FINAL

SHEPLEY'S HILL LANDFILL SUPPLEMENTAL GROUNDWATER AND LANDFILL CAP ASSESSMENT FOR LONG-TERM MONITORING AND MAINTENANCE – ADDENDUM REPORT

SHEPLEY'S HILL LANDFILL

FORMER FORT DEVENS ARMY INSTALLATION, DEVENS, MA

AUGUST 2011

BOOK 1 OF 4

Prepared for:
US Army Corp of Engineers
New England District
Concord, Massachusetts

Prepared by:
Sovereign Consulting Inc.
Contract No.: W912WJ-10-D-0003
Delivery Order: 0002

TRANSMITTAL MEMO

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To	Ginny Lombardo – USEPA	CD / Attachments
	David Chaffin – MADEP	CD / Attachments
	Hui Liang – MADEP	CD / Attachments
	Carolyn L. McCreary – Ayer Board of Selectmen	CD / Attachments
	James R. Greacen – Mabbett & Associates, Inc.	CD / Attachments
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	Marc Cicalese – Sovereign Consulting	CD / Attachments
	Ron Ostrowski – Mass Development (including 1 copy to Haley & Aldrich)	CD / Attachments

Date 19 August 2011

Subject: **Shepley's Hill Landfill – Supplemental Groundwater and Landfill Cap Assessment for Long-term Monitoring and Maintenance Addendum Report (Final Version)**
Contract Number GS-10F-0230J, Delivery Order W912WJ-05-F-0037

On behalf of the US Army Corps of Engineers (USACE) New England District and the Army BRAC Environmental Office at Devens, Sovereign is pleased to provide the following attachments:

1. CD
2. Binder Cover Pages and Spines
3. Replacement Report Text
4. Replacement Figure 30
5. Insert to Supplement Appendix I
6. Insert to Supplement Appendix K

These items are provided to update the May 2011 version of the Shepley's Hill Landfill Supplemental Groundwater and Landfill Cap Assessment for Long-term Monitoring and maintenance Addendum Report.

Please contact Bob Simeone or myself, if there are questions regarding the attachments

Sincerely

Philip D McBain, LSP
Project Manager

Enclosure: As noted above

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	Ron Ostrowski – Mass Development	CD / Attachments
	Marc Cicalese – Sovereign Consulting (including 1 copy to Haley & Aldrich)	CD / Attachments

Date 6 June 2011

Subject: **Shepley's Hill Landfill – Supplemental Groundwater and Landfill Cap Assessment for Long-term Monitoring and Maintenance Addendum Report (Army Draft)**
Contract Number GS-10F-0230J, Delivery Order W912WJ-05-F-0037

On behalf of the US Army Corps of Engineers (USACE) New England District and the Army BRAC Environmental Office at Devens, Sovereign is pleased to provide the following attachments:

1. CD
2. Binder Cover Pages and Spines
3. Replacement Report Text
4. Replacement Figures (2-28, 45, and 55-57)
5. Replacement Table 2 and Table 7
6. Insert to Supplement Appendix I
7. New Appendix K
8. New Appendix L

These items are provided to update the December 2010 version of the Shepley's Hill Landfill Supplemental Groundwater and Landfill Cap Assessment for Long-term Monitoring and maintenance Addendum Report.

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TRANSMITTAL MEMO

Please contact Bob Simeone or myself, if there are questions regarding the attachments

Sincerely

Philip D McBain, LSP
Project Manager

Enclosure: Shepley's Hill Landfill Supplemental Groundwater and Landfill Cap Assessment for Long-term Monitoring and Maintenance Addendum Report, May 2011.

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Army Response to MassDEP Comments dated 30 June 2011

On

DRAFT FINAL SHEPLEY'S HILL LANDFILL SUPPLEMENTAL GROUNDWATER AND LANDFILL CAP ASSESSMENT FOR LONG-TERM MONITORING AND MAINTENANCE – ADDENDUM REPORT

Former Fort Devens Army Installation

August 5 2011

1. Section 5.1: To address the discrepancies with the presumed bedrock depths acknowledged here (refer to MassDEP Comments 1 and 9 on the draft report), the Army agreed during the May 19, 2011 BCT meeting to install a monitoring well transect across Nonacoicus Brook in the vicinity of temporary well SHM-10-08. The well drilling method used to install the wells will be capable of confirming the presence of an east-west trending bedrock trough beneath the brook. Well screens will be placed at depths appropriate to serve as long-term monitoring points and sentinel well between the site and the MacPherson water supply well.

   Response: *Such changes or enhancements to the current groundwater LTM network will be performed pending implementation of an updated remedy for SHL.*

2. Section 6.3: The supplemental analysis provided here does not strengthen the hypothesis that arsenic precipitates along a "redox boundary" in the vicinity of Nonacoicus Brook; valid alternative hypotheses remain (refer to MassDEP Comment 2 on the draft report):

   - The configured cross-sections C-C' and D-D' do not demonstrate that the plume terminated south of cross-section C-C'. An almost 200-foot gap through which the plume could extend to the northwest separates wells SHM-10-20 and SHM-10-26 on cross-section C-C'.

   - The results from the 2010 field effort indicate that vertical flow and discharge to Nonacoicus Brook and adjacent wetlands, rather than precipitation along a "redox boundary", may explain the observed arsenic distribution. In particular, cross sections D-D' and F-F' indicate that the plume may ascend from depth to discharge points in Nonacoicus Brook and the adjacent wetlands (note the upward trajectory of the plume core between wells SHM-10-27 and SHM-10-21 in Figure 9 and between SHM-10-23 and SHM-10-19 in Figure 11).

   Rather than undertaking additional studies in an attempt to obtain conclusive results, which may not be feasible due to the complex geochemical conditions in the vicinity of Nonacoicus Brook, the Army agreed during the May 19, 2011 BCT meeting to implement a surface water and groundwater monitoring program that includes periodic collection and analysis of surface water samples from the portion of the brook where discharge of site-impacted groundwater may occur and installation of periodic sampling of a monitoring wells transect across Nonacoicus Brook in the vicinity of temporary well SHM-10-08 (refer to previous comment).

<u>Response</u>: The Army respectively disagrees. In regards to the 200-foot gab cited between SHM-10-20 and SHM-10-26, the wells SHM-10-21, SHM-10-10, and SHM-10-22 are located between this gap, but located along the upgradient D-D' cross-section line. The highest concentration reported within the profiling samples reported an arsenic concentration of 349-ug/l (SHM-10-21 at 41-foot sampling depth). The remaining two locations reported arsenic concentrations less than 2.5-ug/l. Higher concentrations of Arsenic were reported within wells SHM-10-21, SHM-19, and SHM-10-17, which are east of this gap, and evaluated by the downgradient wells SHM-10-20 and SHM-10-18. These wells indicate a reduction in the dissolved arsenic concentrations from a high of 1,860-ug/l (D-D' line in well SHM-10-17) to a concentration of 429-ug/l (C-C' line in well SHM-10-20).

Bedrock contouring also plays a part in this upward trend reflected in Figures 9 and 10. Next, surface water and sediment sampling conducted by Harding in 2002 and AMEC in 2007 show no conclusive evidence that SHL is a source of a surface water / sediment impact. Each of these two sampling programs reported the highest arsenic concentrations within samples obtained from the upstream Sawmill Brook sampling points. Future surface water / sediment sampling will be performed periodically to confirm these results pending implementation of an updated remedy for SHL.

3. Section 6.4.2.2: The supplemental analysis presented here does not strengthen the hypothesis that the wetlands that were buried beneath the landfill acted as a significant source of dissolved carbon or dissolved arsenic contamination before the landfill was constructed (refer to MassDEP Comment 3 on the draft report). While the cited literature indicates that the geochemical conditions associated with wetlands and peat are generally reducing, the presence of peat is not sufficient to demonstrate a significant groundwater impact attributable to a wetland: the presence of a pre-existing flow regime that transported reducing groundwater from those wetlands to a significant portion of the underlying and downgradient aquifer is also necessary. The report does not include such a demonstration. Further, the cited literature concerning conditions in Bangladesh appears to be more representative of current site conditions than pre-landfill condition; the situation in Bangladesh involves peat that was buried, not peat in existing wetland, and therefore reveals little about the pre-landfill conditions at Devens. In summary, the pre-landfill impacts of the now-buried wetlands are not known and the potential impacts on the remedial alternatives are not known. In particular, the claim that landfill removal would only reduce carbon input by 25 to 50 percent is not reliable.

<u>Response</u>: The Army respectively disagrees with MassDEPs opinion. The fact that peat formed at the site mandates that reducing conditions exist (and existed at the site). Peat

cannot form under oxidative conditions, which was the point of citing the textbook and research references. This is not a site-specific phenomena but a proven scientific fact. While it is impossible to prove through sampling or other investigative methods the methods of arsenic migration in the subsurface prior to the landfill placement, the existence of peat necessitates reducing conditions. The presence of reducing conditions coupled with the presence of arsenic in aquifer sands documented through this and other studies by the Army, USEPA and MassDEP indicates that arsenic mobilization must have occurred during these times. This transport mechanism and site model is exhaustively documented in scientific literature. Moreover the peat deposits were not at the original, pre-landfill, ground surface. Rather, as noted in the literature they were buried beneath the wetland and wetland sediments which again is a requirement for their formation.

4. Section 8.2: The suggestion that wetlands located north of the site contribute to conditions that have mobilized and will continue to mobilize arsenic is inconsistent with data presented in the report. For example, arsenic concentrations in the shallow groundwater samples collected in and near the wetlands associated with Nonacoicus Brook did not exceed 10-ug/l (e.g., Figure 6 and 11). Similarly, arsenic concentrations in shallow groundwater samples recently collected from SHM-99-31A, located in or immediately downgradient of the wetland located between the north end of the landfill and Molumco Road, did not exceed 25 ug/l (refer to 2010 Annual Report).

   <u>Response</u>: This comment is similar to that posed by the EPA in the BCT meeting in that they observed strongly reducing conditions at Plow Shop Pond but found little arsenic in solution. The reason for this is as follows:

   - *Arsenic concentrations are considerably lower in the sands north of the landfill. As noted recently by the EPA and Gannet Fleming, arsenic enrichment of the sands occurs from weathering of arsenopyrite in bedrock in Shepley's Hill. This is the probable source of arsenic enrichment in the area and occurs primarily in the center of the landfill where the highest arsenic concentrations are found.*

   - *Sulfate reduction to sulfide also limits arsenic solubility at the site. Under strongly reducing conditions arsenic sulfides form which have been found in the form of framboidal pyrite (enriched in arsenic) throughout the site. Arsenic variability is to be expected due to the geologic origin of arsenic and the resulting solubility controls. The revised CSM addresses this issue.*

5. *In addition abundant literature, now noted in the revised SAR demonstrates that peat and wetlands will mobilize arsenic to varying but often high concentrations of arsenic (see revised SAR, Section 6).*Figure 7: To avoid potential misunderstandings about the eastern extent of the contaminant plume near the north end of the landfill, the results from well SHM-10-06A should be replaced with the results from well SHM-10-06, or a footnote should be added to the figure for clarify the situation. Arsenic was reported with concentrations exceeding

1,500-ug/l in the samples collected from well SHM-10-06, which was located less than 100-feet wet of well SHM-10-06A, where the maximum sample concentration was 94 ug/l.

Response: Comment noted. However no change to the figure is required. The section locations and nearby well concentrations are indicated in Figure 3.

Email Message from Ginny Lombardo, USEPA dated 29 June 2011

Subject: MNA for North Impact Area and Draft Final SRI Report.

I finally had the chance to follow-up with Bryan and others at EPA on the question of MNA as a remedial component for SHL. Although EPA recognizes that the geochemistry and uncertainties associated with the SHL system make it difficult to complete a full weight-of-evidence MNA assessment, EPA believes that the Army has presented adequate data and documentation in the SRI to select MNA, in conjunction with source control at the north end of the landfill, as components of the SHL remedy. As discussed, the source control remedy will not remedy the elevated As that has already come to be located in the NIA. As EPA has expressed in the past, we are willing to accept MNA as the remedy for the NIA and recognize that there will be uncertainties with attenuation rate and remedial timeframe. We are confident that EPA, DEP and Army can establish an LTM program that will provide for adequate monitoring of the NIA conditions over time to assess whether projections are being met over time. EPA agrees to accept the available data and data evaluation, as presented in the SRI, to select MNA (in conjunction with source control at the north end of the landfill) as part of the planned ROD Amendment. As has been raised several times, the most critical next step is establishing a revised LTM program. EPA requests that these LTM discussions begin as soon as possible so that consensus can be reached on appropriate well locations and protocols for selection of appropriate screen depths. EPA will not concur on a remedy that does not include MNA for addressing the contamination that has come to be located in the NIA (i.e., source control with just LTM will not be accepted).

In addition, I have completed review of the Draft Final SRI Report. I have the following comments:

1. In our GC 7, EPA expressed concern that column experiments were ongoing and questioned the availability of the data. Although the response to comment and Draft Final document includes additional column study results, Section 6.4.2.3 and 6.4.3, page 47, references other column studies that are still ongoing. Please clarify the objectives of these additional column studies and provide a schedule for submission of the results.

   Response: *Additional modelling data being provided as an attachment to the report.*

2. In our GC 8, EPA raised a concern about capture on the northeastern side of the landfill and the data from SHM-10-06 and SHM-10-06A that Army used to support their position that the impacts are bounded between these 2 wells. We requested more data. The Army's response indicated that additional monitoring would be proposed in future monitoring plans. As discussed below, at the May 19, 2011 BCT meeting, Army/Sovereign referred to several planned additional sampling and investigation activities. EPA requests that re-sampling of these wells be incorporated into plans for re-sampling of SRI wells as soon as possible. Groundwater characteristics and capture in this area is critical to the evaluation of

the FFS. In addition, in the near future, the BCT will need to consider the issue of the timing of the installation of the slurry wall to address the discharge to Red Cove and how this will direct additional groundwater to the northeastern side of the landfill. It is critical to have a more thorough evaluation of the capture in this area, so we can adequately consider the fate of the additional groundwater that will be directed to this area once the slurry wall is installed.

Response: Such changes or enhancements to the current groundwater LTM network will be performed pending implementation of an updated remedy for SHL.

3. In response to SC 8, Army agreed to revise Figure 30. I did not see a revised Figure 30 in the Draft Final revisions submission.

   Response: Corrected Figure will be provided.

4. In response to SC 16, Army agreed to provide an appendix with the PHREEQC2 and other modeling details. I did not see this in the Draft Final revisions submission.

   Response: Additional modelling data will be provided as an attachment to the report.

5. In response to SC 22, Army agreed to revise Table 3. I did not see a revised Table 3 in the Draft Final revisions submission.

   Response: The April 2011 Response to Comment mistakenly indicated that Table 3 and not Figure 2 would be revised. Figure 2 was reissued and provided to show all of the results collected for each of the analyzed wells. No changes were made or are proposed to Table 3.

Finally, at the May 19, 2011 BCT meeting, Army/Sovereign discussed the following planned efforts. EPA wants to ensure that we have an opportunity to review and comment on the plans for this work. Please update us on the status and schedule for these efforts:

6. During the discussion of characterization of the NIA, Sovereign stated that they planned to install a new transect (of boreholes or wells?) in the wetland area north of the P&T system. Sovereign also stated that they planned to get additional As solids data in the NIA.

   Response: Such changes or enhancements to the current groundwater LTM network will be performed pending implementation of an updated remedy for SHL.

7. During the discussion on the model, Sovereign stated that the Corps was putting out a bid for gathering more model data and updating the model. The BCT discussed having a model meeting to discuss this further.

   <u>Response</u>: Additional groundwater modelling enhancements will be performed pending implementation of an updated remedy for SHL.

8. During the discussion on DEP's concern regarding characterization of the eastern edge of the plume at Nonacoicus, Army stated that they planned to install a new transect near 10-08 to resolve this concern

   <u>Response</u>: Such changes or enhancements to the current groundwater LTM network will be performed pending implementation of an updated remedy for SHL.

9. During the discussion on LTM, Army stated that they were having Sovereign look at what updates needed to be done and to address some short term needs.

   <u>Response</u>: Such changes or enhancements to the current groundwater LTM network will be performed pending implementation of an updated remedy for SHL.

10. During the discussion on LTM, Sovereign stated that they planned to resample some of the SRI temporary wells this summer.

    <u>Response</u>: Such changes or enhancements to the current groundwater LTM network will be performed pending implementation of an updated remedy for SHL.

FINAL

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FORMER FORT DEVENS ARMY INSTALLATION, DEVENS, MA

AUGUST 2011

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Concord, Massachusetts

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SOVEREIGN CONSULTING INC.

NOTICE

The United States Department of Defense, Department of Army, funded wholly or in part the preparation of this document and work described herein under Contract No. W912WJ-10-D-0003 and Delivery Order 0002. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

Shepley's Hill Landfill
Supplemental Groundwater and Landfill Cap Assessment for Long-term Monitoring and Maintenance - Addendum Report

FINAL VERSION

Devens, Massachusetts

August 2011

CERTIFICATION:

I hereby certify that the enclosed Report, shown and marked in this submittal, is that proposed to be incorporated with Contract Number W912WJ-10-D-0003 DO#0002. This Document was prepared in accordance with USACE Scope of Work and is hereby submitted for Government Approval.

Reviewed By:

Sovereign Project Manager **Date**

Sovereign Quality Control Manager **Date**

Received By:

USACE Project Manager **Date**

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Attachment C	Groundwater Sampling Logs
Attachment D	Soil Laboratory Reports (Disk)
Attachment E	Groundwater Monitoring Well Laboratory Reports (Disk)
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Attachment G	Landfill Gas Evaluation Memo
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ABBREVIATIONS, ACRONYMS, AND SYMBOLS

ADR	Automatic Data Review
AMEC	AMEC Earth and Environmental, Inc.
AOC	Area of Concern
AR	Annual Report
ATP	Arsenic Treatment Plant
AW	Additional Work
BCT	BRAC Cleanup Team
bgs	below ground surface
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COD	Chemical Oxygen Demand
CSM	Conceptual Site Model
cys	cubic yards
DIC	Dissolved Inorganic Carbon
DO	Dissolved Oxygen
DOC	Dissolved Organic Carbon
DPT	Direct Push Technology
DQO	Data Quality Objective
ECC	Environmental Chemical Corporation
FFS	Focused Feasibility Study
FS	Feasibility Study
FSSR	Feasibility Study Screening Report
GPS	Global Positioning System
IDL	Instrument Detection Limit
HERA	Human and Ecological Risk Assessment
IC	Institutional Control
LTM	Long Term Monitoring
MA	Massachusetts
MassDEP	Massachusetts Department of Environmental Protection
MCL	Maximum Contaminant Level
MNA	Monitored Natural Attenuation
MNR	Monitored Natural Recovery
MSL	Mean Sea Level
ND	None Detectable
NIA	North Impact Area
ORP	Oxidation-Reduction Potential
pH	Standard potential of Hydrogen ion concentration
ppb	parts per billion
ppm	parts per million
PVC	polyvinyl chloride
RI	Remedial Investigation
ROD	Record of Decision
REDOX	Reduction and Oxidation

RSE	Remediation System Evaluation
RTC	Response to Comments
SAP	Sampling and Analysis Plan
SAR	Supplemental Assessment Report (AMEC 2009)
SC	Specific Conductance
SHL	Shepley's Hill Landfill
SOW	Scope of Work
Sovereign	Sovereign Consulting Inc.
TAL	Target Analyte List
TDS	Total Dissolved Solids
Temp	Temperature
TOC	Total Organic Carbon
TSS	Total Suspended Solids
UFP-QAPP	Unified Federal Policy - Quality Assurance Project Plan
USACE-NAE	U.S. Army Corps of Engineers - New England District
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
Workplan	SHL Supplemental Investigation Workplan Addendum data May 2010

EXECUTIVE SUMMARY

The Shepley's Hill Landfill encompasses approximately 84 acres in the northeast corner of the main post of the former Fort Devens. The landfill was reportedly operating by the early 1940s, and evidence from test pits within the landfill suggests earlier usage, possibly as early as the mid-nineteenth century. The landfill contains a variety of waste materials, including incinerator ash, demolition debris, asbestos, sanitary wastes, spent shell casings, glass, and other wastes. As described previously (Harding ESE 2002), the maximum depth of the refuse occurs in the central portion of the landfill and is estimated to be about 40 feet bgs. The volume of waste in the landfill has been estimated at over 1,500,000 cys, of which approximately 160,000 cys (11%) is below the water table. The landfill was closed in five phases between 1987 and 1992-93

Since landfill closure, numerous studies have been conducted to evaluate contaminant conditions at the landfill. Data gaps identified by these investigations are outlined within **Table 1**. Because of the complex nature of the site conditions, the following areas were identified for further evaluation as documented in this addendum report:

- Delineation & Monitoring for North Impacted Area - Determine if arsenic impact in groundwater extends beyond the installed locations (SHM-10-01 through SHM-10-04, SHM-10-05A, and SHM-10-08 through SHM-10-10).
- North Impact Capture - Determine if the existing treatment system is capturing the arsenic, and that natural attenuation is an effective alternative;
- Landfill Gas Impact - Determine if methane intrusion into surrounding buildings is a concern or issue;
- East Impact Delineation and Capture - Obtain additional information on the migration of arsenic towards Plow Shop Pond; and
- Arsenic Source Strength - Obtain information to evaluate the strength and duration of the dissolved arsenic conditions. This assessment will be conducted by evaluating arsenic stability, redox boundary, the impact of the existing treatment system, and evaluate the arsenic impact via a fate and transport evaluation.

To facilitate this investigation, the following scope of work was implemented:

- Advancement of 21 borings using DPT and 7 borings using Rotosonic drilling methodologies. Temporary groundwater monitoring wells were constructed within 16 of 29 boreholes. During drilling operations, groundwater profile samples were collected at 10-foot sampling increments for field screening with an arsenic test kit and laboratory analysis. All groundwater samples were collected in accordance with the January 2010 USEPA Region I Low-Stress / Low-Flow groundwater sampling guidance document. During sampling collection, the purge water was monitored using a properly calibrated YSI meter and screened for DO, pH, Temp, Specific Conductivity, ORP, and color;

- Completion of a geophysical survey to identify bedrock surface elevations within the North Delineation and Monitoring Area along three transect lines;

- Analysis of designated soil, groundwater, and groundwater profiling samples for metals (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and/or zinc), hardness, alkalinity, TSS, ammonia, nitrite, nitrate, COD, chloride, DIC, DOC, TOC, sulfide, and/or sulfate;

- Completion of an evaluation to determine whether dissolved methane gas in groundwater from the landfill presents a potentially unacceptable hazard to nearby structures;

- Completion of treatability bench testing on water samples obtained from monitoring wells SHM-10-14 and SHM-10-15;

- Running of column studies on soil and waste samples obtained at the site in order to evaluate arsenic source strength and reducing conditions at the landfill.

The findings of this investigation as summarized as follows:

- Delineation & Monitoring for North Impacted Area - The investigation included the advancement of soil borings, completion of groundwater vertical profiling, and construction and sampling of monitoring wells on the northern and southern side of Nonacoicus Brook. These boring and well locations are identified as SHM-10-01, SHM-10-02, SHM-10-03, SHM-10-04, SHM-10-05 (no well installed), SHM-10-05A, SHM-10-08, SHM-10-09 (no well installed), and SHM-10-10. Groundwater profiling conducted during the drilling program recorded dissolved arsenic concentrations varying from non-detect to 112-ug/l. Sampling and analysis of groundwater samples obtained from the monitoring wells reported concentrations of dissolved arsenic varying between 0.43 and 7.87-ug/l. Lastly, the geophysical survey indicated that bedrock slopes upward, thereby restricting the migration of the release. The results of this data define the down-gradient extent of the arsenic impact below the southern bank of Nonacoicus Brook. Groundwater flow from the north and northeast of the Brook flows and mixes with groundwater advancing north and northwest from the landfill area creates an oxidation/reduction front that effectively limits the northern extent of the arsenic at the mixing front.

- North Impacted Capture - Points SHM-10-06 and SHM-10-06A were installed to evaluate the capture and confinement of the arsenic plume on the north and northeastern side of the existing arsenic treatment plant. Groundwater profiling indicated evidence of dissolved arsenic ranging from 10 to 2,540-ug/l in well SHM-10-06, while decreased concentrations were detected in SHM-10-06A at concentrations of non-detect to 106-ug/l. Sampling and analysis of groundwater from the monitoring wells document concentrations decreasing between the two wells from 2,710 to 60.1-ug/l. This data was included in refined particle tracking modeling that indicates that the treatment system is reducing arsenic mass and capturing the bulk of arsenic mass on the northern and northeastern side of the treatment plant and that the impacts are bounded between monitoring points SHM-10-06 and SHM-10-06A. Drilling operations indicated a shallower than previously extrapolated bedrock surface in this area. The shallower rock elevations were plotted and included in the refined particle track models that document a bedrock trough trending northward through the landfill and that the shallower rock ridge along the east side of the landfill appears to restrict arsenic migration in a northerly direction. These observations will be refined through long term monitoring.

- Landfill Gas Assessment - Modeling was conducted to determine if methane gas intrusion into an occupied building or structure was a concern. The results of this modeling using a dissolved methane concentration of 10-mg/l in the groundwater determined that this concentration would not pose an explosive hazard.

- East Plume Delineation and Capture - For this part of the investigation, a temporary monitoring well was advanced at the location identified as SHM-10-07. Groundwater profiling recorded dissolved arsenic concentrations varied between 58 and 1,350-ug/l, while groundwater sampling of this monitoring well confirmed dissolved arsenic concentrations of 818 and 918-ug/l. Drilling operations indicated a shallower than previously extrapolated bedrock surface in this area. The shallower rock elevations were plotted and included in the refined particle track model that document a bedrock trough trending northward through the landfill and that the shallower rock ridge along the east side of the landfill appears to restrict arsenic migration to a northerly direction.

- Arsenic Natural Attenuation/Source Strength and Reducing Environmental Evaluation - An evaluation of the collected information determined the following;

  - Presently the primary source of arsenic in groundwater appears to be aquifer sands rich in amorphous iron hydroxide solids, usually coated on sand grains as documented through microscopy. Other sources of arsenic include landfill waste, peat, and bedrock/till. The contribution of landfill waste has been reduced due to depletion of easily degradable carbon and recent capping of the landfill. While peat in some instances was found to contain arsenic, it is not clear if the peat contained the arsenic originally or whether arsenic accumulated in the peat by leaching of arsenic from overlying waste. Arsenic solubility is controlled by desorption from the iron solids and by reductive dissolution of the iron (III) solids created by biodegradation of peat and waste. A site specific distribution coefficient (Kd) was derived from the aquifer solids content and aqueous arsenic in contact with the solids, as 7.6. The distribution is useful for predicting ranges of arsenic concentrations that could be expected in local groundwater. This process does not however include dissolution of the iron solid, a process that could lead to higher arsenic concentrations.

- ➢ Arsenic groundwater distribution has been improved via a number of transects and depth profiles. The distribution of arsenic can be considered as (1) increasing with depth to just above the glacial till layer, (2) highest in the center of the landfill near SHM-10-14 and SHM-10-15, (3) slowly decreasing in concentration to the north of the landfill to the south side of the Nonacoicus Brook and wetlands, and (4) controlled in large degree by the bedrock surface as far as flow direction is concerned.

- ➢ A redox boundary appears to be located in the vicinity of SHM-10-10. The boundary consists of three features: (1) a bedrock surface that controls the flow of landfill impacted water to the Brook but also brings groundwater from the north and northeast of the Brook that mixes or dilutes the landfill flow from the south, (2) intrusion of non-impacted, more oxidized groundwater from the north side of the landfill, and (3) mixing of non-impacted with landfill water resulting in precipitation of arsenic that should not impact the water quality in the Brook or wetlands.

- ➢ Carbon inputs to the groundwater from biodegradation of waste or peat indicates that peat is probably a more important carbon source for maintaining reducing conditions than landfill waste at this time. The reducing conditions created by the peat preceded the landfill, but were exacerbated by the additional carbon source from the landfill waste. Peat formation is a result of reducing conditions, but also maintains reducing conditions by biodegradation and release of short chain carboxylic acids and methylated amines that will drive iron oxy hydroxide reduction and ammonia production (Bergmann et al, 1999) both byproducts that are widespread at the site.

