UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND - REGION I
5 Post Office Square, Suite 100
BOSTON, MASSACHUSETTS 02109-3912

Superfund Records Center
SITE: Ft. Devens / Sudbury
BREAK: 8.3
OTHER: 448389

September 15, 2011

Mr. Robert Simeone, BEC
BRAC Environmental Office, DAIM-BO-A-DV
30 Quebec St., Bldg 666, Box 100
Devens, MA 01434

Re: Third Five-Year Review Report (2006-2011) for the Former Ft.Devens-Sudbury Training Annex

Dear Mr. Simeone:

This office is in receipt of the Army's Third Five-Year Review Report for the former Ft.Devens-Sudbury Training Annex, dated September 2011. EPA reviewed the report for compliance with the *Comprehensive Five-Year Review Guidance* (OSWER Directive No. 9355.7-03B-P dated June 2001). The report discusses all five (5) operable units (OUs) at the Site and establishes a protectiveness statement for one of those operable units, OU1 (AOC A7-Old Gravel Pit Landfill). The protectiveness statement is required for OU1 only because hazardous substances, pollutants or contaminants remain at the OU.

EPA concurs with the protectiveness statement for OU1, which states that the remedial action is protective of human health and the environment. This site has also met EPA's environmental indicators: Long-Term Human Health Protected and Contaminated Ground Water Migration Under Control. Although there are no major issues or recommendations that affect protectiveness, the Army will conduct follow-up actions to address several minor concerns.

Land use controls played a key role in EPA's determination that OU1 is protective. The Army must ensure that those institutional controls remain effective until such time that they are no longer necessary.

This third five-year review was triggered by the second five year review, completed in September 2006. Consistent with Section 121(c) of CERCLA and EPA's *Comprehensive Five-Year Review Guidance* (OSWER Directive 9355.7-03B-P), the next statutorily required five-year review must be finalized within five years of the date of this letter.

Sincerely,

James T. Owens III, Director
Office of Site Remediation and Restoration

cc: Bryan Olson, EPA-New England
Mary Sanderson, EPA-New England
Christine Williams, EPA-New England
Monica McEddy, EPA HQ
Robert Campbell, MassDEP

SDMS DocID 448389

Final
Third Five-Year Review Report
For
Former Sudbury Training Annex
Sudbury, Massachusetts

SEPTEMBER 2011

Prepared by

Geo-Environmental Branch
Engineering/Planning Division
New England District
Concord MA

Final
Third Five-Year Review Report
For
Former Sudbury Training Annex
Sudbury, Massachusetts

SEPTEMBER 2011

Prepared by

U.S. Army Corps of Engineers
New England District

Approved by:

Date:

9-12-11

Robert J. Simeone
BRAC Environmental Coordinator
Army Base Realignment and Closure Division
U.S. Army Garrison Fort Devens

EXECUTIVE SUMMARY

This is the third statutory five-year review for the Sudbury Training Annex (Annex) Area of Contamination (AOCs) A7. This remedy included excavation of contaminated soil on A9 and offsite disposal and placement of this soil under a Resource Conservation and Recovery Act (RCRA) cap on A7. The purpose of this AOC A7 (A7) five-year review is to determine whether the remedies identified in the source control (SC) record of decision (ROD) are protective of human health and the environment. While there was a no further action management of migration ROD which included this AOC, the SC ROD covers the groundwater monitoring. Therefore, the focus of this Five-Year Review is the state of protectiveness of the SC ROD remedies. The time period for this review covers July 2006-June 2011.

The Annex was deleted from the NPL in January 2002 and is currently controlled by the US Fish and Wildlife Service, the US Air Force, the Federal Emergency Management Agency, the Massachusetts Department of Conservation and Recreation and the Massachusetts Department of Fire Services. The Army continues to report annually on the condition of the whole annex, and maintains contact with the land owners as specified in the Long Term Monitoring and Maintenance Plan (HGL, 2009).

During the period under review, A7 was subject to operation and maintenance inspections of the landfill cap and surrounding area by geotechnical engineers, water level monitoring at A7 and sampling and analysis of groundwater at the A7 monitoring wells. Maintenance activities included an annual grass mowing contract for the landfill cap area and the optimization of the monitoring well network. The optimization entailed decommissioning of select wells and the installation of a new upgradient well. Land Use Controls (LUCs) and Institutional Controls (ICs) are in place for the entire Annex. The perimeter fence around the A7 landfill is the only LUC. ICs required by the SC ROD for A7, are described in the memorandums of agreement between the US Army and current property owners. An invasive species plant survey was completed in May 2010.

The A7 remedy remains protective of human health and the environment and no protectiveness issues were identified in this five-year review. Some minor concerns involving the maintenance program are outlined in this review, specifically the over mowing of a portion of the replicated wetland and adjacent upland buffer zone. Although some maintenance concerns were revealed during the review, the landfill remains in good condition and continues to function as intended by the SC ROD. Contaminant concentrations monitored in groundwater continue to decline, and in most cases no longer exceed the Massachusetts GW-1or GW-3 standards. There are no concerns that warrant changes to the current monitoring program. The report identifies some minor concerns with the current LUC and ICs. The Five-Year Report Summary Form is included as Table ES-1.

The 2011 Five-Year Review recommends:

- Vegetation growth control on and around the landfill cap should be implemented in a timely manner when the inspections call for it. Coordination of this effort with USFWS (e.g. herbicide application/approval) should be improved.
- Maintenance of the fence should be improved to facilitate inspections as well as restrict access.
- Performance metrics for LTM should be established in the LTMMP according to the ITRC guidance (ITRC, 2006).

- The replicated wetland area will be evaluated during the next annual landfill cap monitoring inspection to determine the recovery of the mowed woody plants and whether any corrective action is required (e.g. replanting). Mowing limits should be clearly marked on the figure provided to the contractor and physical markers (e.g. wooden stakes) should also be placed along the southwestern perimeter of the upland buffer zone surrounding the wetland.

- Finalize the technical memorandum on the protectiveness assessment for AOCs P31/P58

- GPS coordinates and a GPS unit should be utilized to locate surface water gages during the annual sampling event.

- Identify points of contact for Institutional Control inspections

Table ES-1 Five-Year Report Summary Form

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION

Site name: Former Army Sudbury Training Annex Site AOC A7

EPA ID: MAD980520670

Region: 1	State: MA	City/County: Sudbury/Middlesex

SITE STATUS

NPL status: X Final Deleted Other (specify)

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

Multiple OUs?* X YES NO	Construction completion date: 09/19/2000

Has site been put into reuse? X YES NO

REVIEW STATUS

Lead agency: EPA State Tribe X Other Federal Agency Army

Author name: Katherine Malinowski

Author title: USACE Chemist	**Author affiliation:** U.S. Army Corps of Engineers New England District

Review period:** June 2006 – June 2011

Date(s) of site inspection: November 23, 2010 and December 7, 2010

Type of review:

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

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

Triggering action:

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

Triggering action date *(from WasteLAN)*: 09/25/2006

Due date (five years after triggering action date*): 09/25/2011

FIVE-YEAR REVIEW SUMMARY FORM, CONT'D.

Issues:

There are no protectiveness issues identified in this review.

Recommendations and Follow-up Actions:

None

Protectiveness Statement(s)

Because the remedial actions at all OUs are protective, the site is protective of human health and the environment.

The source control and management remedies associated with A7 continue to be protective of human health and the environment.

The source control remedy currently remains protective by precluding the potential for exposures related to the landfill waste. Ongoing maintenance and monitoring activities, the land use control and institutional controls are all functioning to ensure the continued protectiveness of the remedy and human health and the environment at A7 and throughout the annex. Long-term protectiveness will be achieved through continued maintenance and monitoring of the landfill cap area and of the groundwater migrating from the site. Good communication between the Army and the Annex property owners and the neighboring town(s) concerning institutional controls and groundwater quality will assure long-term protectiveness.

Other Comments:

The following are specific recommendations for the Annex:

- Vegetation growth control on and around the landfill cap should be implemented in a timely manner when the inspections call for it. Coordination of this effort with USFWS (e.g. herbicide application/approval) should be improved.
- Maintenance of the fence should be improved to facilitate inspections as well as restrict access.
- Performance metrics for LTM should be should be established in the LTMMP according to the ITRC guidance (ITRC, 2006).
- The replicated wetland area will be evaluated during the next annual landfill cap monitoring inspection to determine the recovery of the mowed woody plants and whether any corrective action is required (e.g. replanting). Mowing limits should be clearly marked on the figure provided to the contractor and physical markers (e.g. wooden stakes) should also be placed along the southwestern perimeter of the upland buffer zone surrounding the wetland.
- Finalize the technical memorandum on the protectiveness assessment for AOCs P31/P58
- GPS coordinates and a GPS unit should be utilized to locate surface water gages during the annual sampling event.
- Identify points of contact for Institutional Control inspections

TABLE OF CONTENTS

EXECUTIVE SUMMARY ES-1

TABLE OF CONTENTS i

LIST OF ABBREVIATIONS AND ACRONYMS iv

1.0 INTRODUCTION 1
- 1.1 Regulatory Background 1
- 1.2 Purpose of the Five Year Review 2
- 1.3 Personnel Conducting the Review 2
- 1.4 Review Status 3

2.0 SITE CHRONOLOGY 4

3.0 BACKGROUND 6
- 3.1 Physical Characteristics 6
- 3.2 Land Resource and Use 6
- 3.3 History of Contamination 8
- 3.4 Initial Response 9
- 3.5 Summary of Basis for Taking Action 9

4.0 REMEDIAL ACTIONS 12
- 4.1 Remedial Action Objectives 12
- 4.2 Remedy Selection and Implementation 13
  - 4.2.1 Source Control 13
  - 4.2.2 Management of Migration 14

5.0 Progress Since the Last Five-Year Review 18
- 5.1 Protectiveness Statements from Last Review 18
- 5.2 Status of Recommendations and Follow-Up Actions from the Last Review 19

6.0 FIVE YEAR REVIEW PROCESS 20
- 6.1 Administrative Components 20
- 6.2 Community Involvement 20
- 6.3 Document Review 20
  - 6.3.1 Background Documents Review 20
  - 6.3.2 Review of ARARs 20
  - 6.3.3 Review of O&M and Monitoring Program 21
  - 6.3.4 Land Use Controls and Institutional Controls 28
- 6.4 Data Review 29
  - 6.4.1 Groundwater and Surface Water Elevations 29
  - 6.4.2 Groundwater Analysis 31
  - 6.4.3 Ecological Components 33
- 6.5 Five-Year Review Site Inspection 35
- 6.6 Five-Year Review Interviews 35

7.0 Technical Assessment 36
- 7.1 Technical Assessment Questions 36

7.2 Summary of the Technical Assessment 39

8.0 ISSUES 41
8.1 CONCERNS 41

9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS to Issues 42
9.1 RECOMMENDATIONS AND FOLLOW-UP ACTIONS TO CONCERNS 42

10.0 PROTECTIVENESS STATEMENT 45

11.0 Next Review 46

12.0 Reference 47

LIST OF TABLES

Table ES-1 Five-Year Report Summary Form ES-1
Table 1 Chronology of Site Events. 4
Table 2 List of Contaminants Initially Identified at AOC A7 and AOC A9 10
Table 3 Annual Operation and Maintenance Costs 15
Table 4 GV-1 Landfill Gas Monitoring Results 23
Table 5 GV-2 Landfill Gas Monitoring Results 23
Table 6 GV-3 Landfill Gas Monitoring Results 24
Table 7 GV-4 Landfill Gas Monitoring Results 24
Table 8 Summary of Groundwater Samples during this Five-Year Review Period 27
Table 9 Water Level Monitoring Wells in Addition to Analytical Monitoring Wells Fall Events 29
Table 10 Water Level Monitoring Wells Spring Events 30
Table 11 Most Significant COPCs Identified in the Risk Assessment (circa 1994) 38
Table 12 Changes in USEPA Toxicity Values for AOC A9 39
Table 13 Concerns for the Sudbury Training Annex Site, Sudbury, Massachusetts 41
Table 14 Recommendations and Follow-up Actions for the Sudbury Training Annex Site, Sudbury, Massachusetts 43

LIST OF FIGURES

Figure 1 Assabet River National Wildlife Refuge

Figure 2 Site Map Former Sudbury Training Annex

Figure 3 Former Sudbury Training Annex Parcel Owners

Figure 4 Site Map Area of Contamination A7

Figure 5 Interpretive Water Table Elevation Map

Figure 6 AOC A7 Landfill Limits of Mowing

LIST OF APPENDICES

Appendix A Site Status Table

Appendix B Site Attendance Sheets

Appendix C Public Notice

Appendix D ARAR Tables

Appendix E Groundwater and Surface Water Charts

Appendix F Interview Documents

Appendix G Groundwater Data Tables 2006-2009

Appendix H Groundwater Data June 2011

LIST OF ABBREVIATIONS AND ACRONYMS

AOC	Area of Contamination
ARARs	Applicable or Relevant and Appropriate Requirements
BRAC	Base Realignment and Closure
BEC	BRAC Environmental Coordinator
bgs	Below Ground Surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability
COCs	Contaminants of Concern
COPCs	Contaminants of Potential Concern
CVOC	Chlorinated Volatile Organic Compound
EPA	United States Environmental Protection Agency
FEMA	Federal Emergency Management Agency
HGL	Hydrogeologic, Inc.
HHRA	Human Health Risk Assessment
IC	Institutional Control
IRIS	Integrated Risk Information System
LUC	Land Use Control
MassDEP	Massachusetts Department of Environmental Protection
MERS	Mobile Emergency Response Support
MCLs	Federal Maximum Contaminant Levels
MCP	Massachusetts Contingency Plan
mg/kg	milligrams per kilogram
MOA	Memorandum of Agreement
MOM	Management of Migration
MSL	Mean Sea Level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
OE	Ordnance and Explosives
O&M	Operations and Maintenance
OU	Operable Unit
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated biphenyl
PCE	Tetrachloroethene
ppb	Parts per billion
ppm	Parts per million
RA	Remedial Action
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RfC	Reference Concentration
RfD	Reference Dose
RFTA	Reserve Forces Training Area
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SC	Source Control
SVOC	Semi-volatile Organic Compound
TBC	To be considered
TCE	Trichloroethene
UCL	Upper Concentration Limit
µg/kg	Microgram per kilogram
µg/L	Microgram per liter
USACE – NAE	United States (U.S.) Army Corps of Engineers New England District

USAF	U.S. Air Force
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Services
USGS	U.S. Geological Survey
VOC	Volatile Organic Compound

1.0 INTRODUCTION

1.1 Regulatory Background

The United States Department of the Army (Army) must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This is the third five-year review for the Former Army Sudbury Training Annex (Annex) for AOCs 7. This review concentrates on only AOC A7 since the rest of Site had No further Action RODs and in the case of AOC A9 the result of the remedial action was that the AOC A9 was cleaned up to levels that allow for unlimited use and unrestricted exposure. The Army is the lead agency for the site and the USEPA (EPA) is the lead regulatory agency. The Army and the EPA provide notice and seek concurrence from the MassDEP on site activities. The U.S. Army Corps of Engineers New England District (USACE NAE) was tasked by the Army Base Realignment and Closure (BRAC) Environmental Coordinator (BEC) to complete this Five-Year Review for the Annex AOC 7. This review is required by statute since the A7 source control remedial action was post Superfund Amendments and Reauthorization Act (SARA) and left contaminants at the site above levels allowed for unlimited use and unrestricted exposure. The Record of Decision (ROD) was signed in 1995 and remedial action was initiated in 1996. Transfer agreements for the transfer of parcels of the Annex from the Army to other agencies contain Institutional Controls (ICs). The status of these ICs for the entire annex is evaluated annually as part of the Long-Term Monitoring and Maintenance Plan and those relating to A7 are reviewed as part of the five-year review process.

CERCLA §121(c), as amended, states:

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

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

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

This report provides a complete review based on the EPA's Five-Year Review Guidance Document (OSWER No. 9355.7-03B-P) (USEPA, 2001) for the remedial action for AOC A7 (A7) as documented in the 1995 ROD (OHM, 1995). There are a total of 73 AOCs at the Annex. A7 is one of the AOCs and requires review every five-years. For reference, a complete list of the Annex AOC descriptions along with decision status, disposition of waste and associated dates is included in Appendix A.

1.2 Purpose of the Five Year Review

The purpose of this five-year review is to determine whether the remedy for A7 remains protective of human health and the environment. Specifically, the report addresses the following 3 questions stated in EPA's Five-Year Review Guidance Document:

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

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

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

The findings and conclusions of this review are documented in this report. There are no issues to report. The report identifies maintenance and IC concerns and offers recommendations.

1.3 Personnel Conducting the Review

The review was conducted between October 2010 and June 2011 by a USACE review team consisting of a geologist, chemist, ecological risk assessor and human health risk assessor (Ken Heim, Katherine Malinowski, Bob Davis and Larry Cain). Personnel supporting the five year review included Libby Herland (Project Leader for the USFWS Eastern Massachusetts National Wildlife Refuge, Jon Kullberg (Project Geotechnical Engineer) and others listed in the Interview Documents in Appendix F.

A site visit took place on November 23, 2010. Participants in the site visit included:

Name	Representation	Discipline
Darrell Moore	USACE	Technical Lead
Lawrence Cain	USACE	Human Health Risk Assessor
Bob Davis	USACE	Ecological Risk Assessor/Environmental Resource Specialist
Rachael Whitermore	USACE	Department of Army Intern
Katherine Malinowski	USACE	Chemist/Lead Author
Ken Heim	USACE	Geologist
Tracy Dorgan	USACE	Geologist
Mike Jackson	HGL	Field Team Leader

A second site visit took place on December 7, 2010 to include stake holders who could not attend the first visit. Participants in the second site visit included:

Name	Representation	Discipline
Christine Williams	USEPA Region 1	Remedial Project Manager
Robert Campbell	Mass DEP	Project Manager
Ellen Iorio	USACE	Project Manager
Katherine Malinowski	USACE	Chemist/Lead Author

Refer to Site Attendance sheets in Appendix B.

1.4 Review Status

This is the third Five-Year Review for A7. The first Five-Year Review was completed September 25, 2001 and the second Five-Year Review was completed September 22, 2006. The triggering action for the statutory review at A7 signature date of the previous Five-Year Review Report. Therefore, the third five-year review date is September 25, 2011.

2.0 SITE CHRONOLOGY

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

Table 1 Chronology of Site Events.

EVENT	DATE
USAEC Site Assessment – designated AOCs A1 - A11	1980
USAEHA Hydrogeological and Subsurface Investigation of AOCs A1 - A11	1983
NUS conducted PA/SI	PA (1985), SI (1987)
Dames & Moore completed RI for AOCs A1-A11 and potential contamination sources in the vicinity of the Capehart Family Housing Area (CFHA), Puffer Pond, and associated streams.	1986
Site listed on NPL	21 February 1990
Expanded RI – Dames & Moore	1990
Federal Facilities Agreement signed	November 1991
Feasibility Study completed	May 1995
ROD – Source Control OU for AOC A7 and AOC A9	August 1995
Fort Devens closed	March 31, 1996
The Devens Reserve Forces Training Area Established	April 1, 1996
Landfill cap construction start date	July 31, 1996
Landfill cap completion	November 1996
ROD – Management of Migration OUs for AOC A7 and AOC A9	September 1997
Monitoring Well Installation	1992-96
Long term groundwater monitoring, cap and institutional control inspections	October 1997 to present
Long Term Monitoring & Maintenance Plan	April 1998
MOA for transfer of property from US Army to US Fish and Wildlife Service	28 September 2000
First Five-Year Statutory Review	September 2001
Annex withdrawn from NPL	30 November 2001; effective date 29 January 2002
Transfer Agreement between US Army and US Air Force for a portion of the former Fort Devens (Sudbury Training Annex)	3 June 2002 (USAF signed 5 June 2002)
Decommissioning of Wells OHM-A7-13 and OHM-A7-07	June 2002

EVENT	DATE
Letter of Transfer for a portion (five FEMA parcels) of the former Fort Devens to the Federal Emergency Management Agency	31 March 2003
Modification to Memorandum of Agreement between US Army and FEMA for the transfer of real property at Sudbury Training Annex	FEMA signature dated 29 July 2003.
Optimization of groundwater monitoring from semi-annual to annual	September 2005
Second Five Year Review	September 2006
Long-term monitoring and maintenance plan updated	March 2009
Third Five Year Review	September 2011

3.0 BACKGROUND

The Sudbury Training Annex became part of Fort Devens, now the Devens Reserve Forces Training Area in 1982. The Annex was placed on the EPA National Priorities List (NPL) as a Superfund Site in 1990 and in May 1991 the Army signed an Interagency Agreement called a Federal Facilities Agreement (FFA) with the EPA stipulating that site investigations and cleanup actions would follow CERCLA and its amendments under the regulatory guidance of NCP 40 CFR Part 300.

In 1995 the Sudbury Training Annex was placed on the Base Realignment and Closure (BRAC) list. The SC ROD for A7 (and AOC A9) was signed in September 1995. The remedial action decision for AOC A4 and the management of migration OU for AOCs A7 and A9 was signed in September 1997. There are a total of 73 AOCs at the former Annex (re: Appendix A).

The Annex was deleted from the NPL in January 2002. Ongoing operation and maintenance (O&M) of the landfill cap and groundwater monitoring occurs annually. The Army also reports annually on the condition of the whole annex as specified in the Long Term Monitoring and Maintenance Plan LTMMP (HGL, 2009).

3.1 Physical Characteristics

The Annex lies in Middlesex County, Massachusetts, about 20 miles west of Boston, and occupies approximately 2300 acres within the towns of Hudson, Stow, Maynard and Sudbury, Massachusetts. See Figure 1. t consisted of rural and agricultural property prior to development by the Army. Average elevation is 200 feet with rounded and forested hills extending approximately 100 feet above the surrounding lowland. The lowland at the former Annex is poorly drained with abundant wetlands and small streams throughout. The regional topography is glacially derived with a relatively thin and intermittent glacial till layer separating the glacial outwash sediment overburden from the bedrock outcropping at higher elevations throughout the former Annex and surrounding region. Overburden soils in the wetland areas consist of finer grained silt and clay sized particles with abundant organic debris. A number of kettle ponds including Puffer Pond, White Pond and Lake Boon are on or nearby the former Annex and the Assabet River. Hudson Road divides the installation into a larger northern section and a smaller southern section.

A7 is a ten-acre area located between Patrol Road and the Assabet River along the northern installation boundary. The landfill is accessed via Patrol Road. The northern edge of the site is less than 100 feet from the Assabet River at its closest point. The landfill is located on the northern lower slope and toe of a hill that slopes downward to the Assabet River (Figures 1 and 2).

3.2 Land Resource and Use

In 1942, the US Army purchased the property from landowners to establish the Fort Devens Sudbury Training Annex. In 1996 Fort Devens was closed and the Reserve Forces Training Area was established. In 2000, the Army transferred 2,230 acres to the US Fish and Wildlife Service (USFWS). This transfer was made under the Defense Base Closure and Realignment Act of 1990, for its "particular value in carrying out the national migratory bird management program." During the years of Army ownership, the land was used for a storage area for ammunition and a training location for troops. The Annex also received wastes from the Army research and development laboratory in Natick, Massachusetts.

The USFWS established the Assabet River National Wildlife Refuge (refuge) with the transferred land. The refuge has a large wetland complex, several smaller wetlands and vernal pools and large forested areas which are important feeding and breeding areas for migratory birds and other wildlife. The refuge is open to the public for many wildlife-dependent recreational uses, such as wildlife observation, environmental education, hunting and fishing.

The following paragraphs describe the current land use by each of the property owners of the former Sudbury Annex land; the USFWS, the Federal Emergency Management Agency (FEMA), the US Air Force (USAF). Within this review period land belonging to the USFWS was transferred to the Massachusetts Department of Conservation and Recreation (DCR) and the Massachusetts Department of Fire Services.

The portion of land owned by USFWS that contains A7 is not used. The USFWS designated it as a "closed area" to the public to protect both the public and the remedy. The closed area is shown in Figure 1. For the remainder of the USFWS property, the USFWS removed military buildings left by the Army as well as buildings pre-dating the military in 2003 and 2004. They also removed barbed wire and other safety hazards. In 2003 they drafted a plan for walking trails and in 2005 the refuge opened to foot traffic. Many more improvements were made within this review period. The USFWS constructed the new visitor center and restrooms located on Winterberry Way. Refer to Figure 1. Winterberry Way was named by the public, it was formerly Craven Road. The visitor center is a green building utilizing a standing column geothermal heating system consisting of four 500' wells. There are solar panels on the roof and many other environmentally conservative features.

On October 17, 2010 there was a grand opening of the visitor center and 1200 people attended. As of January 1, 2011 the center is open weekly Thursday-Sunday. There are many opportunities for the public to enjoy the refuge such as the many walking trails. The east side, near the new visitor center, has mostly short trails to cater to the majority of visitors who prefer short walks and for those visitors with children. There is a canoe portage on Sandbank Trail. There are plans for educational demonstration areas in the back of the visitor center. The existing bunkers are still on site. The public expressed interest in the bunkers and the USFWS now guides Bunker tours. The bunkers are utilized for storage. The USFWS attempted to utilize them for bat habitation; however the bats did not use them. The plan for one bunker is to replace the door with a grated door so visitors can look inside. The USFWS also provides an urban education program and hopes to get a bus for this program in the future.

The refuge is open to hunting, in accordance with Massachusetts state laws and refuge specific regulations. Permitted species are white-tailed deer, ruffed grouse, gray squirrel, rabbit, woodcock and spring turkey. Nothing is stocked or managed for hunting. The only dogs allowed on the refuge are hunting dogs. Fishing is authorized in accordance with state law, but is currently restricted to the Barron fishing access on Puffer Pond.

All remaining houses on the USFWS property and some telephone poles were removed within the review period with the goal of removing all unused telephone poles. Additional plans include adding parking lots, specifically one on White Pond Road. The restoration of Russell Bridge was completed in 2008. The abandoned railroad on the south side may become a rail trail project. In 2009 the USFWS acquired a 28 acre parcel from a private owner. They also made an offer to purchase Crow Island northwest of the refuge however the owner did not accept the offer. Crow Island is utilized for a privately owned airport and Ultra-Light aircraft are flown there regularly. The owner owns the road adjacent to A7, referred to as Track Road, from White Pond Road to his property (see Figure 2).

Approximately 72 acres of the former Annex were transferred to FEMA in 2003. FEMA has had a permit to occupy part of the Annex shown as Parcel I on Figure 3, since May 27, 1980. The Army transferred a total of approximately 72 acres of land to FEMA that includes five non-contiguous small parcels (including Parcel I) in March 2003. FEMA uses the land for its operations and training missions. Within the review period FEMA has cleared approximately six acres on one parcel (FEMA I on Figure 3) for use as a temporary antenna field and the site for construction of a 50,000 square foot storage facility by the FEMA Mobile Emergency Response Support (MERS). This construction is planned for fiscal year 2012. FEMA has also installed a new security fence on the south western side of the property. FEMA has two wells east of Puffer Pond, near the fishing pier. They were installed in 1968. The groundwater from the wells is monitored and there are no water quality issues. FEMA did not have any historic data available, but offered to provide data to USACE from the next sampling event scheduled in February 2011. FEMA needs to go through USFWS property to get to most of their property and the wells. Although this is not ideal for either entity, there is a good relationship between FEMA and USFWS and they accommodate each other's needs for their respective operations.

On June 5, 2002 about four acres of the Annex were transferred to the US Air Force (USAF) where the USAF operated a radar/weather station. The station is still there and USAF occupies the associated building. Refer to Figure 3 for the USAF parcel location.

The DCR owns land adjacent to the refuge and the land is designated as The Sudbury State Forest. In 2005 the Commonwealth logged trees in the forest and in 2007 they transferred 50 acres to the Massachusetts Department of Fire Services. The Department of Fire Services utilized the land to build an overflow parking lot near their buildings.

In areas where developed land is adjacent to the Annex, the development is mostly residential with some commercial development north and northeast of the site. The four towns bordering the land are Hudson, Maynard, Stow,and Sudbury. The combined population of these four towns based on Massachusetts 2007 estimates, is 53,243 (EOHHS, 2011). The Stow Away Golf Course is north of the Site on the opposite side of the Assabet River. A7 is in within the town of Stow.

3.3 History of Contamination

Some contaminated areas within the Annex included the Old Gravel Pit Landfill, currently the site of A7, a former fire training and flame retardant clothing test area, underground storage tanks, a rail yard maintenance area, pesticide storage area, ammunition demolition area and various reported disposal areas. AOC A9, the petroleum oil and lubricant (POL) burn area, was used for product testing and was made available infrequently to local jurisdictions and the Massachusetts Fire fighting Academy for fire prevention training. Natick Laboratory used the area for flame-retardant clothing tests, and the Massachusetts State Police used this area infrequently for the destruction of confiscated fireworks. All activity stopped at the AOC A9 in the 1990s.

A7 is the site of a former dumping ground. Army research and development laboratory, Natick Labs, reportedly dumped and buried laboratory wastes between the late 1950s and mid 1970s. Drums and other chemical containers including quart to gallon size metal and glass containers were reportedly disposed of at A7. Other debris from the base was also reportedly dumped and buried there as well. Burning of flammable wastes was done as a volume reduction method. General refuse (tents, cloth, trash, debris etc.) was reportedly buried at shallow depths since 1941. A7 was also used by the public for unauthorized surface dumping during the 1970s until access was restricted.

3.4 Initial Response

The Annex was assessed for contamination under DoD's Installation Restoration Program (IRP) starting in 1980. This was followed by a Site Discovery in 1981 and a Preliminary Assessment and Site Inspection in 1983 and 1987, respectively. In February 1990 the site was listed on the NPL. The FFA between EPA and the Army, signed on November 15, 1991, states the Army, as the lead agency, is responsible for carrying out all work required in accordance with the requirements of CERCLA under EPA oversight. Further, the FFA states all work completed at the site pursuant to the agreement and the 1992 Master Environmental Plan (MEP) shall be funded by the Army. The Army agreed to undertake, fully implement and report on the following tasks listed in the MEP:

- A Preliminary Assessment (PA) and Site Investigation (SI) of the Site and all AOCs/Study Areas (SA) identified in the MEP
- Remedial Investigations (RIs) of all AOCs
- Feasibility Studies (FS) of all AOCs
- Proposed Plans and RODs for all AOCs
- All Remedial Actions, Removal and Remedial Designs for all AOCS
- Operation and Maintenance of Remedial Actions at the AOCs

Between 1980 and 2001 the Army conducted investigations at the Annex to address potentially contaminated areas. The investigations were followed up with removal of contaminated soil and underground storage tanks within the annex. To prevent trespassers from physical harm or from coming in contact with contaminated areas, the Army fenced off several sites and buildings.

Portions of the Annex groundwater, including groundwater associated with A7, were found to contain elevated levels of VOCs, pesticides and metals above Massachusetts drinking water standards. The contamination is now contained under a landfill cap and the groundwater is being monitored to verify contaminants from the landfill are not above acceptable levels. Other areas of the Annex contained contaminated soil, but have been cleaned up. The Annex was deleted from the NPL in 2002.

The tasks listed above, from the MEP, have been completed and annual long term monitoring at A7 is ongoing under the most recent LTMMP dated March 30, 2009. Remedial actions for A7 are described in section 4.0 of this report. Refer to the Site Status Table in Appendix A for a complete list of areas associated with the Annex and their respective site descriptions, disposition of waste, and final decision documents.

3.5 Summary of Basis for Taking Action

In 1975 the DoD established the Installation Restoration Program (IRP). Under the IRP, the DoD sought to identify, investigate and cleanup contamination from hazardous substances at federal facilities. Environmental investigations were started at the Annex in 1980 under the IRP in order to address the environmental impact of past land usage.

The Initial Installation Assessment records search showed certain areas of the annex may be contaminated with petroleum, oil and lubricants (POL) specifically A9, explosives residues or chemical wastes and evidence of dumping. The geology of the Annex is conducive to potential migration from various chemical burial sites, lab operations, chemical storage facilities and maintenance operations. Therefore a survey was desirable to evaluate the potential for contaminant migration from the installation (US Army

Toxic and Hazardous Materials Agency, 1980). A summary for A7 in the 1994 RI noted numerous areas of contamination and recommended further investigation that would probably identify additional evidence of such hotspots. No evidence of a groundwater contaminant plume was present. The RI results showed risks above the target risk range, so a feasibility study was necessary to evaluate remedial alternatives. Contaminants listed in Table 2 were identified the RI for Area A7. The FS for AOCs A7and A9 provided risk based alternatives for contaminant remediation (OHM, 1995).

Table 2 List of Contaminants Initially Identified at AOC A7 and AOC A9

Soil	Groundwater	Surface Water	Sediment
Pesticides	**Pesticides**	**Metals**	**SVOCs**
4,4'-DDT (DDD and DDE)	4,4'-DDT (DDD and DDE)	iron	N-nitrosodi-n-propylamine
Dieldrin			
Endosulfan			
Alpha chlordane	Alpha chlordane		N,N-bis(2-hydroxyethyl)dodecamide
Heptachlor	Dieldrin		
Heptachlor epoxide	Gamma-BHC(lindane)		**VOCs**
Beta-benzenehexachloride	Endrin aldehyde		Acetone
Beta-endosulfan	Heptachlor epoxide		Methylene chloride
Herbicides	Beta-endosulfan		**Metals**
Silvex	Alpha-hexachlorocyclohexane		Iron
DCPA			Aluminum
PCBs	Gamma-hexachlorocyclohexane		
Aroclors 1242, 1248, 1254, 1260			
Explosives	**SVOCs**		
RDX	Naphthalene		
PAHs	**VOCs**		
Anthracene	Chlorobenzene		
Benzo(a)anthracene	Chloroform		
Naphthalene	Tetrachloroethene		
Phenanthrene	Acetone		
Pyrene	Methylene chloride		
2-methylnaphthalene	1,1,1-tetrachloroethane		
1,5-dimethylnaphthalene	1,1-dichloroethene		
SVOCs	trichloroethene		
Bi(2-ethylhexyl)phthalate			
Hexadecanoic (palmitic) acid	**Metals**		
Octodecanoic (stearic) acid	lead		
VOCs	**Explosives**		
Acetone	3-nitrotoluene		
1,1,1-trihloroethane	1,3,5-trinitrobenzene		
1,1,2-trichloroethane	2,4,6-trinitrotoluene		
1,2-dichloroethane			
Chloroform			
Ethylbenzene			
Tetrachloroethene			
Chlorobenzene			
Toluene			
Xylene			

Soil	Groundwater	Surface Water	Sediment
Methylbenzene			
Nonane			
Octane			
1,2,3,4-tetramethylbenzene			
1-ethyl-2-methylbenzene			
1,3,5-trimethylbenzene			
Metals			
Mercury			
Lead			
Arsenic			
Thallium			
Copper			
Zinc			

4.0 REMEDIAL ACTIONS

This Section discusses the Remedial action objectives (RAOs) and the selection and implementation of the remedial actions for A7. RAOs consist of goals for protecting human health and the environment. They specify the chemicals of concern (COCs), exposure route(s) and receptor(s) and identify an acceptable contaminant level (ARARs and risk-based) or range of acceptable risk for each exposure route. PRGs are the preliminary remedial action cleanup levels. They are derived by compiling and evaluating chemical–specific ARARs and risk-based cleanup criteria. While the MOM ROD was no further action and does not require a five year review, the selection of the SC and MOM remedial actions for A7 are discussed in this section for completeness.

4.1 Remedial Action Objectives

No cleanup concentration requirements are stipulated in the RODs. While the SC ROD does not list cleanup goals, RAOs include eliminating potential risk to human health and the environment associated with exposure to contaminated wastes and minimizing off-site migration of contaminants. It also states that a groundwater sampling and analysis program, to enable the assessment of contaminant migration from A7, and a monitoring and maintenance program for the landfill cap will be conducted. The ROD also states, "The environmental monitoring program would be submitted for regulatory review and approval and will identify the sampling locations and frequencies..." EPA is the lead regulatory agency that reviews and provides approval of the monitoring program.

The first LTMMP (USACE, 1998) stated the effectiveness of the remedy would be evaluated by monitoring trends of groundwater contaminants and comparing the results to the Massachusetts Contingency Plan (MCP) groundwater (GW) standards. The MCP GW-1 groundwater standards apply to groundwater that is either a current drinking water resource or a potential future source of drinking water. These standards are intended to address the potential health effects associated with the use of the groundwater. The MCP GW-3 groundwater standards apply to all groundwater in the Commonwealth. These standards are intended to address the adverse ecological effects that could result from discharge of oil or hazardous material to surface water. The most stringent MCP GW standard, GW-1, was used for comparison of VOCs, pesticides and metals. In addition, several water quality parameters were monitored to evaluate the extent of intrinsic remediation occurring at the site. Groundwater samples were analyzed, for the following parameters: VOCs, pesticides, target analyte list (TAL) metals, phosphate, sulfate, nitrate, ammonia, total dissolved solids (TDS), chemical oxygen demand (COD), chloride and cyanide. The original LTMMP required monitoring for the COPCs identified in the 1994 Risk Assessment (OHM, 1994). The site COCs include both COPC contaminants identified in the risk assessment as well as other contaminants not on the COPC list that were found during the monitoring program such as 1,1,2,2-tetrachloroethane. Although not specifically identified in the ROD, these COCs were approved by regulators.

The most recent LTMMP (HGL, 2009) optimizes the program and points out that GW-3 standards are more appropriate based on the fact that the site is not within a Current Drinking Water Source Area or within a Potential Drinking Water Source Area. However, the groundwater results will continue to be compared to GW-1 standards and GW-3 standards. This LTMMP identifies the COCs as PCE, TCE, 1,1,2,2-tetrachloroethane and lindane since they comprise the majority of risk to human health. After optimization of the 1998 LTMMP, the current parameters in the 2009 LTMMP are; VOCs, pesticides, TAL metals, COD and cyanide. These parameters are those from the previous plan without the additional water quality parameters. The water quality parameters had been collected to determine the potential for bioremediation. The potential for bioremediation was found to be at best limited. Given the low potential

the analyte list was pared back in 2005 to concentrate on COCs with less emphasis on bioremediation assessment. Currently the analytical results are compared to both GW-1 and GW-3 standards although these are not listed as ARARs.

4.2 Remedy Selection and Implementation

A feasibility study of remedial alternatives was done for AOCs A7 and A9 together. Soil and groundwater at the two areas were separated into two operable units (OUs), one for SC and one for MOM. This was done since at the time, the remedy for MOM required additional data and a remedy for SC could be selected with the existing data. The selected remedies were subsequently defined in two RODs completed in 1995 and 1997 respectively. The MOM ROD was no further action.

4.2.1 Source Control

The primary remedial action objectives to be achieved by the RAOs for SC remedy for A7 are:

- Eliminate potential risk to human health and the environment associated with exposure to contaminated wastes
- Minimize off-site migration of contaminants; and,
- Limit infiltration of precipitation to the underlying waste within the landfill area, thereby minimizing leachate generation and groundwater degradation.

For AOC A9 the primary RAO is:

- Reduce potential risk to human health associated with exposure to contaminated soil.

The selected source control remedy was documented in the ROD dated September 1995. To prevent the potential threat to human health, welfare or the environment posed by contaminated soil and solid waste at AOCs A7 and A9 the source control remedy included excavation of buried laboratory wastes and associated soil within A7and A9, off-site disposal, waste consolidation and construction of an impermeable Resource Conservation and Recovery Act (RCRA) cap to contain the remaining contaminants. The RCRA Subtitle C landfill cap was constructed over the existing landfill at A7 to: eliminate the potential risk to human health and the environment associated with exposure to wastes; minimize off-site migration of contaminants; and limit infiltration to the underlying waste within the landfill area, thereby minimizing leachate generation and groundwater degradation. The RCRA cap consists of the following geosynthetic layers from immediately above the waste moving to the ground surface: 12 inches of subgrade fill; a geocomposite gas collection layer, a geosynthetic clay liner, a 40-mil linear low density polyethylene geomembrane, and a geocomposite drainage layer. Above the composite drainage layer lie 15 inches of drainage sand, 15 inches of filter sand and 6 inches of vegetative support soil (topsoil). The cap was completed in the fall of 1996.

The landfill cap was designed to provide a barrier to infiltration and direct precipitation runoff away from landfill material. The landfill and associated ICs also included in the SC ROD are designed to eliminate exposures. The source control remedy includes:

- Removal and off-site disposal of chemical waste debris in the laboratory dump area;
- Excavation of contaminated soil from AOC A9 and consolidation at AOC A7
- Consolidation of contaminated soil and solid waste at A7 to within the limits of the landfill cap

- Construction of a RCRA Subtitle C landfill cap to contain the remaining site contaminants;
- Operation and maintenance at A7
- ICs and LUCs to limit future use of land and restrict access for A7
- Environmental monitoring including long-term groundwater monitoring; and
- Five-year reviews to assess whether the remedy remains protective of human health and the environment.

The Final Operations and Maintenance Plan for the Landfill AOC A7 (Weston, 1997) detailed the groundwater monitoring program. The LUC and ICs associated with the SC remedy were described in the Environmental Condition of Property report and included in the long-term monitoring and maintenance plan (HGL, 2009). ICs for the entire Annex are in the property transfer documents called memorandums of agreement (MOAs). The MOAs are agreements between the Army and the other federal agencies that the Annex land was transferred to.

4.2.2 Management of Migration

The ROD dated September 1997 presents the selected no further remedial action decision for AOC A4 and the MOM OU at AOCs A7 and A9. The US Army and USEPA, with concurrence of the MassDEP determined that no action was necessary for the protection of human health and the environment for these AOCs. Previous response actions had removed or contained contaminated media so they are no longer a continuing source of groundwater contamination.

Since the decision for the management of migration remedy was for no action under CERCLA, the statutory requirements of CERCLA Section 121 for remedial actions are not applicable, and no five-year review is necessary for that remedy.

Although there are no actions associated with the No Action Alternative under CERCLA, in accordance with the FFA, the Army will continue to monitor groundwater at and conduct five-year site reviews for A7 as part of the remedy for the A7 SC OU.

The 1997 ROD discussed groundwater contaminants and focused particularly on the pesticides DDT, lindane (gamma-BHC) and heptachlor epoxide, the semivolatile organic compound naphthalene, and the volatile organic compounds chloroform, tetrachloroethene (PCE), 1,1,2,2,-tetrachloroethane and trichloroethene (TCE). The annual monitoring program has tracked these and related organic compounds since 1997 and compared them to MCP GW-1 standards.

4.2.2.1 Operations and Maintenance

The A7 landfill and the surrounding area are inspected periodically in accordance with the 1997 Operations and Maintenance (O & M) Plan (Roy F. Weston, Inc., 1997) to ensure that the remedy continues to be effective. The Landfill Inspections section of the 2009 LTMMP contains the inspection activities from the 1997 O&M plan. The landfill inspections consist of checking the integrity and functionality of four items:

1. Landfill cap
2. Gas vents
3. Drainage system
4. Access road

The Table below lists the combined in-house and contract costs for operation, maintenance and monitoring activities at Sudbury Annex.

Table 3 Annual Operation and Maintenance Costs

Year	Total Army Cost
2006	$58,000
2007	$58,000
2008	$58,000
2009	$58,000
2010	$58,000
2011 (estimate)	$75,000 (includes five-year review costs)

4.2.2.2 Land Use Controls and Institutional Controls

ICs are non-engineered instruments, such as administrative and legal controls, that help minimize the potential for human exposure and/or protect the integrity of a response action. ICs are typically designed to work by limiting land or resource use or by providing information that helps modify or guide human behavior at a site. ICs are a subset of Land Use Controls (LUCs). LUCs include engineering and physical barriers such as fences as well as ICs. The federal facility program may use either the term Institutional Controls or Land Use Controls (LUCs) in its decision document (USEPA, 2010). The SC ROD for the Annex uses the term ICs to describe the component of the selected remedy to minimize the potential for human exposure to contamination and to protect the integrity of the remedy.

To be consistent with the definitions in the USEPA guidance on institutional controls the term "land use control" is used in this review to describe the fence surrounding the AOC A7 landfill cap area. An additional LUC present for A7, although not defined in the ROD, is restricted access to the USFWS land that contains the landfill. The USFWS designated some of the northwest area of the refuge as closed to the public to protect the AOC A7 remedy. Refer to Figure 1 from the Assabet River National Wildlife Refuge website. The term IC is used to describe the legal land use controls established in the MOAs between the Army and the USAF, FEMA and USFWS.

ICs, referred to as use controls in the Annex transfer documents, are the environmental compliance responsibilities described in the MOAs for the transfer of property between the Army and the USAF, FEMA and USFWS. All three agreements explain the environmental remediation of the contaminated portions of the property has been undertaken by the Army in accordance with the FFA and in cooperation with the MassDEP. The USFWS MOA contains the ICs for A7 and requires any use of the portion of the parcel within the boundaries of A7 shall not disturb either the integrity of the final covers, liners or other components of the containment system(s) or the function of the monitoring system(s) in place at the AOC. These ICs prohibit:

- Surface application of water
- Extraction, consumption, exposure or utilization of groundwater underlying AOC A7

- Any disturbance of the surface or subsurface of that portion of land within the boundaries of AOC A7 in any manner (construction, filling, drilling, excavation or change in topography that might interfere with the protectiveness of the remedy.

The remaining ICs in the other MOAs are evaluated as part of the long term monitoring and maintenance plan (LTMMP). In 1999, the BEC, USEPA Remedial Project Manager, and MassDEP Federal Facilities Manager approved an addendum to the 1998 LTMMP that prescribed IC inspection criteria be performed at least annually. The IC criteria included an annual inspection, an annual report and a review of ICs as part of the next five-year review. The annual inspections include the following components; document review, interviews and a physical on-site inspection. Documents generated within the year are reviewed to confirm that there have been; no land use changes, no activities that may have disturbed the integrity of the landfill containment system or the function of the monitoring system at AOC A7, no activities that have disturbed the subsurface soil below four feet and no negative impact on the monitoring well network or water table at A7 and P58. The 1999 addendum to the 1998 LTMMP included a plan for monitoring arsenic at AOC P58. The 2006 Five-Year Review noted that in 2001 (promulgated in 2006) the drinking water standard for arsenic was revised from 50 μg/L to 10 μg/L and that the final round of groundwater samples from AOC P58 included samples exceeding the 10 μg/L standard. Therefore the following recommendation was made in the 2006 five-year review report: "Further evaluation of arsenic in groundwater in the vicinity of AOC P58 is required to assess the protectiveness of current conditions, since the standard for arsenic has recently changed." The recommendation in the 2006 five-year review report to further evaluate the arsenic in groundwater in the vicinity of AOC P58 resulted in an evaluation and a technical memorandum on the protectiveness assessment for AOCs P31/P58. The memo is currently draft and was written in 2007. The draft recommended no further testing of the groundwater since the arsenic was determined to be naturally occurring.

The owners of properties that make up the former Annex are interviewed to review compliance with the ICs. These interviews have taken place once annually for the review period for all Annex ICs including those associated with A7. The physical on-site inspection consists of examining the following:

- Land use conditions (presence of buildings and level of recreational use)
- Evidence of any changes to the use of the Site
- Evidence of any disturbance to the integrity of the landfill containment system at AOC A7
- Evidence of any disturbance to the function of the monitoring system at AOC A7
- Evidence of any significant excavation or surface or subsurface soil disturbance at AOC A7
- Evidence of any activities that have disrupted the subsurface soil at the Site below the depth of four feet and
- Other conditions necessary to evaluate the continued protectiveness of the ICs.

All findings are documented on an inspection checklist. The annual report summarizes any known or suspected IC deficiencies identified during the annual inspection. The addendum also required the Army, EPA and MassDEP to re-evaluate the scope and frequency of the inspections.

These inspections were done semi-annually from the time of the addendum to the 1998 LTMMP. The 2006 five-year review report recommended going to annual IC inspections and this recommendation was incorporated in the current LTMMP dated March 2009.

4.2.2.3 Groundwater Monitoring

Groundwater sampling and analysis has been performed since 1991. The long-term groundwater monitoring program was implemented after completion of the landfill cap in 1996. From 1997 to 2004, groundwater sampling activities were scheduled semi-annually once in the spring and once in the fall, to monitor both the high groundwater conditions of early spring and low groundwater conditions of early fall. Groundwater sampling has been performed annually since 2005. The annual sampling event takes place in the fall when low water levels are expected.

4.2.2.3.1 Water Levels

In 2006 and 2007 the depth to water was measured in fourteen monitoring wells and at the two surface water gauges. In 2008 the well JO-A07-M63 was eliminated from the list since it was in degraded condition and replaced with a new well, SUD-A07-065. Water levels are measured at the eight sampled monitoring wells listed in section 4.3.2.3, five other wells (JO-A07-M61, OHM-A7-52, OHM-A7-10, OHM-A7-12 and OHM-A7-45) and two surface water locations (Eastern Staff Gauge and Northern Staff Gauge) to evaluate groundwater flow directions. Refer to Figure 4 for the locations of wells and surface water gages.

The reduction of water level data collection to an annual frequency was recommended in the 2009 LTMMP based on the fact that there is over ten years of semi-annual water level data and significant changes in groundwater flow patterns have not been observed during the LTMM program. Therefore the collection of water level data annually during fall sampling events was considered sufficient to confirm groundwater flow patterns. During this review period semi-annual water levels were measured through 2008. Starting in 2009 water level measurement were only taken once annually in the fall. As part of each water level measurement round, the condition of each of the monitoring wells is evaluated and the need for required maintenance, if any, is identified. Each well is inspected for its structural integrity, water level, and total depth to evaluate siltation.

4.2.2.3.2 Groundwater Analysis

Groundwater samples are collected for off-site laboratory analyses. From 2006 -2008 samples were taken from eight monitoring wells. The LTMMP dated 2009 eliminated wells OHM-A7-11 and OHM-A7-46 from the plan due to consistent results of contamination below the GW-1 and GW-3 standards. The plan was also changed to reduce the analyte list to exclude anions, ammonia and total dissolved solids. The remaining analytes are VOCs, pesticides, TAL metals, COD and cyanide.

Field water quality parameters are collected during well purging and recorded at the time the analytical samples are taken to supplement laboratory data.

5.0 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

This section summarizes the protectiveness statements of the last five-year review. It also describes the recommendations and follow-up actions of that review as well as the status of the follow-up actions since the 2006 Five-Year Review.

5.1 Protectiveness Statements from Last Review

The remedy at A7 is protective of human health and the environment. The selected remedy for AOC A7 consists of consolidation of landfill waste, capping, long-term groundwater monitoring with O&M. The selected remedy for AOC 09 was excavation of hazardous material for offsite disposal or consolidation in the AOC A7 consolidated landfill. The remedy currently remains protective by precluding the potential for exposures related to the landfill waste. The remedy is also protective due to the institutional controls, which are functioning. Continued monitoring, as described above is required to determine whether the selected remedy will remain protective. Based on site inspections and interviews with the USFWS and the Army, all of the institutional controls are in place at the Sudbury Training Annex and are still protective. No substantial violation of any institutional control was recorded for the review period.

