Germain & Associates, Inc. for the project proponent, presumably during the Preliminary Environmental Site Assessment. These activities included a test pit program to determine the horizontal limits of waste and assess soil quality, and soil borings with monitoring well installations. Some environmental sampling is described and isolated results provided, but no field reports, laboratory reports, data tables, or conclusions are presented. The descriptions of the borings and wells is inconsistent, and no boring logs or well installation logs are provided. No test pit logs are provided. It is unclear whether the supplied "Conceptual Closure Plan" includes the location of all monitoring wells, and no test pit locations are provided, although the "Approximate limit of existing landfill" is identified on the plans. Generally, no conclusions are provided that would support the belief that the proposed waste removal and closure activities will provide adequate remediation at the site.

3. **Regulatory Structure:** The document states that "Capping and closure of the facility will be performed in accordance with the requirements of 310 CMR 19.00, Solid Waste Management Facility". Proposed language for a consent order (under which the project would be carried out) with the Department of Environmental Protection is included, as is a statement that "a Comprehensive Site Assessment (CSA) and a Corrective Action Alternatives Analysis (CAAA) will be prepared along with final closure plans and specifications for the Department's review and approval." The landfill assessment process usually includes an Initial Site Assessment in addition to the CSA (see 310 CMR 19.150 Landfill Assessment Requirements). In any event, it is not clear whether there has been any communication with the DEP that would support the approach of closing this site under the DEP's solid waste program, as it has been previously identified as a site under the Massachusetts Oil and Hazardous Material Release Prevention and Response Act, M.G.L. c.21E, and the Massachusetts Contingency Plan, 310 CMR 40.000. We have not inquired of the DEP what the regulatory framework would be for this project to proceed. Given the current status, this is a key issue.

   In addition, little mention is made of other permits that are likely to be required, such as NPDES storm water permit coverage administered by the US EPA and wetlands permitting by the Dartmouth Conservation Commission. There is reference to replicated wetlands needing Conservation Commission approval, but it appears likely that the entire project will need wetlands permitting, given the extent of activities within the buffer zone and Riverfront Area. The proponent does state that they "will prepare all necessary permit applications including design plans, reports and studies for submission to DEP..."

4. **Proposed Shaping and Grading of Landfill - Traffic, Materials, and Material Quantity:** The proposal includes importing over half a million tons (or half a million cubic yards; the document refers to both) of various waste materials characterized as reuse or beneficial use materials and approved by the DEP, such as construction & demolition waste (C&D) residues and fines, soils (presumably with low levels of contamination), street sweepings and catch basin cleanings, dredged materials, and coal ash. This material will be imported to the site 5 days per week for an 18 month period, in 100-cubic yard open-top transfer trailers, at a rate of 50 trucks per day. Traffic will be routed on Old Fall River Road, Faunce Corner Road, and Interstate 195.

No data, assumptions or calculations are presented to support the predicted traffic. Making inference from the information that is presented, the material will have an overall average density of one ton per cubic yard and be delivered in average loads of 25 tons. No comment is provided on the potential impact to the roadway network and surrounding neighborhood from the traffic associated with the project.

The materials to be used are either specifically identified by the DEP for use in shaping old dump sites for closure (in a guidance document provided in the proposal), or otherwise identified as by-products or otherwise unusable waste materials that the DEP may approve for such use. Disposal of these materials at the site will be a revenue-generating operation for the project proponent. Use of C&D residues and fines in a very similar project in Brockton is currently generating problem odors, and the DEP is requiring some expensive odor controls at that site. Some precautions should be taken or contingency plans made to combat odors if similar materials are utilized.

The "Conceptual Closure Plan" depicts the finished landfill 60 feet higher than the lowest surrounding elevation, southwest of the site. The landfill is depicted with 33% (or 3:1) side slopes up to 48 feet high, and 5% (or 20:1) slopes at the top of the landfill. 33% and 5% are, respectively, the regulatory maximum and minimum for landfill slope steepness. If the steep side slopes were eliminated, the volume of fill material required to effect a landfill closure in compliance with regulatory criteria would likely be substantially less than the amount proposed. Based on the site development plans included in the proposal, we cannot assess the validity of the volume of waste to be landfilled.

Engineering and Site Design: Two illustrations supplied with the proposal; they contain some contradictory and inaccurate information. The Existing Conditions Plan is an undated black and white photograph at a small scale (1" = 300 feet) with some site features labeled and the approximate limits of waste and wetlands added; it is not very informative. On the Conceptual Closure Plan, the elevations are inaccurate - the text references, and the Plan depicts, existing ground elevations in the range of 485 to 500 feet above sea level, but the USGS maps of the area reveal actual elevations to be in the range of 70 to 85 feet above sea level. The graphic scalebar appears to be incorrect. The area of waste (to be relocated) south of the pipeline easement is labeled 1.67 acres on the plan, but is referred to as 2.6 acres in the text. Cross sections of the proposed landfill are referenced in the text, but not provided.

Very little detail is provided concerning storm water management beyond detention basin locations and statements in the text that storm water control structures will be provided. This is reasonable at the present level of conceptual design; however, controlling runoff to prevent erosion on 48 foot high, 144 foot long 33% slopes does present some engineering challenges, and will be a long-term maintenance issue. Side slope benches for storm water control are mentioned in the text, but not depicted on the Conceptual Closure Plan.

Economic Benefits, Operations, and Post-Closure: The proponent estimates the cost of capping and closing the site as proposed is $3.4 million, and implies that public funds would otherwise be required to perform this closure. Which public entity would otherwise be responsible for this expense is not made clear; the property is privately owned. Up to $100,000 would be provided to the Town for operational oversight, and a desk and telephone in an on-site trailer would be provided for an on-site Town representative. In addition, unspecified amounts would be provided for post-closure care and environmental monitoring. Finally, a flat $200,000 is offered to the Town for discretionary waste management or recreational purposes. Post-closure uses are not addressed in any depth, and it is apparent that the project proponent does not intend to assume post-closure responsibilities for the site.

How the amounts to be provided for post-closure care and environmental monitoring will be determined, and how the funds will be conveyed to the Town, are not addressed.
Under the DEP solid waste regulatory program, a financial assurance mechanism for these costs is required, so that the DEP may perform or cause to be performed the required activities in the event the owner or responsible party fails to do. Not all financial assurance mechanisms may be accessed to cover incremental expenditures - surety bonds, insurance policies, and letters of credit, for example, generally do not pay out over time, while an enterprise fund or trust fund may do so. If an enterprise fund or a trust fund is not utilized, it is likely that both a financial assurance mechanism and the funds to perform the post-closure activities will be required.

Also under the DEP solid waste regulatory program, privately owned landfills are assessed a "Facility Tax" payable to the host community of a set amount of money per ton of waste accepted for disposal. A similar funding mechanism may be more flexible and appropriate for providing benefits to the Town. In addition, a rate for providing funds to the Town for operational oversight based on the project's duration could provide a higher level of protection for the Town, should the project progress more slowly than anticipated.

Town of Dartmouth
Board of Health
400 Slocum Road P.O. Box 79399
Dartmouth, MA 02747

Wendy W. Henderson, R.S. Director
Telephone: 508-910-1804
Fax Telephone: 508-910-1893

Margaret M. Megowen, Chair
Thomas W. Hardman
Linda M. Motha

COPY

March 24, 2003

Mark Popham
New England Waste Services of Massachusetts
15 Hardscrabble Road
Auburn, MA 01501

RE: Cold Brook Pines Landfill Closure proposal

Dear Mr. Popham,

The Board of Health reviewed a report from Samuel G. Chapin, P.E. of Brown and Caldwell at their meeting of March 19, 2003.

Mr. Chapin reviewed your "Proposal for Final Closure Cold Brook Pines Landfill" at the request of our Refuse Management District. We requested input regarding the proposal from the Refuse Management District staff. I have enclosed a copy of Mr. Chapin's report.

In addition to the report, the Board discussed the applicability of the Town Zoning By-Law: Section 30 Commercial Dumps or Landfills, copy attached ①.

Prior to moving further with this project the Board requires the following:

- Clarification of the ownership of this property
- Town Counsel determination regarding the By-Law interpretation with respect to your closure proposal that will include the siting of significant amounts of waste to accommodate the proposed grading.
- A determination from EPA and DEP that the site may safely be closed as a landfill site. There is information indicating a hazardous waste cleanup may need to precede any capping activity.
- More specific information, including test pit logs, soil and water quality sampling results is necessary to determine the suitability of a closure proposal.

Please contact me for further discussion or clarification.

Sincerely,

Wendy W. Henderson, RS
Director of Public Health

①

SECTION 30 COMMERCIAL DUMPS OR LANDFILLS

The operation of private or commercial dumps or sanitary landfills, refuse transfer stations, refuse incinerators with a grate area in excess of ten square feet, refuse composting plants, dumping grounds for refuse or any other works for treating or disposing of refuse is prohibited within the Town of Dartmouth except where operated as a Dartmouth municipal use or as a use operated under a Regional Refuse District. For definition of the terminology in this By-Law, reference is made to Massachusetts General Laws, Chapter 111, Section 150A, as amended.

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HALEY & ALDRICH

MEMORANDUM

05 May 2013
File No. 39899

TO: Boston Environmental Corp.
T. Michael Toomey – Executive Vice President

C: Golledge Strategies & Solutions LLC
Bob Golledge

FROM: Haley & Aldrich, Inc.
Marc J. Richards, PE, LSP

SUBJECT: Summary of Available Environmental Data
Former Cole Brook Pines/Cecil Smith Landfill
452 Old Fall River Road
Dartmouth, Massachusetts

Haley & Aldrich, Inc. has prepared the following memorandum to summarize the environmental sampling data collected throughout the operational history of the property. The attached summary tables include environmental sampling results collected by a variety of entities over a period of the past several decades. The data was summarized from available information included in the US EPA's 28January 2005 Final Expanded Site Inspection Report.

For discussion and comparison purposes, soil data is compared to the Massachusetts Contingency Plan (MCP) Method 1 S-1/GW-1 risk-based cleanup standards. Groundwater data was compared to Method 1 GW-1 standards, as nearby groundwater may be protected or used for drinking water. Groundwater data was also compared to Method 1 GW-3 standards as surface water (Cole Brook and associated wetlands) is located in proximity to the former landfill.

It should be noted that comparisons to MCP standards is for general discussion only as the landfill is adequately regulated under MassDEP's Solid Waste program, and not regulated by the MCP.

SOIL DATA

The attached Table I summarizes available soil data from the landfill property. The majority of the soil sampling was surficial in nature (2 feet and less) from around the property. As shown, one sample collected in 1990 from within the landfill property contained some semi-volatile organic compounds (SCVOCs) at concentrations above Method 1 S-1 standards. In 2002, a soil sample collected from within the landfill area contained lead above the applicable MCP standard.

The more comprehensive sampling performed by the EPA in 2004 did not reveal any constituent concentrations above MCP standards.

The detection of the SVOC and lead concentrations noted above are expected for samples collected from within the limits of a solid waste landfill. No other hazardous or toxic materials were noted in the soil samples that would indicate an immediate risk to human health or the environment, which supports the current proposal to properly cap the landfill.

GROUNDWATER

The attached Table II summarizes available groundwater data from the landfill property. Groundwater sampling has occurred at the property since 1977 and up to 2004. As shown in Table II, intermittent detections of constituents in groundwater have been reported over the years from select groundwater sample locations. Based on a review of the data and the most recent 2004 EPA comprehensive groundwater sampling program, concentrations of volatile organic compounds (VOCs), SVOCs, polychlorinated biphenyls (PCBs) and total cyanide were not detected at concentrations above MCP risk-based standards. The 2004 EPA data identified four inorganic constituents that exceed applicable MCP standards, which included beryllium, total chromium, lead, and vanadium. Aside from lead, which was detected in two separate wells, the other organics above MCP standards were all detected in separate well locations.

It should be noted that the EPA report is not clear with respect to the method of groundwater collection. When sampling for inorganics, it is important to analyze samples for dissolved and not total metals. Dissolved samples are field filtered to remove elevated turbidity that may be present in the sample. Elevated turbidity can lead to false positives. The EPA noted that they only field filtered one sample (GW-11) due to elevate turbidity. The sample result in Table II was the unfiltered (total) result. The EPA noted in the report text that the sample result for GW-11 when filtered (dissolved) did not show organic constituents above MCP standards.

Haley & Aldrich suspects that if the other groundwater samples were field filtered, the inorganic results would be below applicable MCP standards.

DRINKING WATER

The attached Table III summarizes available drinking water data from the on-site private drinking water well located at the residence situated on top of the area designated as landfill. Sampling of water from this well by the EPA in 2004 did not detect constituents above MCP drinking water standards.

SURFACE WATER AND SEDIMENT

In 2004, the EPA did not perform any surface water sampling. The EPA report did summarize that previous surface water samples were collected in 2002; however the data was not available in the EPA report. In 1977, two surface water samples were collected; one upstream and one downstream sample location. The report referenced metal results for these two samples, which were very similar for copper and zinc.

The EPA summarized past sediment sampling performed since 1982, including the EPA's 2004 comprehensive sediment sampling program. The results are summarized in Table IV.

When sampling sediment, it is common to compare sampling results to nearby sample locations that have not been impacted by site operations. Nearby sample locations are often referred to as "background" or "reference" locations. Table IV includes the sample locations that were identified as background samples.

The interpretation of the sediment results collected in the years of 1982, 2000, and 2002 is difficult because location information and background reference locations were not available. This data does report detectable concentrations of beryllium, cadmium, PCBs, and a series of SVOCs. It should be noted that for the detected SVCOCs, cadmium, and PCBs that have sediment screening values established by the MassDEP, the detected concentrations were less than the MassDEP screening values. MassDEP screening values represent concentrations that if exceeded, could signal potential environmental harm. However, as noted, none of the values were exceeded for the compounds that have established screening values.

The EPA's 2004 sediment data includes nine sediment samples collected adjacent to or near the landfill area and eight samples that are identified as "background" samples. The background samples are used for general comparison purposes to help determine if sediment samples collected near the landfill are substantially greater than background, indicating a potential impact by the landfill.

Based on a review of the 2004 EPA data in Table IV, the following is observed:

- PCBs and cyanide were not detected.
- For the various metals and inorganics that were reported above some of the background concentrations, the metals/inorganics with established MassDEP screening criteria were not exceeded.
- The VOCs that were detected are located in background samples and site samples. In addition, the VOCs detected are common laboratory contaminants and may not be associated with the site.
- Only two SVOCs were reported in one sediment sample, at very low concentrations.
- Pesticides were detected in both background and site samples at similar concentrations.

Based on the above data, although localized impacts to sediment may have occurred from the landfill, the data suggests that these impacts are not contributing to environmental harm.

SUMMARY

Based on the above data summary, the data does not identify conditions that are not uncommon to solid waste landfills. In addition, no immediate risk to human health or the environment is apparent from the data that has been collected.

Haley & Aldrich recommends the following:

- Supplemental groundwater sampling of existing groundwater monitoring wells located around the perimeter of the landfill. Installation of additional wells may be necessary if previous wells cannot be located. Select wells should be sampled for VOCs, PCBs, SVOCs, extractable petroleum hydrocarbons (EPH), volatile organic hydrocarbons (VPH), cyanide, and/or dissolved metals.

- Sample the existing on-site drinking water well and select nearby and off-site private drinking water supply wells.

- No additional sampling of soil, sediment, surface water or solid wastes is warranted at this time.

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HALEY & ALDRICH

MEMORANDUM

5 May 2013
File No. 39899

TO: Boston Environmental Corp.
T. Michael Toomey – Executive Vice President

C: Golledge Strategies & Solutions LLC
Bob Golledge

FROM: Haley & Aldrich, Inc.
Marc J. Richards, PE, LSP

SUBJECT: Former Cole Brook Pines/Cecil Smith Landfill
452 Old Fall River Road
Dartmouth, Massachusetts

Haley & Aldrich, Inc. has prepared the following memorandum to briefly summarize known environmental conditions at the landfill and proposed remedies that are necessary to permanently close and monitor the landfill.

Site History Summary:

Portions of the property known as the Cole Brook Pines/Cecil Smith Landfill received solid waste for on-site disposal for approximately 20 years (1954 to 1974). The solid waste is generally described as demolition debris (wood, concrete, brick, roofing, metals, plastics, lead-based paint, and automobile waste). The solid waste disposal practices were consistent with the Town of Dartmouth's site assignment of the property by the Board of Health to receive solid waste materials in accordance with Massachusetts solid waste regulations in effect at that time.

The landfill area is adjacent to wetlands, including Cole Brook that traverses the north, east, and west sides of the landfill. The landfill is also situated in proximity to a potentially productive aquifer and an Interim Wellhead Protection Area.

Solid waste disposal practices ceased in 1974. After that, several entities sought to operate the site as a sanitary landfill. The Town of Dartmouth approved continued use of the site as a sanitary landfill in 1975. The Commonwealth's Executive Office of Environmental Affairs later approved a 700 ton per day sanitary landfill. As part of the sanitary landfill permitting and in connection with allegations of improper waste disposal at the site, a series of environmental testing programs of soil, sediment, surface water, groundwater and well water were performed over many years.

In 2001, the property was transferred to Ms. Mary Robinson. Ms. Robinson initiated steps to close and cap the former landfill, at which time for the next several years additional site investigations were performed to sample soil, groundwater, surface water, sediment and drinking water. In 2009, there

were site activities being performed to remove and reclaim recyclable materials from the landfill. In response, MassDEP issued an order to cease all solid waste management activities and requested the property owner to submit a plan to permanently close the landfill. Since that time, DEP has initiated enforcement action to ensure the landfill is closed consistent with the Commonwealth's Solid Waste Regulations.

Environmental Summary:

Although there have been allegations of improper solid waste disposal practices, the majority of the solid waste contained in the landfill appears consistent with typical landfills of this era. Since the property began solid waste operations, a series of environmental sampling events have occurred over decades to evaluate the limits and content of solid waste and the potential impact to surface water, sediment, soil, and groundwater. The United States Environmental Protection Agency also performed a comprehensive sampling program to further evaluate conditions at the site in 2004 and 2005.

The findings of the EPA's investigation confirmed that the site contains many of the conditions commonly encountered at inactive unlined landfills that operated in the 50s-70. A summary of those conditions is set forth below.

Surface Soil – No contaminants were found in surface soil located outside of the landfill limits that represented a risk to human health or the environment. Surface soil and solid waste located within the limits of the landfill were found to contain certain elevated contaminants, which would be expected.

Groundwater – Other than a few metal compounds, EPA sampling in 2004 did not reveal contaminants that exceed MassDEP standards for groundwater that is protected for drinking water.

Drinking Water – There is one drinking water well located in the center of the landfill, which will be removed as part of the landfill closure. Laboratory analysis of water samples collected from this well did not detect contaminants above drinking water standards established by MassDEP.

Sediment– When sampling sediment, it is common to compare sampling results to nearby sample locations that have not been impacted by site operations. Based on 2004 EPA sampling, constituents were detected in sediment near the landfill that in most cases were constituent with nearby reference results. This indicates that landfill activities have not had an appreciable impact to nearby sediment.

In summary, the site investigations that have been performed to date have not identified levels of impact that would trigger actions under the federal or state hazardous waste cleanup programs in the absence of a solid waste closure. Rather, the testing results are consistent with, and call for, a closure plan under the MassDEP Solid Waste Program.

It should be further noted that the two Release Tracking Numbers (RTNs) that were previously assigned to the landfill property have been closed out by MassDEP. An RTN is assigned to releases that may be subject to cleanup under MassDEP's hazardous waste regulations (referred to as the Massachusetts Contingency Plan or MCP). The MassDEP closed these two RTNs as it was inappropriate to originally issue the RTNs to the property. Solid waste facilities (like the Cole Brook Pines/Cecil Smith landfill) are deemed adequately regulated in accordance with the MCP and therefore not subject to the MCP.

Therefore, the MassDEP closed the two RTNs indicating closure of the landfill is most appropriate under the solid waste regulations.

Closure Plan:

The strategy for landfill closure scenarios it to isolate and contain the solid waste through the construction of a landfill cap. A landfill cap eliminates exposure risk to human health and the environment and also protects groundwater by creating an impervious barrier and eliminating rain water infiltration in to the solid waste.

There are hundreds of unlined landfill sites across Massachusetts that are very similar to this landfill that have undergone similar closure activities. Based on the operational history and sampling performed to date, closure of a landfill of this era would typically be performed in general conformance with the solid waste regulations (as mentioned above) and a negotiated administrative consent order (ACO) with the MassDEP (consistent with their approach to date).

Like many other unlined landfills in Massachusetts that operated prior to the current solid waste regulations, capping of these properties requires significant capital and investment.

The current proposal for permanent closure of the Cole Brook Pines/Cecil Smith landfill is the following:

1. Import additional grading and shaping soils to the property prior to final capping. The import of these mildly impacted soils will be in strict conformance with current MassDEP policies developed for this exact scenario. The MassDEP has established acceptable soil standards for unlined landfills that are designed to be protective of groundwater beneath the landfill.

2. The revenue from the soil import is necessary to facilitate the construction of the required landfill cap, including funding the required post-closure groundwater monitoring (30 years) of the landfill and cap.

3. Once soil import is complete, construction of a standard landfill cap will occur, which consists of a membrane liner (to prevent rain water infiltration through the cap) and a soil cover to support vegetative growth and proper stormwater drainage.

4. Other incidental cleanup work to be performed would include removal of solid waste located in abutting wetlands (including wetland restoration) and removal and consolidation of remaining waste and debris on the property.

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MEMORANDUM

18 June 2013
File No. 39899-010

TO: Massachusetts Department of Environmental - Solid Waste Management Section
20 Riverside Drive
Lakeville, MA

Attn: Mark Dakers, Acting Section Chief

C: Wendy Henderson, Dartmouth Board of Health
Boston Environmental Corp.
Golledge Strategies & Solutions LLC

FROM: Haley & Aldrich, Inc.
Marc J. Richards, P.E., LSP, Senior Project Manager | Vice President
Peter Zawadzkas, Senior Scientist

Subject: Summary of Groundwater Assessment Findings
Former Cole Brook Pines/Cecil Smith Landfill
452 Old Fall River Road
Dartmouth, Massachusetts

EXECUTIVE SUMMARY OF GROUNDWATER ASSESSMENT FINDINGS

The attached memorandum outlines the background, environmental history and analytical results from recent groundwater sampling for the Former Cole Brook/Cecil Smith Landfill ("subject site") located off of Old Fall River Road in Dartmouth, Massachusetts.

Summary

Haley & Aldrich conducted supplemental environmental sampling activities in May 2013 at the subject site, consistent with MassDEP's approval dated 17 May 2013. Based on the recent groundwater sampling and previous site investigations, the following site conditions are noted:

- No compounds were detected in groundwater above applicable risk-based standards established in the Massachusetts Contingency Plan, which are designed to be protective of human health and the environment.

- Upgradient (well HA-4) and downgradient wells (MW-5, MW-6, MW-7, SGA-04) did not have elevated water quality parameters indicating overburden groundwater quality upgradient and downgradient to the landfill has not been adversely degraded from a drinking water perspective. The only exception is a low detection of manganese in wells MW-5 and MW-7. Manganese is naturally occurring and is often detected in elevated concentrations in groundwater and these detections have not been attributed to the landfill.

- For general water quality parameters that relate to drinking water aesthetics, color, taste and odor, there were detected exceedances in groundwater located directly adjacent to the landfill to certain drinking water secondary and recommended levels, including alkalinity, nitrate, dissolved solids, calcium, sodium, iron and manganese. These results are consistent with and typical for areas adjacent to a construction and demolition debris landfill.

Based on historic data and the supplemental groundwater sampling conducted in May 2013, groundwater has not been adversely impacted to a condition where there is immediate risk to human health or the environment.

Additional details regarding the supplemental groundwater sampling are summarized below.

INTRODUCTION

Haley & Aldrich conducted groundwater assessment activities at the site of Former Cole Brook Pines/Cecil Smith Landfill, in Dartmouth, Massachusetts (herein referred to as the "site"). Environmental sampling activities were conducted in accordance with our proposal dated 9May 2013 ("Agreement"). The assessment work summarized below was also performed in accordance with Haley & Aldrich's BWP SW 45 Alternative Review application (Application) and the subsequent Massachusetts Department of Environmental Protection (MassDEP) approval dated 17 May 2013.

BACKGROUND

As part of continuing assessment activities associated with the proposed closure of the landfill by the Boston Environmental Corp., a groundwater assessment program was undertaken by Haley & Aldrich to further evaluate environmental conditions and to assess potential groundwater impacts from historical site uses.