- ➢ The time it takes to flush groundwater arsenic from beneath the landfill has been simulated from two column experiments. The studies suggest that soluble arsenic is removed (concentration less than laboratory detection methods) within 13 to 14 pore volumes of clean water. However, reducing conditions and soluble carbon still remain indicating reserve (non-soluble) arsenic that may be resolubilized. The time frame describing removal of soluble arsenic from the landfill aquifer and north impacted area is approximately 270 years based on this data assuming a flow velocity of 0.5 ft/day and the site travel distance.

The conceptual site model advanced for Shepley's Hill Landfill by others has been updated to include the following new information.

- Waste within the landfill has been further characterized with the recent installation of 5 borings drilled through the landfill to bedrock. Waste analysis revealed that with the exception of lead, zinc and copper most trace elements were at typical background levels. Arsenic in the waste or peat did not exceed 60 mg/kg. Initial leaching tests indicate that landfill waste potentially could deliver up to 500 ug/L arsenic to underlying groundwater. This leaching test is a sequential extraction test that estimates the entire pool of available arsenic, not the amount in equilibrium with the waste. Placement of the cap has likely eliminated leaching of arsenic and any other constituents from landfill waste to underlying groundwater, although recent estimates suggest that only 11% of the landfill waste is in contact with groundwater or saturated.

- In comparison to the waste, underlying sands potentially leach up to 1,500 ug/L arsenic to groundwater. For example, if all of the arsenic entrained in the iron solids on the sand grains was release, then concentrations of 30,000 ug/L or higher of arsenic could be found in solution. Based on these results, underlying aquifer sands are the dominant source of arsenic at the landfill.

- The borings through the landfill revealed that thick peat layers are found underlying waste in the center of the landfill roughly bounded by SHL-99-29x, SHM-10-13, SHM-10-14, and SHM-10-15.

- The peat and the associated wetlands preceded the landfill based on historical mapping of the area. The peat is a significant source of carbon to the groundwater and caused locally reducing conditions prior to emplacement of waste. Therefore arsenic mobilization has been occurring historically prior to landfill development and will continue to occur as long as carbon degradation within the peat takes place.

- The north impacted area (NIA) also appears to have reducing conditions partially from the landfill influence and in part from naturally occurring wetlands occurring in the NIA.

- Arsenic in groundwater in the north impacted area appears to diminish substantially prior to discharge beneath the Brook and wetlands due to a partially observable and mapped redox boundary. The redox boundary occurs due to mixing or dilution with groundwater flow from the north side of the brook. Chemistry of water in DPT points close to the Brook show mixing with water from the north side indicating that the Brook is a discharge divide. Arsenic is not expected to impact the Brook and wetlands due to this redox boundary.

- Groundwater discharge at the north end appears to follow the particle track data presented by and refined by AMEC based on these investigations described herein. Arsenic impact to the MacPherson well is not anticipated based on the results of the investigation at the redox boundary.

- Newly acquired bedrock information indicated that bedrock is located at a shallower depth than originally projected within the area near Nonacoicus Brook. This information was incorporated within the hydrogeologic study and the particle track updated. The results indicated an increase in the groundwater flow velocity near the Brook, but continued to show that the system collected the arsenic impacted groundwater.

- An evaluation of methane determined that the dissolved concentration within groundwater does not present an explosive hazard.

- It is likely that reducing conditions prevalent in the landfill and peat have mobilized arsenic from the aquifer sands which is now entering the Cove via a different flow path than the predominant south–north flow pattern observed for most of the landfill. Similar to the arsenic flux north of the site, the impact to red cove likely preceded the placement of the landfill. The landfill and the corresponding additional dissolved carbon associated with the reducing conditions certainly would have exacerbated the flux prior to capping.

The results of the column and batch studies are complete and included:

- A column study to determine the time (estimated from pore volumes) for clean, oxidized water to restore the column to background conditions under conditions of moderate arsenic in pore water,

- A column study to determine the time for arsenic free, but reduced water to restore the column to background conditions under moderate arsenic pore water concentrations,

- A batch study to determine the rate at which organic carbon is degraded under anaerobic condition, and

- A column study to determine the rate of release of arsenic from aquifer sands under reducing conditions typical of the landfill environment.

1.0 INTRODUCTION

Information contained within this report is associated with the scope of work outlined under two separate contract proposals including:

- 15 April 2010 Supplemental Investigation Contract Proposal; and,
- 22 July 2010 Modification Proposal.

These work scopes were conducted to address data gaps outlined in the Shepley's Hill Landfill Supplemental Investigation Workplan Addendum dated May 2010, the Shepley's Hill Landfill Supplemental Investigation Workplan Addendum for Evaluation of the North Plume Monitored Natural Attenuation for the Impacted Area and Source Strength/Landfill Reducing Environmental Evaluation dated July 2010, and the Supplemental Groundwater and Landfill Cap Assessment for Long-term Monitoring and Maintenance dated June 2009. The location of the site is shown on **Figure 1**.

1.1 Purpose and Scope of Investigation

The purpose of this study is to address the following:

1. Delineation and Monitoring of the North Impacted Area – To delineate the north impacted area in all directions to depth in order to establish final delineated impact boundaries. Install additional monitoring wells to monitor arsenic impact migration and ensure that the arsenic impacts do not migrate further beyond the final delineated plume boundaries. The location of these monitoring points was outlined within the May 2010 Workplan Addendum;

2. North Impact Capture - To evaluate whether the existing treatment system is capturing arsenic, and evaluate and/or demonstrate that natural attenuation will be effective at remediating the North Impact Area within a timeframe that is reasonable given the groundwater chemistry of the site;

3. Landfill Gas Assessment - To evaluate potential landfill gas impacts in the area of the North Impacted Area in accordance with the EPA Guidance for Evaluating Landfill Gas Emissions from Closed or Abandoned Facilities to ensure that methane emanating from the landfill will not cause unacceptable risks in nearby structures;

4. East Impact Delineation and Capture - Install a groundwater monitoring well to evaluate arsenic groundwater impact to Plow Shop Pond sediments;

5. Arsenic Source Strength - To estimate the arsenic source strength and duration, including the quantity of arsenic that may be mobilized and the strength and duration of the source of the reducing conditions.

6. Source Strength / Landfill Reducing Environmental Evaluation – To estimate the duration of the landfill's ability to maintain reducing/methanogenic conditions.

The technical objective and approach of the data collection program is summarized in **Table 1** of this report. To achieve these objectives, the following scope of services was conducted:

1. Advancement of 11 borings using DPT and 7 borings using Rotosonic drilling methodologies. The DPT locations are identified as SHM-10-01 through SHM-10-06, SHM-10-05A, SHM-10-06A, and SHM-10-08 through SHM-10-10. The Rotosonic locations are identified as SHM-10-07, and SHM-10-11 through SHM-10-16. Each of the boring locations are illustrated on **Figure 2**, with copies of the boring logs provided as **Attachment A**;

2. Advancement of an additional 10 DPT points to evaluate reduction and oxidation (REDOX) conditions both horizontally and vertically along the boundaries of the Nonacoicus Brook. Representative soil samples were not obtained during the completion of this phase of the evaluation program, rather a detailed investigation was conducted of the water chemistry between the groundwater and surface water interface. The location of these points are shown on **Figure 3**, and labeled as SHM-10-17 through SHM-10-27;

3. Completion of a geophysical survey to identify bedrock surface elevations within the Northern Delineation and Monitoring Area along three transect lines. These transect lines are identified as A-A', B-B', and C-C' on **Figure 4**. A copy of the Seismic Refraction Survey Report prepared by Geophysical Applications, Inc. is included as **Attachment B** of this document;

4. Analysis of groundwater samples obtained during groundwater profiling for concentrations of total and/or dissolved metals (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and/or zinc) and screened using an Arsenic Field Testing Kit. The samples were also analyzed for hardness, alkalinity, TSS, ammonia, nitrite, nitrate, COD, chloride, DIC, DOC, sulfide, and sulfate. During sampling, purged water was field screened for DO, pH, Temp, Specific Conductivity, ORP, and color. A tabulated summary of the groundwater profiling results is provided in **Table 2**;

5. Construction of temporary groundwater monitoring wells within 16 of the 29 completed boreholes. The well screening depth was based on the arsenic groundwater profiling and laboratory results. No temporary monitoring well was constructed within the point identified as SHM-10-09, since concentrations of arsenic were not present within the profile samples. However, an additional well, SHM-10-06A, was installed to better define the arsenic plume in the north capture zone area. In addition, monitoring wells were not installed within the points identified as SHM-10-17 through SHM-10-27 since they were being used for profiling of the redox conditions along the Nonacoicus Brook only;

6. Analysis of groundwater samples obtained from the temporary monitoring wells for total and/or dissolved metal (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and/or zinc), hardness, alkalinity, TDS, TSS, ammonia, nitrite, nitrate, COD, TOC, chloride, sulfide, and sulfate. During sampling collection, water was field screened for DO, pH, Temp, Specific Conductivity, ORP, and color. A tabulated summary of the groundwater results is provided in **Table 3**;

7. Analysis of soil samples from the landfill borings (SHM-10-07, and SHM-10-11 through SHM-10-16) for concentrations of TAL Metals (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and/or zinc) and TOC. A tabulated summary of the soil results is provided in **Table 4**.

8. Completion of a treatability bench testing on water samples obtained from monitoring wells SHM-10-14 and SHM-10-15. Water collected from the site was run through a column containing iron with the effluent water analyzed for residual arsenic concentrations. Further information on this study is provided in **Section 6.2.3.2** of this report.

9. Running of column study on samples obtained at the site. These column studies were conducted to evaluate Arsenic Source Strength and Reducing conditions.

1.2 Goals of Investigation

The goals of this investigation are to address the summarized data gaps noted on **Table 1** of this report. These goals include:

1. Delineation and Monitoring of the North Impacted Area - Confirm that arsenic does not extend beyond the installed locations;

2. North Impact Capture - Confirm that the existing treatment system is capturing arsenic, and that natural attenuation is an effective alternative;

3. Landfill Gas Assessment - Confirm that methane intrusion into surrounding buildings is not a concern or issue;

4. East Impact Delineation and Capture - Obtain additional information on the migration of arsenic towards Plow Shop Pond;

5. Arsenic Source Strength - Obtain information to evaluate the strength and duration of the dissolved arsenic conditions. This assessment will be conducted by evaluating the plume stability, redox boundary, the impact of the existing treatment system, and evaluate the arsenic plume via a fate and transport evaluation.

2.0 SITE HISTORY AND BACKGROUND

Shepley's Hill Landfill encompasses approximately 84 acres in the northeast corner of the main post of the former Fort Devens. The landfill is bordered to the northeast by Plow Shop Pond, to the west by Shepley's Hill, to the south by recent commercial development, and to the east by land formerly containing a railroad roundhouse. Nonacoicus Brook, which drains the pond, lies to the north of the landfill. The landfill includes three Areas of Contamination (AOCs) investigated under CERCLA: AOC 4, the sanitary landfill incinerator; AOC 5, sanitary landfill No. 1; and AOC 18, the asbestos cell. The landfill was reportedly operating by the early 1940s, and evidence from test pits within the landfill suggests earlier usage, possibly as early as the mid-nineteenth century. The landfill contains a variety of waste materials, including incinerator ash, demolition debris, asbestos, sanitary wastes, spent shell casings, glass, and other wastes. As described previously (Harding ESE, 2002), the maximum depth of the refuse occurs in the central portion of the landfill and is estimated to be about 40 feet below ground surface (bgs). The volume of waste in the landfill has been estimated at over 1.5×10^6 cys, of which approximately 1.6×10^5 cys (11%) is below the water table. The saturated wastes may be emplaced in a wetland reducing environment; at least two areas previously mapped as wetlands appear to have been filled (Harding ESE, 2002).

Subsequent to closure of the landfill (1987-1993), remedial investigations (RIs) completed under CERCLA evaluated soil, sediment, surface water, and groundwater conditions at and in the immediate vicinity of the landfill. The results confirmed the presence of various contaminants, particularly certain inorganics and volatile organic compounds (VOCs), in groundwater, sediments, and surface water at or adjacent to Shepley's Hill Landfill. A Feasibility Study (FS) and Record of Decision (ROD) resulted in a remedy that required long term monitoring and maintenance of the existing landfill cap and groundwater monitoring. The ROD (USEPA, 1995) included a contingency provision, which required that a groundwater extraction system be installed if groundwater contaminant concentrations, primarily arsenic, did not meet risk-based performance standards over time. Due to continued elevated contaminant concentrations, the Army installed and started full time operation of a groundwater extraction and treatment system in March 2006 to address groundwater contamination emanating from the northern portion of the landfill.

2.1 Regulatory Context

Fort Devens was placed on the National Priorities List (NPL) in November 1989 due to contamination of groundwater with arsenic (As), cadmium (Cd), chromium (Cr), lead (Pb), and mercury (Hg). The EPA and Army signed a Federal Facilities Agreement (FFA) on May 13, 1991 (amended March 26, 1996). The ROD outlined the remediation objectives for the Shepley Hill Landfill (USEPA, 1995). It requires the Army to monitor groundwater, maintain the landfill, and prepare annual reports. It also requires that the Army review the effectiveness of the remedy every five years. The goal of that remedy, which relied heavily on the previously installed landfill cap, was to attain groundwater clean-up goals by 2008 thereby reducing exposure risks. In addition, the ROD states that if the landfill cap was found not to meet the prescribed risk reduction performance criteria, the Army was to use a contingency remedy that consisted of groundwater extraction and treatment. That remedy has been constructed and began operation in September 2005, and has operated full time since March 2006. The table below summarizes remediation target levels for Shepley's Hill Landfill Operable Unit groundwater, as defined in the ROD.

Chemical of Concern	Remediation Target Level (ug/l)	Selection Basis
Arsenic	10*	MCL
Chromium	100	MCL
1,2-Dichlorobenzene	600	MCL
1,4-Dichlorobenzene	5	MMCL
1,2-Dichloroethane	5	MCL
Lead	15	Treatment Technology Action Level
Manganese	291	Background**
Nickel	100	MCL
Sodium	20,000	Health Advisory
Aluminum	6,870	Background**
Iron	9,100	Background**

ug/l - micrograms per liter, approximately equivalent to parts per billion (ppb)
MCL - Maximum Contaminant Level; MMCL - Massachusetts MCL
*Note - The MCL for arsenic prior to January 23, 2006 was 50-ug/l. The EDS (CH2M Hill 2005) indicated "It is expected that they (ROD cleanup goals) will change to be responsive to this new (10-ug/l) Standard."
** The estimation of background concentration is presented in Section 4 of the RI Addendum Report (ABB-ES, 1993).

The ROD grouped monitoring wells at Shepley's Hill Landfill into two groups. Well Group 1 consists of wells, primarily at the north end of the landfill, where cleanup levels have been attained historically. Well Group 2 consists of wells where historically cleanup levels have not been attained. However, as discussed further in the next section, the Group 1 and 2 well designations were determined to no longer be relevant for the combined capped landfill and Contingency Remedy in 2007.

2.2 Remedial Actions to Date

The landfill was closed in five phases between 1987 and 1992-93 in accordance with Massachusetts regulations set forth in 310 CMR 19.000. The Massachusetts Department of Environmental Protection (MassDEP) approved the closure plan in 1985. Closure consisted of installing a 30-mil polyvinyl chloride (PVC) membrane cap, covered with soil and vegetation and incorporating gas vents. Closure also included installation of monitoring wells to evaluate groundwater quality around the landfill and construction of drainage swales to control surface water runoff. MassDEP issued a Landfill Capping Compliance Letter approving the closure in February 1996.

The Army maintains and monitors the landfill. Activities include:

- mowing the vegetation;
- monitoring emissions from gas vents;
- monitoring vapor levels in soil gas probes;
- operating a pump and treat system; and
- monitoring of groundwater.

3.0 FIELD INVESTIGATION

The following services were conducted to evaluate conditions associated with the North Impact Area Delineation, North Plume Capture, East Plume, and to provide information of the Arsenic Source Strength and Reducing Conditions.

3.1 Access Arrangements and Conservation Commission

Upon finalizing the proposed exploration locations with the USACE and input from stakeholders, Sovereign personnel obtained contact information of each of the property owners. The prepared letters were submitted to the USACE who assigned a representative to obtain approval from each owner prior to accessing each property. Work was not completed at a proposed exploration point until approval was received from the property owner.

Sovereign then performed a wetland delineation that included routine assessments of vegetation, hydrology, and soil conditions along previously defined geophysical survey transects (A-A', B-B', and C-C') in the area north of Nonacoicus Brook proposed monitoring well locations, and proposed access points to work areas (**Figure 4**). Sovereign also completed a riverfront (Nonacoicus Brook) delineation which included field identification and flagging of the 'top of bank' for riverfront areas, where applicable, to locate the inner and outer riverfront areas/riparian corridors. Wetland delineation procedures followed the "routine method" outlined in the Corps 1987 Wetlands Delineation Manual, as modified by U.S. Army Corps of Engineers Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: North-central and Northeast Region (2009). As discussed in the North-central and Northeast Regional Supplement, Ayer, Massachusetts is located in the Land Resource Region – R, Northeastern Forests. The standards and regulations established in the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00) were reviewed prior to the site delineation. The methodologies described within the Massachusetts Wetland Protection Act differ slightly from the USACE methodology. As such, the procedure for wetland delineation described in the Massachusetts document Delineating Bordering Vegetated Wetlands also was utilized during the May 2010 field investigation. Both the USACE and Massachusetts method delineations established the same wetland line (i.e. the USACE and Massachusetts lines did not diverge); therefore, it was not necessary to flag/delineate two separate wetland lines. The results of this evaluation were issued in a report titled "Wetland Delineation Report" dated 13 May 2010. An updated boring location plan was provided to the Ayer Conservation Commission to detail the location of additional exploration points which were proposed as a result of a modification to the original scope of work. This 30 July 2010 letter report and plan were provided to the Conservation Commission on 5 August 2010.

3.2 Geophysical Survey

Bedrock can have a strong influence on groundwater flow patterns and in aquifers with contaminants at depth in the saturated overburden, the flow changes that occur near depth to the bedrock surface can influence the direction of contaminant migration. Further, variations in bedrock topography (i.e. the presence of troughs and ridges that expand or contract over a distance), can affect the localized groundwater flow velocity in the overlying overburden aquifer as a unit of saturated aquifer migrates across and through those topographical changes. Therefore, a geophysical survey to map the bedrock surface within the North Impact Area Delineation area was conducted to document depth to bedrock within this area and determine if additional information could be gathered pertaining to the mechanisms controlling groundwater flow patterns. The principal objective of the geophysical survey was to determine the depth to and the elevation of the bedrock surface in the vicinity of Nonacoicus Brook, downgradient of the landfill. Available information suggests the presence of a bedrock trough beneath the northern toe of the landfill and Nonacoicus Brook. The trough is oriented north to south beneath the landfill toe, and gradually turns west until generally aligned east to west beneath Nonacoicus Brook. The geophysical survey included seismic refraction imaging along lines designated A-A', B-B', and C-C' as depicted on **Figure 4**.

As part of this investigation, the May 2010 Workplan Addendum outlined the placement of three transect lines to be located and used to conduct a seismic refraction geophysical bedrock elevation survey (Lines A-A', B-B', and C-C'). To conduct this assessment, the GPS coordinates of SHM-10-02, SHM-10-03, SHM-10-04, SHM-10-08, and points near the end of each transect line were determined, and the point located and marked in the field with wooden stakes. Each of the transect lines was surveyed, with grubbing operations conducted for survey line-of-sight and to implement the geophysical survey. In several locations, the transect lines and exploration point were offset or adjusted because of adverse conditions (wet soils or standing water).

The geophysical survey along each traverse was conducted in 250-feet long segments, with geophones placed at 10-foot increments. A Betsy Gun or 450-pound accelerated weight-drop device was used as the energy source. A copy of the Seismic Refraction Survey Report prepared by Geophysical Applications, Inc. is included as **Attachment B** of this document. The results of the survey indicate that bedrock undulates between elevations 145-feet to 167-feet along transaction A-A', 113-feet to 180-feet along transaction B-B', and 142-feet to 176-feet along transaction C-C'.

3.3 Subsurface Exploration

The drilling services outlined under this section of the report were conducted in two separate phases. These services were conducted to evaluate conditions within the North Impact Area Delineation, North Capture, and the East Plume Delineation Areas. The drilling procedures used for each of these two areas are outlined in the following subsections. All drilling and sampling management was conducted as required by the site specific documents which include the HASP, DAP, FSP, and QAPP.

The borings completed under this investigation are shown on **Figure 2** and **Figure 3**. The locations of the proposed exploration points were used to evaluate the following:

1. SHM-10-01 is located to evaluate the western limit of the plume in the area of West Main Street;
2. SHM-10-02 and -03 are located to evaluate the western limit of the plume in the area of Nonacoicus Brook and the bedrock valley;
3. SHM-10-04 is located to evaluate the northern limit of the plume in the area of Nonacoicus Brook;
4. SHM-10-05A (and 05) is located to evaluate the eastern limit of the plume in the area of West Main Street;
5. SHM-10-06 and SHM-10-06A were used to evaluate contaminant capture of the treatment system;
6. SHM-10-07 was used to evaluate the limits of the plume in the area of Red Cove;
7. SHM-10-08 through -10 were used to evaluate the limit of the plume in the area of Nonacoicus Brook;
8. SHM-10-11 through -15 were used to evaluate contaminant conditions and characterize groundwater chemistry within the landfill;
9. SHM-10-16 was used to evaluate contaminant conditions downgradient of the landfill;
10. SHM-10-17 through SHM-10-27 were used to evaluate Redox conditions along the southern side of Nonacoicus Brook.

Copies of the test boring logs/monitoring well construction reports are attached as **Attachment A**. No logs were prepared for the points identified as SHM-10-17 through SHM-10-27 since these points were used to evaluate groundwater Redox conditions, and soil samples were not collected as part of the drilling procedures.

3.3.1 Direct Push Technology (DPT)

A DPT drilling method was used to advance the proposed exploration points located within the North Impact Area Delineation and the North Plume Capture Areas. During this phase of the investigation the DPT investigation was conducted in two separate mobilizations. The initial phase involved advancing DPT groundwater sampling rods continuously, with vertical groundwater sampling conducted at 10 feet intervals to assess groundwater chemistry and arsenic concentrations within the overburden aquifer as discussed in **Section 3.6.3.2** of this report. The second phase of the DPT investigation included continuous soil sampling to evaluate the subsurface soil geology (no soil samples were saved or analyzed), and to allow for the construction of temporary 1.5" Poly Vinyl Chloride (PVC) monitoring wells within select locations. In general, soil conditions consisted of fine to coarse grained sand deposits overlying a varying layer of glacial till within each location, with each location terminated at a refusal conditions (bedrock or presumed bedrock). The exploration points conducted using this drilling method include SHM-10-01 through SHM-10-06, SHM-10-05A, SHM-10-06, and SHM-10-08 through SHM-10-10. These points were used to characterize groundwater chemistry at downgradient points from the landfill.

3.3.2 Rotosonic Drilling Method

Rotosonic drilling methods were used to conduct drilling operations at the exploration points identified as SHM-10-07, and SHM-10-11 through SHM-10-16 within the East Plume Area and Landfill. Continuous soil samples were collected at each location, with select samples obtained during the drilling operations submitted for laboratory analysis or used for the column study analysis. Groundwater profiling was also conducted during the drilling program, with samples obtained at 10-foot sampling increments upon reaching the groundwater table and extending vertically to the bedrock interface. A five to ten foot sample of the underlying bedrock was obtained at each of the completed borings. To complete each location, a 2-inch diameter temporary monitoring well was constructed within the completed borehole. Further information on the sampling analyses is provided in **Section 3.6** of the report. Point SHM-10-07 was used to evaluate groundwater chemistry near Red Cove, while the other points were used to evaluate landfill MNA and SS conditions. In general, soil conditions consisted of sand with varying percentages of silt, gravel, and rock fragments, with areas of waste materials and peat. Refusal conditions were encountered, presumably at bedrock or presumed bedrock, at each of the completed boreholes, with glacial till encountered above the refusal conditions in several locations. Prior to drilling the locations situated within the landfill, the overlying soils were excavated to expose the landfill liner, the liner was cut and air monitoring conducted in accordance with the SOP attached to the FSP.

3.3.3 Redox Evaluation

During the Redox evaluation program, a DPT drilling method was used to advance the proposed exploration points located to the south side of Nonacoicus Brook. To conduct this evaluation program, a DPT groundwater sampling rod was advanced through the underlying soils, with vertical groundwater samples collected at 10 feet intervals to assess groundwater chemistry and arsenic concentrations within the overburden aquifer as discussed in a later section of this report. Soil samples were not collected during drilling operations, or groundwater monitoring wells constructed, since this was not part of the goal of the drilling program. The primary purpose of this drilling program was to evaluate groundwater redox conditions and the potential limits of the release along and near Nonacoicus Brook. Each of these points was terminated at refusal conditions. The exploration points conducted under this phase of the program were identified as SHM-10-17 through SHM-10-27.

3.4 Temporary Monitoring Well Installation

As described in the previous section, temporary monitoring wells (Refer to **Figure 2** and **Figure 3**) were installed to evaluate groundwater chemistry within the North Impact Area, Delineation area, North Plume Capture area, East Plume near Red Cove, and Landfill MNA/SS Conditions. The locations of these points were plotted and mapped based on Global Positioning System coordinates. Vertical profiling of arsenic concentrations and field parameters for groundwater was conducted during drilling operations at each of the points to determine the construction screening depth for the temporary monitoring wells. Temporary groundwater monitoring wells were constructed within each of the completed boreholes, with the exception of SHM-10-09, and SHM-10-17 through SHM-10-27. The construction of a well at location SHM-10-09 was eliminated since no evidence of arsenic was detected within the groundwater profiling samples. Additionally, monitoring wells were not constructed within SHM-10-17 through SHM-10-27 since these points were used to profile redox conditions along Nonacoicus Brook.

At each well location, the well point screening depth was based upon the arsenic profiling results (see **Table 5**). In general, each well was constructed with a 10-foot to 20-foot long PVC screen located at the maximum depth explored or at a depth corresponding with the maximum arsenic concentration. Filter sand was placed around the PVC screen and extended 2 to 3 feet above the well point screen. Next, a two foot thick bentonite seal was installed, followed by grouting the remainder of the void to within two feet of grade. At ground surface a protective casing (stand pipe or flush mounted gate box) was installed to complete each location. With the exception of well SHM-10-07, and SHM-10-11 through SHM-10-16 (2-inch PVC material), each was constructed using 1.5 inch diameter PVC material. A summary of the temporary monitoring well construction information is summarized on the boring logs which are attached as **Attachment A** to this report. Sovereign personnel developed each of the wells several days after construction in accordance with EPA Well Development procedures.

3.5 Media Sampling

During this investigation select groundwater and/or soil samples were collected and submitted for laboratory analysis. The limits of the testing or field screening program are outlined under the following sub-sections. Refer to **Tables 2** through **Table 5** for soil, groundwater profiling, and groundwater monitoring results. The locations of these sampling points are outlined within **Figures 2** through **Figure 5** of this document. All sampling operations were completed using the protocols and procedures outlined within the FSP, DAP, and USP-QAPP.

3.5.1 Field Screening

Groundwater samples obtained during the sampling operations were field screened or analyzed as detailed in the subsections below:

3.5.1.1 Arsenic Test Kit

Upon reaching the groundwater table, profiling samples were obtained at 10-foot sampling increments at both DPT and rotosonic drilling locations. At each profiling interval, groundwater was purged using either a stainless steel bladder pump or a peristaltic/inertial pump and select monitoring parameters recorded (**Section 3.6.1.2**). Next, representative samples were obtained and screened using an Industrial Test Systems Quick As - arsenic field test kit. These field testing results were used to provide preliminary information on the concentration of arsenic within the groundwater samples, and assist in the placement of the monitoring well screening depth. To confirm and obtain accurate information of the actual arsenic concentrations, a split sample was submitted for laboratory analysis. A comparison of the field testing results is detailed in **Table 5**. The field arsenic testing was conducted on the dissolved samples only. Prior to conducting the drilling program, a correlation study was conducted on several of the onsite monitoring wells RSK-12, RSK-24A, RSK-27, and RSK-32. The results of the testing program indicated the following:

Location	Laboratory Concentration	Arsenic Test Kit
RSK-12	736-ug/l	> 500-ug/l
RSK-27	425-ug/l	Approx 500-ug/l
RSK-32	285-ug/l	250 to 300-ug/l
RSK-24A	0.79-ug/l	5-ug/l

3.5.1.2 Sampling Parameters

During groundwater profiling and monitoring well sampling, the samples were passed through a YSI meter with a flow-through cell, which was properly calibrated at the beginning of each day and post-calibrated at the end of the day. The YSI was used to monitor, dissolved oxygen, pH, temperature, specific conductivity, and oxygen reduction potential. A separate turbidity meter was used to monitor turbidity. Samples were collected upon achievement of field parameter stability, if the event field parameters did not stabilize within 2 hours, samples were collected at the 2 hour time mark. Summaries of the results are provided in **Table 2** and **Table 3**, and the sampling monitoring logs are attached as **Attachment C**.