5.2 Status of Recommendations and Follow-Up Actions from the Last Review

The table below describes the status of each issue in the previous FYR. Only one issue is outstanding, but is planned for execution in 2013.

Issue from Previous FYR	Recommendations and Follow-Up Actions	Actions Taken	Date of Action
USACE proposed changes to the frequency of sample collection, to the number of wells sampled, and to the suite of analytes. EPA accepted these changes, which were implemented in the fall of 2005. A revised LTMMP is being prepared by the Army and is scheduled for completion in October 2006	Revise LTMMP	A revised LTMMP was prepared by HydroGeoLogic, Inc. for USACE New England District to document the requirements for ongoing long-term monitoring and maintenance (LTMM) activities at AOC A7 and AOCs P31 and P58. The activities described within this document fulfill the 1995 and 1997 ROD requirements for AOC A7 and No Further Action Decision for AOC P31 and the close out report signed in March 2000 for P58.	March 2009
Trees and bushes growing in close proximity to the fence; recent felling of a large oak tree in the vicinity of JO-A07-M63	Remove trees near fence line	Limited tree limb and brush removal was completed in 2006. Additional tree removal and tree limb work was scheduled for 2007 however no documentation exists. The November 2010 site visit noted proper tree maintenance had not been performed and the integrity of the fence was compromised. From this 5 year review site inspection the team observed some fence sections with leaning posts and trees resting right on the fence.	2006
An empty and discarded drum along the eastern side of the AOC A7 enclosure	Remove the empty and discarded drum along the eastern side of the AOC A7 enclosure	The drum was investigated with a photoionization detector and found not to contain any volatile organic compounds. It was removed and taken as scrap metal to the Range Control office at the Fort Devens South Post for disposal.	December 2006
There are five wells in degraded condition. These are OHM-A7-10, OHM-A7-12, JO-A07-M61, JO-A07-M62, and JO-A07-M63. Damage includes evidence of surface water and debris infiltration in some wells; failing surface seals; and possible siltation, causing reductions in well efficiencies.	Perform required maintenance on wells OHM-A7-10, OHM-A7-12, JO-A07-M61, JO-A07-M62, and JO-A07-M63	• Repaired surface seal for well OHM-A7-10 • Redeveloped well OHM-A7-12 • Repaired road-boxes and redeveloped wells JO-A07-M61 and JO-A07-M62 • A new monitoring well, SUD-A07-065 was installed to replace well JO-A7-M63, whose screen had been compromised by tree roots. • Well JO-A7-M63 was decommissioned	• Nov. 2006 • Nov. 2006 • Nov. 2006 • Dec. 2006 • Nov. 2007
The existing monitoring well network appears appropriate to monitor long-term groundwater trends at and downgradient of the landfill with the exception that an upgradient monitoring well is required by MassDEP regulation. The lack of an upgradient monitoring well does not create a critical data gap regarding contaminant migration at the landfill, but does leave unanswered any potential changes created by modifications upgradient to the site.	Install upgradient well	A new upgradient monitoring well, SUD-A07-014, within the site boundary was installed, surveyed and sampled. It is included in the current LTMMP.	November 2006
Report not completed with 2006 inspection of the replicated (potential) vernal pool wetland.	Complete and submit the 2006 (potential) vernal pool wetland inspection report	Periodic wetland monitoring inspections have been conducted by the USACE, albeit not included in the LTMMP, since the wetland was created in fall 1996 and planted in spring 1997. Inspections were conducted in 1998, 2000, 2004including a follow-up inspection in April 2006 to see if it was functioning as a vernal pool, The most recent inspection was conducted in November 2009 as part of an invasive plant survey. The results of these inspections including all of the historical reports related to the design, construction and monitoring of this potential vernal pool wetland will be reported in a separate stand alone document.	Outstanding Target Date January 2013

6.0 FIVE YEAR REVIEW PROCESS

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

6.1 Administrative Components

The Five Year Review Team included members from the USACE with expertise in geology, chemistry, and human and ecological risk assessment.

During the course of the third Five-Year Review, the Review Team completed the following tasks:

- Reviewed reports and other documents describing Site characteristics and events that took place within the review period;
- Visited the Site to inspect remedy components and effectiveness;
- Interviewed property owners and regulators;
- Assessed historical data and reports as well as current groundwater data, landfill inspection reports and institutional control evaluations; and
- Developed the current Five-Year Review Report.

6.2 Community Involvement

Public notice (Appendix C) of this five-year review was published in the Sudbury Town Crier December 6, 2010. Any persons with Annex related comments and/or information were asked to contact the U.S. Army Corps of Engineers - New England District. No public comments were received. Upon completion of the five year review report, a public notice will be sent to the same newspaper announcing completion and availability to the public. Copies of the administrative record are located at the Fort Devens BRAC Library and at the Sudbury Town Hall, 322 Old Concord Road, Sudbury, Massachusetts.

6.3 Document Review

Documents reviewed to prepare this five-year review report included the 2006 Five-Year Review (USACE, 2006), the Feasibility Study (OHM, 1995), the SC ROD (OHM, 1995), MOM ROD (OHM, 1997), Annual Monitoring Reports for 2006, 2007, 2008 and 2009 and other Site-related documents. New documents within the review period, including the Invasive Plant Species Survey (USACE, 2010) were also reviewed. This Document Review section also lists the Applicable or Relevant and Appropriate Requirements (ARARs) for the Site and any changes in toxicity values.

6.3.1 Background Documents Review

Site-related documents reviewed as part of this effort are listed in the Reference Section of this report (Section 12.0).

6.3.2 Review of ARARs

ARARs and To Be Considered (TBC) criteria for AOCs A7 and A9 were identified in both the RI and FS. The ARARs tables contained in this report are reproductions of those contained in the Final Feasibility

Study Report. The original table numbers were retained for ease of comparison in the 1995 ROD, and they are unchanged in Appendix D of this report.

There are no chemical-specific ARARs for AOC A7 since the area is covered with a landfill cap. Most of the ARARs are action –specific and pertain to the construction of the landfill cap, to storm water management, to environmental monitoring, to consolidation and to other various activities at AOC A7 and are still applicable.

The Federal Safe Drinking Water Act Drinking Water Standards maximum contaminant levels (MCLs) were not included as ARARs within the RODs approved for AOC A7, as the primary element of the selected remedy was source containment and the subsequent MOM OU ROD resulted in no action. Instead, groundwater monitoring results are compared to State of Massachusetts GW-1 and GW-3 groundwater values as specified in the Massachusetts Contingency Plan (MCP) for the purposes of demonstrating the remedy meets the requirements specified in the ROD.

6.3.3 Review of O&M and Monitoring Program

The following sub-sections discuss the results of the physical landfill inspections and measurements taken to monitor the integrity and operation of the landfill cap. Changes to the monitoring well network that have occurred within the review period are also described.

6.3.3.1 Landfill Inspections

The landfill was inspected twice annually in 2006, 2007 and 2008 and once annually in 2009 and 2010. The next inspection is planned for fall 2011. The following is a list of inspection dates for this review period:
May 4, 2006
November 14, 2006
June 26, 2007
October 23, 2007
June 23, 2008
October 24, 2008 (landfill inspection performed but no gas vent monitoring done)
June 10, 2009
November 3, 2010

During the inspections the landfill gas vents were sampled with the exception of October 24, 2008 above since the frequency of gas vent monitoring went to annual events starting in June 2008. Visual observations were made regarding the vegetative cover, vegetation types, erosion, settlement and the general condition of the various features including the drainage system, the access road and the fence surrounding the landfill area.

6.3.3.1.1 Landfill Cap

The RCRA Subtitle C landfill cap constructed over the existing landfill at A7 was inspected as required during the review period. From 2006-2010 it was reported the landfill cap was in excellent condition with no eroding areas or settlement. The cap vegetation appears healthy, dense and provides complete coverage of most areas of the cap, with grass and clover predominating.

The cap and adjacent area vegetation are mowed annually in the fall. It was recommended that future mowing of the cap continue to include mowing of the fields adjacent to the cap to prevent encroachment of woody species on the cap. Mowing should not take place until after late August when ground-nesting songbirds and other organisms (e.g. moths and butterflies) that depend on this type of grassland habitat have completed their life cycles. During the Site Visit on November 23, 2010 it was observed that over mowing occurred into a portion of the replicated wetland and adjacent upland buffer zone. This occurred when the area was mowed in September 2010.

6.3.3.1.2 Gas Vents

The passive gas venting system was installed to facilitate the ventilation of any methane generated from the degrading waste material beneath the landfill cover system. The passive system consists of four six-inch diameter gas vents.

Methane has not been detected in any of the four landfill gas vents. Minimal levels of carbon dioxide and VOCs have been detected during some of the semi-annual monitoring events. Oxygen levels have basically been the same at all four vents, and largely reflect ambient conditions. Refer to tables 4 through 7 on pages 22 and 23 for a summary of gas readings for each vent for the review period. There are no site-specific decision limits for the landfill gases. The readings are monitored by geotechnical engineers who focus primarily on LEL and methane levels. No positive LEL or methane readings have been noted for the landfill.

Table 4 GV-1 Landfill Gas Monitoring Results

Parameter	Ranges from April 1998 to May 2006	Nov 14, 2006	June 26, 2007	Oct 23, 2007	Jun 23, 2008	Jun 10, 2009	Nov 3, 2010
Volatile Organic Compound (ppm[1])	0-3.3(June 2005)	0	0	0	0	0	0
Oxygen (%)	18.18(April 2002) – 20.9 (Oct 1999)	12.4	20.4	19.5	21.9	20.9	16.7
Lower Explosive Limit (%)	All readings = 0	0	0	0	0	0	0
Carbon Dioxide (%)	0-0.7 (April 2002 and May 2006)	6.4	6.4	0.6	0	0	3.0
Methane %)	All readings = 0	0	0	0	0	0	0
Atmospheric Pressure (Inches Hg)	29.35 (April 2000) – 30.2 (Oct 1998 and June 2005)	29.4	30.1	29.9	29.66	29.8	30.2

Table 5 GV-2 Landfill Gas Monitoring Results

Parameter	Ranges from April 1998 to May 2006	Nov 14, 2006	June 26, 2007	Oct 23, 2007	Jun 23, 2008	Jun 10, 2009	Nov 3, 2010
Volatile Organic Compound (ppm[1])	0-7.6 (June 2005)	0	0	0	0	0	0
Oxygen (%)	19.0 (May 2006) – 21.2 (Oct 2002)	9.2	NR	16.0	21.6	20.9	12.7
Lower Explosive Limit (%)	All readings = 0	0	0	0	0	0	0
Carbon Dioxide (%)	0-1.3 (May 2006)	8.1	NR	3.0	0.1	0	4.6
Methane (%)	All readings = 0	0	0	0	0	0	0
Atmospheric Pressure (Inches Hg)	29.35 (April 2000) – 30.2 (Oct 1998 and June 2005)	29.4	30.1	29.9	29.66	29.8	30.2

NR = not recorded due to hornet nest in vent

Table 6 GV-3 Landfill Gas Monitoring Results

Parameter	Ranges from April 1998 to May 2006	Nov 14, 2006	June 26, 2007	Oct 23, 2007	Jun 23, 2008	Jun 10, 2009	Nov 3, 2010
Volatile Organic Compound (ppm[1])	0-2.5 (June 2005)	0	0	0	0	0.3	0
Oxygen (%)	19.7 (Oct 2001 and Apr 2002) – 20.9 (Apr 1998, May 2001 and April 2004)	9.9	20.6	18.5	21.9	20.8	13.6
Lower Explosive Limit (%)	All readings = 0	0	0	0	0	0	0
Carbon Dioxide (%)	0-0.4 (April 2004)	7.9	7.9	1.4	0	0	5.1
Methane (%)	All readings = 0	0	0	0	0	0	0
Atmospheric Pressure (Inches Hg)	29.35 (April 2000) – 30.2 (Oct 1998 and June 2005)	29.4	30.1	29.9	29.66	29.8	30.2

Table 7 GV-4 Landfill Gas Monitoring Results

Parameter	Ranges from April 1998 to May 2006	Nov 14, 2006	June 26, 2007	Oct 23, 2007	Jun 23, 2008	Jun 10, 2009	Nov 3, 2010
VOC (ppm[1])	0-1.9 (June And Sept 2005)	0	0	0	0	0.1	0
O_2 (%)	19.2 (Apr 2002) – 20.9 (Oct 1999, and Apr 2003)	12.9	20.4	20.1	22.0	20.9	15.9
LEL (%)	All readings = 0	0	0	0	0	0	0
CO_2 (%)	0-0.2 (Apr 2002)	6.5	6.5	0.4	0	0	3.7
Methane (%)	All readings = 0	0	0	0	0	0	0
Atmospheric Pressure (Inches Hg)	29.35 (April 2000) – 30.2 (Oct 1998 and June 2005)	29.4	30.1	29.9	29.66	29.8	30.2

The annual reports from 2006- 2010 indicate the Gas Vent System is in good condition. All vent pipes and bird screens were intact and functioning as intended except for V-1 and V-2. Several animal burrows were found at the base of the vent V-2 and the bird screen and hose clamp were missing. At the June 2007 inspection a hornets' nest was in gas vent V-2 preventing gas readings from being taken. The fiberglass screening and hose clamps at the gas vents minimize access by bees and other insects into the vents. Corrective measures, including filling the animal burrow with a combination of stone and native soil and installing a new hose clamp and bird screen on vent V-2, were implemented June 23, 2008. The November 2010 inspection states that V-1 requires a new bird screen and V-2 requires replacement of the bird screen and hose clamp.

6.3.3.1.3 Drainage System

The drainage system at A7 functions in conjunction with the landfill cap to drain precipitation off the cap. The drainage system consists of the following components:

- A geocomposite drainage layer
- A perimeter riprap stone drain along the toe of the slope
- A riprap swale along the western edge of the landfill
- Perimeter drainage channels, and
- A riprap lined outlet area (located at the northeast corner of the landfill)

From 2006 – 2010 the Cap Drainage System was reported to be in good condition. At all inspections, drainage channels were free of sediment and debris. In the annual reports through 2007, unwanted vegetation was noted in riprap areas, indicating that an herbicide should be applied to eliminate further growth. Through March 2007, herbicide had not been applied to the riprap zones around the landfill. All other areas of the drainage channels are free of unwanted vegetation.

An herbicide application in the riprap areas was included in the fall 2006 mowing scope. The application was deferred to a separate contract to be awarded in 2007. The 2008 annual report states, "Herbicide was applied to select portions of the riprap area in September 2008 with the approval of the USFWS personnel." The Inspection and Maintenance Checklist dated October 24, 2008 indicated that the toe drain was "o.k." and that "Herbicide application was successful". The comment next to the inspection item for debris and unwanted vegetation in the drainage channels read "minimal vegetation left".

The 2009 annual report reads that at the time of the inspection drainage channels were free of sediment and debris, although unwanted vegetation was noted in riprap areas. An herbicide was recommended to be applied to riprap areas to eliminate the established vegetation. Herbicide was not applied during the 2009 reporting period. Based on observation during the 5YR site visit, one application of herbicide in 2008 may not have been enough since sometimes several applications are necessary. The 2010 report again notes that an herbicide should be applied to the riprap areas to eliminate unwanted vegetation which has become established.

The toe drain appears to be functioning properly, and there are no observed associated slope stability or erosion problems. Toe drains should be cleared of moss growth and other debris which is accumulating on the geotextile covering the drainage stone which could cause clogging of the covering and prevent proper drainage. On the site visit, holes in the black geotextile covering the drainage stone were noted in several areas. According to the geotechnical engineer, the holes are not an issue since the covering is not a functioning part of the system and were only installed to keep material in place. The covering can be a problem if it gets clogged by moss or other debris and prevents proper drainage. Moss therefore should be kept from becoming established on this layer. The toe drain should continue to be monitored for vegetative growth in the future, and the growth should be periodically removed to maintain the proper operation of the toe drain.

No repair actions for the drainage system are recommended at this time. The grass on drainage channel bottoms is in excellent condition.

6.3.3.1.4 Access Road

Annual reports for 2006 –2010 state that the access road from the entry gate to the cap is in excellent or good condition with no ruts, potholes, or eroded areas. The access road was mowed in September 2008 and November 2009. However the reports indicate minor vegetation is becoming established in areas and herbicide should be applied to control this vegetation. The 2010 report specifies that the vegetation has established within the gravel surface, and in the summer months is overgrown. It is recommended in the annual reports that herbicide should be applied as part of annual maintenance.

6.3.3.2 Monitoring Well Network

Well SUD-A07-014 was installed in November 2006 as a new upgradient well as a follow-up action to a recommendation in the previous five-year review report. Five existing monitoring wells were repaired and redeveloped during the same effort based on another recommendation in the previous five-year review. Extremely slow water level recovery rates during well redevelopment at Well JO-A07-M63 indicated a need for a replacement for this well. The new well, JO-A07-M65, was installed December 22, 2006 and sampled. Well JO-A07-M63 was decommissioned in November 2007.

In 2006 nine wells were sampled including both well JO-A07-M63 and the new replacement well, JO-A07-M65. The monitoring well network consists of one well upgradient of the landfill, two wells screened within the landfill, seven wells immediately surrounding the landfill and three wells located at three locations further downgradient of the landfill adjacent to the Assabet River. Key wells to monitor are OHM-A7-08 (screened on the landfill), OHM-A7-51 (at the toe of the landfill) and the location where wells JO-A07-M63 and SUD-A07-065 are located. Contaminated groundwater appears to migrate along this path.

The monitoring well network was optimized in 2009. The excluded wells are OHM-A7-10, OHM-A7-12, OHM-A7-45, OHM-A7-52 and JO-A07-M61. These wells were retained in the program for water level measurements only.

Samples from all wells were analyzed for VOCs, pesticides, target analyte list (TAL) metals, chemical oxygen demand (COD) and field water quality parameters. Below is a table of the monitoring wells sampled for the designated parameters within the five-year review period. The groundwater results are evaluated in section 6.4.2.

Groundwater samples were not taken in the fall of 2010 as originally scheduled. To compensate for this missed sampling event groundwater was instead sampled on June 28, 2011. The data are included as Appendix H of this report. The results will be evaluated in the 2011 Annual Report.

Table 8 Summary of Groundwater Samples during this Five-Year Review Period

Sample Dates within FYR period	MWs Sampled	Parameters
November 27-28, 2006 December 28, 2006 (SUD-A7-014 and SUD-A07-065 only)	OHM-A7-08 OHM-A7-09 OHM-A7-11 SUD-A7-014 OHM-A7-46 OHM-A7-51 JO-A07-M62 JO-A07-M63 SUD-A07-065	VOCs, pesticides, TAL metals, cyanide and COD
October 22-23, 2007	OHM-A7-08 OHM-A7-09 OHM-A7-11 SUD-A7-014 OHM-A7-46 OHM-A7-51 JO-A07-M62 SUD-A07-065	
October 24, 2008		
November 12, 2009	OHM-A7-08 OHM-A7-09 SUD-A7-014 OHM-A7-51 JO-A07-M62 SUD-A07-065	
June 28, 2011		

The following is a list of well repairs done within this review period:

OHM-A7-10: The 2005 inspections had shown that the surface seal concrete was broken and degraded. Replacement of the surface seal was necessary. During November 2006 drilling/repairs effort, the PVC was cut down by approximately 0.1 ft. to allow for secure closure of the protective casing. This reduced the depth to the well screen and bottom of the well as measured from the top of the PVC. Upon excavation and inspection the surface seal was determined to be intact and sufficient.

OHM-A7-12: During November 2006 root fibers were partially obstructing the well interior. This partial obstruction was removed and the well redeveloped to ensure no further damages. The well is retained for water level monitoring purposes.

SUD-A07-014: The well was installed in November 2006 and screened across the saturated soils as logged during advance of the boring. No evidence of fill or contamination was noted and the well is screened within a dense sandy till formation.

JO-A07-M61: the well was resurveyed in November 2006 and the water level was checked at the start of the November sampling event. A short length of PVC was added to the well, ~0.1 ft., increasing the effective depths to screen and bottom of well as measured from the top of the PVC.

JO-A07-M62: The well riser was secured so that surface water/debris would not enter the well; the well was labeled clearly; reset a new surface seal/sand-box/road-box and surveyed the road-box and PVC.

JO-A07-M63: This well was severely degraded and too shallow. It was replaced with a new well, SUD-A07-065, 15 feet south of JO-A07-M63.

SUD-A07-065: new replacement well intended to replace JO-A07-M63. The well is located 15 feet from the existing downgradient well, and December 2006 sampling results from it achieved similar results to those obtained in November 2006 from JO-A07-M63. The water level in both JO-A07-M63 and SUD-A07-065 was noted at the same elevation in December 2006 indicating both well monitor the same flow path.

All of the monitoring wells were surveyed by the USACE surveyors in November 2006.

6.3.4 Land Use Controls and Institutional Controls

Evaluations of the LUC and ICs relative to A7 during this review period are discussed in the following subsections. Physical on-site inspections are also done annually to verify the integrity of ICs under the LTMMP. One purpose of the interview with the USFWS is to confirm that the ICs relative to A7 continue to be adhered to.

6.3.4.1 Land Use Control - Site Perimeter Fence

Annual reports from 2006 – 2010 report the security perimeter fence is in good condition. During that time there were still some small branches on top of the fence reported, but no other sagging or leaning sections noted, and the main gate was said to be operating normally. In 2006 the inspection report noted small branches should be removed and in general a 5-ft brush break should be maintained on both sides of the fence, and trees should be periodically cleared from the fence area. It also noted that this work should be included in the 2007mowing contract. However, there is no mention of tree removal having taken place in the 2008 annual report.

According to the 2009 inspection report there were numerous large and small branches on top of the fence, however again there were no other sagging or leaning sections noted and the main gate was operating normally. Along the perimeter of the fence, large trees were noted as growing within 5 feet of the fence, and smaller trees are becoming established. The 2009 corrective action summary recommends a five-foot clear zone be established for the entire fence on both sides by cutting all vegetation less than five inches in diameter to the ground level. In general, trees should periodically be cleared from fence area as they naturally grow or fall onto the fence. The branches on the perimeter fence should be cleared during annual maintenance.

Within the five-year review period, the geotechnical inspector recommended repeatedly that all vegetation within five feet of the fence for the entire perimeter be cleared in order to be able to walk and inspect the fence line. This recommendation was not done. It is not possible now to walk the entire fence line.

6.3.4.2 Institutional Controls

The ICs consist of document review, interviews and physical on-site inspections of the A7 and P58 areas. Within the review period a description of these IC components are included in the annual reports and are summarized in the following sub-sections.

When the USFWS constructed the new visitor center and access road a clause was included in the contract for the potential for Ordnance and Explosives (OE) and therefore the USFWS had a specialist on call to handle any unexploded ordnance should any be discovered. The subsurface down to four feet was cleared for OE prior to construction. Similarly there will be an OE clause in the A/E contract funded by FEMA in FY2012 for the construction of their new 50,000 square foot building.

During recent road construction activities on the USFWS property cultural surveys were conducted. Many items of potential historic significance were discovered, such as a large fire pit. The results of the survey will be coming out in a report under a separate cover.

All A7 specific ICs are being followed. There is no use of the groundwater beneath the site. The ICs continue to protect the remedy.

6.4 Data Review

Water elevations, groundwater analytical data as well as IC inspection sheets were reviewed. Evaluations of the landfill inspection and institutional control checklists are presented below. Interviews and site visits done as part of this five-year review report are also discussed in this section.

6.4.1 Groundwater and Surface Water Elevations

The 2006 five-year review recommended semi-annual water level measurements, however as part of the optimization of the monitoring plan the 2009 LTMMP proposed reducing the collection of water level data to an annual frequency to be performed in conjunction with the fall sampling event. The USEPA expressed concerns regarding the recommendation to go from semi-annual to annual groundwater level monitoring. In response, the Army conducted a thorough review of spring and fall groundwater elevations. The Army's review indicated that, for period from 1997-2008, occurrences of seasonal water level reversals were infrequent, with occurrences limited to 2006 and 2008. It should be noted that any variations in COC concentrations resulting from changing levels, flow gradients, etc., have been generally small in magnitude and were generally short lived. Therefore the impacts to COC concentrations and overall fate and transport at A7 as a result of seasonal groundwater level fluctuations have been limited. Regardless of seasonal fluctuations and infrequent trend reversals in groundwater levels and result changes in the groundwater gradient, it is well established that A7 groundwater flows toward the Assabet River and the overall COC concentration trends are overwhelmingly downward. Therefore the continued collection of semi-annual groundwater level data would not add substantive information to evaluate or ensure the protectiveness of the A7 monitoring program (HGL, 2009). Refer to Figure 5 for the most recent Groundwater Contours. Groundwater level monitoring data for the review period support the historically established north/northwest groundwater flow direction at the site. June 2009 marks the first annual groundwater level monitoring event. Refer to the tables below for wells utilized for water level data during the review period:

Table 9 Water Level Monitoring Wells in Addition to Analytical Monitoring Wells Fall Events

Dates Measured	Water Level (Only) Monitoring points
November 27, 2006 October 22, 2007 October 24, 2008 November 12, 2009 June 28, 2011	JO-A07-M61 OHM-A7-52 OHM-A7-10 OHM-A7-45 Eastern Staff Gauge Northern Staff Gauge

Table 10 Water Level Monitoring Wells Spring Events

Dates Measured	Water Level Monitoring points
May 10, 2007	OHM-A7-08 OHM-A7-09 OHM-A7-10 OHM-A7-11 OHM-A7-12 SUD-A07-014 OHM-A7-45 OHM-A7-46 OHM-A7-51 OHM-A77-52 JO-A07-M61 JO-A07-M62 JO-A07-M63 Eastern Staff Gauge Northern Staff Gauge
June 28, 2008 (note: last spring event before annual schedule)	OHM-A7-08 OHM-A7-09 OHM-A7-10 OHM-A7-11 OHM-A7-12 SUMD-A07-014 OHM-A7-45 OHM-A7-46 OHM-A7-51 OHM-A77-52 JO-A07-M61 JO-A07-M62 Eastern Staff Gauge Northern Staff Gauge

Staff gages were installed in both the Assabet River and in the nearby unnamed tributary in 2006 to provide additional water level information for use in developing groundwater elevation maps and for evaluating the vertical and lateral direction of groundwater flow adjacent to the Assabet River. Of note is that the Assabet River gage is affected by the Ben Smith Dam located approximately one mile downstream and the associated impoundment that extends to upstream of the Site. The Ben Smith dam artificially controls the stage in the Assabet River and adjacent groundwater levels within the backwater area resulting largely in elevated localized groundwater levels in the summer and lower groundwater levels during the winter. Additionally, the presence of the dam minimizes the need to collect groundwater

samples and measure river stage only during baseflow conditions. This is because the Assabet River stage is largely unaffected by surface runoff under normal conditions. During the five year period under review, Assabet River flows are reported for each sampling date to illustrate the variable downgradient hydraulic conditions. Refer to Appendix E for surface water Charts 1-6.

The two surface water staff gages were surveyed by the USACE surveyors in November 2006. It was noted in the 2009 annual report that the Northern Staff Gage could not be located. During the 2010 site visit the gage was located with some difficulty. Therefore, the gages should be tied into a nearby fixed reference point or GPS coordinates should be utilized during the field monitoring event so that the gages can easily be located. This would also prevent the need to re-survey the point in the event the current reference point is damaged or missing.

6.4.2 Groundwater Analysis

The LTMMP in 2009 evaluated the site for close-out using the following guidance; "Evaluating, Optimizing or Ending Post-Closure Care at Municipal Solid Waste Landfills Based on Site-Specific Data Evaluations" (ITRC, Alternative Landfill Technologies Team, 2006). It concluded that, "Based on the historical data and the CSM...continued monitoring is recommended at the site. However, based on LTMM data the source containment remedy continues to be effective, the site does not currently pose a risk, and is not expected to pose a risk in the future. Accordingly, reduced monitoring is warranted." The following is a summary of historical concentrations, including this five-year review period, of COCs; PCE, TCE, 1,1,2,2-tetrachloroethane, lindane and 4-4'-DDD.

Target compound tetrachloroethene (PCE) concentrations show an overall downward trend since October 1997 with minor fluctuations from year to year. Long-term trends for PCE at well OHM-A7-08 are depicted on Chart 7 and long-term PCE trends at wells JO-A7-M63/SUD-A07-065 are depicted on Chart 8. Chart 7 shows an overall downward trend following an initial spike with the construction of the landfill. See Remedial Action date on trend Chart 7. The PCE trend at well OHM-A7-08 demonstrates a slight elevation in concentration since the October 2007 sampling event however, the concentrations have been 8 µg/L or lower. The well will continue to be monitored for PCE. The PCE trend at well JO-A7-M63/ SUD-A07-065 shows a slight increase since October 2007, with highest concentration being 13 µg/L, however, the concentration appears to be stabilizing or going down again, according to the November 2009 results. These fluctuations remain close to the GW-1 comparison value and are well below the historical maximum of 140 µg/L. The new well, SUD-A7-065 is the closest monitoring well to the Assabet River. The PCE concentrations found in the well are well below the, GW-3 standard of 5,000 µg/L indicative of no impact to surface water. Well SUD-A07-65 will continue to be monitored for VOCs.

Trichloroethene (TCE) concentrations also exhibit an overall downward trend since October 1998, with minor fluctuations from year to year, and remain consistently close to or below the GW-1 comparison value of 5 µg/L within the five-year review period. The TCE concentrations found in the well are well below the GW-3 standard of 5000 µg/L. Long-term trends for TCE at wells JO-A7-M63 and SUD-A07-065 are depicted on Chart 8.

The VOC 1,1,2,2-tetrachlroroethane concentrations have shown an overall decreasing long-term trend, with minor fluctuations from year to year. This overall downward trend has been occurring since October 1998 for wells JO-A7-M63 and SUD-A07-065 (Chart 8) and since the RA date for well OHM-A7-51 (Chart 9). For wells JO-A7-M63 and SUD-A07-065 (Chart 8) 1,1,2,2-tetrachloroethane concentrations have remained consistently close to or below the GW-1 comparison value of 2 µg/L since April 2003.

For well OHM-A7-51 (Chart 9), the 1,1,2,2-tetrachloroethane concentration has remained consistently close to or below the GW-1 comparison value since the fall of 2002. The concentrations of 1,1,2,2-tetrachloroethane found in both wells, relatively close to the Assabet River, are far below the GW-3 standard of 50, 000 µg/L.

Target pesticide lindane (gamma-BHC) concentrations have exhibited an overall downward trend since April 1997, with minor fluctuations from year to year, and remain consistently below the GW-3 standard and close to the GW-1 comparison value since the April 2002 sampling event. Long-term trends for lindane at well OHM-A7-08 are depicted on Chart 10. Refer to charts 12 and 13 for trends of lindane concentrations in downgradient wells, OHM-A7-51 and wells JO-A7-M63/SUD-A7-065. The concentrations have been below the GW-3 standard of 4 µg/L indicating no negative impact to the river. Although there have been some exceedances of the GW-1 standard in these wells the most recent data shows concentrations below the standard. The ICs in place for A7 keep the remedy protective of human health. Since the concentrations are below GW-3 standards the remedy is also protective of the environment. Well JO-A7-M61 is also on the flat floodplain terrace between the northern boundary of the landfill enclosure and the Assabet River. The concentrations of lindane in this well have been below the GW-1 standard of 0.2 µg/L since April 1998 and below the reporting limit of 0.05 µg/L in April and October of 2004 and June of 2005. Consequently the well has not been sampled since June 2005.

Target pesticide 4,4'-Dichlorodiphenyldichloroethane (4,4'-DDD) concentrations also show an overall decreasing trend, with minor fluctuations from year to year, since October 1998. Long-term trends for 4,4'-DDD concentrations at well OHM-A7-08 are depicted on Chart 11. It should be noted that peaks in April and October 1998, and October 1999, 2000, 2002, and 2003 represent non-detected results with slightly elevated detection limits. The concentrations of 4,4'-DDD have consistently been below the GW-3 standard of 50 µg/L both in well OHM-A7-08 and downgradient wells. 4,4'-DDD had not been detected above the GW-1 standard of 0.2 µg/L in well JO-A7-M63 and it has not been detected above the reporting limits of 0.04µg/L and 0.05 µg/L in the replacement well for JO-A7-63, SUD-A7-65 in the current five-year review period.

Large decreases in concentrations of chemicals of concern have been observed during the history of the LTMM program and low concentrations have been reported during this five-year review period. Exceedances of GW-1 standards for PCE, gamma-BHC (lindane), or 1,1,2,2-tetrachloroethane were observed at groundwater monitoring wells OHM-A7-08 (PCE and lindane), and SUD-A07-65 (PCE and 1,1,2,2- tetrachloroethane). Well OHM-A7-08 is located within the landfill cap area and SUD-A07-65 is located downgradient of the landfill. Chart 14 plots concentrations of three contaminants; tetrachloroethene (PCE), lindane and 4-4'-DDD in well OHM-A7-8 to show the overall decrease in total contamination for that well over time. Other contaminant concentrations were below their respective GW-1 standards. All detections were below GW-3 standards, where applicable. The contaminant trends indicate that concentrations will likely continue to decrease over time. The most current LTMMP dated 2009 recommends continued monitoring for the eight wells currently in the program to ensure the remedy continues to function as intended.

Groundwater data utilized for the current five-year review period are found in Appendix G. Additionally the groundwater data collected in June 2011 can be found in Appendix H. The June 2011 data will be evaluated in the next annual report scheduled for 2011.

6.4.3 Ecological Components

The following subsections summarize the invasive species survey and the chronology and inspection of the replicated wetland at A7. They describe the activities that have taken place during the review period.

6.4.3.1 Invasive Species

The USFWS received a grant in 2006 to map invasive species. Over the years, many non-native invasive plant species have made their way into the local landscape and have degraded habitat value for migratory birds, land animals and native plants. All non-native invasive species, including Japanese knotweed, black locust and spotted knapweed are a concern at the refuge. The refuge has been combating the spread of non-native invasive plant species through the use of herbicide, biological control and manual removal. Black locust has been cut down; there has been control of Phragmites and hand pulling of spotted knapweed.

The Project Leader for the USFWS refuge expressed concern on August 28, 2009 that invasive plant species were becoming established within the AOC A7 landfill area and that they were spreading to surrounding areas within the refuge. Consequently USACE conducted an invasive plants species survey on November 5, 2009 with USFWS representatives and provided their findings and recommendations in a report to the USFWS (USACE, 2010).

The report summary provided recommendations to control the reported invasive plant species (e.g. black locust, glossy buckthorn, bittersweet, et al.) in the upland areas surrounding the mowed cap area by implementation of the best approach to control each of the invasive plant species that are not being mechanically controlled by the annual mowing. The recommendations also included control of the invasive plant species in the uplands surrounding the wetland, and the invasive species within the wetland (e.g. purple loosestrife, reed canary-grass, et al.). As with the upland areas the woody invasives, black locust, glossy buckthorn, Japanese barberry and multiflora rose, which are immediately surrounding the wetland, should be cut at ground level, removed from the site and cut surfaces treated with the appropriate herbicide and method of application. For maximum effectiveness the treatment of invasive plants (including manual cutting and/or herbicide treatment) is typically conducted during the height of the growing season in July-early August before the various species have flowered and set seed.

The recommendations to prevent the spread of invasive species are summarized in Table 1 of the report provided to the USFWS. The USACE is willing to mow the landfill earlier in the growing season, say between July15-31, if requested by the USFWS to mechanically control the invasive species. However, in order to provide protection for the nesting birds and other organisms that need this grassland habitat, the USFWS prefers to have Army mow in early October as they do for their other refuge managed grassland habitats. Army has also provided a key for the lock at the main gate so that the USFWS can now directly access the landfill for control of invasive plant species.

6.4.3.2 Replicated Wetland

Periodic wetland monitoring inspections have been conducted by the USACE, albeit not included in the LTMMP, since the wetland was created in fall 1996 and planted in spring 1997. Inspections were conducted in 1998, 2000, 2004 including a follow-up inspection in April 2006 to see if it was functioning as a vernal pool. The most recent inspection was conducted in November 2009 as part of an invasive plant survey. The results of these inspections including all of the historical reports related to the design,

construction and monitoring of this potential vernal pool wetland will be reported in a separate stand alone document.

Based on a recent survey, there was actually more area mowed in 2009 than indicated in Figure 6 by the Limits of Mowing lines. As shown in Figure 6 the mowed area follows the fence line on the north, the tree line on the northeast, west and south, and the 206 foot elevation contour on the southeast toward the Wetland Replication Area. The actual mowed area encompasses a wedge shaped area that extends to the southeast toward the Wetland Replication Area that approximately follows the 200 foot contour southwest of the wetland to the edge of the tree line and then the 204 contour around an exposed ledge that includes a wedge shaped area that follows the 204 foot contour around an exposed ledge to the 206 foot contour returning to the base of the capped landfill. Consequently Figure 6 was revised to show the additional upland area being mowed as indicated by the area enclosed in red, and to include this revised figure in the 2010 SOW to ensure that this additional area is also mowed in 2010 and beyond.

During the Site Visit to A7 Landfill on November 23, 2010 it was discovered that the contractor mowed a large area of the southwestern portion of the wetland buffer zone and even a small portion of the wetland itself below the 200 foot contour that has never been mowed to date.

Consequently the entire southwestern upland buffer zone of the replicated wetland (about 300 ft in length and about 35 ft wide from the 200-196 foot contours), and about another 150 ft in length and 20 feet wide strip into the wetland itself below the 196 ft contour that surrounds the wetland was mowed incorrectly in September 2010, resulting in loss of habitat.

Therefore the Evaluation Branch of USACE will need to assess the potential damages (e.g. impacts to value and function, spread of invasive plants, direct loss of planted wetland shrubs et al.) in order to develop an appropriate path forward that will at a minimum involve additional monitoring and maintenance. This assessment will be conducted during the next annual landfill cap monitoring inspection.

6.4.3.3

6.5 Five-Year Review Site Inspection

A site inspection was conducted on November 23, 2010. A second site inspection with representatives from the EPA and the MassDEP took place on December 7, 2010. The inspections included a walkover of the A7 site, an inspection of monitoring wells, surface water gages, the site perimeter fence, the gas vents and the wetland. The inspection on November 23rd included a tour of the new USFWS visitor center. The site is secured by a chain-link fence surrounding the A7 landfill. The Site wells are secured with locks. No incidents of vandalism have occurred. A full site inspection is also periodically performed as part of each annual groundwater monitoring event.

6.6 Five-Year Review Interviews

Interviews are conducted on an annual basis under the LTMMP and the five-year review requirement of the ROD to monitor the status of ICs at sections of the Annex that are no longer under Army control. As required in the EPA Five-Year Review Guidance Document, interviews were conducted with representatives of the current land owners and abutters (i.e., USFWS, MassDEP, EPA, USAF and FEMA). Interviews conducted as part of this Five-year review are in Appendix F.

The USEPA and MassDEP project managers were also interviewed during the site visit on December 7, 2010. Based on the results of the interviews conducted, implementation of the selected remedy including the LUC and ICs have not generated any issues or significant concerns.

7.0 TECHNICAL ASSESSMENT

This section summarizes the technical assessment of the Site by evaluating the effectiveness of the remedy, the applicability of the criteria that support the remedy, and the protectiveness of the remedy.

7.1 Technical Assessment Questions

This section addresses the three technical assessment questions identified in the EPA's Five-Year Review guidance document as noted below:

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

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

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

The following discussion details how each question has been answered based on the findings of this five-year review.

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

Yes.

The remedy consists of removal actions and creation of a consolidated landfill (completed) with a LUC and ICs as well as subsequent land fill cover inspections and groundwater monitoring (ongoing). Based on the annual inspections provided in reports from 2006-2010 and the five-year review activities and site visits, the remedy is functioning as designed.

Review of annual reports, other site documents, and the groundwater monitoring data indicate the remedy components completed are functioning as intended by the RODs. The landfill cap is in good condition, and it is mowed and maintained. Finally, the other components of the remedy, such as the LUC and ICs as well as the landfill cap, are functioning as originally intended.

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

Yes.

For AOC A7 (the capped landfill), the primary RAOs in the SC ROD are:

- Eliminate potential risk to human health and the environment associated with exposure to contaminated wastes,
- Minimize off-site migration of contaminants; and,
- Limit infiltration of precipitation to the underlying waste within the landfill area, thereby minimizing leachate generation and ground water degradation.

For AOC A9 the primary RAO is:

- Reduce potential risk to human health associated with exposure to contaminated soil.

The landfill cap prevents exposure to contaminated soil at AOC A7, and the SCROD indicates existing ICs assure protectiveness with respect to the groundwater at AOC A7, as follows:

> *There is no current human health exposure pathway associated with groundwater at AOC A7. In addition, the property downgradient of AOC A7, between the site and the Assabet River, is zoned Recreation-Conservation and is classified as unbuildable by the Town of Stow. Following incorporation of AOC A7 into the Great Meadows National Wildlife Refuge, future residential exposure will not be a realistic exposure scenario.*

Although no formal cleanup goals were specified in the ROD, numerous constituents are regularly monitored in the groundwater at AOC A7[1] in order to support five year reviews. Ecological risks were determined insignificant at both AOC A7 and A9. Although there are no COCs or cleanup goals, the risk assessment did identify the COPCs for human health, as shown in Table 11. The site COCs include both COPC contaminants identified in the risk assessment as well as other contaminants not on the COPC list that were found during the monitoring program such as 1,1,2,2-tetrachloroethane. COC levels are included in annual monitoring.

Since the time of remedy implementation in July 1996, USEPA continues to reevaluate and reestablish toxicity values in accordance with their charge. However, because engineering and land use controls for A7 are designed to eliminate potential for human or ecological exposure to contaminated waste, soil, or groundwater, any past, present, or future change in toxicity values or standards are not expected to compromise the RAOs. RAOs and cleanup goals for the soil at AOC A9 were defined in the SC ROD (i.e., 30 mg/kg for arsenic and 20 mg/kg for thallium). Since these risk-based goals are in place to address potential residual concentrations of COPCs remaining in the soil, the significance of changes in their toxicity values were evaluated.

The IRIS database is the primary source of toxicity information applied in CERCLA risk assessment. No change to the toxicity value of arsenic has occurred during the most recent review period, and no significant change occurred since the ROD. Table 2 indicates that the cancer slope factor for arsenic was reassessed in 1998, shortly after remedy implementation. The change was, however, slight and does not indicate a change in protectiveness. There currently is no toxicity value available for thallium due to inadequate data. For the purpose of this five year review, the cleanup goals for arsenic and thallium at AOC A9 remain unchanged and protective of human health.

[1] VOCs (SW-846 method 8260B [SW8260B]), pesticides (SW-846 method 8081A [SW8081A]), total metals (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium and zinc by SW-846 methods 6010B, 7421, 7841 and 7470A), chemical oxygen demand (410.4), and cyanide (SW-846 method 9014).

Table 11 Most Significant COPCs Identified in the Risk Assessment (circa 1994)

Location	Medium	Most Significant COPC*
A7	Soil	Arsenic
		Benzo(a)anthracene
		Benzo(a)pyrene
		Cadmium
		Chlordane (alpha and gamma)
		Chromium
		DDE
		DDT
		Dieldrin
		Manganese**
		PCB 1260
	Sediment	Arsenic
		Beryllium
		Manganese**
		N-nitroso-n-propylamine
	Groundwater	Arsenic
		Chloroform
		Heptachlor epoxide
		Chloromethane
		DDD
		DDT
		Dieldrin
		Lindane
		Manganese**
		Methylene chloride
		Tetrachloroethylene
A9	Soil	Arsenic
		Cadmium
		Manganese**
	Groundwater	Arsenic
		Bis(2-ethylhexyl)phthalate
		Chlordane
		1,1-Dichloroethane
		Heptachlor epoxide
		Manganese**
		Methylene chloride
		PCB 1254
		1,1,1-Trichloroethane
		Trichloroethylene
		1.3.5-Trinitrobenzene
		2,4,6-Trinitrotoluene

* From the risk assessment dated January 1994, with HI > 0.1 or ELCR > 1×10^{-7}.

** Manganese concentrations in all media were determined to be consistent with the background.

Table 12 Changes in USEPA Toxicity Values for AOC A9

Soil Contaminant	Toxicity Value Type	Units	USEPA Reassessment Date	Toxicity Value at Time of ROD	Current Toxicity Value
Arsenic	Oral RfD	(mg/kg/day)	2/1/1993	0.0003	0.0003
	Oral CSF	$(mg/kg/day)^{-1}$	4/10/1998	1.75	1.5
Thallium	Oral RfD	(mg/kg/day)	9/30/2009	0.00008 (L)	NA

Notes:
Remediation Started July 1996.
RfD – Oral Reference dose (mg/kg*day)
CSF – Oral Cancer Slope Factor $(mg/kg*day)^{-1}$
L – Based on a letter defining cleanup goal for soil of 20 mg/kg from USEPA, dated May 19, 1995.
NA – Insufficient data to derive toxicity values.

The RAO of the minimizing off-site migration of contaminants is being addressed by the current monitoring program. Wells OHM-A7-51, JO-A7-M62 and JO-A7-M63 are monitored annually to evaluate the risk to the river from the landfill constituents. Pesticides, in particular lindane and 4,4'-DDD have the most potential to impact the river since the toxicity is high at low concentrations. The GW-3 standards for lindane and 4,4'-DDD are 4 µg/L and 50 µg/L respectively. These two pesticides have not been detected above their respective GW-3 standards in monitoring wells OHM –A7-51, JO-A7-M62 or JO-A7-M63. Contaminant migration will continue to be monitored to evaluate the RAO of off-site migration.

The final RAO of the SC remedy is limiting infiltration of precipitation to the underlying waste within the landfill area, thereby minimizing leachate generation and ground water degradation. This RAO continues to be met by ensuring the integrity of the landfill cap and ICs during annual inspections.

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

No.

The VOC 1,1,2,2-tetrachloroethane is a COC detected during the long term groundwater monitoring at the site since the time of the ROD. The compound contributes to overall risk, however because of the institutional controls in place it does not affect the protectiveness of the remedy.

An exposure pathway for VOCs not considered at the time of the ROD is the infiltration of volatile vapors into buildings from contaminated groundwater. This vapor intrusion pathway was not considered for A7 since no buildings are over the contaminated groundwater at A7 and none are expected to be constructed in the future given the property use as a wildlife refuge. Therefore, there is no complete vapor intrusion pathway for the Site.

7.2 Summary of the Technical Assessment

The remedy still meets the intentions of the RODs, so no issues are present which challenge the protectiveness to human health or the environment. The LUC and ICs have been maintained, with only minor recommendations for improvements at this time. The groundwater monitoring network has been updated as recommended by the previous five year review. The landfill cap at AOC A7 has been

inspected and found in good condition, with only minor recommendations for improvements at this time. Monitoring of the groundwater continues as specified in the source control ROD and LTMMP. The RAOs have been met for the review period as discussed in section 6.4.2, and present indications are they also will be met during the upcoming review period.

8.0 ISSUES

This Five-Year Review did not identify issues with respect to protectiveness.

8.1 CONCERNS

The concerns apply primarily to AOC A7 except as noted. The concerns are discussed in further detail with the recommendations made in Section 9.1.

Table 13 Concerns for the Sudbury Training Annex Site, Sudbury, Massachusetts

Concerns	Affects Current Protectiveness	Affects Future Protectiveness
Control of vegetation in and around the landfill cap should be improved.	No	No
The fence is being overgrown with trees and shrubs preventing access for an inspection and comprising the integrity.	No	No
Performance metrics for LTM of the remedy should be established in the LTMMP.	No	No
Some of the recently damaged replicated vernal pool wetland will not recover naturally or may be replaced by invasive species. The wetland boundaries have been overrun during mowing.	No	No
POCs for each new owner are difficult to locate.	No	No
Surface water staff gauges are difficult to locate.	No	No
Technical memorandum on the protectiveness assessment for AOCs P31/P58 not completed.	No	No

9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS TO ISSUES

No issues are identified with respect to protectiveness.

9.1 RECOMMENDATIONS AND FOLLOW-UP ACTIONS TO CONCERNS

In response to the concerns noted in Section 8.0, recommended actions for A7 are listed in Table 14. The recommendations include those noted in the recent LTMMP to improve efficiency of the monitoring program.

Annual inspections of the landfill cap and the surrounding area including the access road, drainage system should continue until optimization analysis indicates otherwise. Annual gas monitoring of the four passive gas vents at AOC A7 should continue until optimization analysis indicates otherwise.

Identification of an installation program manager/POC for each agency may be necessary to ensure long term protectiveness. This is due to inconsistent communication and sometimes a delay in response or no response to the annual interviews and IC evaluations. No ICs have been breached; however the maintenance of the ICs, as observed through the interview process, needs improvement. This is especially true for any new property owner because land use and ownership changes can occur over a relatively short time since developers and other parties may not be fully aware of the ICs that have been put in place as part of the remedy. Activities that may interfere with ICs specified by the MOAs should continue to be monitored. Continue to perform windshield surveys along Sudbury Road to monitor for changes in land use in the subject state, federal, and private properties.

The first LTMMP (USACE, 1998) indicates that the effectiveness of the remedy is evaluated by monitoring trends of GW contaminants and comparing the results to the state MCP GW standards. The most stringent standard is used for comparison of VOCs, pesticides and metals. In addition, several WQ parameters are monitored to evaluate the extent of intrinsic remediation occurring at the site.

The more recent LTMMP (HGL, March 2009) optimized the program by applying GW-3 standards as more appropriate since there is no potential source of drinking water and because site groundwater discharges to the Assabet River shortly beyond the facility boundary. The LTMMP identifies PCE, TCE, 1,1,2,2-tetrachloroethane, and lindane as comprising the majority of the risk. The LTMMP evaluated the site for close-out[2], concluding that:

> *"Based on the historical data and the CSM...continued monitoring is recommended at the site. However, based on LTMM data the source containment remedy continues to be effective, the site does not currently pose a risk, and is not expected to pose a risk in the future. Accordingly, reduced monitoring is warranted."*

Annual measurements of water levels should be continued in 10 wells and two surface water gauges at the AOC A7 site and analysis for groundwater for the parameters listed in the current LTMMP at six wells.

[2] Using published guidance in *Evaluating, Optimizing or Ending Post-Closure Care at Municipal Solid Waste Landfills Based on Site-Specific Data Evaluations*, ITRC, Alternative Landfill Technologies Team, 2006.