Portions of the property known as the Cole Brook Pines/Cecil Smith Landfill received solid waste for on-site disposal for approximately 20 years (1954 to 1974). The solid waste is generally described as demolition debris (wood, concrete, brick, roofing, metals, plastics, lead-based paint, and automobile waste). The majority of the solid waste contained in the landfill appears consistent with typical landfills of this era. Since the property began solid waste operations, a series of environmental sampling events have occurred over the years to evaluate the solid waste (limits and content), surface water, sediment, soil, and groundwater. The results from these past investigations enabled the EPA in 2004/2005 to perform a comprehensive sampling program to further evaluate conditions at the site.

The attached summary tables include environmental sampling results collected by a variety of entities over a period of the past several decades. The data was summarized from available information included in the US EPA's 28January 2005 Final Expanded Site Inspection Report.

For discussion and comparison purposes, soil data is compared to the Massachusetts Contingency Plan (MCP) Method 1 S-1/GW-1 risk-based cleanup standards. Groundwater data was compared to Method 1 GW-1 standards, as nearby groundwater may be protected or used for drinking water. Groundwater data was also compared to Method 1 GW-3 standards as surface water (Cole Brook and associated wetlands) is located in proximity to the former landfill.

Comparisons to MCP standards are for general discussion only as the landfill is adequately regulated under MassDEP's Solid Waste program.

Soil Data

The attached Table I summarizes available soil data from the landfill property. The majority of the soil sampling was surficial in nature (2 feet and less) from around the property. As shown, one sample collected in 1990 from within the landfill property contained some semi-volatile organic compounds

(SCVOCs) at concentrations above Method 1 S-1 standards. In 2002, a soil sample collected from within the landfill area contained lead above the Method 1 S-1 MCP standard.

The more comprehensive sampling performed by the EPA in 2004 did not reveal any constituent concentrations above MCP standards.

The detection of the SVOC and lead concentrations noted above are expected for samples collected from within the limits of a solid waste landfill. No other hazardous or toxic materials were noted in the soil samples that would indicate an immediate risk to human health or the environment.

Groundwater

The attached Table II summarizes available data from groundwater samples collected and analyzed in the vicinity of the landfill property. Groundwater sampling has occurred at the property since 1977. As shown in Table II, intermittent detections of constituents in groundwater have been reported over the years from select groundwater sample locations. Based on a review of the data and the 2004 EPA comprehensive groundwater sampling program, concentrations of volatile organic compounds (VOCs), SVOCs, polychlorinated biphenyls (PCBs) and total cyanide were not detected at concentrations above MCP risk-based standards. The 2004 EPA data identified four inorganic constituents that exceed applicable MCP standards, which included beryllium, total chromium, lead, and vanadium. Aside from lead, which was detected in two separate wells, the other organics above MCP standards were all detected in separate well locations.

The EPA report does not include a description of the methodology used to collect the groundwater samples. When sampling for inorganics, it is important to analyze samples for dissolved and not total metals. Dissolved samples are field filtered to remove elevated turbidity that may be present in the sample. Elevated turbidity can lead to false positives or inaccurate elevated results. The EPA noted that they only field filtered one sample (SGA-02) due to elevated turbidity. The sample result in Table II was the unfiltered (total) result. The EPA noted in the report text that the sample result for SGA-02 when filtered (dissolved) did not show organic constituents above MCP standards.

It is Haley & Aldrich's professional opinion that if the other groundwater samples were field filtered, the inorganic results would have likely been below applicable MCP standards.

Drinking Water

The attached Table III summarizes available data from samples collected and analyzed from the on-site private drinking water well located at the residence situated on top of the area designated as landfill. Laboratory analysis of water samples from this well by the EPA in 2004 did not detect constituents above MCP drinking water standards.

Surface Water and Sediment

The 2004 EPA report summarizes that previous surface water samples that were collected in 2002; however, the data was not available in the EPA report. In 1977, two surface water samples were

collected; one upstream and one downstream sample location. The report referenced metal results for these two samples, which were very similar for copper and zinc.

The 2004 EPA report summarizes past sediment sampling performed since 1982, including the EPA's 2004 comprehensive sediment sampling program. The results are summarized in Table IV.

When sampling sediment, it is common to compare sampling results to nearby sample locations that have not been impacted by site operations. Nearby sample locations are often referred to as "background" or "reference" locations. Table IV includes the sample locations that were identified as background samples.

The interpretation of the sediment results collected in the years of 1982, 2000, and 2002 is difficult because location information and background reference locations were not available. The data does indicate detectable concentrations of beryllium, cadmium, PCBs, and a series of SVOCs. It should be noted that for the detected SVOCs, cadmium, and PCBs that have sediment screening values established by the MassDEP, the detected concentrations were less than the MassDEP screening values. MassDEP screening values represent concentrations that if exceeded, could signal potential environmental harm. However, as noted, none of the values were exceeded for the compounds that have established screening values.

The EPA's 2004 sediment data includes nine sediment samples collected adjacent to or near the landfill area and eight samples that are identified as "background" samples. The background samples are used for general comparison purposes to help determine if sediment samples collected near the landfill are substantially greater than background, indicating a potential impact by the landfill.

Based on a review of the 2004 EPA data in Table IV, the following is observed:

- PCBs and cyanide were not detected.

- For those samples where various metals and inorganics were detected above some of the background concentrations, the concentrations did not exceed the established MassDEP screening criteria for those metals/inorganics.

- The VOCs that were detected are from samples collected from within the landfill or were background samples. In addition, the VOCs detected are common laboratory contaminants and may not be associated with the landfill.

- Only two SVOCs were detected in one sediment sample, at very low concentrations.

- Pesticides were detected in both background and site samples at similar concentrations.

Based on the above data, although localized impacts to sediment may have occurred from the landfill, the data suggests that these impacts are not contributing to environmental harm.

Summary of Previous Analytical Data

Based on the above data summary, the data does not identify conditions that are not uncommon to solid waste landfills. The data indicates conditions one would reasonably expect from a historic C&D disposal landfill. In addition, no immediate risk to human health or the environment is apparent from the data that has been collected.

SUBSURFACE INVESTIGATION

The groundwater assessment activities summarized below supplement the previous investigations that have been completed. New monitoring well locations were selected based on spatial coverage and to supplement previous analytical data.

A total of six (6) new observation wells (designated as HA-1 (OW) through HA-6 (OW)) were drilled by Geologic Earth Explorations, Inc., of Norfolk, Massachusetts on 22 through 24 May 2013. Corresponding test borings HA-1 through HA-6 were all relatively shallow soil borings with depths ranging from approximately 10 to 16 feet below ground surface (bgs).

The designations and approximate locations of both the existing and new observation wells are shown on Figure 2, Site and Subsurface Exploration Location Plan. Refer to Appendix A for a copy of the observation well installation logs.

FIELD OBSERVATIONS

Geology

Geologic information was obtained from Haley & Aldrich's subsurface investigation of the subject site. This information is supplemented by available subsurface information from several exploration phases conducted at the site. The general subsurface stratigraphy identified at the test boring locations is outlined in the table below:

Strata	Range of Thickness (ft)
Miscellaneous Fill/Debris	0 to 4
Loess	0 to 2
Topsoil	0 to 2
Organic Deposits (peat /debris)	0 to 5.5
Glaciofluvial Deposits	4.5 to 12
Bedrock	Not Encountered

Much of the fill was found between and among large, buried pieces of debris that was not recorded in the logs, due to its size and exogenous nature. Fill materials recorded in the logs include brick, ash, Styrofoam and plastic fragments.

Soil and material brought to the surface during drilling operations was field-screened for the presence of VOCs by exposing a photoionization detector (PID) equipped with a 10.6 electron-volt lamp to vapors accumulated in the headspace of jar samples containing material encountered. Elevated PID readings were not detected in any soil samples that were field screened indicating lack of a field-identifiable VOC impact to the soils.

Hydrology

Haley & Aldrich measured depth to groundwater in each of the newly installed wells and the existing wells sampled. In addition, surface water elevations in proximity to the existing monitoring wells were collected.

A summary of the groundwater depth measurements and surface water elevations are as follows:

Well ID	Elevation of PVC (ft)	Depth to Water (ft) 5/28/2013	Groundwater Elevation (ft) 5/28/2013	Surface Water Elevation 6/13/2013
HA-1	75.20	5.53	69.67	71.0
SGA-03	74.20	6.26	67.94	
HA-2	75.16	4.95	70.21	70.2
HA-3	84.20	10.3	73.90	
HA-4	81.90	13.4	68.50	75.0
HA-5	74.30	5.57	68.73	71.0
HA-6	73.60	6.16	67.44	
MW-5	74.91	16.11	58.80	--
MW-6	87.41	15.15	72.26	--
MW-7	93.34	9.50	83.84	--
SGA-01S	84.20	14.53	69.67	80.0
SGA-01D	82.40	5.24	77.16	--
SGA-04	75.17	3.45	71.72	--

Notes:
1. Elevations are based on a NGVD 1929 Datum.

Surface water elevations were also measured in five locations within the abutting perennial stream that surrounds the landfill. The surface water elevations were collected on 13 June 2013. Depth to groundwater and surface water measurements were unable to be measured the same day, therefore the

results can not be specifically correlated. In addition, due to precipitation events that occurred within proximity to the timing of the surface water survey, the surface water elevation data are likely not representative of average flow conditions.

GROUNDWATER FLOW DIRECTION

Based on a variety of project site features, including the presence of the stream, nearby wetlands, the relative large spacing of the monitoring well network across the entire study area, and the groundwater elevation and surface water data collected, it was not possible to create a groundwater flow direction contour map that presented clear flow patterns. However, the following observations can be made:

- Groundwater elevations around the landfill generally support the observation that groundwater flow occurs radially from the landfill towards the surrounding surface water stream. This is consistent with past EPA conclusions.

- Surface water elevations (largely due to precipitation events) generally indicate higher surface water elevations than nearby groundwater elevations. Although the groundwater and surface water elevation data were not collected the same day, the data initially supports the observation that the majority of the surface water with the stream originates from the large areas of surrounding wetlands and not from the groundwater beneath the landfill.

- Groundwater quality data (as further presented later in the memorandum may suggest that there is a groundwater flow component from the landfill towards the south west.

- Based on regional surface water features and ground elevations, regional groundwater flow from the landfill is expected to flow in a southwesterly direction.

INITIAL EVALUATION OF EFFECT OF LANDFILL ON "PERENNIAL STREAM"

A site reconnaissance was performed on 10 May 2013 to evaluate if the presence of the landfill has affected the structure and function of the unnamed "perennial stream" that meanders around the perimeter of the landfill. It is apparent from the available maps (including the National Wetland Inventory1), aerial photographs and the direct observation of the hydrology of the stream that most of the discharge of the water body originates from large areas of regional wetlands unrelated to the landfill, including "Colebrook Swamp" to the west (the topographic relief of the landfill is relatively flat). Wetland flagging was observed along the perimeter of the landfill and, with the exception of a small reach on the northwestern side of the facility, the fill/debris does not encroach into the riparian zones of the perennial stream.

The flow of the stream is approximately 1 foot/second in the narrower segments but decreases markedly in the more diffuse emergent wetland areas. The bank stability is excellent with no evidence of

1 Interactive 'Wetlands Mapper' at http://www.fws.gov/wetlands/Wetlands-Mapper.html

abnormal scour, erosion or channeling and the vegetation of the riparian zone, with the exception of forested canopy areas, covers a wide area that is fairly dense and robust. In most reaches, the substrate of the stream is comprised of cobble/gravel/sand and the presence of an adequate number of 'riffles and runs' within various stream segments causes cascading and turbulence of the water which, in turn, promotes oxygenation. There is also a nice distribution of snags, logs and coarse/fine particulate organic matter (woody debris, leaf packs) that is favorable for epifaunal colonization and fish cover. An inspection of these substrates revealed the presence of aquatic insect larvae such as chironomids, craneflies, mayflies and caddisflies. Some of these organisms appeared to be in the category of "pollution-sensitive"(e.g. Heptageniidae, Limnephilidae) which is a good indication of clean water. Frogs and turtles were also observed as were wetland-dependent birds. Overall, the water quality appears to be good to excellent with no discernible odors and a natural light brown hue that is due to the presence of tannins and humic acids. A typical reach of the stream is shown on the attached Photograph 1.

Both the water and the sediment quality did not appear to be affected by the presence of landfill debris. Indeed, natural succession occurring within the wetland observed on the northwestern side of the landfill (where some of the fill has encroached into the waterbody) appears to have compensated for any physical alteration that has occurred in the past (Photograph 2).

GROUNDWATER SAMPLING

Prior to collecting groundwater samples, seven existing wells (designated MW-5, MW-6, MW-7, SGA-01S, SGA-01D, SGA-03 and SGA-04) and the six new wells (HA-1 through HA-6) were developed by a combination of surging and evacuating groundwater until a minimum of 10 well volumes was removed. The purpose of well development was to reduce the amount of fine-grained material entering the wells from the surrounding formation.

It should be noted that existing groundwater monitoring well MW-4 was originally proposed to be sampled. This well is located in proximity to the landfill center. MW-4 was found to be damaged and therefore unable to be sampled.

Groundwater samples were collected in general accordance with the Environmental Protection Agency's (EPA) Region 1 "Low Stress (Low Flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells," dated 9January2010, Revision 3. In summary, groundwater was purged from the well using a peristaltic pump with variable discharge rate. Purged groundwater was pumped to a flow-through cell to record field parameters, including pH, temperature, dissolved oxygen, turbidity, conductivity, and oxidation/reduction potential. In general, purging was continued until a minimum of three well volumes had been removed from the well, field parameters stabilized to within 10 percent for three consecutive readings, and turbidity was below 5 NTU, where possible.

The groundwater samples were collected and placed in laboratory prepared containers and stored on ice in the field prior to being submitted to Alpha Woods Hole Laboratory (Alpha), a Massachusetts Certified Laboratory, for analysis of VOCs, SVOCs, 1,4-dioxane, dissolved MCP metals, PCBs and

general chemistry parameters (alkalinity, chemical oxygen demand, chloride, physiologically available cyanide, total cyanide, nitrate, sulfate and total suspended solids).

No evidence of free product, sheen or petroleum odor was observed in groundwater from the wells. In addition, the headspace of each groundwater monitoring well was screened with a PID and a GEM2000 Landfill Gas Analyzer. No volatile organic compounds, methane or hydrogen sulfide were detected during screening and all oxygen and carbon dioxide levels were within the normal range.

ANALYTICAL RESULTS

Results of the laboratory testing of soil samples were compared to MCP, Method 1 GW-1 and GW-3 risk-based standards for MCP-related considerations. Results were also compared to Massachusetts drinking water standards and guidelines (Maximum Contaminant Levels, Drinking Water Guidelines, Recommended Concentration Limits and Secondary Maximum Contaminant Levels). Results were also generally compared to previous lab results to evaluate any differing site conditions that may have been encountered. Groundwater results are summarized in the attached Table V.

Chemical analysis for the groundwater at the subject site indicated the following:

- No compounds were detected above applicable risk-based MCP Method 1 GW-1 (drinking water) and GW-3 (surface water) standards.

- Alkalinity, nitrate, dissolved iron, dissolved manganese and dissolved sodium were detected above certain secondary parameters for drinking water in select wells.

- Within a few individual select wells, detections of SVOCs/VOCs (1,2,4-Trimethylbenzene, 2-Butanone,3-Methylphenol/4-Methylphenol, Bis(2-Ethylhexyl)phthalate, Naphthalene and Toluene) were noted. However, the results are all below the applicable standards noted in Table V. In addition, these detections were only specific to an individual well and there was no pattern of detection among multiple wells.

- Dissolved metals, and total/physiologically available cyanide were reported at concentrations well below the applicable standards noted in Table V.

A copy of the laboratory analytical results is included as Appendix C.

DISCUSSION

Based on the results summarized above and in Table V, we offer the following professional observations:

- No compounds were detected in groundwater above applicable risk-based standards established in the MCP, which are designed to be protective of human health, safety and the environment.

- Only one compound (3-methylphenol) that was detected in one well (HA-5) that does not have an established risk-based MCP standard. However the result of 6.1 ug/l is over 800 times lower than the MCP reportable concentration of 5,000 ug/l.

- For general water quality parameters that relate to drinking water aesthetics, color, taste and odor, there were exceedances of certain drinking water secondary and recommended levels in groundwater samples collected from locations directly adjacent to the landfill. The drinking water secondary and recommended levels which were exceeded include those for alkalinity, nitrate, dissolved solids, calcium, sodium, iron and manganese. These results are consistent with and typical for areas adjacent to a construction and demolition debris landfill

- Samples collected from upgradient (well HA-4) and downgradient wells (MW-5, MW-6, MW-7, SGA-04) did not have elevated levels of water quality parameters indicating overburden groundwater quality upgradient and downgradient to the landfill has not been adversely degraded from a drinking water perspective. The only exception is a low detection of manganese in wells MW-5 and MW-7. Manganese is naturally occurring and is often detected in elevated concentrations in groundwater and these detections have not been attributed to the landfill.

- Based on a comparison of the new data summarized in Table V to the historic groundwater data summarized in Table II, we state the following:

    - Metal concentrations in the new data are lower than the results collected by EPA. As previously stated, this observation is due to the recent samples being field filtered, which is consistent with MassDEP guidance and industry standard.
    - No new constituents were identified in groundwater above applicable standards as compared to previous historic results.
    - Historic laboratory analysis of groundwater samples detected total cyanide concentrations in four wells at low/estimated concentrations and detectable total cyanide concentrations in two wells (SGA-01S and SGA-05S). Total cyanide was only detected in one well (HA-1) at a very low concentration, while physiologically available cyanide was not detected in this same well. Cyanide was not detected in any other well sampled, including SGA-01S and well HA-5 located in proximity to SGA-05S.

CONCLUSIONS

Based on a review of the historic data and the recent groundwater sampling data, groundwater adjacent to the landfill is consistent with the localized impacts one would reasonably expect and is commonly associated with construction and demolition debris landfills. These impacts are based on "indicator" constituents and not chemicals that are resulting in a potential human health or environmental impact.

Groundwater located upgradient and downgradient to the landfill was absent of the "indicator" compounds that were previously detected adjacent to the landfill, indicating groundwater has not been adversely impacted by the landfill.

Initial groundwater flow patterns indicate that flow is radially from the landfill towards the nearby stream and that regional flow patterns are likely towards the southwest.

Surface water and the abundant wetland resource areas around the landfill initially indicate that stream's hydrology is originating from the wetland areas and not the groundwater beneath the landfill.

USE OF INFORMATION AND LIMITATIONS

This summary report provides data and represents the chemical properties of the groundwater samples collected for this study.

The conclusions provided in this report by Haley & Aldrich, Inc. are based solely on the scope of services conducted and the sources of information discussed in this report. Any additional information that becomes available concerning this site should be provided to Haley & Aldrich, Inc., so that our conclusions and recommendations can be reviewed and modified if necessary. The work performed by Haley & Aldrich, Inc. is subject to the terms and conditions stated in our proposal. This work has been undertaken in accordance with generally accepted environmental consulting and engineering practices

Enclosures:

Table I: Summary of Historic Soil Quality Data

Table II: Summary of Historic Groundwater Quality Data

Table III: Summary of Historic Drinking Water Well Quality Data

Table IV: Summary of Historic Sediment Quality Data

Table V: Summary of Supplemental Groundwater Quality Data

Figure 1: Project Locus

Figure 2: Site and Subsurface Exploration Location Plan

Stream Photographs

Appendix A: Observation Well Installation Logs and Well Sampling Logs

Appendix B: Laboratory Data Reports

TABLE I
SUMMARY OF SOIL QUALITY DATA
COLE BROOK PINES LANDFILL
DARTMOUTH, MASSACHUSETTS
FILE NO. 39899-010

		Within Landfill Area				Reference Sample Outside of Landfill Area	Landfill Area - Sample Locations Unknown				SO-09 is a duplicate of SO-02 — Located Within Landfill Limits							Reference Samples Not Within Landfill Limits	
SAMPLE ID	**MCP 2008**	**SS-411**	**SS-421**	**SS-421D**	**SS-431**	**SS-441**	**TP-18**	**TP-26**	**TP-30**	**TP-38**	**SO-01**	**SO-02**	**SO-09**	**SO-03**	**SO-04**	**SO-05**	**SO-06**	**SO-07**	**SO-08**
SAMPLING DATE	**METHOD 1**	**15-Aug-1990**	**15-Aug-1990**	**15-Aug-1990**	**15-Aug-1990**	**15-Aug-1990**	**8/11-Feb-2002**	**8/11-Feb-2002**	**8/11-Feb-2002**	**8/11-Feb-2002**	**28-Jan-04**	**27-Jan-04**	**27-Jan-04**	**27-Jan-04**	**28-Jan-04**	**27-Jan-04**	**28-Jan-04**	**28-Jan-04**	**28-Jan-04**
SAMPLE TYPE	**S-1/GW-1**	**SURFACE**	**SURFACE**	**SURFACE/DUPLICATE**	**SURFACE**	**SURFACE**					**0-2 feet**	**0-2 feet**	**0-2 feet**	**0-2 feet**	**0-2 feet**	**0-2 feet**	**0-2 feet**	**0-2 feet**	**0-2 feet**
COLLECTED BY:		**EPA**	**EPA**	**EPA**	**EPA**	**EPA**	**St. Germain**	**St. Germain**	**St. Germain**	**St. Germain**	**EPA**	**EPA**	**EPA**	**EPA**	**EPA**	**EPA**	**EPA**	**EPA**	**EPA**
VOCs (ppm)																			
2-Butanone	4	~	~	~	~	0.076 J	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	NA	~	~	~	~	~	~	~	~	~	0.011	ND	ND	ND	ND	0.068	ND	ND	ND
4-Methyl-2-pentanone	0.4	~	~	~	~	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	6	~	~	~	~	0.715 J	~	~	~	~	ND	ND	ND	0.11	0.037	0.001 J	0.018	0.054	ND
Methylene chloride	0.1	~	~	~	~	0.084 J	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	30	~	~	~	~	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total VOCs	NA	~	~	~	~	~	~	~	~	~	0.011	ND	ND	0.11	0.037	0.069	0.018	0.054	ND
SVOCs (ppm)																			
2-Methylnaphthalene		~	~	1.3	~	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	4	~	~	0.7 J	~	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	1	~	~	2.7	~	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	1000	~	~	2	~	~	~	~	~	~	ND	ND	ND	ND	0.37 J	ND	ND	ND	ND
Benzo(a)anthracene	7	~	~	**7.4**	~	~	8.6	~	~		ND	ND	ND	ND	0.84	ND	ND	ND	ND
Benzo(a)pyrene	2	~	~	**6.9 J**	~	~	~	~	~	~	ND	ND	ND	ND	0.79	ND	ND	ND	ND
Benzo(b)fluoranthene	7	~	~	**7.2**	~	~	7.7	~	~	~	ND	ND	ND	ND	0.6	ND	ND	ND	ND
Benzo(ghi)perylene	1000	~	~	2.1 J	~	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	70	~	~	4.9 J	~	~	~	~	~	~	ND	ND	ND	ND	0.72	ND	ND	ND	ND
Bis(2-Ethylhexyl)phthalate	200	~	~	~	~	~	~	~	~	~	ND	ND	ND	0.24 J	ND	0.36 J	ND	ND	ND
Butyl benzyl phthalate	NA	~	0.45 J	~	~	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	70	~	~	8	~	~	10	~	~	~	ND	ND	ND	ND	0.82	ND	ND	ND	ND
Dibenzo(a,h)anthracene	0.7	~	~	**0.71 J**	~	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	1000	~	~	9	~	~	~	~	~	~	ND	ND	ND	ND	1.7	ND	ND	ND	ND
Fluorene	1000	~	~	0.62 J	~	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)Pyrene	7	~	~	2.1 J	~	~	~	~	~	~	ND	ND	ND	ND	0.47	ND	ND	ND	ND
Naphthalene	4	~	~	2.5	~	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	10	~	~	6	~	~	~	~	~	~	ND	ND	ND	ND	1.5	ND	ND	ND	ND
Pyrene	1000		7.6	~	~	~	~	~	~	~	ND	ND	ND	ND	1.6	ND	ND	ND	ND
Total SVOCs	NA	~	~	~	~	~	~	~	~	~	ND	ND	ND	0.24	9.41	ND	ND	ND	ND
Metals (ppm)																			
Aluminum	NA	~	~	~	~	~	~	~	~	~	4580	1900	1870	4430	5200	4070	6790	6250	2730
Barium	1000	~	~	~	~	~	~	~	~	~	46.8	8	7.7	12.8	884	9.2	16.5	8.8	7.1
Calcium	NA	12600 J	~	~	~	~	~	~	~	~	1860	432	433	375	4050	742	387	ND	309
Chromium	30	~	~	34.2	~	~	~	~	~	~	ND	ND	ND	7.8	12.1	5	5.2	8.4	4.9
Cobalt	NA	~	~		~	~	~	~	~	~	3.8	ND	ND	1.9	2.2	2.4	2.9	1.6	1.4
Copper	NA	~	~	146	~	~	~	~	~	~	13.1	ND	ND	5	14.7	4.5	6.1	7.1	ND
Iron	NA	~	~	~	~	~	~	~	~	~	8820	2560	2670	7560	6890	6720	7990	6350	3100
Lead	300	~	268	~	~	~	**6800**	~	~	~	1.7	1.7	1.6	5.1	97.4	4.8	4.9	3.8	2.6
Magnesium	NA	~	~	~	~	~	~	~	~	~	2620	582	578	1160	1840	1310	1600	696	670
Manganese	NA	~	~	~	~	~	~	~	~	~	54.6	58.6	59.9	92.5	111	129	100	56.1	103
Mercury	20	~	1.1	~	~	~	~	~	~	~	ND	ND	ND	ND	0.21 J	ND	ND	ND	ND
Nickel	20	~	~	~	~	~	~	~	~	~	2.5	ND	ND	3.9	7	4.7	3.3	3.9	1.8
Potassium	NA	~	~	~	~	~	~	~	~	~	1250	329	312	609	364	396	490	198	300
Selenium	400	~	~	~	~	~	~	~	~	~	ND	ND	ND	ND	ND	ND	0.71 J	ND	ND
Silver	100	~	~	~	~	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	NA	~	~	~	~	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	600	~	~	~	~	~	~	~	~	~	13.1	3.7	3.9	10	13.4	6.8	15.4	9.1	3.9
Zinc	2500	220 J	~	~	~	~	~	~	~	~	16.2	ND	ND	17.1	337	17.3	16.4	11	8.4
Pesticides (ppm)											ND	ND	ND	ND	ND	ND	ND	ND	ND
Dieldrin	0.05	ND	ND	**0.16**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Pesticides	NA	ND	ND	0.16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCBs (ppm)																			
Total PCBs	NA	ND	ND	ND	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND
General Chemistry																			
Cyanide (mg/kg)	100	-	-	-	-	-	~	~	~	~	ND	ND	ND	ND	0.14 J	ND	ND	ND	ND

NOTES AND ABBREVIATIONS:
ND: Not Detected
- : Not Analyzed
~: Data Not available
J: Quantitation is estimated
1. This table includes only those compounds detected on the dates indicated.
2. Bold/box value exceed indicated standard.