3.5.2 Soil Sampling

During the rotosonic and DPT drilling programs, representative soil samples were collected using a continuous sampling approach. Each sample was reviewed, classified and logged by the site geologist. Only soil samples collected during the rotosonic drilling events were stored, with representative soil samples designated for laboratory analysis or the column study. In general, the underlying soils consisted of sand with varying percentages of silt, gravel, and rock fragments. Refusal conditions were encountered, presumably at bedrock at each of the completed boreholes, with glacial till encountered above the refusal conditions in several locations. A detailed summary of the soil conditions is provided on the Boring Logs which are attached as **Attachment A** to this report.

Three soil samples obtained from SHM-10-07 at sampling depths of 29-feet, 41-feet, and 53-feet were analyzed for TAL Metals and TOC. In addition, 86 soil samples obtained from SHM-10-11 through SHM-10-16 were analyzed for concentrations of TAL Metals (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, sodium, thallium, vanadium, and zinc) and TOC. Each soil sample was analyzed following the appropriate analytical methods listed in worksheets 15-3 and 15-4 of the approved UFP-QAPP. As part of this sampling program, QA/QC procedures included the use of duplicate samples, matrix spikes, matrix spike duplicates, and rinsate blanks. The orientation and results of the testing is summarized in **Table 4**, with the laboratory report attached as **Attachment D.** None of the soil samples obtained during the DPT drilling were submitted for laboratory analysis. No soil samples were collected during the completion of the redox profiling sampling program (SHM-10-17 through SHM-10-27).

Soil cores from borings SHM-10-07 and SHM-10-11 through SHM-10-15 were also sampled to obtain representative strata within each boring to aid in the MNA/SS evaluation. The focus of the sampling was to profile TOC, DOC, DIC, Eh, pH, Conductivity, Turbidity, Total and Dissolved arsenic and iron in the landfill since arsenic mobilization is primarily due to enhanced reducing conditions from the landfill. As long as strongly reducing conditions exist, arsenic will continue to enter groundwater. The samples collected from the borings were selected for analysis via the following methodology:

1.) Collection of discrete samples from the waste, peat, and wetlands deposits that constitutes the likely layers in the landfill profile,
2.) Collection of aquifer sands overlying bedrock based on recognizable strata,
3.) Collection of the upper 5 ft of weathered and/or bedrock, and
4.) All cores were logged in the field. Based on core logging, samples from each important strata were collected

Where soil cores encountered landfill waste and/or bedrock, waste samples were analyzed for:

- Total metal(loid)s (TAL)
- TOC
- X-ray Diffraction (XRD) for common mineralogy
- Sequential Chemical Extraction to identify major solid phase partitioning of arsenic, and
- Thin-section/scanning electron microscopy for identification of arsenic and metal bearing phases.

3.5.3 Groundwater Sampling

Groundwater samples were obtained during the profiling operations and monitoring well sampling program (2 events spaced approximately 2-3 months apart) were used to evaluate groundwater contaminant and chemistry conditions. The results of the testing program are summarized within **Tables 2** and **Table 3**, with the laboratory reports attached as **Attachment E and Attachment F** to this report. Copies of the field sampling logs are attached as **Attachment C**. The locations of each sampling point are detailed in **Figures 2 and Figure 3.** As part of this sampling program, QA/QC procedures included the use of duplicate samples, matrix spikes, matrix spike duplicates, and rinsate blanks. All groundwater samples were collected in accordance with the January 2010 USEPA Region I Low-Stress / Low-Flow groundwater sampling guidance document.

New wells and select existing wells were also sampled to provide at least 6 transects for geochemical analysis. The data was analyzed to identify major geochemical changes in the north end of plume and along several transects emanating from beneath the landfill and extending into the north end of the plume. For the flow path analysis, the following well transects were analyzed (**Figure 2** and **Figure 3**):

a. **Transect A-A'**: Landfill South to North: SHM-10-11 , SHM-10-12, SHM-10-14, SHM-10-15, SHM-10-16, SHM-10-18, and SHM-10-24
b. **Transect B-B'**: East of center of landfill South to North: SHM-10-11, SHM-10-07, SHM-10-06A, SHM-10-16, SHM-10-18, and SHM-10-24
c. **Transect C-C'**: West to East at Wetland Boundary, Wells SHM-10-22, SHM-10-10, SHM-10-19, SHM-10-17, SHM-10-23, SHM-10-25, and SHM-10-27
d. **Transect D-D'**: West to East at Wetland Boundary, Wells SHM-10-22, SHM-10-10, SHM-10-19, SHM-10-18, SHM-10-24, and SHM-10-25
e. **Transect E-E'**: West to East on North side of Brook Wells SHM-10-08, SHM-10-02, SHM-10-03, and SHM-10-04.
f. **Transect F-F'**: South to North across Wetland, Wells SHM-10-08, SHM-10-02, SHM-10-03, and SHM-10-04

3.5.3.1 Groundwater Profiling

Upon reaching the groundwater table, profiling samples were obtained at 10-foot sampling increments. At each profiling interval, water was purged through a YSI flow through cell and monitored for DO, pH, temp, specific conductivity, and ORP. Turbidity was monitored with a separate instrument. Next, representative samples were obtained and screened using an arsenic field test kit. A summary of the monitoring parameters and arsenic test kit results is provided in **Table 5**. In addition split samples at each sampling interval were laboratory analyzed for total and/or dissolved metals (arsenic, calcium, iron, magnesium, manganese, potassium, and/or sodium), alkalinity, ammonia, nitrite, COD, chloride, nitrate, and sulfate following the appropriate analytical methods listed in worksheets 15-1 and 15-2 of the approved UFP-QAPP. The groundwater samples were collected in accordance with the January 2010 USEPA Region I Low-Stress / Low-Flow groundwater sampling guidance document. A tabulation of the results is detailed in **Table 2**, while copies of the laboratory reports are provided as **Attachment F**.

3.5.3.2 Temporary Monitoring Well Sampling

Temporary groundwater monitoring wells were constructed within SHM-10-01 through SHM-10-04, SHM-10-05A, SHM-10-06, SHM-10-06A, SHM-10-07, SHM-10-08, and SHM-10-10 through SHM-10-16. At each of these points, the construction depth of the well point screening was based upon the arsenic profiling results. Several days after installation, each monitoring well was purged and developed in preparation for the initial groundwater sampling event. During the two groundwater sampling events (separated by 2-3 months), the purge water was monitored for DO, pH, temp, specific conductivity, and ORP using a properly calibrated YSI meter. Turbidity was monitored with a separate instrument. Samples were collected after the field parameters stabilized or after 2-hours of purge if stabilization was not encountered. The collected samples were placed in the appropriate container, logged on a chain-of-custody, and analyzed for total and/or dissolved metals (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, sodium, thallium, vanadium, and/or zinc), hardness, alkalinity, TDS, TSS, ammonia, nitrite, nitrate, DIC, DOC, COD, TOC, chloride, sulfide, and/or sulfate following the appropriate analytical methods listed in worksheet 15-1 and 15-2 of the approved

UFP-QAPP. The groundwater samples were collected in accordance with the January 2010 USEPA Region I Low-Stress / Low-Flow groundwater sampling guidance document [EQASOP-GW001, Revision Number 3]. A tabulation of the laboratory results is detailed in **Table 3**, the field sampling parameters in **Table 5**, and the laboratory reports are provided as **Attachment** E.

3.6 Quality Assurance / Quality Control Procedures

Field QC samples that were prepared and submitted to the laboratory for analyses during performance of this field effort consisted of equipment blanks (for all analyses), duplicate samples (for all analyses), and matrix spike/matrix spike duplicate samples (for all analyses). A summary of the QC samples is presented in **Table 2** through **Table 5**. The frequency and method of collection of field QC samples are described in the UFP-QAPP.

Decontamination of equipment used during the investigation program was conducted as follows:

- All down-hole drilling equipment was decontaminated prior to initial use and between each borehole. Non-dedicated groundwater sampling devices (i.e., pumps, etc.) were decontaminated prior to initial use and between collection of each sample to prevent the possible introduction of contaminants into successive samples. Equipment was decontaminated at the sample location, or at a pre-designated, controlled location. All equipment was decontaminated before leaving the site.

- Decontamination of drilling equipment included drill bits, drill-string tools, drill rods, tremie pipes, clamps, hand tools, steel cable, along with pump drop-lines and pumps. These items were cleaned, by the subcontractor, using a steam pressure washer.

- Equipment decontaminated included the water level and water quality meters, pumps and pump equipment, and miscellaneous tools. All items were cleaned using the method detailed within the Sampling Equipment Decontamination SOP which is part of the FSP.

- Heavily soiled equipment was washed a second time using an aqueous non-phosphate detergent solution and using a portable, high presser steam cleaning equipment.

- All non-dedicated equipment was decontaminated in accordance with the procedures presented in the Sampling Equipment Decontamination SOP which are part of the FSP.

4.0 SCREENING AND LABORATORY SAMPLING RESULTS

The results of the field sampling and analysis are outlined within the following sub-sections. A discussion and evaluation of these results are covered under later section of this report. **Tables 2** through **Table 5** provide a summary of the results, and **Figure 2** through **Figure 3** for the location of the sampling points.

4.1 Field Screening

4.1.1 Arsenic Test Kit

As stated previously, an Industrial Test Systems Quick As - arsenic test kit was employed to field screen the collected groundwater profiling samples for concentrations of arsenic. In addition, a split sample was submitted to the analytical laboratory for arsenic testing. The arsenic field test kit was confined to a calibration range of less than 5-ug/l to a maximum of 500-ug/l. In general, a review of the results noted that the test kits provide a slight overestimate of the arsenic concentration. In some cases, sample dilution was used to evaluate concentrations over the 500-ug/l. A review of the results confirms that the temporary well screen construction depths were situated in zones of maximum arsenic impact. A tabulation of the arsenic test kit results against the laboratory results is provided in **Table 5** to this report.

4.1.2 Sampling Parameters

During groundwater sampling (profiling and monitoring well), the purge water was monitored for turbidity, dissolved oxygen, pH, temperature, specific conductivity, and oxygen reduction potential using properly calibrated field equipment. A summary of the results at the collection of the samples is detailed in **Table 2** and **Table 3**, while a copy of the monitoring log is attached as **Attachment C.**

4.2 Soil Sample Analytical Results

To characterize subsurface soil samples obtained during the exploration program, representative samples were collected and submitted for laboratory analysis. These samples were prepared in accordance with the testing methodology and analyzed for TAL Metals (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, sodium, thallium, vanadium, and zinc) and TOC. A summary of the concentrations ranges is recorded as follows:

Compound	Concentration in mg/Kg		Compound	Concentration in mg/Kg	
	Min	Max		Min	Max
Aluminum	1,400	30,000	Antimony	ND (< 0.17)	11
Arsenic	1	62	Barium	5	200
Beryllium	< 0.09	2	Cadmium	ND (< 0.03)	220
Calcium	250	25,000	Chromium	2	69
Cobalt	1	21	Copper	1	310
Iron	950	140,000	Lead	2	1,200
Magnesium	430	21,000	Manganese	22	3,000
Mercury	< 0.002	2	Nickel	3	101
Potassium	160	11,000	Selenium	ND (< 0.11)	3
Silver	< 0.03	14	Sodium	< 22	3,200
Thallium	< 0.23	< 2.19	Vanadium	2	49
Zinc	8	13,000	TOC	< 0.01 %	25%

Copies of the laboratory reports are attached as **Attachment D** and a complete summary of the soil testing results are tabulated in **Table 4**. **Figure 2** and **Figure 3** provide a depiction of the location of the sampling points.

4.3 Groundwater Sample Results

4.3.1 Temporary Monitoring Wells

Following the construction and purging of the groundwater monitoring wells, two separate groundwater sampling and analytical events were conducted on the date and at the locations detailed on **Table 3**. Groundwater samples were collected from the wells using the procedures outlined in the FSP and USF-QAPP, and analyzed for total and/or dissolved metals (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, sodium, thallium, vanadium, and/or zinc), hardness, alkalinity, TDS, TSS, ammonia, nitrite, nitrate, DIC, DOC, COD, TOC, chloride, sulfide, and/or sulfate following the appropriate analytical methods listed in worksheet 15-1 and 15-2 of the approved UFP-QAPP. In general, concentration ranges were noted as follows and represent conditions at each of the well point screening depths of the analyzed monitoring wells:

Compound	Total Analysis (ug/L)		Dissolved Analysis (ug/L)	
	Min	Max	Min	Max
Aluminum	27.6	3,870	< 3.82	35.8
Antimony	0.19	1.93	0.17	2.99
Arsenic	0.59	7,930	0.14	8,110
Barium	40.3	160	36.5	154
Beryllium	< 0.118	0.07	0.07	< 0.59
Cadmium	< 0.236	< 0.59	< 0.236	< 0.59
Calcium	14,200	182,000	2.230	195,000
Chromium	0.38	15.9	< 0.186	0.73
Cobalt	0.84	28.6	0.73	29.3
Copper	0.64	6.88	0.34	2.06
Iron	508	149,000	16.9	145,000
Lead	0.07	4.72	ND (< 0.05)	2.08
Magnesium	1,660	23,600	163	127,000
Manganese	9.54	27,400	6.78	25,800
Mercury	< 0.012	0.1218	< 0.012	0.1268
Nickel	1.16	23.5	0.27	22.2
Potassium	1,770	18,800	841	101,000
Selenium	0.54	0.74	< 0.406	0.7
Silver	< 0.085	< 0.85	< 0.085	< 0.85
Sodium	7,090	536,000	1,400	536,000
Thallium	0.05	< 0.31	0.05	< 0.31
Vanadium	0.31	1.85	0.08	0.22
Zinc	3.49	54.6	3.91	37.7

Compound	Concentration in mg/L		Compound	Concentration in mg/L	
	Min	Max		Min	Max
Hardness	41	490	Alkalinity	4.3*	500*
TDS	110	1,900	TSS	ND (< 5)	640
Ammonia	ND (< 0.017)	9.7	Nitrite	ND (< 0.002)	0.5
COD	ND (< 7)	62	Chloride	1.3	1,100
Nitrate	0.008	3.8	Sulfate	< 0.12	87
Sulfide	ND (< 0.1)	ND (< 0.1)	TOC	0.64	4.8
DOC	< 1	62	DIC	< 8	150
* Alkalinity units are mg CaCO3/L					

Copies of the laboratory reports are attached as **Attachment E** and a complete summary of the testing results are provided in **Table 3**. The locations of the sampling points are shown in **Figure 2** and **Figure 3**.

4.3.2 Profiling

Samples obtained during groundwater profiling were prepared in the appropriate laboratory container, logged on a chain-of-custody, and analyzed for total and/or dissolved metals (arsenic, calcium, iron, magnesium, manganese, potassium, sodium), alkalinity, ammonia, nitrite, COD, chloride, nitrate, and sulfate following the appropriate analytical methods listed in worksheets 15-1 and 15-2 of the approved UFP-QAPP. The concentration ranges were noted as follows:

Compound	Sampling Point	Concentrations in ug/L					
		Test Kit [Dissolved]		Dissolved		Total	
		Min	Max	Min	Max	Min	Max
Arsenic	GP-10-01	ND (< 5)	5	0.3	0.97	0.48	18.9
	GP-10-02	ND (< 5)	5	ND (< 0.226)	8.68	0.41	84.6
	GP-10-03	ND (< 5)	ND (< 5)	ND (< 0.452)	3.85	0.89	42.1
	GP-10-04	ND (< 5)	20	0.15	15.1	1.22	214
	GP-10-05	ND (< 5)	150	0.31	112	1.02	130
	GP-10-05A	ND (< 5)	ND (< 5)	0.33	5.09	0.93	911
	GP-10-06	5	> 500	10	2,540	17.2	2,660
	GP-10-06A	ND (< 5)	60	ND (< 1.13)	106	0.59	1,090
	GP-10-07	ND (< 5)	> 500	58	1,350	283	1,240
	GP-10-08	ND (< 5)	ND (< 5)	0.31	1.06	2.07	19.8
	GP-10-09	ND (< 5)	ND (< 5)	0.15	0.94	0.45	183
	GP-10-10	ND (< 5)	ND (< 5)	0.27	2.47	0.34	13.7
	GP-10-11	< 5	150	19.8	396	230	760
	GP-10-12	30	> 500	38.9	3,880	--	4320
	GP-10-13	< 5	> 500	12.2	1,060	120	176

Compound	Sampling Point	Concentrations in ug/L					
		Test Kit [Dissolved]		Dissolved		Total	
		Min	Max	Min	Max	Min	Max
Arsenic	GP-10-14	5	> 500	14.4	15,100	39.1	17,300
	GP-10-15	70	> 500	278	16,600	—	17,200
	GP-10-16	< 5	100	1.89	445	19.3	333
	GP-10-17	< 5	500	0.25	1,860	0.58	1,950
	GP-10-18	< 5	80	0.73	390	0.93	373
	GP-10-19	< 5	100	0.35	810	0.53	886
	GP-10-20	< 5	50	0.066	429	1.6	446
	GP-10-21	< 5	60	0.31	349	1.48	322
	GP-10-22	< 5	< 5	0.37	14.5	0.51	15.8
	GP-10-23	< 5	> 500	0.38	1,100	0.52	1,160
	GP-10-24	< 5	250	0.39	615	1.52	629
	GP-10-25	< 5	5	0.4	34.9	10.9	44
	GP-10-26	< 5	< 5	0.18	1.96	0.6	6.48
	GP-10-27	< 5	> 500	0.38	1,040	1.11	1,100
The GP and SHM notation refer to the same locations. Refer to **Figure 2** and **Figure 3** for the location of these points using the SHM notation.							

Dissolved Compound	Concentration in ug/L		Dissolved Compound	Concentration in ug/L	
	Min	Max		Min	Max
Aluminum	4.17	345	Antimony	< 0.12	2.39
Barium	5.73	244	Beryllium	< 0.059	< 0.295
Cadmium	0.08	< 0.59	Calcium	2,100	288,000
Chromium	0.2	2.66	Cobalt	0.31	45.2
Copper	0.25	4.32	Iron	57.9	122,000
Lead	< 0.01	0.59	Magnesium	218	38,700
Manganese	21.1	30,700	Mercury	< 0.012	0.1389
Nickel	1.34	25	Potassium	422	25,400
Selenium	< 0.406	0.79	Silver	< 0.085	< 0.34
Sodium	639	598,000	Thallium	< 0.031	0.21
Vanadium	0.1	2.23	Zinc	1.81	44.4
Hardness	210	210	Alkalinity	9 mg CaCO3/L	530 mg CaCO3/L
TSS	< 5	55,000	Chloride	0.43	1,200
Ammonia	0.0166	17.3	Nitrite	ND (< 0.002)	0.025
Nitrate	0.009	5.8	Sulfide	< 0.1	< 0.1
Sulfate	ND (< 0.12)	97	COD	ND (< 7)	170
DOC	< 1	15	DIC	6.4	170

Copies of the laboratory reports are attached as **Attachment F** and a complete summary of the testing results are provided in **Table 2**. The locations of the sampling points are shown in **Figure 2** and **Figure 3**. Geological profiles depicting the concentration gradients of the results are attached as **Figures 6** through **Figure 28**. These profiles show the vertical groundwater profiling results of dissolved arsenic, dissolved iron, dissolved manganese, oxidation reduction potential (Eh), and dissolved organic carbon. An evaluation of these profiles is presented in **Section 6.0** of this report.

4.4 Landfill Gas Evaluation

For this evaluation, AMEC evaluated whether dissolved methane gas in groundwater from the landfill presents a potentially unacceptable hazard to nearby structures. Methane is not toxic at concentrations up to the lower explosive limit (LEL) and is an asphyxiant at higher concentrations. The primary concern is thus the possibility of methane gas explosion within structures. The results of this investigation determined dissolved methane conditions did not pose an explosive hazard within 10-feet of a building using a dissolved methane concentration of 10-mg/l. A copy of the Landfill Gas Evaluation Report prepared by AMEC is attached as **Attachment G**.

4.5 Data Validation

Sovereign contracted AMEC to conduct a data validation of analytical data collected during the field investigation program. AMEC's data validation and data quality review methodology complied with the validation procedures specified in the QAPP. In accordance with the specifications of QAPP Worksheet #35, all laboratory data was processed through the ADR software and the ADR reports were reviewed by an AMEC chemist. A Data Validation Report was prepared for each laboratory sample delivery group indicating any data limitations.

The review of soil and ground water sampling results were evaluated for the usability of the data and to determine any limitations on their use in drawing conclusions about the extent of contamination at the Shepley's Hill Landfill. Based on the data validation and data quality assessment, the analytical data set completeness was calculated as 100 percent. No data was rejected.

A number of analytical and/or sampling biases were applied to the data set. These were the result of imprecision between laboratory and field duplicates, low and high matrix spike recoveries, low or high post digestion spike recoveries, high serial dilution relative percent differences, exceeded holding times, and results reported between the LOQ and LOD. Overall, results were qualified as estimated (J or UJ). These data are considered usable and of acceptable quality. Additional biases were applied due to detections in associated method, calibration and equipment results. Results that had concentrations less than 10-times the blank concentrations were U qualified because of potential contamination.

Overall, the data set satisfies completeness and quality objectives and data can be used for their intended purposes with confidence. Copies of the Data Validation package are provided as **Attachment H** to this report.

5.0 EVALUATION / UPDATE HYDROGEOLOGIC CONDITIONS

This hydrogeologic assessment integrates data collected during 2010 including geophysical survey transects in the Nonacoicus Brook area, lithologic logs and refusal depths from borings constructed within and downgradient of the landfill footprint, and water levels collected from both existing and new monitoring wells.

5.1 Bedrock Surface

Based largely on the results of the geophysical survey, it is evident that the buried bedrock surface, and consequently the saturated thickness of the permeable overburden aquifer, is considerably shallower than previously interpreted in the Nonacoicus Brook area (see **Figure 29**) by as much as 50%. Boring refusal depths around Nonacoicus Brook confirm these results. It should be noted that there are some discrepancies with the presumed bedrock depths encountered during DPT investigations due to the two-step process of the DPT work. In many cases, the initial vertical profiling DPT work was completed with narrow diameter drilling tools which may be able to penetrate into glacial till and/or saprolitic rock. Secondary DPT work to install the temporary wells was completed using larger diameter tools necessary to install the wells. In some instances, the depth to refusal for the second phase of drilling was shallower than the first. In general, refusal and presumed bedrock depth evidence is weighted to the depths noted by the smaller diameter vertical profiling results. Further, the broad east-west trending bedrock 'trough' thought to be present under the brook corridor instead consists of both a narrow east-west trending 'tributary' directly under the brook axis and a north-northwest trending tributary which extends north of the brook. The reduction in overall saturated thickness due to this structure requires that horizontal groundwater velocities are higher than previously interpreted and modeled in this area as there is substantially less aquifer through which it can flow. Based on the assessment of hydraulic gradients discussed below, it is most likely the deep arsenic plume is confined to the east-west trending trough directly under the brook axis and not the north-northwest trending trough. This is also supported by the absence of arsenic in SHM-10-04 located directly within this trough.

Within and around the landfill, boring refusal depths are both shallower and deeper, however, they generally confirm the prior interpretation of a north-south trending bedrock trough just east of Shepley's Hill. Immediately west of Red Cove at SHM-10-07 and in the area east of the extraction wells at SHM-10-06, bedrock was shallower than previously understood, further confirming the presence of a north-south trending ridge generally coinciding with the eastern edge of the landfill cap.

As groundwater flow patterns at the site are strongly influenced by variations in saturated thickness, these data have significant implications with respect to preferential pathways within the overburden aquifer. Consequently, this information has been integrated into the latest groundwater model variants to provide updated predictions of contaminant flow paths as discussed below.

5.2 Lithologic Features

In terms of lithologic variations within the overburden that might also define preferential pathways, the new borings are consistent with previous observations that local overburden is dominantly well sorted sands with little stratification. Gravelly zones were present in a few of the borings in and around Nonacoicus Brook (SHM-10-01, SHM-10-03, SHM-10-09, and SHM-10-10), consistent with where gradients decrease and hydraulic conductivity is hypothesized to increase. The sole occurrence of a silt lens was in SHM-10-02 midway within the 60' of overburden. Within the landfill footprint fairly thick occurrences of peat were found in SHM-10-13 and SHM-10-14, consistent with their location in the historic wetland. This unit may have hydraulic implications and potentially could result in perched or semi-confined conditions locally. Lastly, the basal till unit is further confirmed to vary widely in terms of its thickness and is in places laterally discontinuous.

5.3 Water Levels

Static water levels were collected from all new monitoring wells between July and October. These data were integrated with the regularly scheduled fall synoptic survey of existing wells conducted under the Long Term Maintenance and Monitoring Plan (LTMMP) to produce a current water table elevation map (**Figure 30**) extending to the Nonacoicus Brook area. While this may not represent a true synoptic snapshot of the water table, it is evident that Fall 2010 water levels are uniformly lower than for Fall 2009 (and long term averages) particularly around the extraction wells, a condition likely related to the late summer drought experienced across the region. As a consequence, horizontal hydraulic gradients are generally 'flatter' or lower than under more typical seasonal conditions, ranging from 0.003 to 0.012 ft/ft over the majority of the landfill (corresponding to groundwater transport velocities of 0.15 to 1.7 ft/day). In contrast, the gradient along Nonacoicus Brook is considerably flatter, on the order 0.0015 ft/ft. Within the northern half of the landfill groundwater flow direction, as inferred from water table contours, is predominantly northward, while in the southern half flow direction is more north-northeast. It should be noted that water levels in the N5 cluster are higher than those in the three new wells immediately surrounding it (and existing well SHP-99-29X) though water levels in those wells appear internally consistent.

A number of vertical well pairs in the area downgradient of the extraction wells exhibit water level differences of 1 to 3 feet including SHM-99-31, SHM-05-34, SHM-05-39, SHM-05-49, and the N1 cluster. This difference is presumably related to the 'deflated' water table resulting from drought conditions. These strong downward gradients are interpreted to reflect increased recharge to the shallow aquifer from the pond, and the portion of Nonacoicus Brook nearest the pond, relative to typical seasonal conditions.

Water levels from new wells both south and north of Nonacoicus Brook suggest the horizontal gradient, though not very steep, is uniformly westward. Consequently, the projected arsenic plume trajectory based on field data alone is along the axis of the brook, consistent with previous groundwater flow path modeling predictions.

5.4 Particle Track Prediction

In order to update the numerical groundwater flow model and flow path predictions using the particle tracking technique, the revised bedrock surface interpretation shown in **Figure 29** was incorporated into the current model (SHL007). The groundwater flow model was revised subsequent to the 2010 Supplemental Investigations, principally through adjustment of the interpreted bedrock surface. The development, calibration and refinement of the revised model (SHL008) was reported in the *AOC 72 Remedial Investigation Report* (AMEC, 2011) and the 2009 Annual Report (ECC, 2010). The latest revisions were focused on the bedrock surface, integrating data from drive points, borings, and geophysical studies undertaken as part of the SAR. This revised model is used to explore a range of hydraulic control remedial alternatives in this FFS. The model in its present state is considered adequate to support early-stage comparison of remedial alternatives for the FFS, but will be further refined to support the Remedial Design. Subsequently, the impact of this structural change on calibration of the model was evaluated. It can be shown that not only does this new variant adequately match long-term average water levels (see **Table 6** and, **Figure 31**) but calibration was slightly improved relative to preexisting data.

Using the revised model (SHL008), forward particle tracking was conducted to both update the prediction of current captures zones (**Figure 32**) and simulate the trajectory of current Arsenic exceedances in the aquifer, including those in new wells constructed in 2010 (**Figure 33**). Relative to the previous model predictions documented in the 2009 Annual Report (ECC, 2010) the capture zone under peak operating rate (49 gpm) is slightly larger, extending father east some 50-60 feet closer to the landfill boundary. This is likely the direct consequence of the reduction in average saturated thickness due to bedrock being shallower than previously interpreted.