Table 14 Recommendations and Follow-up Actions for the Sudbury Training Annex Site, Sudbury, Massachusetts

Concerns	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness	
					Current	Future
Control of vegetation in and around the landfill cap should be improved.	Vegetation growth control on and around the landfill cap should be implemented in a timely manner when the inspections call for it. Coordination of this effort with USFWS (e.g. herbicide application/approval) should be improved.	US Army	USEPA	01/01/2013	No	No
The fence is being overgrown with trees and shrubs preventing access for an inspection and comprising the fence integrity.	Maintenance of the fence should be improved to facilitate inspections as well as restrict access.	US Army	USEPA	Fall 2011	No	No
Performance metrics for LTM of the remedy should be established in the LTMMP.	These metrics should be established in the LTMMP according to the ITRC guidance (ITRC, 2006).	US Army	USEPA	01/01/2013	No	No

Some of the recently damaged woody plants in the replicated wetland area may not recover naturally or may be replaced by invasive species. The southwestern portion of the buffer zone and part of the adjacent wetland have been overrun during mowing.	The replicated wetland area will be evaluated during the next annual landfill cap monitoring inspection to determine the recovery of the mowed woody plants and whether any corrective action is required (e.g. replanting). Mowing limits should be clearly marked on the figure provided to the contractor and physical markers (e.g. wooden stakes) should also be placed along the southwestern perimeter of the upland buffer zone surrounding the wetland prior to the next mowing event.	US Army	USEPA	August 2011	No	No
Technical memorandum on the protectiveness assessment for AOCs P31/P58 not completed	Finalize the report	US Army	USEPA	1-1-2013	No	No
POCs for each new owner are difficult to locate	Identify points of contact for institutional control inspections	US Army	USEPA	1-1-2013	No	No
Surface water staff gauges are difficult to locate	GPS coordinates and a GPS unit should be utilized to locate surface water gages during the annual sampling event.	US Army	USEPA	1-1-2013	No	No

10.0 PROTECTIVENESS STATEMENT

The remedies associated with AOC A7 continue to be protective of human health and the environment. Long term protectiveness of the remedial actions should be verified by continuing the ongoing groundwater monitoring program and the maintenance program. Continued IC inspections will also ensure long term protectiveness. Because the remedial action at AOC A7 is protective, the site is protective of human health and the environment.

In order for the remedy to continue to be working effectively, the following actions should be taken:

- Vegetation growth control on and around the landfill cap should be implemented in a timely manner when the inspections call for it. Coordination of this effort with USFWS (e.g. herbicide application/approval) should be improved.
- Maintenance of the fence should be improved to facilitate inspections as well as restrict access.
- Performance metrics for LTM should be established in the LTMMP according to the ITRC guidance (ITRC, 2006).
- The replicated wetland area will be evaluated during the next annual landfill cap monitoring inspection to determine the recovery of the mowed woody plants and whether any corrective action is required (e.g. replanting). Mowing limits should be clearly marked on the figure provided to the contractor and physical markers (e.g. wooden stakes) should also be placed along the southwestern perimeter of the upland buffer zone surrounding the wetland
- Identification of points of contact for institutional control inspections

11.0 NEXT REVIEW

The next five-year review should be completed by September 25, 2016. The next review should include a complete review of data generated under the current LTMMP to determine if contaminant concentration trends are consistent with those outlined in the ROD. The 2016 review should also include evaluation of the LUC and ICs.

12.0 Reference

EOHHS, 2011. Massachusetts Office of Health and human Services, MA 2007 City Town Estimates.

HGL, 2008. 2007 annual report Long-Term Monitoring and Maintenance Area of Contamination A7 Former Sudbury Training annex Sudbury, Massachusetts. July.

HGL, 2009. 2008 Annual Report Long-Term Monitoring and Maintenance Area of Contamination A7 Former Sudbury Training annex Sudbury, Massachusetts. April.

HGL, 2009. Long-Term Monitoring and Maintenance Plan, Former Sudbury Training annex, Sudbury, Massachusetts. March.

HGL, 2010. 2009 Annual Report Long-Term Monitoring and Maintenance Area of Contamination A7 Former Sudbury Training Annex Sudbury, Massachusetts. July.

Interstate Technology Regulatory Council (ITRC), 2006. Evaluating Optimizing or Ending Post-Closure Care at Municipal SOLID Waste Landfills Based on Site-Specific Data Evaluations. September.

OHM Remediation Services, Corp. (OHM), 1992. Final Master Environmental Plan. January 1.

OHM, 1994. Final Site/Remedial Investigation report, fort Devens Sudbury Training annex Middlesex County, Massachusetts, Volumes I. January.

OHM, 1995. Feasibility Study at Fort Devens Sudbury Training Annex Areas A7 and A9. May.

OHM , 1995. Record of Decision Source Control Operable Unit AOC A7, the Old Gravel Pit Landfill, AOC A9 the POL Burn Area, Sudbury Training Annex, Middlesex County, MA as prepared for the U.S. Army Environmental Center. September.

OHM, 1997. Record of Decision Area of Contamination A4 and Areas of Contamination A7 and A9 Management of Migration Operable Units, U.S. Army Sudbury Annex, Middlesex County Massachusetts. September.

Roy F. Weston, Inc. (Weston), 1997. Final Operations and Maintenance Plan for the landfill at AOC A7. February.

US Army and USEPA, 1991. Final Federal Facility Agreement Under CERCLA Section 120, EPA Region I and U.S. Department of the Army. November 15.

US Army Toxic and Hazardous Materials Agency, 1980. Installation Assessment of US Army Natick Research and Development Command (NARADCOM) Report 170. May 1.

USACE, 1998. Long Term Monitoring & Maintenance Plan for the Landfill at Area of Concern A7, Fort Devens Sudbury Training Annex. April 1.

USACE, 2006. 2005 Final Report Long term Monitoring and Maintenance Landfill at Area of Contamination A7 (AOC A7) Devens Sudbury Training Annex Sudbury, Massachusetts. November.

USACE, 2007a. Long Term Monitoring and Maintenance Landfill at Area of Contamination (AOC) A7 Devens Sudbury Training Annex, Sudbury, Massachusetts. September.

USACE, 2007b. Draft Technical Memorandum Protectiveness Assessment for AOC P31/P58 Former Sudbury Training Annex Stow, Massachusetts. April 6.

USACE, 2010. Invasive Plant Species Survey Findings and Recommendations. Former Sudbury Training Annex Area of Contamination (AOC) A7 (Old Gravel Landfill), Sudbury, Massachusetts. May.

USEPA, 2001. Comprehensive Five-Year Review Guidance. EPA-540-R-01-007, prepared by the Office of Emergency and Remedial Response (5204G), USEPA, Washington DC, June 2001.

USEPA, 2010. Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites (PIME IC). November.

Weston, 1999. Final Operations and Maintenance Report for the Landfill at AOC A7 Fort Devens Sudbury Training Annex. February 19.

FIGURES

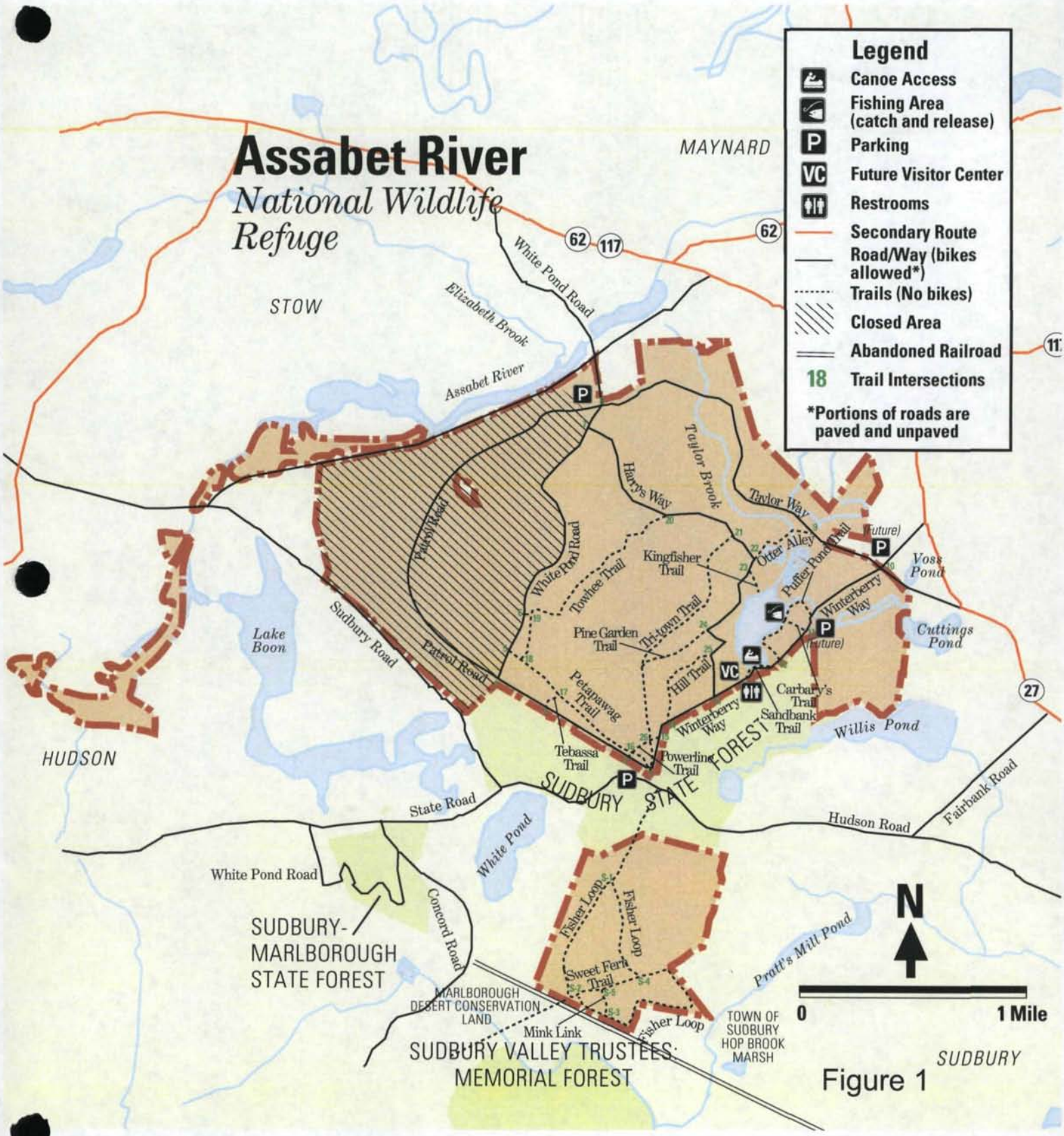

Assabet River
National Wildlife Refuge
Legend
Canoe Access
Fishing Area (catch and release)
Parking
Future Visitor Center
Restrooms
Secondary Route
Road/Way (bikes allowed*)
Trails (No bikes)
Closed Area
Abandoned Railroad
18 Trail Intersections
*Portions of roads are paved and unpaved
MAYNARD
STOW
HUDSON
SUDBURY
62
117
27
White Pond Road
Elizabeth Brook
Assabet River
Lake Boon
Sudbury Road
Patrol Road
Taylor Brook
Harry's Way
Taylor Way
White Pond Road
Towhee Trail
Kingfisher Trail
Otter Alley
Puffer Pond Trail
Winterberry Way
Voss Pond
Cuttings Pond
Pine Garden Trail
Tri-town Trail
Hill Trail
Petapawag Trail
Carbary's Trail
Sandbank Trail
Willis Pond
Tebassa Trail
Powerline Trail
SUDBURY STATE FOREST
State Road
Hudson Road
Fairbank Road
White Pond
White Pond Road
Concord Road
Fisher Loop
Sweet Fern Trail
Pratt's Mill Pond
SUDBURY-MARLBOROUGH STATE FOREST
MARLBOROUGH DESERT CONSERVATION LAND
Mink Link
SUDBURY VALLEY TRUSTEES MEMORIAL FOREST
TOWN OF SUDBURY HOP BROOK MARSH
N
0
1 Mile

Figure 1

Notes:
Orthophoto Date and Source:
May 20, 2008, ESRI World Imagery
Coordinate System: MA State Plane - Mainland, Meters
Horizontal Datum: NAD83
Vertical Datum: NVGD 1929

M:\Projects\Devens\2011\Figures\Fig2_022211.pdf
M:\Projects\Devens\2011\MXDs\Fig2_022211.pdf
February 22, 2011 DWN: MTW CHKD: KAM

US Army Corps of Engineers®
New England District

Legend

- Former Sudbury Training Annex Boundary
- Area of Contamination A7 Site Perimeter
- Major Road
- Area of Contamination

Figure 2
Site Map
Former Sudbury Training Annex

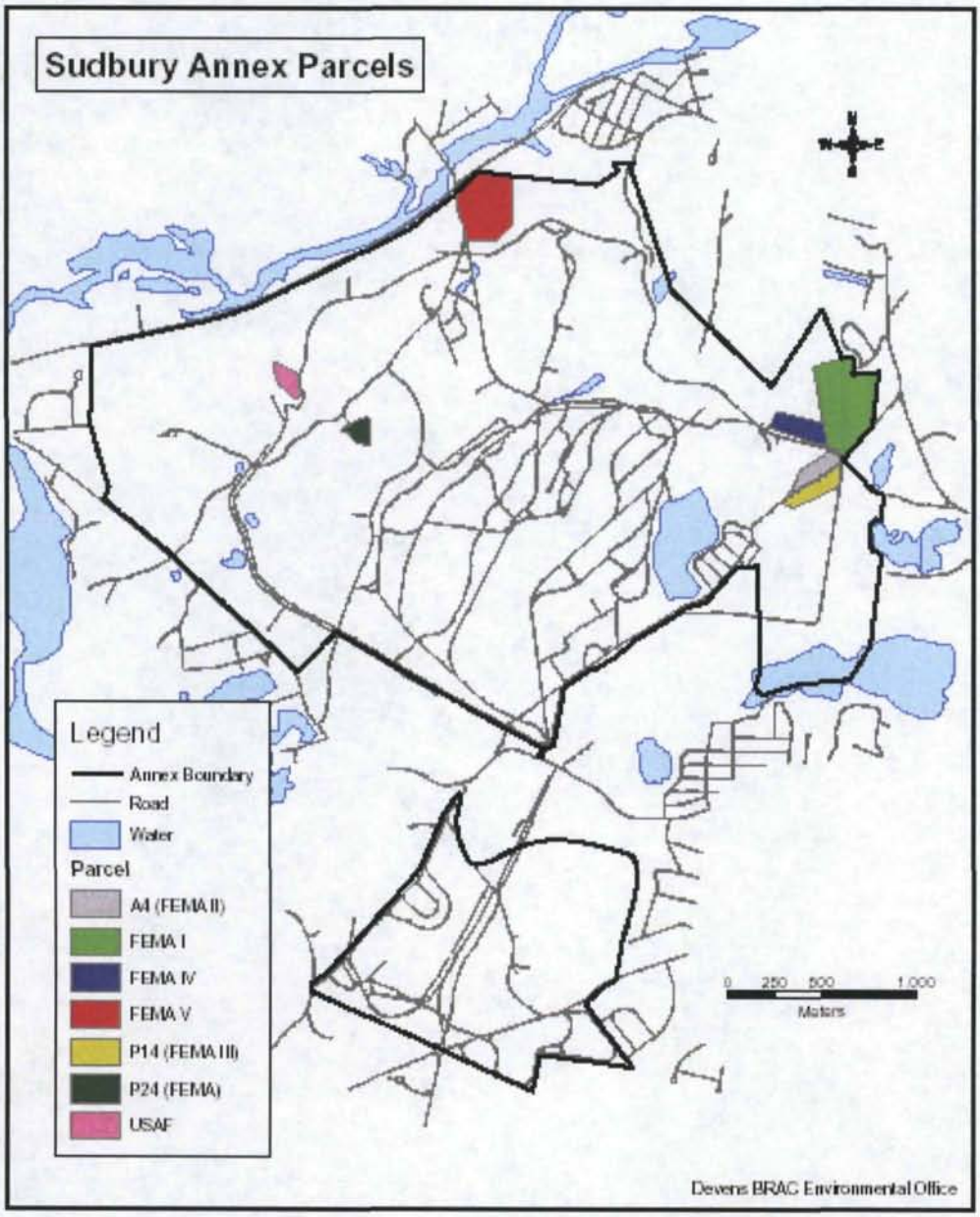


Figure 3
Former Sudbury Training Annex
Parcel Owners

Notes:
Orthophoto Date and Source:
May 20, 2008, ESRI World Imagery
Coordinate System: MA State Plane - Mainland, Meters
Horizontal Datum: NAD83
Vertical Datum: NVGD 1929

2009 Annual Report,
Former Sudbury Training Annex, Sudbury, MA

Figure 4
Site Map
Area of Contamination A7

Legend

- LTM Sample Well
- LTM Well - Gauge Only
- Staff Gauge
- Gas Vent
- Abandoned Monitoring Well
- Topographic Contour
- Fence
- Stump Pile Area
- Toe Drain

Notes:
LTM = Long Term Monitoring
NAD = North American Datum
NGVD = National Geodetic Vertical Datum

N

0 60 120 240
SCALE IN FEET

M:\Projects\Devens\2011\Figures\Fig2_022211.pdf
M:\Projects\Devens\2011\MXDs\Fig2_022211.pdf
February 22, 2011 DWN: MTW CHKD: KAM

US Army Corps of Engineers
New England District

Notes:
Orthophoto Date and Source:
May 20, 2008, ESRI World Imagery
Coordinate System: MA State Plane - Mainland, Meters
Horizontal Datum: NAD83
Vertical Datum: NVGD 1929

2009 Annual Report
Former Sudbury Training Annex, Sudbury, MA

Figure 5
Interpretive Water Table Elevation Map
November 2009

Legend

- LTM Sample Well
- LTM Well - Gauge Only
- Staff Gauge
- Gas Vent
- Abandoned Monitoring Well
- OHM-A7-08 (195.40) Well ID (Groundwater Elevation)
- Groundwater Contour (4 foot Interval)
- Groundwater Flow Direction
- Topographic Contour
- Fence
- Stump Pile Area
- Toe Drain

Groundwater Gradient Calculation

$$A\text{-}A' = \frac{200'-180'}{266'} = 0.075 \text{ FT/FT NNW}$$

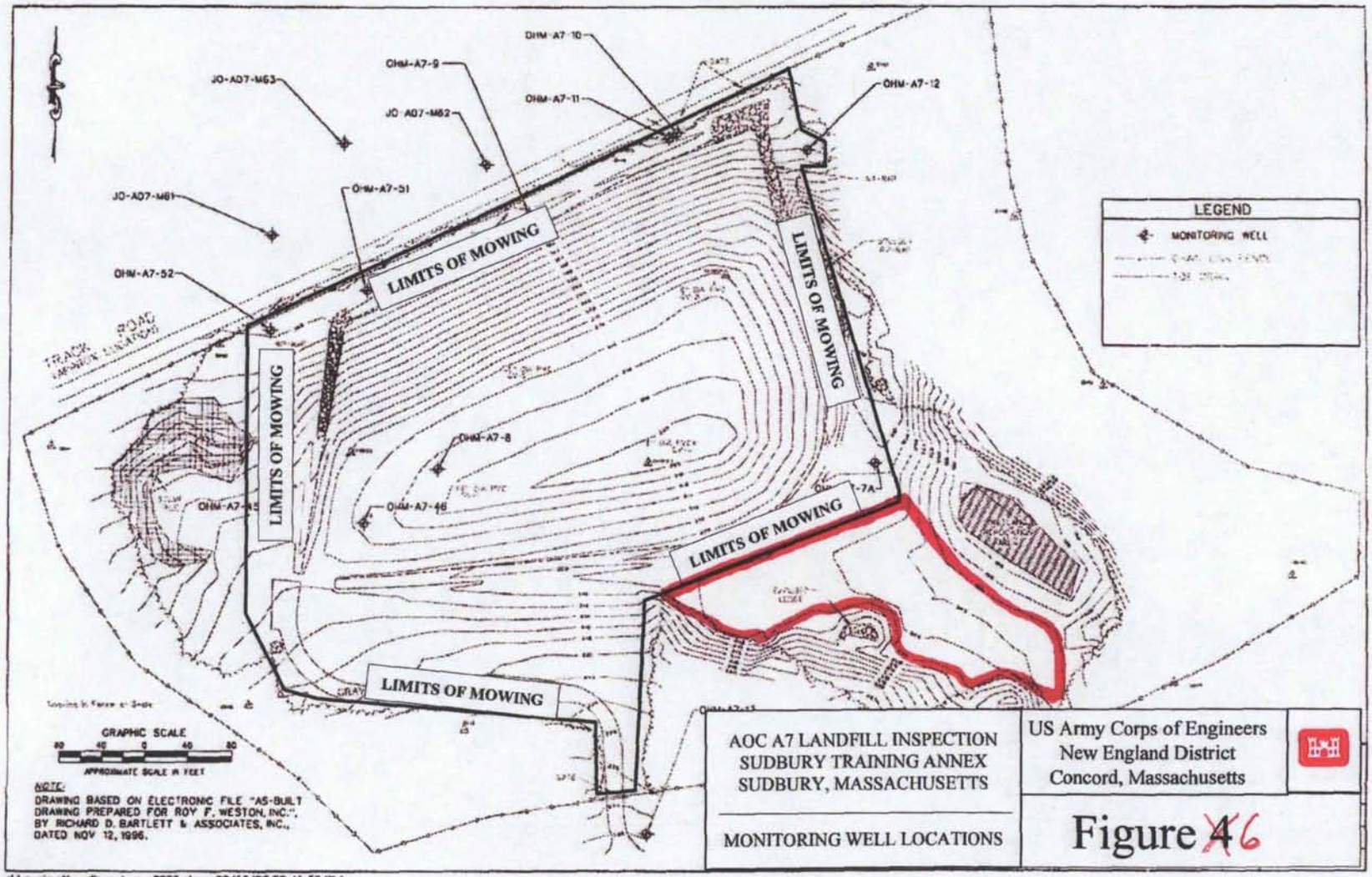
Notes:
OHM-A7-11 groundwater elevation not used in determining groundwater contours.
OHM-A7-12 was dry.
ft = feet
LTM = Long Term Monitoring
NAD = North American Datum
NGVD = National Geodetic Vertical Datum
NC – Not Collected

N

0 60 120 240
SCALE IN FEET

M:\Projects\Devens\2011\Figures\Fig2_022211.pdf
M:\Projects\Devens\2011\MXDs\Fig2_022211.pdf
February 22, 2011 DWN: MTW CHKD: KAM

US Army Corps of Engineers
New England District



d:\project\sudbury\mar02F3.dgn 03/13/02 02:41:52 PM

APPENDICES

Appendix A Site Status Table

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
The following sites were included in Record of Decision documents signed by the EPA and Army with MassDEP concurrence: A4, A7, A9, A12, P11, P13, P36 and P37. For all other AOCs, NFADDs have been signed by the BCT. Greater specificity is included below in this table.						
A1	Decontaminated Mustard Area - located near the northern border of the Annex in Maynard, approximately 2,200-ft southeast of the Green Meadow Elementary School (E&E 1994). Field testing of fumigants, fungicides, and mustard agent. The site is bounded on the north by Patrol Road, on the south and west by Taylor Brook, and is accessed by a dirt road that diverges southwest from Patrol Road.	Cleaned up to residential cleanup goals for metals in soil, circa 1996. Cleanup goals for copper 30 mg/kg, lead 50 mg/kg, manganese 500 mg/kg and zinc 40 mg/kg (Master Environmental Plan Addendum, February 2002). Backfilled with soil from AOC P22. Institutional control in place per MOA between US Army and USFWS 28Sep2000 that requires notification for changes in land use from recreational and wildlife refuge. NFA DD signed December 1997 (see Weston 1997).	RA-CS (Weston 1997b). Removal of two empty drums, with excavation and removal of 38 yd^3 soil contaminated with metals. Removed soil was consolidated as subgrade to landfill cap at AOC A7. Backfilled with soils from AOC P22.	1996	No.	No.
A2	Demolition Ground I - located near the northern border of the Annex, approximately 1,000-ft west of Site A1 and 300-ft south of Patrol Road (Weston	Lead, cadmium, HMX, and camphor cleaned up to residential remediation goals, in July to November, 1996. Institutional control in place per MOA between US Army and USFWS 28Sep2000 that requires notification for changes in land use from recreational and wildlife	RA-CS (Weston 1997b). Excavation and removal of approximately 156 cy of soil contaminated with metals, consolidated as subgrade to landfill cap at AOC A7. **Residential Remediation Goals:** Camphor 52 mg/kg, Sb 3.5, Cd 2, Cu 30, Zn 40, Pb 50 and HMX 5.8 mg/kg. Backfilled with soil from	1996, signed Dec 1997.	No. Notes from 2006 FYR: Residential soil standards were achieved at AOC A2. Since the	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
	2001). A2 is bordered on the north by Patrol Road, on the east by Taylor Brook, and is accessed by a dirt road that diverges either southwest from Patrol Road or north from Puffer Pond.	refuge. NFA DD signed December 1997 (see Weston 1997).	AOC P22. **Summary:** Antimony nondetect, with detection levels up to 3.2 mg/kg (below target of 3.5 mg/kg). Cadmium nondetect, with detection limits up to 0.91 mg/kg (below target of 2 mg/kg). Copper 4.1 to 14.6 mg/kg (below target of 30 mg/kg). Lead non-detect (detection limit 3.9 mg/kg) to 5.5 mg/kg (below target of 50 mg/kg). Zinc 12.9 to 32.9 mg/kg (below target of 40 mg/kg). HMX was not detected (the detection limit was 1.1 mg/kg which is below the target of 5.8 mg/kg). Camphor was not detected (this included review of tentatively identified compounds). Backfill from AOC P22		MCP standards for these chemicals have not changed since 1997, the site remains protective of human health and the environment, with no land use restrictions	
A3	General Dump (former trash dump). - AOC A3 and P5 are approx. 1,000 ft NE of Puffer Pond (Weston 2001). AOC A3 is a large cleared area sloping north to south. AOC A3 is bordered on its northern side by Patrol Road and	No further action decision document signed by BCT. See ABB 1996b. Soil—minor and infrequent exceedances of residential screening criteria for Aroclor-1254. Surface water and sediment—metals Al, Fe and Pb. Be and Al in sediment slightly exceed criteria (circa 1998). Heptachlor epoxide in GW, not exceeding GW-1 or EPA MCL standards.	Four drums removed. Soil left in place.	Nov 1998	No. Notes from 2006 FYR: A3 satisfies MCP S-1 and GW-1 standards.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
	on its western and southern sides by a wetland. Next to a road and a cranberry bog. Two dirt roads lead south and uphill from Patrol Road to a large sandy pit surrounded by earthen berms. The tree line borders the dirt road as well as the clear pit area. In the southern corner of the large pit, a trail leads south and then southwest for about 200-ft towards AOC P5 and the wetland					
A4	Waste Dump	No further action per record of decision (signed by Army and EPA with MassDEP concurrence). Risk assessment indicated suitability for unrestricted land use.	No information regarding types of waste material. Included in facility-wide arsenic investigation.	Sep97	No. Notes from 2006 FYR: No review required per ROD	No.
A5	Solvent/Waste Dump	No further action decision document (Signed by BCT; see ABB 1996b), based on soil sampling with no exceedances of residential criteria for EPA Region 3 RBC for residential soil. (circa 1998).	Laboratory solvents disposed into a trench. Canned food buried.	Nov98	No.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
A6	Demolition Ground II Demolition of explosives from Watertown Arsenal and reject munitions.	NFA DD (Sudbury Annex Administrative Record (AR) document SU 94101EEP; U.S. Army Environmental Center, 1995b). No further action decision document signed by the Army with EPA concurrence 27 March 1995. NFA recommended based on low PAH concentrations and no migration of them.	No remediation conducted due to low levels of PAHs in soil and groundwater (falling below criteria MCP GW-1/ S-1 and MCL). Trace levels only of pesticides and metals. Localized PAHs at center of AOC A6. No migration of PAHs from the center of AOC A6.	Mar95	No.	No.
A7	Old Gravel Pit Landfill – Landfill site has received materials from various other AOCs; some materials were transported away; the landfill was capped; AOC A7 has been inspected and wells sampled semiannually through May 2006. EPA has approved a recommendation to change to monitoring at fewer wells with the frequency changing to annual.	No further action to control soil source per record of decision, with long-term monitoring of groundwater to manage migration (OHM 1997; Weston 1997a). Constituents including VOCs, BNAs, PCBs, pesticides, herbicides, explosives, and metals. Institutional controls restrict other land uses.	Constituents are contained within a landfill that has a multi-layer impermeable cover. Included in facility-wide arsenic investigation.	SC ROD (OHM 1995b) Sep 95 MOM ROD (OHM 1997) signed Sep97	**Yes. Statutory review per ROD.**	**Yes. Statutory review per ROD.**
A8	Food Burial Area	No further action decision document (NFADD signed by the Army with EPA concurrence March 27, 1995)	Burial of foods following preservation experimentation. No contamination was found.	27 March 1995	No.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
		for AOC A8/P10. AR document SU 94111EEP. Soil, surface water, and sediment sampling found no evidence of contamination. Soil criteria were protective of human health; (below MCP GW-1/ S-1 standard) sediment criteria were protective of ecological health. (Ontario Minisry of the Environment lowest effect level and/or the NOAA effects range low-levels). Groundwater screening values were based on the assumption that groundwater would be used in the future and that the Annex will be used for residential purposes and is compared to MCP GW-1 standards and the EPA and MASSDEP MCLs for DW, no evidence of groundwater contamination was detected. (Master Environmental Plan Addendum, February 2002).				
A9	POL Burn Area	No further action and suitable for unrestricted land use per record of decision for management of migration (OHM 1997).	Eleven (11) cy of soil were removed, and backfilled with clean soil (Weston 1997b). Although the A9 site was included in facility-wide arsenic investigation, remedial actions at the site moved soils containing lead, thallium and arsenic in excess of the cleanup standards 300 mg/kg, 20 mg/kg, and 30 mg/kg. In each of these cases, the final concentrations were less than half the cleanup standards (thallium was not detected, with reporting limits up	Sep97	No.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
			to 0.21 mg/kg).			
A10	Railroad Pit/UST Area Neighbors reportedly dumped waste automotive oil into pit.	NFA DD for A8 and A10 (AR document SU 94111EEP; also ABB 1996b) signed by the Army, with EPA concurrence March 27, 1997. Constituents in soil found to be below EPA Region III risk-based concentrations for residential soil. All groundwater results were below federal and Massachusetts MCLs.	Former USTs have been pumped out and filled with water. Included in facility-wide arsenic investigation.	Dec99	No.	No.
A11	Leaching Field - located in the southern part of the Sudbury Training Annex, east of the intersection of Marlboro Brook and Diagonal Road (Weston 2001). Bounded by Marlboro Brook and Diagonal Road on its western edge and by a forest on all other sides. This site was a sanitary sewer leaching field and served as the pump house and water purification systems for CFHA.	NFADD (ABB 1996b) Inorganics in surface water formerly exceeded MCLs. Arsenic in sediment formerly exceeded criteria for soil. Cadmium in soil formerly exceeded ecological criteria. Risk assessment conducted for recreational visitors, workers, construction workers, and groundwater use as drinking water.	Sanitary sewer leaching field. A drum was removed from the area and staged with debris at AOC P13. Preliminary risk evaluation – No risk.	Dec98	No. Notes from 2006 FYR: Further informatio n can be found in Appendix F.	No.
A12	Polychlorinated biphenyls (PCBs) Spill Remediation	No further action per record of decision (ROD) for Operable Units 4 and 5 (US	RA-CS: Temporarily stored transformers were vandalized and fluids spilled	Sep96	No.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
	Area - AOC A12 is located in the southern part of the Annex and on the southern side of Moore Road between Firehouse Road and Diagonal Road (Weston 2001). This site is located between AOCs P36 and P37. AOC P36 (Former Raytheon Building) is located on the southern side of Moore Road in the southern part of the Sudbury Training Annex about 1,000-ft from the installation boundary (Weston 2001). AOC P37 is located near the intersection of Moore Road and Diagonal Road in the southern part of the Annex (Weston 2001), northeast of Building T104 (Site P36) and the PCB remediation	Army Environmental Center , 1996) which states that a five year review is not required. Cleanup goals were approved by MassDEP.	in 1983- 1984. In July 1985 transformers were removed and disposed of. 300 gallons of oil and 162.7 tons of soil were removed during multiple phases of remediation in the summer of 1985. Confirmatory samples after November 1985 indicated 1 result of 10.7 ppm, therefore MassDEP requested additional removal. Additional soil was excavated bringing the total to approximately 175 tons in 1986. Confirmatory samples yielded results of less than 4 ppm of PCBs. MassDEP approved clean up March 1, 1989 (OHM, 1994). Adjacent to AOC P36. Included in facility-wide arsenic investigation.		Notes from 2006 FYR: Further informatio n can be found in Appendix F.	

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
	area (Site A12)					
P1	UST Across from Building T223 - on the southeastern side of Patrol Road, approximately 1,800-ft northeast of the main gate of the Sudbury Training Annex (Weston 2001).	No further action decision document signed by BCT. Risk assessment determined no adverse risks for recreational visitors, workers, construction workers, and ecological receptors.	Included in facility-wide arsenic investigation. Greater detail may be found in ABB 1997 (AR document SU97032ABBS; ABB 1997; see also HLA 1999), an SSI report in which ABB reported concern over potential exposures to As in AOC P1 soils for human receptors; antimony was reported from filtered groundwater as "slightly above its primary MCLs".	Dec99	No. Notes from 2006 FYR: Further informatio n can be found in Appendix F.	No.
P2	Building T267 Fuel Spills - situated on the southeastern side of Patrol Road about 2,000-ft northeast from the main gate of the Annex (Weston 2001). This aluminum building stands in a cleared area. Two large openings exist on the northern side of the structure.	Institutional control in place per MOA between US Army and USFWS 28Sep2000 (MOA 2000) that requires notification for changes in land use from recreational and wildlife refuge. USFWS reported in 2006 that Building T267 was removed in 2003. Post-remedial confirmation samples below residential cleanup goals.	RA-CS. Pesticide malathion was spilled onto dirt floor, with soil excavated in 1988 and removed with confirmation at 0.062 ppm. Metals and PCBs found in soil. 693 yd^3 soil removed and placed at AOC A7. Confirmatory samples taken after the removal action showed that residual concentrations were below MCP S-1 soil standards: • TPH at concentrations below 159 mg/kg • Lead below 11.4 mg/kg • Zinc below 20.7 mg/kg • VOCs not detected • SVOCs not detected • Diesel fuel below 48 mg/kg • Arsenic below 58.7 mg/kg The Army, EPA, and MassDEP agreed that no further excavation was needed. Excavation backfilled with clean	1999	No.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
			soil.			
P3	Building T209 UST	NFADD (AR document SU 94112EEP) signed by the Army, with EPA concurrence 27 March 1995, stating that no TPH was found at downgradient locations, and metals in groundwater appear to be associated with particulate matter.	Leaking UST containing heating oil. 190 tons of soil were removed. Residual soil contained less than 100 ppm TPH.	March 1995	No.	No.
P4	Bunker Drum Area in a wooded area in the central area of the Sudbury Training Annex, south of Honey Brook between Bunkers 347 and 349 (Weston 2001). AOC P4: four upright 55-gallon drums, lashed together on a pallet, located between Bunker 347 and 349 (OHM 1994). One of the drums was marked "poison".	No further action decision document signed by BCT, stating no adverse risk associated with wildlife refuge or recreational land use, construction workers, or ecological receptors. ABB 1997 (AR document SU 97032ABBS) reported excessive SVOCs and arsenic in surface soils for residential development; possibly toxic concentrations of vanadium for certain plants. Recommended wildlife refuge land use with inclusion in facility-wide arsenic investigation.	Four intact and upright drums on a pallet, one marked "poison", were removed. Another drum was removed and staged at AOC P17. Included in facility-wide arsenic investigation.	Dec1999	No. Notes from 2006 FYR: Further information can be found in Appendix F.	No.
P5	Drum Storage Area, reported in 2001 5-Yr Review as having been included in the SI for AOC A3.	No further action decision document signed by BCT. See also ABB 1996b.	Drums removed and staged at AOC P13. No visible staining of soil. Samples indicated the presence of metals slightly above background. Human health PRE with conservative assumptions of exposure. As and Be slightly above public health screening	Nov98	No.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
			values. Ecological PRE: DDD, As, Cr and Pb slightly exceeded ecological screening values in only 1 or 2 samples.			
P6	Puffer Pond Possible Dump Area - located in the forest between the northern shore of Puffer Pond and Puffer Pond Road (Weston 2001). The dirt access road into the site splits and ends in an oval loop by an old landing stage on the shore of Puffer Pond.	No further action decision document signed by BCT. See also ABB 1996b.	Possible dumping and burial of laboratory waste reported by former Natick laboratory employees. A preliminary risk evaluation was conducted for exposures to trespassers, recreational users, construction workers, and groundwater uses. Concentrations of inorganics in soil were found to exceed only ecological screening values, which was attributable to a single subsurface soil sample. In surface water, inorganic substances were detected in excess of human and ecological risk screening values, even though it is unlikely that the surface water is a viable source of drinking water. Pesticides were detected in sediment at concentrations exceeding ecological screening values, although in some cases the screening values were below values expected in the background. The ecological screening values for surface water sediment were notably conservative, and were determined to overestimate risks. The concentrations of constituents in groundwater were found to be acceptable since they were all less than the prevailing MCP standards. A no further action decision document was signed by	Nov98	No. Notes from 2006 FYR: A significant change since 1998 is the current (2006) MCP GW-1 and EPA requirement (MCL) for arsenic in groundwater which has changed from 50 to 10 µg/L. The site remains protective of human health and the environment, even under the more stringent standard for arsenic in groundwater.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
			BCT in November 1998.			
P7	Patrol Road Dump Area	NFADD signed by the Army 31 Aug 1995, EPA concurrence 14 November 1995. AR document SU 95042OHMP.	Miscellaneous chemical waste disposal area reported by former Natick laboratory employees. No contamination indicated by soil gas, test pits, soil and groundwater samples. No likely complete exposure pathway for ecological receptors. No remedial actions were conducted.	Apr95	No.	No.
P8	Possible Transformer Disposal	See AOC A7.	Possible transformer disposal area within AOC A7. Subsumed into AOC A7 during remedial activities at AOC A7.	Sep97	No. Notes from 2006 FYR: The site is physically included in AOC A7.	No.
P9	Stream Dump Sites A7 and A9 - near the northern border of the installation boundary between AOC A7 and AOC A9 along Patrol Road (Weston 2001). The dump area is on the north side of the intersection of Patrol Road and a southeast-to-northwest-flowing brook. The brook flows underneath a bridge on Patrol Road and	No further action decision document included in ABB 1996b.	Possible dumping and burial of laboratory waste reported by former Natick laboratory employees. Surface soil samples were taken in the timeframe May to September 1995. Risk assessment included soil exposures to trespasser, workers, construction workers, and use of the groundwater. Only minor exceedance of ecological criteria by pesticides in sediment. No remedial activities were conducted. Included in facility-wide arsenic investigation.	Dec99	No. Notes from 2006 FYR: The site is protective with the current institutional controls in place.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
	continues northwest to the Assabet River about 800-ft to the north.					
P10	Confidence Course Dump Area	No further action decision document with AOC A8.	Possible dumping and burial of laboratory waste was reported by former Natick laboratory employees. No significant evidence of contamination was found. No exceedances of criteria for human or ecological health. Evaluated concurrently with AOC A8.	Nov94	No.	No.
P11	Building T405 Dump Area - Building T405 is located within AOC P11 on the Stow boundary of the Sudbury Annex, at the approximate center of the property (Weston 2001). Buildings T406 through T409 and the Firehouse are located in the vicinity of Building T405. Building T104 is located across Hudson Road, approximately 2 miles southeast of the main property.	Listed on NPL in 1990. Included in FFA between US Army and US EPA in 1991. No further action per ROD for OU4, allowing for use as a wildlife refuge (US Army Environmental Center 1996) The ROD for OUs 4 and 5 is AR document SU-96091USAS (US Army Environmental Center 1996)	Possible dumping and burial of laboratory waste along the fence line was reported by former Natick laboratory employees. Between July 1999 and August 2000 asbestos containing material was removed from 11 buildings and structures and disposed of at a permitted asbestos landfill. Between November 1999 and July 2000 remediation of explosive residue occurred within building T405 and the associated drainage system during the closure of AOC P11 and building T104. Confirmatory soil sample results were well below MCP S-1 guidelines in 2000. Fluorescent lights and ballasts, hazardous waste and scrap metal and mercury switches were removed from all buildings within the annex. Materials were classified and disposed of accordingly (Master Environmental Plan Addendum, February 2002). Further remedial actions occurred	Sep96	No. Notes from 2006 FYR: Not required by the ROD for OU4. In addition, MCP S-1 standards have not changed since 2000, so the site remains protective.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
			under BRAC. Confirmatory soil results were well below MCP S-1 human health standards in 2000. The ecological assessment indicated that arsenic, lead, and zinc in the soil were unlikely to pose a significant risk to the raccoon, red fox, white-footed mouse, or American robin species.			
P12	Abandoned UST at Site A9	NFA per ROD (AR document SU 96091 USAS; U.S. Army Environmental Center 1996) for Operable Units 4 and 5; signed by BCT for land use as a wildlife refuge. Removal actions in 1992 led to the remaining soil being tested and having 14-35 mg/kg of TPH; up to 0.27 ppm Zn; 0.5 ppm Pb.	RA-CS. UST holding JP-4 and water was removed and contents containerized. Soil beneath tank stained. 30.75 yd^3 containing TPH removed and recycled. Included in the AOC A9 ROD.	Sep96	No.	No.
P13	MFFA (Massachusetts Fire Fighting Academy) – reviewed in connection with P11 - Building T405 is located within AOC P11 on the Stow boundary of the Sudbury Annex, at the approximate center of the property (Weston 2001). Buildings T406 through T409 and the Firehouse are located in the	Listed on NPL in 1990. Included in FFA between US Army and US EPA in 1991. No further action per record of decision (US Army Environmental Center 1996) for use as a wildlife refuge.	Remediation actions occurred under BRAC (See AOC P11). USTs, ASTs, and fire training activities. Post-remediation confirmatory soil results were well below MCP S-1 guidelines in 2000. The ecological assessment indicated that arsenic, lead, and zinc in the soil were unlikely to pose a significant risk to the raccoon, red fox, white-footed mouse, or American robin species. Included in facility-wide arsenic investigation.	Sep96	No. Notes from 2006 FYR: The site remains protective while the MCP S-1 standards are unchanged.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
	vicinity of Building T405. Building T104 is located across Hudson Road, approximately 2 miles southeast of the main property.					
P14	East Gate Burial Dump	NFADD (AR document SU94052OHMP) signed by US Army 4 Aug 1994, with EPA concurrence 13 April 1994. (Title page dated May 1994)	Disposal of drummed waste derived from polyurethane foam and fiberglass structure research. No evidence of the purported disposal was found.	Aug94	No. Notes from 2006 FYR: 2001 5YrRvw reported "no use restrictions".	No.
P15	Navy Burning Ground	NFADD (AR document SU 94031OHMP; US Army Environmental Center 1994a) signed by the Army with EPA concurrence dated 25 March 1994.	SI - Identified as a burning ground by former Natick Laboratory employees. Field investigation included soil gas survey, geophysical survey and groundwater sampling from one well. No significant contamination was found. Upon second interview with Natick lab employees who first identified the site, that he mistook P15 for activities associated with area P48.	Mar94	No. Notes from 2006 FYR: The site was mistakenly identified.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
P16	Bunkers 302,306, and 309 - located in the north central part of the Annex on slightly higher ground between a wetland on the west and Puffer Pond to the east (Weston 2001). AOC P16 consists of three bunkers (302, 306, and 309) that are located 800 ft west of Puffer Pond along a dirt road which, in this area, runs parallel to Puffer Pond Road. The three bunkers are surrounded by forest and their entrances face the direct road. Surface elevations range from approximately 195 ft amsl at Bunker 309 to over 200 ft amsl at Bunker 302. Depth to groundwater was estimated to be less than 16-ft below ground surface (bgs). Surface water flows from the site to the	Institutional control in place per MOA between US Army and USFWS 28Sep2000 that requires notification for changes in land use from recreational and wildlife refuge. Post-remedial confirmation samples below residential cleanup goals. No further action decision document signed by BCT December 1997. See also ABB 1996b.	Former ammunition bunkers used to store waste from Natick Laboratories, wood pallets, sheet metal ductwork, heat exchangers, foods, and food preparation equipment. Soil in bunkers found to contain pesticides and PAHs in excess of risk-based concentrations. Arsenic and SVOCs detected in drainage pathways and soil between bunkers. Empty drum removed. 38 yd^3 of soil exceeding soil standards in August 1996 were removed and placed at AOC A7. The reader is referred to Weston 1997 RA closeout report for greater detail.	Dec97	No. Notes from 2006 FYR: MCP S-1 standards were not exceeded in the 1996 confirmato ry soil sampling.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
	northwest to the wetland and east toward Puffer Pond.					
P17	Building T206	USFWS reported in 2006 that Building T206 was removed in 2003. No further action decision document signed by BCT.	Burial of Vietnam-era clothing from Natick Laboratories. No excess risk found for recreational visitors, workers, and construction workers. No remediation was found to be necessary. Included in facility-wide arsenic investigation.	Dec99	No.	No.
P18	Cloth Burial Area. SI activities showed P18 to be the site of a discarded tent.	NFADD (AR document 94053OHMP) signed by the Army, with EPA concurrence 19 Aug 1994.	Burial of 1970s-era cloth from Natick Laboratories. No signs of contamination found. No remediation was found to be necessary.	May94	No.	No.
P19	Clearing and Tracked Area	NFADD (AR document SU95043OHMP; US Army Environmental Center 1995k) signed by Army 31 Aug 1995 with EPA concurrence 14 November 1995. (Title page April 1995)	Small burn area, stressed trees. One drum removed. One sample was taken. No indication of possible contamination was identified.	Nov95	No. Notes from 2006 FYR: No land use restrictions	No.
P20	Burned Area and Drum - AOC P20 is a clearing located in the north-central part of the Sudbury Training	No further action decision document signed by BCT, January 13, 2000. ABB 1997 (SSI data packages, March 1997); AR document	RA – CS. Small burn area, stressed trees. Remedial actions completed 1999. Soil excavated to 2 foot depth based on a lead cleanup goal of	Jan 13, 2000	No.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
	Annex (Weston 2001). The area is separated from Puffer Pond Road on the SW side by a soil and stone berm.	SU 97032 ABBS.	300 mg/kg and laboratory confirmation samples.			
P21	Possible Dump Area	NFADD (AR document SU94054OHMP) signed by the Army, with EPA concurrence 19 August 1994.	Possible dump area by Natick Laboratories, reportedly with stained soil. No apparent contamination was found; no threat to human health or the environment.	May94	No.	No.
P22	Old Gravel Pit	No further action decision document signed by BCT (USACE 1999).	No evidence of contamination was found. No remediation was found to be necessary. Soils from AOC P22 were used to backfill various AOCs from which soil was removed and applied to AOC A7.	Apr99	No.	No.
P23	Building T465 (Drums). South side of Puffer Pond, in the central part of the Annex. - includes Building T465 and a concrete pad near the building (Weston 2001). P23 is on the broad crest of a ridge that slopes southeastward toward the northeastern	Institutional control in place per MOA between US Army and USFWS 28Sep2000 that requires notification for changes in land use from recreational and wildlife refuge. Post-remedial confirmation samples below residential cleanup goals. See also ABB 1996b. Cleanup satisfied MCP S-1 soil standards in 1996/1997; S-1 standards have not changed. Site remains protective of human health	Former aerial delivery testing facility for Natick Laboratories, and for measuring smoke obscurants. Two drums removed. Arsenic and TPH found in soil at levels exceeding criteria protective of human health. Lead found at high levels at only one location, prior to remediation/excavation. 24 yd^3 of soil was excavated and removed to AOC A7, and backfilled with clean soil. Confirmatory soil samples were below the human health and ecological PRE cleanup goals that would confirm acceptability for use as residential land or as recreational/ wildlife refuge use (USACE ROD Sep1997;	Dec 97	No.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
	most bunkers and slopes northwestward across Puffer Road toward Honey Brook	and the environment.	PRE "residential" standard was applied to A1, A2, A7, A9, P2, P16, P23, P39, P41 as outlined in Stone and Webster Basis of Design/Design Analysis1996)			
P24	Cleared Area	NFADD (AR document SU94055OHMP; US Army Environmental Center 1994m) signed Aug 1994 by Army with EPA concurrence 19 August 1994.	Cleared area with vehicle tracks and metal debris. No evidence of contamination was found, no samples taken, and no remediation was found to be necessary.	May94	No.	No.
P25	Test Chamber Building T463 - located in the west-central part of the Sudbury Training Annex, about 3,000-ft south of the Assabet River and midway between Patrol Road and White Pond Road along an unpaved road connecting the two (Weston 2001). Building T463 stands against a hill and is surrounded by forest. Building T463 is a reinforced-concrete bunker-like structure, reported as empty April 2001.	NFADD (AR document SU95044OHMP; US Army Environmental Center 1995l) signed by the Army 31 Aug 1995 with EPA concurrence 14 November 1995.	Cleared area with vehicle tracks, a reinforced-concrete bunker-like structure, and an empty above-ground storage tank. Remedial actions were conducted, by removing the tank. Soil samples were compared to criteria protective of human and ecological health.	Nov95	No. Notes from 2006 FYR: Review confirms that there was no evidence of contaminat ion.	No.
P26	Air Drop Zone Clearing	NFADD (AR document SU 94102EEP; US Army	Area was used to test flame retardant clothing. Sampling of	Mar 1995	No.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
		Environmental Center 1995m) signed by by the Army 6 January 1995 with EPA concurrence 27 March 1995.	soil, surface water, and groundwater, and comparison to residential screening values indicated no evidence of contamination.			
P27	Pyrotechnics Test Area - located in the north-central part of the Sudbury Training Annex on the north side of Patrol Road and mostly north of the perimeter fence (Weston 2001). Two clear areas, adjacent to a wetland on the north.	Listed on the NPL in 1990. No further action decision document signed by BCT. See also ABB 1996b.	Two clearings used to test pyrotechnics. A risk-based cleanup goal for arsenic was set at 250 mg/kg (for laboratory confirmation) and 200 µg/g (for analysis by on-site x-ray fluorescence). 3693 cy of soil and ACM were removed, and O&M for groundwater was conducted in May 2001 GW sampling round for both total and dissolved arsenic. As was not detected in the May 2001 sampling event. (MEP Addendum, 2002).	Aug00	No. Notes from 2006 FYR: Further informatio n can be found in Appendix F. Cleanup removed material known to contain more than 250 mg/kg arsenic. EPA has expressed concerns over toxicity values related to dirt-bikers' exposure to arsenic-containing dust. Since the toxicity value used to derive the cleanup goal has not changed, the site	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
					remains protective of human health and the environment.	
P28	Rocket Range - located in the northern section of the southern part of the Annex (Weston 2001). The southern part of the Annex is just south of Hudson Road, which divides the Sudbury Training Annex into north and south sections. The AOC P28 location is also situated adjacent to the former CFHA, a residential area. The main corridor consists of an area about 3600-ft long and 100-ft wide and includes a gravel roadway. This area consists of a sandy-gravely surface that is relatively flat. No vegetation exists along this corridor. The surrounding area contains tall grass	Institutional control in place per MOA between US Army and USFWS 28Sep2000 that requires notification for changes in land use from recreational and wildlife refuge. See also ABB 1996b. Details can be found in Weston 1997.	RA – CS. Area formerly used for rail activities, rocket testing, and recreational activities. Herbicides used along railway and to maintain line-of-sight. Elevated levels of arsenic warranted soil removal actions. 4,700 yd^3 of soil was removed and placed at AOC A7. Excavation was backfilled from AOC P22. Included in facility-wide arsenic investigation.	Dec99	No. Notes from 2006 FYR: Further information can be found in Appendix F. Cleanup achieved arsenic levels below the risk-based target of 250 mg/kg for dirt-bikers' exposure to dust. MOA requires USFWS to notify EPA of any changes from recreational/ wildlife refuge use. AOC P28 is included in the facility-	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
	and brush, and is moderately forested.				wide arsenic investigation discussed in Appendix F. Since the toxicity value used to derive the cleanup goal has not changed, the site remains protective of human health and the environment.	
P29	Static Rocket Firing	NFADD (AR document SU 94032OHMP; US Army Environmental Center 1994g) signed by the Army with EPA concurrence 1 April 1994.	EAR – NC 1992 Forested area reportedly used to static fire rockets. No evidence of rocket firing was found.	Apr94	No. Notes from 2006 FYR: No use restrictions	No.
P30	Proposed Test Area	NFADD (AR document SU94033OHMP; US Army Environmental Center 1994h), signed by the Army with EPA concurrence 1 April 1994, includes: "test area is believed to have been proposed but never implemented".	EAR – NC EAR performed February 1992. Proposed test area was investigated and no apparent contamination was found. No further action was proposed.	Mar94	No.	No.
P31	Old Dump - AOC P31 is located approximately	No further action decision document (USACE 1999) signed by BCT December 21,	Possible old dump with apparent stained soil and stressed vegetation. Two empty, crushed	Apr99	Yes, ICs only. Not required by	Not required by the