TABLE II
SUMMARY OF GROUNDWATER QUALITY DATA
COLE BROOK PINES LANDFILL
DARTMOUTH, MASSACHUSETTS
FILE NO. 39899-010

			Well Locations Unknown												Wells Located Around Landfill Perimeter								
SAMPLE ID	**METHOD 1**	**METHOD 1**	**A-1**	**A-2**	**A-3**	**A-4**	**A-5**	**B-1**	**B-2**	**B-5**	**B-6**	**B-7**	**OW-3**	**OW-4**	**MW-1S**	**MW-1D**	**MW-2**	**MW-3**	**MW-4**	**MW-5S**	**MW-5D**	**MW-6S**	**MW-6D**
Well ID	**MCP 2008**	**MCP 2008**													**SGA-01S**	**SGA-01D**	**SGA-02**	**SGA-03**	**SGA-04**	**SGA-05S**	**SGA-05D**	**SGA-06S**	**SGA-06D**
SAMPLING DATE	**GW-1**	**GW-3**	**2-Dec-1977**	**2-Dec-1977**	**2-Dec-1977**	**2-Dec-1977**	**2-Dec-1977**	**5-Jan-1982**	**5-Jan-1982**	**5-Jan-1982**	**5-Jan-1982**	**5-Jan-1982**	**12-Feb-1982**	**12-Feb-1982**	**2002**	**2002**	**2002**	**2002**	**2002**	**2002**	**2002**	**2002**	**2002**
SAMPLE TYPE	**(ppb)**	**(ppb)**																					
COLLECTED BY:			**GHR**	**GHR**	**GHR**	**GHR**	**GHR**	**GHR**	**GHR**	**GHR**	**GHR**	**GHR**	**GHR**	**GHR**	St. Germain	St. Germain	St. Germain	St. Germain	St. Germain	St. Germain	St. Germain	St. Germain	St. Germain
VOCs (ppb)																							
Benzene	5	10000	NA	NA	NA	NA	NA	**13**	~	~	~	~	NA	NA		ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	200	20000	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total VOCs	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
SVOCs (ppb)																							
bis(2-ethylhexl)phthalate	6	50000	NA	NA	NA	NA	NA	ND	ND	ND	**59**	ND	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
Caprolactam	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total SVOCs	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
Metals (ppb)																							
Aluminum	NA	NA	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND									
Arsenic	10	900	~	~	~	~	~	ND	ND	ND	ND	ND	**20**	~	~	~	150	~	~	~	~	~	~
Barium	2000	50000	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Beryllium	4	200	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	~	~	**4.8**	~	~	~	~	~	~
Cadmium	5	4	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	NA	NA	~	~	~	~	~	~	~	~	4200	~	18500	~	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	100	300	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	NA	NA	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	NA	NA	10400	~	~	~	~	~	~	~	80	~	940	~	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	NA	NA	~	~	~	~	~	~	~	6800	~	~	2500	~	31000 - Max concentration from these wells. Individual result unknown.								
Lead	15	10	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	**49.2 - Max concentration from these wells. Individual result unknown.**								
Magnesium	NA	NA	~	~	~	~	~	~	~	~	13000	ND	9800	~	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manganese	NA	NA	~	~	~	~	~	~	~	6200	~	~	420	~	970- Max concentration from these wells. Individual result unknown.								
Mercury	2	20	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	100	200	**1600**	~	~	~	~	~	~	~	~	~	80	~	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium	NA	NA	~	~	~	~	~	~	~	~	2400	ND	2300	~	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	50	100	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	100	7	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	NA	NA	~	~	~	~	~	~	~	~	8800	ND	ND	5500	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	30	4000	~	~	~	~	~	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	5000	900	**9500**	~	~	~	~	~	~	~	110	ND	440	~	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCBs (ppm)	0.5	10																					
Total PCBs	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
General Chemistry																							
Cyanide (ppb)	200	30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

NOTES AND ABBREVIATIONS:
- : Not Analyzed
~: Data not available
NA: Not Applicable
R: Non-Detect results rejected
ND: Not detected
VOCs: Volatile Organic Compounds
SVOCs: Semivolatile Organic Compounds
PCBs: Polychlorinated Biphenyls
1. This table includes only those compounds detected on the dates indicated.

TABLE II
SUMMARY OF GROUNDWATER QUALITY DATA
COLE BROOK PINES LANDFILL
DARTMOUTH, MASSACHUSETTS
FILE NO. 39899-010

SAMPLE ID	**METHOD 1**	**METHOD 1**	**GW-01**	**GW-02**	**GW-03**	**GW-04**	**GW-05**	**GW-06**	**GW-08**	**GW-09**	**GW-10**	**GW-11***	**GW-12**	**GW-13**	**GW-14**	**GW-15**
Well ID	**MCP 2008**	**MCP 2008**	**MW-01**	**MW-02**	**MW-03**	**MW-04**	**MW-05**	**MW-06**	**MW-02**	**SGA-01S**	**SGA-01D**	**SGA-02**	**SGA-03**	**SGA-05S**	**SGA-05D**	**SGA-04**
SAMPLING DATE	**GW-1**	**GW-3**	**17-Feb-2004**	**18-Feb-2004**	**18-Feb-2004**	**17-Feb-2004**	**19-Feb-2004**	**18-Feb-2004**	**18-Feb-2004**	**17-Feb-2004**	**17-Feb-2004**	**19-Feb-2004**	**18-Feb-2004**	**17-Feb-2004**	**17-Feb-2004**	**18-Feb-2004**
SAMPLE TYPE	**(ppb)**	**(ppb)**							**DUPLICATE**							
COLLECTED BY:			EPA	EPA	EPA	EPA	EPA	EPA								
VOCs (ppb)																
Benzene	5	10000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	200	20000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	33	ND
Total VOCs	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	33	ND
SVOCs (ppb)																
bis(2-ethylhexl)phthalate	6	50000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Caprolactam	NA	NA	22	ND	ND	ND	16	41	ND	ND	ND	ND	16	ND	10	ND
Total SVOCs	NA	NA	22	ND	ND	ND	16	41	ND	ND	ND	ND	16	ND	10	ND
Metals (ppb)																
Aluminum	NA	NA	ND	3740	14100	ND	261	273	3070	1020	1580	41700	ND	ND	ND	ND
Arsenic	10	900	ND	ND	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	2000	50000	9.9 J	25.4	17.1	258	24.1	11.5 J	22.8	10.5 J	113	378	18.1	18.4	47.8	7.4 J
Beryllium	4	200	ND	0.24 J	**6.9**	ND	0.14 J	ND	0.17 J	ND	0.07 J	3.1	ND	ND	ND	ND
Cadmium	5	4	ND	ND	2.2	ND	ND	ND	ND	ND	ND	1.6	ND	ND	ND	ND
Calcium	NA	NA	2280	1200	21100	41300	1380	6560	1160	2760	13100	11900	72600	41600	12800	2870
Chromium	100	300	85.3 J	ND	ND	ND	ND	ND	ND	ND	**191 J**	12 J	41.2 J	ND	ND	ND
Cobalt	NA	NA	4.1	ND	47.8	ND	0.69	ND	ND	ND	4.1	7.5	ND	ND	ND	ND
Copper	NA	NA	22.4 J	ND	6 J	12.1 J	ND	ND	ND	ND	41.5 J	36.1 J	8.2 J	ND	ND	ND
Iron	NA	NA	543 J	1040 J	ND	14500 J	ND	227 J	820 J	1240 J	3030 J	28200 J	276 J	2950 J	110 J	ND
Lead	15	10	ND	ND	ND	**103**	ND	ND	ND	ND	ND	**30.9**	ND	ND	ND	ND
Magnesium	NA	NA	815	584	8380	3230	729	2330	509	1540	8050	11100	5230	3770	6450	1280
Manganese	NA	NA	202	131	1880	236	403	123	124	17	184	742	318	358	221	ND
Mercury	2	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	100	200	121 J	ND	91.0 J	4.8 J	2 J	ND	ND	ND	91.4 J	9.5 J	20.6 J	ND	ND	ND
Potassium	NA	NA	961 J	1250 J	1720	1480 J	458 J	1130 J	1160 J	574 J	4700 J	6730 J	2250 J	1800 J	3260 J	950 J
Selenium	50	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	100	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	NA	NA	4580	3740	2950	4830	3420	6350	3900	6310	14400	19100	4610	8490	10400	3810
Vanadium	30	4000	ND	1.2	ND	1.2	ND	ND	0.65 J	1.6	5.8	**36.3**	0.48 J	3.7	ND	ND
Zinc	5000	900	ND	ND	316	322	25.6	ND	ND	7.9 J	5.6 J	66.4	ND	ND	ND	ND
PCBs (ppm)	0.5	10														
Total PCBs	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
General Chemistry																
Cyanide (ppb)	200	30	2.6 J	2.2 J	ND	ND	ND	ND	ND	189	3.9 J	ND	ND	56	4.2 J	ND

NOTES AND ABBREVIATIONS:
- : Not Analyzed
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NA: Not Applicable
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ND: Not detected
VOCs: Volatile Organic Compounds
SVOCs: Semivolatile Organic Compounds
PCBs: Polychlorinated Biphenyls
1. This table includes only those compounds detected on the dates indicated.

TABLE III
SUMMARY OF DRINKING WATER QUALITY DATA
COLE BROOK PINES LANDFILL
DARTMOUTH, MASSACHUSETTS
FILE NO. 39899-010

Well ID **SAMPLE ID** **SAMPLING DATE** **SAMPLE TYPE** **COLLECTED BY:**	**MCP** **2008** **RCGW-1** **(ppb)**	**DW-01** **DW-01** **2/18/2004** **On-site Private Well** **EPA**	**DW-02** **DW-02** **2/18/2004** **On-site Private Well** **EPA**
VOCs (ppb)			
Methylene chloride	5	ND	0.24 J
Total VOCs	NA	ND	0.24
SVOCs (ppb)			
Total SVOCs	NA	ND	ND
Metals (ppb)			
Calcium	NA	15700	15700
Copper	10000	6.8	7.6
Iron	NA	29.2	23
Magnesium	NA	2700	2740
Potassium	NA	1410 J	1430 J
Sodium	NA	11700	11800
PCBs (ppb)			
Total PCBs	0.5	ND	ND

NOTES AND ABBREVIATIONS:
NA: Not Applicable
ND: Not detected
VOCs: Volatile Organic Compounds
SVOCs: Semivolatile Organic Compounds
PCBs: Polychlorinated Biphenyls
1. This table includes only those compounds detected on the dates indicated.

TABLE IV
SUMMARY OF SEDIMENT QUALITY DATA
COLE BROOK PINES LANDFILL
DARTMOUTH, MASSACHUSETTS
FILE NO. 39899-010

					Upstream - Background Location Tributary to Cole Brook		Upstream - Background Location Cole Brook	
	Location Unknown	Cole Brook		Cole Brook				
SAMPLE ID	**NA**	**SD-01**	**SD-02**	**SD-07**	**SD-03**	**SD-04**	**SD-05**	**SD-06**
SAMPLING DATE	**11-Feb-1982**	**10-Oct-2000**	**10-Oct-2000**	**10-Oct-2000**	**10-Oct-2000**	**10-Oct-2000**	**10-Oct-2000**	**10-Oct-2000**
COLLECTED BY:	**TOWN CONSERVATION COMMISSION**	**EPA**	**EPA**	**EPA**	**EPA**	**EPA**	**EPA**	**EPA**
VOCs (mg/kg)								
2-Butanone	-	ND	ND	ND	ND	ND	ND	ND
Acetone	-	ND	ND	ND	ND	ND	ND	ND
Methyl Acetate	-	ND	ND	~	~	ND	~	ND
Total VOCs	-	ND	ND	~	~	ND	~	ND
SVOCs (mg/kg)								
Benzaldehyde	-	ND	ND	ND	~	ND	ND	ND
Benzo(a)anthracene	-	ND	ND	ND	~	ND	ND	ND
Benzo(a)pyrene	-	ND	ND	ND	~	ND	ND	ND
Benzo(b)fluoranthene	-	ND	ND	ND	~	ND	ND	ND
Benzo(k)fluoranthene	-	ND	ND	ND	~	ND	ND	ND
Chrysene	-	ND	ND	ND	~	ND	ND	ND
Fluoranthene	-	ND	ND	ND	~	ND	ND	ND
Indeno(1,2,3-cd)Pyrene	-	ND	ND	ND	~	ND	ND	ND
Pyrene	-	ND	ND	ND	~	ND	ND	ND
Total SVOCs	-	ND	ND	ND	~	ND	ND	ND
Metals (mg/kg)								
Aluminum	-	ND	ND	ND	ND	ND	ND	ND
Antimony	-	ND	ND	1.3	ND	ND	ND	ND
Arsenic	-	ND	ND	ND	ND	ND	ND	ND
Barium	-	ND	ND	ND	ND	ND	ND	ND
Beryllium	-	1.4	1.1	ND	ND	ND	ND	ND
Cadmium	-	ND	ND	0.12 J	ND	ND	ND	ND
Calcium	-	ND	ND	ND	ND	ND	ND	ND
Chromium	-	ND	ND	ND	ND	ND	ND	ND
Cobalt	-	ND	ND	ND	ND	ND	ND	ND
Copper	-	ND	ND	ND	ND	ND	ND	ND
Iron	-	ND	ND	ND	ND	ND	ND	ND
Lead	-	ND	ND	ND	ND	ND	ND	ND
Magnesium	-	ND	ND	ND	ND	ND	ND	ND
Manganese	-	ND	ND	ND	ND	ND	ND	ND
Mercury	-	ND	ND	ND	ND	ND	ND	ND
Nickel	-	ND	ND	ND	ND	ND	ND	ND
Potassium	-	ND	ND	ND	ND	ND	ND	ND
Selenium	-	ND	ND	ND	ND	ND	ND	ND
Sodium	-	ND	ND	ND	ND	ND	ND	ND
Vanadium	-	ND	ND	ND	ND	ND	ND	ND
Zinc	-	ND	ND	ND	ND	ND	ND	ND
Pesticides (mg/kg)								
4,4'-DDE	-	ND	ND	ND	ND	ND	ND	ND
4,4'-DDD	-	ND	ND	ND	ND	ND	ND	ND
4,4'-DDT	-	ND	ND	ND	ND	ND	ND	ND
Endosulfan II	-	ND	ND	ND	ND	ND	ND	ND
Total Pesticides	-	ND	ND	ND	ND	ND	ND	ND
PCBs (mg/kg)								
Aroclor 1242	~	ND	ND	ND	ND	ND	ND	ND
Aroclor 1254	0.022	ND	ND	ND	ND	ND	ND	ND
Total PCBs	0.022	ND	ND	ND	ND	ND	ND	ND
General Chemistry								
Cyanide (mg/kg)	-	ND	ND	ND	ND	ND	ND	ND

NOTES AND ABBREVIATIONS:
- : Not Analyzed
~: Data not available
NA: Not Applicable
ND: Not detected
VOCs: Volatile Organic Compounds
SVOCs: Semivolatile Organic Compounds
PCBs: Polychlorinated Biphenyls
1. This table includes only those compounds detected on the dates indicated.

TABLE IV
SUMMARY OF SEDIMENT QUALITY DATA
COLE BROOK PINES LANDFILL
DARTMOUTH, MASSACHUSETTS
FILE NO. 39899-010

	No Background Samples for comparison of these results					Cole Brook		Background for SD-01/SD-02		Landfill Wetlands		Background Samples for Comparison to SD-05 and SD-06		Cole Brook Sedimente Samples - Adjacent/Downstream of Landfill					Background Samples for Comparison to SD-09 toSD-13			
SAMPLE ID	**SED-01**	**SED-02**	**SED-03**	**SED-04**	**SED-05**	**SD-01**	**SD-02**	**SD-03**	**SD-04**	**SD-05**	**SD-06**	**SD-07**	**SD-08**	**SD-09**	**SD-10**	**SD-11**	**SD-12**	**SD-13**	**SD-14**	**SD-15**	**SD-16**	**SD-17**
SAMPLING DATE	**7-Feb-2002**	**8-Feb-2002**	**9-Feb-2002**	**10-Feb-2002**	**11-Feb-2002**	**4/13/2004**	**4/13/2004**	**4/13/2004**	**4/13/2004**	**4/13/2004**	**4/13/2004**	**4/13/2004**	**4/13/2004**	**4/13/2004**	**4/13/2004**	**4/13/2004**	**4/13/2004**	**4/13/2004**	**4/13/2004**	**4/13/2004**	**4/13/2004**	**4/13/2004**
COLLECTED BY:	**St. Germain**	**St. Germain**	**St. Germain**	**St. Germain**	**St. Germain**	**EPA**	**EPA**	**EPA**	**EPA**	**EPA**	**EPA**	**EPA**	**EPA**	**EPA**	**EPA**	**EPA**	**EPA**	**EPA**	**EPA**	**EPA**	**EPA**	**EPA**
VOCs (mg/kg)																						
2-Butanone	ND	ND	ND	ND	ND	0.007 J	0.003 J	ND	-	0.029 J	0.028 J	0.016 J	-	0.14 J	0.006 J	ND	0.038 J	ND	0.11 J	-	ND	-
Acetone	ND	ND	ND	ND	ND	0.046	ND	ND	-	0.24 J	0.38 J	ND	-	1.2 J	0.045 J	0.019	0.27 J	0.025 J	0.59 J	-	ND	-
Methyl Acetate	ND	ND	ND	ND	ND	ND	ND	0.001 J		ND	0.11 J	ND	-	ND	0.003 J	0.001 J	0.013 J	0.001 J	0.024 J	-	ND	
Total VOCs	ND	ND	ND	ND	ND	0.053	ND	0.001	ND	0.269	0.518	0.016	-	1.34	0.054	0.02	0.321	0.026	0.724	-	ND	-
SVOCs (mg/kg)																						
Benzaldehyde	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	0.18 J	-
Benzo(a)anthracene	12	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-
Benzo(a)pyrene	12	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-
Benzo(b)fluoranthene	9.8	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-
Benzo(k)fluoranthene	9.8	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-
Chrysene	13	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-
Fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	0.19 J	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-
Indeno(1,2,3-cd)Pyrene	89	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-
Pyrene	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	0.18 J	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-
Total SVOCs	145.6	ND	ND	ND	ND	ND	ND	ND	-	ND	0.37	ND	-	ND	ND	ND	ND	ND	ND	-	0.18	-
Metals (mg/kg)																						
Aluminum	ND	ND	ND	ND	ND	719	693	922	895	4100	5630	6580	5820	2490	2650	2240	3860	2120	5510	720	4010	6890
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.2 J	2.1 J	2.7 J	ND	ND	ND	ND	ND	ND	2.1 J	2.5 J	2.5 J
Barium	ND	ND	ND	ND	ND	7.1	4.6	4.8	6.5	40.3	71.6	97.8	103	78	16.4	6.1	53.2	10.7	88	106	132	152
Beryllium	1.2	ND	ND	ND	1.2	0.01	0.15	0.07	0.07	1.1	0.74	3.7	3.3	0.73	0.18	0.12	0.94	0.15	0.83	2	2.1	0.93
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.15	0.25	0.36	0.36	0.2	0.07 J	ND	ND	ND	0.11 J	0.016	0.94	1.2
Calcium	ND	ND	ND	ND	ND	445 J	184 J	281 J	350 J	2060 J	4120 J	4590 J	3880 J	7820 J	939 J	284 J	4240 J	559 J	5900 J	4510 J	9510 J	8570 J
Chromium	ND	ND	ND	ND	ND	0.74	0.61	0.91	1	3.2	5.3	3.3	2.7	3	2	1.6	6.1	1.7	2.5	6.5	11.5	17.3
Cobalt	ND	ND	ND	ND	ND	ND	0.19 J	0.43	0.33	1.4	2.2	1.5	1.3	1.9	1.6	0.82	1.5	1.3	1.4	0.93	3.9	7.7
Copper	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.5	10.2	8.9	7.5	6.5	ND	ND	8	ND	11.6	21.8	17.9	22.2
Iron	ND	ND	ND	ND	ND	1500	616	1260	1180	2070	7570	1230	1010	2400	2910	2200	1800	2470	2140	2020	5540	12800
Lead	ND	ND	ND	ND	ND	3.8 J	ND	2.5 J	2.8 J	19.4	55.4	18.2	24.7	11.9	8.6	6.2	9	5.8	7.9	11.5	118	170
Magnesium	ND	ND	ND	ND	ND	142	120	297	259	312	722	702	638	885	489	434	727	457	1100	795	2130	2600
Manganese	ND	ND	ND	ND	ND	16.7	12.7	20.5	21.8	20.2	47.7	9.7	9.8	419	64.1	21	29	48.7	19	12.3	52.2	98.6
Mercury	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.19 J	0.17 J	0.15 J	0.15 J	0.05 J	ND	ND	0.03 J	ND	0.13 J	0.26	0.10 J	0.13 J
Nickel	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.6	4.7	3.9	ND	ND	ND	ND	ND	ND	ND	10.8	14.5
Potassium	ND	ND	ND	ND	ND	ND	ND	123	ND	195	360	213	227	ND	175	194	197	165	199	221	375	720
Selenium	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.9	2.9	4.2	3.5	3.1	ND	ND	1.9 J	ND	3.3	5.8	3.7	3.2
Sodium	ND	ND	ND	ND	ND	ND	75.2 J	65.4 J	49.0 J	218 J	315 J	640 J	579 J	264 J	106 J	87 J	360 J	80.8 J	381 J	687 J	486 J	452 J
Vanadium	ND	ND	ND	ND	ND	1.4	1.2	1.4	1.6	8.6	17.2	15.3	16.4	7.1	3.7	3.4	12	2.8	9.6	9.4	16.3	23
Zinc	ND	ND	ND	ND		3.7 J	3.8 J	5.6 J	5.5 J	9.4 J	38.3 J	20.4 J	16.8 J	19.7 J	16.5 J	7.7 J	8.6 J	12.7 J	22.5 J	5.7 J	68.7 J	130 J
Pesticides (mg/kg)																						
4,4'-DDE	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	0.0038 J	ND	-	0.0078 J	-
4,4'-DDD	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	0.0058 J	0.0017 J	-	ND	**0.011**	ND	ND	0.01 J	ND	-	ND	-
4,4'-DDT	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	0.003 J	-
Endosulfan II	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	0.0019 J	ND	-	ND	-
Total Pesticides	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	0.0058	0.0017	-	ND	0.011	ND	ND	0.0157	ND	-	0.0108	-
PCBs (mg/kg)																						
Aroclor 1242	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-
Aroclor 1254	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-
Total PCBs	ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-
General Chemistry																						
Cyanide (mg/kg)	NA	NA	NA	NA	NA	ND	ND	ND	-	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	-	ND	-

NOTES AND ABBREVIATIONS:
- : Not Analyzed
~: Data not available
NA: Not Applicable
ND: Not detected
VOCs: Volatile Organic Compounds
SVOCs: Semivolatile Organic Compounds
PCBs: Polychlorinated Biphenyls
1. This table includes only those compounds detected on the dates indicated.