As depicted in **Figure 33**, patterns of flow and velocity relationships have changed somewhat relative to previous predictions. Predicted groundwater transport velocities within the landfill average just over 0.6 feet/day and are largely identical to the preceding SHL007 model. In the area immediately downgradient of the landfill toe, velocities average just under 0.5 feet/day, as the magnitude of horizontal hydraulic gradient declines slightly. Within the Nonacoicus Brook corridor, gradient is much flatter and consequently velocities rapidly decline to less than 0.1 feet/day as the deeper groundwater flow becomes entrained with the westward flowing stream. The most significant difference between previous predictions and the new SHL008 model is that particle tracks representing detections all discharge upgradient of the 'bend' in the brook, and no longer travel farther west before discharging into Nonacoicus Brook or the Nashua River. This again is a direct consequence of the reduction in average saturated thickness due to bedrock being significantly shallower than previously interpreted. Further, the quantity of water predicted to discharge along the brook is increased, as would be expected with less aquifer available through which to flow horizontally.

6.0 MNA / SS LANDFILL REDUCING CONDITIONS EVALUATION

The purpose of this section is to present collected data and to summarize the technical findings concerning (1) Shepley's Hill Landfill groundwater characterization, (2) the landfill source strength (SS) and reducing conditions, and (3) effectiveness of monitored natural attenuation (MNA). This section also addresses data gaps as outlined in the AMEC 2010 Supplemental Groundwater Investigation Workplan Volumes 1 and 2, Sovereign 2010 Supplemental Investigation Workplan Volume 1 and 2, and the AMEC 2009 Supplemental Groundwater and Landfill Cap Assessment. The data and data interpretation presented here also serves to supplement information required for the Sovereign 2010 Focused Feasibility Study.

While source strength/landfill reducing conditions, site characterization, and evaluation of data for possible remedial alternatives appear as separate topics, they are linked in the overall conceptual site model and development of criteria for selecting an appropriate remedy for the landfill.

6.1 Objectives

The specific objectives are identified in **Table 1** of the Sovereign Workplan (May 2010) and include:

- **Objective 1 - Natural Attenuation for the North Impacted Area** - Once capture (hydraulic control from the ATP) is demonstrated, establish that natural attenuation will be effective at remediating the North Impacted Area) within a timeframe that is reasonable given the circumstances of the site.

- **Objective 2 - Source Strength/Landfill Reducing Environment Evaluation -** Estimate the duration of the landfill's ability to maintain reducing/methanogenic conditions.

The results presented here are used to determine if attenuation is effective for remediation of the arsenic plume north of the arsenic treatment plant (ATP) capture zone within a timeframe that is reasonable given the complexities of the site due to the landfill induced reducing conditions. Evaluation of attenuation involves identifying the current distribution of arsenic in local groundwater and identifying the fate of arsenic as it moves from the landfill along the identified flow paths to its ultimate fate some distance from the landfill. In the present case this requires evaluation of the arsenic in the flow path as it approaches the Nonacoicus Brook and associated wetlands to the north of the landfill.

The study also addressed data collected to date that is required to determine the time it will take for the aquifer to return to normal (pre-landfill) if reducing and/or anaerobic conditions created by the landfill and underlying peat and wetlands were to cease. Pre-landfill in this context simply suggests the condition of the aquifer prior to landfill emplacement. While the landfill presumably leached arsenic and created its own reducing conditions, some degree of anaerobic conditions existed prior to the landfill due to the existence of the wetlands and peat over which the landfill was placed. The attempt to determine the pre-landfill conditions and the time it takes for restoration to occur to bring these conditions back is referred to as Source

Strength/Landfill Reducing Environment Evaluation. The landfill evaluation was approached by recognizing that arsenic release from beneath the landfill is linked to conditions within the landfill that add to reducing and methanogenic conditions including the presence of a peat layer within the former wetlands. Both arsenic and carbon cycling was evaluated in order to determine the landfill impact and the length of time required for arsenic or carbon depletion to occur.

In the present case, the landfill impact to reducing conditions and subsequent mobilization of arsenic is confounded by the presence of underlying wetlands and peat layers existing beneath and within the landfill footprint. The data collected as part of this study demonstrated that the underlying wetlands and peat layers generate their own reducing conditions with or without the landfill.

6.2 Review of Data Collection Efforts

In the summer of 2010 the following field work and types of samples were collected. A description of the data gaps, use of samples and resulting data is described in the 2010 Workplan Addendum and summarized below:

Data Gap	Data Collection Objectives	Type(s) of Samples Collected
Arsenic Distribution in Landfill and North Impacted Area	Fate and Transport Transect Analysis	2 rounds of groundwater sampling Landfill groundwater profiles DPT samples
Redox Boundary/MNA	Comparative water geochemistry	DPT samples North placed wells and water samples
Landfill Profiling: Solids and Water profiles	Landfill borings for solids and water	5 new borings and landfill wells
Arsenic Source and Fate	Solids and water geochemistry Column studies	Core samples from 6 borings Water profiles from new borings Select core for flushing and release studies
Carbon Source and Fate	Solids and water geochemistry Column studies	Core samples from 6 borings Water profiles from new borings Select core samples for flushing and release studies
Waste Distribution and Characterization	Landfill borings for solids	Core samples by lithology for 6 new borings

6.2.1 Laboratory Bench and Column Studies

Several bench and column studies were initially proposed and are listed below. These studies include:

- A column study to determine the time (estimated from pore volumes) for clean water to restore the column to background conditions under conditions of high arsenic in pore water,
- A column study to determine the time for clean water to restore the column to background conditions under moderate arsenic pore water concentrations,
- A batch study to determine the rate at which organic carbon is degraded under anaerobic conditions
- A batch study to determine the distribution coefficient (Kd) of arsenic sorption to native aquifer sands, and
- A column study to determine the rate of release of arsenic from aquifer sands under reducing conditions typical of the landfill environment.

The initial list of bench studies was altered during the course of the investigation based on the data collected and were amended to the studies described below:

- Two column studies were conducted. The first was designed to test the number of pore volumes required to flush arsenic free from the sand under the influence of oxidized water infiltration.
- A second column study was conducted that also examined the number of pore volumes required to flush arsenic from a core sample but under reducing conditions instead. The same column was then allowed to run with more infiltration of reducing water in order to determine how much arsenic would be re-mobilized from the sand under continued reducing conditions. This study is essentially similar to the one designed to look at rate of release of arsenic under reducing conditions.
- The initial results and usefulness of the carbon degradation study is in question since only minute amounts of gas have been collected to date. This lack of degradation is now thought to be due to the negative effect of freezing on the microbial population. Therefore, the study was terminated since it would not provide any further information concerning carbon degradation rates.
- The Kd study was not done since the discussion with BCT and USACE indicated that a Kd developed from one site sample was probably insufficient to provide any meaningful data.
- All laboratory data can be found in **Attachment I** (Report of Findings, PRIMA Environmental).

6.2.1.1 Column Study

The high TOC arsenic flushing test under oxidizing conditions is described here along with the flushing of arsenic and remobilization column study under reducing conditions. (Refer to the PRIMA Environmental: Report of Findings, Shepley's Hill Landfill 2011, **Attachment I** for all column data).

The high arsenic column flushing test was conducted in duplicate using 2 inch diameter clear PVC pipe approximately 24 inches long. The columns were filled with approximately 3 kg of landfill soil from a moderate to relatively high (about 1,200 ug/L) arsenic containing portion of the landfill area and packed to a density similar to the native field density (see **Attachment I** for details). Next synthetic water (water that was made in the laboratory and based on composites of non-impacted well water from the site, refer to **Attachment I** for the composition) similar to up-gradient native groundwater was passed through the column in an up flow direction at a rate of about 1 pore volume per day. Effluent was collected in Tedlar bags in 12 hour increments (for example, 0-12 hours, 12-24 hrs, etc) for the first 3 pore volumes, after which it was collected in 24 hour increments. Influent water and effluent samples for the first 2.5 pore volumes, were analyzed for arsenic (total dissolved), total dissolved iron, DO, DOC, ORP, and pH. Additional samples in additional pore volumes were analyzed for the same constituents.

The study design is very similar to that conducted by the USGS at the Saco Landfill in Maine. The column parameters are summarized in **Attachment I**.

The second column test was conducted in exactly the same manner as above with a few important differences:

- The column was pre-flushed with reducing water made by passing tap water through zero-valent iron and then into the column.
- The reduced water was allowed to flush pore water arsenic out of the column until <5 ug/L As could be detected.
- At this point reducing water was allowed to flow through the column at about a rate of 0.3 ft/day. Samples were collected every 3 to 4 days to examine the rate at which arsenic could be re-released or mobilized from the solids entrained in the sands.

Modeling of the column data and some of the transect data was also completed to understand the significance of geochemical changes due to the landfill conditions and at the redox boundary at the north end of the impacted area. Chemical analysis and speciation in the transects following groundwater flow was modeled using MINTEQA2 (USEPA), Geochemist's Workbench and PHREEQC2 which allowed a well by well comparison of key geochemical changes such as iron and arsenic solubility and precipitation as well as changes in dissolved oxygen, sulfate and Eh. Column data was analyzed using PHREEQC2 (USGS, 1999) which can be used to assess the changes in arsenic concentration due to geochemical conditions versus those due only to advection-dispersion. In this exercise, the flushing results were compared to model results where only advection and dispersion were considered since arsenic was removed not by adsorption or attenuation but by displacement with water containing no arsenic. The modeling input and output is also presented in **Attachment I**.

6.3 Site Characterization and Arsenic Distribution

Historic and recent data collected for examining arsenic distribution at the landfill includes water samples from numerous wells located adjacent to and down-gradient from the landfill, cores collected from borings, sediment samples and surface water samples. What is known presently and confirmed by the results of the newest work is presented herein:

- The landfill and underlying peat increase arsenic solubility due to biodegradation of carbonaceous material, oxygen depletion, creation of reducing conditions, and the reductive dissolution of arsenic containing iron solids;
- The landfill is <u>not</u> the main source of arsenic or dissolved organic carbon. Most arsenic appears to be associated with iron coated sands below the waste;
- The landfill cap is effectively decreasing the interaction of meteoric water with landfill waste;
- Only a portion of the waste is in contact with groundwater. Based on new estimates (Sovereign 2010) approximately 11% of the waste is thought to be saturated;
- Groundwater beneath the landfill has been characterized in terms of flow direction and velocity. Groundwater flow and direction has been modeled. In addition dissolved and suspended analytes in the groundwater flow path have been identified and quantified;
- Arsenic is likely precipitating beneath the wetlands at Nonacoicus Brook. The Brook appears to represent the northern most edge of the contaminated groundwater plume from the landfill. This area is also the primary redox boundary which occurs near or at the Brook/wetlands area north of the landfill; and,
- The redox boundary has been generally identified and the fate of arsenic at the Brook/wetlands investigated.

6.3.1 Arsenic Distribution in Landfill and North Impacted Area

The vertical and horizontal distribution of arsenic and other analytes within and north of the landfill in the north impacted area are presented as a series of geological transects constructed using the water chemistry profiles compiled from Sovereign temporary well installation and groundwater profiling conducted in 2010 and described below.

The transect locations are depicted in **Figure 2** and **Figure 3** and the arsenic distribution in each transect in **Figure 6** to **Figure 11**. Other analytes in the same transects are shown in **Figure 12** to **Figure 28**. Please note that only wells with depth profiles are shown in this exercise. Each transect is discussed below.

6.3.1.1 Geological Transect A-A' and Groundwater Profile Analysis

This transect is a south to north view of arsenic with depth from the south end of the landfill (SHM-10-11), through the center of the landfill (SHM-10-12,, SHM-10-14 and SHM-10-15) and then north to the Brook and wetlands (SHM-10-16, and SHM-10-18 and SHM-10-24) (**Figure 2, Figure 3, Figure 12, Figure 17, Figure 21** and **Figure 26** show other analytes along this transect). The transect represents a two dimensional slice through the apparent center of the highest arsenic area and then follows arsenic north as the concentrations gradually diminish. The highest arsenic concentrations are found in groundwater beneath wells SHM-10-14 and SHM-10-15 where arsenic exceeds 14,000-ug/L. The arsenic follows the dipping bedrock surface to the north and arsenic in general is found to be highest at depth above the till layer, in all wells except SHM-10-12 where high arsenic is encountered at 44 ft bgs. Proceeding north, there is a thinner profile of high arsenic through SHM-10-16 (about 500 ug/L) and then much lower arsenic at the Brook/wetlands boundary (<400 ug/L). This north end distribution is discussed further in the C, D and E Transects.

The arsenic distribution along the transects is noteworthy for several reasons:

- The highest arsenic concentrations are frequently found at depth. This could be from a source of arsenic that is at the same depth of the arsenic found in the groundwater, or due to a source of arsenic in the underlying aquifer that is not associated with the landfill. . While several theories have been hypothesized for the existing distribution of arsenic, the data presently cannot confirm or deny these depositional hypotheses. Presently, it has been estimated based on drilling observations and mass calculations that only 11% of the waste is in contact with groundwater. Therefore the landfill may not be a significant source of arsenic presently but may have been one earlier in its history. The distribution of arsenic at Shepley's Hill is also similar to that found at the Winthrop Landfill in Maine. Keimowitz et al. (2005). At that site, the authors point to several lines of evidence as to why the Winthrop Landfill was not a source of arsenic. These include lack of enrichment of arsenic in hot spots beneath the landfill and in soil immediately below the waste, the fact that capping the landfill has not reduced arsenic concentrations in groundwater to any observable degree, and the fact that waste was not enriched in arsenic relative to native soil or rock, similar to Shepley's Hill.

- Some locations in the center of the landfill have very high arsenic concentrations (>14,000 ug/L) at depth but then immediately above the glacial till layer, arsenic concentrations in groundwater decrease dramatically to less than 400-ug/L. This may be due to infiltrating non-impacted groundwater entering beneath the landfill as recharge. At SHM-10-12 and SHM-10-15, groundwater at about 60 ft was partially oxygenated (6-mg/L) and contained arsenic at about 300-ug/L. This could be the original infiltrating landfill leachate boundary or recharging groundwater. Given the high DO contents, the latter seems more plausible as dissolved organic carbon would likely have caused the original oxygen in this layer to be consumed. Recent work by Gannett Fleming (2011) indicates that this lower concentration of arsenic in bedrock and till originates from oxidation reactions in the surrounding bedrock which then feeds the aquifer sands a continuous source of arsenic.

- The bedrock and till do not appear to be a major source of arsenic. Under oxidizing conditions as noted above, arsenic solubility will likely be controlled by sulfide oxidation (eg pyrite) which could lead to arsenic concentrations up to 400-ug/L as noted in the USEPA well on Shepley's Hill. While the concentration from bedrock weathering reactions, this process may be the original source of arsenic responsible for the arsenic enrichment in the aquifer sands prior to reducing conditions.

- Also as discussed with the BCT, it is understood that establishing a background number for SHL groundwater arsenic will be determined based on a monitoring program that is instituted as part of the final remedy as well studies performed by others including but not limited to the USGS, EPA and MassDEP. The USGS (USGS Special Report 2011-5013), EPA and MassDEP have and are performing studies to determine the background arsenic concentration in the regional groundwater. These studies have demonstrated that arsenic concentrations vary depending on whether the groundwater is oxidizing or reducing. Under oxidizing conditions arsenic will typically be controlled by sorption to hydrous ferric oxide (HFO) and by the weathering of arsenic occluded within pyrite or true arsenopyrite minerals. Under these conditions typical groundwater concentrations may range from <10 ug/L (Appelo, 2006) to 1,500 ug/L (Vermooten and Gunnink, 2007) depending on pH and bicarbonate concentrations. Near SHL, an EPA well has been found to contain about 400 ug/L in the bedrock which contains arsenopyrite. Other numerous regional studies indicate that concentrations up 2,000 ug/L in groundwater is possible from bedrock arsenic mineral weathering (Peters and Blum, 2003, Gilpin and Ayotte, 2006, Peters, 2008, Ryan et al., 2011 (in press), Lipfert et al., 2006, and Lipfert et al., 2007).

- Under reducing conditions, dissolution of HFO containing arsenic appears to be the most important control on arsenic concentrations. Ultimately the amount of arsenic found in groundwater in aquifers of this type will depend on the total solid phase arsenic in HFO, the extent of reducing conditions and the amount of dissolved sulfide which can precipitate soluble arsenic as well. Dissolution of HFO containing arsenic can result in ppm (>1,000 ug/L) levels of arsenic in solution (Appelo, 2006). A recent USGS (2011) report for arsenic in wells in bedrock units of central Massachusetts indicates background arsenic concentrations exceeding 1,500 ug/L. Given these fluctuations in background groundwater arsenic concentrations, a determination of the background to be used in the areas outside of the SHL will be based on a monitoring program that is instituted as part of the final remedy, and as agreed upon with USEPA and MassDEP.

- Based on the above, it seems most probable that the arsenic distribution pattern is due to a native source of arsenic in the underlying sands and then infiltration of groundwater with lower arsenic concentrations emanating from and along the bedrock surface. This is similar to distributions speculated by Harding ESE in the 2002 Supplemental Groundwater Investigation.

- Any interpretation should be qualified to recognize that the cap placed on the landfill has and will prevent further meteoric water infiltration which may have altered the original arsenic distribution pattern.

- The effect of the ATP could also be altering the arsenic distribution by pulling in non-impacted water.

6.3.1.2 Geological Transect B-B' and Groundwater Profile Analysis

This transect (**Figure 7**) begins at the south end of the landfill then proceeds east from transect A-A' before again converging at SHM-10-16 to the north and then to the Brook and wetlands (see also **Figure 2, Figure 3, Figure 7, Figure 13, Figure 18,** and **Figure 22** for other analytes on this transect). This transect presents the conditions on the eastern side of the landfill in contrast to the A-A' transect. The arsenic concentration is 396 ug/L at SHM-10-11 at the south end of the landfill, and then increases to 1,200 ug/L at SHM-10-07. SHM-10-07 is roughly east of and cross-gradient from the SHM-10-13, SHM-10-14, and SHM-10-15 cluster in the elevated arsenic concentrations. Wells north of SHM-10-07 have lower arsenic concentrations ranging from about 100 ug/L to 700 ug/L. Placing the A-A' transect in context with this transect suggests that arsenic is relatively low at the south end of the landfill (<400 ug/L), increases in the 29X, N-5, SHM-10-14 and 15 cluster (>14,000 ug/L), thins rapidly to the east through SHM-10-13 and SHM-10-07 (<1,200 ug/L) and then proceeds in a somewhat narrow flow path to the north. As with transect A-A', arsenic concentrations are generally higher at depth and the distribution generally follows the bedrock contour. As before, bedrock and till do not appear to be reduced but rather well oxygenated (DO = 5 and 9 mg/L at SHM-10-15 and SHM-10-13, respectively).

6.3.1.3 Geological Transect C-C' / D-D' and Groundwater Profile Analysis

Transect C-C' is at the north end of the site at the Brook/wetlands boundary (**Figure 2, Figure 3, Figure 8, Figure 14, Figure 19, Figure 23** and **Figure 27**). This transect is located at the edge of the partially observed redox boundary and should be discussed with transect D-D' for clarity. Transect C-C' includes, from east to west, wells SHM-10-18, SHM-10-20, SHM-10-26 and SHM-10-01. Transect D-D' (**Figure 2, Figure 3, Figure 9, Figure 15,** and **Figure 28**) is similar to C-C' but steps slightly south and includes wells, from east to west, SHM-10-27, SHM-10-25, SHM-10-23, SHM-10-24, SHM-10-17, SHM-10-21, and SHM-10-22. The two transects run roughly parallel to each other and allow a comparison of groundwater chemistry at the edge of the wetlands to chemistry further south in the landfill flow path.

In C-C' (from east to west) the arsenic concentration is < 500 ug/L at SHM-10-18 and SHM-10-20 and then decreases to non-detectable at SHM-10-26 and SHM-10-01. Therefore in DPT profiling points immediately on the perimeter of the brook and wetlands, arsenic is quite low, especially to the west of SHM-10-18.

Comparing the C-C' wells to those in D-D' which extends even further east than C-C' it can be seen that arsenic concentrations in wells SHM-10-17, SHM-10-23 and SHM-10-27 is much higher or between 1,000 and 2,000 ug/L. Moving to the west of these points, arsenic again diminishes to less than 400 ug/L. Thus a redox boundary appears to occur to the north and west of the landfill, but not necessarily to the east, although in general the concentrations observed in these northern DPT points are much less than in the landfill.

The other notable characteristic of the transect analysis is that the bedrock surface also appears to control arsenic distribution. As noted in the C-C' transect, the highest arsenic groundwater appears to be flowing through a structural bedrock topographical trough beneath the wetlands. The newest bedrock elevation map (**Figure 29**) from AMEC (December 2010) confirms this structural trough. The bedrock elevation data is discussed further below.

6.3.1.4 Geological Transect E-E' and Groundwater Profile Analysis

Transect E-E' shows the west to east configuration of wells SHM-10-08, SHM-10-02, SHM-10-03, SHM-10-04 on the north side of the Brook. As noted no elevated arsenic occurs on this north side of the Brook (**Figure 3** and **Figure 10**).

6.3.1.5 Geological Transect F-F' and Groundwater Profile Analysis

Transect F-F' is a east to west view from well SHM-10-03 on the north side of the Brook to the wells on the southern edge of the Brook (**Figure 3, Figure 11, Figure 16,** and **Figure 20**) wells SHM-10-27, SHM-10-25, SHM-10-23, SHM-10-24, SHM-10-17, SHM-10-19 and SHM-10-10. We note that the transect does not consider any arsenic concentrations that might be found east of this transect. Based on **Figure 30**, this transect runs perpendicular to the groundwater contouring pattern. In transect, F-F', arsenic impact to wells on the north side of the Brook (see also E-E') does not occur. On the south side of the Brook, well SHM-10-10 has less than 5-ug/L while SHM-10-17 has soluble arsenic at depth approaching 1,900-ug/L. The transect illustrates the landfill impact up to SHM-10-17 and east, but arsenic diminishes north at SHM-10-18 and west at SHM-10-10. The key to understanding the arsenic distribution in this transect relies on three important considerations: (1) the bedrock contour and resulting groundwater flow direction, (2) the change in arsenic chemistry near the south side of the Brook, and (3) the change in cation/anion chemistry in the wells along the Brook and wetlands. Bedrock contours (AMEC, December 2010) are shown in **Figure 29**. This updated bedrock delineation map (**Figure 29**) assists in explaining the important features for water quality data observed at both the north and south sides of the Brook. The bedrock elevation is at a low in the middle to north end of the landfill (120 to 140 ft msl). Water flow is then confined to a resulting structural trough bounded on the east by increasing bedrock elevation of 140 to 160 msl and to the west by bedrock elevations of 160 msl or higher likely from the Shepley's Hill bedrock surface. Bedrock remains at about 140 msl up to and through the wetlands, but still rises to the east, confining groundwater flow to a north and west direction. At approximately the location of the Brook, bedrock rises again to the north to 140 to 160 ft msl, near the location of the SHM-10-08, SHM-10-02, SHM-10-03 and SHM-10-04 wells. Bedrock slopes to the west to a 120 ft msl contour.

6.3.1.6 Geological Transect Evaluation

The general elevation of the northern most wells indicates that the bedrock surface is about 20 ft higher on the north side of the wetlands (at the location of the wells) and Brook than the southern side which indicates that groundwater flow is counter to flow from the landfill. This groundwater flow from the north provides the redox barrier that both oxidizes and precipitates arsenic at SHM-10-18 as it discharges into/below the wetlands.

The bedrock figure shows that on the north side of the Brook, bedrock slopes downward to the Brook, and to the west. In addition there is another structural trough on the north side of the Brook where water would also enter counter to the flow from the south side of the Brook. Where new data were not available the previous interpretation of the bedrock surface was retained, as is the case with the areas east and west of the geophysical survey transects. It is noted that bedrock outcrops are plotted on the USGS bedrock map to the north of Nonacoicus Brook, just beyond the short segment of 220′ contour. Further, the eastern extent of Transect B-B′ supports this systematic shallowing of the bedrock surface in a northeasterly direction. These observations preclude the possibility of a deepening trough between the end of Transect B-B′ and the mapped outcrops.

The water quality of the wells on the south side of the Brook (i.e. SHM-10-10 and other DPT locations) reveals an impact from water entering counter to the flow from the landfill. It is this water flow (from the north and east) that provides the redox boundary on the south side and west of the Brook. To examine the impact of non-landfill impacted water on water quality at the south side a comparison of well water chemistry from SHM-10-08, SHM-10-02, SHM-10-03, and SHM-10-04 can be made with SHM-10-10 and select DPT points.

Arsenic concentration decreases dramatically to the north of SHM-10-17 (1,800 ug/L) at SHM-10-18 (<400 ug/L) and west at SHM-10-19 (<800 ug/L) and SHM-10-10 (<5 ug/L). The decrease is presumed to be from mixing with water from the north side of the Brook and from the westerly flow of the Brook and wetlands. The zone of mixing is considered the redox zone or boundary, where more non-impacted water mixes with water from the landfill emanating through SHM-10-17 and SHM-10-18 resulting in iron oxidation and adsorption of arsenic. The zone exhibits reduced arsenic by 61% to 83% over a distance of about 20 meters. Arsenic in detectable quantities is therefore unlikely to ever occur in the wetlands or the Brook at this location.

To determine the extent of changes in the water chemistry from intrusion of oxidized, relatively arsenic-free water from the north, simple mixing calculations were performed to determine how much clean water is intruding and creating the redox boundary at the south side of the Brook and wetlands.

Cation and anion chemistry from the landfill may be characterized by SHM-10-14 or SHM-10-15. If this water is mixed with the water from the north side of the landfill, then predicted mixing scenarios are summarized in the following table (Data from sampling of screened wells in September 2010):

The table suggests that mixing ranges from 25 to 75% at the redox boundary depending on the analyte (conservative/non-conservative) used. Regardless of the percent mixing, it is clear that as landfill-impacted groundwater mixes with non-impacted groundwater, clear chemical changes are occurring.

Analyte	Landfill Well SHM-10-14 (mg/L)	Ave of North Side Wells 08,02,03,04 (mg/L)	25:75 Mixing North Side Water/Landfill Water (mg/L)	50:50 Mixing (mg/L)	75:25 Mixing North Side Water/Landfill Water (mg/L)	Water Chemistry at SHM-10-10 (Observed) (mg/L)
Ca	55	170	84	113	141	95
Mg	4	20	8	12	16	14
Na	15	40	21	28	34	26
K	17	5	14	11	8	4
Cl	6	100	30	53	77	20

6.3.2 Geochemical Changes Along Flow Path

Other redox sensitive or redox-driven analytes can be compared to the arsenic distribution detailed above in order to illustrate the underlying geochemistry associated with arsenic mobility and fate at the site. This is also illustrated through a series of transects presented in **Figures 6** through **Figure 28**. The transects are discussed per analyte and how each is distributed compared to arsenic.

6.3.2.1 Iron and Manganese

The iron and manganese (**Figures 12** to **Figure 19**) concentrations in the groundwater profiles depicted in each transect are similar to the arsenic distribution (see **Figures 6** through **Figure 11**) described above. In general, iron is found highest at depth (except at the top of the bedrock surface where it is very low (less than 0.5 mg/L)). Additionally, iron and manganese concentrations tend to diminish slightly with distance from the landfill. For example concentrations of dissolved iron range from 44 mg/L to 110 mg/L in the elevated arsenic area and decrease to 30 mg/L at the redox boundary. Manganese decline from north to south does not occur to the same extent as iron. This process has been noted in other landfill induced groundwater regimes presumably due to the ease with which manganese is reduced. Thus manganese will persist until very well oxidized conditions are again encountered.

6.3.2.2 Redox Potential (Eh)

The measured redox potential (Eh) does not always correlate to the presence of redox sensitive species such as iron, manganese, sulfate etc. However at the landfill Eh is a reasonable indicator of conditions where elevated iron, manganese or ammonia should exist and correlates reasonably with where these constituents should be found. The observed Eh does not however identify where the highest concentrations of redox sensitive species exist (see **Figures 21** through **Figure 25**). It should be noted that ORP is not a particularly sensitive parameter. The electrode response to mixed redox couples is unknown. If redox was calculated from known redox chemistry in the borings a different result may have been obtained. As it is, most of the redox measurements appear to be buffered by the Fe (II)/Fe (III) couple and possibly the sulfate/sulfide couple.