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
	800-ft northwest of Lake Boon (Boons Pond in one aerial photo), between Sudbury Road and White Pond Road but also includes some area east of White Pond Road (Weston 2001). There are two ways to access the site: either by means of White Pond Road that diverges north from Sudbury Road at power pole 120-½, or through a parking lot located on the western part of the site adjacent to Sudbury Road. White Pond Road leads into the northern part of the AOC P31.	1999.	drums were removed. Cleared area. Sample concentrations did not exceed criteria protecting recreational users, workers, and construction workers.		the ROD, but review of ICs required by 2009 LTMMP. Notes from 2006 FYR: Further informatio n can be found in Appendix F, presented in conjunctio n with AOC P58. The site required As sampling through spring 2001, at which time As was below 50 µg/L. Weston 2001 recommen ded abandonin g the wells; wells were abandoned with EPA approval in June 2002; both the	ROD, but review of ICs required by 2009 LTMMP.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
					EPA MCL and the MassDEP MCL for As in drinking water have been lowered to 10 µg/L. See Appendix F.	
P32	Road and Railroad Intersection	NFADD (AR document SU 94056OHMP; U.S. Army Environmental Center 1994j) signed by the Army 4 Aug 1994 with EPA concurrence 19 August 1994.	Road and rail intersection with burned areas, dead trees, and debris from off-site sources. No evidence of contamination was found.	Aug 1994.	No. Notes from 2006 FYR: No land use restrictions	No.
P33	Ground Scar	NFADD (AR document SU 95045OHMP; US Army Environmental Center 1995n) signed by the Army 3 August 1995 with EPA concurrence 14 November 1995.	Former railroad classification yard. No evidence of contamination was found.	Apr95	No. Notes from 2006 FYR: NC	No.
P34	Vegetation Stress at Main Gate	NFADD (AR document SU 94057OHMP; US Army Environmental Center 1994k) signed by the Army 4 August 1994 with EPA concurrence 19 August 1994.	Area with a pipeline easement and a stone-lined pit with reported drums and stressed vegetation. No debris or evidence of contamination was found.	May94	No. Notes from 2006 FYR: NC	No.
P35	Main Gate Guard Shack	No further action decision document signed by BCT(USACE 1999; Weston 2001).	Shack formerly contained non-asbestos flooring. ACM in walls and roof were removed, beginning March 15, 2000. A 275-gallon above-ground storage tank was removed, beginning March 17, 2000. Soil sample results did not exceed criteria for land use to be as a wildlife refuge, for	Apr99	No. Notes from 2006 FYR: NC. No land use restrictions	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
			recreational activities, or for USFWS workers.			
P36	Former Raytheon Building T104	Record of Decision included rationale for no further action (AR document SU 96091 USAS; U.S. Army Environmental Center 1996) for Operable Units 4 and 5; signed by the Army and EPA with MassDEP concurrence for land use as a wildlife refuge. Weston 1998 documented decontamination and asbestos abatement cleanup as completed in 1997.	Former research facility for missile guidance and radar systems, and manufacturing electronic equipment. Remediation activities: 10,000 gallon UST removed in December 1988. This UST was in good condition and contained no. 2 fuel oil. Cleanup goals were met.	Sep96	No. Notes from 2006 FYR: The P36 site "is suitable for unrestricted use" (MEP Addendum 2002).	No.
P37	Building T106 UST	Record of Decision included rationale for no further action (AR document SU 96091 USAS; U.S. Army Environmental Center 1996). for Operable Units 4 and 5; signed by the Army and EPA with MassDEP concurrence for land use as a wildlife refuge.	Abandoned former Raytheon building. 1000 gallon heating (no. 2 fuel) oil tank removed in December 1988. The tank was in poor condition with extensive corrosion. .16 cubic yards of contaminated soil was removed. Confirmatory samples for TPH indicated 6521 and 6517 ppm for the stockpile concentrations	Sep96 ROD for OU5	No.	No.
P38	Former Railroad Inspection Pit	NFA signature page dated December 1999 was included in AR binder XXVIII (ABB 1996b) (reported also by Weston 2001). Risk was based on recreational users and USFWS workers potentially exposed to surface soil and sediment.	ABB 1996 arsenic study: Annex-wide subsurface soils study for arsenic in 1992-95: highest observation at P38 was 6.66 µg/g, well below highest observation at the annex (960 µg/g). The highest concentration of arsenic in sediment at P38 was 11.5 µg/g, approximately the median observation in the study. The highest As concentration in surface soil (less than 2 ft deep) at P38 was 200 µg/g, a result in the	Dec-99	No.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
			top quartile of observations. Harding 2002 reported arsenic and manganese in sediment exceeding EPA Region III residential soils RBC, but less than the MCP S-1 standard. Included in facility-wide arsenic investigation.			
P39	Dump Area	NFA DD, Oct 1997 (Weston 1997b; see also Weston 2001)	RA-CS 1991 SI included sampling for metals, TPH, and pesticides and geophysical testing. A 1995 PRE indicated "no substantial human health or ecological risks" but recommended removal of debris with field screening to verify the location of one "hot spot". Stone & Webster 1996 BD/DA allowed for removal of approximately 14 cy to be placed in the landfill at AOC A7. 12 samples taken; detection limits too great. 13 further samples. Results were non-detect. "The MADEP and EPA did not require any further action for P39." (Weston 1997b).	Oct-97	No.	No.
P40	Building T452 Area One known spill in 1992 led to removal of contaminated soil to TPH below 65 µg/g.	NFA DD (AR document SU94103EEP; U.S. Army Environmental Center 1995c) signed by the Army 6 January 1995 with EPA concurrence 27 March 1995. Human health screening values assumed that the annex would be used for residential purposes and the groundwater would be used for potable water (so MCP	NCF One known spill in 1992 led to removal by Laidlaw of contaminated soil to TPH below 65 µg/g. Elevated metal concentrations in a cesspool were determined to be from plumbing in Building T452. Groundwater sampling indicated there was no solvent contamination.	Mar-95	No.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
		GW-1 and EPA drinking water MCLs were used in the NFADD).				
P41	Bunker 303 Pesticide Storage. Pesticides were found during PA/SI sampling, and S&W (S&W 1996) proposed that contaminated soils be removed from AOC P41 and placed in the landfill at AOC A7 (BD/DA). Cleanup levels at AOC P41 were to MCP S-1 and GW-3.	NFA DD See also ABB 1996b. Details may be found in the Weston 1997 RA closeout report.	RA-CS Harding 2002 reported that 89 cy were removed from AOC P41 and CS showed no area containing DDD, DDT, or DDE above the cleanup goal. The property was transferred to USFWS in September 2000.	Oct-97 Signed Dec97, per Harding ESE 2002 (MEP addendum)	No. Notes from 2006 FYR: MOA requires that USFWS inform EPA of any change from recreational and wildlife refuge land use.	No.
P42	Off-Site Dump (along the Annex property line).	NFA DD (AR document SU 94104EEP; US Army Environmental Center 1995d) signed by the Army 6 January 1995 with EPA concurrence 27 March 1995.	NCF NFADD: "The results of extensive environmental investigations, including historic documentation reviews, and sampling efforts at AOC P42 do not indicate any discernable impact from the site on surface soil, or surface water and sediments in the vicinity." Human health screening satisfied requirements for potential use of groundwater for residential use (e.g., GW-1 and EPA MCLs)	March 1995	No. Notes from 2006 FYR: There are no use restrictions at AOC P42	No.
P43	A/B-Disturbed Area/ Staining Soils and Stressed Vegetation	NFA DD (AR document SU 94105EEP; US Army Environmental Center 1995e) signed by the Army 6 January 1995 with EPA concurrence	NCF No evidence of contamination at P43A/B.	March 1995	No. Notes from 2006 FYR: There are	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
	P43A is 800 ft north of Maynard Town Well No. 3; P43B is between Maynard Town Well No. 3 and the parking lot south of Digital Corporation.	27 March 1995. "The results of extensive environmental investigations, including historic documentation reviews, and sampling efforts at AOC P43A/B do not indicate any significant contamination or discernable impact from the site on the surface soil, or surface water and sediments in the vicinity. The SI undertaken by E&E confirmed that no evidence of contamination could be identified and that a threat to human health or the environment at the site appears highly unlikely."			no use restrictions at AOC P43 A/B.	
P44	A/B-Clearing with Stains and White Objects. Located at land now (2006) operated by FEMA.	NFA DD (AR document SU93034OHMP; US Army Environmental Center 1994b) signed by the Army 9 March 1994 with EPA concurrence 28 March 1994. No evidence of a threat to human health or the environment.	EAR – NC. EAR 1992 confirmed the results of a 1985 reconnaissance.	Mar-94	No. Notes from 2006 FYR: No use restrictions	No.
P45	Burned Area Outside Fence	NFA DD See also ABB 1996b. per Weston 2001.	PRE for NFADD assumed USFWS could be exposed to soil, sediment, surface water, and groundwater could be used for potable water. Included in facility-wide arsenic investigation.	Dec-99	No.	No.
P46	Cleared/Burned Area/ Dead Trees	NFA DD (AR document 94035OHMP; US Army Environmental Center 1994c) signed by the Army 9 March 1994 with EPA concurrence	EAR-NC. Identified by EPA by aerial photo interpretation. Site reconnaissance in 1985 which	Mar-94	No.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
		28 March 1994.	showed no evidence of disposal or burning activities. EAR was done in 1992, no evidence of stressed vegetation was found. No samples collected and no further action proposed. There was a devastating gypsy moth outbreak in 1980 and 1981. The damaged vegetation identified on aerial photographs may have been the result of heavy infestation of the gypsy moth on the hardwoods.			
P47	Damaged Vegetation	NFA DD (AR document SU 94036OHMP; US Army Environmental Center 1994d) signed by the Army 9 March 1994 with EPA concurrence 28 March 1994.	EAR-NC Area initially identified by EPA as damaged vegetation. EAR was performed in 1985, found dead trees but no disposal area was noted. No evidence of contamination was found in area of reconnaissance. No samples were taken. There was a devastating gypsy moth outbreak in 1980 and 1981. The damaged vegetation identified on aerial photographs may have been the result of heavy infestation of the gypsy moth on the hardwoods.	March 1994	No.	No.
P48	Fuel Bladder Area Area is 30 ft by 45 ft.	NFADD signed by the Army 6 January 1995 with EPA concurrence 27 March 1995 (US Army Environmental Center 1995f). "Although historical evidence identified that POL bladders and clothing treated with fungicides were tested at AOC P48, and spills from the POL bladders were reported to have occurred, sampling results to date do not indicate any residual	NCF Human health screenings for the NFADD assumed groundwater would be used in the future and the Annex would be used for residential purposes (therefore used MCP GW-1 and EPA MCLs for drinking water).	March 1995	No.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
		contamination in subsurface soils or groundwater at the site that would pose potential risks to human health or the environment."				
P49	Two Drums Near Road/ Bunker 323 AOC P49 is located in the vicinity of Bunker 323 in the central area of the Annex (Weston 2001). The bunker is located on the side of an east-to-west-trending stretch of road.	NFA DD (AR document SU 94046OHMP; US Army Environmental Center 1995o) signed by the Army 31 August 1995 with EPA concurrence 14 November 1995. NFADD signed by the Army in August 1995, EPA concurrence 14 Nov 1995. AOC P49 was removed from further consideration under CERCLA. No further investigation or remediation was necessary.	RA-CS. An SI by OHM in 1991/92 assessed the land as suitable for unrestricted development. The noted drums were removed and confirmatory sampling was performed. No volatile organics or pesticides were detected. Following drum removal, soil sampling at and around the drums led to the following findings for the pesticides DDT, DDE, DDD, dieldrin and heptachlor epoxide, the volatile organic compound tetrachloroethene (PCE), and the metal nickel: DDT concentrations ranged from 0.03 to 0.23 mg/kg (below the 2 mg/kg standard for a human health assessment, or 0.5 mg/kg for an ecological assessment.) DDE concentrations ranged from 0.055 to 0.124 mg/kg (below the 2 mg/kg standard for a human health assessment, or 0.5 mg/kg for an ecological assessment) DDD concentrations ranged from non-detect to 0.071 mg/kg (below the 2 mg/kg standard for a human health assessment, or 0.5 mg/kg for an ecological assessment) Dieldrin detected in one sample at 0.012 mg/kg (below the 0.03	Nov 1995	No.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
			mg/kg standard for a human health assessment) Heptachlor epoxide detected in only one of the five soil samples at 0.005 mg/kg (below the 0.06 mg/kg standard for a human health assessment). PCE detected once at 0.003 mg/kg (below the 200 mg/kg standard for a human health assessment). Nickel, at 41.5 mg/kg in the one sample that was analyzed for metals (greater than the background concentration but below the 300 mg/kg standard for human health assessment or 100 mg/kg for an ecological health). The concentrations in soil suggested that the drums may have once contained solvents and pesticides. The post-removal sampling indicated that "extensive contamination" due to pesticides, VOCs, and/or metals did not exist. This finding led to an NFADD signed by the Army in August 1995, EPA concurrence 14 Nov 1995.			
P50	One Drum Near Road/ Bunker 325 NFA DD (AR document SU 94058OHMP) signed by the Army 4 August 1994 with EPA concurrence 19 August 1994. No	NFA DD (AR document SU 94058OHMP; US Army Environmental Center 1994i) signed by the Army 4 August 1994 with EPA concurrence 19 August 1994. No contamination was found in the sample that was collected.	RA-CS One drum was removed. There are no use restrictions at AOC P50.	Aug-94	No.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
	contamination was found in the sample that was collected.					
P51	One Drum Near White Pond Road AOC P51 is located on the west-central part of the Sudbury Training Annex along White Pond Road, approximately 1,600-ft north of the intersection with Patrol Road (Weston 2001). West across White Pond Road from this point, there is and extensive wetland. AOC P51 was identified by OHM during a site reconnaissance in March 1991 (Weston 2001). One drum was discovered along the edge of White Pond Road.	NFA DD (AR document SU 95047OHMP; US Army Environmental Center 1995j) signed by the Army 31 August 1995 with EPA concurrence 14 November 1995. Confirmation sampling of soil as follows: All samples were compared to EcoRisk screening values (ESAT 1994) Human health PRE compared soil samples to MCP S-1/ GW-1 soil standards. "the activities involved in the OHM investigation qualified for a categorical exclusion (CX) in accordance with National Environmental Policy Act (NEPA), as amended, and did not require prior preparation of an environmental assessment or an environmental impact statement."	SI performed 1991-1992. Drum was removed, staged, scanned. Took confirmatory samples VOAs, SVOCs TAL metals explosives, PCBs/Pesticides. 9 metals detected above background concentrations, but the exceedances were not widespread, so were considered not representative of the true risk at P51. Additional 4 point grid around area where drum was located. **Results** **Pesticides** – none exceeded the 2 ppm standard for human health, and none exceeded the ecological screening value (ESAT 1994) of 0.5 µg/g. **Dieldrin** – 0.117 ppm (exceeded the standard, but in only 1 of 5 samples). **Arsenic** – 12 ppm. Greater detail can be found in the NFA DD. RA-CS	Nov 1995	No. Notes from 2006 FYR: There are no use restrictions at AOC P51.	No.
P52	Possible Dump Area near FEMA Property	NFADD (AR document 94113EEP; US Army Environmental Center, 1995g) signed by the Army 6 January 1995 with EPA	NCF	March 1995	No. Notes from 2006 FYR: There are no use	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
		concurrence 27 March 1995. "no physical or chemical evidence of contamination above screening levels has been found at this site."			restrictions at AOC P52	
P53	Building T210 "UST" Sign indicated No. 2 Fuel Oil.	NFA DD (AR document SU 94037OHMP; US Army Environmental Center, 1994e) signed by the Army 9 March 1994 with EPA concurrence 28 March 1994): "no evidence of contamination was observed." Building T210 was located across the road from the proposed location of the USFWS Visitors' Center, for which a Finding of No Significant Impact was approved March 1, 2006 for this new construction.	NCF Site was identified in 1991. The UST was found to be an AST in the building. No visual evidence of staining. GW samples were taken as part of a facility wide investigation, no PCBs Pesticides, SVOCs, VOCs, TAL metals explosives, chlorinated herbicides or phosphate were detected. No significant contamination was found; based on the results of the investigation NFA recommendation was made. No remediation and no further action.	Mar-94	No. Notes from 2006 FYR: There are no use restrictions at AOC P53.	No.
P54	Bunkers 305,307, and 314. Identified as a general chemical storage area. NFA DD PRE assumed land to be used as a wildlife refuge, with recreational users and USFWS workers potentially exposed, with possible use of	NFA DD (included in ABB 1996b.) PRE assumed land to be used as a wildlife refuge, with recreational users and USFWS workers potentially exposed, with possible use of groundwater for drinking water supply.	Sampling was conducted for SVOCs, pesticides, arsenic. Included in facility-wide arsenic investigation: several soil boring samples were found to have As concentrations in the top quartile of the Annex's soil boring sample results, and two of these had concentrations exceeding 20 µg/g, and the peak observed value was 86 µg/g (both of these were at nominal depth 4 feet)	Dec-99	No.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
	groundwater for drinking water supply.					
P55	Cleared Area South of Bunker 301	NFA DD (AR document SU 94038OHMP) signed by the Army with EPA concurrence March 1994, stating "no evidence of contamination was observed".	EAR-NC The site was identified as possible site based on vegetation condition. Recommendation for an EAR. The EAR in Feb 1992 was a field investigation. No evidence of possible contamination was found and no samples were taken. The differing forest density and varying tree heights in the area may have been the cause for the identification of a clearing based on aerial photographs (NFA DD, March 1994) NC	Mar-94	No. Notes from 2006 FYR: There are no use restrictions at AOC 55.	No.
P56	Cleared Area South of Bunker 313.	NFA DD (AR document SU 94107EEP; US Army Environmental Center 1995h) signed by the Army 6 January 1995 with EPA concurrence 27 March 1995.	NCF	March 1995	No. Notes from 2006 FYR: There are no use restrictions at AOC P56.	No.
P57	Former Building S449	NFA DD (AR document SU 94108EEP; US Army Environmental Center 1995i) signed by the Army 6 January 1995 with EPA concurrence 27 March 1995. "Sampling results did not identify any site-related contamination other than low-level PAH concentrations in the immediate area around the metal and debris in the center of the site. It is	NCF	March 1995	No. Notes from 2006 FYR: There are no use restrictions at AOC P57.	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
		highly unlikely that the residual PAH levels pose any threat to human health or the environment. Given that no impacts were detected in groundwater, sediment, or soils outside of this one area."				
P58	Sudbury Road Dump. The wetland area is approximately 450 ft x 70 ft. (Weston 2001) A culvert on the western end of the wetland carries water under Sudbury Road and drains into Lake Boon. AOC P58 is immediately north of AOC P31. P58 is an exposed dump in a NE-to-SW oriented wetland area, surrounded by forest.	Close-Out Report (+ LTM required through spring 2001) (AR document SU 00021USAP; HLA 1999 and BEC 2000) signed by the Army 21 March 2000; by EPA 15 March 2000; by MassDEP 14 March 2000.	Four wells at AOC P31 and AOC P58 were required to be sampled semi-annually at least through spring 2001. Following the May 2001 sampling event, the 2001 Five-Year Review (Weston 2001) reported that all concentrations were below the EPA drinking water MCL of 50 µg/L, and that there was no trend of concentrations rising over time. The report therefore recommended that no further sampling should be done, and that the wells should be abandoned. The wells were abandoned with EPA approval in June 2002.	March 2000.	Yes, ICs only. Not required by the ROD, but review of ICs required by 2009 LTMMP. Notes from 2006 FYR: Further informatio n can be found in Appendix F, of 2006 FYR presented in conjunctio n with AOC P31. It is no longer clear that arsenic concentrati ons in groundwat er are	Not required by the ROD, but review of ICs required by 2009 LTMMP.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
					below the new (lowered) EPA MCL of 10 µg/L. See Appendix F.	
P59	Cans/ Metal Debris North of B-319 Included five-gallon cans and other metal debris.	NFA signature page signed December 1999 and included in USACE 1999. Debris was removed from the site. Supplementary SSI (HLA February 1999) advised NFA based on the site's small size (approximately ¼ acre), the fact that DDT seemed to be undergoing degradation over time, and any further removal action would result in untenable habitat destruction.	Only arsenic was reported in soil in excess of MCP S-1 soil standards and EPA residential RBC. Included in facility-wide arsenic investigation.	Dec 1999.	No. Notes from 2006 FYR: NFA was based on small site size, low yet subsiding DDT, and likely habitat destruction during any further removal actions for arsenic.	No.
P60	Three Drums West of Patrol Road	NFA signature page signed December 1999 and included in USACE 1999.	Drums were removed. Only arsenic exceeded MCP S-1 soil standards and EPA residential RBC. Included in facility-wide arsenic investigation.	Dec 1999	No. Notes from 2006 FYR: Adequate protectiveness is ensured through institutional controls provided by the US Fish and Wildlife	No.

Site Status Table

Site	Site Description	Current Protectiveness and Decision Status	Disposition of Waste	Date	Evaluated in 2011 Five Year Review?	Evaluate in 2016 Five Year Review?
					Service who use the land for recreational and wildlife refuge purposes.	
P61	Honey Brook Old Dump	NFADD Weston Remedial Action Completion Report 1999 (AR document SU 99091RFWR; Weston 1999)	Weston Remedial Action Completion Report 1999 (AR document SU 99091RFWR) RA-CS. CS was 3 sediment samples plus QC that included field duplicate and lab MS/MSD for QC. Drum was removed from the stream. Sediment was sampled for PAHs, TOC, grain size distribution, immediately downgradient of the drum's location.	Dec 15, 1999	No.	No.

Appendix B Site Attendance Sheets

8.0 PRE-ENTRY BRIEFING ATTENDANCE SHEET

Conducted by: Katherine Malinowski	Date Performed: 11/23/10
Topics Discussed:	Slips Trips and Falls
	Hunting
	Ticks

Printed Name	Signature	Representing
Larry Cain		USACE
Bob Davis		USACE
Tracy Dorgan		USACE
Ken Heim		USACE
Libby Herland	NA - Visitor Ctr. only	USFWS
Mike Jackson		HGL
Raimo Liias		USACE
Kathy Malinowski		USACE
Darrell Moore		USACE
Rachel Whittemore		USACE
~~Tracy~~		

8.0 PRE-ENTRY BRIEFING ATTENDANCE SHEET

	Conducted by: Katherine Malinowski	**Date Performed:** 12-7-10
Topics Discussed:	Slips trips & falls	
	hunters	

Printed Name	Signature	Representing
Robert Campbell	[illegible]	MASS DCP
Christine Williams	[illegible]	EPA
Elfred Tomlo	[illegible]	USACE

Appendix C Public Notice

US Army Corps of Engineers
New England District

PUBLIC COMMENT PERIOD OPEN FOR FIVE-YEAR REVIEW

FORMER FORT DEVENS SUDBURY TRAINING ANNEX SUPERFUND SITE
SUDBURY, MASSACHUSETTS

The U.S. Army Corps of Engineers (USACE) is announcing the start of a Five-Year Review for the former Fort Devens Sudbury Training Annex Superfund Site, Sudbury, MA.

BACKGROUND

Established in 1942, the Sudbury Training Annex has been used for ammunition storage, troop training, product and equipment testing, ordnance testing and laboratory waste disposal.

The Sudbury Training Annex was placed on the U.S. Environmental Protection Agency (USEPA) National Priorities List (NPL) as a Superfund Site in 1990. In May 1991 the Army signed an Interagency Agreement with the USEPA stipulating that site investigations and cleanup actions would follow the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) because of environmental contamination. Portions of the Training Annex groundwater has been found to contain volatile organic compounds (VOCs), pesticides, and metals above drinking water standards, however this contamination is contained under a landfill cap. Other areas of the Annex contained contaminated soil, but have been cleared up.

This site was deleted from the NPL on January 29, 2002. Long term groundwater monitoring and institutional controls are ongoing as part of the cleanup actions. Most of the site is now a U.S. Fish and Wildlife Service controlled National Wildlife Refuge named the Assabet River Wildlife Refuge. The U.S. Army, U.S. Air Force and the Federal Emergency Management Agency retained some land at the Site.

By law, remedial actions performed under CERCLA require site reviews no more than five years after the initiation of a remedial action and every five years thereafter. This is the third Five-Year review from the remedial action of construction of the landfill cap on July 31, 1996. This review is being conducted by the USACE, New England District and will be completed by July 8, 2011.

More detailed information on this site can be found under Sudbury Training Annex on the USEPA web page at: http://www.epa.gov/ne/superfund/site

The public is invited to provide any information regarding this site that it deems relevant to the review process. To submit comments and questions regarding the Five-Year Review process or site clean-up, please contact:

Maryellen Iorio
Project Manager
US Army Corps of Engineers - New England District
696 Virginia Road
Concord, MA 01742-2751
Office: 978-318-8433
Email: Maryellen.Iorio@usace.army.mil

Appendix D ARAR Tables

TABLE 3-2

FORT DEVENS SUDBURY TRAINING ANNEX - AOC A7
ARARs FOR EXCAVATION AND OFF-SITE TREATMENT AND DISPOSAL OF LABORATORY WASTE AND CONTAINMENT BY RCRA SUBTITLE C LANDFILL CAP

Requirement	*Status*	*Requirement Synopsis*	*Action To Be Taken To Attain ARAR*
		ACTION-SPECIFIC	
Laboratory Waste - Federal			
RCRA - Identification and Listing of Hazardous Waste (40 CFR 261)	Relevant and Appropriate	Establishes definitions for solid and hazardous wastes. Sets forth criteria used to identify hazardous waste and to list particular wastes. Identifies characteristics of a hazardous waste and contains a particular list of hazardous wastes.	Laboratory waste includes soil and debris contaminated by liquid containers. The waste is assumed to be classified as F002 spent solvents.
RCRA - Land Disposal Restrictions (40 CFR 268)	Relevant and Appropriate	Identifies hazardous wastes that are restricted from land disposal and defines exemptions. Subpart D contains treatment standards for RCRA-listed wastes.	Removal of laboratory waste and associated contaminated soils triggers LDRs. Since the wastes have been classified as F002 spent halogenated solvents, the wastes will be transported off site for treatment and disposal in accordance with the requirements of the LDRs.
Off-Site Rule (40 CFR §300.440)	Applicable	Requires that hazardous substances, pollutants, or contaminants transferred off site for treatment, storage, or disposal during a CERCLA response action be transferred to a facility operating in compliance with §3004 and §3005 of RCRA and other federal laws and all applicable state requirements.	Laboratory waste material will be transported to a TSDF that is in compliance.
Laboratory Waste - State			
HWR - Requirements for Generators (310 CMR 30.4000-30.416)	Relevant and Appropriate	Requirements for generators, including accumulation of waste prior to off-site disposal.	Generator requirements will be complied with during excavation and removal of laboratory waste materials.
HWR - Use and Management of Containers (310 CMR 30.680)	Relevant and Appropriate	Requirements for use and management of containers.	Packing of laboratory waste materials will adhere to these requirements.
Soil - Federal			
RCRA Subtitle C, Subpart B - General Facility Standards (40 CFR 264.10 - 264.18)	Relevant and Appropriate	General requirements regarding waste analysis, security, training, inspections, and location for any facility that treats, stores, or disposes of hazardous wastes (a TSDF).	Requirements regarding security, training, and inspections will be met.

TABLE 3-2
(CONTINUED)

Requirement	*Status*	*Requirement Synopsis*	*Action To Be Taken To Attain ARAR*
RCRA Subtitle C, Subpart B - Construction Quality Assurance Program (40 CFR 264.19)	Relevant and Appropriate	For all surface impoundments, waste piles, and landfill units, this regulation requires that a construction quality assurance (CQA) program be developed and implemented. A written CQA plan must identify the steps that will be used to monitor and document the quality of materials and their installation.	A CQA program will be developed and implemented for the construction of the landfill cap at Area A7.
RCRA Subtitle C, Subpart C - Preparedness and Preparation (40 CFR 264.30 - 264.37)	Relevant and Appropriate	Requirements applicable to the design, operation, equipment, and communications associated with a TSDF, and to arrangements with local response departments.	Since these regulations are primarily intended for facilities with indoor operations and a landfill cap is being constructed at Area A7, only requirements regarding communications equipment will apply during construction activities.
RCRA Subtitle C, Subpart D - Contingency Plan and Emergency Procedures (40 CFR 264.50 - 264.56)	Relevant and Appropriate	Outlines general requirements for contingency and emergency planning procedures for TSDF operations.	During all remedial action, a contingency plan with emergency procedures will be developed.
RCRA - Subpart N, Landfill Closure and Post-Closure Care (40 CFR 264.310)	Relevant and Appropriate	Final cover at a landfill requires the cover to be designed and constructed to meet certain performance standards. Cover to provide long-term minimization of infiltration. Settling and subsidence must be accommodated. Post-closure use of property must be restricted as necessary to prevent damage to cover. Runoff and runon must be prevented. Protect and maintain surveyed benchmarks. References §264.117 - 264.120 for maintenance and monitoring requirements.	Cap design will meet performance standards. Runoff and runon prevention measures will be taken. Surveyed benchmarks will be protected.
RCRA Subtitle C, Subpart G - Closure and Post-closure (40 CFR 264.117 - 264.120)	Relevant and Appropriate	Details general requirements for closure and post-closure of hazardous waste facilities, including installation of a ground water monitoring program and beginning a period of 30 years of post closure care. §264.119 requires the placement of deed restrictions.	Because Area A7 is being closed as a landfill, parts of this requirement concerning long-term monitoring and maintenance of the site are relevant and appropriate. Sets a minimum of 30-year post-closure care period. Deed restrictions will be placed restricting the future uses of the site. A post-closure plan will be prepared. The plan will identify monitoring and maintenance activities, and their frequency.
RCRA Subtitle C, Subpart F - Releases from Solid Waste Management Units (40 CFR 264.90 - 264.101)	Relevant and Appropriate	Specifies compliance points and ground water monitoring requirements for TSDFs during active-care and closure-care periods. Corrective action program must be developed if monitoring shows exceedences in limits.	Ground water monitoring will be conducted following the construction of the cap. Corrective action may be taken if monitoring warrants action.
RCRA Proposed Amendments for Landfill Closure (52 FR 8712)	To Be Considered	Provides an option for the application of alternative closure and post-closure requirements based on a consideration of site-specific conditions, including exposure pathways of concern.	Cap and post-closure monitoring will be designed taking into account exposure pathways of concern.

TABLE 3-2
(CONTINUED)

Requirement	*Status*	*Requirement Synopsis*	*Action To Be Taken To Attain ARAR*
RCRA - Land Disposal Restrictions (LDRs) (40 CFR 268)	Applicable	Land disposal of a RCRA hazardous waste is restricted without specified treatment. It must be determined that the waste meets the definition of one of the specified restricted wastes and the remedial action must constitute "placement" for the land disposal restrictions to be considered applicable. For each hazardous waste, the LDRs specify that the waste must be treated either by a treatment technology or to a concentration level prior to disposal in a RCRA Subtitle C-permitted facility.	If soil at Areas A7 and A9 fail TCLP testing, soil must be treated before the final disposal. Soils that fail TCLP testing could not be consolidated under the landfill cap at Area A7.
USEPA Guidance: Design and Construction of RCRA/CERCLA Final Covers (EPA/625/4-91/025)	To Be Considered	USEPA guidance that provides technical guidance on the design and construction of RCRA/CERCLA final covers.	Guidance will be considered in the design and construction of the landfill cap at Area A7.
USEPA Guidance: Quality Assurance and Quality Control for Waste Containment Facilities (EPA/600/R-93/182)	To Be Considered	USEPA guidance that provides technical guidance on quality assurance and quality control measures for containment facilities.	A construction quality assurance program will be developed for the remedial action at Area A7 based on this guidance document.
Clean Water Act: Final NPDES General Permits for Storm Water Discharges From Construction Sites; Notice (57 FR 44412-44435)	Relevant and Appropriate	Addresses NPDES permits for construction sites. For construction sites greater than 5 acres, develop and implement storm water pollution prevention plans. Storm water controls include stabilization practices, such as seeding and geotextiles, and structural practices, such as silt fences, swales, sediment traps, basins, etc. Identify maintenance procedures.	During construction, storm water management practices will be implemented.
Soil - State			
HWR - General Management Standards for All Facilities (310 CMR 30.510)	Relevant and Appropriate	Establishes requirements for operation of facilities including security, inspection, and personnel training.	Requirements regarding security, inspection, and training will be met during and after construction of the landfill cap.
HWR - Contingency Plan, Emergency Procedures, Preparedness, and Prevention (310 CMR 30.520)	Relevant and Appropriate	Requirements for notification, safety equipment, and spill control for hazardous waste facilities. A facility's contingency plan shall include: procedures to be used following emergency situations and to prevent hazards to public health, safety, or welfare and the environment. Copies of the plan shall be submitted to the local police and fire departments, hospitals, and emergency response teams.	During the remedial construction, safety and communication equipment will be kept at the site, and local authorities will be familiarized with site operations. Plans will be developed and implemented during site work. Copies of plans will be kept on site.

TABLE 3-2
(CONTINUED)

Requirement	*Status*	*Requirement Synopsis*	*Action To Be Taken To Attain ARAR*
HWR - Landfill Closure and Post-Closure Care (310 CMR 30.633(1) & (2B))	Relevant and Appropriate	Sets forth performance requirements for the closure of a landfill. For closure, the final cover must be designed and constructed to: provide long-term minimization of migration of liquids through the closed landfill; function with minimum maintenance; promote drainage and minimize erosion or abrasion of the cover; and accommodate settling. Post-closure, long-term maintenance, and monitoring requirements from 310 CMR 30.592 apply. Establishes a 30-year post-closure care period (310 CMR 30.590) and ground water monitoring (310 CMR 30.660).	Landfill cap at Area A7 will be designed to meet performance standards for this requirement. Following construction, long-term monitoring and maintenance requirements for the landfill will also apply.
HWR - Post-Closure (310 CMR 30.591(b) & 30.592(b))	Relevant and Appropriate	Requirement that establishes 30-year period of operations and maintenance for owners and operators of all facilities at which hazardous waste will remain on site after closure.	Requires a minimum of 30 years for post-closure care at Area A7, and at any other site where hazardous waste will remain in place.
HWR - Land Disposal Restrictions (310 CMR 30.750)	Relevant and Appropriate	Identifies and describes those hazardous wastes which are restricted from land disposal. These regulations also define the limited circumstances where prohibited land disposal is permissible.	If soils from Areas A7 and A9 fail TCLP test, then this requirement, which requires treatment prior to disposal, is applicable. Soil that fails TCLP testing could not be consolidated under the landfill cap as part of the necessary subgrade.
Massachusetts Surface Water Quality Standards (310 CMR 4.00) (see also 57 FR 44426-44427)	Relevant and Appropriate	Massachusetts 401 certification for the Clean Water Act requires additional measures for surface water discharges during construction. Set backs and best management practices (BMPs) are identified and are dependent upon the classification of the receiving water.	During construction, any new discharge outfill pipes will be designed to be set back from the Assabet River. Receiving swales, infiltration trenches or basins, filter media dikes or other BMPs will be prepared with the goal to minimize erosion yet maximize infiltration or otherwise improve water quality prior to discharge.
Massachusetts Ambient Air Quality Standards (310 CMR 6.00)	Applicable	Establishes the standards and requirements for ambient air quality standards in the Commonwealth. Specifically, Section 6.04(1) provides ambient air quality criteria such as particulate matter standards. The primary ambient air quality standards for particulate matter are: 50 $\mu g/m^3$ annual ambient air quality standard, attained when the expected annual mean arithmetic concentration is less than or equal to 50 $\mu g/m^3$; and 150 $\mu g/m^3$ - maximum 24-hour concentration, attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is less than or equal to one.	The emissions limits for particulate matter will be managed through engineering controls during construction activities at Area A7.

TABLE 3-3

FORT DEVENS SUDBURY TRAINING ANNEX - AOC A9
ARARs FOR CONTAMINATED SOIL EXCAVATION
AND CONSOLIDATION AT AOC A7

Requirement	*Status*	*Requirement Synopsis*	*Action To Be Taken To Attain ARAR*
		CHEMICAL-SPECIFIC	
Federal			
Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals)(OSWER 9285.7-01B)	To Be Considered	USEPA guidance used to develop preliminary remediation goals for carcinogenic and non-carcinogenic contaminants in various media.	Using the guidance, risk-based cleanup levels were developed for arsenic and thallium. Arsenic and thallium contaminated soils at AOC A9 will be excavated to 30 and 20 parts per million, respectively. Confirmatory samples will be taken to ensure that all contaminated soils above the cleanup level are removed.
		LOCATION SPECIFIC - None.	
		ACTION-SPECIFIC	
Federal			
RCRA - Identification and Listing of Hazardous Waste (40 CFR 261)	Applicable	Establishes definitions for solid and hazardous waste. Sets forth criteria used to identify hazardous waste and to list particular wastes. Identifies the characteristics of a hazardous waste and contains a list of particular hazardous wastes.	Soils at Area A9 will be TCLP tested to determine if it is hazardous.
Preparation of Soil Sampling Protocols: Sampling Techniques and Strategies (EPA/600/R-92/128, July 1992)	To Be Considered	USEPA guidance document for use in the development of soil sampling protocols. A particulate sampling theory is the basis for proper soil sampling. Other soil sampling scenarios are discussed including sampling from stockpiled material.	During remedial design, a soil sampling plan will be developed for implementation during excavation of soil. The goal of the sampling will be to determine whether soil can be consolidated as part of the subgrade of the landfill cap or must be shipped off-site for treatment/disposal.
State			
HWR - Identification and Listing of Hazardous Waste (310 CMR 30.100)	Applicable	Establishes provisions for classifying waste as regulated hazardous waste. Two methods are employed to identify wastes as hazardous, characteristics and listing.	Soil will be TCLP tested for arsenic to determine if it is hazardous by characteristics.
Massachusetts Air Pollution Control Regulations (310 CMR 6.00)	Applicable	Establishes the standards and requirements for ambient air quality standards in the Commonwealth. Specifically, Section 6.04(1) provides ambient air quality criteria such as particulate matter standards. The primary ambient air quality standards for particulate matter are: $50\mu g/m^3$ annual ambient air quality standard, attained when the expected annual mean arithmetic concentration is less than or equal to $50\mu g/m^3$; and $150\mu g/m^3$ - maximum 24-hour concentration, attained when the expected number of days per calendar year with a 24-hour average concentration above $150\mu g/m^3$ is less than or equal to one.	If necessary, emissions limits for particulate matter will be managed through engineering controls during excavation activities at all sites.

Appendix E Groundwater and Surface Water Charts

CHART 1

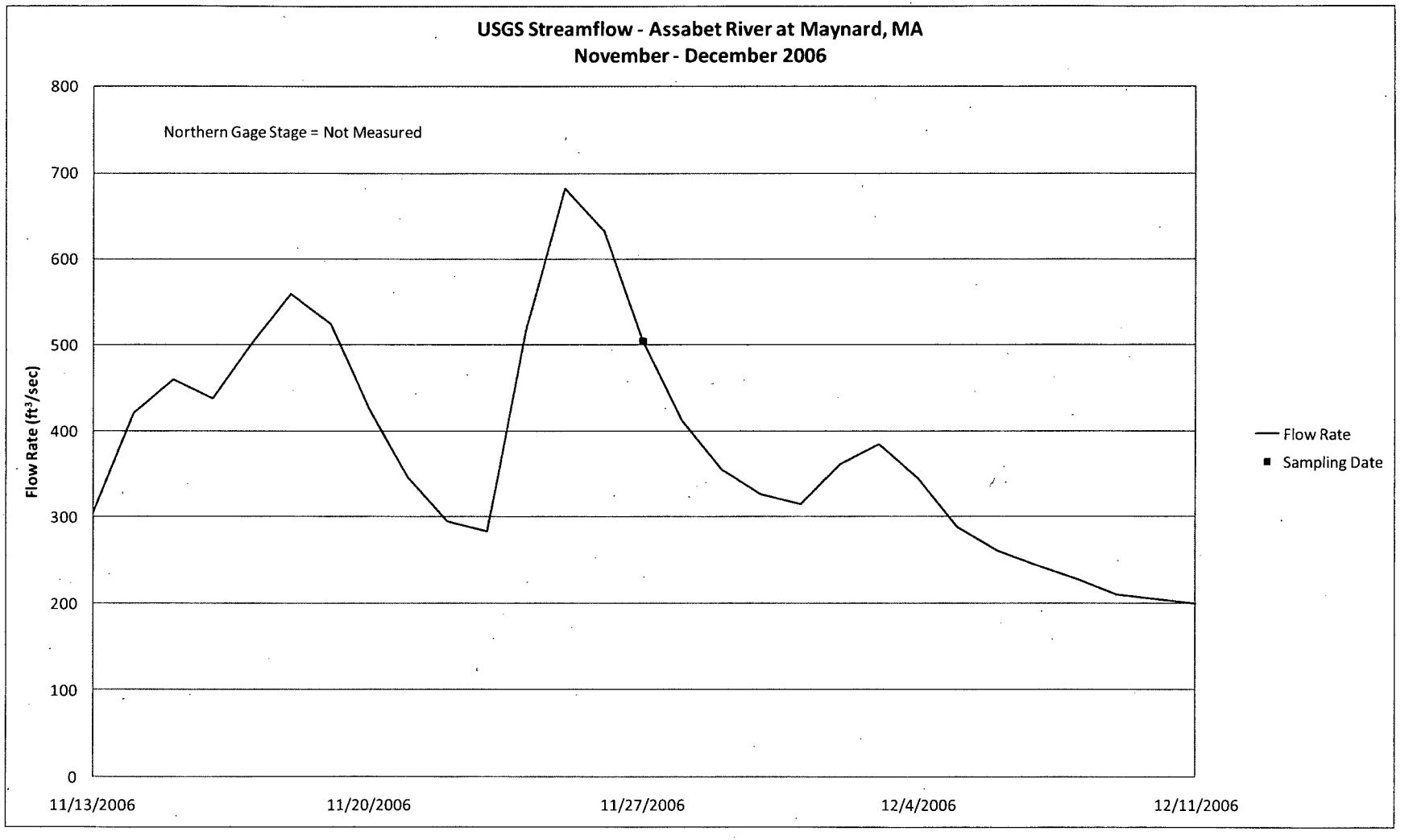

USGS Streamflow - Assabet River at Maynard, MA
November - December 2006
Northern Gage Stage = Not Measured
Flow Rate (ft³/sec)
800
700
600
500
400
300
200
100
0
11/13/2006
11/20/2006
11/27/2006
12/4/2006
12/11/2006
Flow Rate
Sampling Date

CHART 2

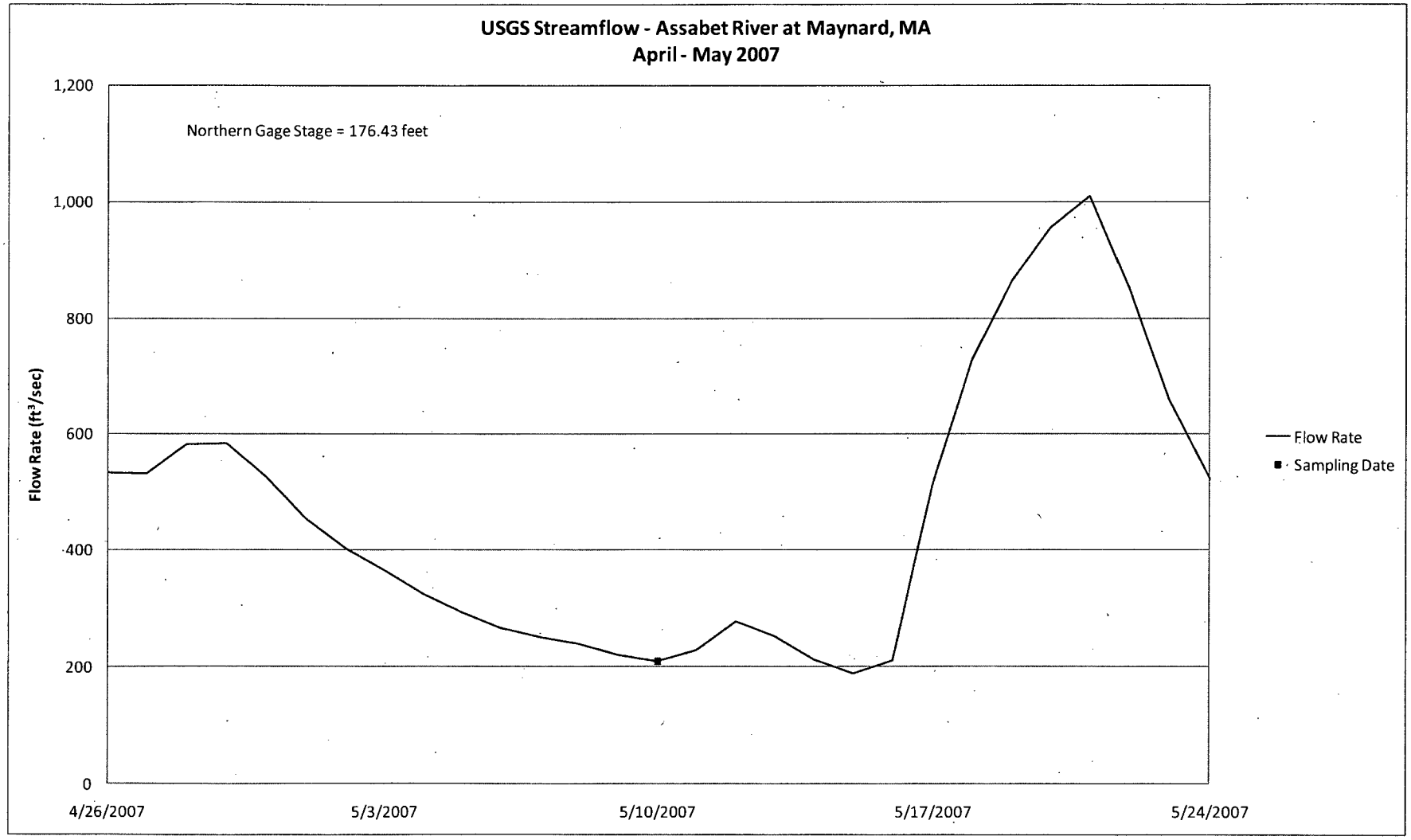

USGS Streamflow - Assabet River at Maynard, MA
April - May 2007
Northern Gage Stage = 176.43 feet
Flow Rate (ft³/sec)
1,200
1,000
800
600
400
200
0
4/26/2007
5/3/2007
5/10/2007
5/17/2007
5/24/2007
Flow Rate
Sampling Date

CHART 3

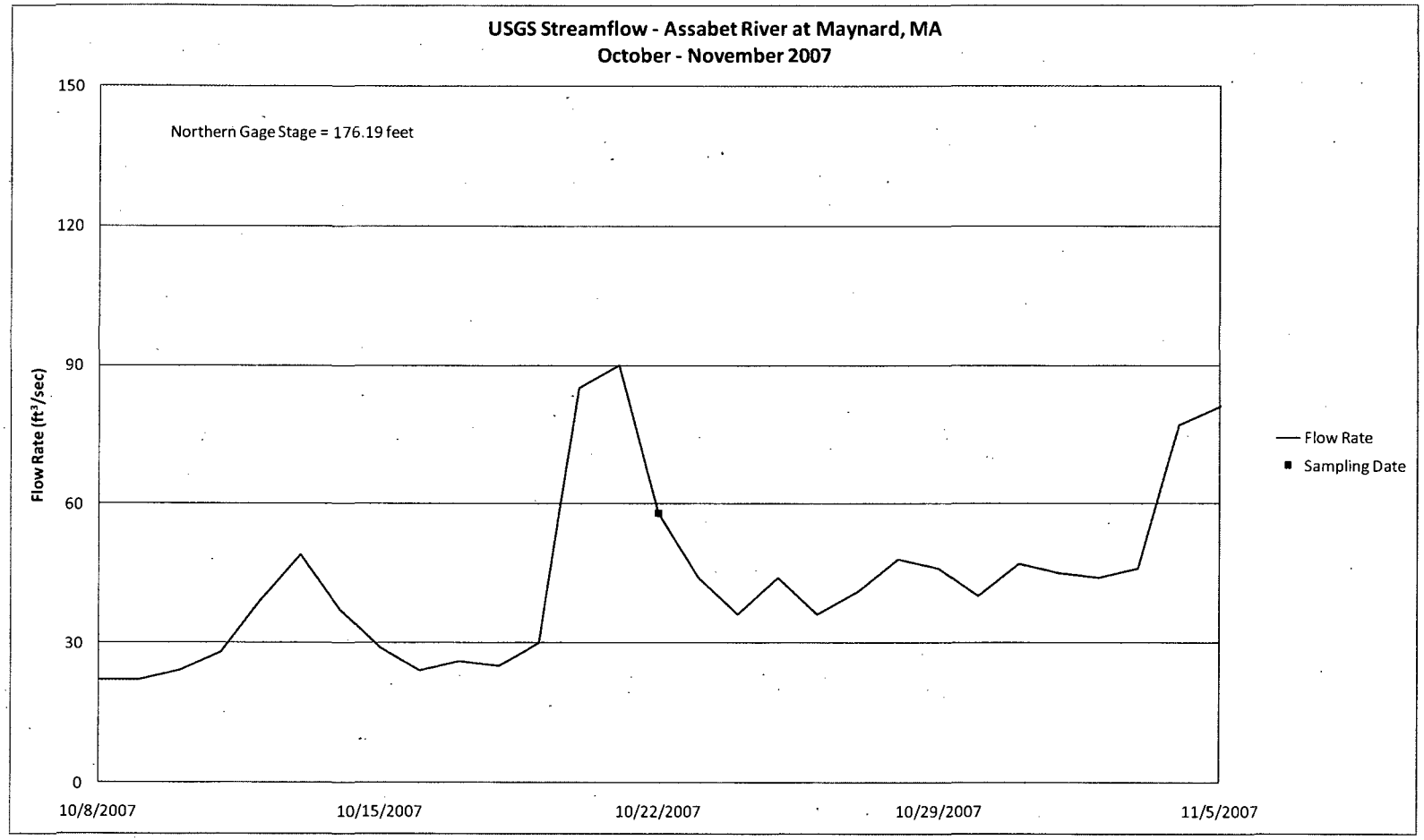

USGS Streamflow - Assabet River at Maynard, MA
October - November 2007
Northern Gage Stage = 176.19 feet
Flow Rate (ft³/sec)
150
120
90
60
30
0
10/8/2007
10/15/2007
10/22/2007
10/29/2007
11/5/2007
Flow Rate
Sampling Date