TABLE V - SUMMARY OF SUPPLEMENTAL GROUNDWATER QUALITY DATA
FORMER COLE BROOK PINES/ CECIL SMITH LANDFILL
452 OLD FALL RIVER ROAD
DARTMOUTH, MASSACHUSETTS
File No. 39899-010

Location Name Lab Sample IDs Sampling Date	MCP Method 1 GW-1 Standards	MCP Method 1 GW-3 Standards	Massachusetts Maximum Contaminant Levels (MMCLs)	Massachusetts Drinking Water Guidelines (ORSGs)	Massachusetts Recommended Concentration Limits (MRCLs)	Massachusetts Secondary Maximum Contaminant Levels (SMCLs)	HA-1 L1309671-01, L1309671-01 R1, L1309667-01 5/29/2013	HA-2 L1309671-02, L1309671-02 R1, L1309667-02 5/29/2013	HA-3 L1309742-04, L1309746-04 5/30/2013	HA-4 L1309671-03, L1309667-03 5/29/2013	HA-5 L1309879-03, L1309880-03 5/31/2013	HA-6 L1309879-04, L1309880-04 5/31/2013	MW-5 L1309671-04, L1309667-04 5/29/2013	MW-6 L1309742-02, L1309746-02 5/30/2013	MW-7 L1309742-03, L1309746-03 5/30/2013
Chemical Parameters															
pH					6.5 to 8.5		**6.33**	**6.4**	**6.2**	**5.58**	**6.01**	malfunctioning	**4.36**	**6.00**	**5.22**
Temperature (C)							11.7	12.6	11.7	11.75	14.2	13.85	11.71	12.8	13.6
Conductivity /Specific Conductance							862	685	557	0.285	0.346	0.068	0.077	54.0	1.151
Oxidation Reduction Potential							28.0	34.0	137.4	133.4	28.7	147.3	214.5	124.0	33.9
Dissolved Oxygen (mg/L)							0.33	0.79	2.8	0.26	0.12	0.45	0.53	3.75	0.24
Turbidity (NTU)							3.5	3	6	3.67	4.7	9.83	4.03	3.5	1.71
1,4 Dioxane by 8270D-SIM (ug/l)	3	50000		0.3	3		ND(0.15)	ND(0.158)	ND(0.165)	ND(0.156)	ND(0.15)	ND(0.16)	ND(0.157)	ND(0.164)	ND(0.16)
General Chemistry															
Alkalinity, Total (mg CaCO3/L)					30 to 100		**421**	**414**	**190**	**23.4**	**107**	**8.8**	**2.7**	**11.9**	**2.3**
Chemical Oxygen Demand (ug/l)							52000	64000	45000	22000	61000	71000	ND(20000)	29000	ND(20000)
Chloride (ug/l)					250000	250000	68000	27000	56000	21000	56000	7200	3000	5100	12000
Cyanide, Physiologically Available (ug/l)	200	30					ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Cyanide, Total (ug/l)	200	30			200	200	6	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Nitrogen, Nitrate (ug/l)			10000		10000	10000	4700	ND(100)	**11800**	6040	1350	ND(100)	ND(100)	424	943
Solids, Total Dissolved (ug/l)					500000		**750000**	**580000**	470000	120000	290000	99000	25000	45000	54000
Sulfate (ug/l)					250000		120000	76000	63000	ND(10000)	20000	17000	ND(10000)	ND(10000)	12000
MCP Dissolved Metals (ug/l)															
Arsenic, Dissolved	10	900	10		10		ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Barium, Dissolved	2000	50000	2000		2000		139	141	69	55	189	81	19	17	31
Cadmium, Dissolved	5	4	5		5		ND(4)	ND(4)	ND(4)	ND(4)	ND(4)	ND(4)	ND(4)	ND(4)	ND(4)
Calcium, Dissolved					50000 to 150000		**190000**	140000	98000	**14000**	**42000**	**5200**	**710**	**4800**	**6300**
Chromium, Dissolved	100	300	100		100		ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Copper, Dissolved			1300		1300	1000	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Iron, Dissolved						300	**360**	**510**	ND(50)	ND(50)	**7800**	160	ND(50)	ND(50)	220
Lead, Dissolved	15	10	15		15		ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Manganese, Dissolved				50		50	**412**	**9410**	38	**56**	**1300**	**364**	**122**	11	**87**
Mercury, Dissolved	2	20	2		2		ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)
Selenium, Dissolved	50	100	50		50		ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Silver, Dissolved	100	7				100	ND(7)	ND(7)	ND(7)	ND(7)	ND(7)	ND(7)	ND(7)	ND(7)	ND(7)
Sodium, Dissolved				20000	20000		**23000**	12000	**29000**	11000	**20000**	6800	2300	5000	6400
Zinc, Dissolved	5000	900				5000	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	110	ND(50)	ND(50)	ND(50)
MCP Polychlorinated Biphenyls (ug/l)															
Total PCBs					40		ND	ND	ND	ND	ND	ND	ND	ND	ND
MCP Semivolatile Organics (ug/l)															
3-Methylphenol/4-Methylphenol	5000(2)						ND(5)	ND(5)	ND(5)	ND(5)	6.1	ND(5)	ND(5)	ND(5)	ND(5)
Bis(2-Ethylhexyl)phthalate	6	50000	6				ND(3)	ND(3)	ND(3)	3.8	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
Total SVOCs							ND	ND	ND	3.8	6.1	ND	ND	ND	ND
MCP Volatile Organics (ug/l)															
1,2,4-Trimethylbenzene	200(3)	50000(3)					ND(2)	5.3	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
2-Butanone	4000	50000		4000			ND(5)	ND(5)	ND(5)	ND(5)	7.3	ND(5)	ND(5)	ND(5)	ND(5)
Naphthalene	140	20000		140			ND(2)	6.2	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
Toluene	1000	40000	1000		1000		ND(1)	ND(1)	ND(1)	ND(1)	4.1	ND(1)	ND(1)	ND(1)	ND(1)
Total VOCs							ND	11.5	ND	ND	11.4	ND	ND	ND	ND

NOTES:
- : Not analyzed
NA : Not applicable
ND(2.5): Not detected; number in parentheses is the laboratory reporting limit.

1. This table includes only VOC, SVOC and PCB compounds detected on the dates indicated.
2. RCGW-1 reportable concentration shown for this compound.
3. C9-C10 Standard shown for this compound, which is inclusive of trimethylbenzene compounds.

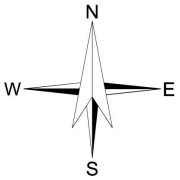
TABLE V - SUMMARY OF SUPPLEMENTAL GROUNDWATER QUALITY DATA
FORMER COLE BROOK PINES/ CECIL SMITH LANDFILL
452 OLD FALL RIVER ROAD
DARTMOUTH, MASSACHUSETTS
File No. 39899-010

Location Name Lab Sample IDs Sampling Date	MCP Method 1 GW-1 Standards	MCP Method 1 GW-3 Standards	Massachusetts Maximum Contaminant Levels (MMCLs)	Massachusetts Drinking Water Guidelines (ORSGs)	Massachusetts Recommended Concentration Limits (MRCLs)	Massachusetts Secondary Maximum Contaminant Levels (SMCLs)	SGA-01S L1309879-02, L1309880-02 5/31/2013	SGA-01D L1309879-01, L1309880-01 5/31/2013	SGA-03 L1309578-01, L1309672-01 5/28/2013	SGA-04 L1309742-01, L1309746-01 5/30/2013
Chemical Parameters										
pH					6.5 to 8.5		**5.18**	6.79	6.51	**5.17**
Temperature (C)							12.3	11.8	11.2	10.28
Conductivity /Specific Conductance							78.5	176	371.1	0.083
Oxidation Reduction Potential							96.2	163.5	156.6	249.1
Dissolved Oxygen (mg/L)							0.93	3.02	0.83	0.64
Turbidity (NTU)							3.5	1.8	2.06	0.92
1,4 Dioxane by 8270D-SIM (ug/l)	3	50000		0.3	3		ND(0.167)	ND(0.165)	ND(0.174)	ND(0.15)
General Chemistry										
Alkalinity, Total (mg CaCO3/L)					30 to 100		**5.3**	52.1	**214**	**13.2**
Chemical Oxygen Demand (ug/l)							43000	ND(20000)	20000	ND(20000)
Chloride (ug/l)					250000	250000	19000	15000	12000	3700
Cyanide, Physiologically Available (ug/l)	200	30					ND(5)	ND(5)	ND(5)	ND(5)
Cyanide, Total (ug/l)	200	30			200	200	ND(5)	ND(5)	ND(5)	ND(5)
Nitrogen, Nitrate (ug/l)			10000		10000	10000	ND(100)	3900	478	118
Solids, Total Dissolved (ug/l)					500000		96000	130000	330000	43000
Sulfate (ug/l)					250000		ND(10000)	21000	42000	ND(10000)
MCP Dissolved Metals (ug/l)										
Arsenic, Dissolved	10	900	10		10		ND(5)	ND(5)	ND(5)	ND(5)
Barium, Dissolved	2000	50000	2000		2000		13	63	30	11
Cadmium, Dissolved	5	4	5		5		ND(4)	ND(4)	ND(4)	ND(4)
Calcium, Dissolved					50000 to 150000		**4000**	**16000**	84000	**3500**
Chromium, Dissolved	100	300	100		100		ND(10)	ND(10)	ND(10)	ND(10)
Copper, Dissolved			1300		1300	1000	ND(10)	ND(10)	ND(10)	ND(10)
Iron, Dissolved						300	**1100**	ND(50)	ND(50)	ND(50)
Lead, Dissolved	15	10	15		15		ND(10)	ND(10)	ND(10)	ND(10)
Manganese, Dissolved				50		50	48	ND(10)	**248**	ND(10)
Mercury, Dissolved	2	20	2		2		ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)
Selenium, Dissolved	50	100	50		50		ND(10)	ND(10)	ND(10)	ND(10)
Silver, Dissolved	100	7				100	ND(7)	ND(7)	ND(7)	ND(7)
Sodium, Dissolved				20000	20000		9400	12000	7700	5800
Zinc, Dissolved	5000	900				5000	ND(50)	ND(50)	ND(50)	ND(50)
MCP Polychlorinated Biphenyls (ug/l)										
Total PCBs					40		ND	ND	ND	ND
MCP Semivolatile Organics (ug/l)										
3-Methylphenol/4-Methylphenol	5000[2]						ND(5)	ND(5)	ND(5)	ND(5)
Bis(2-Ethylhexyl)phthalate	6	50000	6				ND(3)	ND(3)	ND(3)	ND(3)
Total SVOCs							ND	ND	ND	ND
MCP Volatile Organics (ug/l)										
1,2,4-Trimethylbenzene	200[3]	50000[3]					ND(2)	ND(2)	ND(2)	ND(2)
2-Butanone	4000	50000		4000			ND(5)	ND(5)	ND(5)	ND(5)
Naphthalene	140	20000		140			ND(2)	ND(2)	ND(2)	ND(2)
Toluene	1000	40000	1000		1000		ND(1)	ND(1)	ND(1)	ND(1)
Total VOCs							ND	ND	ND	ND

NOTES:
- : Not analyzed
NA : Not applicable
ND(2.5): Not detected; number in parentheses is the laboratory reporting limit.

1. This table includes only VOC, SVOC and PCB compounds detected on the dates indicated.
2. RCGW-1 reportable concentration shown for this compound.
3. C9-C10 Standard shown for this compound, which is inclusive of trimethylbenzene compounds.

SITE COORDINATES: 41°40'40"N,71°0'40"W



U.S.G.S. QUADRANGLE: FALL RIVER EAST, MA

HALEY & ALDRICH

CECIL SMITH LANDFILL
452 OLD FALL RIVER ROAD
DARTMOUTH, MASSACHUSETTS

PROJECT LOCUS

SCALE: 1:24,000
JUNE 2013

FIGURE 1

39899-010 1.PDF

LEGEND:

HA-1 — DESIGNATION AND APPROXIMATE LOCATION OF OBSERVATION WELL INSTALLED BY GEOLOGIC EARTH EXPLORATION, INC. OF NORFOLK, MASSACHUSETTS AND MONITORED BY HALEY & ALDRICH, INC. DURING THE PERIOD 22 THROUGH 24 MAY 2013

SGA-05S — DESIGNATION AND APPROXIMATE LOCATION OF EXISTING MONITORING WELL

SGA-05D — DESIGNATION OF EXISTING MONITORING WELL NOT LOCATED IN FIELD

DW-1 — DESIGNATION AND APPROXIMATE LOCATION OF DRINKING WATER SUPPLY WELL

NOTES:

1. IMAGE, DATED 2 APRIL 2012, TAKEN ELECTRONICALLY FROM GOOGLE EARTH PRO.
2. SITE FEATURES TAKEN FORM PLAN TITLED "CECIL SMITH LANDFILL-CORRECRTIVE ACTION DESIGN, EXISTING CONDITIONS PLAN", DATED 11 JANUARY 2013, BY SITEC ENVIRONMENTAL OF MARSHFIELD, MASSACHUSETTS.
3. MONITORING WELL LOCATIONS TAKEN FROM PLAN TITLED: "MONITORING WELL AND SURFACE WATER ELEVATION DATA", PREPARED BY SITEC ENVIRONMENTAL OF MARSHFIELD, MASSACHUSETTS, DATED 17 JUNE 2013.

0 150 300 450 600
SCALE IN FEET

HALEY & ALDRICH

CECIL SMITH LANDFILL
452 OLD FALL RIVER ROAD
DARTMOUTH, MASSACHUSETTS

SITE AND SUBSURFACE
EXPLORATION LOCATION PLAN

SCALE: AS SHOWN
JUNE 2013

FIGURE 2

J:\GRAPHICS\39899\39899-010-D004.DWG

Photograph 1. Photograph of 'Perennial Stream' on SE perimeter of facility. Note the presence of cobble, riffles, snags and woody debris. The banks of the stream are very stable and the water appears clear and well oxygenated.

Photograph 2. Photograph of 'Perennial Stream' at the NW perimeter of facility (near debris encroachment). This section is deeper and borders typical palustrine emergent wetland to the west. The stream ecology in this area does not appear to be affected by the presence of debris.

APPENDIX A

Observation Well Installation Logs and Well Sampling Logs

HALEY & ALDRICH

LOW-FLOW GROUNDWATER SAMPLING RECORD

HA-6

PROJECT	452 OLD FALL RIVER ROAD	**H&A FILE NO.**	39899-010
LOCATION	DARTMOUTH, MA	**PROJECT MGR.**	M. RICHARDS
CLIENT	BOSTON ENVIRONMENTAL CORPORATION	**FIELD REP**	M. DODSON
CONTRACTOR	HALEY & ALDRICH, INC.	**DATE**	5/29/2013

GROUNDWATER SAMPLING INFORMATION

Well ID	HA-6	
Depth Of Well (ft.) per Log		
Reference Mark	riser	
Depth to Water from Reference Mark (ft.)	6.16 5/29/13 6.03 (5/30/13)	
Time	1115	
Depth to Product (ft.)	ND	
Field Measured Depth Of Well (ft.)	12.28	
Inside Diameter (in.)	2	
Standing Water Depth (ft.)	6.25	
Volume Of Water In Well (gallons/liters)	1.0 gal / 3.79L	
Purging Device	peristaltic	
Volume of Bailer/Pump Capacity	variable	
Cleaning Procedure	N/A	
Bails Removed/ Volume Removed	approximately 4.0 gal and Suite	
Time Purging Started	1120	
Time Purging Stopped	1310- samples collected "on paper" at 1250 due to slow pumprate	
Instrument Used to Monitor Field Parameters	YSI 556MPS	
Sampling Device	tubing	
Cleaning Procedure	dedicated	
Color	light brown to clear	
Odor	none	

TIME SAMPLES TAKEN		
	full suite	CO_2: 1.1%
		CH4: ND
		H_2S: ND
		O_2: 20.5%
		PID 10.6 EV 1.6/0.0 ppm

PARAMETERS													
Time	1125	1135	1145	1155	1200	1205	1210	1215				
Temp, C	13.79	13.80	13.78	14.00	13.67	13.69	13.90	13.85				
Conductivity (umhos/cm)	0.064	0.065	0.065	0.066	0.066	0.067	0.067	0.068				
Dissolved Oxygen (mg/L)	1.08	0.70	0.54	0.50	0.49	0.47	0.46	0.45				
pH	Malfunctioning											
ORP	79.9	105.7	136.0	137.4	142.4	146.2	149.6	147.3				
Drawdown (Ft)	6.30	6.30	6.31	6.32	6.27	6.23	6.22	6.22				
Volume purged (L)	1.89	4.73	7.57	10.40	12.11	12.87	13.63	14.38				
Turbidity (NTU)	57.50	21.80	16.00	11.6*	10.70	9.67	9.42	9.83*				

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

* denotes reduced flow rate, unable to reduce turbidity at reasonable flow rate

HALEY & ALDRICH

LOW-FLOW GROUNDWATER SAMPLING RECORD

HA-5

PROJECT	452 OLD FALL RIVER ROAD	**H&A FILE NO.**	39899-010
LOCATION	DARTMOUTH, MA	**PROJECT MGR.**	M. RICHARDS
CLIENT	BOSTON ENVIRONMENTAL CORPORATION	**FIELD REP**	M. DODSON
CONTRACTOR	HALEY & ALDRICH, INC.	**DATE**	5/29/2013

GROUNDWATER SAMPLING INFORMATION

Well ID	HA-5	
Depth Of Well (ft.) per Log		
Reference Mark	riser	
Depth to Water from Reference Mark (ft.)	5.57 5/29/13; 5.52 (5/31/13)	
Time	0850	
Depth to Product (ft.)	ND	
Field Measured Depth Of Well (ft.)	13.1	
Inside Diameter (in.)	2	
Standing Water Depth (ft.)	7.58	
Volume Of Water In Well (gallons/liters)	1.2 gal / 4.54L	
Purging Device	peristaltic	
Volume of Bailer/Pump Capacity	variable	
Cleaning Procedure	N/A	
Bails Removed/ Volume Removed	16.66L and suite	
Time Purging Started	9000	
Time Purging Stopped	1030	
Instrument Used to Monitor Field Parameters	YSI 556MPS	
Sampling Device	tubing	
Cleaning Procedure	dedicated	
Color	light brown to clear	
Odor	none	

TIME SAMPLES TAKEN		
	full suite	CO_2: 0.7%
		CH4: ND
		H_2S: ND
		O_2: 20.6%
		PID 10.6 EV 1.7/0.0

PARAMETERS													
Time	0905	0915	0925	0930	0935	0940	0945	0950	0955				
Temp, C	14.20	13.76	13.92	14.00	14.14	14.04	14.10	14.15	14.20				
Conductivity (umhos/cm)	0.313	0.287	0.299	0.317	0.321	0.322	0.340	0.345	0.346				
Dissolved Oxygen (mg/L)	0.98	0.30	0.18	0.17	0.15	0.14	0.13	0.13	0.12				
pH	7.81	6.85	6.19	6.10	6.06	6.05	6.03	6.02	6.01				
ORP	14.5	14.0	16.7	21.7	24.0	26.1	27.2	28.0	28.7				
Drawdown (Ft)	5.55	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56				
Volume purged (L)	0.95	3.79	6.62	8.33	10.22	11.73	13.63	15.14	16.66				
Turbidity (NTU)	85.10	26.30	15.10	12.70	8.10	7.21	5.98	5.31	4.70				

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

HALEY & ALDRICH

LOW-FLOW GROUNDWATER SAMPLING RECORD

SGA-01D

PROJECT	452 OLD FALL RIVER ROAD	**H&A FILE NO.**	39899-010
LOCATION	DARTMOUTH, MA	**PROJECT MGR.**	M. RICHARDS
CLIENT	BOSTON ENVIRONMENTAL CORPORATION	**FIELD REP**	M. DODSON
CONTRACTOR	HALEY & ALDRICH, INC.	**DATE**	5/29/2013

GROUNDWATER SAMPLING INFORMATION

Well ID	SGA-01D	SGA-01D 5/31/13
Depth Of Well (ft.) per Log		
Reference Mark	riser	riser
Depth to Water from Reference Mark (ft.)	5.24 5/29/13	5.1 5/31/13
Time		0900
Depth to Product (ft.)		-
Field Measured Depth Of Well (ft.)	53.1	53.1
Inside Diameter (in.)		2
Standing Water Depth (ft.)		48
Volume Of Water In Well (gallons/liters)		7.8 gal / 29.6L
Purging Device		peristaltic
Volume of Bailer/Pump Capacity		-
Cleaning Procedure		dedicated
Bails Removed/ Volume Removed		88 + liters
Time Purging Started		915
Time Purging Stopped		1125
Instrument Used to Monitor Field Parameters		YSI
Sampling Device		waterra
Cleaning Procedure		dedicated
Color		clear
Odor		none
TIME SAMPLES TAKEN	1130 hrs	CO_2: 0.0%
		CH4: ND
		H_2S: ND
		O_2: 21.0%

PARAMETERS														
Time	0920*	0930*	0940*	0950*	1000*	1010*	1020*	1030*	1040*	1050*	1100*	1105	1110	1115
Temp, C	11.40	11.40	11.40	11.40	11.40	11.40	11.40	11.50	11.60	11.5	11.5	11.6	11.7	11.8
Conductivity (umhos/cm)	170	167	170	170	170	171	171	173	174	175	176	176	176	176
Dissolved Oxygen (mg/L)	8.21	4.97	3.21	3.33	3.30	3.33	3.21	2.95	2.98	2.98	3.08	2.96	2.95	3.02
pH	8.85	7.95	7.32	7.12	7.01	6.99	6.94	6.91	6.88	6.85	6.79	6.8	6.81	6.79
ORP	159.0	163.0	170.0	169.0	169.0	168.0	167.5	166.6	166	165	164	164	163.9	163.5
Drawdown (Ft)	1.00	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	0.25	0.25	0.25
Volume purged (L)	2.00	10.00	18.00	26.00	34.00	42.00	50.00	58.00	66	74	82	83	84	85
Turbidity (NTU)	25.0	19.0	11.0	8.0	5.0	4.6	4.2	3.5	3.2	3.0	3.0	2.2	2.1	1.8

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

* denotes running pump on high. Post Hach Reading: 1.6 NTU's

HALEY & ALDRICH

LOW-FLOW GROUNDWATER SAMPLING RECORD

SGA-01S

PROJECT	452 OLD FALL RIVER ROAD	**H&A FILE NO.**	39899-010
LOCATION	DARTMOUTH, MA	**PROJECT MGR.**	M. RICHARDS
CLIENT	BOSTON ENVIRONMENTAL CORPORATION	**FIELD REP**	M. DODSON
CONTRACTOR	HALEY & ALDRICH, INC.	**DATE**	5/29/2013

GROUNDWATER SAMPLING INFORMATION

Well ID	SGA-01S	SGA-01S
Depth Of Well (ft.) per Log		
Reference Mark	riser	riser
Depth to Water from Reference Mark (ft.)	4.65 5/29/13	4.5 5/31/13
Time		0905
Depth to Product (ft.)		-
Field Measured Depth Of Well (ft.)	14.53	14.53
Inside Diameter (in.)		2
Standing Water Depth (ft.)		10.03
Volume Of Water In Well (gallons/liters)		1.63 gal/ 6.18 L
Purging Device		peristaltic
Volume of Bailer/Pump Capacity		-
Cleaning Procedure		dedicate
Bails Removed/ Volume Removed		
Time Purging Started		1200
Time Purging Stopped		1255
Instrument Used to Monitor Field Parameters	YSI	YSI
Sampling Device	waterra	waterra
Cleaning Procedure	(ditritus)	(ditritus)
Color	ORGANICS to clear	ORGANICS to clear
Odor	rusty odor	rusty odor
TIME SAMPLES TAKEN: VOA	1300	CO_2: 0.0% 5/29/13
TIME SAMPLES TAKEN: ABN		CH4: ND 5/29/13
TIME SAMPLES TAKEN: Metals		H_2S: ND 5/29/13
TIME SAMPLES TAKEN:		O_2: 21.0% 5/29/13
TIME SAMPLES TAKEN:		
TIME SAMPLES TAKEN:		