6.3.2.3 Carbon Degradation

Carbon degradation species (ammonia, DOC, alkalinity). The distribution of carbon related species requires some background information as to their geochemical formation. Under anaerobic conditions such as observed at the landfill, carbon bearing molecules degrade in a very general sense via:

$$C_aH_bO_cN_dS_e + (a\text{-}b/4\text{-}c/2\text{+}3d/4\text{+}e/2)\ H_2O = (a/2\text{+}b/8\text{+}c/4\text{+}3d/8\text{+}e/4)\ CO_2 + dNH_3 + eH_2S + CH_4$$

This degradation scheme serves to show that under anaerobic conditions, ammonia, carbon dioxide and methane are produced, all detectable at the landfill. Further reactions proceed including:

- Carbonic acid formation: $CO_2 + H_2O = H_2CO_3^- = H^+ + HCO_3^-$
- Metal sulfide precipitation: $H_2S = 2H^+ + S^= = (Metal)S_{(solid)}$

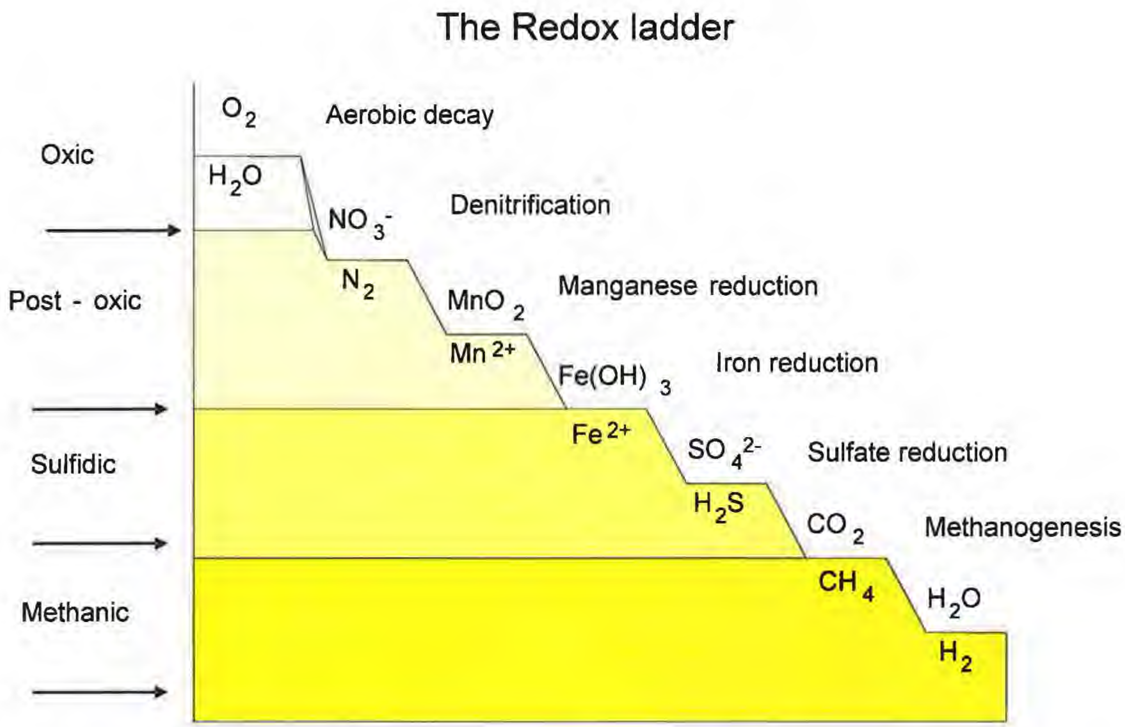
These reactions result in the overall addition of the following analytes to landfill leachate and groundwater:

- Soluble species = residual carbon (DOC), bicarbonate, ammonium, and some sulfide
- Gaseous species = methane, carbon dioxide, and ammonia

This overall reaction scheme is similar to the individual reaction examples listed below which occur as oxygen is consumed in an organic rich environment such as the peat and landfill waste. The reactions that occur as redox becomes more negative are illustrated below.

Reducing Stage: from oxidizing to more reducing	Chemical Reactions
Aerobic Respiration	$CH_2O + O_2 \rightarrow CO_2 + H_2O$
Denitrification	$5CH_2O + 4NO_3^- + 4H^+ \rightarrow 5CO_2 + 2N_2 + 7H_2O$
Manganic Reduction	$CH_2O + 2MnO_2 + 4H^+ \rightarrow CO_2 + 2Mn^{2+} + 3H_2O$
Ferric Reduction	$CH_2O + 4Fe(OH)_3 + 8H^+ \rightarrow CO_2 + 4Fe^{2+} + 11H_2O$
Sulphatic Reduction	$2CH_2O + SO_4^{2-} + H^+ \rightarrow 2CO_2 + HS^- + 2H_2O$

Based on the landfill geochemistry the redox ladder presented below illustrates where the landfill and underlying groundwater are presently poised and the order with which reactions have occurred.



Based on these basic principles and comparing them to the chemistry observed at the site, several observations regarding redox species in the landfill and north of the landfill are presented below:

- The landfill is highly reducing and methanagenic. Methane production is widespread in the landfill. Ammonia is present throughout groundwater sampled from the landfill wells and to the north indicating the influence of the landfill and the strongly reducing conditions. Ammonia and alkalinity are good indicators of the extent of landfill-reducing conditions throughout the area.
- The transects show elevated DOC (**Figure 26** through **Figure 28**) that does not necessarily parallel the other redox sensitive species. This may be due to the microbial conversion of groundwater carbon to other species such as methane or carbon dioxide. The DOC may also act as an on-going source of reducing conditions. This is addressed in the next **Section 6.3.3.** Both transect and profile data for the various wells show elevated bicarbonate concentrations due to carbon dioxide production. These concentrations are highest in the center of the landfill and lower on the perimeter of the landfill.
- Bicarbonate is a good indicator of landfill influence and extent of intrusion into local groundwater. As explained earlier and in the redox diagrams, anaerobic biodegradation produces carbon dioxide which in turn dissolves in water and forms bicarbonate (and carbonate if pH is high enough). The high bicarbonate water produced from the landfill waste (and peat) intrudes upon native groundwater and changes the water quality from calcium chloride type water to calcium-iron-bicarbonate type water. This process is

described in a series of figures (**Figures 34** to **Figure 40**) that show groundwater quality changes from the south of the landfill to the north of the landfill, discussed below.

To illustrate the use of bicarbonate as an indicator of landfill influence, the changes in bicarbonate concentrations are shown along a group of wells within the landfill and outside of the landfill. The well locations start in the south landfill at SHM-10-11 then to SHM-10-12 to SHM-10-13 with a cluster of wells in the center at SHM-10-15 and SHM-10-14 then north out of the landfill to SHM-10-16 and further north to SHM-10-04 across the Brook (**Figures 34** to **Figure 40**). In **Figure 35**, the cation and anion balance is shown for SHM-10-11 that is illustrative of a partially landfill impacted groundwater. (i.e., shows chemical characteristics of landfill leachate such as elevated bicarbonate). At this location bicarbonate is the dominant anion (due to carbon dioxide production during carbon degradation) but measurable amounts of both chloride and sulfate are still found. This may be compared to groundwater sampled from SHM-10-04 (**Figure 34**) which is north of the landfill and across the Brook and wetlands and is thought to represent local, non-landfill (or peat) impacted groundwater. As noted anion chemistry in this well is nearly equally distributed among bicarbonate, sulfate and chloride. Thus the landfill/peat will enrich local groundwater in bicarbonate compared to other anions.

The bicarbonate enrichment expected from landfill carbon degradation processes is seen in the wells in the center of the landfill for SHM-10-12, SHM-10-13, SHM-10-14, and SHM-10-15 (**Figure 36 through Figure 39**). In these wells, bicarbonate is clearly the dominant anion with only small amounts of chloride and no detectable sulfate (due to sulfate reduction). This anion distribution is characteristic of the landfill influence. Moving north to SHM-10-16 outside of the landfill (**Figure 40**), bicarbonate still dominates, but chloride has increased and small amounts of sulfate are also noted, indicating some mixing with other groundwater or surface water recharge.

6.3.3 Summary of Arsenic Fate and Transport in Landfill and North Impact Area from Transect Analysis

This section summarizes the data collected for the north impacted area.

6.3.3.1 Fate of Arsenic and Carbon in Landfill and North Area

The geochemical analysis of groundwater profile and transect data are summarized as follows:

- Arsenic concentrations are found to be highest beneath the area roughly defined by N-5, SHL-99-29X, SHM-10-12, SHM-10-14 and SHM-10-15. Observed arsenic concentrations range from 1,000-ug/L to about 17,000-ug/L.
- Sampling of groundwater from monitoring wells to the north of the landfill including SHM-10-16, SHM,-10-17, SHM-10-18 and SHM-10-10 reveal that arsenic concentrations are diminished compared to the landfill concentrations. Arsenic in the wells ranges from <5-ug/L (SHM-10-10) to about 1,900-ug/L (SHM-10-17) indicating a gradual but identifiable decrease in arsenic with distance from the landfill.

- Monitoring well water chemistry from the east side of the landfill also shows that arsenic decreases in this direction. Wells SHM-10-06A and SHM-10-07 on the east side of the landfill have arsenic ranging from <200 ug/L to about 1,400 ug/L.
- The transect analysis illustrates that the arsenic concentrations usually increase with depth from the groundwater surface. There is, however, a noticeable and measureable change in arsenic and dissolved oxygen just above the till and bedrock surface. Here dissolved oxygen is high (up to 9 mg/L DO) and arsenic <300 to 400 ug/L.
- These transects clearly delineate the extent of arsenic with depth, within the landfill and to the north at the Brook/wetlands.
- The other redox sensitive analytes, iron and manganese, and the carbon degradation related analytes (especially bicarbonate) also define the extent to which degradation of landfill waste and peat have impacted native groundwater. Aside from manganese and possibly dissolved organic carbon (DOC), the redox species generally mirror the distribution of arsenic.
- The resulting picture from the transect analysis demonstrates that landfill waste and peat degradation have caused reducing conditions which in turn have mobilized arsenic through reduction of iron (III) solids and subsequent release of arsenic. The main area of arsenic mobilization is directly below the landfill in the area where the former wetlands were found underlain with peat. The organic carbon degradation here has resulted in a predictable series of redox changes identified through methane, carbon dioxide and ammonia production. These analytes are found throughout the flow paths examined. These analytes are found in diminishing concentrations as the north end of the site is encountered at the Brook and wetlands presumably due to intrusion of clean non-landfill impacted groundwater and groundwater recharge.

6.3.3.2 Summary of Redox Boundary Data in North Area

In this document, the term "redox boundary" is used to define significant and measureable changes in groundwater geochemistry that occur at the edges of the landfill impacted groundwater. These changes may occur for several reasons:

- Flow of landfill-impacted water that intrudes into non-impacted groundwater downgradient of the landfill (i.e. the downgradient extent of the impacted groundwater migration)
- Mixing of landfill-impacted water with non-impacted water beneath the Brook and wetlands, and
- Dilution of landfill impacted water by infiltrating non-impacted water along the sides of the plume outside of the landfill footprint where infiltrating meteoric water is not restricted due to capping.

The redox boundary has been roughly defined by Transects C-C', D-D', E-E', and F-F'. The extent and significance of the redox boundary can be described as follows:

- The general elevation of the northern most wells indicates that the bedrock surface is about 20 ft higher on the north side of the wetlands (at the location of the wells) and Brook than the southern side which indicates that groundwater flow is likely in the opposite direction to flow from the landfill. This provides a redox boundary due to the generally better water quality from the north compared to that emanating from the landfill.
- The bedrock contours also show that on the north side of the Brook, bedrock slopes downward to the Brook, and to the west. In addition there is another structural trough on the north side of the Brook where water would also enter in the opposite direction to the flow from the south side of the Brook. This counter flow should also create an effective redox boundary.
- The groundwater on the north side of the brook that is intruding, diluting or mixing into the landfill impacted water on the south side of the brook contains on average 40 mg/L of sodium. The wells in the landfill contain on average 15 mg/L of sodium. This is due to the intrusion of the iron-bicarbonate water created from the landfill carbon degradation process and subsequent replacement of calcium and sodium in the native groundwater. The wells at the north end of the impacted area at the south side of the Brook and wetlands contain on average 15 mg/L of sodium. This indicates that mixing of water from the north side of the Brook which is high in sodium is occurring. Using a simple mixing model, approximately 50% mixing between the two waters has occurred. This same analysis can be done with calcium, bicarbonate, sulfate or chloride with similar results. Some analyses suggest up to 75% mixing with water from the north.
- The subsequent mixing with this water diminishes arsenic to low levels. Mixing also results in redox changes that will oxidize iron (II) to iron (III) with subsequent adsorption of soluble arsenic. This redox boundary has been clearly delineated to the west of SHM-10-17 near DEP-08-03 and to the north at SHM-10-18. To the west SHM-10-19 and SHM-10-10 show marked decreases in Eh, DO, iron and arsenic and to the north SHM-10-18 shows only 17% (300 ug/L) of the arsenic encountered at SHM-10-17 (1,800 ug/L). This reduction is consistent with the change in sodium, chloride and other general chemistry parameters found at SHM-10-18 or SHM-10-10 which indicate mixing with non-impacted water. To the east, the redox boundary was not as clearly defined since access was not obtained for several key locations. However, based on earlier DPT work to the east, the extent of landfill intrusion into the Brook/wetlands may not occur past SHX-01-14X.
- Due to the observed geochemical changes in some parts of the north end, arsenic exceeding 400-ug/L will likely not enter the wetlands/Brook underflow. Since rapid oxidation is expected in the wetlands, detectable arsenic entering the base-flow is unlikely.
- Since the data was collected at the lowest flow stage of the wetlands and Brook it is expected that during other flow stages the impact from the landfill will be even less as the percentage of mixing and oxidation will increase as peak flows are approached.
- The redox boundary can be better identified using a groundwater monitoring network established from the well water chemistry completed in this SAR. Wells placed to the

north of the landfill, to the west along the brook and east along the brook can, over time allow changes in arsenic geochemistry to be observed along the groundwater flow path in this area of the site which can be used to refine the redox boundary observations

- The existing data support the conceptual model of arsenic laden groundwater migrating along and above the bedrock surface at depth through the documented bedrock topographic trough that proceeds north from the landfill and turns westward along Nonacoicus Brook. Based on the depth of impacts and as depicted on the Transects, arsenic laden groundwater does not appear to discharge to the brook or wetlands as the arsenic impacts are located deeper than the brook and wetlands.

6.3.4 Column Results and Modeling of Monitoring Natural Attenuation

6.3.4.1 Column Results

The first column study was designed to address the question of how long would it take for the landfill aquifer to recover to pre-landfill conditions if un-impacted oxidized water were to enter and flush the arsenic and carbon out of the column pore water.

The data for the initial column flushing study is presented in Prima Environmental: Report of Findings, Shepley's Hill Landfill 2011 (**Attachment I**). As noted from the data the column is washed free of arsenic (to less than 5 ug/L) in 8 to 9 pore volumes in one column and 13 pore volumes in the column duplicate (**Figure 41**). **Figure 42** and **Figure 43**, show that while arsenic diminished rapidly, the column is still maintaining reducing conditions (Eh < -25 mv) and carbon is still elevated at 3 mg/L.

Using the initial arsenic flushing rate from this study an estimate of the time it takes for the aquifer to be flushed free of arsenic can be made. Since the groundwater velocity ranged from approximately 0.5 to 1 ft/day and the migration of 1 pore volume of groundwater through the landfill would take approximately 13.5 years, then 13 pore volumes represents about 176 years of flushing and roughly 269 years to the brook at an initial arsenic concentration of 1,200 ug/L.

The above example can be considered a best case scenario since the column effluent was still reducing at the end of the study, containing roughly half the dissolved organic carbon (about 3 mg/L) indicating reducing conditions will persist beyond the initial flushing of the pore water entrained arsenic.

In a second column study a different scenario was tested. The details included:

- Flushing of a section of core containing high solid phase arsenic (35 mg/kg) with oxidized water to remove all pore water arsenic (initial concentration 1,450 ug/L).
- Once the core was flushed free of soluble arsenic, introduce reduced water and flush at a slow rate (1 pore volume per 4 days or less than 0.5 ft/day)
- Examine effluent to determine how fast arsenic is re-released from the remaining solid phase pool (presumably HFO and other solids)

This test is especially relevant since several proposed remedial strategies focus on removing arsenic from groundwater while allowing reducing conditions to persist. Therefore the test simulates the potential for re-release of arsenic from aquifer solids downgradient either from the ATP or a reactive barrier. Under both situations arsenic will be removed allowing for the pore water arsenic to decrease, but reducing conditions will still prevail.

The results from the study are summarized as follows:

- Influent water: Bicarbonate alkalinity = 210 mg/L, Arsenic (total dissolved) < 5 ug/L, Calcium = 92 mg/L, Cl = 12 mg/L, DOC = 62 mg/L, Mg = 9 mg,L, K = 42 mg/L, Fe (II) < 0.01 mg/L, Na = 75 mg/L, DO = 2 mg/L, pH = 6.8.
- Arsenic in column 1 (experiment was duplicated) began at <5 ug/L. After 12 pore volumes arsenic in the column 1 effluent was 210 ug/L. In column 2, arsenic was 190 ug/L after 9 pore volumes (See **Figure 1**).
- The arsenic in the effluent in both columns was low (<70 ug/L) through the first 9 pore volumes extracted at a rate of 0.5 ft/day.
- At pore volumes 10 and 11, arsenic began to increase presumably due to dissolution of HFO in the sands.
- The slow dissolution pattern suggest that HFO dissolution and arsenic release is initially rate limited and will take time before significant amounts of arsenic are released to solution. After 15 weeks arsenic appeared to level off between 300 and 400 ug/L.

6.3.4.2 Geochemical Modeling and Mixing

The data from the above flushing exercise was modeled with PHREEQC2 which is a US Geological Survey computer code that can be used for modeling column data and other water quality exercises. The model parameters were used to address the time of flushing for the center of the landfill where arsenic concentrations approach 15,000-ug/L. The results are shown also in **Figure 44**. As noted, arsenic rapidly diminishes in the first few pore volumes and then diminishes to about 200-ug/L at 12 to 14 pore volumes. Thus flushing the center of the plume may take approximately 50 to 100 years longer than found in the moderate arsenic column flushing data.

Another geochemical exercise was conducted. The purpose of this exercise was to determine (1) the primary solid phase controlling arsenic solubility, and (2) determine the distribution coefficient of arsenic per a site specific analysis. These are needed to understand what the primary source of arsenic is in groundwater and what concentrations can be expected in groundwater based on the presence of the source. In the first case, it is assumed that iron solids control arsenic solubility by adsorption of arsenic onto the surface of amorphous hydrous ferric oxide (HFO) or ferrihydrite. This assumption has been based on previous site work and literature that demonstrates the control that HFO has on arsenic solubility and mobilization under reducing conditions. While this control on arsenic solubility is probable in the Shepley's Hill Landfill, there may also be other controls on arsenic solubility such as oxidation of arsenopyrite in bedrock and till and dissolution of pyrites or sulfides containing arsenic. Recent mineralogical investigation of some of the core samples has been examined by RJ Lee Group (**Attachment L**, Mineralogy and SEM Results). It was noted that in-situ formed framboidal pyrites were prevalent in many of the samples even in some of the waste. Thus there is at least some evidence that other iron minerals may be present. Due to this, if all solid phase iron and arsenic concentrations in the soil/aquifer solids from the borings is examined by plotting Fe versus As there should be considerable variability as noted in **Figure 45**. This suggests that iron solids (as HFO) contain different amounts of arsenic and/or there are several sinks for iron which can alter the arsenic to iron ratio expected from arsenic in HFO alone.

Since water samples were collected every 10 ft, it was possible to assign an aqueous arsenic value at the same depth where the solid arsenic content was measured in all the boring samples. By plotting the aqueous phase arsenic against the solid phase it would be possible to define a site specific distribution coefficient or Kd for arsenic. Since Kd:

$$\text{Arsenic (solid)} = Kd * \text{Arsenic (solution)}$$
$$Kd = \text{Arsenic (solid phase)/Arsenic (solution phase) – liters/kilogram}$$

This exercise was carried out and plotted in **Figure 46**. The plot is generally linear with a Kd (slope) of 7.62 and an R squared of 0.76. Since the plot is generally linear and the parameters well correlated a site specific Kd of 7.62 can be used in subsequent geochemical analyses. Care should be exercised in the use of the Kd since the correlation is dominated the cluster of samples at the low end of the plot. This site specific Kd, which covers a large range of concentrations, may also be in fact a series of 2 or more slightly different plots or lines representing different mechanisms of arsenic retention.

6.4 Reducing Conditions in Landfill

One of the most difficult processes to quantify at the landfill is the source strength. Source strength is defined as the mass of potentially reactive arsenic emanating from the landfill or the aquifer minerals or both. Landfills are notoriously difficult to characterize due to severe variability in types of material disposed and irregular placement of refuse. In the case of Shepley's Hill Landfill, this is made more difficult due to the relatively new cap placed over the landfill. The cap alters the original delivery of arsenic and carbon to the underlying groundwater by cutting off the infiltration of meteoric water and results in a new or different distribution of arsenic and carbon in the groundwater. Due to these complications it is not likely that the landfill can be characterized vertically and aerially with any degree of confidence. As such, the borings completed in the landfill were advanced in several distinct locations based on previous site investigations that would yield important information about the potential arsenic contents within the landfill and also the carbon distribution at key locations within the landfill. Waste characteristics within the landfill borings is described first followed by a discussion of the carbon as a source of reducing conditions.

6.4.1 Waste Distribution and Characterization

Waste was encountered in all of the borings advanced in the landfill, with the exception of SHM-10-13. Here a layer of ash and sand from approximately 6 feet to 10 feet below grade and again at approximately 22 to 24 feet (mixed with sand) below grade was encountered overlying a large thick section of peat. **Table 7** summarizes the occurrence of waste and the type of waste and the major trace element analyses encountered.

The table illustrates that the waste metal content is highly variable but with the exception of a few samples not necessarily enriched in metals with respect to normal soil background ranges (see yellow highlighted values which represent enriched samples). The shaded values represent enrichment with respect to normal soil ranges. As noted, lead appears to be enriched most commonly in the waste samples, a not unexpected result given the composition of municipal waste. Arsenic in the waste varies from 0.8 to 60 mg/kg with the highest contents found in a single ash sample and in peat. The distribution of important trace elements in the waste and underlying sands are shown (and discussed) in the following soil boring profiles.

Figure 47 displays the trace metal content of the SHM-10-11 landfill boring strata. Several important observations can be derived. First, there are 4 distinct zones in the profile. The first zone is a layer of waste of mainly paper, plastic, and some metal scraps that occurs to about 12 ft bgs. This zone is elevated in lead, zinc, and copper. The second zone occurs below the first and also includes paper waste but wood fragments as well (13-23 feet). The waste in this zone is mainly chromium, copper and zinc enriched and at levels lower than the first zone. The third zone (24 to 60 feet) is the underlying aquifer sand that has very low (less than 20 mg/kg) metal contents. Finally, at the bottom of the boring (> 60-feet) glacial till and weathered bedrock is encountered from 55 to 70 ft. Here chromium, zinc, nickel and lead increase again due to the native mineralization of the bedrock and till in the area.

Another observation from the profile is the sharp break in concentration of metals from the waste layers to the underlying sands. There is no gradual decrease in metals with depth suggesting that enrichment of the underlying solids from waste leaching has not occurred. As noted previously this is similar to the distribution of arsenic and metals at the Winthrop landfill where waste is not considered a source of arsenic or metals to underlying groundwater (Keimowitz et al. 2005).

Figure 48 shows the same trend for boring SHM-10-12. A simpler trend is observed in this profile, with only the upper waste enriched in lead, copper and zinc (10-feet) and lower strata (10 to 60 feet) showing no significant variation in trace metal content. Again the sharp break in concentration is observed.

Figure 49 shows the profile for SHM-10-13. This profile also has 4 distinct zones. Waste occurs to approximately 25 to 30 feet bgs which is elevated in lead, chromium, and copper. Below this waste, sand is encountered with no obvious elevated metals, and just underlying the first sand zone is another sand layer with elevated nickel, chromium, and copper (40-45 feet). The reason for the elevated metals in this part of the profile is not fully known. Sands occurring from 50 to 70 ft are relatively low in metals concentrations (<20 mg/kg) until till is encountered and metals (lead, copper, and arsenic) increase as noted earlier.

Figure 50 is the metal profile for SHM-10-14. This profile shows a waste zone occurring to about 25 feet bgs followed by a thin clean sand layer and then a 14 ft thick layer of peat. The waste contains some lead and zinc while the peat is slightly elevated in arsenic and zinc. Below the peat layer is low metal containing sand from 44 to 60 ft bgs. At 60 ft till and weathered bedrock are encountered which explains the increase in arsenic and zinc from 70 to 83 ft.

Figure 51 is the final profile for landfill boring SHM-10-15. The profile shows elevated lead, zinc, and copper in the waste layer (5-25 feet) and as observed in the other borings, relatively clean sand followed by increases in metals at the till/bedrock interface.

Figure 52 and Figure 54 display the carbon and arsenic contents of the aquifer solids from three of the landfill borings. Initial analysis of the data suggests little correlation between TOC and arsenic. Unlike arsenic distribution, TOC outlines the waste and peat profiles very well and the decreases, presumably to background with depth. In all cases TOC decreases rapidly below the waste and or peat layer.

A summary of the waste characteristics and depth profiling shows that:

- Most trace metals are confined to the upper part of the profile defined by the landfill waste boundary. No enrichment of underlying sands has been found indicating leaching has not resulted in measurable changes to the solid phase metal content in the aquifer.
- Most of the waste is enriched in metals typically found in municipal landfill: lead, copper, zinc, chromium, and nickel.
- Arsenic in waste samples was found to be 31 mg/kg. Only in the peat underlying SHM-10-14 did arsenic reach levels approaching 60 mg/kg.
- Two borings appeared to have waste and or peat in contact with groundwater. These were borings SHM-10-14 and SHM-10-15.
- The effect of the cap will likely have a great effect on preventing possible migration of metals from the waste into groundwater. Future analysis of wells should reveal marked declines in any soluble metals such as nickel and zinc.

6.4.2 Landfill and Peat / Wetlands as Arsenic and Carbon Source

This section discusses the relative importance of the landfill waste and peat as sources of arsenic and carbon.

6.4.2.1 Geochemical Analysis: Arsenic Source

Additional calculations were made using the arsenic contents from the waste and underlying sands to determine the relative importance of waste or aquifer sands as a source of arsenic to groundwater. This was attempted by calculating the relative mass of arsenic in waste and the mass of arsenic in aquifer sands. The results are summarized as follows:

Material	Average As Content (mg/kg)	Depth of Material (ft)	Arsenic Inventory in Landfill Due to Waste or Sand (kg) assumes 90 acre landfill and Bulk Density of 1.6
Waste	10.9	23.2	27,598 kg
Sand	14.2	35.6	68,710 kg

The table shows that the aquifer sands had a slightly higher average arsenic content compared to waste (14.2 mg/kg compared to 10.9 mg/kg). The depth of waste versus aquifer sands was obtained from the boring logs and collection of samples from each stratum at borings SHM-10-11, SHM-10-12, SHM-10 SHM-10-13, SHM-10-14, and SHM-10-15. While the waste was considered to be 23 ft deep on average, most of the waste was bisected by sand layers or daily cover. A correction of 4 ft of sand cover per 20 ft of waste was made. The calculations indicate that the aquifer sand contains about 2.5x the amount of arsenic as the waste, confirming the significance of this (aquifer sand) source to the overall groundwater quality.

The data show on a mass basis there is more arsenic inventory in the underlying aquifer sands than in the waste. Hence as an on-going source of arsenic, the aquifer sand is a more important source. On a mass basis the waste contains about 27,600 kg of arsenic compared to 68,800 kg in the aquifer sand. If the amount of saturated waste is further taken into account, only 7,000 kg of arsenic in the waste is possibly in contact with groundwater. It is not known with certainty how much if any waste based arsenic has leached into the groundwater, this calculation simply describes the condition of the landfill as it now occurs. Capping and pumping have likely altered the distribution of arsenic from the previous uncapped condition.