CHART 4

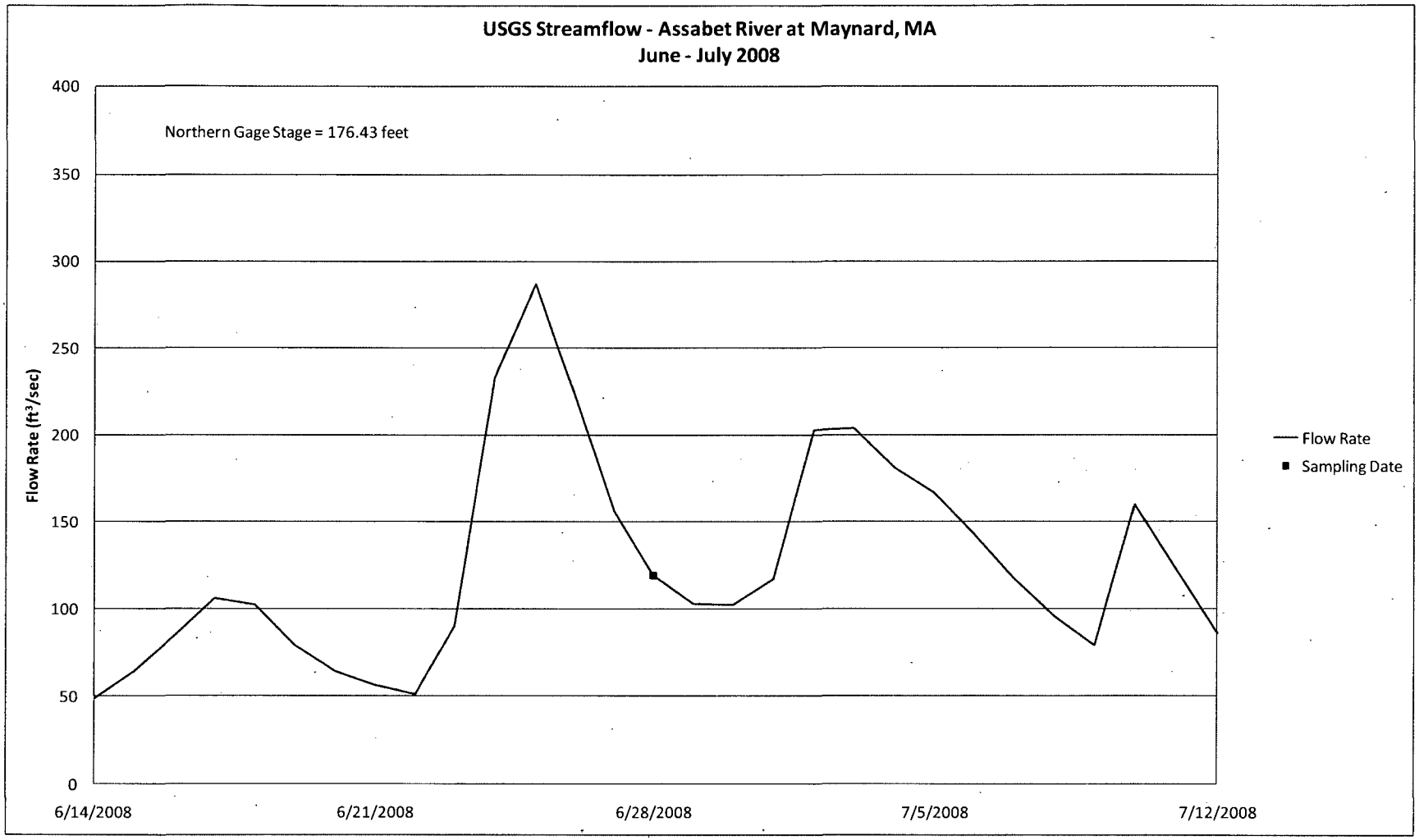

USGS Streamflow - Assabet River at Maynard, MA
June - July 2008
Northern Gage Stage = 176.43 feet
Flow Rate (ft³/sec)
400
350
300
250
200
150
100
50
0
6/14/2008
6/21/2008
6/28/2008
7/5/2008
7/12/2008
Flow Rate
Sampling Date

CHART 5

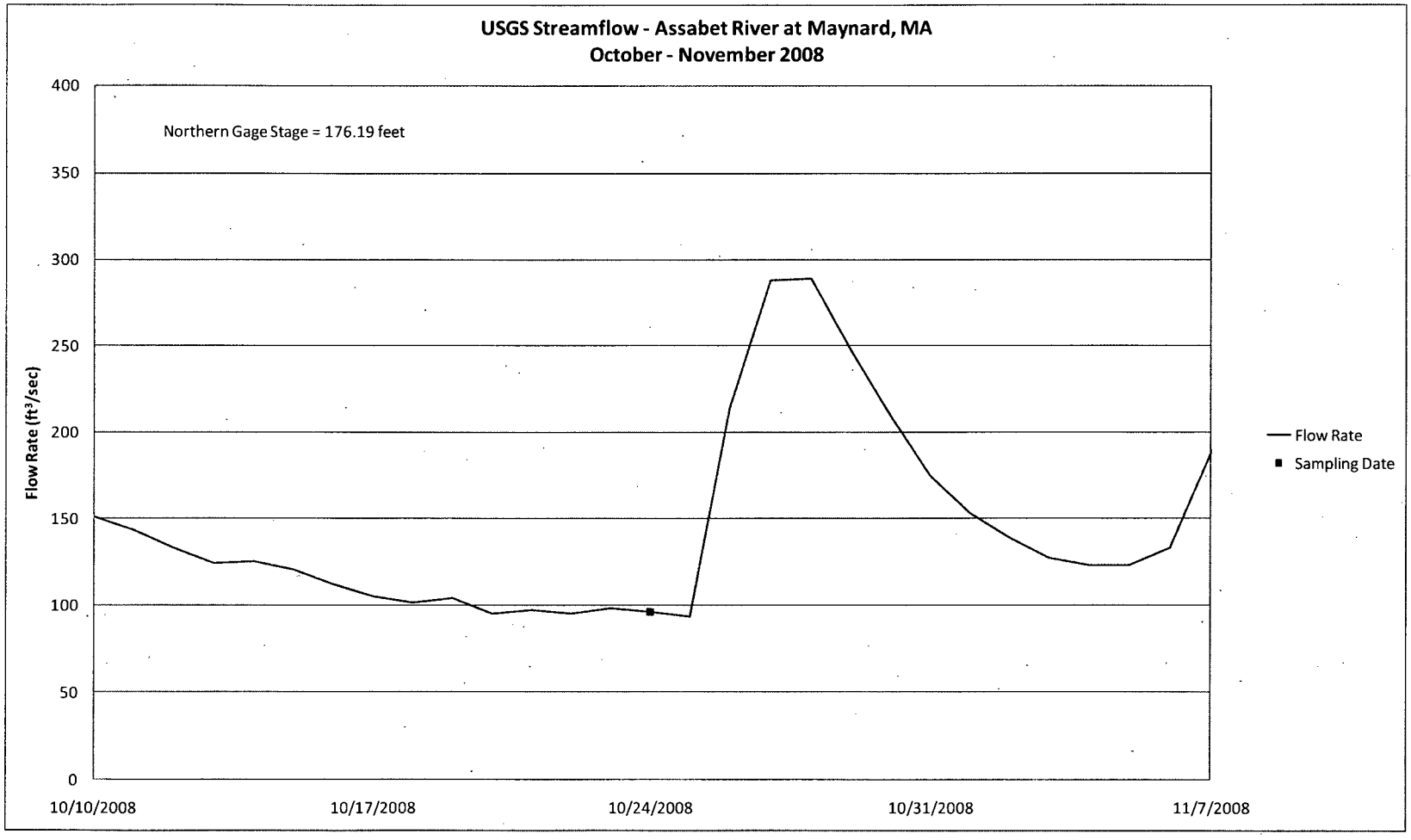

USGS Streamflow - Assabet River at Maynard, MA
October - November 2008
Northern Gage Stage = 176.19 feet
Flow Rate (ft³/sec)
400
350
300
250
200
150
100
50
0
10/10/2008
10/17/2008
10/24/2008
10/31/2008
11/7/2008
Flow Rate
Sampling Date

CHART 6

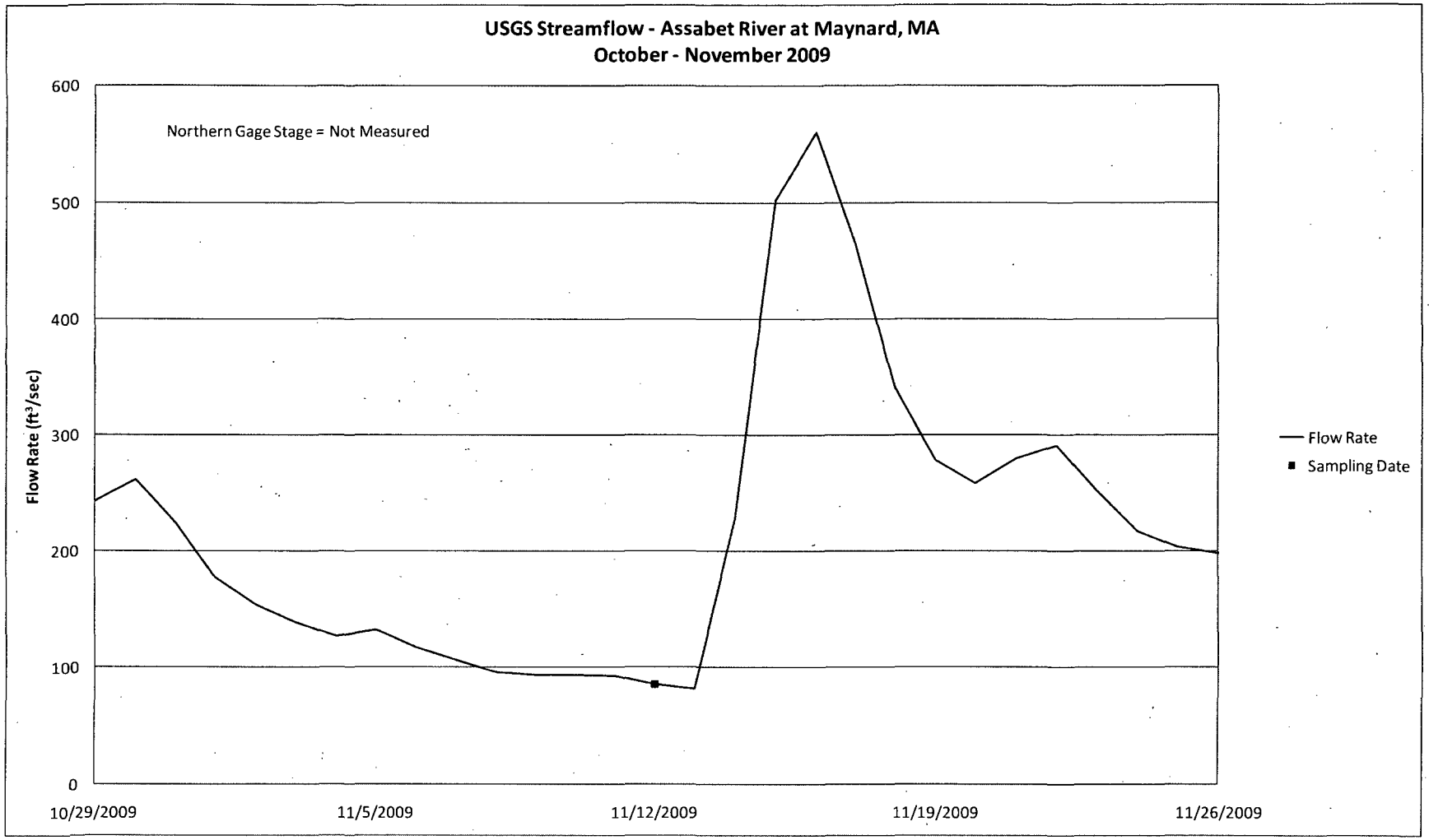

USGS Streamflow - Assabet River at Maynard, MA
October - November 2009
Northern Gage Stage = Not Measured
Flow Rate (ft³/sec)
600
500
400
300
200
100
0
10/29/2009
11/5/2009
11/12/2009
11/19/2009
11/26/2009
Flow Rate
Sampling Date

Chart 7
Long-Term Trends
Well OHM-A7-08
Tetrachloroethene
Area of Contamination A7

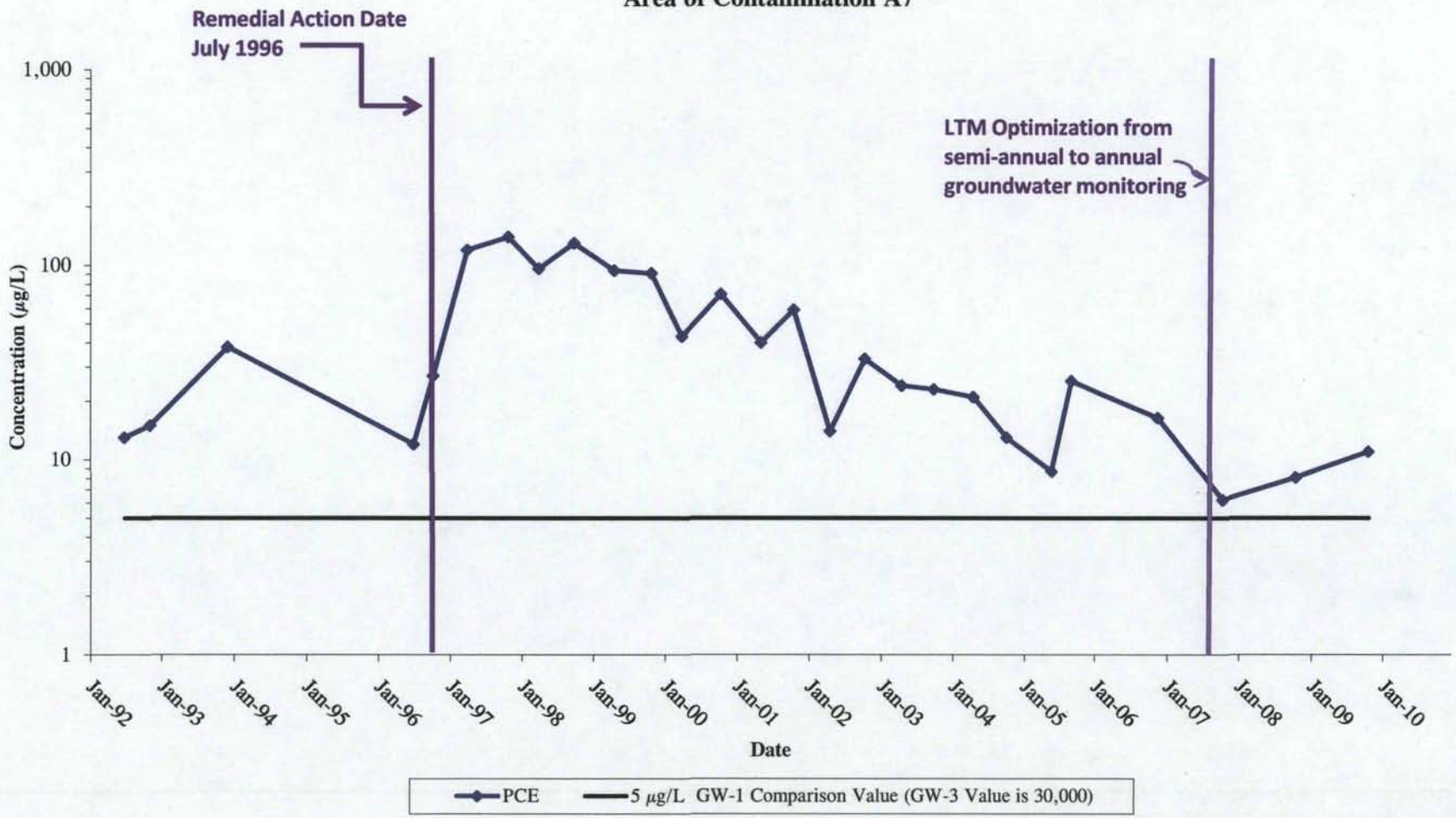


Chart 8
Long-Term Trends
Wells JO-A7-M63/SUD-A07-065
Tetrachloroethene, Trichloroethene and 1,1,2,2-Tetrachloroethane
Area of Contamination A7

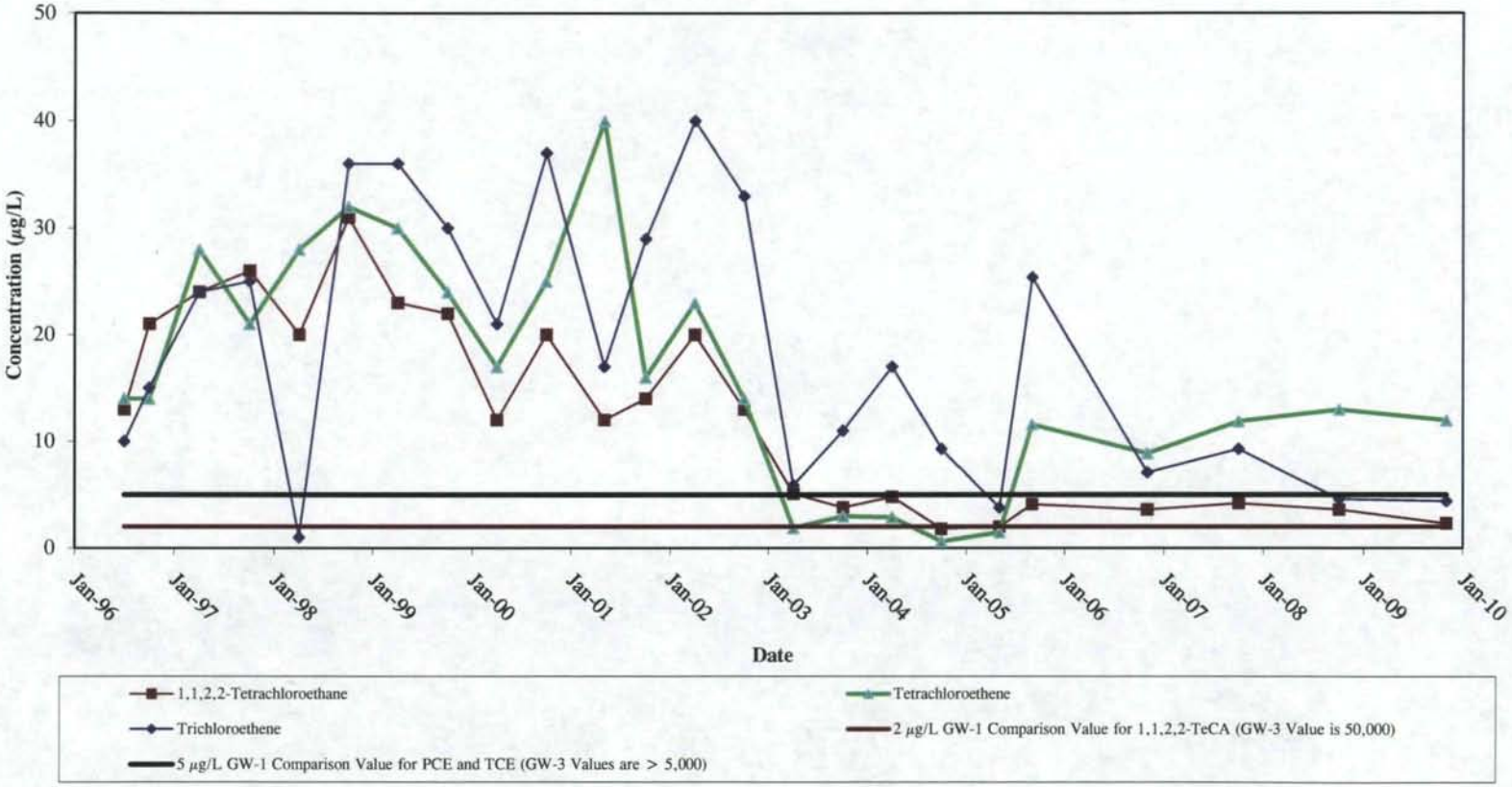


Chart 9
Long-Term Trends
Well OHM-A7-51
1,1,2,2-Tetrachloroethane
Area of Contamination A7

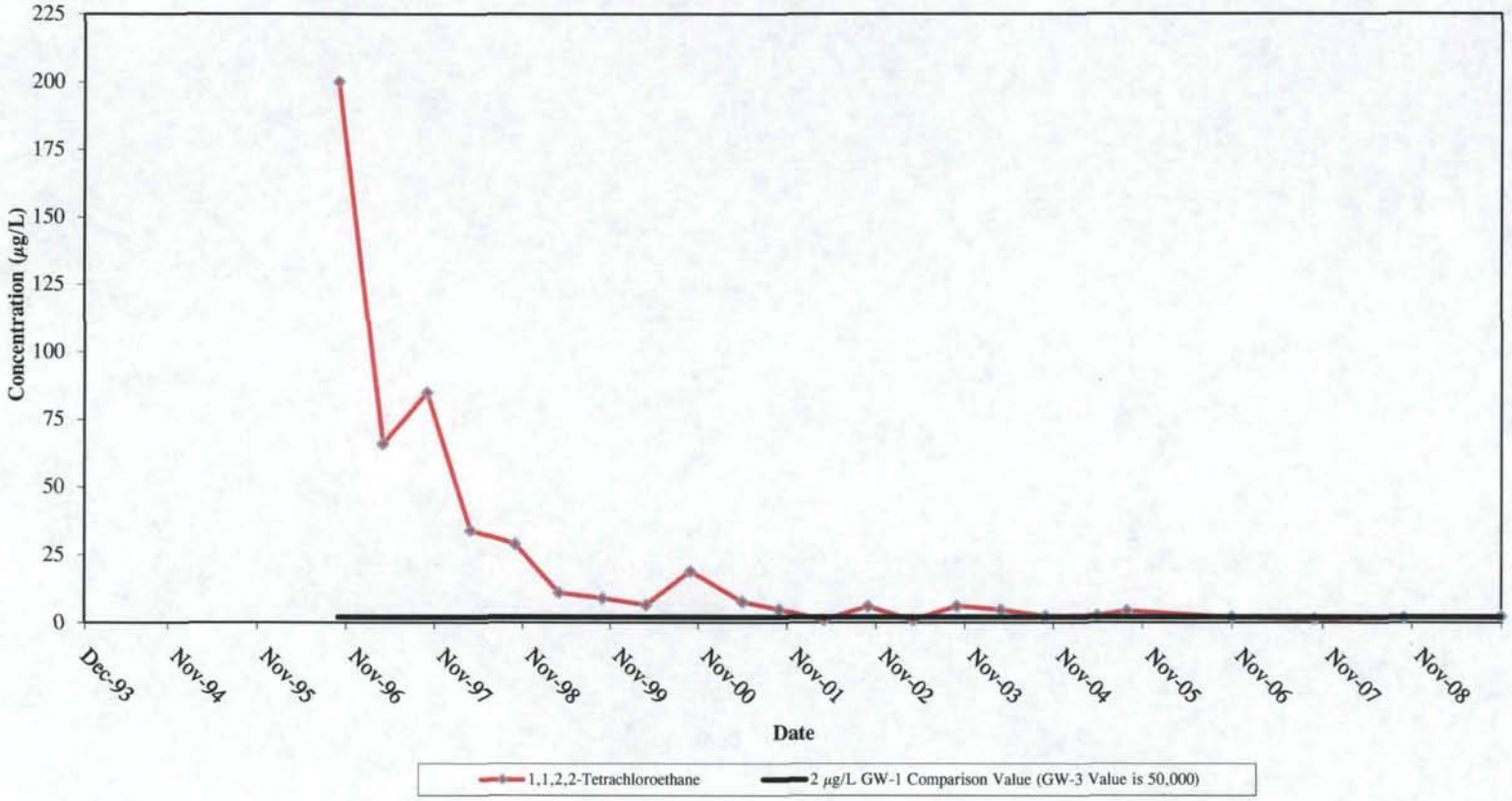


Chart 10
Long-Term Trends
Well OHM-A7-08
Gamma-BHC (Lindane)
Area of Contamination A7

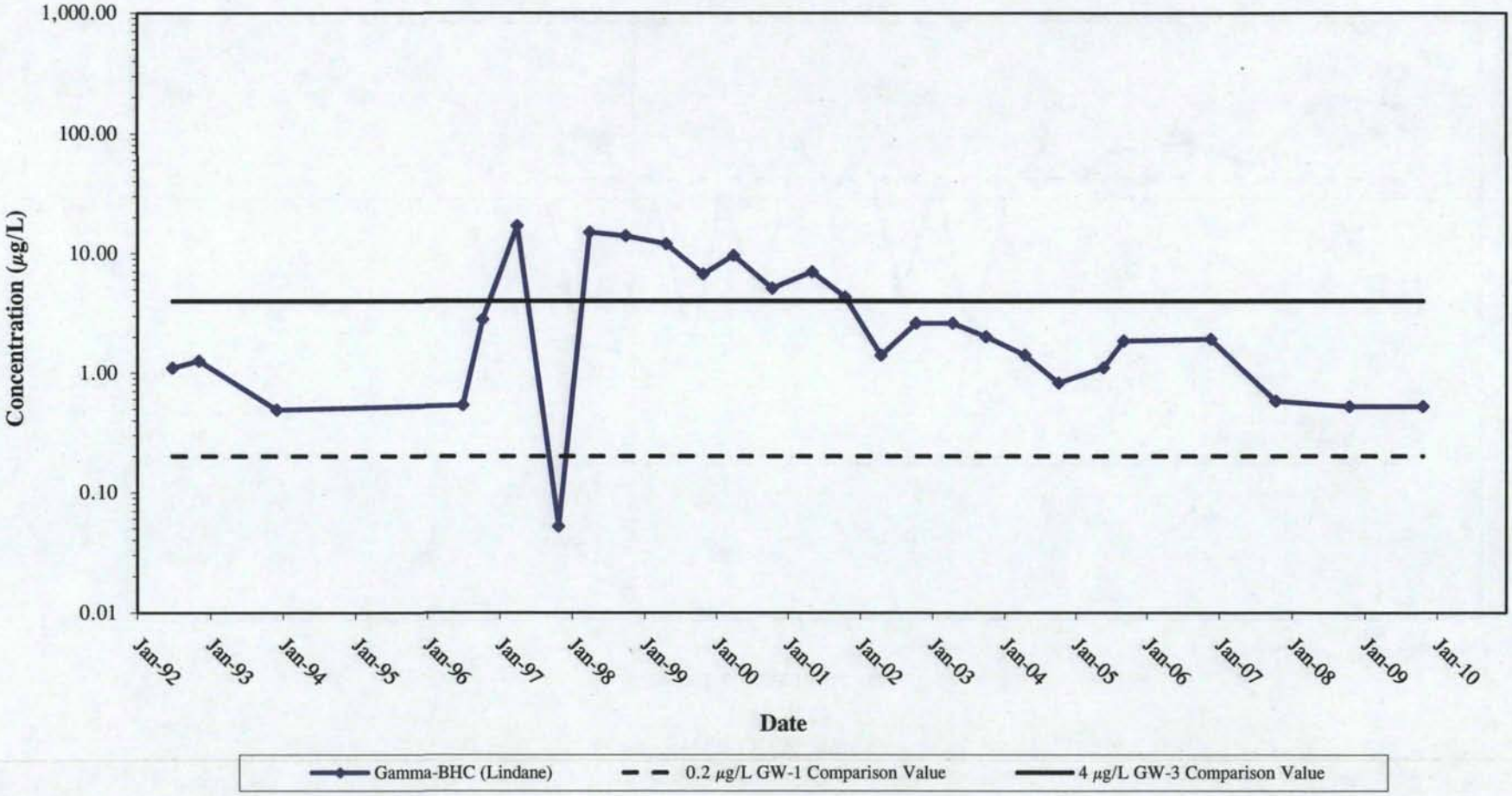


Chart 11
Long-Term Trends
Well OHM-A7-08
4,4'-DDD
Area of Contamination A7

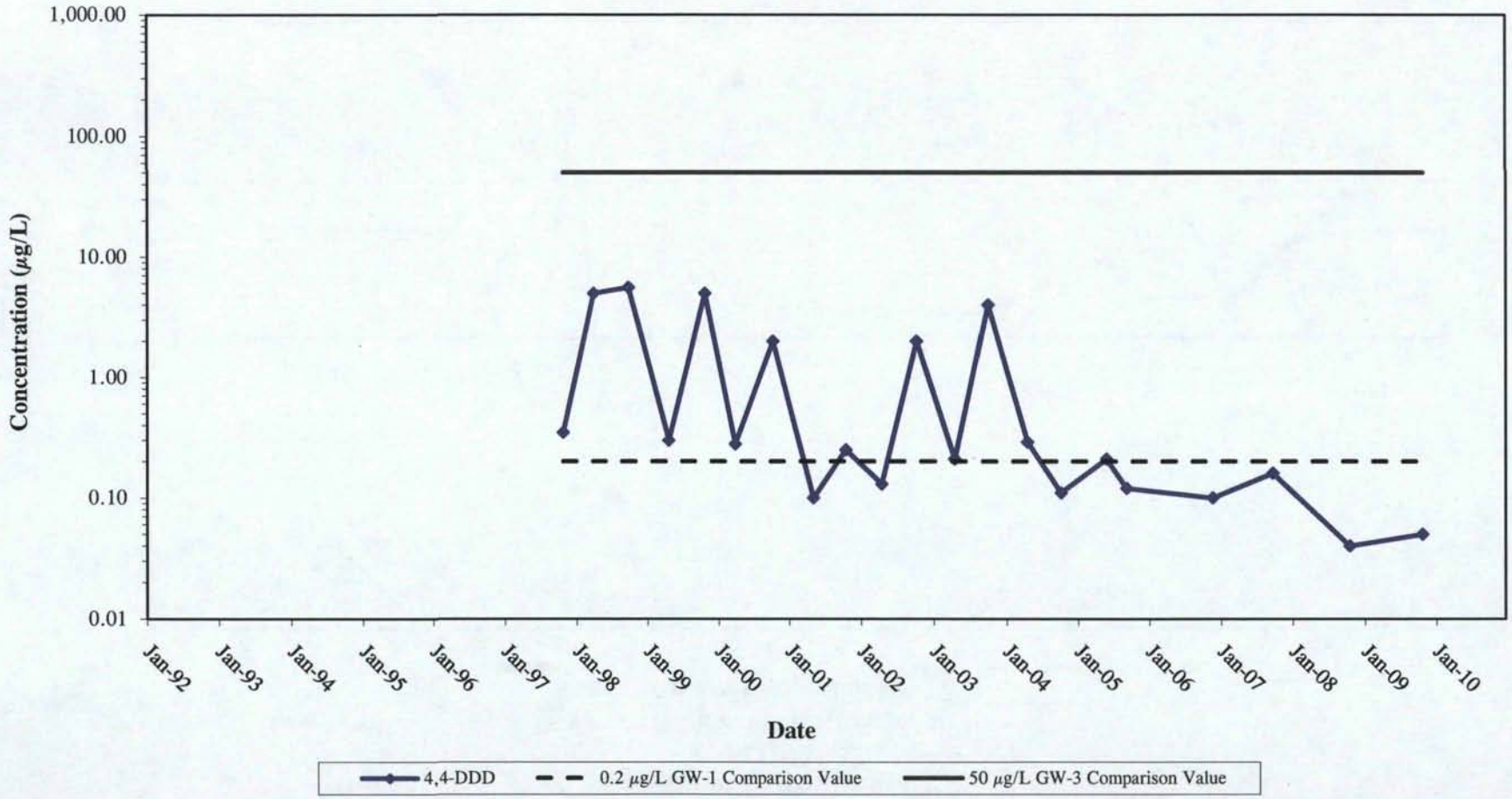


Chart 12
Long-Term Trends
Well OHM-A7-51
Lindane (gamma-BHC)
Area of Contamination A7

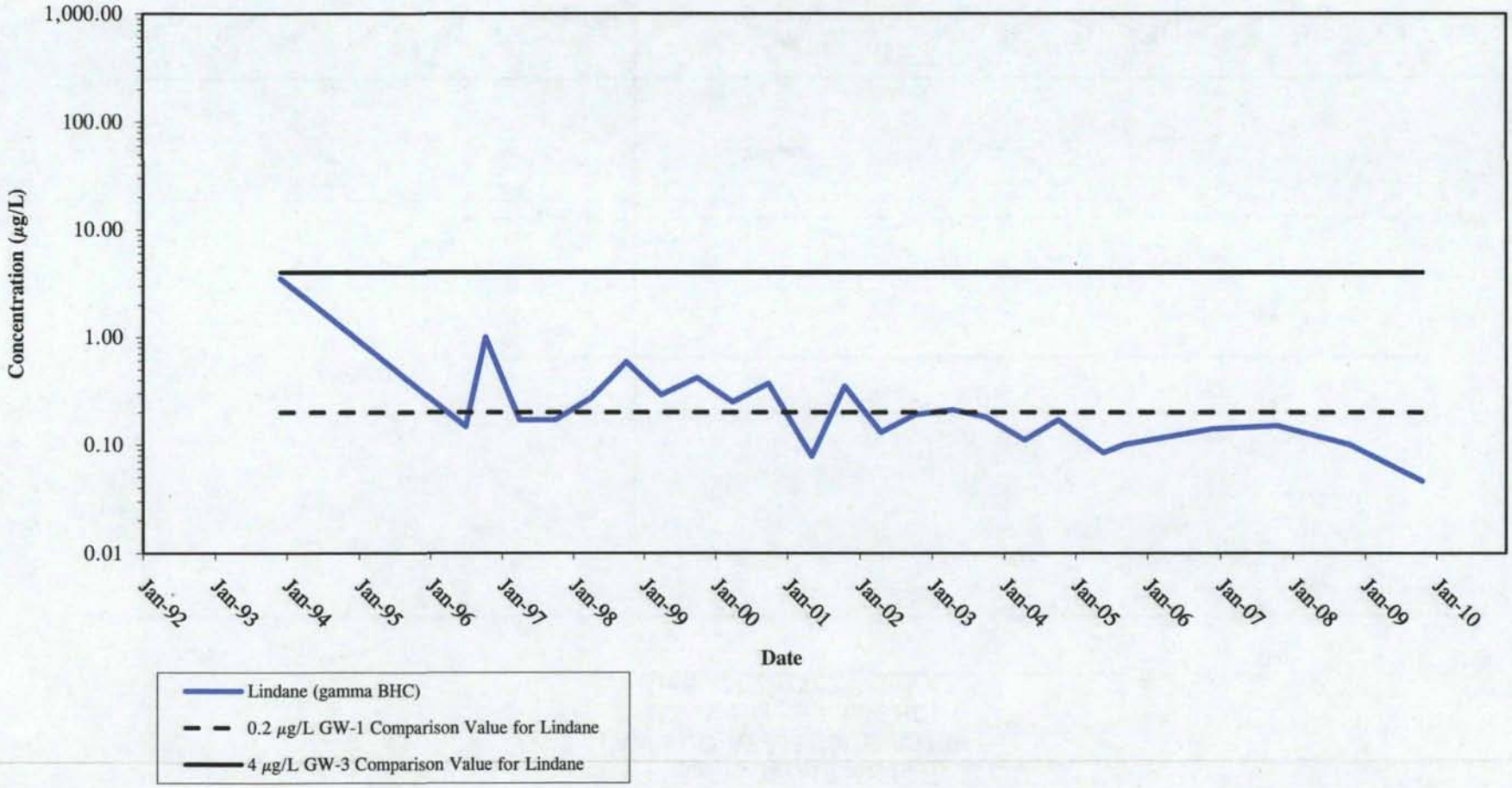


Chart 13
Long-Term Trends
Wells JO-A7-M63/SUD-A07-065
Lindane (gamma-BHC)
Area of Contamination A7

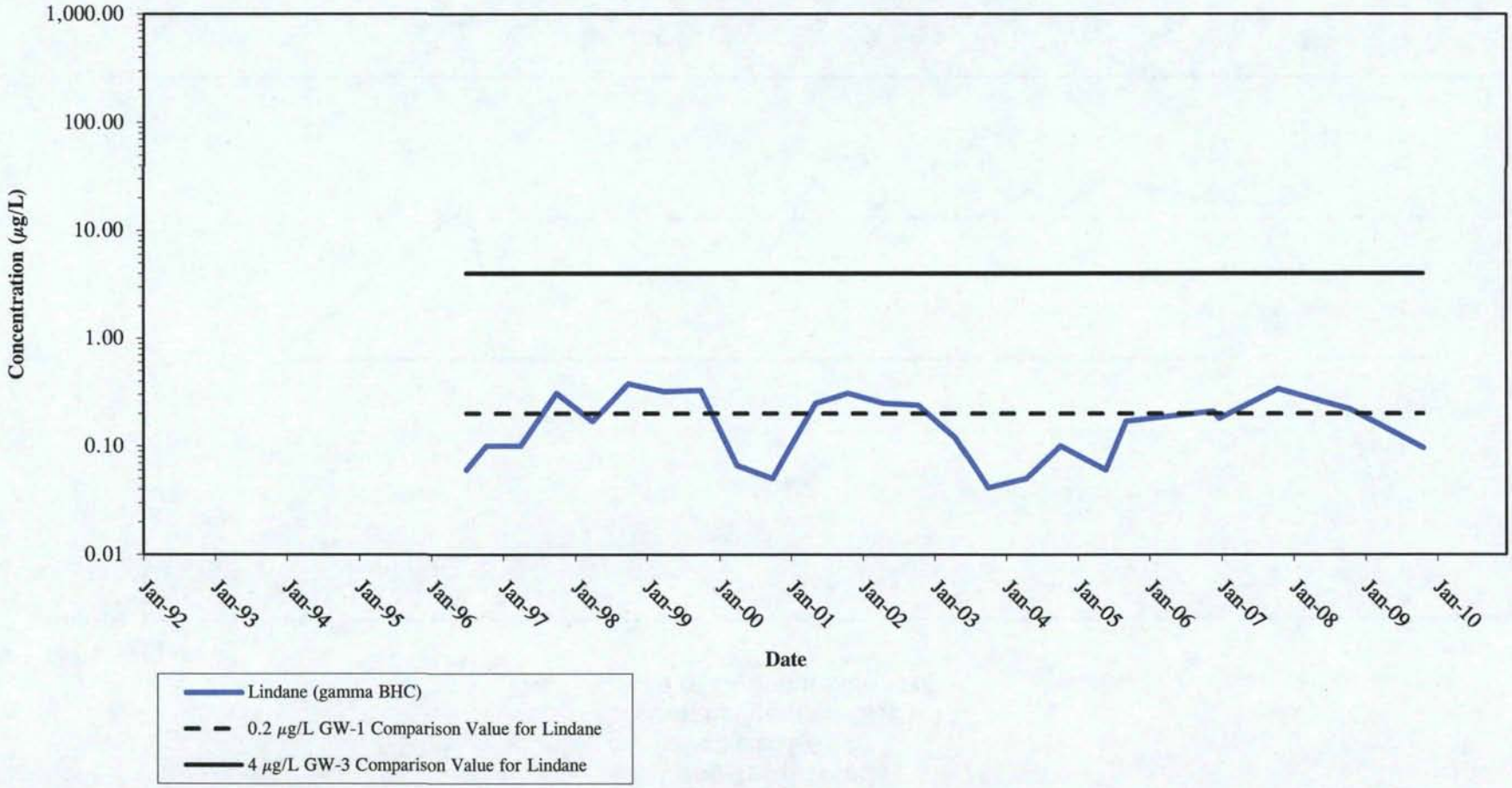
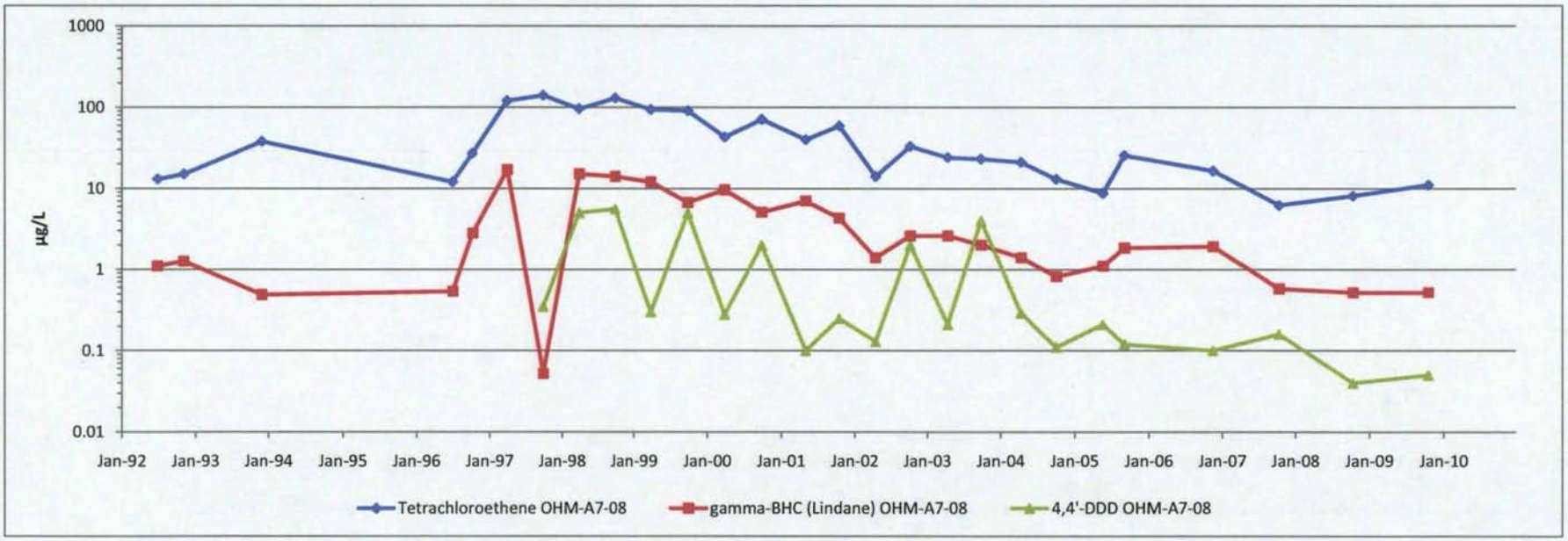


CHART 14
Long-Term Trends
Well OHM-A7-08
Tetratchloroethene, Lindane (gamma-BHC) and 4,4'-DDD



Appendix F Interview Documents

INTERVIEW DOCUMENTATION FORM

The following is a list of individual interviewed for this five-year review. See the attached contact record(s) for a detailed summary of the interviews.

Name	Title/Position	Organization	Date
Christine Williams	Remedial PM	USEPA	12-7-10
Robert Campbell	PM	MassDEP	12-7-10
Libby Herland	Project Leader	USFWS	11-23-10
Mike Moran	Logistics Specialist/Facilities	FEMA	1-24-11

INTERVIEW RECORD

Site Name: **Former Army Sudbury Training Annex**	EPA ID No.: **MAD980520670**	
Subject: Third Five-Year Review	Time:	Date: Dec. 7, 2010
Type: Telephone **X** Visit Other : Email	Incoming Outgoing	

CONTACT MADE BY

Name: Katherine Malinowski	Title: Chemist	Organization: USACE

INDIVIDUAL CONTACTED:

Name: Christine Williams	Title: Remedial Project Manager	Organization: USEPA

Telephone No: (617)918-1384 Fax No: (617)918-0384 E-Mail Address: williams.christine@epa.gov	Street Address: 5 Post Office Square- Suite 100 City, State, Zip: Boston, MA 02109-3912

SUMMARY OF CONVERSATION

Q1: What is your overall impression of the project and site? A1: "Very good."

Q2: Are you aware of any issues the five-year review should focus on?

A2: Christine replied, "No", but then added "evaluating the integrity of the cap".

Q3: Who should USACE speak to in the community to solicit local input?

A3: Libby (Herland), FEMA (with respect to ICs). Christine expressed concern specifically about the FEMA well. However this was due to misinformation that there was a new well installed when actually the FEMA production wells have been in place for awhile.

Q4: Is the remedy functioning as expected? A4: "most likely, as long as ICs have not been breached."

Q5: Is the Town actively involved in the site or do they show an active interest?

A5: Christine suggested that a copy of the five-year review report should go to the four towns' boards of health, not only in the library at Devens.

Q6: Have there been any changes in the site or surrounding property in the last 5 years, or are changes planned?

A6: Christine agrees that there have been good changes and the new visitor center, as an example, is wonderful.

INTERVIEW RECORD

Site Name: **Former Army Sudbury Training Annex**	EPA ID No.: **MAD980520670**	
Subject: Third Five-Year Review	Time:	Date: Dec. 7, 2010
Type: Telephone **X** Visit Other : Email	Incoming Outgoing	

CONTACT MADE BY

Name: Katherine Malinowski	Title: Chemist	Organization: USACE

INDIVIDUAL CONTACTED:

Name: Robert Campbell	Title: Project Manager	Organization: Mass DEP

Telephone No:	Street Address:
E-Mail Address: Robert.G.Campbell@state.ma.us	City, State, Zip:

SUMMARY OF CONVERSATION

Q1: What is your overall impression of the project and site? A1: "Marvelous Environmental Success.

Q2: Are you aware of any issues the five-year review should focus on?

A2: Bob replied, "No". He commented that we should focus on the landfill and continued monitoring and that contamination is not migrating.

Q3: Who should USACE speak to in the community to solicit local input.

A3: Bob replied that we should speak with FEMA. He would like to see data for their production well. He would also like to see well logs.

Q4: Is the remedy functioning as expected.

A4: Bob cited the fencing around the landfill. He thinks it's important to monitor the contaminants especially since the river is so close. Another concern is that we cannot control the zoning on the other side of the fence and therefore we need to keep an eye on development.

Q5: Is the Town actively involved in the site or do they show an active interest?

A5: "Yes", but not with respect to regulatory. Their interest is in the refuge and increasing use for activities that are excluded now, i.e. snowmobiles, dirt bikes etc.

Q6: Have there been any changes in the site or surrounding property in the last 5 years, or are changes planned?

A6: Changes are consistent with the remedy.

INTERVIEW RECORD

Site Name: **Former Army Sudbury Training Annex**	EPA ID No.: **MAD980520670**	
Subject: Third Five-Year Review	Time:	Date: Nov. 23, 2010
Type: Telephone **X** Visit Other : Email	Incoming Outgoing	

CONTACT MADE BY

Name: Katherine Malinowski	Title: Chemist	Organization: USACE

INDIVIDUAL CONTACTED:

Name: Libby Herland	Title: Project Leader	Organization: USFWS

Telephone No: 978-443-4661 X11 Fax No: 978-443-2898 E-Mail Address: Libby_Herland@fws.gov	Street Address: 73 Weir Hill Road City, State, Zip: Sudbury, MA 01776

SUMMARY OF CONVERSATION

Libby met with the Sudbury FYR team on the day of the site visit at the new visitor center. She gave us a brief presentation about the refuge and recent activities and a tour of the new building.

The following is a synopsis of the discussion that day:

In 2003 and 2004 USFWS removed military buildings, barbed wire and other safety hazards. And also buildings pre-dating the military. In 2003 they drafted a plan for public comment on trails for the refuge. IN 2005 the refuge was opened to foot traffic. All of the trails were preexisting including old rail beds etc.

The visitor center is one of many similar buildings; the same plan was used to cut down on costs. The east side has mostly short trails (near the visitor center) has mostly short trails to cater to visitors with kids.

The USFWS will be updating the management plan. They are working on Habitat Management – for more diversity.

The public named Winterberry Way (previously Craven Road). The visitor center is a green building. There is a paved, porous (well draining) path along Winterberry Way from the main entrance to Puffer Pond. The small parking lot at the front entrance by the Kiosk is made with the same porous pavement.

There were 3 phase cultural surveys done for the new road. A lot of things were found i.e. a fire pit, etc. There will be a report coming out.

At the end of Sand Bank Trail there is a canoe portage. Nothing is stocked or managed for hunting. Only

hunting dogs are allowed on the refuge. There are coyotes here.

In 2002 there was a restoration of the field off of White Pond Road.

The Gate System is new.

There are plans for demonstration areas in back of the visitor center.

Sudbury State Forest – the State has no money and therefore cannot do anything to maintain. Some logging was done ~2005, but no restoration after.

The biggest challenge for the refuge is people management. Therefore the area around the landfill is designated as "closed" to the public.

The Air Force may be leaving. The USFWS has expressed interest in that property.

There has been a lot of beaver activity. Three trees were downed recently on Harry's Way. There is a group monitoring the beavers. Dams are on Honey and Taylor Brooks. The culverts are dammed, therefore they are thinking of removing and replacing with foot bridges in an effort to co-exist.

FEMA- just cut down a lot of trees, everything east of their building – maybe for a new building?

FEMA has 71.5 acres. FEMA has to go through USFWS property to get to most of their property. They have a production well north of Puffer Pond.

There is money in the appropriation bill and with it they want to add parking lots, one on White Pond Road.

Rob Albright is the owner of the Ultra Light area – there are 3 wells on his land on Track Road.

To get to Crow Island, most people go via White Pond Road.

Towns recently got money for Rail Trails.

Russell Bridge Restoration was done in 2000/2001 and it was finished in 2008.

Libby says her concern with A7 is with invasive species. There was a grant in 2006 to map invasive species. They cut down Black Locust, done fragmites control, hand pulling of spotted knapweed etc. Girl Scouts have helped with this project.

On October 17, 2010 there was a Grand Opening with 1200 people.

Libby says she likes that the landfill is grassland. They do an annual fence walk – Libby suggested we walk it on the site visit today. She asked if there will be an application of herbicide this fall and stump treatment in the toe drain.

USFWS wants to know in advance of pesticide/herbicide application. Need to have it approved ahead of time. Information they need is: what are the targeted species, chemicals used, application

rate/frequency. She has worked with HGL on this.