PARAMETERS												
Time	1205	1210	1215	1220	1225	1230	1235	1240	1245			
Temp, C	11.6	11.7	11.7	12.0	12.3	12.3	12.2	12.3	12.3			
Conductivity (umhos/cm)	76.0	78.0	79.0	79.0	79.0	79.4	78.9	78.8	78.5			
Dissolved Oxygen (mg/L)	2.10	1.45	1.33	1.32	0.96	1.01	1.01	0.96	0.93			
pH	6.12	5.70	5.60	5.33	5.25	5.23	5.20	5.21	5.18			
ORP	89.8	96.0	97.0	97.0	97.0	96.7	96.1	96.5	96.2			
Drawdown (Ft)	0.5	0	0	0	0	0	0	0	0			
Volume purged (L)	1.00	3.00	5.00	7.00	9.00	10.00	11.00	12.00	13.00			
Turbidity (NTU)	6.0	6.0	6.0	5.0	5.0	4.5	4.0	4.0	3.5			

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

Post HACH reading: 4 NTU's

HALEY & ALDRICH

LOW-FLOW GROUNDWATER SAMPLING RECORD

MW-6

PROJECT	452 OLD FALL RIVER ROAD	**H&A FILE NO.**	39899-010
LOCATION	DARTMOUTH, MA	**PROJECT MGR.**	M. RICHARDS
CLIENT	BOSTON ENVIRONMENTAL CORPORATION	**FIELD REP**	M. DODSON
CONTRACTOR	HALEY & ALDRICH, INC.	**DATE**	5/29/2013

GROUNDWATER SAMPLING INFORMATION

Well ID	MW-6	
Depth Of Well (ft.) per Log		
Reference Mark	top of riser	
Depth to Water from Reference Mark (ft.)	4.81	
Time	0915	
Depth to Product (ft.)	-	
Field Measured Depth Of Well (ft.)	15.15	
Inside Diameter (in.)	2	
Standing Water Depth (ft.)	10.34	
Volume Of Water In Well (gallons/liters)	1.68 gal/ 6.35 L	
Purging Device	peristaltic	
Volume of Bailer/Pump Capacity	-	
Cleaning Procedure	dedicated	
Bails Removed/ Volume Removed	12+ L	
Time Purging Started	925	
Time Purging Stopped	1015	
Instrument Used to Monitor Field Parameters	YSI	
Sampling Device	waterra	
Cleaning Procedure	dedicated	
Color	light brown to clear	
Odor	none	
TIME SAMPLES TAKEN	1030	
		CO_2: 0.5%
		CH4: ND
		H_2S: ND
		O_2: 20.6%
		HNU: 1.8 ppm

PARAMETERS												
Time	0930	0940	0945	0950	0955	1000	1005	1010	1015			
Temp, C	12	12.4	12.9	12.9	12.8	12.7	12.7	12.8	12.8			
Conductivity (umhos/cm)	94.1	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0			
Dissolved Oxygen (mg/L)	9.44	4.97	4.64	4.30	4.20	3.99	3.85	3.79	3.75			
pH	8.57	7.33	6.77	6.52	6.33	6.15	6.05	6.01	6.00			
ORP	74.2	121.0	121.0	123.0	127.0	129.0	120.0	122.0	124.0			
Drawdown (Ft)	0	0.5	0	0	0	0	0	0	0			
Volume purged (L)	1	3	5	7	8	9	10	11	12			
Turbidity (NTU)	48.0	30.0	9.0	6.0	5.5	3.0	3.0	3.0	3.5			

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

Note: Excellent well recharge. Post HACH: 2.5 NTU's

HALEY & ALDRICH

LOW-FLOW GROUNDWATER SAMPLING RECORD

HA-3

PROJECT	452 OLD FALL RIVER ROAD	**H&A FILE NO.**	39899-010
LOCATION	DARTMOUTH, MA	**PROJECT MGR.**	M. RICHARDS
CLIENT	BOSTON ENVIRONMENTAL CORPORATION	**FIELD REP**	M. DODSON
CONTRACTOR	HALEY & ALDRICH, INC.	**DATE**	5/29/2013

GROUNDWATER SAMPLING INFORMATION

Well ID	HA-3	
Depth Of Well (ft.) per Log		
Reference Mark	top of riser	
Depth to Water from Reference Mark (ft.)	10.3 5/29/13	
Time	1245	
Depth to Product (ft.)	-	
Field Measured Depth Of Well (ft.)	18.1	
Inside Diameter (in.)	2	
Standing Water Depth (ft.)	7.79	
Volume Of Water In Well (gallons/liters)	1.27 gal / 4.8 L x 3 w.v.= 14.4 L+ 3 well volumes	
Purging Device	peristaltic	
Volume of Bailer/Pump Capacity		
Cleaning Procedure	dedicated	
Bails Removed/ Volume Removed	14 + L	
Time Purging Started	1245	
Time Purging Stopped	1355	
Instrument Used to Monitor Field Parameters	YSI	
Sampling Device	waterra	
Cleaning Procedure	dedicated	
Color	orange-brown (silty)	
Odor	no odor	

TIME SAMPLES TAKEN		
	1400	CO_2: 0.6%
		CH4: ND
		H_2S: ND
		O_2: 20.1%
		HNU: 2.8 ppm

PARAMETERS													
Time	1250	1255	1300	1305	1310	1315	1325	1335	1345	1355		
Temp, C	10.8	11.6	11.9	12.0	11.7	11.9	11.7	11.9	11.7			
Conductivity (umhos/cm)	541	552	557	557	554	556	557	557	557			
Dissolved Oxygen (mg/L)	4.49	4.32	3.83	3.49	3.24	3.00	2.80	2.80	2.80			
pH	6.32	6.20	6.20	6.20	6.20	6.20	6.20	6.20	6.20			
ORP	129.8	136.1	137.1	139.0	138.0	137.6	137.9	137.4	137.4			
Drawdown (Ft)	0.5	0.5	0	0	0	0	0	0	0			
Volume purged (L)	1	2	3	4	5	6	8	10	12	14 +		
Turbidity (NTU)	709	427	259	87	58	33	25	11	6	4		

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

Post HACH reading- 3.28 NTU's

HALEY & ALDRICH

LOW-FLOW GROUNDWATER SAMPLING RECORD

HA-4

PROJECT	452 OLD FALL RIVER ROAD	**H&A FILE NO.**	39899-010
LOCATION	DARTMOUTH, MA	**PROJECT MGR.**	M. RICHARDS
CLIENT	BOSTON ENVIRONMENTAL CORPORATION	**FIELD REP**	M. DODSON
CONTRACTOR	HALEY & ALDRICH, INC.	**DATE**	5/29/2013

GROUNDWATER SAMPLING INFORMATION

Well ID	HA-4	
Depth Of Well (ft.) per Log		
Reference Mark	riser	
Depth to Water from Reference Mark (ft.)	6.7	
Time	0900	
Depth to Product (ft.)	-	
Field Measured Depth Of Well (ft.)	13.4	
Inside Diameter (in.)	2	
Standing Water Depth (ft.)	6.7	
Volume Of Water In Well (liters)	4.16L	
Purging Device	peristaltic	
Volume of Bailer/Pump Capacity	variable	
Cleaning Procedure	N/A	
Bails Removed/ Volume Removed	10L + suite	
Time Purging Started	910	
Time Purging Stopped	1015	
Instrument Used to Monitor Field Parameters	YSI 556 mps	
Sampling Device	tubing	
Cleaning Procedure	dedicated	
Color	cloudy to clear	
Odor	none	

TIME SAMPLES TAKEN		
	full suite	CO_2: 0.4%
		CH4: ND
		H_2S: ND
		O_2: 021.6%

PARAMETERS													
Time	0915	0920	0925	0930	0935	0940	0945						
Temp, C	11.91	11.85	11.80	11.83	11.70	11.79	11.75						
Conductivity (umhos/cm)	0.239	0.247	0.256	0.265	0.277	0.280	0.285						
Dissolved Oxygen (mg/L)	0.59	0.32	0.30	0.29	0.28	0.27	0.26						
pH	6.99	6.37	6.21	5.79	5.60	5.58	5.58						
ORP	161.4	156.0	147.3	143.9	138.4	133.4	133.4						
Drawdown (Ft)	6.75	6.75	6.75	6.75	6.75	6.75	6.75						
Volume purged (L)	1.3	2.6	3.9	5.2	6.5	7.9	9.3						
Turbidity (NTU)	41.00	25.30	13.00	7.09	5.03	4.28	3.67						

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

HALEY & ALDRICH

LOW-FLOW GROUNDWATER SAMPLING RECORD

MW-5

PROJECT	452 OLD FALL RIVER ROAD	**H&A FILE NO.**	39899-010
LOCATION	DARTMOUTH, MA	**PROJECT MGR.**	M. RICHARDS
CLIENT	BOSTON ENVIRONMENTAL CORPORATION	**FIELD REP**	M. DODSON
CONTRACTOR	HALEY & ALDRICH, INC.	**DATE**	5/29/2013

GROUNDWATER SAMPLING INFORMATION

Well ID	MW-5	
Depth Of Well (ft.) per Log		
Reference Mark	riser	
Depth to Water from Reference Mark (ft.)	5.61	
Time	1115	
Depth to Product (ft.)	ND	
Field Measured Depth Of Well (ft.)	16.11 (riser)	
Inside Diameter (in.)	2	
Standing Water Depth (ft.)	10.5	
Volume Of Water In Well (liters)	6.44L	
Purging Device	peristaltic	
Volume of Bailer/Pump Capacity	variable	
Cleaning Procedure	N/A	
Bails Removed/ Volume Removed	20.5 L + suite	
Time Purging Started	1120	
Time Purging Stopped	1245	
Instrument Used to Monitor Field Parameters	YSI 556MPS	
Sampling Device	tubing	
Cleaning Procedure	dedicated	
Color	red-brown with sediment	
Odor	none	

TIME SAMPLES TAKEN		
		CO_2: 0.5%
		CH4: ND
		H_2S: ND
		O_2: 20.7%

PARAMETERS												
Time	1125	1135	1145	1150	1200	1205	1210	1215	1220			
Temp, C	15.11	13.33	12.02	11.76	11.72	11.68	11.82	11.73	11.71			
Conductivity (umhos/cm)	0.205	0.128	0.104	0.077	0.016	0.077	0.077	0.077	0.077			
Dissolved Oxygen (mg/L)	1.95	0.95	0.58	0.57	0.56	0.56	0.55	0.54	0.53			
pH	5.56	4.74	4.60	4.41	4.21	4.30	4.32	4.34	4.36			
ORP	215.3	229.0	232.4	227.1	227.0	226.8	219.0	218.1	214.5			
Drawdown (Ft)	5.67	5.67	5.67	5.67	5.67	5.67	5.67	5.67	5.67			
Volume purged (L)	0.5	4.5	8.5	10.5	12.5	14.5	16.5	18.5	20.5			
Turbidity (NTU)	53.40	38.00	18.20	10.90	6.32	5.50	4.44	4.21	4.03			

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

HALEY & ALDRICH

LOW-FLOW GROUNDWATER SAMPLING RECORD

HA-1

PROJECT	452 OLD FALL RIVER ROAD	**H&A FILE NO.**	39899-010
LOCATION	DARTMOUTH, MA	**PROJECT MGR.**	M. RICHARDS
CLIENT	BOSTON ENVIRONMENTAL CORPORATION	**FIELD REP**	M. DODSON
CONTRACTOR	HALEY & ALDRICH, INC.	**DATE**	5/29/2013

GROUNDWATER SAMPLING INFORMATION

Well ID	HA-1	
Depth Of Well (ft.) per Log		
Reference Mark	top of riser	
Depth to Water from Reference Mark (ft.)	5.53	
Time	0855	
Depth to Product (ft.)	-	
Field Measured Depth Of Well (ft.)	14.6	
Inside Diameter (in.)	2	
Standing Water Depth (ft.)	9.07	
Volume Of Water In Well (gallons/liters)	1.47 gal/ 5.59 L x 3w.v. = 16.77 L	
Purging Device	peristaltic	
Volume of Bailer/Pump Capacity	-	
Cleaning Procedure	dedicated	
Bails Removed/ Volume Removed	20+ L	
Time Purging Started	900	
Time Purging Stopped	1005	
Instrument Used to Monitor Field Parameters	YSI	
Sampling Device	waterra	
Cleaning Procedure	dedicated	
Color	light gray to gray-brown	
Odor	none	

TIME SAMPLES TAKEN		
	1015	CO_2: 0.2%
		CH4: ND
		H_2S: ND
		O_2: 20.3%
		MiniRae 2000 reading = 2.2 ppm

PARAMETERS													
Time	0905	0915	0925	0935	0940	0945	0950	0955	1000	1005	1010		
Temp, C	11.6	11.6	11.7	11.7	11.8	11.7	11.7	11.8	11.7	11.7			
Conductivity (umhos/cm)	840	857	855	854	854	855	859	860	861	862			
Dissolved Oxygen (mg/L)	2.18	1.31	0.85	0.58	0.46	0.41	0.39	0.35	0.34	0.33			
pH	6.94	6.46	6.36	6.34	6.33	6.33	6.33	6.33	6.33	6.33			
ORP	109.6	91.4	64.7	42.7	36.0	32.0	31.0	24.0	29.0	28.0			
Drawdown (Ft)	0	0.5	0.5	0	0	0	0	0	0	0			
Volume purged (L)	1	5	10	12	14	16	17	18	19	20			
Turbidity (NTU)	168	81	28	14	6	6	4	4	3.8	3.5			

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

Post HACH reading: 2.39 NTU's

HALEY & ALDRICH

LOW-FLOW GROUNDWATER SAMPLING RECORD

HA-2

PROJECT	452 OLD FALL RIVER ROAD	**H&A FILE NO.**	39899-010
LOCATION	DARTMOUTH, MA	**PROJECT MGR.**	M. RICHARDS
CLIENT	BOSTON ENVIRONMENTAL CORPORATION	**FIELD REP**	M. DODSON
CONTRACTOR	HALEY & ALDRICH, INC.	**DATE**	5/29/2013

GROUNDWATER SAMPLING INFORMATION

Well ID	HA-2	
Depth Of Well (ft.) per Log		
Reference Mark	top or riser	
Depth to Water from Reference Mark (ft.)	4.95	
Time	1130	
Depth to Product (ft.)	-	
Field Measured Depth Of Well (ft.)	14.5	
Inside Diameter (in.)	2	
Standing Water Depth (ft.)	9.55	
Volume Of Water In Well (gallons/liters)	1.55 gal / 5.89 L x 3 w.v. = 17.67 L	
Purging Device	peristaltic	
Volume of Bailer/Pump Capacity	-	
Cleaning Procedure	dedicated	
Bails Removed/ Volume Removed	12 L	
Time Purging Started	1135	
Time Purging Stopped	1215	
Instrument Used to Monitor Field Parameters	YSI	
Sampling Device	waterra	
Cleaning Procedure	dedicated	
Color	clear	
Odor	none	
TIME SAMPLES TAKEN	1235	

PARAMETERS												
Time	1135	1145	1155	1200	1205	1210	1215					
Temp, C	12.3	12.1	12.3	12.5	12.4	12.6	12.6					
Conductivity (umhos/cm)	674	672	677	681	680	682	685					
Dissolved Oxygen (mg/L)	4.91	2.07	1.48	1.26	1.00	0.88	0.79					
pH	7.0	6.5	6.4	6.4	6.4	6.4	6.4					
ORP	66	46	42	39	37	34	34					
Drawdown (Ft)	0	0.5	0.5	0	0	0	0					
Volume purged (L)	0.5	3	6	8	10	11	12					
Turbidity (NTU)	43	13	7	5	4	3	3					

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

HNU reading: 2.6 ppm; post HACH reading: 2.6 NTU's

HALEY & ALDRICH

LOW-FLOW GROUNDWATER SAMPLING RECORD

SGA-03

PROJECT	452 OLD FALL RIVER ROAD	**H&A FILE NO.**	39899-010
LOCATION	DARTMOUTH, MA	**PROJECT MGR.**	M. RICHARDS
CLIENT	BOSTON ENVIRONMENTAL CORPORATION	**FIELD REP**	M. DODSON
CONTRACTOR	HALEY & ALDRICH, INC.	**DATE**	5/29/2013

GROUNDWATER SAMPLING INFORMATION

Well ID	SGA-03	
Depth Of Well (ft.) per Log		
Reference Mark	top of riser	
Depth to Water from Reference Mark (ft.)	6.265	
Time	1205	
Depth to Product (ft.)	-	
Field Measured Depth Of Well (ft.)	21.1	
Inside Diameter (in.)	2	
Standing Water Depth (ft.)	14.84	
Volume Of Water In Well (gallons/liters)	2.418 gal x 3 = 7.25 gal / 27.4 L (3 well volumes)	
Purging Device	peristaltic pump	
Volume of Bailer/Pump Capacity	-	
Cleaning Procedure	dedicated	
Bails Removed/ Volume Removed		
Time Purging Started	1215	
Time Purging Stopped		
Instrument Used to Monitor Field Parameters	YSI	
Sampling Device	waterra	
Cleaning Procedure	dedicated	
Color	clear with trace ORGANIC detritus	
Odor		

TIME SAMPLES TAKEN		
VOA	1345	CO_2: 1.6%
ABN		CH4: ND
Metals		H_2S: ND
		O_2: 19.0%
		MiniRae 2000 reading = 6.2 ppm upon opening well cap

PARAMETERS												
Time	1220	1230	1240	1250	1300	1310	1320	1325	1330*			
Temp, C	10.9	11.3	11.5	11.2	11.2	11.2	11.3	11.3	11.2			
Conductivity (umhos/cm)	376.5	377.2	382.7	378.7	376.5	374.8	374.6	372.4	371.1			
Dissolved Oxygen (mg/L)	2.92	2.53	1.86	1.24	0.96	0.80	0.80	0.81	0.83			
pH	7.77	7.06	6.67	6.56	6.52	6.52	6.51	6.51	6.51			
ORP	169.3	177.7	175.3	171.6	165.6	162.6	159.9	157.1	156.6			
Drawdown (Ft)	0	0	0	0	0	0	0	0	0			
Volume purged (L)	1	3	6	10	15	20	25	26	27			
Turbidity (NTU)	25.8	20.4	8.75	4.7	3.39	4.14	2.69	2.15	2.06			

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

*3 well volumes Note: Excellent recharge. Post HACH reading: 2.38 NTU's

HALEY & ALDRICH

LOW-FLOW GROUNDWATER SAMPLING RECORD

MW-7

PROJECT	452 OLD FALL RIVER ROAD	**H&A FILE NO.**	39899-010
LOCATION	DARTMOUTH, MA	**PROJECT MGR.**	M. RICHARDS
CLIENT	BOSTON ENVIRONMENTAL CORPORATION	**FIELD REP**	M. DODSON
CONTRACTOR	HALEY & ALDRICH, INC.	**DATE**	5/30/2013

GROUNDWATER SAMPLING INFORMATION

Well ID	MW-7	
Depth Of Well (ft.) per Log		
Reference Mark	top of riser	
Depth to Water from Reference Mark (ft.)	9.50 5/29/13; 9.43 5/30/13	
Time	1230	
Depth to Product (ft.)	ND	
Field Measured Depth Of Well (ft.)	18.03	
Inside Diameter (in.)	2	
Standing Water Depth (ft.)	8.53	
Volume Of Water In Well (liters)	5.30L	
Purging Device	peristaltic pump	
Volume of Bailer/Pump Capacity	-	
Cleaning Procedure	N/A	
Bails Removed/ Volume Removed	full suite + 4.5L	
Time Purging Started	1235	
Time Purging Stopped	1410	
Instrument Used to Monitor Field Parameters	YSI 556 MPS	
Sampling Device	Tubing	
Cleaning Procedure	dedicated	
Color	light brown	
Odor	none	

TIME SAMPLES TAKEN		
	full suite	CO_2: 0.6%
		CH4: ND
		H_2S: ND
		O_2: 20.6%
		PID 10.6EV (PPM) = ND

PARAMETERS												
Time	1240	1250	1300	1310	1320	1325	1330	1335				
Temp, C	11.50	12.35	12.93	13.37	13.61	13.38	13.65	13.60				
Conductivity (umhos/cm)	0.160	0.150	0.150	0.149	1.149	1.149	1.149	1.151				
Dissolved Oxygen (mg/L)	0.30	0.25	0.24	0.22	0.22	0.23	0.24	0.24				
pH	5.60	5.40	5.17	5.10	5.04	5.20	5.21	5.22				
ORP	175.2	179.0	163.0	85.0	19.0	27.4	31.2	33.9				
Drawdown (Ft)	10.4	10.3	10.25	10.1	10.1	10.1	10.1	10.1				
Volume purged (L)	1.14	5.68	9.84	11.73	13.63	14.76	15.52	16.66				
Turbidity (NTU)	345.00	62.10	8.94	5.77	5.16	4.01	3.10	1.71				

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

Note: Unable to reduce drawdown at reasonable pump rate.

HALEY & ALDRICH

LOW-FLOW GROUNDWATER SAMPLING RECORD

SGA-04

PROJECT	452 OLD FALL RIVER ROAD	**H&A FILE NO.**	39899-010
LOCATION	DARTMOUTH, MA	**PROJECT MGR.**	M. RICHARDS
CLIENT	BOSTON ENVIRONMENTAL CORPORATION	**FIELD REP**	M. DODSON
CONTRACTOR	HALEY & ALDRICH, INC.	**DATE**	5/30/2013

GROUNDWATER SAMPLING INFORMATION

Well ID	SGA-04	
Depth Of Well (ft.) per Log		
Reference Mark	top of riser (+2.10)	
Depth to Water from Reference Mark (ft.)	3.45	
Time	0920	
Depth to Product (ft.)	ND	
Field Measured Depth Of Well (ft.)	21.47	
Inside Diameter (in.)	2	
Standing Water Depth (ft.)	18.02	
Volume Of Water In Well (liters)	10.98L	
Purging Device	peristaltic	
Volume of Bailer/Pump Capacity	-	
Cleaning Procedure	N/A	
Bails Removed/ Volume Removed	sample suite + 8.5L	
Time Purging Started	1013	
Time Purging Stopped	1125	
Instrument Used to Monitor Field Parameters	YSI 556 MPS	
Sampling Device	Tubing	
Cleaning Procedure	dedicated	
Color	cloudy to clear	
Odor	none	

TIME SAMPLES TAKEN		
	full suite	CO_2: 0.4%
		CH4: ND
		H_2S: ND
		O_2: 20.7%
		PID 10.6EV = 0.8ppm

PARAMETERS													
Time	1020	1027	1037	1047	1052	1057	1102						
Temp, C	10.16	10.01	10.13	10.23	10.18	10.18	10.28						
Conductivity (umhos/cm)	0.093	0.080	0.080	0.081	0.082	0.082	0.083						
Dissolved Oxygen (mg/L)	0.98	0.63	0.62	0.63	0.64	0.65	0.64						
pH	6.18	5.38	5.60	5.21	5.19	5.18	5.17						
ORP	285.6	273.3	256.5	254.1	258.1	250.9	249.1						
Drawdown (Ft)	3.56	3.56	3.52	3.52	3.52	3.52	3.52						
Volume purged (L)	1.89	7.57	14.01	20.82	24.23	27.63	31.04						
Turbidity (NTU)	7.50	1.25	0.80	0.61	0.91	0.87	0.92						

Remarks: (ie: field filtrations, persons communicated with at site, etc.)

HALEY & ALDRICH

TEST BORING REPORT

Boring No. HA-1 (OW)

Project 452 OLD FALL RIVER ROAD, DARTMOUTH, MA
Client BOSTON ENVIRONMENTAL CORP.
Contractor GEOLOGIC EARTH EXPLORATIONS, INC.