Early reports by Harding ESE, AMEC and Gannett Fleming and more recently by Sovereign have revealed: (1) the primary source of arsenic now mobilized in groundwater originates from the aquifer sands. Other sources such as landfill waste and bedrock may contribute to dissolved arsenic but are not the primary source. Aquifer sands are rich in hydrous ferric oxide (HFO) which hosts surface adsorbed arsenic; (2) arsenic solubility is controlled by reducing conditions imposed by both landfill waste and pre-existing peat deposits within the wetlands over which waste was emplaced; (3) reducing (and anaerobic) conditions force reduction of Fe (III) to Fe (II) resulting in dissolution of HFO and concurrent release of sorbed arsenic; (4) This process has resulted in arsenic concentrations in groundwater that range up to 16,000 ug/L. The importance of HFO in controlling arsenic solubility is a widely accepted process and has been demonstrated to occur at other landfills.

Another evaluation of the waste and aquifer sand is presented. Reported here are the results of the Sequential Extraction which have been used to determine how much arsenic could be potentially released and leached into groundwater from the different potential source samples. The Table below describes the results received to date.

Sample ID		Arsenic in Sample (Total) (mg/kg)	Arsenic in Phosphate Extract (mg/L)	Potential Leachable Arsenic (ug/L)
SHM-10-12	Waste at 5-ft	12	0.14	140
	Sand at 42-ft	29	0.39	390
	Sand at 65-ft	34	0.48	480
SHM-10-13	Waste at 23-ft	31	0.51	510
	Sand at 83-ft	23	0.39	390
SHM-10-14	Waste at 10-ft	18	0.28	280
	Waste at 15-ft	12	0.08	8
	Waste at 20-ft	18	0.21	21
	Waste at 27-ft	3.8	< 0.052	< 52
	Sand at 70-ft	35	0.55	550
	Sand at 75-ft	51	1.24	1,240
SHM-10-15	Waste at 18-ft	25	0.083	83
Method Blank		NA	< 0.052	< 52

Preliminary analysis reveals that waste samples potentially could leach from <53 ug/L arsenic to 510 ug/L arsenic. The underlying aquifer sands by comparison could leach up to 1,240 ug/L. This leachable quantity is not however an indication of the amount of arsenic that could be released in the sand samples by reducing conditions. For example if all of the arsenic entrained in the iron solids on the sand grains was released, then concentrations of 30,000-ug/L or higher could be found in solution (i.e., 15-mg As/g sand dissolving into 0.5-mL of pore water). This range of concentration has been reported in SHM-10-14. This simple analysis suggests again that the waste, like the bedrock, is not the most significant source of arsenic to the underlying groundwater under reducing conditions. The sands rich in surface precipitated iron and arsenic are the main source of arsenic. The cap will prevent further migration of potentially soluble arsenic from the landfill waste to the underlying soils in most locations.

6.4.2.2 Landfill and Peat / Wetlands as Carbon Source

For evaluating reducing conditions or carbon source strength, a well by well comparison was completed in order to assess the relative contributions of landfill waste to peat as a source of reducing conditions. From the previous discussion, reducing conditions evolve from a set of geochemical reactions that begin when carbon degradation utilizes, then expends all available oxygen. At this point other oxygen sources such as nitrate and sulfate are utilized that further drive the redox potential down (more negative). Once these are expended, anaerobic metabolism proceeds and carbon dioxide, methane and ammonia are produced. A simple way to assess the relative "reducing strength" of the landfill waste and peat is to examine the total carbon produced by the geochemical conditions within the landfill waste or peat. To do this the following protocol was used:

- The landfill borings recently completed were segregated by whether waste or peat or both were encountered in the borings. This led to the following classes:
    - SHM-10-13 contains almost **exclusively peat**, with only a trace of ash well above the water table. No other organic waste was found in the boring;
    - SHM-10-14 contains **peat and waste;**
    - SHM-10-15 and SHM-10-12 **contain waste** but no peat.
- The carbon balance encountered in the well water at each of these locations was examined to determine which location contributed more carbon to the system.
- The analysis provides a limited but useful comparison of peat vs. waste vs. peat plus waste as far as carbon and reducing conditions are concerned.

The analysis yielded the following results:

Location	DIC (mg/l)	DOC (mg/l)	Total Carbon Input (DIC + DOC)
SHM-10-11 (waste)	62	3.3	65.5
SHM-10-12 (ash/waste)	110	4.1	114.1
SHM-10-13 (peat)	140	5.6	145.6
SHM-10-14 (peat/waste)	120	8.7	128.7
SHM-10-15 (waste)	82	4	86

The results show that the two wells drilled into the peat, SHM-10-13 and SHM-10-14 have the greatest carbon input of 129 and 146 mg/L, respectively. The two wells drilled into waste only, SHM-10-15 and SHM-10-11 have the lowest carbon input of 65.5 and 86 mg/L, respectively. The boring through the ash layer is intermediate with 114 mg/L of total carbon.

This limited analysis suggests that the peat layer, with or without waste above it supplies more carbon input to the groundwater than ash or waste alone by almost a factor of two. This also suggests that the peat layer and associated wetlands have been acting as a carbon source long before the landfill existed. This carbon source resulted from and contributes to locally reducing conditions that would have mobilized arsenic long before the existence of the landfill. The landfill impact to reducing conditions has no doubt decreased through time due in part to exhaustion of easily degradable carbon sources and to the placement off the cap on the landfill. Thus this analysis can only be valid for the present time. The exercise conducted above is substantiated by the scientific literature. The emplacement of landfill waste clearly has created its own carbon metabolism, degradation and anaerobic reducing conditions. Municipal landfills are known to behave in this manner and there is no dispute that the landfill comes with its own set of impacts to underlying groundwater. SHL is considered an older landfill (>20 years). By literature standards (El Fadel et al., 2001) leachate from these landfills have lower COD (<1,000 mg/L), BOD (<50 mg/L), ammonia (<30 mg/L), TDS (<1,000 mg/L) and other constituents compared to newer landfills. SHL groundwater falls within these ranges even with dilution considered. Since SHL has been capped, most of the waste (89 %) is no longer in contact with groundwater. Over time, the landfill's role in maintaining reducing conditions will diminish and cease.

The wetlands and peat appear, from historic USGS maps, to encompass about 70% of the northern half of the landfill and possibly half of the southern part of the landfill. These wetland areas formed shortly after or during the retreat of glaciers during the last Ice Age and typically date 13,000 yrs before present (BP). Formation of wetlands, and underlying peat, results in a number of important biogeochemical changes (Mitsch and Gosselink, 2007):

- Inundation of water into the surface soils in the wetlands results in anaerobic conditions. Low diffusion rates of oxygen under saturated conditions will result in anaerobic conditions typically within 12 weeks.
- Lack of oxygen leads to nitrate reduction, then iron reduction and sulfate reduction, and finally methanogenesis.

These biogeochemical changes will result in production of soluble iron as Fe (II), hydrogen sulfide which can off-gas and/or precipitate as a metal sulfide, production of ammonia and methane. Measured methane rates (Mitsch and Wu, 1995) have been found to range from 0.1 to 500 mg C m^{-2} d^{-1}. Global carbon emission rates from methane from peat are 150 mg C m^{-2} d^{-1} (Matthews and Fung, 1987).

Literature reviews and textbooks on wetlands and peat make it abundantly clear that the formation and maintenance of wetland and peat always result in anaerobic conditions and resulting biogeochemical conditions that will mobilize arsenic as explained in the SAR. To illustrate this we point to a paper (Ravenscroft et al., 2001) in which peat occurs extensively beneath arsenic affected areas of southwestern Bangladesh. The peat is thought to be Holocene aged, about 5,000 yr BP. In wells where peat was not encountered arsenic levels rarely exceeded 100 ug/L. In wells drilled through peat deposits, arsenic concentrations increased to over 1,000 ug/L. It is important to note that peat was encountered at various depths up to 60 meters below ground surface. The findings can be summarized as follows: The concentration of arsenic was not exceptional in much of the study area and the occurrence of reducing conditions was not enough to explain the degree and extent of arsenic pollution. High arsenic levels were attributed to biodegradation of buried peat deposits which drives the reductive dissolution of FeOOH supplying high amounts of arsenic to groundwater. The correlation of peat deposits to high arsenic has also been noted by others (Smedley and Kinniburg, 2002). Arsenic mobilization by peat is also described by Bauer et al., (2008), Rothwell et al., (2008), in wetlands by Kalbitz and Wennrich (1997) and in an urban pond by Durant et al. (2004). The importance of peat and wetlands in mobilizing arsenic due to carbon and reducing conditions is well established.

The fact that wetlands and peat underlie a significant portion of the landfill can only mean that additional sources of carbon and arsenic were introduced to an already dynamic anaerobic system via the landfill emplacement. Estimates of dissolved carbon from either landfill or wetland sources as noted in the SAR suggests that peat and wetlands have increased total carbon by 50 to 75% of that delivered by the landfill suggesting that removal of the landfill would only reduce the carbon input by 25 to 50%. Thus the peat and wetland areas are a major source of carbon and reducing conditions. With the landfill aging, the peat and buried wetlands will continue to act as a carbon source and hence maintain reducing conditions into the future. Additional information on the role of peat as a carbon source and its use as an analogue for the long-term behavior of landfills can be found in a review paper by Bozkurt et al., (2001).

6.4.2.3 Bench Scale / Column Testing

As noted previously freezing of the soils may have negatively impacted the microbial populations and prevented degradation from occurring to a measurable degree. This study has, unfortunately, been discontinued.

6.4.3 Duration of Reducing Conditions

To date only estimates of the life cycle of reducing conditions can be made. Carbon will persist in the aquifer due to 3 types of carbon processes. The first is the degradation rate of the peat or waste alone. Coupled with this is the fact that the cap may provide a barrier to water infiltration effectively ending the delivery of carbon from much of the waste. This seems to be true in the southern half of the landfill where the waste is 10 to 15 feet above the water table such as at SHM-10-11 and SHM-10-12. At SHM-10-14 and SHM-10-15 peat and some waste are still in contact with groundwater. The release rates of carbon are being studied in the laboratory (results pending).

The second carbon source is the persistent TOC measured in the aquifer sand solid phase that likely migrated geologically from the peat into the underlying sand. Concentrations up to 4% TOC have been found in the center of the landfill around borings SHM-10-13, SHM-10-14 and SHM-10-15 at depth of 45 ft or more, although 0.1 to 0.5% TOC are more common. This carbon will slowly biodegrade (via an anaerobic pathway) and maintain reducing conditions.

The last type of carbon to consider is the dissolved organic carbon (DOC) that is still persistent in all the wells measured even into the wells at the edge of the Brook/wetlands. This carbon will also degrade to further maintain reducing conditions and/or flush out over time.

The literature has some anaerobic biodegradation rates, mostly from laboratory studies. For example degradation of waste and peat can vary from 0.01 mg d^{-1} to 1 mg d^{-1}. Assuming the lowest value has some meaning for the present case, 5% of the carbon in the peat will degrade in roughly 13,000 years (or 1,300 years at 0.1mg/d^{-1}).

Column studies completed to date that describe arsenic flushing also have tracked carbon flushing. The results of carbon flushing from the column study through 13 pore volumes show a 59% reduction in carbon with a long apparent tail associated with the removal. The 13 pore volumes are equivalent to removing carbon from an initial concentration of 6.3 mg/L to 2.6 mg/L. Keimowitz et al. (2005) found a similar slow removal of carbon from the landfill due to sorption of carbon to the mineral phase in the aquifer sediment. Using a distribution coefficient model they estimated that carbon flushing would require at least twice as much time to diminish as arsenic which would allow for continued release of arsenic from HFO. As applied to Shepley's Hill this suggests that up to 500 years would be required to remove carbon from the landfill groundwater. Recall, however, that unlike Winthrop, Shepley's Hill has a thick layer of peat and underlying wetlands that will continue to deliver carbon to groundwater.

7.0 Bench Scale PRB Zero Valent Iron Test

Bench testing of zero valent iron for arsenic removal at the site is discussed below.

7.1 Purpose

The potential use of a permeable reactive barrier (PRB) composed of zero-valent iron (ZVI) for in-situ arsenic removal at the Shepley's Hill Landfill has generated considerable interest due to the relatively low cost and potential high efficiency of the method. A similar system has been explored and published for a former municipal landfill in Maine, published by Nicolaidis et al. 2003 Water Research. In that study, reduced water (Eh <-50 mv) high in dissolved arsenic (550 ug/L) and iron (8 mg/L) was effectively treated to <1 ug/L with retention times as low as 10 minutes. While the sites are similar, the Shepley's Hill Landfill has higher dissolved arsenic (4 mg/L) and iron (60 mg/L) and some different geochemical properties. Thus a lab bench test was performed to confirm the viability of the use of ZVI as part of a PRB at this site. The specific goals of the test were to:

- Test removal capacity of ZVI on unamended site groundwater
- Compare the removal efficiency of two types of ZVI Aggregates: ETI CC-1004 and CC-1200, both manufactured by Connelly-GPM, Inc.

7.2 Methods and Materials

Testing included flow of site groundwater through columns prepared with Iron Aggregates ETI CC-1004 and CC-1200 and silica sand. Two tests were run with different conditions. Test methods are given below.

- Column configuration 18 inches long x 2 inches diameter (clear schedule 80 PVC)
- Up flow into bed from a variable speed peristaltic pump (GeoPump 2)
- Each column was fully packed with the following:
    - Column 1 contained 100% Iron Aggregate ETI CC-1004.
    - Column 2 contained 100% Iron ETI CC -1200 which due to the fine dust like particles led to "concrete like" mass and was not further evaluated.
    - Column 3 contained approximately 50% Iron Aggregate ETI CC-1004 by volume and 50% silica sand by volume.
    - Column 4 contained 25% Iron Aggregate CC-1200 by volume and 75% silica sand by volume.
    - Column 5 contained 100% silica sand.

- Site groundwater (SHM-10-14 and SHM-10-15) used in the column tests were collected directly into three 5-gallon carboys using a peristaltic pump while minimizing headspace in the carboys.

- Influent and effluent groundwater were analyzed for:

  - pH (by direct-read instrument YSI-556)
  - ORP (by direct-read instrument YSI-556)
  - DO (by direct-read instrument YSI-556)
  - dissolved and total As (by USEPA Method 200.7)
  - dissolved and total Iron (by USEPA Method 200.7)
  - dissolved and total Mn (by USEPA Method 200.7)
  - dissolved organic carbon (by Standard Method 5310)
  - sulfate (by USEPA Method 375.4)
  - alkalinity (by Standard Method 2320B)

- Laboratory analysis was conducted by Accutest Laboratories in Dayton, NJ.

Test 1

- Test 1 was run through Column 1, Column 3, and Column 5.
- Test 1 was conducted using 5 gallons groundwater of obtained from site monitoring well SHM-10-15.
- Test 1 was run for a 3.0 hour period. All columns were run simultaneously using common influent water.
- Groundwater was run through each column at approximately 30 mL/min for a retention time of approximately 9 minutes.
- Lab analytical samples were collected at t=0.25 hrs, 1.25 hrs, and 2.0 hrs. Analytical results from Test 1 are provided in **Attachment J**.

Test 2

- Test 2 was run through Column 1, Column 3, Column 4, and Column 5.
- Test 2 was conducted using 10 gallons of obtained from site monitoring well SHM-10-12.
- Test 2 was run for a 5.0 hour period. All columns were run simultaneously using common influent water.
- Groundwater was run through each column at approximately 30 mL/min for a retention time of approximately 9 minutes.
- Lab analytical samples were collected at t=0.5 hrs, 1.2 hrs, 2.9 hrs, and 4.3 hrs. Analytical results from Test 2 are provided in **Attachment J**.

7.3 Methods and Materials

7.3.1 Test 1

7.3.1.1 Field Results

Attempts to pass groundwater through a column with 100% Iron Aggregate CC-1200 and with 50% Iron Aggregate CC-1200 and 50% silica sand were unsuccessful due to excessive back pressure formed by the iron material when saturated.

Influent groundwater pH increased by approximately 0.5 SU after passing through Column 1 and Column 3. There was no change as it passed through Column 5.

Influent groundwater ORP decreased by over 60 mV after passing through Column 1 and Column 3. There was no change in the ORP as it passed through Column 5.

7.3.1.2 Laboratory Analytical Results

Influent water contained dissolved and total arsenic concentrations of 1,560-ug/L and 4,560-ug/L, respectively. Additionally, influent water contained dissolved and total iron concentrations of 21,700-ug/L and 47,000-ug/L, respectively. Sulfate was not detected in the influent water.

Both dissolved and total arsenic concentrations in groundwater decrease of >99.9% after passing through Column 1. Dissolved arsenic concentrations decreased an average of 99.7% and total arsenic concentrations decreased an average of 98.3% decrease after passing through Column 3. Dissolved arsenic concentrations showed an average of 4.1% and total arsenic concentrations decreased an average of 34.2% after passing through Column 5.

Dissolved Iron concentrations in groundwater decreased an average of 66.7% and total Iron concentrations decreased an average 5.6% after passing through Column 1, though dissolved and total iron increased over the course of the test. Dissolved iron concentrations in groundwater increased 134% and total iron concentrations increased an average 127%after passing through Column 3. Dissolved iron concentrations in groundwater decreased 16.1% and total iron concentrations decreased an average 28.5% after passing through Column 5.

Sulfate was present at concentrations of 87.6 mg/L, 38.3 mg/L, and 11.4 mg/L after passing through Column 1, Column 3, and Column 5, respectively.

7.3.2 Test 2

7.3.2.1 Field Results

Influent groundwater pH increased by approximately 1.0 SU after passing through Column 1, Column 3, and Column 4. There was an increase of approximately 0.2 SU as it passed through Column 5.

Influent groundwater ORP decreased by over 100 mV after passing through Column 1, Column 3, and Column 4. There was no change in the ORP as it passed through Column 5.

7.3.1.1 Laboratory Analytical Results

Influent water showed averaged dissolved and total arsenic concentrations of 708-ug/L and 2,810-ug/L, respectively. Additionally, it showed average dissolved and total iron concentrations of 53,950-ug/L and 78,600-ug/L, respectively. Sulfate was not detected in the influent water.

Both dissolved and total arsenic concentrations in groundwater decreased by 99.9% after passing through Column 1. Dissolved arsenic concentrations on average decreased 98.8% and total arsenic concentrations decreased an average of 90.9% decrease after passing through Column 3. Dissolved arsenic concentrations decreased 97.7% and total arsenic concentrations decreased an average of 92.9% after passing through Column 4. Dissolved arsenic concentrations increased 28.6% and total arsenic concentrations decreased an average of 35.0% after passing through Column 5.

Dissolved iron concentrations in groundwater increased 114% and total iron concentrations increased an average 165% after passing through Column 1. Dissolved iron concentrations in groundwater increased an average of 192% and total iron concentrations increased an average of 284% after passing through Column 3. Dissolved iron concentrations in groundwater increased an average of 162% and total iron concentrations increased an average of 135% after passing through Column 4. Dissolved iron concentrations in groundwater increased an average of 7.2% and total iron concentrations decreased an average of 10.1% after passing through Column 5.

Sulfate was present at concentrations of 16.9 mg/L and 33.6 mg/L after passing through Column 1 and Column 4, respectively. Sulfate was not detected after passing through Column 3 or Column 5.

7.4 Conclusions

Both Iron Aggregate ETI CC-1004 and CC-1200 were effective in decreasing arsenic concentrations in site groundwater through the bench scale testing. Iron Aggregate ETI CC-1004 was easier to handle during the test and may be preferable for implementation in the field.

Increases in dissolved and total iron after passing through the iron aggregate suggest that during field implementation a solids filter may be desirable for water that passes through the iron aggregate. This is supported by the decrease in total arsenic seen in both tests after passing through the column packed with silica sand only.

Changes in parameters pH, ORP, and sulfate after passing through iron-packed columns suggest that the iron aggregate is having the intended effect of creating an environment conducive to arsenic removal.

8.0 CONTAMINANT CHARACTERISTICS

This section describes and summarizes the contaminants of concern and the site specific fate and transport patterns.

8.1 Sources and Releases

The primary contaminant of concern is arsenic. The sources of arsenic have been described previously and include (1) bedrock, (2) glacial till, (3) aquifer sands overlying bedrock and underlying waste or peat, (4) landfill waste, and (5) peat. While the exact magnitudes of the various types of sources at and beneath the landfill are unknown, the relative importance of the possible sources (as they now exist) is known based on recent waste and peat characterization studies. The relative importance of the arsenic sources is as follows: aquifer sands > landfill waste = peat > bedrock = glacial till. Due to the cap place on the landfill, leachate from the landfill waste is expected to be minimal except where waste is in direct contact with the groundwater. Current estimates suggest that only 11% of the landfill waste is now in contact with groundwater. Based on recent groundwater profiling in this area, metals and arsenic entering groundwater from the waste appears to be minimal and primarily in the center of the landfill. Arsenic is released into groundwater from the sources by naturally occurring and landfill-induced reducing conditions caused by carbon degradation and oxygen depletion that lead to the anaerobic conditions. Portions of the landfill also overlay pre-existing, buried peat deposits that induced reducing conditions prior to emplacement of the landfill over the peat and associated wetlands. Therefore, the peat within the landfill footprint caused arsenic mobilization to both the North end of the site at Nonacoicus Brook and east to Red Cove prior to the placement of waste. This natural process will persist even if the landfill waste were to be removed. Recent estimates indicate that peat degradation and reducing conditions could persist far into the future

8.2 Nature and Extent of Contaminant

Potential sources of arsenic in groundwater include (1) bedrock, (2) till, (3) aquifer sand overlying bedrock and underlying waste or peat, (4) landfill waste, and (5) peat (see **Section 6.4**, Sovereign, 2011 for discussion of arsenic content in different materials). In terms of mass available for mobilization, the primary source of arsenic in groundwater appears to be the aquifer sand rich in amorphous iron hydroxide solids, usually coated on sand grains as documented through microscopy. While the exact magnitudes of the various types of sources at and beneath the landfill are unknown, the relative importance of the possible sources is known based on recent waste and peat characterization studies. The relative importance of the arsenic sources decreases in the order: aquifer sand > landfill waste = peat > bedrock = till. Due to the cap placed on the landfill, leachate from the landfill waste is expected to be minimized except where waste is in direct contact with the groundwater. Based on recent groundwater profiling in this area, metals and arsenic entering groundwater from the waste appears to be minimal and primarily in the center of the landfill. Arsenic is released into groundwater from the sources by naturally occurring and landfill-induced reducing conditions caused by carbon degradation and oxygen depletion that lead to anaerobic conditions. Portions of the landfill overly pre-existing, buried peat deposits that induced reducing conditions prior to emplacement of the landfill over the peat and associated wetlands. Therefore, the peat within the landfill footprint caused arsenic mobilization to the north end of the site toward Nonacoicus Brook as well as east toward Plow Shop Pond prior to the placement of waste. This natural process will persist even if the landfill waste were to be removed. Recent estimates indicate that peat degradation and reducing conditions could persist for hundreds to thousands of years.

Arsenic solubility is controlled by desorption from the iron solids and by reductive dissolution of the iron (III) solids created by biodegradation of peat and waste. The distribution coefficient of 7.6 L/kg indicates that for example, if 30 mg/kg arsenic is found in the aquifer sand then 3,947 ug/L could be found in the aquifer groundwater. The distribution coefficient is useful for predicting ranges of arsenic concentrations that could be expected in local groundwater. It is important to note that this process does not, however, include dissolution of the iron solid, a process that could lead to higher arsenic concentrations. Use of the Kd should consider that the correlation is dominated by the cluster of samples at the low end of the plot. This site specific Kd, which covers a large range of concentrations, may also be in fact a series of two or more slightly different plots or lines representing different mechanisms of arsenic retention.

Prior to emplacement of the landfill, much of the local groundwater flow emanating from and through the peat within the landfill footprint discharged to Red Cove. As waste was emplaced in the landfill and the landfill was capped, local groundwater gradients changed and much of the groundwater flow was directed in a more northern direction.

To date, peat has not been encountered north of the landfill. However, due to the presence of wetlands, areas of buried peat deposits would not be unexpected. Recent well sampling north of the landfill indicates that in-situ carbon degradation and landfill leachate have resulted in reducing conditions. This has been confirmed by the low dissolved oxygen, elevated dissolved methane concentrations, elevated dissolved carbon, elevated ammonia concentrations, and elevated arsenic and iron concentrations. Thus both naturally occurring conditions and landfill influence have and will continue to mobilize arsenic in that area.

Nonacoicus Brook is a groundwater discharge divide. Recent sampling shows there is no arsenic in the monitoring wells directly north of the wetlands confirming no impact from the landfill. The bedrock delineation and general elevation of the northern most wells indicates that the bedrock surface is much higher on the north side of the wetlands and brook than the southern side which indicates that groundwater flow is roughly opposite in direction to flow from the landfill. This flow of groundwater from the north effectively creates a redox boundary that should precipitate arsenic into iron solids as the water becomes more oxidizing. The impact on water quality is somewhat predictive. Based on the mixing estimates in the SAR (Sovereign, 2011) and the observed changes in arsenic from the DPT points placed in the north end, arsenic in detectable quantities are unlikely to ever occur in the wetlands or the brook.

8.3 Contaminant Fate and Transport

Fate and transport of arsenic is related both to the source of arsenic and the presence of degradable carbon species in the aquifer.

Arsenic fate and transport at the north end of the site has been determined in some locations. The groundwater on the north side of the Brook that is intruding into the landfill impacted water on the southern side of the Brook contains on average 50 mg/L of sodium. The wells in the landfill contain on average 15 mg/L of sodium. This is due to the intrusion of the iron-bicarbonate water created from the landfill carbon degradation process and subsequent replacement of calcium and sodium in the native groundwater. The wells at the north end of the impacted area at the south side of the Brook and wetlands contain on average 26 mg/L of sodium. This indicates that mixing of water from the north side of the Brook which is high in sodium is occurring. Using a simple mixing model, approximately 47% mixing between the two waters has occurred. This same analysis can be done with calcium, bicarbonate, sulfate or chloride with similar results. Depending on the analyte used in the mixing calculation, some water appears to be mixing with water from the north by as much as 75%

The subsequent mixing with this water diminishes arsenic to low levels. Mixing also results in redox changes that will oxidize iron (II) to iron (III) with subsequent adsorption of soluble arsenic. Due to the marked geochemical changes in the north end, arsenic exceeding 400-ug/L will not enter the wetlands/Brook underflow. Since rapid oxidation is expected in the wetlands, detectable arsenic entering the base-flow is unlikely. A proposed monitoring well network will be used to further examine the geochemical changes in the north end impacted area.

Analysis of reducing conditions created by landfill waste or peat suggests that the peat layer, with or without waste above it supplies more carbon input to the groundwater than ash or waste alone by almost a factor of two. This also suggests that the peat layer and associated wetlands have been acting as a carbon source long before the landfill existed. This carbon source would also have led to locally reducing conditions that would have mobilized arsenic before the existence of the landfill.

9.0 CONCEPTUAL SITE MODEL

The data gathered during the above noted and previously referenced investigations were used to continually update and refine the CSM as it has been presented herein. Presently, the conceptual site model has been updated to include the following new information.

- Waste within the landfill has been further characterized with the recent installation of 5 borings drilled through the landfill to bedrock. Waste analysis revealed that with the exception of lead, zinc and copper most trace elements were at typical background levels. Arsenic does not appear to have leached significantly from the waste into groundwater due to the lack of typical leaching patterns or enrichment in subsurface soils. Arsenic in waste was also not dissimilar to arsenic observed locally or regionally in soils or rock. Arsenic in the waste or peat did not exceed 60 mg/kg. Leaching tests indicate that landfill waste potentially could deliver up to 500 ug/L arsenic to underlying groundwater. However, placement of the cap has likely eliminated possible leaching of arsenic and any other constituents from landfill waste to underlying groundwater.

- In comparison to the waste, the underlying sand potentially leaches up to 1,500 ug/L arsenic to groundwater. In addition reductive dissolution of arsenic containing amorphous iron solids could release as much as 30,000 ug/L of arsenic. Based on these results, the aquifer sand is the dominant source of arsenic at the landfill.