In the 1996 appropriation bill – if South Post is no longer used it is supposed to go to USFWS as part of the Oxbow National Wildlife Refuge.

The south side of property adjacent to the railroad bed may become another rail trail project.

Sudbury State Forest (where sign is at entrance)... In ~2007 the state transferred 50 acres to Massachusetts Department of Fire Services. They built an overflow parking lot (near their buildings and P58).

In 2009 USFWS acquired HP (Hewlett Packard) land and a 28 acre parcel from a private owner. They made an offer for Crow Island but the owner said no.

Future plans for the refuge include habitat management focusing on more diversity.

The gravel pit was expanded because of road project and has been completely restored.

Since there is a clause in the contract (MOA) for potential of UXO, the USFWS had a specialist on call during recent construction. There were no problems. Found a water line under the road.

In 2008 they took down all other houses completely and some telephone poles. They would like to take down all un-needed telephone poles.

There are still some wells on the refuge. Monitoring wells still on state property. Tracy Dorgan said that an effort should be made to decommission all unused monitoring wells.

USFWS has been doing Bunker Tours. There is a lot of interest in the old bunkers. They use one for storage and want to replace the door with a grated door so people can look in.

There is no money for Patrol Road. It's open to the public. They need to decide what to do with roads in disrepair – White Pond and Patrol.

USFWS has an Urban Education Program. They want to get a bus for the program.

They are monitoring the number of people using the building (visitor center). Now it's open Friday through Sunday. After January 1, 2011 it will be open Thursday through Sunday.

The building utilizes geothermal heating with electronic controls. There are four wells 500' deep.

There are also solar panels on the roof. Recovery stimulus money was used. It costs $600/mo. To run pumps.

Libby says it's good to have the same people working at Oxbow and Assabet.

INTERVIEW RECORD

Site Name: **Former Army Sudbury Training Annex**	EPA ID No.: **MAD980520670**	
Subject: Third Five-Year Review	Time:	Date: Jan. 24, 2011
Type: X Telephone Visit Other : X Email	Incoming Outgoing	

CONTACT MADE BY

Name: Katherine Malinowski	Title: Chemist	Organization: USACE

INDIVIDUAL CONTACTED:

Name: Mike Moran	Title: logistics management specialist	Organization: FEMA MERS Department of Homeland Security

Telephone No: 978 461 5535 E-Mail Address: mike.moran@dhs.gov	Street Address: 65 Old Marlboro Road City, State, Zip: Maynard, MA 01754

SUMMARY OF CONVERSATION

1. What is your overall impression of the cleanup efforts at the Sudbury Annex Site?

ANS: NO REPLY, AS WE ARE NOT INFORMED TO DATE WITH ANY NEW CLEAN UPEFFORTS.

2. Are you aware of any issues regarding the Site? ANS: NO REPLY, AS WE HAVE NO ISSUES REGARDING THE SITE.

3. Have there been any changes on the FEMA property in the last five years, or are any changes planned?

ANS: YES, WE HAVE CLEARED APPROXIMATELY 6 ACRES FOR USE AS A TEMPORARY ANTENNA FIELD AND THE SITE FOR CONSTRUCTION OF A 50K SQUARE FOOT STORAGE FACILITY. WE HAVE INSTALLED A NEW SECURITY FENCE ON THE SOUTH WESTERN SIDE OF THE FEMA PROPERTY.

4. Are you aware of any vandalism or trespassing on or adjacent to your property? ANS: WE ARE NOT AWARE OF ANY VANDALISM.

5. Has FEMA done any water testing for the on-site production well? (a back-up water supply well?) If so, can you provide any data?

ANS: TESTING IS PERFORMED AT 6 MONTH INTERVALS. THE NEXT DATE BEING FEBRUARY 2011. WE HAVE NO ISSUES WITH THE WATER AT THIS TIME. PAPERWORK WITH TEST RESULTS IS NOT AVAILABLE, BUT WILL FORWARD NEXT TEST RESULTS WHEN RECEIVED. AGAIN THIS IS SCHEDULED FOR FEB 2011.

Appendix G Groundwater Data Tables 2006-2009

Table 8
Groundwater Analytical Results - November 27-28 and December 28, 2006 Sampling Events
Nov 27-28 and Dec 28, 2006
Sudbury Training Annex - Landfill at AOC A7
Sheet 1 of 2: VOCs

PARAMETER (Method)	Historical Maximum	OHM-A7-8 µg/L	Q	OHM-A7-8DUP µg/L	Q	OHM-A7-9 µg/L	Q	OHM-A7-11 µg/L	Q	SUD-A07-014 µg/L	Q	OHM-A7-46 µg/L	Q	OHM-A7-51 µg/L	Q	JO-A07-M52 µg/L	Q	JO-A07-M53 µg/L	Q	SUD-A07-055 µg/L	Q
VOLATILES (SW846 8260B)	µg/L																				
1,1,1,2-Tetrachloroethane	0.5 U	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
1,1,1-Trichloroethane	0.8	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
1,1,2,2-Tetrachloroethane	31	0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		1.9		0.5 U		3.6		3.5	
1,1,2-Trichloroethane	2	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		0.5 J		0.2 J	
1,1-Dichloroethane	0.5 U	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
1,1-Dichloroethene	0.5 U	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
1,1-Dichloropropene	0.5 U	2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U	
1,2,3-Trichlorobenzene	4	1.1		1.7		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
1,2,3-Trichloropropane	1	1.0 U		1.0 U		1.0 UJ		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
1,2,4-Trichlorobenzene	2	1.1		1.7		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
1,2,4-Trimethylbenzene	3	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
1,2-Dibromo-3-chloropropane (DBCP)	4	5.0 U		5.0 U		5.0 U		5.0 U		5.0 U		5.0 U		5.0 U		5.0 U		5.0 U		5.0 U	
1,2-Dibromoethane (EDB)	1.0 U	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
1,2-Dichlorobenzene	0.5 U	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
1,2-Dichloroethane	6.7	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		0.8 J		0.7 J	
1,2-Dichloropropane	0.5 U	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
1,3,5-Trimethylbenzene	12	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
1,3-Dichlorobenzene	0.5 U	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		0.2 J		1.0 U		1.0 U		1.0 U		1.0 U	
1,3-Dichloropropane	0.5 U	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
1,4-Dichlorobenzene	0.5 U	0.2 J		0.3 J		1.0 U		1.0 U		1.0 U		0.3 J		1.0 U		1.0 U		1.0 U		1.0 U	
1-Chlorohexane	1.0 U	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
2,2-Dichloropropane	0.5 U	2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 UJ	
2-Butanone	25 U	25.0 U		25.0 U		25.0 U		25.0 U		25.0 U		25.0 U		25.0 U		25.0 U		25.0 U		25.0 U	
2-Chlorotoluene	0.5 U	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
2-Hexanone	10 U	10.0 U		10.0 U		10.0 U		10.0 U		10.0 U		10.0 U		10.0 U		10.0 U		10.0 U		10.0 U	
4-Chlorotoluene	1.0 U	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
4-Isopropyltoluene	0.5 U	1.0 U		1.0 U		1.0 UJ		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
4-Methyl-2-Pentanone	25.0 U	25.0 U		25.0 U		25.0 U		25.0 U		25.0 U		25.0 U		25.0 U		25.0 U		25.0 U		25.0 U	
Acetone	25.0 U	25.0 U		25.0 U		25.0 U		25.0 U		25.0 U		25.0 U		25.0 U		25.0 U		25.0 U		25.0 U	
Benzene	1	0.3 J		0.4 J		1.0 U		1.0 U		1.0 U		0.3 J		1.0 U		1.0 U		1.0 U		0.2 J	
Bromobenzene	0.5 U	2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U	
Bromochloromethane	0.5 U	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
Bromodichloromethane	0.5 U	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
Bromoform	0.5 U	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
Bromomethane	0.5 U	2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U	
Carbon Disulfide	1.0 U	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
Carbon Tetrachloride	0.5 U	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
Chlorobenzene	64	8.7		12.6		1.0 U		1.0 U		1.0 U		1.0		1.0 U		1.0 U		1.4		3.7	
Chloroethane	0.5 U	2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U	
Chloroform	300	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.6 U		1.9	
Chloromethane	0.5 U	2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U	
cis-1,2-Dichloroethene	19	5.3		7.4		1.0 U		1.0 U		1.0 U		1.0 U		0.5 J		1.0 U		4.4		4.0	
cis-1,3-Dichloropropene	0.5 U	0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U	
Dibromochloromethane	0.5 U	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
Dibromomethane	0.5 U	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
Dichlorodifluoromethane (Freon 12)	0.8	2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U	
Ethylbenzene	7	1.0 U		0.2 J		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
Hexachlorobutadiene	*0.5 U*	*0.6 U*		*0.6 U*		*0.6 U*		*0.6 U*		*0.6 U*		*0.6 U*		*0.6 U*		*0.6 U*		*0.6 U*		*0.6 U*	
Isopropylbenzene	5	0.3 J		0.7 J		1.0 UJ		1.0 U		1.0 U		0.2 J		1.0 U		1.0 U		1.0 U		1.0 U	
m-Xylene & p-Xylene *	9	2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U		2.0 U	
Methyl tert-Butyl Ether (MTBE)	1.0 U	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
Methylene Chloride	1	5.0 U		5.0 U		5.0 U		5.0 U		5.0 U		5.0 U		5.0 U		5.0 U		5.0 U		5.0 U	
Naphthalene	37	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
n-Butylbenzene	4	1.0 U		0.7 J		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
n-Propylbenzene	9	1.0 U		0.2 J		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
o-Xylene *	9	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
sec-Butylbenzene	3	0.6 J		1.2 J		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
Styrene	0.5 U	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
tert-Butylbenzene	0.5 U	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	
Tetrachloroethene	140	16.4 J		29.1 J		1.0 U		1.0 U		1.0 U		1.0 U		3.8		1.0 U		8.9		16.3	
Toluene	26	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		0.4 J		1.0 U	
trans-1,2-Dichloroethene	6	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		0.8 J		1.1	
trans-1,3-Dichloropropene	0.5 U	0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U	
Trichloroethene	40	0.7 J		1.0		1.0 U		1.0 U		1.0 U		1.0 U		0.8 J		1.0 U		7.1		7.0	
Trichlorofluoromethane (Freon 11)	7	2.0 U		2.0 U		0.5 J		2.0 U		2.0 U		2.0 U		1.0 J		2.0 U		0.4 J		0.5 J	
Vinyl Chloride (chloroethene)	0.5 U	1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U		1.0 U	

Historical Maximum values: Highest concentrations through 1999 (typically taken in or before 1997).
Xylenes: peak is for TOTAL xylenes.
U = Compound not detected above laboratory's Practical Quantitation Limit (PQL).
UJ = Compound tentatively not detected at reported concentration due to blank contamination or the reporting limit is estimated based on data evaluation of laboratory results.
J = Estimated value less than PQL or based on data evaluation of laboratory results.
Q = Qualifier

Table 8
Groundwater Analytical Results - November 27-28 and December 28, 2006 Sampling Events
Nov 27-28 and Dec 28, 2006
Sudbury Training Annex - Landfill at AOC A7
Sheet 2 of 2: Pesticides, Metals, Water Quality

PARAMETER (Method)	Historical Maximum	OHM-A7-8	Q	OHM-A7-8DUP	Q	OHM-A7-9	Q	OHM-A7-11	Q	SUD-A07-014	Q	OHM-A7-46	Q	OHM-A7-51	Q	JO-A07-M62	Q	JO-A07-M63	Q	SUD-A07-065	Q
	Well No.	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
PESTICIDES (SW846 8081A)	µg/L																				
4,4'-DDD	0.48	0.10		0.12		0.05 U		0.06 U		0.05 U		0.05 U		0.05 U		0.05 U		0.06 U		0.05 U	
4,4'-DDE	0.1 U	0.05 U		0.05 U		0.05 U		0.06 U		0.05 U		0.05 U		0.05 U		0.05 U		0.06 U		0.05 U	
4,4'-DDT	0.36	0.07		0.07		0.05 U		0.06 U		0.05 U		0.05 U		0.05 U		0.05 U		0.06 U		0.05 U	
Aldrin	0.058 U	0.05 U		0.05 U		0.05 U		0.06 U		0.05 U		0.05 U		0.05 U		0.05 U		0.06 U		0.05 U	
alpha-BHC	0.042	0.05 U		0.04 J		0.05 U		0.06 U		0.05 U		0.04 J		0.05 U		0.05 U		0.04 J		0.05 U	
alpha-Chlordane	0.058 U	0.05 U		0.05 U		0.05 U		0.06 U		0.05 U		0.05 U		0.05 U		0.05 U		0.06 U		0.05 U	
beta-BHC	0.058 U	0.05 U		0.05 U		0.05 U		0.06 U		0.05 U		0.05 U		0.05 U		0.05 U		0.06 U		0.05 U	
Chlordane (total)	0.058 U	0.5 U		0.54 U		0.53 U		0.61 U		0.53 U		0.52 U		0.5 U		0.53 U		0.58 U		0.53 U	
delta-BHC	0.31	0.05 U		0.05 U		0.05 U		0.06 U		0.04 J		0.05 U		0.05 U		0.05 U		0.06 U		0.05 U	
Dieldrin	0.12 U	0.05 U		0.05 U		0.05 U		0.06 U		0.05 U		0.05 U		0.05 U		0.05 U		0.06 U		0.05 U	
Endosulfan I	0.058 U	0.05 U		0.05 U		0.05 U		0.06 U		0.05 U		0.05 U		0.05 U		0.05 U		0.06 U		0.05 U	
Endosulfan II	0.12 U	0.05 U		0.05 U		0.05 U		0.06 U		0.05 U		0.05 U		0.05 U		0.05 U		0.06 U		0.05 U	
Endosulfan sulfate	0.12 U	0.05 U		0.05 U		0.05 U		0.06 U		0.05 U		0.05 U		0.05 U		0.05 U		0.06 U		0.05 U	
Endrin	0.12 U	0.05 U		0.05 U		0.05 U		0.06 U		0.05 U		0.05 U		0.05 U		0.05 U		0.06 U		0.05 U	
Endrin aldehyde	0.12 U	0.05 U		0.05 U		0.05 U		0.06 U		0.05 U		0.05 U		0.05 U		0.05 U		0.06 U		0.05 U	
Endrin ketone	0.05 U	0.05 U		0.05 U		0.05 U		0.06 U		0.05 U		0.05 U		0.05 U		0.05 U		0.06 U		0.05 U	
gamma-BHC (Lindane)	17.0	1.91		1.98		0.05 U		0.06 U		0.05 U		0.05 U		0.14		0.05 U		0.21		0.18	
gamma-Chlordane	0.058 U	0.05 U		0.05 U		0.05 U		0.06 U		0.05 U		0.05		0.05 U		0.05 U		0.06 U		0.05 U	
Heptachlor	0.058 U	0.05 U		0.05 U		0.05 U		0.06 U		0.05 U		0.05 U		0.05 U		0.05 U		0.06 U		0.05 U	
Heptachlor epoxide	0.058 U	0.05 U		0.05 U		0.05 U		0.06 U		0.05 U		0.05 U		0.05 U		0.05 U		0.06 U		0.05 U	
Hexachlorobenzene	0.06 U	0.05 U		0.05 U		0.05 U		0.06 U		0.05 U		0.05 U		0.05 U		0.05 U		0.06 U		0.05 U	
Methoxychlor	0.058 U	0.05 U		0.05 U		0.05 U		0.06 U		0.05 U		0.05 U		0.05 U		0.05 U		0.06 U		0.05 U	
Toxaphene	1.2 U	2.5 U		2.72 U		2.63 U		3.05 U		2.63 U		2.6 U		2.5 U		2.63 U		2.91 U		2.63 U	
TAL METALS (6020)																					
Mercury (7470A)		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Aluminum	42,100	50 U		50 U		94.8		50 U		77.3		50 U		63.4		50 U		50 U		636	
Antimony	5 U	2.5 U		2.5 U		2.5 U		2.5 U		2.5 U		2.5 U		2.5 U		2.5 U		2.5 U		2.5 U	
Arsenic	67	2.5 U		2.5 U		2.5 U		2.5 U		2.5 U		3.4		2.5 U		2.5 U		2.5 U		2.5 U	
Barium	376	41		39.6		25 U		25 U		25 U		25 U		25 U		25 U		25 U		25 U	
Beryllium	4 U	0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U	
Cadmium	10 U	2.5 U		2.5 U		2.5 U		2.5 U		2.5 U		2.5 U		2.5 U		2.5 U		3.9		2.5 U	
Calcium	40,600	21,000		20,500		6,220		17,600		2,060		6,230		7,820		5,900		9,090		12,100	
Chromium	112	10 U		10 U		10 U		10 U		10 U		10 U		10 U		10 U		10 U		10 U	
Cobalt	132	44.9		44.1		10 U		10 U		10 U		17.7		10 U		10 U		10 U		10 U	
Copper	86.2	21 J		10 U		10 U		10 U		10 U		11.9		10 U		12.7		10 U		10 U	
Iron	135,000	6,750		6,180		124		532		74		25,400		222		50 U		3,020		668	
Lead	485	2.5 U		2.5 U		2.5 U		2.5 U		2.5 U		2.5 U		2.5 U		2.5 U		2.5 U		2.5 U	
Magnesium	19,300	5460		5360		1230		4120		478		1,950		2,460		1,170		2,910		3,390	
Manganese	25,100	3160		3090		41.2		249		50.2		2,020		156		10 U		1,230		423	
Mercury	3.1	0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U		0.5 U	
Nickel	80.4	18.6		18.7		10 U		10 U		10 U		12.8		10 U		10 U		10 U		10 U	
Potassium	16,400	4630		4570		2500 U		4430		2500 U		3,880		2,500 U		2,500 U		2,630		2,520	
Selenium	100 U	25 U		25 U		25 U		25 U		25 U		25 U		25 U		25 U		25 U		25 U	
Silver	5 U	2.5 U		2.5 U		2.5 U		2.5 U		2.5 U		2.5 U		2.5 U		2.5 U		2.5 U		2.5 U	
Sodium	27,200	7560		7410		4430		10400		14300		5,640		5,520		3,410		9,650		8,200	
Thallium	2 U	1 U		1 U		1 U		1 U		1 U		1 U		1 U		1 U		1 U		1 U	
Vanadium	97.2	10 U		10 U		10 U		10 U		10 U		10 U		10 U		10 U		10 U		10 U	
Zinc	126	34.4		29.4		25 U		25 U		25 U		25 U		25 U		25 U		30.3		25 U	
COD (410.4)	**mg/L**	**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**	
Chemical Oxygen Demand	190	14		15		10 U		10 U		10 U		17		10 U		10 U		10 U		10 U	
CYANIDE (9014)	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Cyanide, Total	11	5 U		5 U		5 U		5 U		5 U		5 U		5 U		5 U		5 U		5 U	
FIELD PARAMETERS	**Measurement units**																				
Temperature °C (initial)	**°C**	12.2		12.2		13.67		12.05		13.37		12.78		10.91		10.43		9.54		8.87	
Temperature °C (at sampling)	**°C**	15.43		15.43		13.07		12.77		20		12.78		11.45		10.54		9.70		9.16	
Specific Conductance		221		221		75		140		84		213		73		71		96		123	
pH	**pH**	5.66		5.66		5.41		8.23		5.96		5.88		5.9		5.65		6.04		6.1	
Oxidation Reduction Potential n	**mV**	83.4		83.4		180.4		113.6		132.1		5.6		163		180.5		119.1		-28.6	
Dissolved Oxygen mg/L	**mg/L**	1.07		1.07		2.26		6.42		8.24		2.16		0.84		2.98		2.24		2.57	
Turbidity	**NTU**	3.6		3.6		0.70		2		8.4		4.2		0.42		0.00		23.1		21	

Historical Maximum values: Highest concentrations through 1999 (typically taken in or before 1997).
U = Compound not detected above laboratory's Practical Quantitation Limit (PQL).
UJ = Compound tentatively not detected at reported concentration due to blank contamination or the reporting limit is estimated based on data evaluation of laboratory results.
J = Estimated value less than PQL or based on data evaluation of laboratory results.
Q = Qualifier
Field parameters: ORP is the final value recorded in the field, not temperature-adjusted.

Table 3.1
Groundwater Analytical Results
Fall 2007
Former Sudbury Training Annex - Landfill at AOC A7

PARAMETER (Method)	Historical Maximum	Q	MCP GW-1 Groundwater Standard	MCP GW-3 Groundwater Standard	Units	OHM-A7-08	Q	OHM-A7-09	Q	OHM-A7-11	Q	SUD-A07-014	Q	OHM-A7-46[1]	Q	OHM-A7-51	Q	OHM-A7-51 Duplicate	Q	JO-A07-M62	Q	SUD-A07-065	Q
VOLATILES (SW846 8260B)																							
1,1,1,2-Tetrachloroethane	0.5	U	5	50,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
1,1,1-Trichloroethane	0.8		200	20,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
1,1,2,2-Tetrachloroethane	31		2	50,000	µg/L	0.5	U	0.5	U	0.5	U	0.5	U		U	**2.4**		**2.8**		0.5	U	**4.2**	
1,1,2-Trichloroethane	2		5	50,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	0.2	J
1,1-Dichloroethane	0.5	U	70	20,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
1,1-Dichloroethene	0.5	U	7	30,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
1,1-Dichloropropene	0.5	U	-	-	µg/L	2.0	U	2.0	U	2.0	U	2.0	U		U	2.0	U	2.0	U	2.0	U	2.0	U
1,2,3-Trichlorobenzene	4		-	-	µg/L	0.9	J	1.0	U	1.0	U	1.0	U		U	0.4	J	0.3	J	1.0	U	1.0	U
1,2,3-Trichloropropane	1		-	-	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
1,2,4-Trichlorobenzene	2		70	50,000	µg/L	0.9	J	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
1,2,4-Trimethylbenzene	3		-	-	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
1,2-Dibromo-3-chloropropane (DBCP)	4		-	-	µg/L	5.0	U	5.0	U	5.0	U	5.0	U		U	5.0	U	5.0	U	5.0	U	5.0	U
1,2-Dibromoethane (EDB)	1.0	U	-	-	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
1,2-Dichlorobenzene	0.5	U	600	2,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
1,2-Dichloroethane	6.7		5	20,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.2	
1,2-Dichloropropane	0.5	U	5	50,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
1,3,5-Trimethylbenzene	12		-	-	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
1,3-Dichlorobenzene	0.5	U	40	50,000	µg/L	1.0	U	1.0	U	0.2	J	1.0	U		J	0.4	J	0.4	J	0.3	J	0.3	J
1,3-Dichloropropane	0.5	U	-	-	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
1,4-Dichlorobenzene	0.5	U	5	8,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		J	1.0	U	1.0	U	1.0	U	1.0	U
1-Chlorohexane	1.0	U	-	-	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
2,2-Dichloropropane	0.5	U	-	-	µg/L	2.0	U	2.0	U	2.0	U	2.0	U		U	2.0	U	2.0	U	2.0	U	2.0	U
2-Butanone	25	U	4,000	50,000	µg/L	25.0	U	25.0	U	25.0	U	25.0	U		U	25.0	U	25.0	U	25.0	U	25.0	U
2-Chlorotoluene	0.5	U	-	-	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
2-Hexanone	10	U	-	-	µg/L	10.0	U	10.0	U	10.0	U	10.0	U		U	10.0	U	10.0	U	10.0	U	10.0	U
4-Chlorotoluene	1.0	U	-	-	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
4-Isopropyltoluene	0.5	U	-	-	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
4-Methyl-2-Pentanone	25.0	U	-	-	µg/L	25.0	U	25.0	U	25.0	U	25.0	U		U	25.0	U	25.0	U	25.0	U	25.0	U
Acetone	25.0	U	6,300	50,000	µg/L	25.0	U	25.0	U	24.9	J	18.8	J		U	25.0	U	25.0	U	25.0	U	25.0	U
Benzene	1		5	10,000	µg/L	0.4	J	1.0	U	1.0	U	1.0	U		J	1.0	U	1.0	U	1.0	U	1.0	U
Bromobenzene	0.5	U	-	-	µg/L	2.0	U	2.0	U	2.0	U	2.0	U		U	2.0	U	2.0	U	2.0	U	2.0	U
Bromochloromethane	0.5	U	-	-	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
Bromodichloromethane	0.5	U	3	50,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
Bromoform	0.5	U	4	50,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
Bromomethane	0.5	U	10	800	µg/L	2.0	U	2.0	U	2.0	U	2.0	U		U	2.0	U	2.0	U	2.0	U	2.0	U
Carbon Disulfide	1.0	U	-	-	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
Carbon Tetrachloride	0.5	U	5	5,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
Chlorobenzene	64		100	1,000	µg/L	4.3		0.7	J	1.0	U	1.0	U			0.3	J	0.3	J	1.0	U	2.5	
Chloroethane	0.5	U	-	-	µg/L	2.0	U	2.0	U	2.0	U	2.0	U		U	2.0	U	2.0	U	2.0	U	2.0	U
Chloroform	300		70	20,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.7	
Chloromethane	0.5	U	-	-	µg/L	2.0	U	2.0	U	2.0	U	2.0	U		U	2.0	U	2.0	U	2.0	U	2.0	U
cis-1,2-Dichloroethene	19		70	50,000	µg/L	5.3		1.0	U	1.0	U	1.0	U		U	0.6	J	0.7	J	1.0	U	6.0	
cis-1,3-Dichloropropene	0.5	U	-	-	µg/L	0.5	U	0.5	U	0.5	U	0.5	U		U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromochloromethane	0.5	U	2	50,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
Dibromomethane	0.5	U	-	-	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U

Table 3.1
Groundwater Analytical Results
Fall 2007
Former Sudbury Training Annex - Landfill at AOC A7

PARAMETER (Method)	Historical Maximum	Q	MCP GW-1 Groundwater Standard	MCP GW-3 Groundwater Standard	Units	OHM-A7-08	Q	OHM-A7-09	Q	OHM-A7-11	Q	SUD-A07-014	Q	OHM-A7-46[1]	Q	OHM-A7-51	Q	OHM-A7-51 Duplicate	Q	JO-A07-M62	Q	SUD-A07-065	Q
Dichlorodifluoromethane (Freon 12)	0.8		-	-	µg/L	2.0	U	2.0	U	2.0	U	2.0	U		U	2.0	U	2.0	U	2.0	U	2.0	U
Ethylbenzene	7		700	5,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
Hexachlorobutadiene	0.5	U	0.6	3,000	µg/L	0.6	U	0.6	U	0.6	U	0.6	U		U	0.6	U	0.6	U	0.6	U	0.6	U
Isopropylbenzene	5		-	-	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		J	1.0	U	1.0	U	1.0	U	1.0	U
m-Xylene & p-Xylene	9		10,000	5,000*	µg/L	2.0	U	2.0	U	2.0	U	2.0	U		U	2.0	U	2.0	U	2.0	U	2.0	U
Methyl tert-Butyl Ether	1.0	U	70	50,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
Methylene Chloride	1		5	50,000	µg/L	5.0	U	5.0	U	5.0	U	5.0	U		U	5.0	U	5.0	U	5.0	U	5.0	U
Naphthalene	37		140	20,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
n-Butylbenzene	4		-	-	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
n-Propylbenzene	9		-	-	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
o-Xylene	9		10,000	5,000*	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
sec-Butylbenzene	3		-	-	µg/L	0.4	J	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
Styrene	0.5	U	100	6,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
tert-Butylbenzene	0.5	U	-	-	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
Tetrachloroethene	140		5	30,000	µg/L	**6.2**	**J**	1.0	UJ	1.0	UJ	1.0	UJ		U	3.1	J	3.2		0.4	J	**11.9**	**J**
Toluene	26		1,000	40,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
trans-1,2-Dichloroethene	6		100	50,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.7	
trans-1,3-Dichloropropene	0.5	U	0.4	200	µg/L	0.5	U	0.5	U	0.5	U	0.5	U		U	0.5	U	0.5	U	0.5	U	0.5	U
Trichloroethene	40		5	5,000	µg/L	0.6	J	1.0	U	1.0	U	1.0	U		U	1.2		1.4		1.0	U	**9.3**	
Trichlorofluoromethane (Freon 11)	7		-	-	µg/L	2.0	U	2.0	U	2.0	U	2.0	U		U	0.6	J	0.7	J	2.0	U	0.3	J
Vinyl Chloride (chloroethene)	0.5	U	2	50,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U		U	1.0	U	1.0	U	1.0	U	1.0	U
PESTICIDES (SW846 8081A)																							
4,4'-DDD	0.48		0.2	50	µg/L	0.16		0.05	U	0.06	U	0.06	U			0.05	U	0.05	U	0.05	U	0.05	U
4,4'-DDE	0.1	U	0.05	400	µg/L	0.05	U	0.05	U	0.06	U	0.06	U			0.05	U	0.05	U	0.05	U	0.05	U
4,4'-DDT	0.36		0.3	1	µg/L	0.06		0.05	U	0.06	U	0.06	U			0.05	U	0.05	U	0.05	U	0.05	U
Aldrin	0.058	U	0.5	20	µg/L	0.05	U	0.05	U	0.06	U	0.06	U			0.05	U	0.05	U	0.05	U	0.05	U
alpha-BHC	0.042		-	-	µg/L	0.05	U	0.05	U	0.06	U	0.06	U			0.05	U	0.05	U	0.05	U	0.05	U
alpha-Chlordane	0.058	U	2**	-	µg/L	0.05	U	0.05	U	0.06	U	0.06	U			0.05	U	0.05	U	0.05	U	0.05	U
beta-BHC	0.058	U	-	-	µg/L	0.05	U	0.05	U	0.06	U	0.06	U			0.05	U	0.05	U	0.05	U	0.05	U
Chlordane (total)	0.058	U	2**	2	µg/L	0.50	U	0.50	U	0.56	U	0.60	U			0.50	U	0.50	U	0.53	U	0.50	U
delta-BHC	0.31		-	-	µg/L	0.05	U	0.05	U	0.06	U	0.06	U			0.05	U	0.05	U	0.05	U	0.05	U
Dieldrin	0.12	U	0.1	0.5	µg/L	0.05	U	0.05	U	0.06	U	0.06	U			0.05	U	0.05	U	0.05	U	0.05	U
Endosulfan I	0.058	U	10	2	µg/L	0.05	U	0.05	U	0.06	U	0.06	U			0.05	U	0.05	U	0.05	U	0.05	U
Endosulfan II	0.12	U	-	-	µg/L	0.05	U	0.05	U	0.06	U	0.06	U			0.05	U	0.05	U	0.05	U	0.05	U
Endosulfan sulfate	0.12	U	-	-	µg/L	0.05	U	0.05	U	0.06	U	0.06	U			0.05	U	0.05	U	0.05	U	0.05	U
Endrin	0.12	U	2	5	µg/L	0.05	U	0.05	U	0.06	U	0.06	U			0.05	U	0.05	U	0.05	U	0.05	U
Endrin aldehyde	0.12	U	-	-	µg/L	0.05	U	0.05	U	0.06	U	0.06	U			0.05	U	0.05	U	0.05	U	0.05	U
Endrin ketone	0.05	U	-	-	µg/L	0.05	U	0.05	U	0.06	U	0.06	U			0.05	U	0.05	U	0.05	U	0.05	U
gamma-BHC (Lindane)	17.0		0.2	4	µg/L	**0.58**		0.05	U	0.06	U	0.06	U			0.15		0.15		0.05	U	0.34	
gamma-Chlordane	0.058	U	2 **	-	µg/L	0.05	U	0.05	J	0.06	U	0.06	U			0.05	U	0.05	U	0.05	U	0.05	U
Heptachlor	0.058	U	0.4	1.0	µg/L	0.05	U	0.05	U	0.06	U	0.06	U			0.05	U	0.05	U	0.05	U	0.05	U
Heptachlor epoxide	0.058	U	0.2	2	µg/L	0.05	U	0.05	U	0.06	U	0.06	U			0.05	U	0.05	U	0.05	U	0.05	U
Hexachlorobenzene	0.06	U	1	6,000	µg/L	0.05	U	0.05	UJ	0.06	U	0.06	U			0.05	U	0.05	U	0.05	U	0.05	U
Methoxychlor	0.058	U	40	10	µg/L	0.05	U	0.02	J	0.06	U	0.06	U			0.05	U	0.05	U	0.05	U	0.05	U
Toxaphene	1.2	U	-	-	µg/L	1.30	U	1.30	U	1.46	U	1.55	U			1.30	U	1.30	U	1.37	U	1.30	U
TAL METALS (6020) Mercury (7470A)																							
Aluminum	42,100		-	-	µg/L	1700		146		50.0	U	42600				50.0	U	50.0	U	108		91.7	
Antimony	5	U	6	8,000	µg/L	2.5	U	2.5	U	2.5	U	2.5	U			2.5	U	2.5	U	2.5	U	2.5	U

Table 3.1
Groundwater Analytical Results
Fall 2007
Former Sudbury Training Annex - Landfill at AOC A7

PARAMETER (Method)	Historical Maximum	Q	MCP GW-1 Groundwater Standard	MCP GW-3 Groundwater Standard	Units	OHM-A7-08	Q	OHM-A7-09	Q	OHM-A7-11	Q	SUD-A07-014	Q	OHM-A7-46[1]	Q	OHM-A7-51	Q	OHM-A7-51 Duplicate	Q	JO-A07-M62	Q	SUD-A07-065	Q
Arsenic	67		10	900	µg/L	4.7		2.5	U	2.5	U	20.1				2.5	U	2.5	U	2.5	U	2.5	U
Barium	376		2,000	50,000	µg/L	52.7		25.0	U	25.0	U	250				25.0	U	25.0	U	25.0	U	25.0	U
Beryllium	4	U	4	200	µg/L	0.5	U	0.5	U	0.5	U	2.1				0.5	U	0.5	U	0.5	U	0.5	U
Cadmium	10	U	5	4	µg/L	2.5	U	2.5	U	2.5	U	2.5	U			2.5	U	2.5	U	2.5	U	2.5	U
Calcium	40,600		-	-	µg/L	19100		14100		19400		13500				9080		8920		22200		13200	
Chromium	112		100	300	µg/L	10.0	U	10.0	U	10.0	U	270				10.0	U	10.0	U	10.0	U	10.0	U
Cobalt	132		-	-	µg/L	48.0		10.0	U	10.0	U	59.9				10.0	U	10.0	U	10.0	U	10.0	U
Copper	86.2		-	-	µg/L	14.6		10.0	U	10.0	U	111				10.0	U	10.0	U	10.0	U	10.0	U
Iron	135,000		-	-	µg/L	9330		422		269		58800				506		321		473		62.3	
Lead	485		15	10	µg/L	7.3		2.5	U	2.5	U	19.1				2.5	U	2.5	U	2.5	U	2.5	U
Magnesium	19,300		-	-	µg/L	5720		2920		4650		17500				2920		2810		4940		4020	
Manganese	*25,100*		-	-	*µg/L*	*2430*		*1110*		*104*		*1270*				*86.0*		*74.5*		*541*		*517*	
Mercury	3.1		2	20	µg/L	0.5	U	0.5	U	0.5	U	0.5	U			0.5	U	0.5	U	0.5	U	0.5	U
Nickel	80.4		100	200	µg/L	26.8		10.0	U	10.0	U	219				10.0	U	10.0	U	10.0	U	10.0	U
Potassium	16,400		-	-	µg/L	5030		3740		4450		19700				2500	U	2500	U	4980		2730	
Selenium	100	U	50	100	µg/L	25.0	U	25.0	U	25.0	U	25.0	U			25.0	U	25.0	U	25.0	U	25.0	U
Silver	5	U	100	7	µg/L	2.5	U	2.5	U	2.5	U	2.5	U			2.5	U	2.5	U	2.5	U	2.5	U
Sodium	27,200		-	-	µg/L	7140		5470		10100		20300				5930		5770		15100		9050	
Thallium	2	U	2	3,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U			1.0	U	1.0	U	1.0	U	1.0	U
Vanadium	97.2		30	4,000	µg/L	10.0	U	10.0	U	10.0	U	106				10.0	U	10.0	U	10.0	U	10.0	U
Zinc	126		5,000	900	µg/L	42.3		25.0	U	44.1		143				25.0	U	25.2		25.0	U	25.0	U
COD (410.4)																							
Chemical Oxygen Demand	190		-	-	mg/L	17		10	U	10	U	10	U			10	U	10	U	10	U	10	U
CYANIDE (9014)																							
Cyanide, Total	11		200	30	µg/L	5	U	5	U	5	U	5	U			5	U	5	U	5	U	5	U

Historical Maximum values: Highest concentrations through 1999 (typically taken in or before 1997).
* GW-1 and GW-3 values, based on MCP revision dated February 14, 2008.
** Regulatory standard is for total chlordane
[1]Well was dry, no samples collected.
- indicates there is no MCP standard
Shaded area with bold numbers indicates MCP GW-1 exceedance.
Grey shaded area = above GW-1 standard.
U = Compound not detected above laboratory's Practical Quantitation Limit (PQL).
UJ = Compound tentatively not detected at reported concentration due to blank contamination or the reporting limit is estimated based on data evaluation of laboratory results.
J = Estimated value less than PQL or based on data evaluation of laboratory results.
Q = Qualifier

Table 3.1
Groundwater Analytical Results
Fall 2008
Former Sudbury Training Annex - Landfill at AOC A7

PARAMETER (Method)	Historical Maximum	Q	MCP GW-1 Groundwater	MCP GW-3 Groundwater Standard	Units	OHM-A7-08	Q	OHM-A7-09	Q	OHM-A7-11	Q	OHM-A7-46[1]	Q	OHM-A7-51	Q	OHM-A7-51 Duplicate	Q	JO-A07-M62	Q	SUD-A07-014	Q	SUD-A07-065	Q
VOLATILES (SW846 8260B)																							
1,1,1,2-Tetrachloroethane	0.5	U	5	50,000	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,1-Trichloroethane	0.8		200	20,000	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2,2-Tetrachloroethane	31		2	50,000	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	**2.0**		**2.0**		0.5	U	0.5	U	**3.6**	
1,1,2-Trichloroethane	2		5	50,000	µg/L	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U	0.75	U	0.8	U
1,1-Dichloroethane	0.5	U	70	20,000	µg/L	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U	0.75	U	0.8	U
1,1-Dichloroethene	0.5	U	7	30,000	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloropropene	0.5	U	-	-	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2,3-Trichlorobenzene	4		-	-	µg/L	0.7	J	2.5	U	2.5	U	2.5	U	0.5	J	2.5	U	2.5	U	2.5	U	2.5	U
1,2,3-Trichloropropane	1		-	-	µg/L	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,2,4-Trichlorobenzene	2		70	50,000	µg/L	0.5	J	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2,4-Trimethylbenzene	3		-	-	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2-Dibromo-3-chloropropane (DBCP)	4		-	-	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2-Dibromoethane (EDB)	1.0	U	0.02	50,000	µg/L	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
1,2-Dichlorobenzene	0.5	U	600	2,000	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2-Dichloroethane	6.7		5	20,000	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.4	J
1,2-Dichloropropane	0.5	U	5	50,000	µg/L	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U
1,3,5-Trimethylbenzene	12		-	-	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,3-Dichlorobenzene	0.5	U	40	50,000	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,3-Dichloropropane	0.5	U	-	-	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,4-Dichlorobenzene	0.5	U	5	8,000	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
2,2-Dichloropropane	0.5	U	-	-	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
2-Butanone	25	U	4,000	50,000	µg/L	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2-Chlorotoluene	0.5	U	-	-	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
2-Hexanone	10	U	-	-	µg/L	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
4-Chlorotoluene	1.0	U	-	-	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
4-Isopropyltoluene	0.5	U	-	-	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
4-Methyl-2-Pentanone (MIBK)	25.0	U	350	50,000	µg/L	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Acetone	25.0	U	6,300	50,000	µg/L	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Benzene	1		5	10,000	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromobenzene	0.5	U	-	-	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Bromochloromethane	0.5	U	-	-	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Bromodichloromethane	0.5	U	3	50,000	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromoform	0.5	U	4	50,000	µg/L	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Bromomethane	0.5	U	10	800	µg/L	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Carbon Disulfide	1.0	U	-	-	µg/L	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Carbon Tetrachloride	0.5	U	5	5,000	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chlorobenzene	64		100	1,000	µg/L	0.5	U	0.5	U	0.5	U	3.7		0.5	U	0.5	U	0.5	U	0.5	U	2.1	
Chloroethane	0.5	U	-	-	µg/L	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Chloroform	300		70	20,000	µg/L	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U	3.0	
Chloromethane	0.5	U	-	-	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
cis-1,2-Dichloroethene	19		70	50,000	µg/L	3.8		0.5	U	0.5	U	0.7		0.4	J	0.4	J	0.5	U	0.5	U	2.8	
cis-1,3-Dichloropropene	0.5	U	-	-	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromochloromethane	0.5	U	2	50,000	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromomethane	0.5	U	-	-	µg/L	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U

Table 3.1
Groundwater Analytical Results
Fall 2008
Former Sudbury Training Annex - Landfill at AOC A7

PARAMETER (Method)	Historical Maximum	Q	MCP GW-1 Groundwater	MCP GW-3 Groundwater Standard	Units	OHM-A7-08	Q	OHM-A7-09	Q	OHM-A7-11	Q	OHM-A7-46[1]	Q	OHM-A7-51	Q	OHM-A7-51 Duplicate	Q	JO-A07-M62	Q	SUD-A07-014	Q	SUD-A07-065	Q
Dichlorodifluoromethane (Freon 12)	0.8		-	-	µg/L	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Ethylbenzene	7		700	5,000	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Hexachlorobutadiene	0.5	U	0.6	3,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Isopropylbenzene	5		-	-	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
m-Xylene & p-Xylene	9		10,000	5,000*	µg/L	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Methyl tert-Butyl Ether	1.0	U	70	50,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Methylene Chloride	1		5	50,000	µg/L	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Naphthalene	37		140	20,000	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
n-Butylbenzene	4		-	-	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
n-Propylbenzene	9		-	-	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
o-Xylene	9		10,000	5,000*	µg/L	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
sec-Butylbenzene	3		-	-	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Styrene	0.5	U	100	6,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
tert-Butylbenzene	0.5	U	-	-	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Tetrachloroethene	140		5	30,000	µg/L	**8.1**		0.5	U	0.5	U	0.4	J	4.5		4.5		0.5	U	0.5	U	**13.0**	
Toluene	26		1,000	40,000	µg/L	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U
trans-1,2-Dichloroethene	6		100	50,000	µg/L	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U	0.8	
trans-1,3-Dichloropropene	0.5	U	0.4	200	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Trichloroethene	40		5	5,000	µg/L	0.3	J	0.5	U	0.5	U	0.5	U	1.0		1.0		0.5	U	0.5	U	4.6	
Trichlorofluoromethane (Freon 11)	7		-	-	µg/L	2.5	U	0.8	J	2.5	U	2.5	U	0.6	J	0.5	J	2.5	U	2.5	U	0.3	J
Vinyl Chloride (chloroethene)	0.5	U	2	50,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
PESTICIDES (SW846 8081A)																							
4,4'-DDD	0.48		0.2	50	µg/L	0.04	UJ	0.04	UJ	0.04	UJ	0.05	UJ	0.04	U	0.04	UJ	0.04	U	0.04	UJ	0.04	U
4,4'-DDE	0.1	U	0.05	400	µg/L	0.04	UJ	0.04	UJ	0.04	UJ	0.05	UJ	0.04	U	0.04	UJ	0.04	U	0.04	UJ	0.04	U
4,4'-DDT	0.36		0.3	1	µg/L	0.04	UJ	0.04	UJ	0.04	UJ	0.05	UJ	0.04	U	0.04	UJ	0.04	U	0.04	UJ	0.04	U
Aldrin	0.058	U	0.5	20	µg/L	0.02	UJ	0.02	UJ	0.02	UJ	0.02	UJ	0.02	U	0.02	UJ	0.02	U	0.02	UJ	0.02	U
alpha-BHC	0.042		-	-	µg/L	0.02	UJ	0.02	UJ	0.02	UJ	0.02	UJ	0.02	U	0.02	UJ	0.02	U	0.02	UJ	0.02	U
alpha-Chlordane	0.058	U	2**	-	µg/L	0.02	UJ	0.02	UJ	0.02	UJ	0.02	UJ	0.02	U	0.02	UJ	0.02	U	0.02	UJ	0.02	U
beta-BHC	0.058	U	-	-	µg/L	0.02	UJ	0.02	UJ	0.02	UJ	0.02	UJ	0.02	U	0.02	UJ	0.02	U	0.02	UJ	0.02	U
delta-BHC	0.31		-	-	µg/L	0.02	UJ	0.02	UJ	0.02	UJ	0.02	UJ	0.02	U	0.02	UJ	0.02	U	0.02	UJ	0.02	U
Dieldrin	0.12	U	0.1	0.5	µg/L	0.04	UJ	0.04	UJ	0.04	UJ	0.05	UJ	0.04	U	0.04	UJ	0.04	U	0.04	UJ	0.04	U
Endosulfan I	0.058	U	10	2	µg/L	0.02	UJ	0.02	UJ	0.02	UJ	0.02	UJ	0.02	U	0.02	UJ	0.02	U	0.02	UJ	0.02	U
Endosulfan II	0.12	U	-	-	µg/L	0.04	UJ	0.04	UJ	0.04	UJ	0.05	UJ	0.04	U	0.04	UJ	0.04	U	0.04	UJ	0.04	U
Endosulfan sulfate	0.12	U	-	-	µg/L	0.04	UJ	0.04	UJ	0.04	UJ	0.05	UJ	0.04	U	0.04	UJ	0.04	U	0.04	UJ	0.04	U
Endrin	0.12	U	2	5	µg/L	0.04	UJ	0.04	UJ	0.04	UJ	0.05	UJ	0.04	U	0.04	UJ	0.04	U	0.04	UJ	0.04	U
Endrin aldehyde	0.12	U	-	-	µg/L	0.04	UJ	0.04	UJ	0.04	UJ	0.05	UJ	0.04	U	0.04	UJ	0.04	U	0.04	UJ	0.04	U
Endrin ketone	0.05	U	-	-	µg/L	0.04	UJ	0.04	UJ	0.04	UJ	0.05	UJ	0.04	U	0.04	UJ	0.04	U	0.04	UJ	0.04	U
gamma-BHC (Lindane)	17.0		0.2	4	µg/L	**0.52**	J	0.02	UJ	0.02	UJ	0.02	UJ	0.1		0.1	J	0.02	U	0.02	UJ	**0.22**	
gamma-Chlordane	0.058	U	2 **	-	µg/L	0.02	UJ	0.02	UJ	0.02	UJ	0.02	UJ	0.0206	U	0.02	UJ	0.02	U	0.02	UJ	0.02	U
Heptachlor	0.058	U	0.4	1.0	µg/L	0.02	UJ	0.02	UJ	0.02	UJ	0.02	UJ	0.02	U	0.02	UJ	0.02	U	0.02	UJ	0.02	U
Heptachlor epoxide	0.058	U	0.2	2	µg/L	0.02	UJ	0.02	UJ	0.02	UJ	0.02	UJ	0.02	U	0.02	UJ	0.02	U	0.02	UJ	0.02	U
Hexachlorobenzene	0.06	U	1	6,000	µg/L	0.02	UJ	0.02	UJ	0.02	UJ	0.02	UJ	0.02	U	0.02	UJ	0.02	U	0.02	UJ	0.02	U
Methoxychlor	0.058	U	40	10	µg/L	0.2	UJ	0.2	UJ	0.2	UJ	0.2	UJ	0.2	U	0.2	UJ	0.2	U	0.2	UJ	0.2	U
Toxaphene	1.2	U	-	-	µg/L	0.5	UJ	0.5	UJ	0.5	UJ	0.6	UJ	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	U
TAL METALS (6020) Mercury (7470A)																							
Aluminum	42,100		-	-	µg/L	100	U	100	U	100	U	100	U	71	J	36	J	30	J	100	U	58	J
Antimony	5	U	6	8,000	µg/L	0.53	J	0.35	U	0.12	U	0.28	U	1.12	J	2	U	0.1	U	2	U	0.08	U

Table 3.1
Groundwater Analytical Results
Fall 2008
Former Sudbury Training Annex - Landfill at AOC A7

PARAMETER (Method)	Historical Maximum	Q	MCP GW-1 Groundwater	MCP GW-3 Groundwater Standard	Units	OHM-A7-08	Q	OHM-A7-09	Q	OHM-A7-11	Q	OHM-A7-46[1]	Q	OHM-A7-51	Q	OHM-A7-51 Duplicate	Q	JO-A07-M62	Q	SUD-A07-014	Q	SUD-A07-065	Q
Arsenic	67		10	900	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	2.7	J	5	U	5	U
Barium	376		2,000	50,000	µg/L	44	U	2.5	U	3	U	9.8	U	5.5	U	5.8	U	3.8	U	3.2	U	9.2	U
Beryllium	4	U	4	200	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Cadmium	10	U	5	4	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Calcium	40,600		-	-	µg/L	17,000	U	6,900	U	19,000	U	3,400	U	10,000	U	10,000	U	6,900	U	2,300	U	11,000	U
Chromium	112		100	300	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Cobalt	132		-	-	µg/L	8.4	J	20	U	20	U	4.9	J	20	U	20	U	20	U	20	U	20	U
Copper	86.2		-	-	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Iron	135,000		-	-	µg/L	400		640		120		2,700		3,200		3,000		43	U	30	U	90	U
Lead	485		15	10	µg/L	10	U	10	U	10	U	10	U	1.9	J	10	U	10	U	10	U	10	U
Magnesium	19,300		-	-	µg/L	5,300	U	1,300	U	5,000	U	990	U	3,600	U	3,600	U	1,400	U	500	U	3,000	U
Manganese	25,100		-	-	µg/L	973		90		151		1,150		451		440		14	U	12	U	243	
Mercury	3.1		2	20	µg/L	0.03	J	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Nickel	80.4		100	200	µg/L	11.6	J	25	U	25	U	7.2	J	5	J	4.9	J	25	U	25	U	25	U
Potassium	16,400		-	-	µg/L	4,600	U	2,300	U	4,200	U	4,100	U	2,100	U	2,100	U	2,500	U	2,500	U	2,100	U
Selenium	100	U	50	100	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Silver	5	U	100	7	µg/L	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U
Sodium	27,200		-	-	µg/L	7,300	U	2,900	U	9,900	U	5,600	U	6,600	U	6,500	U	3,400	U	15,000	U	7,800	U
Thallium	2	U	2	3,000	µg/L	0.19	J	2	U	2	U	0.12	J	2	U	2	U	2	U	2	U	2	U
Vanadium	97.2		30	4,000	µg/L	10	U	10	U	10	U	10	U	10	U	1.4	J	10	U	10	U	10	U
Zinc	126		5,000	900	µg/L	8.4	U	50	U	50	U	13	U	8.3	U	10	U	10.7	U	50	U	19.7	U
CYANIDE (9014)																							
Cyanide, Total	11		200	30	µg/L	5	U	5	U	5	U	5	U	5	U	6		5	U	5	U	5	U
COD (410.4)																							
Chemical Oxygen Demand	190		-	-	mg/L	18	J	20	U	20	U	14	J	20	U	20	U	7.2	J	20	U	20	U