File No. 39899-010
Sheet No. 1 of 1
Start May 24, 2013
Finish May 24, 2013
Driller J. Raymond
H&A Rep. M. Dodson
Elevation
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	-	Rig Make & Model: CME 75 on Track
Inside Diameter (in.)	4.25	1 3/8	-	Bit Type: Cutting Head Drill Mud: None
Hammer Weight (lb)	SPUN	140	-	Casing: HSA Spun to 10 ft
Hammer Fall (in.)	-	30	-	Hoist/Hammer: Winch Automatic Hammer PID Make & Model: MiniRAE 2000 10.6 eV

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	WOH/12" 1/12"	S1 8	0.0 2.0	ML/OH/OH/SM		Very soft gray-brown sandy SILT/ORGANIC SOIL (ML/OL/OH), disturbed with silty SAND (SM), mps 0.5 in., organic odor, wet PID = 0.7/0.0 ppm		5	10	10	25	50				
	1 2 1 1	S2 8	2.0 4.0	ML/OH/OH/SM		Similar to above except mps 1.3 in., trace brick fragments/particles PID = 0.8/0.0 ppm -FILL-										
5	WOH 1/18"	S3 6	4.0 6.0	OL/OH	4.0	Very soft dark brown ORGANIC SOIL (OL/OH), organic odor, wet, 40% peat and organic debris PID = 0.6/0.0 ppm -ORGANIC DEPOSITS-						100	N	L	L	
	WOH 1	S4 10	6.0 7.0	OL/OH		Similar to above except 25% peat and organic debris PID = 0.8/0.0 ppm						100	S	L	L	
	3 6	S4A 8	7.0 8.0	SP	7.0	Loose light gray-brown poorly graded SAND (SP), mps 1mm, bedded (organic/silty at top), organic odor, wet					85	15				
	2 2 3 6	S5 18	8.0 10.0	SP		Loose light gray poorly graded SAND (SP), mps 3mm, bedded/stratified, no odor, wet, occasional silty (organic) brown beds and oxidized beds PID = 0.9/0.3 ppm					95	5				
10	1 3 2 5	S6 9	10.0 12.0	SP		Similar to above except no "organic-y" beds or oxidized beds PID = 1.1/ 0.4 ppm -FLUVIAL DEPOSITS-										
					12.0	BOTTOM OF EXPLORATION 12.0 FT Note: Installed 2-in. observation well in completed borehole to 12.0 ft.										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
5/24/13	1155	0.5	installed well		2.5

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 12.0
Rock Cored (ft) -
Samples 6S

Boring No. HA-1 (OW)

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†Note: Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

H&A-TEST BORING-07-1 REV HA-LIB07-1-BOS.GLB HA-TB+CORE+WELL-07-1.GDT G:\39899 DARTMOUTH\0100\GINT AND GROUNDWATER SAMPLING PRINTOUT\39899-010_TB_OW.GPJ Jun 12, 13

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

HALEY & ALDRICH

Well No. HA-1 (OW)
Boring No. HA-1 (OW)

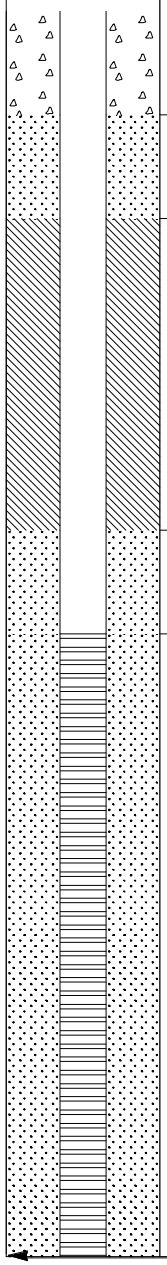
Project 452 OLD FALL RIVER ROAD
Location DARTMOUTH, MA
Client BOSTON ENVIRONMENTAL CORP.
Contractor GEOLOGIC EARTH EXPLORATIONS, INC.
Driller J. Raymond
Initial Water Level (depth bgs) 5.5 ft

Well Diagram
- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

File No. 39899-010
Date Installed 24 May 2013
H&A Rep. M. Dodson
Location See Plan

Ground El.
Datum

SOIL/ROCK CONDITIONS	DEPTH (ft.)	GRAPHIC	WELL DETAILS	DEPTH (ft.)	ELEVATION (ft.)
				0.0	
FILL	4.0			1.0, 2.0, 5.0	
ORGANIC DEPOSITS	7.0			6.0	
FLUVIAL DEPOSITS	12.0			12.0	



WELL CONSTRUCTION DETAILS

Type of protective cover: Standpipe/Masterlock
Height of Standpipe above ground surface: 3.1 ft
Height of top of riser above ground surface: 3.0 ft
Type of protective casing: Standpipe
Length: 5.0 ft
Inside diameter: 4.0 in.
Depth of bottom of Standpipe: 1.9 ft
Type of riser pipe: Schedule 40 PVC
Inside diameter of riser pipe: 2.0 in.
Depth of bottom of riser pipe: 6.0 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Concrete	0.0	1.0
Bentonite	2.0	3.0
	-	-

Diameter of borehole: 8.0 in.
Depth to top of well screen: 6.0 ft
Type of screen: Machine slotted Sch 40 PVC
Screen gauge or size of openings: 0.010 in.
Diameter of screen: 2.0 in.
Type of Backfill around Screen: Filter Sand
Depth to bottom of well screen: 12.0 ft
Bottom of silt trap: -
Depth of bottom of borehole: 12.0 ft

GW INSTALLATION REPORT-07-1 HA-LIB07-1-BOS.GLB HA-TB+CORE+WELL-07-1.GDT G:\39899 DARTMOUTH\0100\GINT AND GROUNDWATER SAMPLING PRINTOUT\39899-010_TB_OW.GPJ Jun 12, 13

TEST BORING REPORT

HALEY & ALDRICH

Boring No. HA-2 (OW)

Project 452 OLD FALL RIVER ROAD, DARTMOUTH, MA
Client BOSTON ENVIRONMENTAL CORP.
Contractor GEOLOGIC EARTH EXPLORATIONS, INC.

File No. 39899-010
Sheet No. 1 of 1
Start May 23, 2013
Finish May 23, 2013
Driller J. Raymond
H&A Rep. M. Dodson
Elevation
Datum
Location Moved approximately 20' SW parallel to landfill edge

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	-	Rig Make & Model: CME 75 on ATV
Inside Diameter (in.)	4.25	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	SPUN	140	-	Drill Mud:
Hammer Fall (in.)	-	30	-	Casing: HSA Spun to 12 ft
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model: MiniRAE 2000 10.6 eV

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Toughness	Plasticity	Strength
0	1 1 2 3	S1 13	0.0 2.0	OL/OH		Soft dark gray-brown sandy ORGANIC SOIL (OL/OH), disturbed, unnatural and organic odor, moist, 5% cinders, ash, trace styrofoam PID = 2.0/0.0 ppm -FILL-		5	5	10	25	55	R			
	2 1 3 1	S2 7	2.0 4.0	OL/OH	2.0	Soft dark gray-brown ORGANIC SOIL 9OL/OH), no structure, possible faint petroleum-like odor, organic odor PID = 1.2/0.0 ppm -ORGANIC DEPOSITS-				5	15	80	N	L	L	
	WOH/18" 1	S3 22	4.0 6.0	PT		Very soft dark brown to black PEAT (PT), no structure, organic odor, wet, top 3 in. black ORGANIC SOIL (OL/OH) PID = 0.5/0.0 ppm						100	N/A			
5	WOH/12" 1	S4 12	6.0 7.5	PT		Similar to above PID = 0.3/0.0 ppm						100	N/A			
	4 WOH 1 1 4	S4A 5 S5 11	7.5 8.0 8.0 10.0	SP-SM SP	7.5 8.0	Loose gray-brown poorly graded SAND with silt (SP-SM), mps 2mm, stratified, organic odor, wet, trace peat fibers, fines highly organic Very loose gray/light gray poorly graded SAND (SP), occasionally with silt, weakly layered, no odor, wet PID = 0.3/0.0 ppm -FLUVIAL DEPOSITS-				10	85	5				
10	6 6 6 6	S6 16	10.0 12.0	SP	12.0	Medium dense light gray poorly graded SAND (SP), mps 3mm, layered/stratified, no odor, wet PID = ND ppm Note: 3 ft of "blow in" during well construction. 12 in. "blow in" after last sample.			5	15	80					

BOTTOM OF EXPLORATION 12.0 FT

Note: Installed 2-in. observation well at 12.0 ft in completed borehole.

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
5/23/13	1500	0.1	installed well		

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 12.0
Rock Cored (ft) -
Samples 6S

Boring No. HA-2 (OW)

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†Note: Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

H&A-TEST BORING-07-1 REV HA-LIB07-1-BOS.GLB HA-TB+CORE+WELL-07-1.GDT G:\39899 DARTMOUTH\0100\GINT AND GROUNDWATER SAMPLING PRINTOUT\39899-010_TB_OW.GPJ Jun 12, 13

HALEY & ALDRICH

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

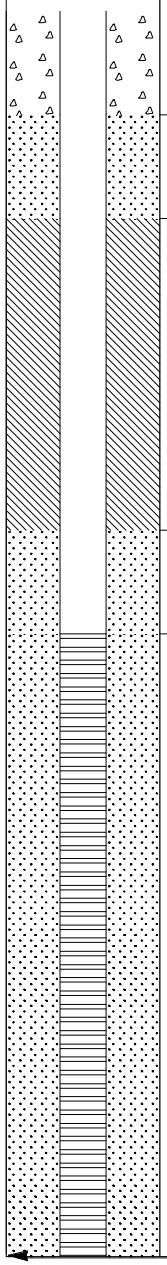
Well No. HA-2 (OW)
Boring No. HA-2 (OW)

Project 452 OLD FALL RIVER ROAD
Location DARTMOUTH, MA
Client BOSTON ENVIRONMENTAL CORP.
Contractor GEOLOGIC EARTH EXPLORATIONS, INC.
Driller J. Raymond
Initial Water Level (depth bgs) 1.9 ft

Well Diagram
- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

File No. 39899-010
Date Installed 23 May 2013
H&A Rep. M. Dodson
Location Moved approximately 20' SW parallel to landfill edge.
Ground El.
Datum

SOIL/ROCK CONDITIONS	DEPTH (ft.)	GRAPHIC	WELL DETAILS	DEPTH (ft.)	ELEVATION (ft.)
				0.0	
FILL	0			1.0	
	2.0			2.0	
ORGANIC DEPOSITS	5			5.0	
				6.0	
	7.5				
FLUVIAL DEPOSITS	10				
	12.0			12.0	



WELL CONSTRUCTION DETAILS

Type of protective cover: Standpipe/Masterlock
Height of Standpipe above ground surface: 3.3 ft
Height of top of riser above ground surface: 3.1 ft
Type of protective casing: Standpipe
Length: 5.0 ft
Inside diameter: 4.0 in.
Depth of bottom of Standpipe: 1.8 ft
Type of riser pipe: Schedule 40 PVC
Inside diameter of riser pipe: 2.0 in.
Depth of bottom of riser pipe: 6.0 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Concrete	0.0	1.0
Bentonite	2.0	3.0
	-	-

Diameter of borehole: 8.0 in.
Depth to top of well screen: 6.0 ft
Type of screen: Machine slotted Sch 40 PVC
Screen gauge or size of openings: 0.010 in.
Diameter of screen: 2.0 in.
Type of Backfill around Screen: Filter Sand
Depth to bottom of well screen: 12.0 ft
Bottom of silt trap: -
Depth of bottom of borehole: 12.0 ft

GW INSTALLATION REPORT-07-1 HA-LIB07-1-BOS.GLB HA-TB+CORE+WELL-07-1.GDT G:\39899 DARTMOUTH\0100\GINT AND GROUNDWATER SAMPLING PRINTOUT\39899-010_TB_OW.GPJ Jun 12, 13

HALEY & ALDRICH

TEST BORING REPORT

Boring No. HA-3 (OW)

Project 452 OLD FALL RIVER ROAD, DARTMOUTH, MA
Client BOSTON ENVIRONMENTAL CORP.
Contractor GEOLOGIC EARTH EXPLORATIONS, INC.

File No. 39899-010
Sheet No. 1 of 1
Start May 24, 2013
Finish May 24, 2013
Driller J. Raymond
H&A Rep. M. Dodson
Elevation
Datum
Location See plan.

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	-	Rig Make & Model: CME 75 on Track
Inside Diameter (in.)	4.25	1 3/8	-	Bit Type: Cutting Head Drill Mud: None
Hammer Weight (lb)	SPUN	140	-	Casing: HSA Spun to 15 ft
Hammer Fall (in.)	-	30	-	Hoist/Hammer: Winch Automatic Hammer PID Make & Model: MiniRAE 2000 10.6 eV

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	1 1 1 1	S1 7	0.0 2.0	SM		Very loose gray (organic) silty SAND (SM), mps 0.5 in., no structure, organic odor, moist PID = 0.5/0.0 ppm -TOPSOIL-		5	10	15	30	40				
	1 2 1 3	S2 6	2.0 4.0	SM	2.0	Very loose yellow silty SAND (SM), mps 3mm, becoming less silty and organic with depth, no odor, moist PID = 0.7/0.0 ppm -LOESS-				10 20	60 65	30 15				
5	2 1 2 3	S3 17	4.0 6.0	SW	4.0	Very loose yellow to tan well-graded SAND (SW), weakly layered, no odor, moist PID = 0.3/0.0 ppm -GLACIOFLUVIAL DEPOSITS-			25	40	35					
	2 1 2 1	S4 14	6.0 8.0	SW		Similar to above except gray-brown, trace roots, wet below approximately 7.0 ft PID = 0.5/0.0 ppm			45	35	20					
	2 3 7 13	S5 15	8.0 10.0	SP	8.0	Loose light brown/tan, poorly graded SAND with gravel (SP), mps 0.6 in., weakly layered, no odor, wet PID = 0.5/0.0 ppm -GLACIOFLUVIAL DEPOSITS-		15	40	35	10					
10	12 10 6 2	S6 7	10.0 12.0	SW	10.0	Medium dense light brown well-graded SAND with gravel (SW), mps 1.0 in., no visible structure, no odor, wet PID = 0.3/0.0 ppm	5	15	30	25	25					
	1 2 3 4	S7 10	12.0 14.0	SP		Loose brown poorly graded SAND (SP), mps 0.3 in., stratified, no odor, wet PID = 0.4/0.0 ppm -GLACIOFLUVIAL DEPOSITS-			35	40	20					
15	3 4 2 1	S8 8	14.0 16.0	SW		Loose brown well-graded SAND (SW), mps 0.3 in., no visible structure, no odor, wet PID = 0.3/0.0 ppm										
					16.0	BOTTOM OF EXPLORATION 16.0 FT Note: Installed 2-in. observation well in completed borehole to 15.0 ft.										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
5/24/13	1100	0.1	10.0	14.0	7.5

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 16.0
Rock Cored (ft) -
Samples 8S

Boring No. HA-3 (OW)

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†Note: Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

H&A-TEST BORING-07-1 REV HA-LIB07-1-BOS.GLB HA-TB+CORE+WELL-07-1.GDT G:\39899 DARTMOUTH\0100\GINT AND GROUNDWATER SAMPLING PRINTOUT\39899-010_TB_OW.GPJ Jun 12, 13

HALEY & ALDRICH

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

Well No. HA-3 (OW)
Boring No. HA-3 (OW)

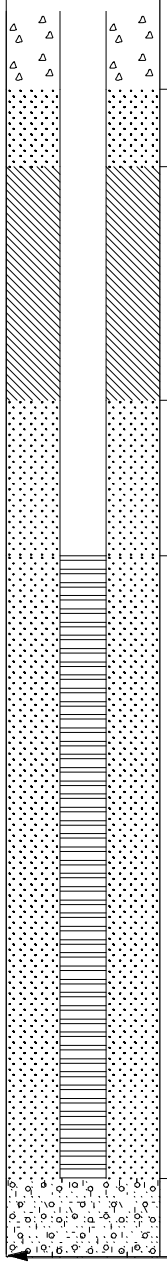
Project 452 OLD FALL RIVER ROAD
Location DARTMOUTH, MA
Client BOSTON ENVIRONMENTAL CORP.
Contractor GEOLOGIC EARTH EXPLORATIONS, INC.
Driller J. Raymond
Initial Water Level (depth bgs) 7.5 ft

Well Diagram
- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

File No. 39899-010
Date Installed 24 May 2013
H&A Rep. M. Dodson
Location See plan.

Ground El.
Datum

SOIL/ROCK CONDITIONS	DEPTH (ft.)	GRAPHIC	WELL DETAILS	DEPTH (ft.)	ELEVATION (ft.)
				0.0	
TOPSOIL	2.0			1.0	
LOESS	4.0			2.0	
				5.0	
				7.0	
GLACIOFLUVIAL DEPOSITS	16.0			15.0	
				16.0	



WELL CONSTRUCTION DETAILS

Type of protective cover: Standpipe/Masterlock
Height of Standpipe above ground surface: 3.2 ft
Height of top of riser above ground surface: 3.0 ft
Type of protective casing: Standpipe
Length: 5.0 ft
Inside diameter: 4.0 in.
Depth of bottom of Standpipe: 1.9 ft
Type of riser pipe: Schedule 40 PVC
Inside diameter of riser pipe: 2.0 in.
Depth of bottom of riser pipe: 7.0 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Concrete	0.0	1.0
Bentonite	2.0	3.0
	-	-

Diameter of borehole: 8.0 in.
Depth to top of well screen: 7.0 ft
Type of screen: Machine slotted Sch 40 PVC
Screen gauge or size of openings: 0.010 in.
Diameter of screen: 2.0 in.
Type of Backfill around Screen: Filter Sand
Depth to bottom of well screen: 15.0 ft
Bottom of silt trap: -
Depth of bottom of borehole: 16.0 ft

GW INSTALLATION REPORT-07-1 HA-LIB07-1-BOS.GLB HA-TB+CORE+WELL-07-1.GDT G:\39899 DARTMOUTH\0100\GINT AND GROUNDWATER SAMPLING PRINTOUT\39899-010_TB_OW.GPJ Jun 12, 13

HALEY & ALDRICH

TEST BORING REPORT

Boring No. HA-4 (OW)

Project 452 OLD FALL RIVER ROAD, DARTMOUTH, MA
Client BOSTON ENVIRONMENTAL CORP.
Contractor GEOLOGIC EARTH EXPLORATIONS, INC.

File No. 39899-010
Sheet No. 1 of 1
Start May 22, 2013
Finish May 22, 2013
Driller J. Raymond
H&A Rep. M. Dodson
Elevation
Datum
Location

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	-	Rig Make & Model: CME 75 on ATV
Inside Diameter (in.)	4.25	1 3/8	-	Bit Type: Cutting Head Drill Mud: None
Hammer Weight (lb)	SPUN	140	-	Casing: HSA Spun to 10 ft
Hammer Fall (in.)	-	30	-	Hoist/Hammer: Winch Automatic Hammer PID Make & Model: MiniRAE 2000 10.6 eV

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	2 4 2 3	S1 18	0.0 2.0	ML		Loose brown sandy SILT (ML), mps 0.8 in., no structure, no odor, moist, roots in top 4 in., fines moderately organic PID = 15.0/0.0 ppm -TOPSOIL-		10	5	5	25	55	R			
	10 28 35 23	S2 10	2.0 4.0	SP	2.0	Very dense light gray-brown poorly graded SAND with gravel (SP), mps 1.375 in., no structure, no odor, moist, brown and silty top 3 in. of recovery PID = 0.5/0.0 ppm	10	5	5	20	50	15				
	12 28 19 21	S3 9	4.0 6.0	SP-SM	4.0	Note: Auger refusal at 3.5 ft, moved 3.0 ft south. 3.5 ft refusal moved 5 ft north of planned. Dense light brown poorly graded SAND with silt and gravel (SP-SM), mps 1.375 in., no structure, no odor, wet PID = 0.7/0.0 ppm -GLACIOFLUVIAL DEPOSITS-										
5	23 10 16 10	S4 7	6.0 8.0	SP-SM / SP	6.5	Similar to above PID = 0.7/0.3 ppm		5	10	20	60	5				
	3 4 4 5	S5 14	8.0 10.0	SP		Dense tan to light brown poorly graded SAND (SP), mps 0.5 in., no structure, no odor, wet Loose tan poorly graded SAND (SP), mps 1mm, weakly bonded/stratified, no odor, wet PID = ND ppm -GLACIOFLUVIAL DEPOSITS-										
10					10.0	BOTTOM OF EXPLORATION 10.0 FT Note: Installed 2-in. observation well in completed borehole to 10.0 ft.										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
5/22/13	-	0.1	installed well		3.15

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 10.0
Rock Cored (ft) -
Samples 5S

Boring No. HA-4 (OW)

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†Note: Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

H&A-TEST BORING-07-1 REV HA-LIB07-1-BOS.GLB HA-TB+CORE+WELL-07-1.GDT G:\39899 DARTMOUTH\0100\GINT AND GROUNDWATER SAMPLING PRINTOUT\39899-010_TB_OW.GPJ Jun 12, 13

HALEY & ALDRICH

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

Well No. HA-4 (OW)
Boring No. HA-4 (OW)

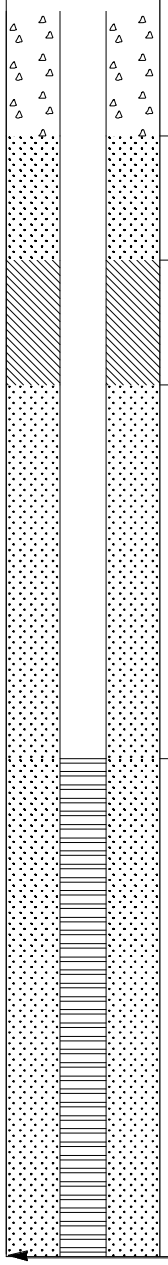
Project 452 OLD FALL RIVER ROAD
Location DARTMOUTH, MA
Client BOSTON ENVIRONMENTAL CORP.
Contractor GEOLOGIC EARTH EXPLORATIONS, INC.
Driller J. Raymond
Initial Water Level (depth bgs) 3.2 ft

Well Diagram
- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

File No. 39899-010
Date Installed 22 May 2013
H&A Rep. M. Dodson
Location

Ground El.
Datum

SOIL/ROCK CONDITIONS	DEPTH (ft.)	GRAPHIC	WELL DETAILS	DEPTH (ft.)	ELEVATION (ft.)
				0.0	
TOPSOIL	2.0			1.0	
				2.0	
				3.0	
				6.0	
GLACIOFLUVIAL DEPOSITS	10.0			10.0	



WELL CONSTRUCTION DETAILS

Type of protective cover: Standpipe/Masterlock
Height of Standpipe above ground surface: 3.3 ft
Height of top of riser above ground surface: 3.1 ft
Type of protective casing: Standpipe
Length: 5.0 ft
Inside diameter: 4.0 in.
Depth of bottom of Standpipe: 1.8 ft
Type of riser pipe: Schedule 40 PVC
Inside diameter of riser pipe: 2.0 in.
Depth of bottom of riser pipe: 6.0 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Concrete	0.0	1.0
Bentonite	2.0	1.0
	-	-

Diameter of borehole: 8.0 in.
Depth to top of well screen: 6.0 ft
Type of screen: Machine slotted Sch 40 PVC
Screen gauge or size of openings: 0.010 in.
Diameter of screen: 2.0 in.
Type of Backfill around Screen: Filter Sand
Depth to bottom of well screen: 10.0 ft
Bottom of silt trap: -
Depth of bottom of borehole: 10.0 ft

GW INSTALLATION REPORT-07-1 HA-LIB07-1-BOS.GLB HA-TB+CORE+WELL-07-1.GDT G:\39899 DARTMOUTH\0100\GINT AND GROUNDWATER SAMPLING PRINTOUT\39899-010_TB_OW.GPJ Jun 12, 13

HALEY & ALDRICH

TEST BORING REPORT

Boring No. HA-5 (OW)

Project 452 OLD FALL RIVER ROAD, DARTMOUTH, MA
Client BOSTON ENVIRONMENTAL CORP.
Contractor GEOLOGIC EARTH EXPLORATIONS, INC.

File No. 39899-010
Sheet No. 1 of 1
Start May 23, 2013
Finish May 23, 2013
Driller J. Raymond
H&A Rep. M. Dodson
Elevation
Datum
Location See plan.