- The borings through the landfill revealed that thick peat layers are found underlying waste in the center of the landfill roughly bounded by SHL-99-29x, SHM-10-13, SHM-10-14 and SHM-10-15.

- The peat and the associated wetlands preceded the landfill. The peat is a significant source of carbon to the groundwater and caused locally reducing conditions prior to emplacement of waste. Therefore arsenic mobilization has been occurring historically prior to landfill development and will continue to occur as long as carbon degradation within the peat takes place.

- Anaerobic degradation within the aquifer in the northern impacted area is occurring with or without landfill influence. This occurs likely from natural organic matter and possibly peat since this area was at least in part a former wetland. These conditions have allowed arsenic to be mobilized within the northern impacted area aquifer sands and will likely persist for centuries.

- The importance of peat as a source of reducing conditions and arsenic mobilization has been addressed. Calculation of carbon inputs to groundwater at the site demonstrates that peat could supply up to twice as much carbon to underlying groundwater compared to waste alone. This may or may not have been the case throughout the landfill history. Early in the landfill history waste might have been the more important carbon source but as easily degradable material was consumed, the landfill input diminished compared to that of the underlying peat. The carbon dating studies conducted by Gannett Fleming (2009 Memo, USEPA) on methane sources from the landfill seem to indicate that methane emanating from the landfill was biogenic (produced by biodegradation) and that the carbon source was likely entirely from historic or old carbon such as the peat. However analytical problems discussed in the report prevent any further use of the data.

- Literature reviews and textbooks on wetlands and peat make it abundantly clear that the formation and maintenance of wetlands and peat always result in anaerobic conditions and resulting biogeochemical conditions that will mobilize arsenic as explained in the SAR. High arsenic levels are attributed to biodegradation of buried peat deposits which drives the reductive dissolution of FeOOH supplying high amounts of arsenic to groundwater. The correlation of peat deposits to high arsenic has also been noted by others (Ravenscroft, et al., 2001; Smedley and Kinniburgh, 2002).

- Arsenic in groundwater in the north impacted area appears to diminish substantially prior to discharge into Nonacoicus Brook and wetlands due to the underlying oxygenated zone. The redox boundary occurs due to intrusion or mixing of non-impacted groundwater entering the Brook and wetlands from the north and north east of the Brook in the opposite direction of the flow from the landfill. Chemistry of water in several DPT points close to the brook show mixing or dilution with water from the north side indicating that the brook is a discharge divide. Arsenic is not expected to impact the brook and wetlands due to this redox boundary. The area to the east of the new DPT points has only been partially characterized.

- The placement of the landfill cap increased arsenic flux to the north. Operation of the pump and treat system subsequently caused a significant reduction in arsenic concentrations in wells SHP-05-41B and SHM-93-22B as the additional arsenic flux was mitigated.

- Groundwater discharge at the north end appears to follow the particle track data presented by AMEC. Arsenic impact to the MacPherson well is not anticipated based on the results of the investigation at the redox boundary.

- Newly acquired bedrock information indicated that bedrock was located at a shallow depth than originally projected within the area near Nonacoicus Brook. This information was incorporated within the hydrogeologic study and the particle track updated. The results indicated an increase in the groundwater flow velocity near the brook, but continued to show that the system is collecting the arsenic impacted groundwater.

- An evaluation of methane determined that the dissolved concentration within groundwater does not present an explosive hazard.

- Arsenic entering Red Cove is likely from reducing conditions prevalent in the landfill and peat. The reducing conditions have mobilized arsenic from the aquifer sand which is now entering the Red Cove via a different flow path than the predominant south-north flow pattern observed for most of the landfill. It is also possible that the arsenic and iron floc impact to Red Cove preceded the placement of the landfill due to the same reducing conditions created by the historic wetlands and peat. The landfill and its reducing conditions would then have exacerbated the flux

10.0 FINDINGS AND CONCLUSIONS

The findings of this investigation as summarized as follows:

- North Impact Area Delineation & Monitoring – The investigation included the advancement of soil borings, completion of groundwater vertical profiling, and construction and sampling of monitoring wells on the northern and southern side of Nonacoicus Brook. These boring and well locations are identified as SHM-10-01, SHM-10-02, SHM-10-03, SHM-10-04, SHM-10-05 (no well installed), SHM-10-05A, SHM-10-08, SHM-10-09 (no well installed), and SHM-10-10. Groundwater profiling conducted during the drilling program recorded dissolved arsenic concentrations varying from non-detect to 112-ug/l. Sampling and analysis of groundwater samples obtained from the monitoring wells reported concentrations of dissolved arsenic varying between 0.43 and 7.87-ug/L. Lastly, the geophysical survey indicated that bedrock slopes upward, thereby restricting the migration of the arsenic. The results of these data define the down-gradient extent of the arsenic impact below the vicinity of the southern bank of Nonacoicus Brook. Groundwater flow from the north and northeast of the Brook flows and mixes with groundwater advancing north and northwest from the landfill area creates an oxidation/reduction front that effectively limits the northern extent of the arsenic at the mixing front.

- North Plume Capture – Points SHM-10-06 and SHM-10-06A were installed to evaluate the capture and confinement of the arsenic plume on the north and northeastern side of the existing arsenic treatment plant. Groundwater profiling indicated evidence of dissolved arsenic ranging from 10 to 2,540-ug/L in well SHM-10-06, while decreased concentrations were detected in SHM-10-06A at concentrations of non-detect to 106-ug/L. Sampling and analysis of groundwater from the monitoring wells document concentrations decreasing between the two wells from 2,710 to 60.1-ug/L. These data were included in refined particle tracking modeling that indicates that the treatment system is reducing arsenic mass and capturing the bulk of arsenic mass on the northern and northeastern side of the treatment plant and that the impacts are bounded between monitoring points SHM-10-06 and SHM-10-06A. Drilling operations indicated a shallower than previously extrapolated bedrock surface in this area. The shallower rock elevations were plotted and included in the refined particle track models that document a bedrock trough trending northward through the landfill and that the shallower rock ridge along the east side of the landfill appears to restrict arsenic migration in a northerly direction.

- Landfill Gas Impact –Modeling was conducted to determine if methane gas intrusion into an occupied building or structure was a concern. The results of this modeling used a dissolve methane concentration of 10-mg/L in the groundwater and determined that this concentration would not pose an explosive hazard.

- East Plume Delineation and Capture – A temporary monitoring well was advanced at the location identified as SHM-10-07. Groundwater profiling recorded dissolved arsenic concentrations varying between 58 and 1,350-ug/L, while groundwater sampling of this monitoring well confirmed dissolved arsenic concentrations of 818 and 918-ug/L. Drilling operations indicated a shallower than previously extrapolated bedrock surface in this area. The shallower rock elevations were plotted and included in the refined particle track models that document a bedrock trough trending northward through the landfill and that the shallower rock ridge along the east side of the landfill appears to restrict arsenic migration to a northerly direction.

- Arsenic MNA/Source Strength and Reducing Environmental Evaluation – An evaluation of the collected information determined the following;

  - The primary source of arsenic in groundwater appears to be aquifer sands rich in amorphous iron hydroxide solids, usually coated on sand grains as documented through microscopy. Other sources of arsenic may include landfill waste, peat, and bedrock/till. The possible contribution of landfill waste has been reduced due to depletion of easily degradable carbon and recent capping of the landfill. While peat in some instances was found to contain arsenic, it is not clear if the peat contained the arsenic originally or whether arsenic accumulated in the peat by leaching of arsenic from overlying waste.

  - Arsenic solubility is controlled by desorption from the iron solids and by reductive dissolution of the iron (III) solids created by biodegradation of peat and waste. A site specific distribution coefficient (Kd) was derived from the aquifer solids content and aqueous arsenic in contact with the solids. The equilibrium distribution coefficient of 7.6. The distribution is useful for predicting ranges of arsenic concentrations that could be expected in local groundwater. This process does not however include dissolution of the iron solid, a process that could lead to higher arsenic concentrations.

  - Arsenic groundwater distribution has been elucidated via a number of transects and depth profiles. The distribution of arsenic can be considered as (1) increasing with depth to just above the glacial till layer, (2) highest in the center of the landfill near SHM-10-14 and SHM-10-15, (3) slowly decreasing in concentration to the north of the landfill to the south side of the Brook and wetlands, and (4) controlled in large degree by the bedrock surface as far as flow direction is concerned.

  - The redox boundary appears to be located in the vicinity of SHM-10-10. The boundary consists of three features: (1) a bedrock surface that controls the flow of landfill impacted water to the Brook but also brings groundwater from the north and northeast of the Brook that counters the landfill flow, (2) intrusion of clean more oxidized groundwater from the north side of the landfill, and (3) mixing of clean water resulting in precipitation of arsenic that does not impact the water quality in the Brook or wetlands. The area east of SH-10-17 along the brook and wetlands has not been completely delineated.

- Carbon inputs to the groundwater from biodegradation of waste or peat indicates that peat is likely more important for maintaining reducing conditions than landfill waste. The reducing conditions created by the peat preceded the landfill, but were exacerbated by the additional carbon source from the landfill waste. Peat formation is a result of reducing conditions, but also maintains reducing conditions by biodegradation and release of short chain carboxylic acids and methylated amines that will drive iron oxy hydroxide reduction and ammonia production (Bergmann et al, 1999) both byproducts that are widespread at the site.
- The time to return the aquifer to "pre-landfill" conditions has been simulated from columns experiments. The time frame describing removal of soluble arsenic from the landfill aquifer and north impacted area is approximately 270 years based on this data.
- Peat within the landfill footprint caused arsenic mobilization to the north end of the site toward Nonacoicus Brook as well as east toward Plow Shop Pond prior to the placement of waste. In addition, wetlands and presumably peat occurring in the NIA are also a source of natural reducing conditions that will persist even if the landfill waste were to be removed. Recent estimates indicate that peat degradation and reducing conditions could persist for hundreds to thousands of years.

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FIGURES

FIGURES

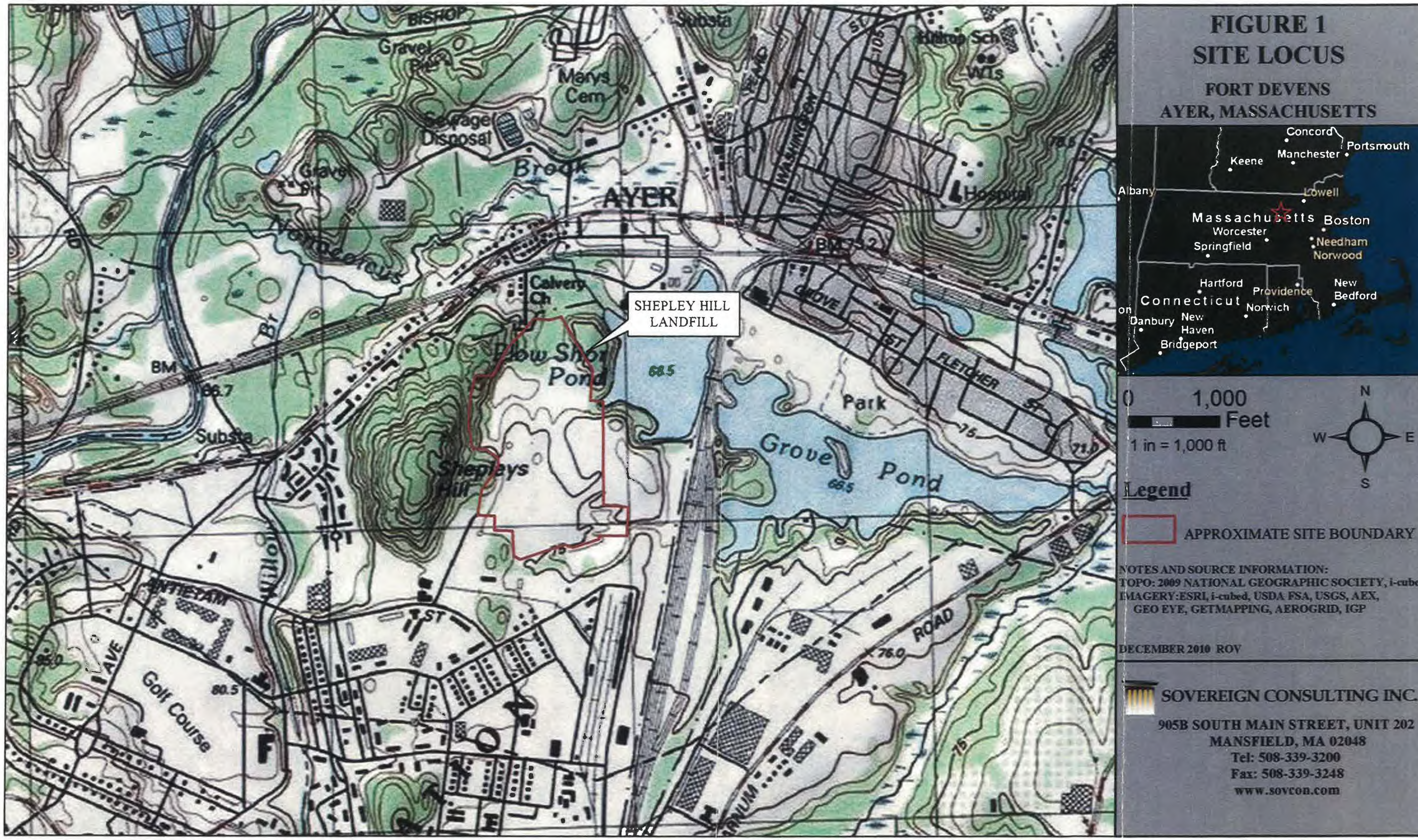

FIGURE 1
SITE LOCUS
FORT DEVENS
AYER, MASSACHUSETTS
SHEPLEY HILL LANDFILL
AYER
Grove Pond
Shepleys Hill
Plow Shop Pond
Concord
Portsmouth
Manchester
Keene
Albany
Lowell
Massachusetts
Boston
Worcester
Springfield
Needham
Norwood
Hartford
Providence
New Bedford
Connecticut
Norwich
Danbury
New Haven
Bridgeport
0 1,000 Feet
1 in = 1,000 ft
N
W
E
S
Legend
APPROXIMATE SITE BOUNDARY
NOTES AND SOURCE INFORMATION:
TOPO: 2009 NATIONAL GEOGRAPHIC SOCIETY, i-cubed
IMAGERY: ESRI, i-cubed, USDA FSA, USGS, AEX, GEO EYE, GETMAPPING, AEROGRID, IGP
DECEMBER 2010 ROV
SOVEREIGN CONSULTING INC.
905B SOUTH MAIN STREET, UNIT 202
MANSFIELD, MA 02048
Tel: 508-339-3200
Fax: 508-339-3248
www.sovcon.com

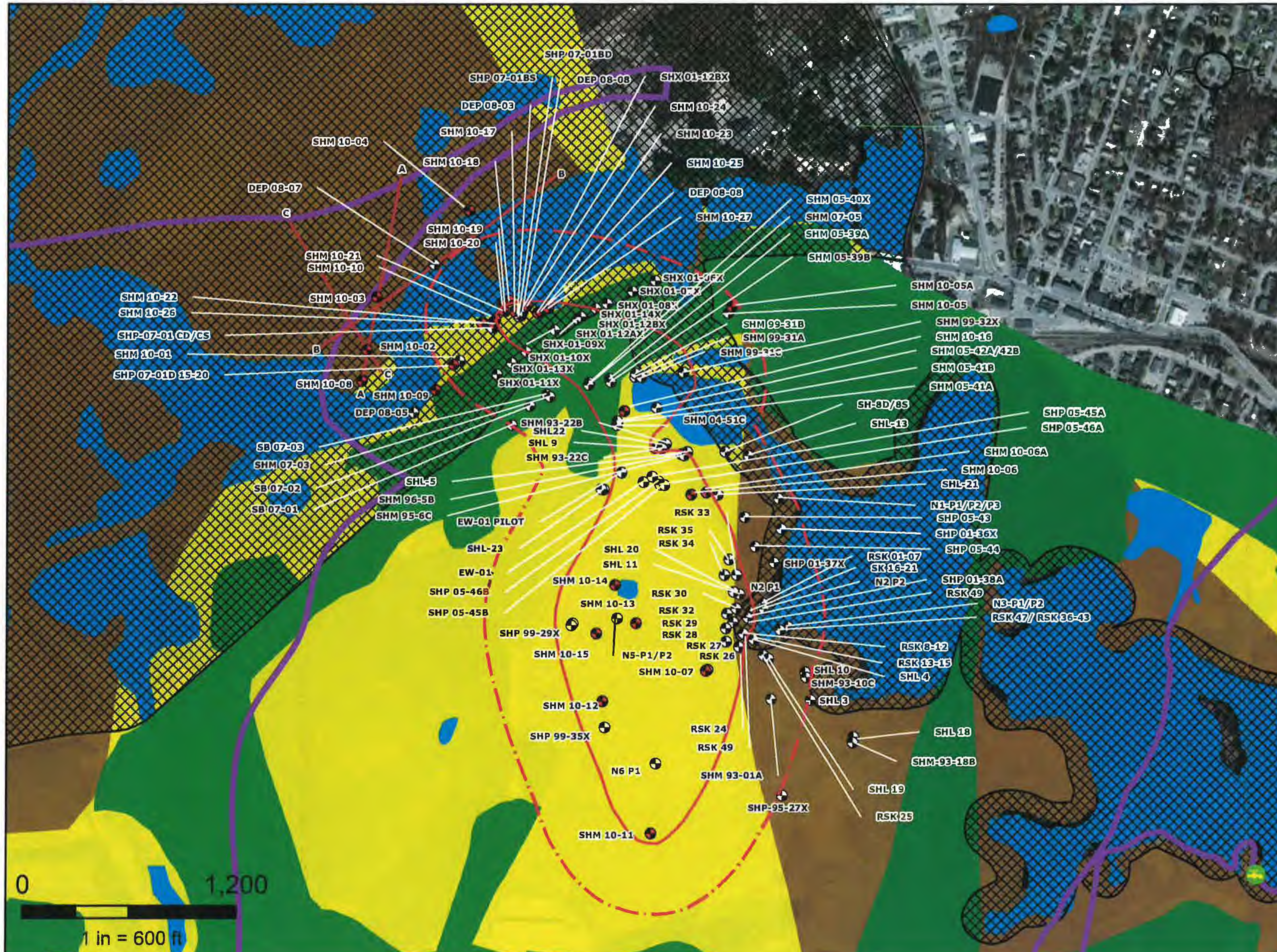

FIGURE 4
OVERALL SITE PLAN

FORT DEVENS
AYER, MASSACHUSETTS

LEGEND

- BORING/ WELL LOCATION
- 2010 WELL INSTALLATION
- COMMUNITY GROUNDWATER SOURCE
- TRANSECTS
- IMPACTED AREA
- 400' FROM IMPACTED AREA
- DEP APPROVED ZONE II
- ACEC
- WETLAND
- NPDWSA
- HIGH YIELD AQUIFER
- MEDIUM YIELD AQUIFER

NOTES AND SOURCE INFORMATION:
AERIAL IMAGERY: 2010 ESRI, I-cubed, USDA FSA, USGS, AEX, GEOEYE, GETMAPPING, AEROGRID, IGP
WETLAND DATA: 2010 U.S. FISH AND WILDLIFE SERVICE, DIVISION OF HABITAT AND RESOURCE CONSERVATION
2010 AMEC EARTH AND ENVIRONMENTAL. PROPOSED INVESTIGATIONS NEAR THE IMPACTED AREA. JDP
OFFICE OF GEOGRAPHIC INFORMATION (MASSGIS), COMMONWEALTH OF MASSACHUSETTS EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS:
JUNE 2006 NON-POTENTIAL DRINKING WATER SOURCE AREAS (NPDWSA)
JULY 2007 AQUIFERS
APRIL 2009 AREAS OF CRITICAL ENVIRONMENTAL CONCERN (ACEC)
MARCH 2010 PUBLIC WATER SUPPLY
MARCH 2010 WELLHEAD PROTECTION AREAS

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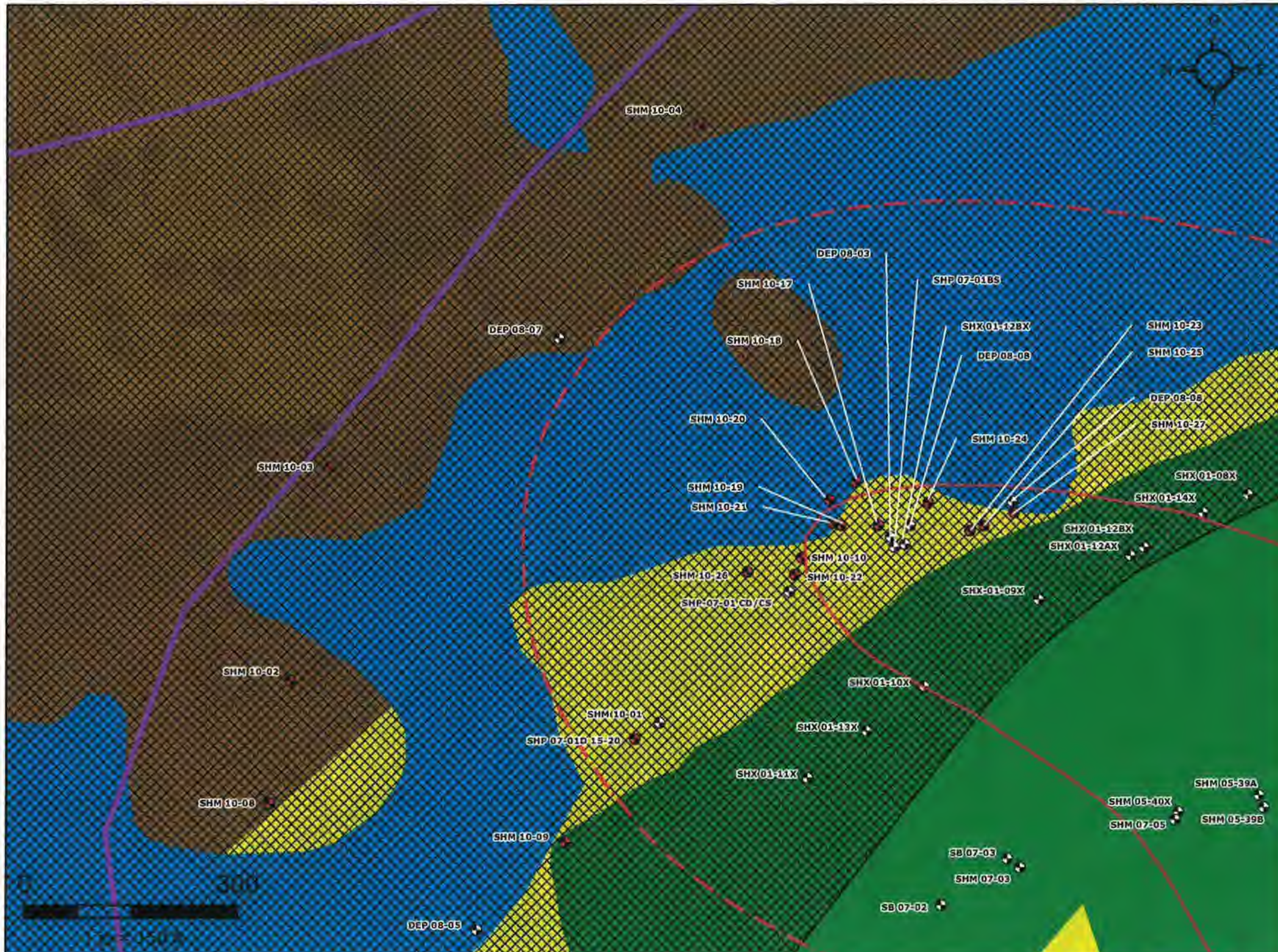
FIGURE 5
OVERALL SITE PLAN - NORTHWESTERN ENLARGEMENT
FORT DEVENS
AYER, MASSACHUSETTS



LEGEND

- BORING/ WELL LOCATION
- 2010 WELL INSTALLATION
- IMPACTED AREA
- 400' FROM IMPACTED AREA
- DEP APPROVED ZONE II
- ACEC
- WETLAND
- NPDWSA
- HIGH YIELD AQUIFER
- MEDIUM YIELD AQUIFER

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DECEMBER 2010 ROV; REVISED MAY 2011 ROV

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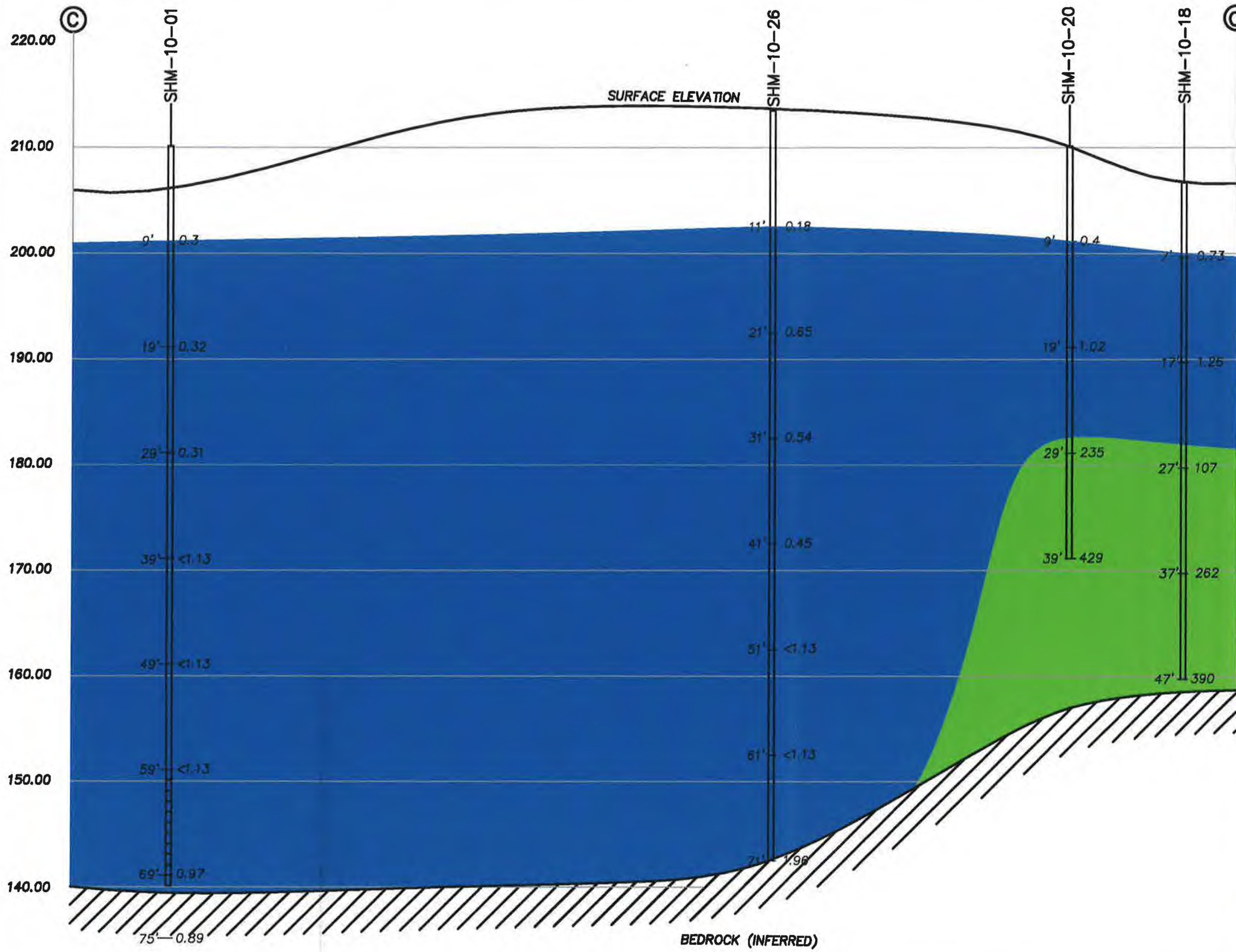