Historical Maximum values: Highest concentrations through 1999 (typically taken in or before 1997).
* GW-1 and GW-3 values, based on MCP revision dated February 14, 2008.
** Regulatory standard is for total chlordane
[1]Well was dry, no samples collected.
- indicates there is no MCP standard
Shaded area with bold numbers indicates MCP GW-1 exceedance.
U = Compound not detected above laboratory's Practical Quantitation Limit (PQL).
UJ = Compound tentatively not detected at reported concentration due to blank contamination or the reporting limit is estimated based on data evaluation of laboratory results.
J = Estimated value less than PQL or based on data evaluation of laboratory results.
Q = Qualifier

Table 3.1
Groundwater Analytical Results
Fall 2009
Former Sudbury Training Annex - Landfill at AOC A7

Method	Analyte	Historical Maximum	Q	MCP GW-1 Groundwater Standard	MCP GW-3 Groundwater Standard	Units	OHM-A7-08	Q	OHM-A7-09	Q	OHM-A7-51	Q	OHM-A7-51 Duplicate	Q	JO-A07-M62	Q	SUD-A07-014	Q	SUD-A07-065	Q
VOLATILES (SW846 8260B)	1,1,1,2-Tetrachloroethane	0.5	U	5	50,000	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
	1,1,1-Trichloroethane	0.8		200	20,000	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
	1,1,2,2-Tetrachloroethane	31		2	50,000	µg/L	0.5	U	0.5	U	0.94		0.95		0.5	U	0.5	U	**2.3**	
	1,1,2-Trichloroethane	2		5	50,000	µg/L	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U
	1,1-Dichloroethane	0.5	U	70	20,000	µg/L	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U
	1,1-Dichloroethene	0.5	U	7	30,000	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
	1,1-Dichloropropene	0.5	U	NS	NS	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
	1,2,3-Trichlorobenzene	4		NS	NS	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
	1,2,3-Trichloropropane	1		NS	NS	µg/L	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
	1,2,4-Trichlorobenzene	2		70	50,000	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
	1,2,4-Trimethylbenzene	3		NS	NS	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
	1,2-Dibromo-3-chloropropane (DBCP)	4		NS	NS	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
	1,2-Dibromoethane (EDB)	1.0	U	0.02	50,000	µg/L	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
	1,2-Dichlorobenzene	0.5	U	600	2,000	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
	1,2-Dichloroethane	6.7		5	20,000	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.36	J
	1,2-Dichloropropane	0.5	U	5	50,000	µg/L	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U
	1,3,5-Trimethylbenzene	12		NS	NS	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
	1,3-Dichlorobenzene	0.5	U	40	50,000	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
	1,3-Dichloropropane	0.5	U	NS	NS	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
	1,4-Dichlorobenzene	0.5	U	5	8,000	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
	2,2-Dichloropropane	0.5	U	NS	NS	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
	2-Butanone	25	U	4,000	50,000	µg/L	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
	2-Chlorotoluene	0.5	U	NS	NS	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
	2-Hexanone	10	U	NS	NS	µg/L	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
	4-Chlorotoluene	1.0	U	NS	NS	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
	4-Isopropyltoluene	0.5	U	NS	NS	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
	4-Methyl-2-Pentanone (MIBK)	25.0	U	350	50,000	µg/L	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
	Acetone	25.0	U	6,300	50,000	µg/L	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
	Benzene	1		5	10,000	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
	Bromobenzene	0.5	U	NS	NS	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
	Bromochloromethane	0.5	U	NS	NS	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
	Bromodichloromethane	0.5	U	3	50,000	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
	Bromoform	0.5	U	4	50,000	µg/L	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
	Bromomethane	0.5	U	10	800	µg/L	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
	Carbon Disulfide	1.0	U	NS	NS	µg/L	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
	Carbon Tetrachloride	0.5	U	5	5,000	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
	Chlorobenzene	64		100	1,000	µg/L	3.2		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.48	J
	Chloroethane	0.5	U	NS	NS	µg/L	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
	Chloroform	300		70	20,000	µg/L	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.51	J
	Chloromethane	0.5	U	NS	NS	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
	cis-1,2-Dichloroethene	19		70	50,000	µg/L	3.8		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	2.3	
	cis-1,3-Dichloropropene	0.5	U	NS	NS	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U

Table 3.1
Groundwater Analytical Results
Fall 2009
Former Sudbury Training Annex - Landfill at AOC A7

Method	Analyte	Historical Maximum	Q	MCP GW-1 Groundwater Standard	MCP GW-3 Groundwater Standard	Units	OHM-A7-08	Q	OHM-A7-09	Q	OHM-A7-51	Q	OHM-A7-51 Duplicate	Q	JO-A07-M62	Q	SUD-A07-014	Q	SUD-A07-065	Q
VOLATILES (SW846 8260B) (continued)	Dibromochloromethane	0.5	U	2	50,000	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
	Dibromomethane	0.5	U	NS	NS	µg/L	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
	Dichlorodifluoromethane (Freon 12)	0.8		NS	NS	µg/L	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
	Ethylbenzene	7		700	5,000	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
	Hexachlorobutadiene	0.5	U	0.6	3,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
	Isopropylbenzene	5		NS	NS	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
	m-Xylene & p-Xylene	9		10,000	5,000*	µg/L	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
	Methyl tert-Butyl Ether	1.0	U	70	50,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
	Methylene Chloride	1		5	50,000	µg/L	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
	Naphthalene	37		140	20,000	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
	n-Butylbenzene	4		NS	NS	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
	n-Propylbenzene	9		NS	NS	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
	o-Xylene	9		10,000	5,000*	µg/L	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
	sec-Butylbenzene	3		NS	NS	µg/L	0.61		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
	Styrene	0.5	U	100	6,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
	tert-Butylbenzene	0.5	U	NS	NS	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
	Tetrachloroethene	140		5	30,000	µg/L	11.0		0.5	U	2.6		2.6		0.5	U	0.5	U	12.0	
	Toluene	26		1,000	40,000	µg/L	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U
	trans-1,2-Dichloroethene	6		100	50,000	µg/L	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.40	J
	trans-1,3-Dichloropropene	0.5	U	0.4	200	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
	Trichloroethene	40		5	5,000	µg/L	0.42	J	0.5	U	0.45	J	0.45	J	0.5	U	0.5	U	4.4	
	Trichlorofluoromethane (Freon 11)	7		NS	NS	µg/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
	Vinyl Chloride (chloroethene)	0.5	U	2	50,000	µg/L	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
PESTICIDES (SW846 8081A)	4,4'-DDD	0.48		0.2	50	µg/L	0.05		0.04	U	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U
	4,4'-DDE	0.1	U	0.05	400	µg/L	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U
	4,4'-DDT	0.36		0.3	1	µg/L	0.0269	J	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U
	Aldrin	0.058	U	0.5	20	µg/L	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
	alpha-BHC	0.042		NS	NS	µg/L	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
	alpha-Chlordane	0.058	U	2**	NS	µg/L	0.02	U	0.02	U	0.02	U	0.02	U	0.02	UJ	0.02	U	0.02	U
	beta-BHC	0.058	U	NS	NS	µg/L	0.02	UJ	0.02	UJ	0.02	UJ	0.02	UJ	0.02	UJ	0.02	UJ	0.02	UJ
	delta-BHC	0.31		NS	NS	µg/L	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	UJ
	Dieldrin	0.12	U	0.1	0.5	µg/L	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U
	Endosulfan I	0.058	U	10	2	µg/L	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
	Endosulfan II	0.12	U	NS	NS	µg/L	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U
	Endosulfan sulfate	0.12	U	NS	NS	µg/L	0.04	UJ	0.04	UJ	0.04	UJ	0.04	UJ	0.04	UJ	0.04	UJ	0.04	UJ
	Endrin	0.12	U	2	5	µg/L	0.04	U	0.04	U	0.04	U	0.04	U	0.04	UJ	0.04	U	0.04	U
	Endrin aldehyde	0.12	U	NS	NS	µg/L	0.04	UJ	0.04	UJ	0.04	UJ	0.04	UJ	0.04	UJ	0.04	UJ	0.04	UJ
	Endrin ketone	0.05	U	NS	NS	µg/L	0.04	UJ	0.04	UJ	0.04	UJ	0.04	UJ	0.04	UJ	0.04	UJ	0.04	UJ

Table 3.1
Groundwater Analytical Results
Fall 2009
Former Sudbury Training Annex - Landfill at AOC A7

Method	Analyte	Historical Maximum	Q	MCP GW-1 Groundwater Standard	MCP GW-3 Groundwater Standard	Units	OHM-A7-08	Q	OHM-A7-09	Q	OHM-A7-51	Q	OHM-A7-51 Duplicate	Q	JO-A07-M62	Q	SUD-A07-014	Q	SUD-A07-065	Q
PESTICIDES (SW846 8081A) (continued)	gamma-BHC (Lindane)	17.0		0.2	4	µg/L	0.522		0.02	U	0.046		0.041		0.02	U	0.02	U	0.097	
	gamma-Chlordane	0.058	U	2 **	NS	µg/L	0.02	U	0.02	U	0.02	U	0.02	U	0.02	UJ	0.02	U	0.02	U
	Heptachlor	0.058	U	0.4	1.0	µg/L	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
	Heptachlor epoxide	0.058	U	0.2	2	µg/L	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
	Hexachlorobenzene	0.06	U	1	6,000	µg/L														
	Methoxychlor	0.058	U	40	10	µg/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	UJ	0.2	U	0.2	U
	Toxaphene	1.2	U	NS	NS	µg/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
TAL METALS (6020) MERCURY (7470A)	Aluminum	42,100		NS	NS	µg/L	100	U	70	J	100	U	100	U	100	U	100	U	150	
	Antimony	5	U	6	8,000	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
	Arsenic	67		10	900	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U
	Barium	376		2,000	50,000	µg/L	37		10	U	10	U	10	U	10	U	11		7.2	J
	Beryllium	4	U	4	200	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U
	Cadmium	10	U	5	4	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U
	Calcium	40,600		NS	NS	µg/L	17,000		5,800		7,200		7,500		6,200		19,000		11,000	
	Chromium	112		100	300	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
	Cobalt	132		NS	NS	µg/L	20		20	U	20	U	20	U	20	U	20	U	20	U
	Copper	86.2		NS	NS	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
	Iron	135,000		NS	NS	µg/L	1,100		760		350		370		50	U	50	U	1100	
	Lead	485		15	10	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
	Magnesium	19,300		NS	NS	µg/L	4,600		1,100		2,400		2,500		1,200		3900		3,000	
	Manganese	25,100		NS	NS	µg/L	1360		29		83		88		10		24		222	
	Mercury	3.1		2	20	µg/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Nickel	80.4		100	200	µg/L	25	U	25	U	25	U	25	U	25	U	25	U	25	U
	Potassium	16,400		NS	NS	µg/L	4,200		2,300	J	1,700	J	1,800		2,500		1,900	J	2,200	J
	Selenium	100	U	50	100	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
	Silver	5	U	100	7	µg/L	7	U	7	U	7	U	7	U	7	U	7	U	7	U
	Sodium	27,200		NS	NS	µg/L	6,900		3,200		5,300		5,600		2,900		49,000		8,000	
	Thallium	2	U	2	3,000	µg/L	0.25	J	0.5	U	0.5		0.5	U	0.5	U	0.5	U	0.5	U
	Vanadium	97.2		30	4,000	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U
	Zinc	126		5,000	900	µg/L	50	U	50	U	50	U	50	U	50	U	50	U	50	U
CYANIDE (9014)	Cyanide, Total	11		200	30	µg/L	5	U	5	U	5	U	5	U	5	U	3.7	J	5	U
COD (410.4)	Chemical Oxygen Demand	190		NS	NS	mg/L	14	J	20	U	20	U	11	J	20	U	20	U	20	U
FIELD PARAMETERS	Temperature, initial			NS		° Celsius	10.62		11.84		12.1		12.1		10.65		11.4		10.38	
	Temperature, final			NS		° Celsius	10.61		11.76		12.15		12.15		10.65		11.08		10.65	
	pH			NS		Std units	5.52		5.53		5.98		5.98		5.53		5.44		5.83	
	Specific Conductance			NS		µS/cm	176		64		110		110		176		419		124	
	ORP/Eh[2]			NS		mV	4.1		240.4		227.8		227.8		4.8		44.6		242.2	
	Dissolved Oxygen			NS		mg/L	0.67		2.59		1.32		1.32		0.83		8.69		1.83	
	Turbidity			NS		NTU	0.78		4		5.16		5.16		0.8		4.16		8.77	

Notes:
[1] Cleanup goal is based upon the MCP GW-3 Standard (310 CMR 40 Subpart P)
[2] Revised GW-1 or GW-3 standard effective June 26, 2009

Appendix H Groundwater Data June 2011

Volatile Organic Compounds
SW-846 Method 8260B
Level II Review

Site: Former Fort Devens, MA – Sudbury AOC A7	SDG #: L1109548
Laboratory: Alpha Analytical Laboratories	Date: 07/21/11
HydroGeoLogic, Inc. Reviewer: Vanessa Colloca HGL Peer Reviewer: Denise Rivers (07/22/11)	Project: SUDO10501

Client Sample ID	Laboratory Sample ID	Analysis Batch	Matrix
OHM-A7-08	L1109548-01	WG478472-3	Groundwater
OHM-A7-09	L1109548-02	WG478472-3	Groundwater
OHM-A7-51	L1109548-03	WG478472-3	Groundwater
JO-A07-M62	L1109548-04	WG478472-6	Groundwater
SUD-A07-014	L1109548-05	WG478472-3	Groundwater
SUD-A07-065	L1109548-06	WG478472-3	Groundwater
TB062811	L1109548-07	WG478472-3	Water QC
A7-DUP1	L1109548-08	WG478472-3	Groundwater
A7-RB	L1109548-09; L1109548-09D	WG478472-3; WG478472-6	Water QC

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No discrepancies were noted. The case narrative indicated that one target analyte was outside the acceptance criteria for the initial and continuing calibration standards associated with batch WG478472; this particular QC element is not within the scope of Level II data validation and was not evaluated.

Qualification: None required.

Sample Delivery and Condition – All samples arrived intact at the laboratory, in acceptable condition and temperature, and were properly preserved. Proper custody was documented.

Qualification: None required.

Holding Times – All samples were analyzed within the 14-day holding time required by the QAPP for preserved aqueous samples.

Qualification: None required.

Surrogates – All surrogate recoveries were within the control limits specified in the QAPP.

Qualification: None required.

Laboratory Control Sample – Two LCS/LCSD pairs were associated with the samples in this SDG. The LCS/LCSD for batch WG478472-3 met all %R and RPD control limits established in the QAPP.

The LCS/LCSD for batch WG478472-6 met the %R and RPD control limits established by the QAPP, with the exception of a high recovery for bromomethane (149%). The bromomethane result for sample JO-A07-M62 was a non-detection and no qualification was required.

Qualification: None required.

MS/MSD – Matrix spike/matrix spike duplicate analyses were performed on sample JO-A07-M62 from this SDG. The %R and RPD results were within the QAPP control limits, with the exception of a high recovery for bromomethane (148%). The bromomethane results for all environmental samples in this SDG were non-detections and no qualification was required due to high recovery bias.

Qualification: None required.

Method Blanks – Two method blanks were associated with the samples in this SDG. The method blanks analyzed on 07/11/11 and 07/12/11, for batches WG478472-3 and WG478472-6, respectively, were free from contamination.

Qualification: None required.

Trip Blanks – All samples meant for VOC analysis were shipped in a single cooler. One trip blank, identified as TB062811, was associated with all samples in this SDG and was free from contamination.

Qualification: None required.

Equipment Blanks – One rinsate blank, identified as A7-RB, was associated with all samples in this SDG and was free from contamination with the exception of acetone (210 µg/L), yielding an action level of 2,100 µg/L. The acetone results for all environmental samples were non-detections and no qualification was required.

Qualification: None required.

Field Duplicate – Sample A7-DUP1 was a field duplicate of sample OHM-A7-51. The calculated RPDs for trichloroethene (2.5%), 1,1,2,2-tetrachloroethane (8.7%), and trichloroethene (12.0%) met the QC criteria established by the QAPP; all other results for the duplicate pair were non-detections.

Qualification: None required.

Compound Quantitation – Analyte non-detections were reported as "ND"; these results should be considered the equivalent of "RL U." Analyte detections below the RL were reported as J qualified results. These J qualifiers were retained unless superseded by a more severe qualifier. Due to an elevated acetone concentration, sample A7-RB was reanalyzed at a dilution factor of 5x; as this sample was meant for QC purposes only, no qualification was required. The laboratory adjusted the acetone RL appropriately.

Qualification Summary Table (all concentrations in µg/L):

Sample	Analyte	Lab Value	Lab Qualifier	Validated Value	Validated Qualifier
OHM-A7-08	No qualification required.				
OHM-A7-09	No qualification required.				
OHM-A7-51	No qualification required.				
JO-A07-M62	No qualification required.				
SUD-A07-014	No qualification required.				
SUD-A07-065	No qualification required.				
A7-DUP1	No qualification required.				

Only environmental samples and field duplicates are included in the above table. MS/MSDs and field blanks are used to evaluate the sample data but are not qualified during the review process.

Project Name: SUDBURY AOC A7 **Lab Number:** L1109548
Project Number: SUD010501 **Report Date:** 07/21/11

SAMPLE RESULTS

Lab ID:	L1109548-01	Date Collected:	06/28/11 15:10
Client ID:	OHM-A7-08	Date Received:	06/28/11
Sample Location:	SUDBURY, MA	Field Prep:	Not Specified
Matrix:	Water		
Analytical Method:	1,8260B		
Analytical Date:	07/11/11 16:15		
Analyst:	PD		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	5.0	2.5	1
1,1-Dichloroethane	ND		ug/l	0.75	0.38	1
Chloroform	ND		ug/l	0.75	0.38	1
Carbon tetrachloride	ND		ug/l	0.50	0.25	1
1,2-Dichloropropane	ND		ug/l	1.8	0.90	1
Dibromochloromethane	ND		ug/l	0.50	0.25	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.38	1
Tetrachloroethene	5.6		ug/l	0.50	0.25	1
Chlorobenzene	ND		ug/l	0.50	0.25	1
Trichlorofluoromethane	ND		ug/l	2.5	1.3	1
1,2-Dichloroethane	ND		ug/l	0.50	0.25	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.25	1
Bromodichloromethane	ND		ug/l	0.50	0.25	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.25	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.25	1
1,1-Dichloropropene	ND		ug/l	2.5	1.3	1
Bromoform	ND		ug/l	2.0	1.0	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	0.25	1
Benzene	ND		ug/l	0.50	0.25	1
Toluene	ND		ug/l	0.75	0.38	1
Ethylbenzene	ND		ug/l	0.50	0.25	1
Chloromethane	ND		ug/l	2.5	1.3	1
Bromomethane	ND		ug/l	1.0	0.50	1
Vinyl chloride	ND		ug/l	1.0	0.50	1
Chloroethane	ND		ug/l	1.0	0.50	1
1,1-Dichloroethene	ND		ug/l	0.50	0.25	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.38	1
Trichloroethene	0.27	J	ug/l	0.50	0.25	1
1,2-Dichlorobenzene	ND		ug/l	2.5	1.3	1
1,3-Dichlorobenzene	ND		ug/l	2.5	1.3	1
1,4-Dichlorobenzene	ND		ug/l	2.5	1.3	1

07/25/11

Project Name: SUDBURY AOC A7 **Lab Number:** L1109548

Project Number: SUD010501 **Report Date:** 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-01 Date Collected: 06/28/11 15:10

Client ID: OHM-A7-08 Date Received: 06/28/11

Sample Location: SUDBURY, MA. Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methyl tert butyl ether	ND		ug/l	1.0	0.50	1
p/m-Xylene	ND		ug/l	1.0	0.50	1
o-Xylene	ND		ug/l	1.0	0.50	1
cis-1,2-Dichloroethene	2.6		ug/l	0.50	0.25	1
Dibromomethane	ND		ug/l	5.0	2.5	1
1,2,3-Trichloropropane	ND		ug/l	5.0	2.5	1
Styrene	ND		ug/l	1.0	0.50	1
Dichlorodifluoromethane	ND		ug/l	5.0	2.5	1
Acetone	ND		ug/l	5.0	2.5	1
Carbon disulfide	ND		ug/l	5.0	2.5	1
2-Butanone	ND		ug/l	5.0	2.5	1
4-Methyl-2-pentanone	ND		ug/l	5.0	2.5	1
2-Hexanone	ND		ug/l	5.0	2.5	1
Bromochloromethane	ND		ug/l	2.5	1.3	1
2,2-Dichloropropane	ND		ug/l	2.5	1.3	1
1,2-Dibromoethane	ND		ug/l	2.0	1.0	1
1,3-Dichloropropane	ND		ug/l	2.5	1.3	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	0.25	1
Bromobenzene	ND		ug/l	2.5	1.3	1
n-Butylbenzene	ND		ug/l	0.50	0.25	1
sec-Butylbenzene	ND		ug/l	0.50	0.25	1
tert-Butylbenzene	ND		ug/l	2.5	1.3	1
o-Chlorotoluene	ND		ug/l	2.5	1.3	1
p-Chlorotoluene	ND		ug/l	2.5	1.3	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	1.3	1
Hexachlorobutadiene	ND		ug/l	1.0	0.50	1
Isopropylbenzene	ND		ug/l	0.50	0.25	1
p-Isopropyltoluene	ND		ug/l	0.50	0.25	1
Naphthalene	ND		ug/l	2.5	1.3	1
n-Propylbenzene	ND		ug/l	0.50	0.25	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	1.3	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	1.3	1
1,3,5-Trimethylbenzene	ND		ug/l	2.5	1.3	1
1,2,4-Trimethylbenzene	ND		ug/l	2.5	1.3	1

DML
07/25/11

Project Name: SUDBURY AOC A7 **Lab Number:** L1109548

Project Number: SUD010501 **Report Date:** 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-01 Date Collected: 06/28/11 15:10

Client ID: OHM-A7-08 Date Received: 06/28/11

Sample Location: SUDBURY, MA. Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	100		70-120
Toluene-d8	99		85-120
4-Bromofluorobenzene	100		75-120
Dibromofluoromethane	100		85-115

DM
07/25/11

Project Name: SUDBURY AOC A7
Project Number: SUD010501

Lab Number: L1109548
Report Date: 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-02
Client ID: OHM-A7-09
Sample Location: SUDBURY, MA
Matrix: Water
Analytical Method: 1,8260B
Analytical Date: 07/11/11 16:50
Analyst: PD

Date Collected: 06/28/11 17:47
Date Received: 06/28/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	5.0	2.5	1
1,1-Dichloroethane	ND		ug/l	0.75	0.38	1
Chloroform	ND		ug/l	0.75	0.38	1
Carbon tetrachloride	ND		ug/l	0.50	0.25	1
1,2-Dichloropropane	ND		ug/l	1.8	0.90	1
Dibromochloromethane	ND		ug/l	0.50	0.25	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.38	1
Tetrachloroethene	ND		ug/l	0.50	0.25	1
Chlorobenzene	ND		ug/l	0.50	0.25	1
Trichlorofluoromethane	ND		ug/l	2.5	1.3	1
1,2-Dichloroethane	ND		ug/l	0.50	0.25	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.25	1
Bromodichloromethane	ND		ug/l	0.50	0.25	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.25	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.25	1
1,1-Dichloropropene	ND		ug/l	2.5	1.3	1
Bromoform	ND		ug/l	2.0	1.0	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	0.25	1
Benzene	ND		ug/l	0.50	0.25	1
Toluene	ND		ug/l	0.75	0.38	1
Ethylbenzene	ND		ug/l	0.50	0.25	1
Chloromethane	ND		ug/l	2.5	1.3	1
Bromomethane	ND		ug/l	1.0	0.50	1
Vinyl chloride	ND		ug/l	1.0	0.50	1
Chloroethane	ND		ug/l	1.0	0.50	1
1,1-Dichloroethene	ND		ug/l	0.50	0.25	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.38	1
Trichloroethene	ND		ug/l	0.50	0.25	1
1,2-Dichlorobenzene	ND		ug/l	2.5	1.3	1
1,3-Dichlorobenzene	ND		ug/l	2.5	1.3	1
1,4-Dichlorobenzene	ND		ug/l	2.5	1.3	1

07/25/11

ALPHA

Project Name: SUDBURY AOC A7 **Lab Number:** L1109548

Project Number: SUD010501 **Report Date:** 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-02 Date Collected: 06/28/11 17:47

Client ID: OHM-A7-09 Date Received: 06/28/11

Sample Location: SUDBURY, MA. Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methyl tert butyl ether	ND		ug/l	1.0	0.50	1
p/m-Xylene	ND		ug/l	1.0	0.50	1
o-Xylene	ND		ug/l	1.0	0.50	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.25	1
Dibromomethane	ND		ug/l	5.0	2.5	1
1,2,3-Trichloropropane	ND		ug/l	5.0	2.5	1
Styrene	ND		ug/l	1.0	0.50	1
Dichlorodifluoromethane	ND		ug/l	5.0	2.5	1
Acetone	ND		ug/l	5.0	2.5	1
Carbon disulfide	ND		ug/l	5.0	2.5	1
2-Butanone	ND		ug/l	5.0	2.5	1
4-Methyl-2-pentanone	ND		ug/l	5.0	2.5	1
2-Hexanone	ND		ug/l	5.0	2.5	1
Bromochloromethane	ND		ug/l	2.5	1.3	1
2,2-Dichloropropane	ND		ug/l	2.5	1.3	1
1,2-Dibromoethane	ND		ug/l	2.0	1.0	1
1,3-Dichloropropane	ND		ug/l	2.5	1.3	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	0.25	1
Bromobenzene	ND		ug/l	2.5	1.3	1
n-Butylbenzene	ND		ug/l	0.50	0.25	1
sec-Butylbenzene	0.43	J	ug/l	0.50	0.25	1
tert-Butylbenzene	ND		ug/l	2.5	1.3	1
o-Chlorotoluene	ND		ug/l	2.5	1.3	1
p-Chlorotoluene	ND		ug/l	2.5	1.3	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	1.3	1
Hexachlorobutadiene	ND		ug/l	1.0	0.50	1
Isopropylbenzene	ND		ug/l	0.50	0.25	1
p-Isopropyltoluene	ND		ug/l	0.50	0.25	1
Naphthalene	ND		ug/l	2.5	1.3	1
n-Propylbenzene	ND		ug/l	0.50	0.25	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	1.3	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	1.3	1
1,3,5-Trimethylbenzene	ND		ug/l	2.5	1.3	1
1,2,4-Trimethylbenzene	ND		ug/l	2.5	1.3	1

OM
07/25/11

Project Name: SUDBURY AOC A7 **Lab Number:** L1109548

Project Number: SUD010501 **Report Date:** 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-02 Date Collected: 06/28/11 17:47

Client ID: OHM-A7-09 Date Received: 06/28/11

Sample Location: SUDBURY, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Volatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	100		70-120
Toluene-d8	99		85-120
4-Bromofluorobenzene	99		75-120
Dibromofluoromethane	99		85-115

ALPHA

07/25/11

Project Name: SUDBURY AOC A7
Project Number: SUD010501

Lab Number: L1109548
Report Date: 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-03
Client ID: OHM-A7-51
Sample Location: SUDBURY, MA
Matrix: Water
Analytical Method: 1,8260B
Analytical Date: 07/11/11 17:24
Analyst: PD

Date Collected: 06/28/11 17:05
Date Received: 06/28/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	5.0	2.5	1
1,1-Dichloroethane	ND		ug/l	0.75	0.38	1
Chloroform	ND		ug/l	0.75	0.38	1
Carbon tetrachloride	ND		ug/l	0.50	0.25	1
1,2-Dichloropropane	ND		ug/l	1.8	0.90	1
Dibromochloromethane	ND		ug/l	0.50	0.25	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.38	1
Tetrachloroethene	4.0		ug/l	0.50	0.25	1
Chlorobenzene	ND		ug/l	0.50	0.25	1
Trichlorofluoromethane	ND		ug/l	2.5	1.3	1
1,2-Dichloroethane	ND		ug/l	0.50	0.25	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.25	1
Bromodichloromethane	ND		ug/l	0.50	0.25	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.25	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.25	1
1,1-Dichloropropene	ND		ug/l	2.5	1.3	1
Bromoform	ND		ug/l	2.0	1.0	1
1,1,2,2-Tetrachloroethane	1.2		ug/l	0.50	0.25	1
Benzene	ND		ug/l	0.50	0.25	1
Toluene	ND		ug/l	0.75	0.38	1
Ethylbenzene	ND		ug/l	0.50	0.25	1
Chloromethane	ND		ug/l	2.5	1.3	1
Bromomethane	ND		ug/l	1.0	0.50	1
Vinyl chloride	ND		ug/l	1.0	0.50	1
Chloroethane	ND		ug/l	1.0	0.50	1
1,1-Dichloroethene	ND		ug/l	0.50	0.25	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.38	1
Trichloroethene	0.44	J	ug/l	0.50	0.25	1
1,2-Dichlorobenzene	ND		ug/l	2.5	1.3	1
1,3-Dichlorobenzene	ND		ug/l	2.5	1.3	1
1,4-Dichlorobenzene	ND		ug/l	2.5	1.3	1

07/25/11

Project Name: SUDBURY AOC A7 **Lab Number:** L1109548

Project Number: SUD010501 **Report Date:** 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-03 Date Collected: 06/28/11 17:05

Client ID: OHM-A7-51 Date Received: 06/28/11

Sample Location: SUDBURY, MA. Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methyl tert butyl ether	ND		ug/l	1.0	0.50	1
p/m-Xylene	ND		ug/l	1.0	0.50	1
o-Xylene	ND		ug/l	1.0	0.50	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.25	1
Dibromomethane	ND		ug/l	5.0	2.5	1
1,2,3-Trichloropropane	ND		ug/l	5.0	2.5	1
Styrene	ND		ug/l	1.0	0.50	1
Dichlorodifluoromethane	ND		ug/l	5.0	2.5	1
Acetone	ND		ug/l	5.0	2.5	1
Carbon disulfide	ND		ug/l	5.0	2.5	1
2-Butanone	ND		ug/l	5.0	2.5	1
4-Methyl-2-pentanone	ND		ug/l	5.0	2.5	1
2-Hexanone	ND		ug/l	5.0	2.5	1
Bromochloromethane	ND		ug/l	2.5	1.3	1
2,2-Dichloropropane	ND		ug/l	2.5	1.3	1
1,2-Dibromoethane	ND		ug/l	2.0	1.0	1
1,3-Dichloropropane	ND		ug/l	2.5	1.3	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	0.25	1
Bromobenzene	ND		ug/l	2.5	1.3	1
n-Butylbenzene	ND		ug/l	0.50	0.25	1
sec-Butylbenzene	ND		ug/l	0.50	0.25	1
tert-Butylbenzene	ND		ug/l	2.5	1.3	1
o-Chlorotoluene	ND		ug/l	2.5	1.3	1
p-Chlorotoluene	ND		ug/l	2.5	1.3	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	1.3	1
Hexachlorobutadiene	ND		ug/l	1.0	0.50	1
Isopropylbenzene	ND		ug/l	0.50	0.25	1
p-Isopropyltoluene	ND		ug/l	0.50	0.25	1
Naphthalene	ND		ug/l	2.5	1.3	1
n-Propylbenzene	ND		ug/l	0.50	0.25	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	1.3	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	1.3	1
1,3,5-Trimethylbenzene	ND		ug/l	2.5	1.3	1
1,2,4-Trimethylbenzene	ND		ug/l	2.5	1.3	1

ALPHA

DM 07/25/11

Project Name: SUDBURY AOC A7 **Lab Number:** L1109548

Project Number: SUD010501 **Report Date:** 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-03 Date Collected: 06/28/11 17:05

Client ID: OHM-A7-51 Date Received: 06/28/11

Sample Location: SUDBURY, MA. Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	100		70-120
Toluene-d8	99		85-120
4-Bromofluorobenzene	99		75-120
Dibromofluoromethane	98		85-115

8/25/11

Project Name: SUDBURY AOC A7
Project Number: SUD010501

Lab Number: L1109548
Report Date: 07/21/11

SAMPLE RESULTS

Lab ID:	L1109548-04	Date Collected:	06/28/11 15:05
Client ID:	JO-A07-M62	Date Received:	06/28/11
Sample Location:	SUDBURY, MA.	Field Prep:	Not Specified
Matrix:	Water		
Analytical Method:	1,8260B		
Analytical Date:	07/12/11 09:50		
Analyst:	PD		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	5.0	2.5	1
1,1-Dichloroethane	ND		ug/l	0.75	0.38	1
Chloroform	ND		ug/l	0.75	0.38	1
Carbon tetrachloride	ND		ug/l	0.50	0.25	1
1,2-Dichloropropane	ND		ug/l	1.8	0.90	1
Dibromochloromethane	ND		ug/l	0.50	0.25	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.38	1
Tetrachloroethene	0.26	J	ug/l	0.50	0.25	1
Chlorobenzene	ND		ug/l	0.50	0.25	1
Trichlorofluoromethane	ND		ug/l	2.5	1.3	1
1,2-Dichloroethane	ND		ug/l	0.50	0.25	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.25	1
Bromodichloromethane	ND		ug/l	0.50	0.25	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.25	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.25	1
1,1-Dichloropropene	ND		ug/l	2.5	1.3	1
Bromoform	ND		ug/l	2.0	1.0	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	0.25	1
Benzene	ND		ug/l	0.50	0.25	1
Toluene	ND		ug/l	0.75	0.38	1
Ethylbenzene	ND		ug/l	0.50	0.25	1
Chloromethane	ND		ug/l	2.5	1.3	1
Bromomethane	ND		ug/l	1.0	0.50	1
Vinyl chloride	ND		ug/l	1.0	0.50	1
Chloroethane	ND		ug/l	1.0	0.50	1
1,1-Dichloroethene	ND		ug/l	0.50	0.25	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.38	1
Trichloroethene	ND		ug/l	0.50	0.25	1
1,2-Dichlorobenzene	ND		ug/l	2.5	1.3	1
1,3-Dichlorobenzene	ND		ug/l	2.5	1.3	1
1,4-Dichlorobenzene	ND		ug/l	2.5	1.3	1

DM 07/25/11

ALPHA

Project Name: SUDBURY AOC A7 **Lab Number:** L1109548

Project Number: SUD010501 **Report Date:** 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-04 Date Collected: 06/28/11 15:05

Client ID: JO-A07-M62 Date Received: 06/28/11

Sample Location: SUDBURY, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methyl tert butyl ether	ND		ug/l	1.0	0.50	1
p/m-Xylene	ND		ug/l	1.0	0.50	1
o-Xylene	ND		ug/l	1.0	0.50	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.25	1
Dibromomethane	ND		ug/l	5.0	2.5	1
1,2,3-Trichloropropane	ND		ug/l	5.0	2.5	1
Styrene	ND		ug/l	1.0	0.50	1
Dichlorodifluoromethane	ND		ug/l	5.0	2.5	1
Acetone	ND		ug/l	5.0	2.5	1
Carbon disulfide	ND		ug/l	5.0	2.5	1
2-Butanone	ND		ug/l	5.0	2.5	1
4-Methyl-2-pentanone	ND		ug/l	5.0	2.5	1
2-Hexanone	ND		ug/l	5.0	2.5	1
Bromochloromethane	ND		ug/l	2.5	1.3	1
2,2-Dichloropropane	ND		ug/l	2.5	1.3	1
1,2-Dibromoethane	ND		ug/l	2.0	1.0	1
1,3-Dichloropropane	ND		ug/l	2.5	1.3	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	0.25	1
Bromobenzene	ND		ug/l	2.5	1.3	1
n-Butylbenzene	ND		ug/l	0.50	0.25	1
sec-Butylbenzene	ND		ug/l	0.50	0.25	1
tert-Butylbenzene	ND		ug/l	2.5	1.3	1
o-Chlorotoluene	ND		ug/l	2.5	1.3	1
p-Chlorotoluene	ND		ug/l	2.5	1.3	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	1.3	1
Hexachlorobutadiene	ND		ug/l	1.0	0.50	1
Isopropylbenzene	ND		ug/l	0.50	0.25	1
p-Isopropyltoluene	ND		ug/l	0.50	0.25	1
Naphthalene	ND		ug/l	2.5	1.3	1
n-Propylbenzene	ND		ug/l	0.50	0.25	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	1.3	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	1.3	1
1,3,5-Trimethylbenzene	ND		ug/l	2.5	1.3	1
1,2,4-Trimethylbenzene	ND		ug/l	2.5	1.3	1

DMR
07/25/11

Project Name: SUDBURY AOC A7 **Lab Number:** L1109548

Project Number: SUD010501 **Report Date:** 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-04 Date Collected: 06/28/11 15:05

Client ID: JO-A07-M62 Date Received: 06/28/11

Sample Location: SUDBURY, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	98		70-120
Toluene-d8	99		85-120
4-Bromofluorobenzene	100		75-120
Dibromofluoromethane	98		85-115

07/25/11

ALPHA

Project Name: SUDBURY AOC A7
Project Number: SUD010501
Lab Number: L1109548
Report Date: 07/21/11

SAMPLE RESULTS

Lab ID:	L1109548-05	Date Collected:	06/28/11 11:25
Client ID:	SUD-A07-014	Date Received:	06/28/11
Sample Location:	SUDBURY, MA	Field Prep:	Not Specified
Matrix:	Water		
Analytical Method:	1,8260B		
Analytical Date:	07/11/11 17:59		
Analyst:	PD		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	5.0	2.5	1
1,1-Dichloroethane	ND		ug/l	0.75	0.38	1
Chloroform	ND		ug/l	0.75	0.38	1
Carbon tetrachloride	ND		ug/l	0.50	0.25	1
1,2-Dichloropropane	ND		ug/l	1.8	0.90	1
Dibromochloromethane	ND		ug/l	0.50	0.25	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.38	1
Tetrachloroethene	ND		ug/l	0.50	0.25	1
Chlorobenzene	ND		ug/l	0.50	0.25	1
Trichlorofluoromethane	ND		ug/l	2.5	1.3	1
1,2-Dichloroethane	ND		ug/l	0.50	0.25	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.25	1
Bromodichloromethane	ND		ug/l	0.50	0.25	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.25	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.25	1
1,1-Dichloropropene	ND		ug/l	2.5	1.3	1
Bromoform	ND		ug/l	2.0	1.0	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	0.25	1
Benzene	ND		ug/l	0.50	0.25	1
Toluene	ND		ug/l	0.75	0.38	1
Ethylbenzene	ND		ug/l	0.50	0.25	1
Chloromethane	ND		ug/l	2.5	1.3	1
Bromomethane	ND		ug/l	1.0	0.50	1
Vinyl chloride	ND		ug/l	1.0	0.50	1
Chloroethane	ND		ug/l	1.0	0.50	1
1,1-Dichloroethene	ND		ug/l	0.50	0.25	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.38	1
Trichloroethene	ND		ug/l	0.50	0.25	1
1,2-Dichlorobenzene	ND		ug/l	2.5	1.3	1
1,3-Dichlorobenzene	ND		ug/l	2.5	1.3	1
1,4-Dichlorobenzene	ND		ug/l	2.5	1.3	1

DMM 07/25/11

Project Name: SUDBURY AOC A7
Project Number: SUD010501
Lab Number: L1109548
Report Date: 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-05
Client ID: SUD-A07-014
Sample Location: SUDBURY, MA
Date Collected: 06/28/11 11:25
Date Received: 06/28/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methyl tert butyl ether	ND		ug/l	1.0	0.50	1
p/m-Xylene	ND		ug/l	1.0	0.50	1
o-Xylene	ND		ug/l	1.0	0.50	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.25	1
Dibromomethane	ND		ug/l	5.0	2.5	1
1,2,3-Trichloropropane	ND		ug/l	5.0	2.5	1
Styrene	ND		ug/l	1.0	0.50	1
Dichlorodifluoromethane	ND		ug/l	5.0	2.5	1
Acetone	ND		ug/l	5.0	2.5	1
Carbon disulfide	ND		ug/l	5.0	2.5	1
2-Butanone	ND		ug/l	5.0	2.5	1
4-Methyl-2-pentanone	ND		ug/l	5.0	2.5	1
2-Hexanone	ND		ug/l	5.0	2.5	1
Bromochloromethane	ND		ug/l	2.5	1.3	1
2,2-Dichloropropane	ND		ug/l	2.5	1.3	1
1,2-Dibromoethane	ND		ug/l	2.0	1.0	1
1,3-Dichloropropane	ND		ug/l	2.5	1.3	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	0.25	1
Bromobenzene	ND		ug/l	2.5	1.3	1
n-Butylbenzene	ND		ug/l	0.50	0.25	1
sec-Butylbenzene	ND		ug/l	0.50	0.25	1
tert-Butylbenzene	ND		ug/l	2.5	1.3	1
o-Chlorotoluene	ND		ug/l	2.5	1.3	1
p-Chlorotoluene	ND		ug/l	2.5	1.3	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	1.3	1
Hexachlorobutadiene	ND		ug/l	1.0	0.50	1
Isopropylbenzene	ND		ug/l	0.50	0.25	1
p-Isopropyltoluene	ND		ug/l	0.50	0.25	1
Naphthalene	ND		ug/l	2.5	1.3	1
n-Propylbenzene	ND		ug/l	0.50	0.25	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	1.3	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	1.3	1
1,3,5-Trimethylbenzene	ND		ug/l	2.5	1.3	1
1,2,4-Trimethylbenzene	ND		ug/l	2.5	1.3	1

Dmc
07/25/11

ALPHA

Project Name: SUDBURY AOC A7 **Lab Number:** L1109548

Project Number: SUD010501 **Report Date:** 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-05 Date Collected: 06/28/11 11:25

Client ID: SUD-A07-014 Date Received: 06/28/11

Sample Location: SUDBURY, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	100		70-120
Toluene-d8	99		85-120
4-Bromofluorobenzene	98		75-120
Dibromofluoromethane	99		85-115

DM 07/25/11

Project Name: SUDBURY AOC A7
Project Number: SUD010501

Lab Number: L1109548
Report Date: 07/21/11

SAMPLE RESULTS

Lab ID:	L1109548-06	Date Collected:	06/28/11 12:28
Client ID:	SUD-A07-065	Date Received:	06/28/11
Sample Location:	SUDBURY, MA	Field Prep:	Not Specified
Matrix:	Water		
Analytical Method:	1,8260B		
Analytical Date:	07/11/11 18:34		
Analyst:	PD		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	5.0	2.5	1
1,1-Dichloroethane	ND		ug/l	0.75	0.38	1
Chloroform	1.2		ug/l	0.75	0.38	1
Carbon tetrachloride	ND		ug/l	0.50	0.25	1
1,2-Dichloropropane	ND		ug/l	1.8	0.90	1
Dibromochloromethane	ND		ug/l	0.50	0.25	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.38	1
Tetrachloroethene	15		ug/l	0.50	0.25	1
Chlorobenzene	2.9		ug/l	0.50	0.25	1
Trichlorofluoromethane	ND		ug/l	2.5	1.3	1
1,2-Dichloroethane	0.36	J	ug/l	0.50	0.25	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.25	1
Bromodichloromethane	ND		ug/l	0.50	0.25	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.25	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.25	1
1,1-Dichloropropene	ND		ug/l	2.5	1.3	1
Bromoform	ND		ug/l	2.0	1.0	1
1,1,2,2-Tetrachloroethane	3.3		ug/l	0.50	0.25	1
Benzene	ND		ug/l	0.50	0.25	1
Toluene	ND		ug/l	0.75	0.38	1
Ethylbenzene	ND		ug/l	0.50	0.25	1
Chloromethane	ND		ug/l	2.5	1.3	1
Bromomethane	ND		ug/l	1.0	0.50	1
Vinyl chloride	ND		ug/l	1.0	0.50	1
Chloroethane	ND		ug/l	1.0	0.50	1
1,1-Dichloroethene	ND		ug/l	0.50	0.25	1
trans-1,2-Dichloroethene	0.66	J	ug/l	0.75	0.38	1
Trichloroethene	4.7		ug/l	0.50	0.25	1
1,2-Dichlorobenzene	ND		ug/l	2.5	1.3	1
1,3-Dichlorobenzene	ND		ug/l	2.5	1.3	1
1,4-Dichlorobenzene	ND		ug/l	2.5	1.3	1

DM 07/25/11

ALPHA

Project Name: SUDBURY AOC A7 **Lab Number:** L1109548

Project Number: SUD010501 **Report Date:** 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-06 Date Collected: 06/28/11 12:28

Client ID: SUD-A07-065 Date Received: 06/28/11

Sample Location: SUDBURY, MA. Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methyl tert butyl ether	ND		ug/l	1.0	0.50	1
p/m-Xylene	ND		ug/l	1.0	0.50	1
o-Xylene	ND		ug/l	1.0	0.50	1
cis-1,2-Dichloroethene	3.1		ug/l	0.50	0.25	1
Dibromomethane	ND		ug/l	5.0	2.5	1
1,2,3-Trichloropropane	ND		ug/l	5.0	2.5	1
Styrene	ND		ug/l	1.0	0.50	1
Dichlorodifluoromethane	ND		ug/l	5.0	2.5	1
Acetone	ND		ug/l	5.0	2.5	1
Carbon disulfide	ND		ug/l	5.0	2.5	1
2-Butanone	ND		ug/l	5.0	2.5	1
4-Methyl-2-pentanone	ND		ug/l	5.0	2.5	1
2-Hexanone	ND		ug/l	5.0	2.5	1
Bromochloromethane	ND		ug/l	2.5	1.3	1
2,2-Dichloropropane	ND		ug/l	2.5	1.3	1
1,2-Dibromoethane	ND		ug/l	2.0	1.0	1
1,3-Dichloropropane	ND		ug/l	2.5	1.3	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	0.25	1
Bromobenzene	ND		ug/l	2.5	1.3	1
n-Butylbenzene	ND		ug/l	0.50	0.25	1
sec-Butylbenzene	ND		ug/l	0.50	0.25	1
tert-Butylbenzene	ND		ug/l	2.5	1.3	1
o-Chlorotoluene	ND		ug/l	2.5	1.3	1
p-Chlorotoluene	ND		ug/l	2.5	1.3	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	1.3	1
Hexachlorobutadiene	ND		ug/l	1.0	0.50	1
Isopropylbenzene	ND		ug/l	0.50	0.25	1
p-Isopropyltoluene	ND		ug/l	0.50	0.25	1
Naphthalene	ND		ug/l	2.5	1.3	1
n-Propylbenzene	ND		ug/l	0.50	0.25	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	1.3	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	1.3	1
1,3,5-Trimethylbenzene	ND		ug/l	2.5	1.3	1
1,2,4-Trimethylbenzene	ND		ug/l	2.5	1.3	1

DMM 07/25/11

Project Name: SUDBURY AOC A7 **Lab Number:** L1109548

Project Number: SUD010501 **Report Date:** 07/21/11

SAMPLE RESULTS

Lab ID:	L1109548-06	Date Collected:	06/28/11 12:28
Client ID:	SUD-A07-065	Date Received:	06/28/11
Sample Location:	SUDBURY, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Volatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	102		70-120
Toluene-d8	99		85-120
4-Bromofluorobenzene	100		75-120
Dibromofluoromethane	99		85-115

DM 07/25/11

Project Name: SUDBURY AOC A7
Project Number: SUD010501
Lab Number: L1109548
Report Date: 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-07
Client ID: TB062811
Sample Location: SUDBURY, MA
Matrix: Water
Analytical Method: 1,8260B
Analytical Date: 07/11/11 19:09
Analyst: PD

Date Collected: 06/28/11 12:00
Date Received: 06/28/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	5.0	2.5	1
1,1-Dichloroethane	ND		ug/l	0.75	0.38	1
Chloroform	ND		ug/l	0.75	0.38	1
Carbon tetrachloride	ND		ug/l	0.50	0.25	1
1,2-Dichloropropane	ND		ug/l	1.8	0.90	1
Dibromochloromethane	ND		ug/l	0.50	0.25	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.38	1
Tetrachloroethene	ND		ug/l	0.50	0.25	1
Chlorobenzene	ND		ug/l	0.50	0.25	1
Trichlorofluoromethane	ND		ug/l	2.5	1.3	1
1,2-Dichloroethane	ND		ug/l	0.50	0.25	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.25	1
Bromodichloromethane	ND		ug/l	0.50	0.25	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.25	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.25	1
1,1-Dichloropropene	ND		ug/l	2.5	1.3	1
Bromoform	ND		ug/l	2.0	1.0	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	0.25	1
Benzene	ND		ug/l	0.50	0.25	1
Toluene	ND		ug/l	0.75	0.38	1
Ethylbenzene	ND		ug/l	0.50	0.25	1
Chloromethane	ND		ug/l	2.5	1.3	1
Bromomethane	ND		ug/l	1.0	0.50	1
Vinyl chloride	ND		ug/l	1.0	0.50	1
Chloroethane	ND		ug/l	1.0	0.50	1
1,1-Dichloroethene	ND		ug/l	0.50	0.25	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.38	1
Trichloroethene	ND		ug/l	0.50	0.25	1
1,2-Dichlorobenzene	ND		ug/l	2.5	1.3	1
1,3-Dichlorobenzene	ND		ug/l	2.5	1.3	1
1,4-Dichlorobenzene	ND		ug/l	2.5	1.3	1

DM 07/25/11

Project Name: SUDBURY AOC A7
Project Number: SUD010501

Lab Number: L1109548
Report Date: 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-07
Client ID: TB062811
Sample Location: SUDBURY, MA

Date Collected: 06/28/11 12:00
Date Received: 06/28/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methyl tert butyl ether	ND		ug/l	1.0	0.50	1
p/m-Xylene	ND		ug/l	1.0	0.50	1
o-Xylene	ND		ug/l	1.0	0.50	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.25	1
Dibromomethane	ND		ug/l	5.0	2.5	1
1,2,3-Trichloropropane	ND		ug/l	5.0	2.5	1
Styrene	ND		ug/l	1.0	0.50	1
Dichlorodifluoromethane	ND		ug/l	5.0	2.5	1
Acetone	ND		ug/l	5.0	2.5	1
Carbon disulfide	ND		ug/l	5.0	2.5	1
2-Butanone	ND		ug/l	5.0	2.5	1
4-Methyl-2-pentanone	ND		ug/l	5.0	2.5	1
2-Hexanone	ND		ug/l	5.0	2.5	1
Bromochloromethane	ND		ug/l	2.5	1.3	1
2,2-Dichloropropane	ND		ug/l	2.5	1.3	1
1,2-Dibromoethane	ND		ug/l	2.0	1.0	1
1,3-Dichloropropane	ND		ug/l	2.5	1.3	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	0.25	1
Bromobenzene	ND		ug/l	2.5	1.3	1
n-Butylbenzene	ND		ug/l	0.50	0.25	1
sec-Butylbenzene	ND		ug/l	0.50	0.25	1
tert-Butylbenzene	ND		ug/l	2.5	1.3	1
o-Chlorotoluene	ND		ug/l	2.5	1.3	1
p-Chlorotoluene	ND		ug/l	2.5	1.3	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	1.3	1
Hexachlorobutadiene	ND		ug/l	1.0	0.50	1
Isopropylbenzene	ND		ug/l	0.50	0.25	1
p-Isopropyltoluene	ND		ug/l	0.50	0.25	1
Naphthalene	ND		ug/l	2.5	1.3	1
n-Propylbenzene	ND		ug/l	0.50	0.25	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	1.3	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	1.3	1
1,3,5-Trimethylbenzene	ND		ug/l	2.5	1.3	1
1,2,4-Trimethylbenzene	ND		ug/l	2.5	1.3	1