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	-	Rig Make & Model: Mobile B-57 on ATV
Inside Diameter (in.)	4.25	1 3/8	-	Bit Type: Cutting Head
Hammer Weight (lb)	SPUN	140	-	Drill Mud: None
Hammer Fall (in.)	-	30	-	Casing: HSA Spun
				Hoist/Hammer: Winch Automatic Hammer
				PID Make & Model: MiniRAE 2000 10.6 eV

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	% Coarse Gravel	% Fine Gravel	% Coarse Sand	% Medium Sand	% Fine Sand	% Fines	Dilatancy	Toughness	Plasticity	Strength
0	6 3 2 2	S1 6	0.0 2.0	SM		Loose brown to dark brown silty SAND (SM), mps 0.5 in., no structure, no odor, moist, 20% roots and organic debris, fines moderately organic PID = 2.5/0.0 ppm		10	5	20	35	30				
	3 2 1 1	S2 3	2.0 4.0	SM		-FILL- Similar to above PID = 2.0/0.0 ppm										
					3.0	Note: Inferred stratum changed based on blow counts.										
	1 1 5 5	S3 5	4.0 6.0	OL/ OH		Note: Soil not recovered below 3.0 ft. -PROBABLE ORIGINAL TOPSOIL/ FOREST MAT- Dark brown sandy ORGANIC SOIL (OL/OH), no structure, organic odor, wet, 20% organic debris, gravel lodged in spoon tip PID = 1.1/0.0 ppm	5	5	10	10	20	50				
5					5.0	Note: Inferred stratum changed based on blow counts.										
	9 11 10 14	S4 8	6.0 8.0	SW		Note: Soils not recovered below 5.0 ft- gravel. Medium dense light brown well-graded SAND with gravel (SW), mps 1.3 in., no structure, no odor, wet PID = 0.6/0.0 ppm	15	15	25	15	25	5				
	5 5 1 1	S5 11	8.0 10.0	SW		-FLUVIAL DEPOSITS- Loose tan well-graded SAND (SW), mps 1.375 in., no structure, no odor, wet PID = 0.4/0.0 ppm	5	5	35	30	25					
10	1 2 3 10	S6 8	10.0 12.0	SW		Similar to above except mps 0.4 in. PID = 0.5/0.0 ppm			40	35	25					
						Note: 18 in. of "blow in" before advancing augers to 12.0 ft. Set well at 10.0 ft due to running sand conditions.										
					12.0	BOTTOM OF EXPLORATION 12.0 FT										
						Note: Installed 2-in. observation well in completed borehole to 10.2 ft.										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
5/23/13	1000	0.5	installed well		4.0

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 12.0
Rock Cored (ft) -
Samples 6S

Boring No. HA-5 (OW)

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†Note: Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

H&A-TEST BORING-07-1 REV HA-LIB07-1-BOS.GLB HA-TB+CORE+WELL-07-1.GDT G:\39899 DARTMOUTH\0100\GINT AND GROUNDWATER SAMPLING PRINTOUT\39899-010_TB_OW.GPJ Jun 12, 13

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

HALEY & ALDRICH

Well No. HA-5 (OW)
Boring No. HA-5 (OW)

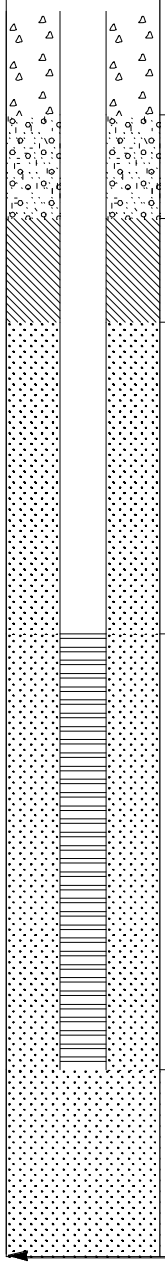
Project 452 OLD FALL RIVER ROAD
Location DARTMOUTH, MA
Client BOSTON ENVIRONMENTAL CORP.
Contractor GEOLOGIC EARTH EXPLORATIONS, INC.
Driller J. Raymond
Initial Water Level (depth bgs) 2.5 ft

Well Diagram
- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

File No. 39899-010
Date Installed 23 May 2013
H&A Rep. M. Dodson
Location See plan.

Ground El.
Datum

SOIL/ROCK CONDITIONS	DEPTH (ft.)	GRAPHIC	WELL DETAILS	DEPTH (ft.)	ELEVATION (ft.)
				0.0	
FILL	0			1.0	
				2.0	
	3.0			3.0	
PROBABLE ORIGINAL TOPSOIL/FOREST MAT	5.0			6.0	
FLUVIAL DEPOSITS	10			10.2	
	12.0			12.0	



WELL CONSTRUCTION DETAILS

Type of protective cover: Standpipe/Masterlock
Height of Standpipe above ground surface: 3.0 ft
Height of top of riser above ground surface: 3.0 ft
Type of protective casing: Standpipe
Length: 5.0 ft
Inside diameter: 4.0 in.
Depth of bottom of Standpipe: 2.0 ft
Type of riser pipe: Schedule 40 PVC
Inside diameter of riser pipe: 2.0 in.
Depth of bottom of riser pipe: 6.0 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Concrete	0.0	1.0
Bentonite	2.0	1.0
	-	-

Diameter of borehole: 8.0 in.
Depth to top of well screen: 6.0 ft
Type of screen: Machine slotted Sch 40 PVC
Screen gauge or size of openings: 0.010 in.
Diameter of screen: 2.0 in.
Type of Backfill around Screen: Filter Sand
Depth to bottom of well screen: 10.2 ft
Bottom of silt trap: -
Depth of bottom of borehole: 12.0 ft

GW INSTALLATION REPORT-07-1 HA-LIB07-1-BOS.GLB HA-TB+CORE+WELL-07-1.GDT G:\39899 DARTMOUTH\0100\GINT AND GROUNDWATER SAMPLING PRINTOUT\39899-010_TB_OW.GPJ Jun 12, 13

TEST BORING REPORT

HALEY & ALDRICH

Boring No. HA-6 (OW)

Project 452 OLD FALL RIVER ROAD, DARTMOUTH, MA
Client BOSTON ENVIRONMENTAL CORP.
Contractor GEOLOGIC EARTH EXPLORATIONS, INC.

File No. 39899-010
Sheet No. 1 of 1
Start May 23, 2013
Finish May 23, 2013
Driller J. Raymond
H&A Rep. M. Dodson
Elevation
Datum
Location 15 ft south of planned- test pit in area

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HSA	S	-	Rig Make & Model: CME 75 on ATV
Inside Diameter (in.)	4.25	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	SPUN	140	-	Drill Mud: None
Hammer Fall (in.)	-	30	-	Casing: HSA Spun to 10 ft
				Hoist/Hammer: Safety Hammer
				PID Make & Model: MiniRAE 2000 10.6 eV

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	2 2	S1 4	0.0 0.8	SM	0.8	Loose brown silty SAND (SM), mps 0.7 in., no structure, no odor, moist, fines slightly organic, trace roots/organic matter -FILL-		5	5	15	50	25				
	3 1	S1A 8	0.8 2.0	OL/ OH	2.3	Loose dark brown to black sandy ORGANIC SOIL (OL/OH), no structure, organic odor, moist, 50% roots and organic matter PID = 1.5/0.0 ppm -TOPSOIL/ FOREST MAT-			5	5	20	70	R			
	2 2 9 10	S2 17	2.0 4.0	OL/ OH / SM	4.0	Similar to above PID = 1.0/0.0 ppm / Medium dense dark brown silty (organic) SAND (SM), mps 1.1 in., no structure, no odor, moist to wet in spoon tip, 20% roots and organic matter, fines highly organic -SUBSOIL-	5	5	10	15	20	40				
5	12 14 14 11	S3 16	4.0 6.0	SW	6.0	Medium dense dark brown well-graded SAND with gravel 9SW), mps 1.375 in., no visible structure, organic odor, wet PID = 0.7/0.0 ppm -GLACIOFLUVIAL DEPOSITS-	10	30	30	15	10	5				
	9 6 3 2	S4 13	6.0 8.0	SW/ SP	8.0	Loose tan light brown well-graded SAND with gravel (SW), interbedded with poorly graded SAND (SP) (15%), no odor, wet PID = 0.5/0.0 ppm -GLACIOFLUVIAL DEPOSITS- Note: 6 in. "blow in" before collecting S5.	15	20	30	20 10	15 85	5				
	3 2 1 4	S5 10	8.0 10.0	SP	10.0	Very loose tan poorly graded SAND (SP), mps 0.3 in., weakly layered, no odor, wet PID = 0.5/0.0 ppm -GLACIOFLUVIAL DEPOSITS-			15	35	50					
10						BOTTOM OF EXPLORATION 10.0 FT										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
5/23	1230	0.2	installed well		4.0

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 10.0
Rock Cored (ft) -
Samples 5S

Boring No. HA-6 (OW)

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†Note: Maximum particle size is determined by direct observation within the limitations of sampler size.

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

H&A-TEST BORING-07-1 REV HA-LIB07-1-BOS.GLB HA-TB+CORE+WELL-07-1.GDT G:\39899 DARTMOUTH\0100\GINT AND GROUNDWATER SAMPLING PRINTOUT\39899-010_TB_OW.GPJ Jun 12, 13

HALEY & ALDRICH

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

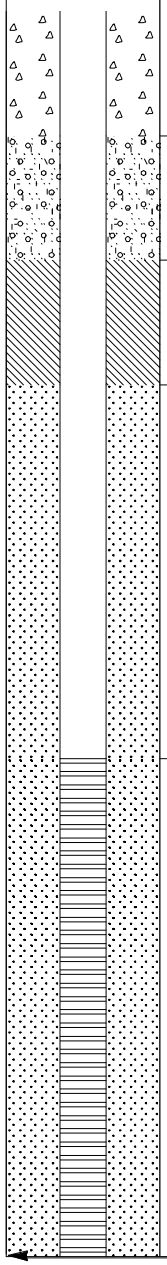
Well No. HA-6 (OW)
Boring No. HA-6 (OW)

Project 452 OLD FALL RIVER ROAD
Location DARTMOUTH, MA
Client BOSTON ENVIRONMENTAL CORP.
Contractor GEOLOGIC EARTH EXPLORATIONS, INC.
Driller J. Raymond
Initial Water Level (depth bgs) 2.0 ft

Well Diagram
- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

File No. 39899-010
Date Installed 23 May 2013
H&A Rep. M. Dodson
Location 15 ft south of planned-test pit in area
Ground El.
Datum

SOIL/ROCK CONDITIONS	DEPTH (ft.)	GRAPHIC	WELL DETAILS	DEPTH (ft.)	ELEVATION (ft.)
				0.0	
FILL	0.8			1.0	
SUBSOIL	4.0			2.0	
				3.0	
				6.0	
GLACIOFLUVIAL DEPOSITS	10.0			10.0	



WELL CONSTRUCTION DETAILS

Type of protective cover: Standpipe/Masterlock
Height of Standpipe above ground surface: 3.2 ft
Height of top of riser above ground surface: 3.1 ft
Type of protective casing: Standpipe
Length: 5.0 ft
Inside diameter: 4.0 in.
Depth of bottom of Standpipe: 1.8 ft
Type of riser pipe: Schedule 40 PVC
Inside diameter of riser pipe: 2.0 in.
Depth of bottom of riser pipe: 6.0 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Concrete	0.0	1.0
Bentonite	2.0	1.0
	-	-

Diameter of borehole: 8.0 in.
Depth to top of well screen: 6.0 ft
Type of screen: Machine slotted Sch 40 PVC
Screen gauge or size of openings: 0.010 in.
Diameter of screen: 2.0 in.
Type of Backfill around Screen: Filter Sand
Depth to bottom of well screen: 10.0 ft
Bottom of silt trap: -
Depth of bottom of borehole: 10.0 ft

GW INSTALLATION REPORT-07-1 HA-LIB07-1-BOS.GLB HA-TB+CORE+WELL-07-1.GDT G:\39899 DARTMOUTH\0100\GINT AND GROUNDWATER SAMPLING PRINTOUT\39899-010_TB_OW.GPJ Jun 12, 13

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

In the Matter of: Mary Robinson 383 Hixville Road North Dartmouth, Massachusetts & Boston Environmental Corporation 338 Howard Street Brockton, Massachusetts 02302	)	RE: DARTMOUTH—BWP/Solid Waste Closure/Capping of the Cecil Smith Landfill 452 Old Fall River Road ADMINISTRATIVE CONSENT ORDER #ACO-SE-14-4001

ADMINISTRATIVE CONSENT ORDER

I. THE PARTIES

1. The Massachusetts Department of Environmental Protection (the "MassDEP" or the "Department") is a duly constituted agency of the Commonwealth of Massachusetts established pursuant to M.G.L. c. 21A, § 7. MassDEP maintains its principal office at One Winter Street, Boston, Massachusetts 02108, and its Southeast Regional Office at 20 Riverside Drive, Lakeville, Massachusetts, 02347.

2. Mary Robinson (the "Owner") is an Individual who resides at 383 Hixville Road, North Dartmouth, Massachusetts. The Owner's mailing address for purposes of this Consent Order is 383 Hixville Road, North Dartmouth, Massachusetts.

3. Boston Environmental Corporation ("BEC" and/or the "Operator") is a Massachusetts corporation and maintains its principal offices at 338 Howard Street, Brockton, Massachusetts 02302.

4. Hereinafter, Mary Robinson and BEC shall be referred to and collectively known as the "Respondents".

5. Hereinafter, MassDEP and the Respondents will be referred to and collectively known as the "Parties".

II. STATEMENT OF FACTS AND LAW

6. The Department is responsible for the implementation and enforcement of M.G.L. c. 111, §§ 150A and 150A1/2, the Site Assignment Regulations for Solid Waste Facilities at 310 CMR 16.00, the Solid Waste Management Regulations at 310 CMR 19.000, and the Massachusetts Contingency Plan ("MCP") at 310 CMR 40.0000. MassDEP has authority under M.G.L. c. 21A, § 16 and the Administrative Penalty Regulations at 310 CMR 5.00 to assess civil administrative penalties to persons in noncompliance with the laws and regulations set forth above.

7. Mary Robinson owns an inactive, unlined, uncapped landfill (the "Landfill") located at 452 Old Fall River Road in North Dartmouth, Massachusetts. The Landfill is approximately 25-acres in size and is situated on a 60-acre parcel of site-assigned land (the "Site").

8. MassDEP records indicate that construction and demolition ("C&D") waste was disposed of in the Landfill from approximately 1954 until 1974. Sometime around 1982, and subsequent to accepting waste, the Landfill was capped according to plans approved by the Department.

9. Between 2002 and 2005, the United States Environmental Protection Agency ("USEPA) conducted site assessment investigation activities at the Site. The USEPA determined that although the Landfill had caused adverse impacts to the environment, as a result of measured elevated levels of contaminants in the ground water and sediments and soil, the impact was relatively low, and as such the Landfill was classified to be a low priority for further assessment, and that no further action by USEPA was planned.

10. On July 17, 2009, in response to a complaint alleging that there was unpermitted landfill disruption activity occurring at the Landfill, MassDEP conducted an inspection and observed that the Landfill had been disrupted as it displayed signs of excavation and presence of exposed solid waste. In some areas of the Landfill there were accumulations of recyclable metal that appeared to have been excavated from the Landfill and that the residual materials had been placed back into the excavation area. MassDEP also observed evidence of ash and partially burned solid waste materials that had been excavated from the Landfill.

11. On August, 7, 2009, MassDEP issued a Unilateral Administrative Order ("#UAO-SE-09-4001") to the Owner, citing the following violations as observed on July 17, 2009:

    - 310 CMR 19.142(5)(a), "Post-Closure Requirements", for not taking corrective actions to remediate or mitigate conditions that compromised the integrity of the final cover system, including but not limited to the removal of the final cover system.

    - 310 CMR 19.130(32)(a), "Disruption of Landfilled Areas", for causing and/or allowing the excavation, disruption and/or removal of previously buried solid waste material without prior written approval.

    - 310 CMR 7.07(5), "Open Burning", for causing and/or allowing open burning to be conducted at the Site.

    The UAO required:

    - Immediate cessation of all unapproved post-closure use activities at the Landfill (especially that of landfill excavation/mining) and to promptly cover all exposed waste materials with six (6) inches of clean soil.

    - Immediate implementation of a Health & Site Safety Plan ("HASP") in order to ensure the protection of public health and safety on the Landfill/Site, especially

regarding potential exposure to chemical and physical dangers associated with the buried waste materials.

- Within thirty (30) days, submittal of a Remedial Action Plan that would be prepared by a registered professional engineer in order to conduct an assessment of the Landfill/Site, and submit for review and approval a plan and schedule to: clean up, re-cap and otherwise remediate the Landfill.

12. MassDEP records indicate that the Owner did not appeal the UAO.

13. On August 28, 2009, MassDEP granted the Owner a thirty (30) day extension to comply with the UAO.

14. MassDEP did not receive the Remedial Action Plan from the Owner within the specified extended timeframe of the UAO.

15. On June 22, 2011, MassDEP conducted an Enforcement Conference with the Owner regarding noncompliance at the Landfill. During the conference, the Owner proposed to achieve compliance by excavating and removing all solid waste from the Site.

16. On August 23, 2011, MassDEP sent an Administrative Consent Order with Penalty to the Owner for her signature. The ACOP set forth a complaince plan and schedule for the Landfill/Site as discussed and agreed to during the enforcement conference conducted on June 22, 2011.

17. The Owner did not sign the ACOP and the compliance plan was not implemented.

18. On or about July 2, 2012, MassDEP met with BEC, who stated that they had Powers of Attorney for the Owner for purposes of achieving compliance with 310 CMR 19.000 and the outstanding UAO dated August 7, 2009. BEC proposed utilization of the Department's "Revised Guidelines for Determining Closure Activities at Inactive Unlined Landfill Sites" ("Inactive Landfill Closure Guidelines") dated July 6, 2001, as revised on February 16,

2007, to close and cap the Landfill through the use of approved grading/shaping materials: including mildly contaminated soils pursuant to MassDEP Policy #COMM-97-001; and processed construction and demolition materials), in order to accrue sufficient funds to pay for the closure/capping of the Landfill, as well as to fund the Landfill's post-closure monitoring and maintenance during the post-closure period of thirty (30) years.

19. On or about December 17, 2012, MassDEP received a conceptual landfill closure proposal (the "Conceptual Closure Proposal") from BEC pursuant to the Department's "Inactive Landfill Closure Guidelines". As proposed, the existing footprint of the Landfill (i.e. 25-acres) would be excavated/consolidated to a final size of 23-acres, and an estimated one-million cubic-yards of approved grading shaping materials would be used to achieve final landfill closure grades/configuration.

20. In mid-January 2013, MassDEP instructed BEC that pursuant to the outlined procedures in the Department's "Inactive Landfill Closure Guidelines", BEC should conduct a public informational session within the community of Dartmouth regarding the "Conceptual Closure Proposal". The purpose of the public informational sessions was to solicit input from the Town of Dartmouth officials and the community at large regarding the proposed landfill closure project.

21. On March 12, 2013, BEC submitted a Notice of Intent ("NOI") to the Town of Dartmouth for the excavation/removal of solid waste from wetland resource areas surrounding the Landfill. The wetlands project was assigned Wetlands File Number #SE 15-2186.

22. On March 20, 2013, BEC submitted a BRPWW10-Water Quality Certification application to MassDEP under Transmittal Number #X255424, for proposed work within wetland resource areas surrounding the Landfill.

23. On March 23, 2013, the first public informational session on BEC's "Conceptual Closure Proposal" was conducted. As a result of public interest, two (2) additional public informational meetings were conducted on June 27, 2013 and on July 11, 2013.

24. On May 6, 2013, MassDEP met with BEC and Town officials regarding the installation of additional ground water monitoring wells at the Site.

25. On May 13, 2013, BEC submitted a BWPSW45-Alternative Review permit application (Transmittal Number #X255925) regarding the installation of the additional monitoring wells.

26. On May 17, 2013, MassDEP issued a conditional approval of the BWPSW45-Alternative Review permit application regarding the installation of the additional monitoring wells.

27. On or about, May 21, 2013, BEC installed six (6) new/additional monitoring wells at/around the Site.

28. On May 22, 2013, MassDEP, as part of its review of BEC's "Conceptual Closure Proposal", conducted an inspection of the Landfill/Site. During the inspection, MassDEP observed that many of the previously observed violations of 310 CMR 19.000, as described in the UAO, had not been corrected. MassDEP also observed additional violations including: numerous agricultural, farming and commercial activities being conducted on top of and/or immediately adjacent to the unlined/uncapped Landfill. Additionally, MassDEP observed a residential house had been constructed within the footprint of the Landfill and appeared to be occupied.

29. On or about, May 29, 2013, BEC sampled the six (6) new/additional monitoring wells, and the seven (7) existing monitoring wells.

30. On May 30, 2013, BEC filed an Environmental Notification Form ("ENF"), with the Massachusetts Environmental Policy Act ("MEPA") unit regarding the "Conceptual Closure Proposal". MEPA designated the project as EOEEA #15058.

31. On June 4, 2013, MassDEP issued a Notice of Enforcement Conference ("NOEC") to the Owner regarding MassDEP's observed violations of May 22, 2013.

32. On June 10, 2013, MassDEP held the Enforcement Conference. The Owner did not attend the Enforcement Conference, but was represented by BEC who acted in the Owner's capacity as her Power of Attorney for purposes of achieving compliance. BEC proposed that the implementation of their "Conceptual Closure Proposal" would serve as the means to achieve compliance with the regulatory violations as observed on May 22, 2013, as well as the outstanding UAO dated August 7, 2009.

33. On or about June 14, 2013, BEC, in response to the public's comments (as generated during the public informational meetings), as well as discussions with MassDEP, submitted a revised "Conceptual Closure Proposal" to MassDEP for the landfill closure project. .

34. Between June 14, 2013, and March 12, 2014, MassDEP evaluated revisions to BEC's revised "Conceptual Closure Proposal" that was submitted on June 14, 2013.

35. In an effort to assist in its evaluation of BEC's revised "Conceptual Closure Proposal" of June 2013, MassDEP hired an independent third-party engineering firm [Parsons] to evaluate the proposed closure of the Landfill.

36. On or about June 18, 2013, BEC submitted analytical results of the ground water monitoring/sampling activities in accordance with the BWPSW45-Alternative Review permit for the additional ground water monitoring wells. The analytical results indicated, and MassDEP agreed, that there was no immediate risk to human health or the environment, and that the measured environmental impacts were consistent with that of a historic C&D waste landfill.

37. On or about July 3, 2013, BEC submitted their draft "Response to Public Comments" concerning issues that were raised during the three public informational sessions conducted on: March 23, 2013; June 27, 2013; and on July 11, 2013.

38. On July 12, 2013, the Secretary of Energy and Environmental Affairs issued a determination that the ENF (EOEEA #15058) would not require further MEPA review.

39. On August 20, 2013, the Dartmouth Conservation Commission issued a denial of the NOI.

40. On August 27, 2013, BEC filed a request with MassDEP for a Superseding Order of Conditions ("SOC") regarding the Town of Dartmouth's denial of the NOI.

41. October 18, 2013, MassDEP released Parsons's evaluation of all costs to close, cap and monitor and maintain the Landfill as well as the revenue necessary to be generated to cover those costs.

42. On December 2, 2013, MassDEP issued a Superseding Order of Conditions ("SOC") regarding the NOI.

43. On December 4, 2013, MassDEP issued an approval of the BRPWW10-Water Quality Certification application (Transmittal Number #X255424).

44. On December 16, 2013, the Town of Dartmouth filed an appeal of MassDEP's SOC.

45. On March 27, 2014, BEC submitted its final/revised "Conceptual Closure Proposal" in accordance with the Department's Inactive Landfill Guidelines. As proposed in BEC's revised/final "Conceptual Closure Proposal", the project will include the following:

    A. The existing foot-print of the Landfill will be reduced from approximately 25-acres to approximately 23-acres through the excavation of waste from surrounding wetland resource areas that abut the Landfill.

    B. A four (4) year landfill closure timeframe will be established, whereby approved landfill closure grading/shaping materials will be placed during the first three (3) years, in order to achieve proper Landfill closure grades/configuration, and during the fourth and final year, the Landfill's final capping system will be installed.

    C. The total amount of approved landfill closure grading/shaping materials that would be used to close the Landfill would be approximately 926,000 cubic-yards ("yds^3").

1. Of the total amount of approved landfill closure grading/shaping materials, up to 100% (by in-place volume) may consist of mildly contaminated soils that would comply with the Department's Policy #COMM-97-001 entitled "Reuse and Disposal of Contaminated Soil at Massachusetts Landfills" dated August 15, 1997.

2. Of the total amount of approved landfill closure grading/shaping material, up to 11% (by in-place volume) may consist of C&D "fines" that would be generated from MassDEP approved/permitted C&D processors.