07/25/11

ALPHA

Project Name: SUDBURY AOC A7 **Lab Number:** L1109548

Project Number: SUD010501 **Report Date:** 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-07 Date Collected: 06/28/11 12:00

Client ID: TB062811 Date Received: 06/28/11

Sample Location: SUDBURY, MA. Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	100		70-120
Toluene-d8	99		85-120
4-Bromofluorobenzene	99		75-120
Dibromofluoromethane	99		85-115

DM 07/25/11

Serial_No:07211112:27

Project Name:	SUDBURY AOC A7	**Lab Number:**	L1109548
Project Number:	SUD010501	**Report Date:**	07/21/11

SAMPLE RESULTS

Lab ID:	L1109548-08	Date Collected:	06/28/11 16:30
Client ID:	A7-DUP1	Date Received:	06/28/11
Sample Location:	SUDBURY, MA.	Field Prep:	Not Specified
Matrix:	Water		
Analytical Method:	1,8260B		
Analytical Date:	07/11/11 19:44		
Analyst:	PD		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	5.0	2.5	1
1,1-Dichloroethane	ND		ug/l	0.75	0.38	1
Chloroform	ND		ug/l	0.75	0.38	1
Carbon tetrachloride	ND		ug/l	0.50	0.25	1
1,2-Dichloropropane	ND		ug/l	1.8	0.90	1
Dibromochloromethane	ND		ug/l	0.50	0.25	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.38	1
Tetrachloroethene	3.9		ug/l	0.50	0.25	1
Chlorobenzene	ND		ug/l	0.50	0.25	1
Trichlorofluoromethane	ND		ug/l	2.5	1.3	1
1,2-Dichloroethane	ND		ug/l	0.50	0.25	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.25	1
Bromodichloromethane	ND		ug/l	0.50	0.25	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.25	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.25	1
1,1-Dichloropropene	ND		ug/l	2.5	1.3	1
Bromoform	ND		ug/l	2.0	1.0	1
1,1,2,2-Tetrachloroethane	1.1		ug/l	0.50	0.25	1
Benzene	ND		ug/l	0.50	0.25	1
Toluene	ND		ug/l	0.75	0.38	1
Ethylbenzene	ND		ug/l	0.50	0.25	1
Chloromethane	ND		ug/l	2.5	1.3	1
Bromomethane	ND		ug/l	1.0	0.50	1
Vinyl chloride	ND		ug/l	1.0	0.50	1
Chloroethane	ND		ug/l	1.0	0.50	1
1,1-Dichloroethene	ND		ug/l	0.50	0.25	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.38	1
Trichloroethene	0.39	J	ug/l	0.50	0.25	1
1,2-Dichlorobenzene	ND		ug/l	2.5	1.3	1
1,3-Dichlorobenzene	ND		ug/l	2.5	1.3	1
1,4-Dichlorobenzene	ND		ug/l	2.5	1.3	1

Ow 07/25/11

ALPHA

Project Name: SUDBURY AOC A7 **Lab Number:** L1109548

Project Number: SUD010501 **Report Date:** 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-08 Date Collected: 06/28/11 16:30

Client ID: A7-DUP1 Date Received: 06/28/11

Sample Location: SUDBURY, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methyl tert butyl ether	ND		ug/l	1.0	0.50	1
p/m-Xylene	ND		ug/l	1.0	0.50	1
o-Xylene	ND		ug/l	1.0	0.50	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.25	1
Dibromomethane	ND		ug/l	5.0	2.5	1
1,2,3-Trichloropropane	ND		ug/l	5.0	2.5	1
Styrene	ND		ug/l	1.0	0.50	1
Dichlorodifluoromethane	ND		ug/l	5.0	2.5	1
Acetone	ND		ug/l	5.0	2.5	1
Carbon disulfide	ND		ug/l	5.0	2.5	1
2-Butanone	ND		ug/l	5.0	2.5	1
4-Methyl-2-pentanone	ND		ug/l	5.0	2.5	1
2-Hexanone	ND		ug/l	5.0	2.5	1
Bromochloromethane	ND		ug/l	2.5	1.3	1
2,2-Dichloropropane	ND		ug/l	2.5	1.3	1
1,2-Dibromoethane	ND		ug/l	2.0	1.0	1
1,3-Dichloropropane	ND		ug/l	2.5	1.3	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	0.25	1
Bromobenzene	ND		ug/l	2.5	1.3	1
n-Butylbenzene	ND		ug/l	0.50	0.25	1
sec-Butylbenzene	ND		ug/l	0.50	0.25	1
tert-Butylbenzene	ND		ug/l	2.5	1.3	1
o-Chlorotoluene	ND		ug/l	2.5	1.3	1
p-Chlorotoluene	ND		ug/l	2.5	1.3	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	1.3	1
Hexachlorobutadiene	ND		ug/l	1.0	0.50	1
Isopropylbenzene	ND		ug/l	0.50	0.25	1
p-Isopropyltoluene	ND		ug/l	0.50	0.25	1
Naphthalene	ND		ug/l	2.5	1.3	1
n-Propylbenzene	ND		ug/l	0.50	0.25	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	1.3	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	1.3	1
1,3,5-Trimethylbenzene	ND		ug/l	2.5	1.3	1
1,2,4-Trimethylbenzene	ND		ug/l	2.5	1.3	1

07/25/11

Project Name: SUDBURY AOC A7 **Lab Number:** L1109548

Project Number: SUD010501 **Report Date:** 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-08 Date Collected: 06/28/11 16:30

Client ID: A7-DUP1 Date Received: 06/28/11

Sample Location: SUDBURY, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Volatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	100		70-120
Toluene-d8	99		85-120
4-Bromofluorobenzene	100		75-120
Dibromofluoromethane	98		85-115

DM 07/25/11

ALPHA

Project Name: SUDBURY AOC A7
Project Number: SUD010501

Lab Number: L1109548
Report Date: 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-09
Client ID: A7-RB
Sample Location: SUDBURY, MA
Matrix: Water
Analytical Method: 1,8260B
Analytical Date: 07/11/11 20:18
Analyst: PD

Date Collected: 06/28/11 18:35
Date Received: 06/28/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	5.0	2.5	1
1,1-Dichloroethane	ND		ug/l	0.75	0.38	1
Chloroform	ND		ug/l	0.75	0.38	1
Carbon tetrachloride	ND		ug/l	0.50	0.25	1
1,2-Dichloropropane	ND		ug/l	1.8	0.90	1
Dibromochloromethane	ND		ug/l	0.50	0.25	1
1,1,2-Trichloroethane	ND		ug/l	0.75	0.38	1
Tetrachloroethene	ND		ug/l	0.50	0.25	1
Chlorobenzene	ND		ug/l	0.50	0.25	1
Trichlorofluoromethane	ND		ug/l	2.5	1.3	1
1,2-Dichloroethane	ND		ug/l	0.50	0.25	1
1,1,1-Trichloroethane	ND		ug/l	0.50	0.25	1
Bromodichloromethane	ND		ug/l	0.50	0.25	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.25	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.25	1
1,1-Dichloropropene	ND		ug/l	2.5	1.3	1
Bromoform	ND		ug/l	2.0	1.0	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	0.25	1
Benzene	ND		ug/l	0.50	0.25	1
Toluene	ND		ug/l	0.75	0.38	1
Ethylbenzene	ND		ug/l	0.50	0.25	1
Chloromethane	ND		ug/l	2.5	1.3	1
Bromomethane	ND		ug/l	1.0	0.50	1
Vinyl chloride	ND		ug/l	1.0	0.50	1
Chloroethane	ND		ug/l	1.0	0.50	1
1,1-Dichloroethene	ND		ug/l	0.50	0.25	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	0.38	1
Trichloroethene	ND		ug/l	0.50	0.25	1
1,2-Dichlorobenzene	ND		ug/l	2.5	1.3	1
1,3-Dichlorobenzene	ND		ug/l	2.5	1.3	1
1,4-Dichlorobenzene	ND		ug/l	2.5	1.3	1

DML
07/25/11

Project Name: SUDBURY AOC A7
Project Number: SUD010501

Lab Number: L1109548
Report Date: 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-09
Client ID: A7-RB
Sample Location: SUDBURY, MA

Date Collected: 06/28/11 18:35
Date Received: 06/28/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methyl tert butyl ether	ND		ug/l	1.0	0.50	1
p/m-Xylene	ND		ug/l	1.0	0.50	1
o-Xylene	ND		ug/l	1.0	0.50	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	0.25	1
Dibromomethane	ND		ug/l	5.0	2.5	1
1,2,3-Trichloropropane	ND		ug/l	5.0	2.5	1
Styrene	ND		ug/l	1.0	0.50	1
Dichlorodifluoromethane	ND		ug/l	5.0	2.5	1
Acetone	200	E	ug/l	5.0	2.5	1
Carbon disulfide	ND		ug/l	5.0	2.5	1
2-Butanone	ND		ug/l	5.0	2.5	1
4-Methyl-2-pentanone	ND		ug/l	5.0	2.5	1
2-Hexanone	ND		ug/l	5.0	2.5	1
Bromochloromethane	ND		ug/l	2.5	1.3	1
2,2-Dichloropropane	ND		ug/l	2.5	1.3	1
1,2-Dibromoethane	ND		ug/l	2.0	1.0	1
1,3-Dichloropropane	ND		ug/l	2.5	1.3	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	0.25	1
Bromobenzene	ND		ug/l	2.5	1.3	1
n-Butylbenzene	ND		ug/l	0.50	0.25	1
sec-Butylbenzene	ND		ug/l	0.50	0.25	1
tert-Butylbenzene	ND		ug/l	2.5	1.3	1
o-Chlorotoluene	ND		ug/l	2.5	1.3	1
p-Chlorotoluene	ND		ug/l	2.5	1.3	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	1.3	1
Hexachlorobutadiene	ND		ug/l	1.0	0.50	1
Isopropylbenzene	ND		ug/l	0.50	0.25	1
p-Isopropyltoluene	ND		ug/l	0.50	0.25	1
Naphthalene	ND		ug/l	2.5	1.3	1
n-Propylbenzene	ND		ug/l	0.50	0.25	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	1.3	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	1.3	1
1,3,5-Trimethylbenzene	ND		ug/l	2.5	1.3	1
1,2,4-Trimethylbenzene	ND		ug/l	2.5	1.3	1

07/25/11

ALPHA

Project Name: SUDBURY AOC A7 **Lab Number:** L1109548

Project Number: SUD010501 **Report Date:** 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-09 Date Collected: 06/28/11 18:35

Client ID: A7-RB Date Received: 06/28/11

Sample Location: SUDBURY, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	101		70-120
Toluene-d8	100		85-120
4-Bromofluorobenzene	99		75-120
Dibromofluoromethane	98		85-115

07/25/11

Project Name:	SUDBURY AOC A7	**Lab Number:**	L1109548
Project Number:	SUD010501	**Report Date:**	07/21/11

SAMPLE RESULTS

Lab ID:	L1109548-09	D	Date Collected:	06/28/11 18:35
Client ID:	A7-RB		Date Received:	06/28/11
Sample Location:	SUDBURY, MA.		Field Prep:	Not Specified
Matrix:	Water			
Analytical Method:	1,8260B			
Analytical Date:	07/12/11 11:36			
Analyst:	PD			

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Acetone	210		ug/l	25	13	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	100		70-120
Toluene-d8	99		85-120
4-Bromofluorobenzene	101		75-120
Dibromofluoromethane	98		85-115

ALPHA

07/25/11

Organochlorine Pesticides
SW-846 Method 8081A
Level II QC Review

Site: Former Fort Devens, MA – Sudbury AOC A7	SDG #: L1109548
Laboratory: Alpha Analytical Laboratories	Date: 07/21/11
HydroGeoLogic, Inc. Reviewer: Vanessa Colloca HGL Peer Reviewer: Denise Rivers (07/22/11)	Project: SUDO10501

Client Sample ID	Laboratory Sample ID	Analysis Batch	Matrix
OHM-A7-08	L1109548-01	WG476986	Groundwater
OHM-A7-09	L1109548-02	WG476986	Groundwater
OHM-A7-51	L1109548-03	WG476986	Groundwater
JO-A07-M62	L1109548-04	WG476986	Groundwater
SUD-A07-014	L1109548-05	WG476986	Groundwater
SUD-A07-065	*L1109548-06*	*WG476986*	*Groundwater*
A7-DUP1	L1109548-08	WG476986	Groundwater
A7-RB	L1109548-09	WG476986	Water QC

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No discrepancies were noted.

Qualification: None required.

Sample Delivery and Condition – All samples arrived intact at the laboratory, in acceptable condition and temperature, and were properly preserved. Proper custody was documented.

Qualification: None required.

Holding Times – All samples were extracted within the 7-day holding time required by the QAPP and analyzed within 40 days of extraction.

Qualification: None required.

Surrogates – All surrogate recoveries were within the control limits specified in the QAPP.

Qualification: None required.

Laboratory Control Sample – One LCS/LCSD pair was associated with all samples in this SDG. The LCS/LCSD for batch WG476986 met all %R and RPD control limits established in the QAPP.

Qualification: None required.

MS/MSD – Matrix spike/matrix spike duplicate analyses were performed on sample JO-A07-M62 from this SDG. All %R and RPD results were within the QAPP control limits.

Qualification: None required.

Method Blanks – One method blank was associated with all samples in this SDG. The method blank analyzed on 07/13/2011 for batch WG476986 was free from contamination.

Qualification: None required.

Equipment Blanks – One rinsate blank, identified as A7-RB, was associated with all samples in this SDG and was free from contamination.

Qualification: None required.

Field Duplicate – Sample A7-DUP1 was a field duplicate of sample OHM-A7-51. The calculated RPD for lindane (5.3%) was below the control limit established in the QAPP; all other results for the duplicate pair were non-detections.

Qualification: None required.

Compound Quantitation – Analyte non-detections were reported as "ND"; these results should be considered the equivalent of "RL U." Analyte detections below the RL were reported as J-qualified results. These J qualifiers were retained unless superseded by a more severe qualifier. According to the UFP-QAPP, all positive detections above the RL must be confirmed through analysis on a secondary column. Per the case narrative, the secondary column confirmation concentration for target pesticide 4,4'-DDE in sample OHM-A7-08 did not show good agreement with the reported (primary column) concentration. As a result, the laboratory assigned analyte 4,4'-DDE a non-standard P qualifier to denote the uncertainty of the value per the secondary column analysis; since 4,4'-DDE was already qualified J by the laboratory for a concentration between the MDL and RL, the P qualifier should be removed and no additional qualification was required.

***Qualification:* The non-standard P flag applied by the laboratory to the 4.4'-DDE result for sample OHM-A7-08 was removed.**

Qualification Summary Table (all concentrations in µg/L):

Sample	Analyte	Lab Value	Lab Qualifier	Validated Value	Validated Qualifier
OHM-A7-08	4,4'-DDE	0.021	J P	0.021	J
OHM-A7-09	No qualification required.				
OHM-A7-51	No qualification required.				
JO-A07-M62	No qualification required.				
SUD-A07-014	No qualification required.				
SUD-A07-065	No qualification required.				
A7-DUP1	No qualification required.				

Only environmental samples and field duplicates were included in the above table. MS/MSDs and field blanks are used to evaluate the sample data but are not qualified during the review process.

Project Name:	SUDBURY AOC A7	**Lab Number:**	L1109548
Project Number:	SUD010501	**Report Date:**	07/21/11

SAMPLE RESULTS

Lab ID:	L1109548-01	Date Collected:	06/28/11 15:10
Client ID:	OHM-A7-08	Date Received:	06/28/11
Sample Location:	SUDBURY, MA.	Field Prep:	Not Specified
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	1,8081A	Extraction Date:	07/05/11 01:02
Analytical Date:	07/13/11 16:13	Cleanup Method1:	EPA 3620B
Analyst:	JC	Cleanup Date1:	07/07/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Organochlorine Pesticides by GC - Westborough Lab						
Delta-BHC	ND		ug/l	0.020	0.010	1
Alpha-BHC	ND		ug/l	0.020	0.010	1
Beta-BHC	ND		ug/l	0.020	0.010	1
Heptachlor	ND		ug/l	0.020	0.010	1
Aldrin	ND		ug/l	0.020	0.010	1
Heptachlor epoxide	ND		ug/l	0.020	0.010	1
Endrin	ND		ug/l	0.040	0.020	1
Endrin aldehyde	ND		ug/l	0.040	0.020	1
Endrin ketone	ND		ug/l	0.040	0.020	1
Dieldrin	ND		ug/l	0.040	0.020	1
Endosulfan I	ND		ug/l	0.020	0.010	1
Endosulfan II	ND		ug/l	0.040	0.020	1
Endosulfan sulfate	ND		ug/l	0.040	0.020	1
Methoxychlor	ND		ug/l	0.200	0.100	1
Toxaphene	ND		ug/l	0.500	0.250	1
Hexachlorobenzene	ND		ug/l	0.020	0.010	1
cis-Chlordane	ND		ug/l	0.020	0.010	1
trans-Chlordane	ND		ug/l	0.020	0.010	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	61		25-140	A
Decachlorobiphenyl	49		30-135	A
2,4,5,6-Tetrachloro-m-xylene	60		25-140	B
Decachlorobiphenyl	81		30-135	B

07/25/11

Serial_No:07211112:27

Project Name:	SUDBURY AOC A7	**Lab Number:**	L1109548
Project Number:	SUD010501	**Report Date:**	07/21/11

SAMPLE RESULTS

Lab ID:	L1109548-01	Date Collected:	06/28/11 15:10
Client ID:	OHM-A7-08	Date Received:	06/28/11
Sample Location:	SUDBURY, MA	Field Prep:	Not Specified
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	1,8081A	Extraction Date:	07/05/11 01:02
Analytical Date:	07/13/11 16:13	Cleanup Method1:	EPA 3620B
Analyst:	JC	Cleanup Date1:	07/07/11

Parameter	*Result*	*Qualifier*	*Units*	*RL*	*MDL*	*Dilution Factor*
Organochlorine Pesticides by GC - Westborough Lab						
Lindane	0.332		ug/l	0.020	0.010	1
4,4'-DDE	0.021	~~JP~~ J	ug/l	0.040	0.020	1
4,4'-DDD	0.053		ug/l	0.040	0.020	1
4,4'-DDT	0.057		ug/l	0.040	0.020	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	61		25-140	A
Decachlorobiphenyl	49		30-135	A
2,4,5,6-Tetrachloro-m-xylene	60		25-140	B
Decachlorobiphenyl	81		30-135	B

DMC 07/25/11

ALPHA

Project Name:	SUDBURY AOC A7	**Lab Number:**	L1109548
Project Number:	SUD010501	**Report Date:**	07/21/11

SAMPLE RESULTS

Lab ID:	L1109548-02	Date Collected:	06/28/11 17:47
Client ID:	OHM-A7-09	Date Received:	06/28/11
Sample Location:	SUDBURY, MA.	Field Prep:	Not Specified
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	1,8081A	Extraction Date:	07/05/11 01:02
Analytical Date:	07/13/11 16:26	Cleanup Method1:	EPA 3620B
Analyst:	JC	Cleanup Date1:	07/07/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Organochlorine Pesticides by GC - Westborough Lab						
Delta-BHC	ND		ug/l	0.020	0.010	1
Lindane	ND		ug/l	0.020	0.010	1
Alpha-BHC	ND		ug/l	0.020	0.010	1
Beta-BHC	ND		ug/l	0.020	0.010	1
Heptachlor	ND		ug/l	0.020	0.010	1
Aldrin	ND		ug/l	0.020	0.010	1
Heptachlor epoxide	ND		ug/l	0.020	0.010	1
Endrin	ND		ug/l	0.040	0.020	1
Endrin aldehyde	ND		ug/l	0.040	0.020	1
Endrin ketone	ND		ug/l	0.040	0.020	1
Dieldrin	ND		ug/l	0.040	0.020	1
4,4'-DDE	ND		ug/l	0.040	0.020	1
4,4'-DDD	ND		ug/l	0.040	0.020	1
4,4'-DDT	ND		ug/l	0.040	0.020	1
Endosulfan I	ND		ug/l	0.020	0.010	1
Endosulfan II	ND		ug/l	0.040	0.020	1
Endosulfan sulfate	ND		ug/l	0.040	0.020	1
Methoxychlor	ND		ug/l	0.200	0.100	1
Toxaphene	ND		ug/l	0.500	0.250	1
Hexachlorobenzene	ND		ug/l	0.020	0.010	1
cis-Chlordane	ND		ug/l	0.020	0.010	1
trans-Chlordane	ND		ug/l	0.020	0.010	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	75		25-140	A
Decachlorobiphenyl	68		30-135	A
2,4,5,6-Tetrachloro-m-xylene	61		25-140	B
Decachlorobiphenyl	86		30-135	B

DMC 07/25/11

Project Name:	SUDBURY AOC A7	**Lab Number:**	L1109548
Project Number:	SUD010501	**Report Date:**	07/21/11

SAMPLE RESULTS

Lab ID:	L1109548-03	Date Collected:	06/28/11 17:05
Client ID:	OHM-A7-51	Date Received:	06/28/11
Sample Location:	SUDBURY, MA.	Field Prep:	Not Specified
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	1,8081A	Extraction Date:	07/05/11 01:02
Analytical Date:	07/13/11 16:39	Cleanup Method1:	EPA 3620B
Analyst:	JC	Cleanup Date1:	07/07/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Organochlorine Pesticides by GC - Westborough Lab						
Delta-BHC	ND		ug/l	0.020	0.010	1
Lindane	0.077		ug/l	0.020	0.010	1
Alpha-BHC	ND		ug/l	0.020	0.010	1
Beta-BHC	ND		ug/l	0.020	0.010	1
Heptachlor	ND		ug/l	0.020	0.010	1
Aldrin	ND		ug/l	0.020	0.010	1
Heptachlor epoxide	ND		ug/l	0.020	0.010	1
Endrin	ND		ug/l	0.040	0.020	1
Endrin aldehyde	ND		ug/l	0.040	0.020	1
Endrin ketone	ND		ug/l	0.040	0.020	1
Dieldrin	ND		ug/l	0.040	0.020	1
4,4'-DDE	ND		ug/l	0.040	0.020	1
4,4'-DDD	ND		ug/l	0.040	0.020	1
4,4'-DDT	ND		ug/l	0.040	0.020	1
Endosulfan I	ND		ug/l	0.020	0.010	1
Endosulfan II	ND		ug/l	0.040	0.020	1
Endosulfan sulfate	ND		ug/l	0.040	0.020	1
Methoxychlor	ND		ug/l	0.200	0.100	1
Toxaphene	ND		ug/l	0.500	0.250	1
Hexachlorobenzene	ND		ug/l	0.020	0.010	1
cis-Chlordane	ND		ug/l	0.020	0.010	1
trans-Chlordane	ND		ug/l	0.020	0.010	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	70		25-140	A
Decachlorobiphenyl	63		30-135	A
2,4,5,6-Tetrachloro-m-xylene	57		25-140	B
Decachlorobiphenyl	80		30-135	B

DMC 07/25/11

ALPHA

Project Name: SUDBURY AOC A7
Project Number: SUD010501
Lab Number: L1109548
Report Date: 07/21/11

SAMPLE RESULTS

Lab ID:	L1109548-04	Date Collected:	06/28/11 15:05
Client ID:	JO-A07-M62	Date Received:	06/28/11
Sample Location:	SUDBURY, MA	Field Prep:	Not Specified
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	1,8081A	Extraction Date:	07/05/11 01:02
Analytical Date:	07/13/11 16:52	Cleanup Method1:	EPA 3620B
Analyst:	JC	Cleanup Date1:	07/07/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Organochlorine Pesticides by GC - Westborough Lab						
Delta-BHC	ND		ug/l	0.020	0.010	1
Lindane	ND		ug/l	0.020	0.010	1
Alpha-BHC	ND		ug/l	0.020	0.010	1
Beta-BHC	ND		ug/l	0.020	0.010	1
Heptachlor	ND		ug/l	0.020	0.010	1
Aldrin	ND		ug/l	0.020	0.010	1
Heptachlor epoxide	ND		ug/l	0.020	0.010	1
Endrin	ND		ug/l	0.040	0.020	1
Endrin aldehyde	ND		ug/l	0.040	0.020	1
Endrin ketone	ND		ug/l	0.040	0.020	1
Dieldrin	ND		ug/l	0.040	0.020	1
4,4'-DDE	ND		ug/l	0.040	0.020	1
4,4'-DDD	ND		ug/l	0.040	0.020	1
4,4'-DDT	ND		ug/l	0.040	0.020	1
Endosulfan I	ND		ug/l	0.020	0.010	1
Endosulfan II	ND		ug/l	0.040	0.020	1
Endosulfan sulfate	ND		ug/l	0.040	0.020	1
Methoxychlor	ND		ug/l	0.200	0.100	1
Toxaphene	ND		ug/l	0.500	0.250	1
Hexachlorobenzene	ND		ug/l	0.020	0.010	1
cis-Chlordane	ND		ug/l	0.020	0.010	1
trans-Chlordane	ND		ug/l	0.020	0.010	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	78		25-140	A
Decachlorobiphenyl	71		30-135	A
2,4,5,6-Tetrachloro-m-xylene	61		25-140	B
Decachlorobiphenyl	86		30-135	B

DML 07/25/11

Serial_No:07211112:27

Project Name:	SUDBURY AOC A7	**Lab Number:**	L1109548
Project Number:	SUD010501	**Report Date:**	07/21/11

SAMPLE RESULTS

Lab ID:	L1109548-05	Date Collected:	06/28/11 11:25
Client ID:	SUD-A07-014	Date Received:	06/28/11
Sample Location:	SUDBURY, MA	Field Prep:	Not Specified
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	1,8081A	Extraction Date:	07/05/11 01:02
Analytical Date:	07/13/11 17:05	Cleanup Method1:	EPA 3620B
Analyst:	JC	Cleanup Date1:	07/07/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Organochlorine Pesticides by GC - Westborough Lab						
Delta-BHC	ND		ug/l	0.020	0.010	1
Lindane	ND		ug/l	0.020	0.010	1
Alpha-BHC	ND		ug/l	0.020	0.010	1
Beta-BHC	ND		ug/l	0.020	0.010	1
Heptachlor	ND		ug/l	0.020	0.010	1
Aldrin	ND		ug/l	0.020	0.010	1
Heptachlor epoxide	ND		ug/l	0.020	0.010	1
Endrin	ND		ug/l	0.040	0.020	1
Endrin aldehyde	ND		ug/l	0.040	0.020	1
Endrin ketone	ND		ug/l	0.040	0.020	1
Dieldrin	ND		ug/l	0.040	0.020	1
4,4'-DDE	ND		ug/l	0.040	0.020	1
4,4'-DDD	ND		ug/l	0.040	0.020	1
4,4'-DDT	ND		ug/l	0.040	0.020	1
Endosulfan I	ND		ug/l	0.020	0.010	1
Endosulfan II	ND		ug/l	0.040	0.020	1
Endosulfan sulfate	ND		ug/l	0.040	0.020	1
Methoxychlor	ND		ug/l	0.200	0.100	1
Toxaphene	ND		ug/l	0.500	0.250	1
Hexachlorobenzene	ND		ug/l	0.020	0.010	1
cis-Chlordane	ND		ug/l	0.020	0.010	1
trans-Chlordane	ND		ug/l	0.020	0.010	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	81		25-140	A
Decachlorobiphenyl	72		30-135	A
2,4,5,6-Tetrachloro-m-xylene	67		25-140	B
Decachlorobiphenyl	92		30-135	B

Dm 07/25/11

Project Name:	SUDBURY AOC A7	**Lab Number:**	L1109548
Project Number:	SUD010501	**Report Date:**	07/21/11

SAMPLE RESULTS

Lab ID:	L1109548-06	Date Collected:	06/28/11 12:28
Client ID:	SUD-A07-065	Date Received:	06/28/11
Sample Location:	SUDBURY, MA	Field Prep:	Not Specified
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	1,8081A	Extraction Date:	07/05/11 01:02
Analytical Date:	07/13/11 17:18	Cleanup Method1:	EPA 3620B
Analyst:	JC	Cleanup Date1:	07/07/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Organochlorine Pesticides by GC - Westborough Lab						
Delta-BHC	ND		ug/l	0.020	0.010	1
Lindane	0.161		ug/l	0.020	0.010	1
Alpha-BHC	ND		ug/l	0.020	0.010	1
Beta-BHC	ND		ug/l	0.020	0.010	1
Heptachlor	ND		ug/l	0.020	0.010	1
Aldrin	ND		ug/l	0.020	0.010	1
Heptachlor epoxide	ND		ug/l	0.020	0.010	1
Endrin	ND		ug/l	0.040	0.020	1
Endrin aldehyde	ND		ug/l	0.040	0.020	1
Endrin ketone	ND		ug/l	0.040	0.020	1
Dieldrin	ND		ug/l	0.040	0.020	1
4,4'-DDE	ND		ug/l	0.040	0.020	1
4,4'-DDD	ND		ug/l	0.040	0.020	1
4,4'-DDT	ND		ug/l	0.040	0.020	1
Endosulfan I	ND		ug/l	0.020	0.010	1
Endosulfan II	ND		ug/l	0.040	0.020	1
Endosulfan sulfate	ND		ug/l	0.040	0.020	1
Methoxychlor	ND		ug/l	0.200	0.100	1
Toxaphene	ND		ug/l	0.500	0.250	1
Hexachlorobenzene	ND		ug/l	0.020	0.010	1
cis-Chlordane	ND		ug/l	0.020	0.010	1
trans-Chlordane	ND		ug/l	0.020	0.010	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	74		25-140	A
Decachlorobiphenyl	63		30-135	A
2,4,5,6-Tetrachloro-m-xylene	64		25-140	B
Decachlorobiphenyl	87		30-135	B

07/25/11

Serial_No:07211112:27

Project Name:	SUDBURY AOC A7	**Lab Number:**	L1109548
Project Number:	SUD010501	**Report Date:**	07/21/11

SAMPLE RESULTS

Lab ID:	L1109548-08	Date Collected:	06/28/11 16:30
Client ID:	A7-DUP1	Date Received:	06/28/11
Sample Location:	SUDBURY, MA	Field Prep:	Not Specified
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	1,8081A	Extraction Date:	07/05/11 01:02
Analytical Date:	07/13/11 17:31	Cleanup Method1:	EPA 3620B
Analyst:	JC	Cleanup Date1:	07/07/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Organochlorine Pesticides by GC - Westborough Lab						
Delta-BHC	ND		ug/l	0.020	0.010	1
Lindane	0.073		ug/l	0.020	0.010	1
Alpha-BHC	ND		ug/l	0.020	0.010	1
Beta-BHC	ND		ug/l	0.020	0.010	1
Heptachlor	ND		ug/l	0.020	0.010	1
Aldrin	ND		ug/l	0.020	0.010	1
Heptachlor epoxide	ND		ug/l	0.020	0.010	1
Endrin	ND		ug/l	0.040	0.020	1
Endrin aldehyde	ND		ug/l	0.040	0.020	1
Endrin ketone	ND		ug/l	0.040	0.020	1
Dieldrin	ND		ug/l	0.040	0.020	1
4,4'-DDE	ND		ug/l	0.040	0.020	1
4,4'-DDD	ND		ug/l	0.040	0.020	1
4,4'-DDT	ND		ug/l	0.040	0.020	1
Endosulfan I	ND		ug/l	0.020	0.010	1
Endosulfan II	ND		ug/l	0.040	0.020	1
Endosulfan sulfate	ND		ug/l	0.040	0.020	1
Methoxychlor	ND		ug/l	0.200	0.100	1
Toxaphene	ND		ug/l	0.500	0.250	1
Hexachlorobenzene	ND		ug/l	0.020	0.010	1
cis-Chlordane	ND		ug/l	0.020	0.010	1
trans-Chlordane	ND		ug/l	0.020	0.010	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	70		25-140	A
Decachlorobiphenyl	57		30-135	A
2,4,5,6-Tetrachloro-m-xylene	55		25-140	B
Decachlorobiphenyl	77		30-135	B

07/25/11

ALPHA

Serial_No:07211112:27

Project Name:	SUDBURY AOC A7	**Lab Number:**	L1109548
Project Number:	SUD010501	**Report Date:**	07/21/11

SAMPLE RESULTS

Lab ID:	L1109548-09	Date Collected:	06/28/11 18:35
Client ID:	A7-RB	Date Received:	06/28/11
Sample Location:	SUDBURY, MA	Field Prep:	Not Specified
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	1,8081A	Extraction Date:	07/05/11 01:02
Analytical Date:	07/13/11 17:44	Cleanup Method1:	EPA 3620B
Analyst:	JC	Cleanup Date1:	07/07/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Organochlorine Pesticides by GC - Westborough Lab						
Delta-BHC	ND		ug/l	0.020	0.010	1
Lindane	ND		ug/l	0.020	0.010	1
Alpha-BHC	ND		ug/l	0.020	0.010	1
Beta-BHC	ND		ug/l	0.020	0.010	1
Heptachlor	ND		ug/l	0.020	0.010	1
Aldrin	ND		ug/l	0.020	0.010	1
Heptachlor epoxide	ND		ug/l	0.020	0.010	1
Endrin	ND		ug/l	0.040	0.020	1
Endrin aldehyde	ND		ug/l	0.040	0.020	1
Endrin ketone	ND		ug/l	0.040	0.020	1
Dieldrin	ND		ug/l	0.040	0.020	1
4,4'-DDE	ND		ug/l	0.040	0.020	1
4,4'-DDD	ND		ug/l	0.040	0.020	1
4,4'-DDT	ND		ug/l	0.040	0.020	1
Endosulfan I	ND		ug/l	0.020	0.010	1
Endosulfan II	ND		ug/l	0.040	0.020	1
Endosulfan sulfate	ND		ug/l	0.040	0.020	1
Methoxychlor	ND		ug/l	0.200	0.100	1
Toxaphene	ND		ug/l	0.500	0.250	1
Hexachlorobenzene	ND		ug/l	0.020	0.010	1
cis-Chlordane	ND		ug/l	0.020	0.010	1
trans-Chlordane	ND		ug/l	0.020	0.010	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	76		25-140	A
Decachlorobiphenyl	52		30-135	A
2,4,5,6-Tetrachloro-m-xylene	60		25-140	B
Decachlorobiphenyl	66		30-135	B

07/21/11

Total Metals
SW-846 Methods 6010B (Total Metals)
SW-846 Method 7470A (Mercury)
Level II Review

Site: Former Fort Devens, MA – Sudbury AOC A7	SDG #: L1109548
Laboratory: Alpha Analytical Laboratories	Date: 07/21/11
HydroGeoLogic, Inc. Reviewer: Vanessa Colloca HGL Peer Reviewer: Denise Rivers (07/25/11)	Project: SUDO10501

Client Sample ID	Laboratory Sample ID	Analysis Batch	Matrix
OHM-A7-08	L1109548-01	WG477896; WG477704	Groundwater
OHM-A7-09	L1109548-02	WG477896; WG477704	Groundwater
OHM-A7-51	L1109548-03	WG477896; WG477704	Groundwater
JO-A07-M62	L1109548-04	WG477896; WG477704	Groundwater
SUD-A07-014	L1109548-05	WG477896; WG477704	Groundwater
SUD-A07-065	L1109548-06	WG477896; WG477704	Groundwater
A7-DUP1	L1109548-08	WG477896; WG477704	Groundwater
A7-RB	L1109548-09	WG477896; WG477704	Water QC

Narrative and Completeness Review – The case narrative and data package were checked for completeness. No discrepancies were noted.

Qualification: None required.

Sample Delivery and Condition – All samples arrived intact at the laboratory, in acceptable condition and temperature, and were properly preserved. Proper custody was documented.

Qualification: None required.

Holding Times – All samples were analyzed within the six-month (total metals) and 28-day (mercury) holding times required by the QAPP for preserved water samples.

Qualification: None required.

Laboratory Duplicate – Laboratory duplicate analyses were not requested or performed on a sample from this SDG.

Qualification: None required.

Laboratory Control Sample – Two LCSs were associated with all samples in this SDG and were analyzed as follows: on 07/08/11 for batch WG477704 (Method 7470A) and on 07/13/11 for batch WG477896 (Method 6010B). Both LCSs met the %R control limits established in the QAPP.

Qualification: None required.

MS/MSD – Matrix spike analyses were performed for all total metals and mercury on sample JO-A07-M62 from this SDG. All %R and RPD results were within the QAPP control limits.

Qualification: None required.

Method Blank – Two method blanks were associated with all samples in this SDG and were analyzed as follows: on 07/08/11 for batch WG477704 (Method 7470A) and on 07/13/11 for batch WG477896 (Method 6010B). Both blanks were free from contamination.

Qualification: None required.

Equipment Blanks – One equipment blank, identified as A7-RB, was associated with all samples in this SDG and was free from contamination.

Qualification: None required.

Field Duplicate – Sample A7-DUP1 was a field duplicate of sample OHM-A7-51. The calculated RPDs for total iron (0.0%) and total manganese (8.3%) were below the QC criteria stated in the QAPP; all other results for the duplicate pair were non-detections.

Qualification: None required.

Compound Quantitation – Analyte non-detections were reported as "ND"; these results should be considered the equivalent of "RL U." Analyte detections below the RL were reported as J-qualified results. These J qualifiers were retained unless superseded by a more severe qualifier. The arsenic concentration units for sample OHM-A7-09 were reported incorrectly as µg/L on the sample results form; as confirmed by the laboratory on 07/25/11, the correct units should be mg/L.

Qualification: None required.

Qualification Summary Table (all concentrations in mg/L):

Sample	Analyte	Lab Value	Lab Qualifier	Validated Value	Validated Qualifier
OHM-A7-08	No qualification required.				
OHM-A7-09	No qualification required.				
OHM-A7-51	No qualification required.				
JO-A07-M62	No qualification required.				
SUD-A07-014	No qualification required.				
SUD-A07-065	No qualification required.				
A7-DUP1	No qualification required.				

Only environmental samples and field duplicates were included in the above table. MS/MSDs and field blanks are used to evaluate the sample data but are not qualified during the review process.

Project Name: SUDBURY AOC A7
Project Number: SUD010501
Lab Number: L1109548
Report Date: 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-01
Client ID: OHM-A7-08
Sample Location: SUDBURY, MA.
Matrix: Water
Date Collected: 06/28/11 15:10
Date Received: 06/28/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Westborough Lab											
Arsenic, Total	ND		mg/l	0.005	0.003	1	07/07/11 13:48	07/13/11 11:19	EPA 3005A	1,6010B	AI
Barium, Total	0.042		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:19	EPA 3005A	1,6010B	AI
Cadmium, Total	ND		mg/l	0.005	0.003	1	07/07/11 13:48	07/13/11 11:19	EPA 3005A	1,6010B	AI
Chromium, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:19	EPA 3005A	1,6010B	AI
Copper, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:19	EPA 3005A	1,6010B	AI
Iron, Total	0.23		mg/l	0.05	0.03	1	07/07/11 13:48	07/13/11 11:19	EPA 3005A	1,6010B	AI
Lead, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:19	EPA 3005A	1,6010B	AI
Manganese, Total	0.294		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:19	EPA 3005A	1,6010B	AI
Mercury, Total	ND		mg/l	0.0002	0.0001	1	07/07/11 15:40	07/08/11 12:48	EPA 7470A	1,7470A	AH
Selenium, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:19	EPA 3005A	1,6010B	AI
Silver, Total	ND		mg/l	0.007	0.004	1	07/07/11 13:48	07/13/11 11:19	EPA 3005A	1,6010B	AI

07/25/11

Project Name:	SUDBURY AOC A7	**Lab Number:**	L1109548
Project Number:	SUD010501	**Report Date:**	07/21/11

SAMPLE RESULTS

Lab ID:	L1109548-02	Date Collected:	06/28/11 17:47
Client ID:	OHM-A7-09	Date Received:	06/28/11
Sample Location:	SUDBURY, MA	Field Prep:	Not Specified
Matrix:	Water		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Westborough Lab											
Arsenic, Total	ND		ug/l	0.005	0.003	1	07/07/11 13:48	07/13/11 11:22	EPA 3005A	1,6010B	AI
Barium, Total	0.005	J	mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:22	EPA 3005A	1,6010B	AI
Cadmium, Total	ND		mg/l	0.005	0.003	1	07/07/11 13:48	07/13/11 11:22	EPA 3005A	1,6010B	AI
Chromium, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:22	EPA 3005A	1,6010B	AI
Copper, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:22	EPA 3005A	1,6010B	AI
Iron, Total	0.55		mg/l	0.05	0.03	1	07/07/11 13:48	07/13/11 11:22	EPA 3005A	1,6010B	AI
Lead, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:22	EPA 3005A	1,6010B	AI
Manganese, Total	0.890		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:22	EPA 3005A	1,6010B	AI
Mercury, Total	ND		mg/l	0.0002	0.0001	1	07/07/11 15:40	07/08/11 12:50	EPA 7470A	1,7470A	AH
Selenium, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:22	EPA 3005A	1,6010B	AI
Silver, Total	ND		mg/l	0.007	0.004	1	07/07/11 13:48	07/13/11 11:22	EPA 3005A	1,6010B	AI

07/25/11

Project Name: SUDBURY AOC A7
Project Number: SUD010501
Lab Number: L1109548
Report Date: 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-03
Client ID: OHM-A7-51
Sample Location: SUDBURY, MA
Matrix: Water

Date Collected: 06/28/11 17:05
Date Received: 06/28/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Westborough Lab											
Arsenic, Total	ND		mg/l	0.005	0.003	1	07/07/11 13:48	07/13/11 11:25	EPA 3005A	1,6010B	AI
Barium, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:25	EPA 3005A	1,6010B	AI
Cadmium, Total	ND		mg/l	0.005	0.003	1	07/07/11 13:48	07/13/11 11:25	EPA 3005A	1,6010B	AI
Chromium, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:25	EPA 3005A	1,6010B	AI
Copper, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:25	EPA 3005A	1,6010B	AI
Iron, Total	0.078		mg/l	0.050	0.025	1	07/07/11 13:48	07/13/11 11:25	EPA 3005A	1,6010B	AI
Lead, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:25	EPA 3005A	1,6010B	AI
Manganese, Total	0.025		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:25	EPA 3005A	1,6010B	AI
Mercury, Total	ND		mg/l	0.0002	0.0001	1	07/07/11 15:40	07/08/11 12:52	EPA 7470A	1,7470A	AH
Selenium, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:25	EPA 3005A	1,6010B	AI
Silver, Total	ND		mg/l	0.007	0.004	1	07/07/11 13:48	07/13/11 11:25	EPA 3005A	1,6010B	AI

07/25/11

Project Name:	SUDBURY AOC A7	**Lab Number:**	L1109548
Project Number:	SUD010501	**Report Date:**	07/21/11

SAMPLE RESULTS

Lab ID:	L1109548-04	Date Collected:	06/28/11 15:05
Client ID:	JO-A07-M62	Date Received:	06/28/11
Sample Location:	SUDBURY, MA.	Field Prep:	Not Specified
Matrix:	Water		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Westborough Lab											
Arsenic, Total	ND		mg/l	0.005	0.003	1	07/07/11 13:48	07/13/11 10:40	EPA 3005A	1,6010B	AI
Barium, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:40	EPA 3005A	1,6010B	AI
Cadmium, Total	ND		mg/l	0.005	0.003	1	07/07/11 13:48	07/13/11 10:40	EPA 3005A	1,6010B	AI
Chromium, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:40	EPA 3005A	1,6010B	AI
Copper, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:40	EPA 3005A	1,6010B	AI
Iron, Total	0.061		mg/l	0.050	0.025	1	07/07/11 13:48	07/13/11 10:40	EPA 3005A	1,6010B	AI
Lead, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:40	EPA 3005A	1,6010B	AI
Manganese, Total	0.008	J	mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:40	EPA 3005A	1,6010B	AI
Mercury, Total	ND		mg/l	0.0002	0.0001	1	07/07/11 15:40	07/08/11 12:54	EPA 7470A	1,7470A	AH
Selenium, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:40	EPA 3005A	1,6010B	AI
Silver, Total	ND		mg/l	0.007	0.004	1	07/07/11 13:48	07/13/11 10:40	EPA 3005A	1,6010B	AI

07/25/11

ALPHA

Project Name: SUDBURY AOC A7
Project Number: SUD010501
Lab Number: L1109548
Report Date: 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-05
Client ID: SUD-A07-014
Sample Location: SUDBURY, MA.
Matrix: Water

Date Collected: 06/28/11 11:25
Date Received: 06/28/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Westborough Lab											
Arsenic, Total	ND		mg/l	0.005	0.003	1	07/07/11 13:48	07/13/11 10:51	EPA 3005A	1,6010B	AI
Barium, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:51	EPA 3005A	1,6010B	AI
Cadmium, Total	ND		mg/l	0.005	0.003	1	07/07/11 13:48	07/13/11 10:51	EPA 3005A	1,6010B	AI
Chromium, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:51	EPA 3005A	1,6010B	AI
Copper, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:51	EPA 3005A	1,6010B	AI
Iron, Total	ND		mg/l	0.050	0.025	1	07/07/11 13:48	07/13/11 10:51	EPA 3005A	1,6010B	AI
Lead, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:51	EPA 3005A	1,6010B	AI
Manganese, Total	0.008	J	mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:51	EPA 3005A	1,6010B	AI
Mercury, Total	ND		mg/l	0.0002	0.0001	1	07/07/11 15:40	07/08/11 13:00	EPA 7470A	1,7470A	AH
Selenium, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:51	EPA 3005A	1,6010B	AI
Silver, Total	ND		mg/l	0.007	0.004	1	07/07/11 13:48	07/13/11 10:51	EPA 3005A	1,6010B	AI

DM
07/25/11

Project Name: SUDBURY AOC A7
Project Number: SUD010501
Lab Number: L1109548
Report Date: 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-06
Client ID: SUD-A07-065
Sample Location: SUDBURY, MA.
Matrix: Water

Date Collected: 06/28/11 12:28
Date Received: 06/28/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Westborough Lab											
Arsenic, Total	ND		mg/l	0.005	0.003	1	07/07/11 13:48	07/13/11 10:54	EPA 3005A	1,6010B	AI
Barium, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:54	EPA 3005A	1,6010B	AI
Cadmium, Total	ND		mg/l	0.005	0.003	1	07/07/11 13:48	07/13/11 10:54	EPA 3005A	1,6010B	AI
Chromium, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:54	EPA 3005A	1,6010B	AI
Copper, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:54	EPA 3005A	1,6010B	AI
Iron, Total	0.44		mg/l	0.05	0.03	1	07/07/11 13:48	07/13/11 10:54	EPA 3005A	1,6010B	AI
Lead, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:54	EPA 3005A	1,6010B	AI
Manganese, Total	0.279		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:54	EPA 3005A	1,6010B	AI
Mercury, Total	ND		mg/l	0.0002	0.0001	1	07/07/11 15:40	07/08/11 13:01	EPA 7470A	1,7470A	AH
Selenium, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:54	EPA 3005A	1,6010B	AI
Silver, Total	ND		mg/l	0.007	0.004	1	07/07/11 13:48	07/13/11 10:54	EPA 3005A	1,6010B	AI

DMR
07/25/11

Project Name: SUDBURY AOC A7 **Lab Number:** L1109548

Project Number: SUD010501 **Report Date:** 07/21/11

SAMPLE RESULTS

Lab ID: L1109548-08 Date Collected: 06/28/11 16:30

Client ID: A7-DUP1 Date Received: 06/28/11

Sample Location: SUDBURY, MA Field Prep: Not Specified

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Westborough Lab											
Arsenic, Total	ND		mg/l	0.005	0.003	1	07/07/11 13:48	07/13/11 10:57	EPA 3005A	1,6010B	AI
Barium, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:57	EPA 3005A	1,6010B	AI
Cadmium, Total	ND		mg/l	0.005	0.003	1	07/07/11 13:48	07/13/11 10:57	EPA 3005A	1,6010B	AI
Chromium, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:57	EPA 3005A	1,6010B	AI
Copper, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:57	EPA 3005A	1,6010B	AI
Iron, Total	0.078		mg/l	0.050	0.025	1	07/07/11 13:48	07/13/11 10:57	EPA 3005A	1,6010B	AI
Lead, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:57	EPA 3005A	1,6010B	AI
Manganese, Total	0.023		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:57	EPA 3005A	1,6010B	AI
Mercury, Total	ND		mg/l	0.0002	0.0001	1	07/07/11 15:40	07/08/11 13:03	EPA 7470A	1,7470A	AH
Selenium, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 10:57	EPA 3005A	1,6010B	AI
Silver, Total	ND		mg/l	0.007	0.004	1	07/07/11 13:48	07/13/11 10:57	EPA 3005A	1,6010B	AI

DM
07/25/11

Project Name:	SUDBURY AOC A7	**Lab Number:**	L1109548
Project Number:	SUD010501	**Report Date:**	07/21/11

SAMPLE RESULTS

Lab ID:	L1109548-09	Date Collected:	06/28/11 18:35
Client ID:	A7-RB	Date Received:	06/28/11
Sample Location:	SUDBURY, MA	Field Prep:	Not Specified
Matrix:	Water		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Westborough Lab											
Arsenic, Total	ND		mg/l	0.005	0.003	1	07/07/11 13:48	07/13/11 11:16	EPA 3005A	1,6010B	AI
Barium, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:16	EPA 3005A	1,6010B	AI
Cadmium, Total	ND		mg/l	0.005	0.003	1	07/07/11 13:48	07/13/11 11:16	EPA 3005A	1,6010B	AI
Chromium, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:16	EPA 3005A	1,6010B	AI
Copper, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:16	EPA 3005A	1,6010B	AI
Iron, Total	ND		mg/l	0.050	0.025	1	07/07/11 13:48	07/13/11 11:16	EPA 3005A	1,6010B	AI
Lead, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:16	EPA 3005A	1,6010B	AI
Manganese, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:16	EPA 3005A	1,6010B	AI
Mercury, Total	ND		mg/l	0.0002	0.0001	1	07/07/11 15:40	07/08/11 13:09	EPA 7470A	1,7470A	AH
Selenium, Total	ND		mg/l	0.010	0.005	1	07/07/11 13:48	07/13/11 11:16	EPA 3005A	1,6010B	AI
Silver, Total	ND		mg/l	0.007	0.004	1	07/07/11 13:48	07/13/11 11:16	EPA 3005A	1,6010B	AI

DM
07/25/11