D. When completed, through the use of the following approved grading and shaping materials, the final maximum peak elevation of the capped Landfill will be approximately 135-feet above mean sea level (i.e. approximately 57-feet above the average existing grade level which is approximately 78-feet above mean sea level).

46. On March 27, 2014, MassDEP determined that BEC's final/revised "Conceptual Closure Proposal", as submitted on March 27, 2014, met the requirements of the "Inactive Landfill Closure Guidelines", and notified the Respondents that they could proceed with the preparation and submittal of requisite permit applications pursuant to the applicable requirements set forth at 310 CMR 19.000, and as required by this Consent Order regarding the assessment and closure of the Landfill.

III. DISPOSITION and ORDER

For the reasons set forth above, the Department hereby issues, and the Respondents hereby consent to the following:

47. The Parties have agreed to enter into this Consent Order because they agree that it is in their own interests, and in the public interest, to proceed promptly with the actions called for herein rather than to expend additional time and resources litigating the matters set forth

above. Respondents enter into this Consent Order without admitting or denying the facts or allegations set forth herein. However, Respondents agree not to contest such facts and allegations for the limited purposes of the issuance or enforcement of this Consent Order.

48. MassDEP's authority to issue this Consent Order is conferred by the Statutes and Regulations cited in Section II of this Consent Order.

49. Respondents shall perform the following actions:

50. The Respondents shall ensure that all engineering work performed pursuant to the Consent Order shall be under the general direction and supervision of a qualified Massachusetts Registered Professional Engineer ("PE") experienced in solid waste facility design and solid waste management. All landfill closure grading/shaping materials that will be used in this landfill closure project shall be classified and certified by PE or Licensed Site Professional ("LSP") prior to use at the Landfill. Any contractual relationship between the Respondents and the PE and/or LSP to perform such services shall require the PE and/or LSP, as a condition of the contract, to implement their work consistent with all applicable provisions of this Consent Order.

51. The Respondents shall submit all required permit applications associated with this project in accordance with the provisions of 310 CMR 4.00 "Timely Action Schedule and Fee Provisions" regulations.

IMPLEMENTATION OF ENVIRONMENTAL SITE ASSESSMENT

52. **Within sixty (60) days of the Effective Date of this Consent Order,** the Respondents shall submit a BWPSW12 – ISA/CSA-Scope of Work ("ISA/CSA-SOW") permit application to MassDEP. The ISA/CSA-SOW application shall comply with all applicable provisions and requirements outlined at 310 CMR 19.150 and the Department's "Landfill Technical Guidance Manual dated May 1997" (the "Manual").

A. **Within thirty (30) days of MassDEP's approval of the ISA/CSA-SOW,** the Respondents shall install all approved additional ground water monitoring equipment and shall collect one round of samples from the entire environmental monitoring network including existing as well as newly installed ground water monitoring equipment.

B. **Within forty-five (45) days of MassDEP's approval of the ISA/CSA-SOW,** the Respondents shall submit to MassDEP for review and approval, an "interim" ISA/CSA Report. The interim report shall be consistent with the environmental monitoring requirements specified at 310 CMR 19.132(1)(f), and shall at a minimum include the following information:

i. Site plans or maps showing: the locations of all monitoring equipment, the ground water flow direction, and the location and distribution of measured contaminants;

ii. A summary of all analytical data inclusive of all applicable standards (MCP method GW-1 and 3, and the "*Massachusetts Drinking Water Guidelines*"), with a corresponding comparison to recent, previous and/or past historical data; and,

iii. Identification of any particular issues of concern, including but not limited to assessment data that could affect the design of the CAD or implementation of the CSA.

53. Environmental monitoring of the Landfill/Site shall be performed on a routine schedule throughout the duration of the Landfill closure project. The environmental monitoring results shall be submitted to the Department in accordance with 310 CMR 19.132, or in accordance with a schedule established in the approved ISA/CSA-SOW and/or CAD permits, or as otherwise specified by the Department.

CORRECTIVE ACTION DESIGN ("CAD") PLANS

54. **Within ninety (90) days of the Effective Date of this Consent Order,** the Respondents shall submit a BWPSW25 – CAD permit application to MassDEP for the closure/capping of the Landfill. The CAD application shall comply with all applicable provisions of 310 CMR 4.00, 310 CMR 19.000, the Manual, and all applicable Guidelines and Policies. In addition to the "standard" features of a landfill closure plan, as required under 310 CMR 19.112, the CAD application shall also include the following components:

A. The CAD application shall describe the types and amounts of the total in-place volume of approved landfill closure grading and shaping materials that will be used to achieve the proposed final grades and configuration of the Landfill The grading/shaping materials that will be used in the Landfill's closure include: mildly contaminated soils in accordance with the parameters established under MassDEP's Policy #COMM-97-001 dated August 15, 1997, and approved C&D fines that are produced by MassDEP approved/permitted C&D processing facilities.

B. The CAD application shall include a "Materials Management Plan" that at a minimum describes:

1. Methods and procedures for the testing, stockpiling and management of the delivered approved grading/shaping materials;

2. Methods and procedures for the testing of the C&D fines for their sulfate content; and,

3. Methods and procedures for the mixing of the C&D fines with soil inclusive of the relative amounts of each material, as predicated on the sulfate content of the C&D fines.

C. The CAD application shall include details regarding the areas and amounts of all solid waste that will be excavated/consolidated waste from the Landfill's existing foot-print perimeter in order to consolidate and reduce the size of the Landfill's foot-print.

D. The CAD application shall include details and construction features of all associated appurtenances, equipment, and structures at the Site that will be associated with the Landfill's closure activities.

E. The CAD application shall include a "Health and Safety Plan" ("HASP") as it pertains to worker safety and environmental measures that will be employed during the excavation/management of all waste materials as well as the Landfill closure activities in order to protect the workers from any dangers associated thereto. The HASP plan shall address the methods and procedures concerning the handling of any excavated waste materials that could potentially be dangerous and/or would be unsuitable for re-burial in the consolidated Landfill, and a plan as to how unacceptable waste would be disposed of at another appropriately permitted waste disposal facility. The HASP shall also address the materials management practices for the re-burial of the excavated wastes at the Landfill.

F. The CAD application shall include a "Confirmatory Soil Sampling and Analysis Plan" regarding the procedures and practices for testing of all waste excavation areas of the Landfill/Site in order to ensure that during and after the excavation/consolidation process, the excavated areas have been cleaned of all previously buried waste and that there is no residual contamination from the excavated areas. The confirmatory Soil Sampling and Analysis Plan shall adhere to the applicable Method 1: Soil Category pursuant to 310 CMR 40.0974, and shall, at a minimum, test for the following parameters: EPH, VPH with targets, PCBs, and 8 RCRA metals. MassDEP shall be periodically apprised of the findings of the confirmatory soil sampling activities.

G. The CAD application shall also include all appropriate design features, details and calculations for storm water controls at the Site for a 24-hour/25-year storm event at the Site during the Landfill closure project and during the post-closure period. The

storm water control plan shall comply with all applicable local, state and federal requirements.

H. The CAD application shall include plans and provisions for a "phased" or sequencing closure operation. The Landfill closure project shall, at a minimum, provide for a three-phased Landfill closure process.

I. The CAD application shall include all specific design features and details regarding the installation/construction of the final cover/capping system in accordance with all applicable provisions under 310 CMR 19.000 and the Manual.

J. The CAD application shall include a "Hydrogen Sulfide and Odorous Landfill Gas Response Plan" in accordance with MassDEP's Guidance Document entitled "Control of Odorous Gas at Massachusetts Landfills, in Support of 310 CMR 19.000, Solid Waste Management Regulations (September 2007)".

K. The CAD application shall include all appropriate design features and specifications for the installation of a passive gas collection/control system that would have the potential to be retro-fitted and operated as an active landfill gas collection/control system. The CAD application design shall also include provisions for the installation of an emergency active gas collection and control system including horizontal collection pipes and header lines, as well as all necessary utilities for the gas collection/control system to be potentially operated as an active gas control system (e.g. flare) should MassDEP determine such controls are necessary as a result of the release of offensive or harmful gases as a result of the Landfill's closure activities. The active gas collection system would be able to be installed and made operational within ten (10) days of receipt of written Notice from the Department to the Respondents that odors from the Landfill are creating an off-site nuisance condition or posing a risk or threat to the public health, safety welfare or the environment.

L. The CAD application shall include all appropriate design features and control measures concerning a "Traffic Mitigation Plan" regarding truck-traffic to/from the

Landfill/Site during the Landfill closure project. The Traffic Mitigation Plan shall not be limited to the immediate vicinity of the Landfill/Site, but shall also include all access roads that would be utilized during the Landfill closure project, including all major routes of/in abutting communities.

M. The CAD application shall include a conceptual "post-closure monitoring and maintenance plan" that will be implemented after the completion of the Landfill closure project. The "post-closure monitoring and maintenance plan" may be revised based on the findings of the Landfill assessment activities.

N. The CAD application shall not include any component that would constitute a lateral increase of the existing foot-print of the Landfill (after excavation/consolidation), or a vertical increase in the proposed final height of the landfill as indicated in BEC's revised/final "Conceptual Closure Proposal" of **March 27, 2014**, as referenced above in Paragraphs 45 and 46.

O. The Respondent shall respond to any deficiency notice or request for additional information concerning MassDEP's review of the CAD application **within thirty (30) days** of being notified by the Department in writing of same.

P. At the conclusion of its review of the CAD application and the interim ISA/CSA report as referenced in Paragraph 52B MassDEP will issue a "Provisional Decision" on the CAD application pursuant to the provisions of 310 CMR 19.037(4)(a). The Department will provide the public with twenty-one (21) days to comment on the Provisional Decision. During the 21-day public comment period, the Department and the Respondents shall consider all relevant comments from interested persons regarding the Provisional Decision on the CAD application.

Q. At the conclusion of the twenty-one (21) day public comment period MassDEP will review any comments, and will issue its "Final Decision" on the CAD application pursuant to the provisions of 310 CMR 19.037(5).

FINANCIAL ASSURANCE MECHANISM ("FAM")

55. After MassDEP's issuance of its review determination on the Interim ISA/CSA Report (as referenced in Paragraph 52B), and after MassDEP's issuance of its Final Decision on the CAD application (as referenced in Paragraph 54Q) the Respondents shall provide MassDEP with documentation that a Financial Assurance Mechanism ("FAM"), in the amount of approximately five million six hundred thousand ($5,600,000.00) dollars has been established by the Respondents in accordance with the provisions of 310 CMR 19.051 for the implementation and completion of the Landfill's closure plan.

56. The FAM shall also include provisions for the establishment of a separate "Post-Closure Monitoring and Maintenance Account, on the behalf of the Owner regarding the monitoring, maintenance and care of the Landfill after the Landfill has been capped and closed. The "Post-Closure Monitoring and Maintenance" account will be funded through a portion of the proceeds from the delivery and use of the approved landfill closure grading and shaping materials during the Landfill closure project. The "Post-Closure Monitoring and Maintenance" account shall be managed by a third party for the performance of all required post-closure monitoring and maintenance activities associated with the Landfill during the "post-closure period" (30-years) after the Landfill has been closed/capped.

IMPLEMENTATION OF LANDFILL CLOSURE

57. Upon the Respondent's compliance with the performance and submittal of an interim ISA/CSA Report (as referenced in Paragraph 52B), and upon MassDEP's issuance of its review determination thereto, and upon MassDEP's issuance of its Final Decision on the CAD application (as referenced in Paragraph 54Q), and upon the Respondent's establishment of a FAM for the closure and capping of the Landfill (as referenced in Paragraph 55) , the Respondents may commence the delivery, acceptance, stockpiling, and placement of approved landfill closure grading/shaping materials at the Landfill/Site.

The acceptance/placement of the approved landfill closure grading/shaping materials shall be allowed to continue for a period of time not to exceed three (3) years from the date of initial placement of the approved landfill closure grading/shaping materials, in order to achieve the approved closure grades in the CAD permit, or until such time as MassDEP determines that the closure activities have caused nuisance conditions or an adverse impact to the environment.

A. The Respondents shall immediately advise MassDEP in writing of the commencement of the delivery/placement of the approved Landfill closure grading/shaping materials.

B. The Respondents shall maintain a daily records management system documenting all materials delivered to and/or shipped from the Landfill/Site as part of the closure/capping project. Amounts of all such materials shall be recorded in units of weight and volume.

C. The Site shall be equipped with wheel-washing equipment or other similar equipment in order to prevent dirt and debris from leaving the Site and "soiling" roadways that will be utilized as part of the project. The Site shall also be equipped with street sweeping equipment in order to routinely clean all impacted roadways that will be utilized as part of the project.

D. All on-site diesel fuel powered construction equipment associated with the project shall be equipped with or suitably retrofitted with oxidation catalysts or particulate traps in order to reduce air pollution emission from the combustion of fossil fuels. NOTE: Equipment which currently meets EPA Tier 2 and EU Stage 2 Off-Highway Emissions Limits does not require after engine controls.

E. At no time during the landfill closure process should landfill activities be allowed to cause or contribute to a public nuisance condition, as a result of dust, noise, odors, etc., or cause or pose a risk or threat to the public health, safety welfare or the environment.

F. In the event the interim ISA/CSA report identifies site conditions which are substantially different from those known by the Respondents and MassDEP as of the date of the revised final Conceptual Closure Proposal and said different conditions substantially increase the scope of remedial activities, the Respondent shall submit a revised CAD permit application that reflects the increased remedial activities.

COMPLETION OF ENVIRONMENTAL SITE ASSESSMENT

58. **Within three-hundred-sixty-five (365) days of the Effective Date of this Consent Order,** the Respondents shall complete the CSA in accordance with the terms and conditions of the ISA/CSA-SOW approval and/or as may be supplemented pursuant to MassDEP's review determination of the interim ISA/CSA report as described in Paragraph 52B.

59. **Within four-hundred-fifty-five (455) days of the Effective Date of this Consent Order,** the Respondents shall submit a BWPSW23 – CSA report application to MassDEP, describing the findings of the environmental site assessment. The CSA report shall include a recommendation whether a CAAA is necessary.

A. Should MassDEP determine that a CAAA is not necessary, the Respondents shall proceed with the implementation of MassDEP's final approved CAD permit.

B. Should MassDEP determine that a CAAA is necessary, and that the Landfill's final capping system will need to be of a different design from that which has been previously described in MassDEP's final approved CAD permit (as referenced in Paragraph 54Q), the Respondents shall, within sixty (60) days of the MassDEP's issuance of written approval of the final CSA Report, submit a BWPSW24 - CAAA application to MassDEP for review and approval.

C. In addition, should a CAAA be determined necessary, and should MassDEP determine that the Landfill's final capping system will be of a different design from that which had been previously described in MassDEP's final CAD permit, the Respondent's

shall prepare and submit a revised BWPSW25 – CAD application to MassDEP for review and approval. Nothing herein shall prohibit a phased final closure.

COMPLETION OF LANDFILL CLOSURE

60. **Within four (4) years of the Effective Date of this Consent Order,** the Respondents shall complete the installation of the final approved CAD cover/capping system. More specifically, and unless extended pursuant to the provisions of Paragraph 57F, the placement of the approved grading/shaping materials will occur during the first three (3) years of operation in order to achieve proper Landfill closure grades/configuration, and the installation of the final capping system shall be completed no later than within (1) year thereafter of achieving the final approved grades as described in the final CAD approval, or **upon stopping the delivery of acceptable landfill closure grading/shaping materials to the** Site, whichever occurs first.

An order of a court, or regulatory authority, of competent jurisdiction that prohibits the Respondents from receiving or placing approved grading and shaping materials shall toll the period Respondents have time to complete the closure of the Landfill for the period of time the order is in force and effect.

CERTIFICATION OF LANDFILL CLOSURE

61. **Within ninety (90) days of completing the installation of the final cover/capping system,** the Respondents shall submit a BWPSW43 - Landfill Closure Certification Report to the Department in accordance with the provisions of 310 CMR 19.130(31) and 19.140. The Certification Report shall serve as documentation that the closure/capping activities at the landfill have been completed in accordance with the approved CAD permit, the regulations, the Manual, and all relevant policies, guidelines and requirements.

SUBMITTAL OF INFORMATION

62. Respondent shall pay such permit application fee(s) in accordance with the instructions set forth in the permit application, and shall simultaneously deliver a copy of the payment to:

Mark Dakers, Section Chief
Solid Waste Management Section
Department of Environmental Protection
Southeast Regional Office
20 Riverside Drive
Lakeville, MA 02347

63. Except as otherwise provided, all notices, submittals and other communications required by this Consent Order shall be directed to:

Mark Dakers, Section Chief
Solid Waste Management Section
Department of Environmental Protection
Southeast Regional Office
20 Riverside Drive
Lakeville, MA 02347

Such notices, submittals and other communications shall be considered delivered by Respondents upon receipt by MassDEP.

64. Actions required by this Consent Order shall be taken in accordance with all applicable federal, state, and local laws, regulations and approvals. This Consent Order shall not be construed as, nor operate as, relieving Respondents or any other person of the necessity of complying with all applicable federal, state, and local laws, regulations and approvals.

65. Respondents understand, and hereby waive, their right to an adjudicatory hearing before MassDEP on, and judicial review of, the issuance and terms of this Consent Order and to notice of any such rights of review.

66. This Consent Order may be modified only by written agreement of the Parties hereto.

67. The provisions of this Consent order are severable, and if any provision of this Consent Order or the application thereof is held invalid, such invalidity shall not affect the validity of other provisions of this Consent Order, or the application of such other provisions, which can be given effect without the invalid provision or application, provided however, that MassDEP shall have the discretion to void this Consent Order in the event of any such invalidity.

68. Nothing in this Consent Order shall be construed or operate as barring, diminishing, adjudicating or in any way affecting (i) any legal or equitable right of MassDEP to issue any additional order or to seek any other relief with respect to the subject matter covered by this Consent Order, or (ii) any legal or equitable right of MassDEP to pursue any other claim, action, suit, cause of action, or demand which MassDEP may have with respect to the subject matter covered by this Consent Order, including, without limitation, any action to enforce this Consent order in an administrative or judicial proceeding.

69. This Consent Order shall be binding upon Respondents and their heirs, successors and assigns. Respondents shall not violate this Consent Order and shall not allow or suffer Respondent's employees, agents, contractors or consultants to violate this Consent Order. Until Respondents have fully complied with this Consent Order, Respondents shall provide a copy of this Consent Order to each successor or assignee at such time that any succession or assignment occurs.

70. If any event occurs that delays or may delay the performance of any requirement of this Consent Order, Respondents shall immediately, but in no event later than ten (10) days after obtaining knowledge of such event, notify MassDEP in writing of such event. The notice shall describe in detail: (i) the reason for and the anticipated length of the delay or

potential delay; (ii) the measures taken and to be taken to prevent, avoid, or minimize the delay or potential delay; and (iii) the timetable for taking such measures. If Respondents intend to attribute such delay or potential delay to a Force Majeure event, such notice shall also include all available documentation supporting a claim of Force Majeure for the event. Failure to comply with the notice requirements set forth herein shall constitute a waiver of Respondent's right to request an extension based on the event.

71. If MassDEP determines that Respondents' failure to perform a requirement of this Consent Order is caused by a Force Majeure event, and Respondents otherwise comply with the notice provisions set forth above, MassDEP agrees to extend in writing the time for performance of such requirement. The duration of this extension shall be equal to the period of time the failure to perform is caused by the Force Majeure event. No extension shall be provided for any period of time that Respondents' failure to perform could have been prevented, avoided or minimized by the exercise of due care. No penalties shall become due for Respondents' failure to perform a requirement of this Consent Order during the extension of time for performance resulting from a Force Majeure event.

72. Delay in the performance of a requirement of this Consent Order caused by a Force Majeure event shall not, of itself, extend the time for performance of any other requirement of this Consent Order.

73. Stipulated Penalties, as set forth herein, shall not accrue for any failure to perform provided that they are excused in writing by the Department as a "Force Majeure" event, in accordance with the terms set forth herein.

74. Unanticipated or increased costs or expenses associated with the implementation of the actions required under this Consent Order, failure to generate anticipated revenues, or changed financial circumstances shall not be considered circumstances beyond the control and without the fault of the Respondents for purposes of complying with the Consent Order.

75. In the event the Respondents fail to comply with the actions or deadlines contained in Section III of this Consent Order without the expressed written approval of the Department, Respondents shall pay stipulated civil administrative penalties to the Commonwealth for each day, or portion thereof, each such violation continues.

Stipulated civil administrative penalties shall begin to accrue on the day a violation occurs and shall continue to accrue until the day Respondents correct the violation or completes performance, whichever is applicable. Stipulated civil administrative penalties shall accrue regardless of whether MassDEP has notified Respondents of a violation or act of noncompliance. All stipulated civil administrative penalties accruing under this Consent Order shall be paid within thirty (30) days of the date MassDEP issues Respondents a written demand for payment. If simultaneous violations occur, separate penalties shall accrue for separate violations of this Consent Order. The payment of stipulated civil administrative penalties shall not alter in any way Respondents' obligation to complete performance as required by this Consent Order. MassDEP reserves its right to elect to pursue alternative remedies and alternative civil and criminal penalties which may be available by reason of Respondents' failure to comply with the requirements of this Consent Order. In the event MassDEP collects alternative civil administrative penalties, Respondents shall not be required to pay stipulated civil administrative penalties pursuant to this Consent Order for the same violations.

Respondents reserve whatever rights it may have to contest MassDEP's determination that Respondents failed to comply with the Consent Order and/or to contest the accuracy of MassDEP's calculation of the amount of the stipulated civil administrative penalty. Upon exhaustion of such rights, if any, Respondents agree to assent to the entry of a court judgment if such court judgment is necessary to execute a claim for stipulated penalties under this Consent Order.

For each day, or portion thereof, of each violation, Respondents shall pay stipulated civil administrative penalties in the following amounts:

Violation	Penalty Per Day
1st day through 30th day	$ 500.00 per day/per violation
31st day thereafter	$ 1,000.00 per day/per violation

76. Respondents shall pay all civil administrative penalties due under this Consent Order, including suspended and stipulated penalties, by certified check, cashier's check, or money order made payable to the Commonwealth of Massachusetts, or by electronic funds transfer. If payment is made by certified check, cashier's check, or money order, Respondents shall clearly print on the face of its payment Respondent's full name, the file number appearing on the first page of this Consent Order, and the Respondent's Federal Employer Identification Number, and shall mail it to:

Commonwealth of Massachusetts
Department of Environmental Protection
Commonwealth Master Lockbox
P.O. Box 3982
Boston, Massachusetts 02241-3982

In the event Respondents fail to pay in full any civil administrative penalty as required by this Consent Order, then pursuant to M.G.L. c. 21A, § 16, Respondent shall be liable to the Commonwealth for up to three (3) times the amount of the civil administrative penalty, together with costs, plus interest on the balance due from the time such penalty became due and attorneys' fees, including all costs and attorneys' fees incurred in the collection thereof. The rate of interest shall be the rate set forth in M.G.L. c. 231, § 6C.

77. Failure on the part of MassDEP to complain of any action or inaction on the part of Respondents shall not constitute a waiver by MassDEP of any of its rights under this Consent Order. Further, no waiver by MassDEP of any provision of this Consent Order shall be construed as a waiver of any other provision of this Consent Order.

78. Respondents agree to provide MassDEP, and MassDEP's employees, representatives and contractors, access at all reasonable times to 452 Old Fall River Road in Dartmouth (the "Site") for purposes of conducting any activity related to its oversight of this Consent Order. Notwithstanding any provision of this Consent Order, MassDEP retains all of its access authorities and rights under applicable state and federal law.

79. This Consent Order may be executed in one or more counterpart originals, all of which when executed shall constitute a single Consent Order.

80. The undersigned certify that they are fully authorized to enter into the terms and conditions of this Consent Order and to legally bind the party on whose behalf they are signing this Consent Order.

81. This Consent Order shall become effective on the date that it is executed by MassDEP.

82. This ACO shall not become effective until such time as the Owner enters into #ACOP-SE-14-4002, which in addition to requiring the closure/capping of the Landfill, sets forth the requirement that the Owner cease any and all non-permitted post-closure activities, the requirement for payment of an Administrative Penalty in accordance with G.L. 21A §16, and the requirement that the Owner conduct a Supplemental Environmental Project.

Consented To:

MARY ROBINSON (the "Owner")

By: _____ Date: 3/23/14

Consented To:

BOSTON ENVIRONMENTAL CORPORATION (the "Operator")

By: DD WD Date: 3/28/14

Issued By:

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION ("MassDEP and/or the "Department")

By: Philip Weinberg Date: 3/28/14

Philip Weinberg, Regional Director
Southeast Regional Office