VERTICAL SCALE 1"=10'
VERTICAL EXAGGERATION=5X

LEGEND

DISSOLVED ARSENIC CONCENTRATION 0–100 ug/L BASED ON GROUNDWATER PROFILING

DISSOLVED ARSENIC CONCENTRATION 100–500 ug/L BASED ON GROUNDWATER PROFILING

47'–390 DEPTH – DISSOLVED ARSENIC CONCENTRATION ug/L

POINTS TERMINATED AT REFUSAL CONDITIONS/POSSIBLE BEDROCK

FIGURE 8
GEOLOGICAL CROSS SECTION C-C'
DISSOLVED ARSENIC CONCENTRATIONS

FORT DEVENS
AYER, MASSACHUSETTS

MAP PREPARED 12/1/10. REV. 5-4-11	PLAN PREPARED BY: NRS

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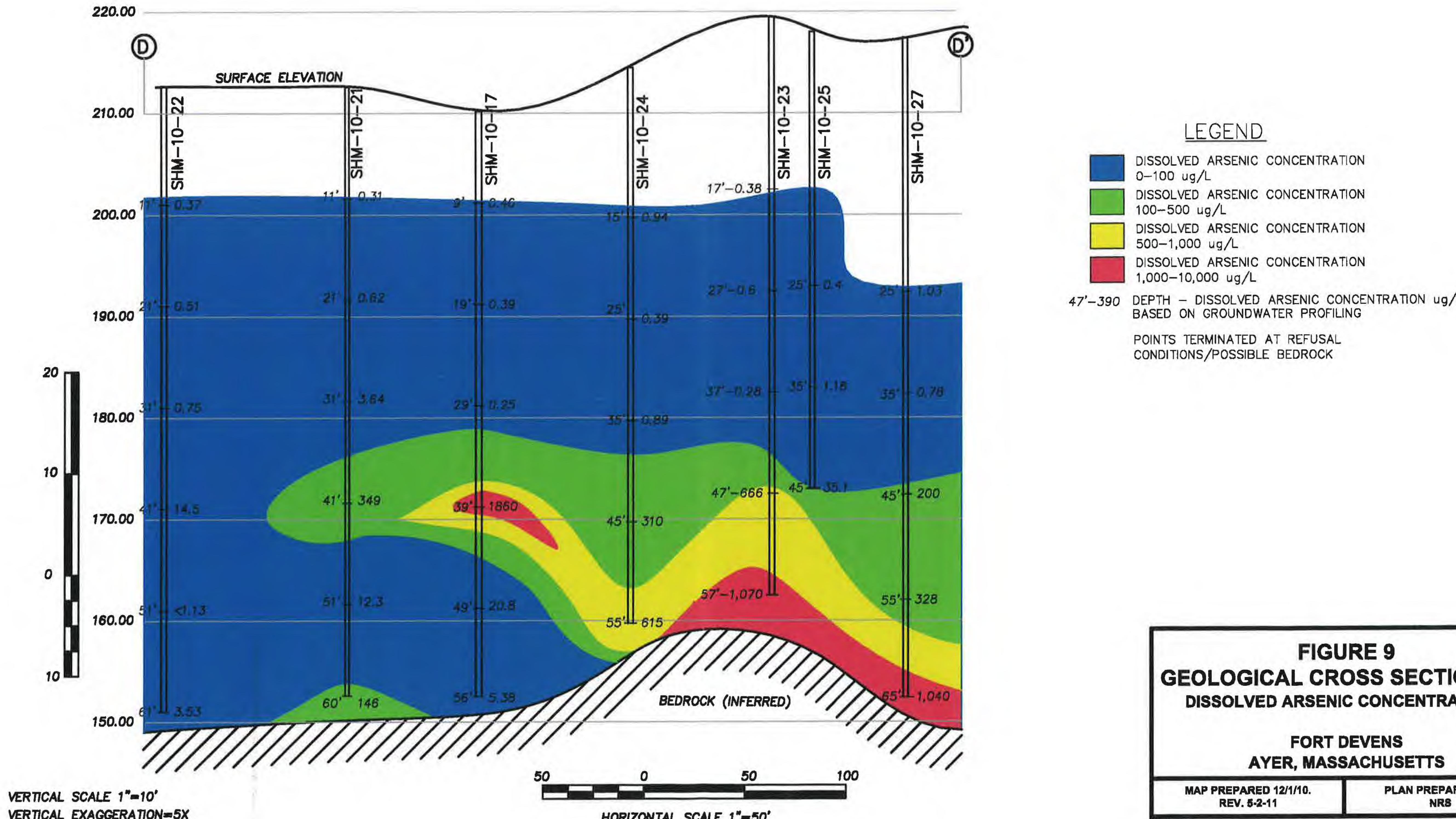

FIGURE 9

GEOLOGICAL CROSS SECTION D-D'

DISSOLVED ARSENIC CONCENTRATIONS

FORT DEVENS
AYER, MASSACHUSETTS

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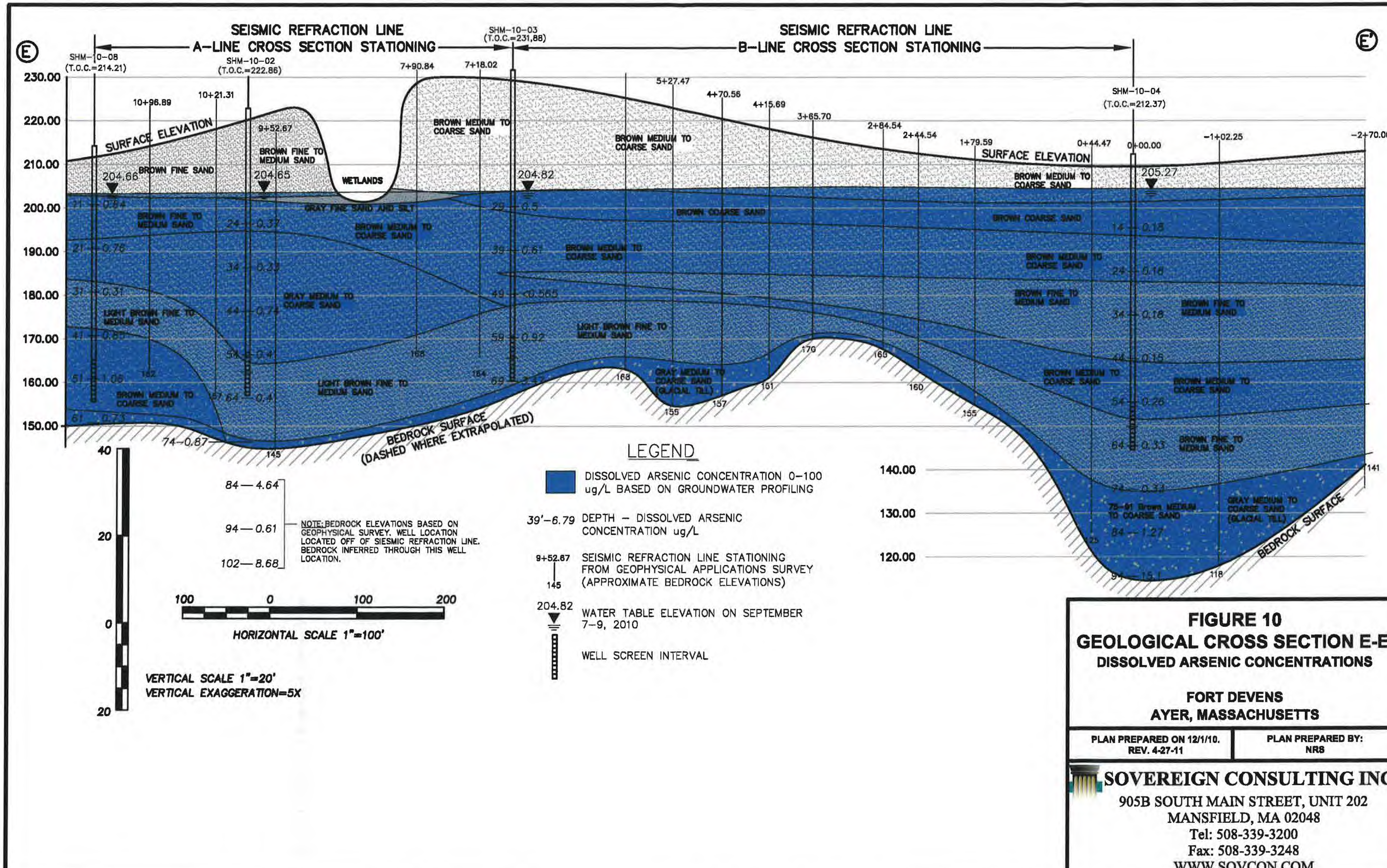

SEISMIC REFRACTION LINE
A-LINE CROSS SECTION STATIONING
SEISMIC REFRACTION LINE
B-LINE CROSS SECTION STATIONING
E
E'
SHM-10-08 (T.O.C.=214.21)
SHM-10-02 (T.O.C.=222.86)
SHM-10-03 (T.O.C.=231.88)
SHM-10-04 (T.O.C.=212.37)
SURFACE ELEVATION
BEDROCK SURFACE (DASHED WHERE EXTRAPOLATED)
BEDROCK SURFACE
WETLANDS
GRAY FINE SAND AND SILT
BROWN FINE SAND
BROWN FINE TO MEDIUM SAND
BROWN MEDIUM TO COARSE SAND
BROWN COARSE SAND
GRAY MEDIUM TO COARSE SAND
LIGHT BROWN FINE TO MEDIUM SAND
GRAY MEDIUM TO COARSE SAND (GLACIAL TILL)
230.00
220.00
210.00
200.00
190.00
180.00
170.00
160.00
150.00
140.00
130.00
120.00
LEGEND
DISSOLVED ARSENIC CONCENTRATION 0-100 ug/L BASED ON GROUNDWATER PROFILING
39'-6.79 DEPTH - DISSOLVED ARSENIC CONCENTRATION ug/L
9+52.67 145 SEISMIC REFRACTION LINE STATIONING FROM GEOPHYSICAL APPLICATIONS SURVEY (APPROXIMATE BEDROCK ELEVATIONS)
204.82 WATER TABLE ELEVATION ON SEPTEMBER 7-9, 2010
WELL SCREEN INTERVAL
84 — 4.64
94 — 0.61
102 — 8.68
NOTE: BEDROCK ELEVATIONS BASED ON GEOPHYSICAL SURVEY. WELL LOCATION LOCATED OFF OF SIESMIC REFRACTION LINE. BEDROCK INFERRED THROUGH THIS WELL LOCATION.
HORIZONTAL SCALE 1"=100'
VERTICAL SCALE 1"=20'
VERTICAL EXAGGERATION=5X
FIGURE 10
GEOLOGICAL CROSS SECTION E-E'
DISSOLVED ARSENIC CONCENTRATIONS
FORT DEVENS
AYER, MASSACHUSETTS
PLAN PREPARED ON 12/1/10. REV. 4-27-11
PLAN PREPARED BY: NRS
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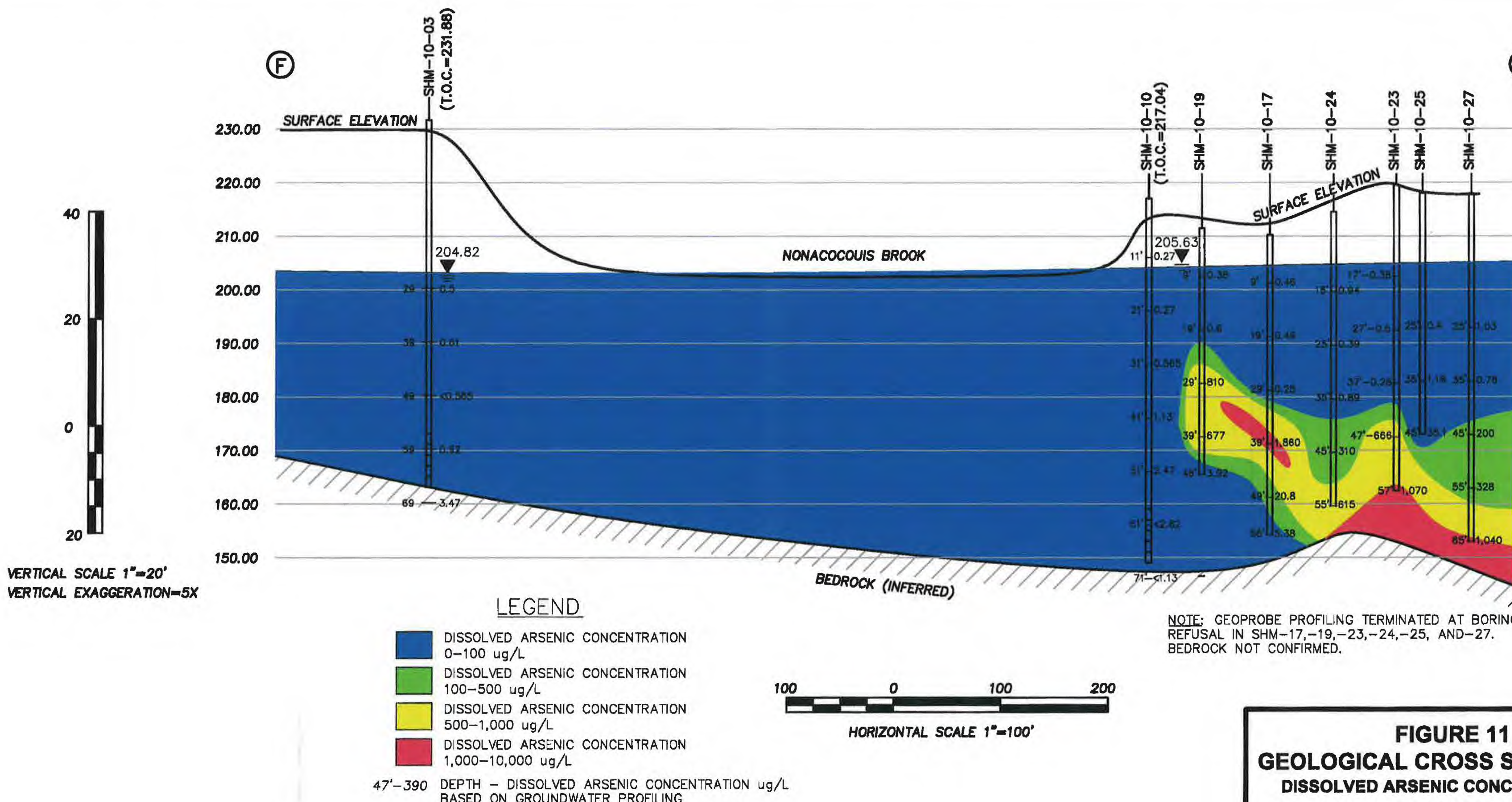

FIGURE 11
GEOLOGICAL CROSS SECTION F-F'
DISSOLVED ARSENIC CONCENTRATIONS

FORT DEVENS
AYER, MASSACHUSETTS

PLAN PREPARED ON 12/1/10. REV. 4/26/11.	PLAN PREPARED BY: NRS

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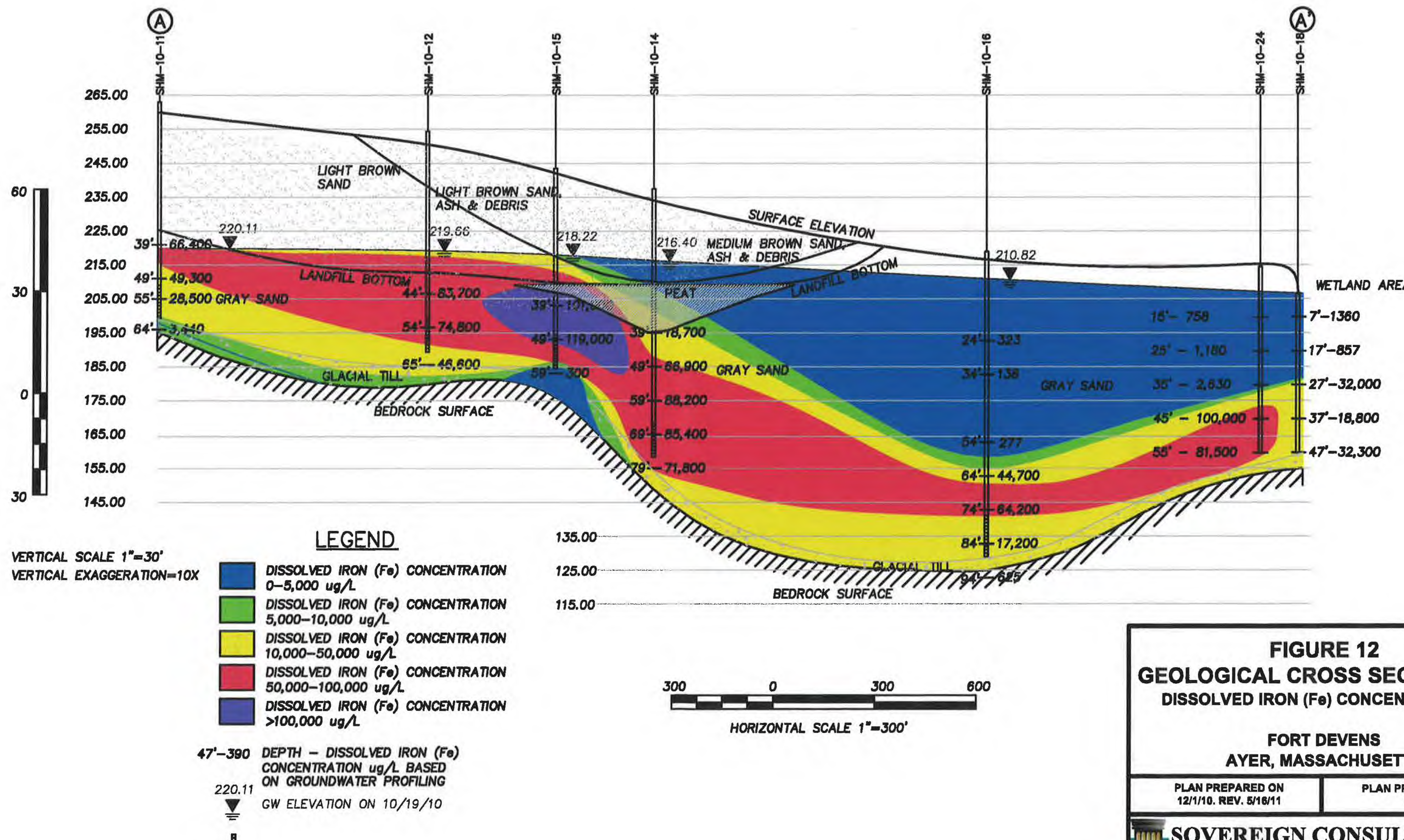

FIGURE 12
GEOLOGICAL CROSS SECTION A-A'
DISSOLVED IRON (Fe) CONCENTRATIONS

FORT DEVENS
AYER, MASSACHUSETTS

PLAN PREPARED ON	PLAN PREPARED BY:
12/1/10. REV. 5/16/11	NRS

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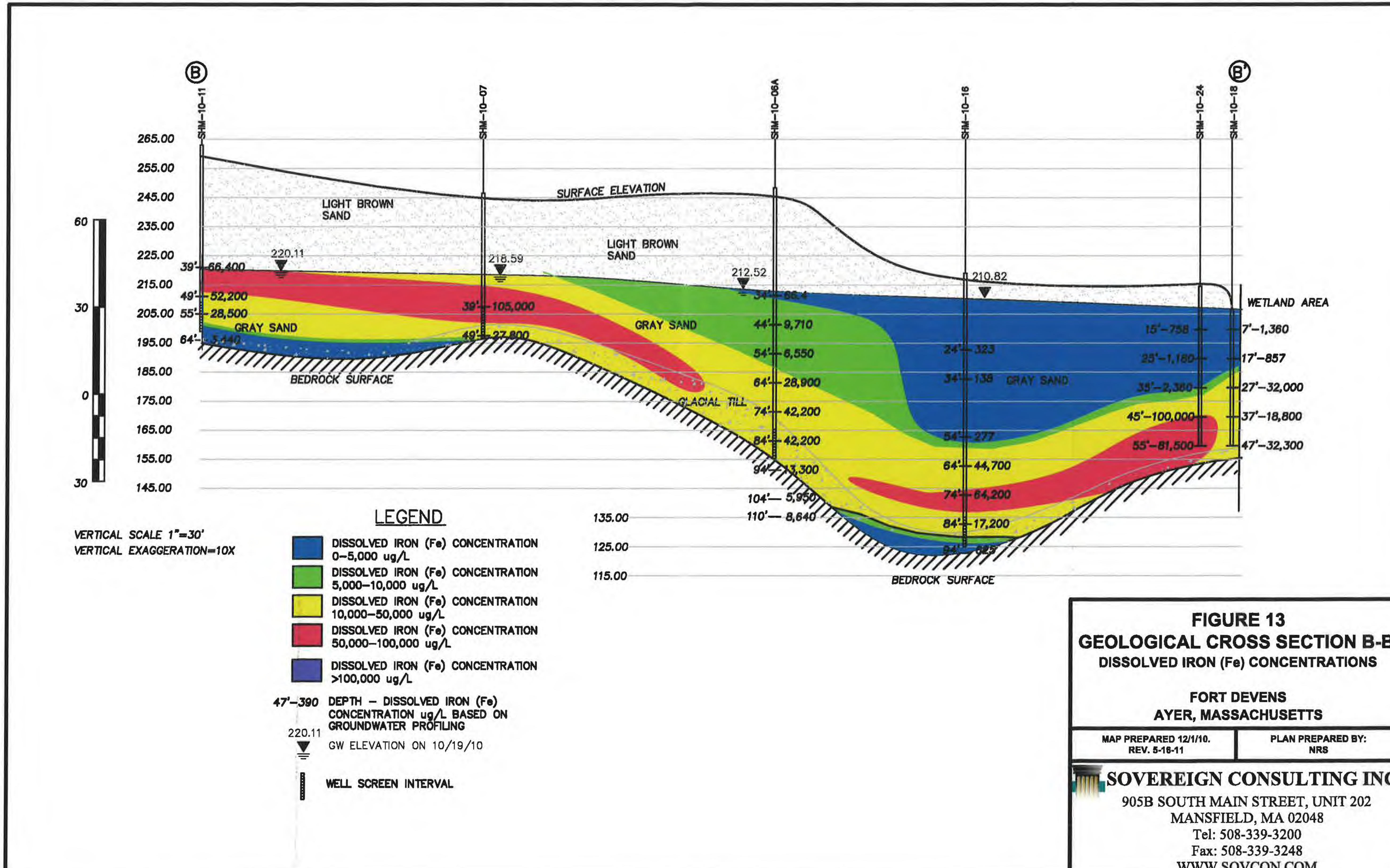
B
B'
SHM-10-11
SHM-10-07
SHM-10-06A
SHM-10-16
SHM-10-24
SHM-10-18
265.00
255.00
245.00
235.00
225.00
215.00
205.00
195.00
185.00
175.00
165.00
155.00
145.00
135.00
125.00
115.00
60
30
0
30
SURFACE ELEVATION
LIGHT BROWN SAND
LIGHT BROWN SAND
GRAY SAND
GRAY SAND
GRAY SAND
GLACIAL TILL
BEDROCK SURFACE
BEDROCK SURFACE
WETLAND AREA
220.11
218.59
212.52
210.82
39'—66,400
49'—52,200
55'—28,500
64'—5,440
39'—105,000
49'—27,800
34'—66.4
44'—9,710
54'—6,550
64'—28,900
74'—42,200
84'—42,200
94'—13,300
104'— 5,950
110'— 8,640
24'—323
34'—138
54'—277
64'—44,700
74'—64,200
84'—17,200
15'—758
25'—1,180
35'—2,380
45'—100,000
55'—81,500
7'—1,360
17'—857
27'—32,000
37'—18,800
47'—32,300
VERTICAL SCALE 1"=30'
VERTICAL EXAGGERATION=10X
LEGEND
DISSOLVED IRON (Fe) CONCENTRATION 0–5,000 ug/L
DISSOLVED IRON (Fe) CONCENTRATION 5,000–10,000 ug/L
DISSOLVED IRON (Fe) CONCENTRATION 10,000–50,000 ug/L
DISSOLVED IRON (Fe) CONCENTRATION 50,000–100,000 ug/L
DISSOLVED IRON (Fe) CONCENTRATION >100,000 ug/L
47'–390 DEPTH – DISSOLVED IRON (Fe) CONCENTRATION ug/L BASED ON GROUNDWATER PROFILING
220.11 GW ELEVATION ON 10/19/10
WELL SCREEN INTERVAL
FIGURE 13
GEOLOGICAL CROSS SECTION B-B'
DISSOLVED IRON (Fe) CONCENTRATIONS
FORT DEVENS
AYER, MASSACHUSETTS
MAP PREPARED 12/1/10.
REV. 5-16-11
PLAN PREPARED BY:
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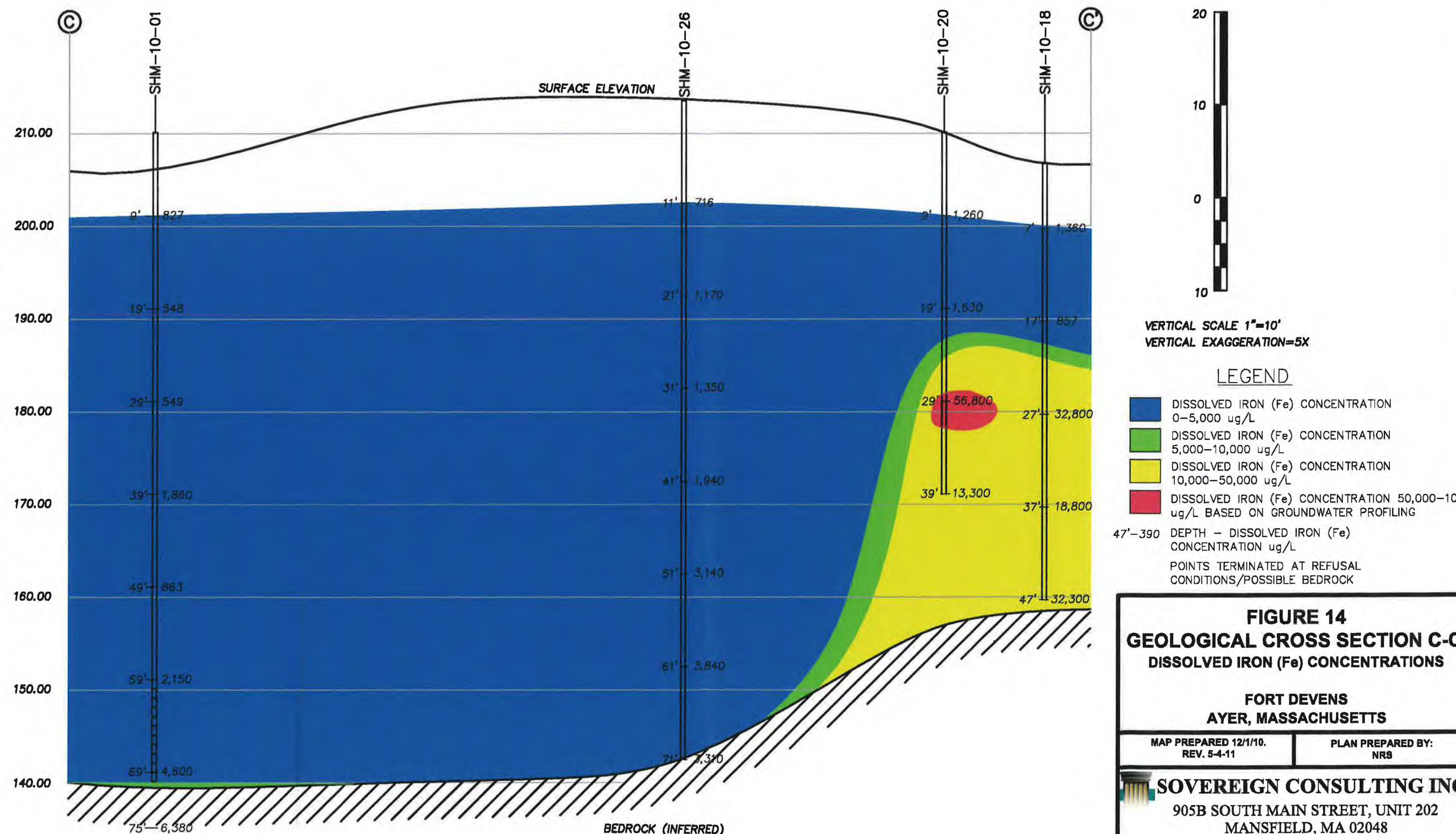

FIGURE 14
GEOLOGICAL CROSS SECTION C-C'
DISSOLVED IRON (Fe) CONCENTRATIONS

FORT DEVENS
AYER, MASSACHUSETTS

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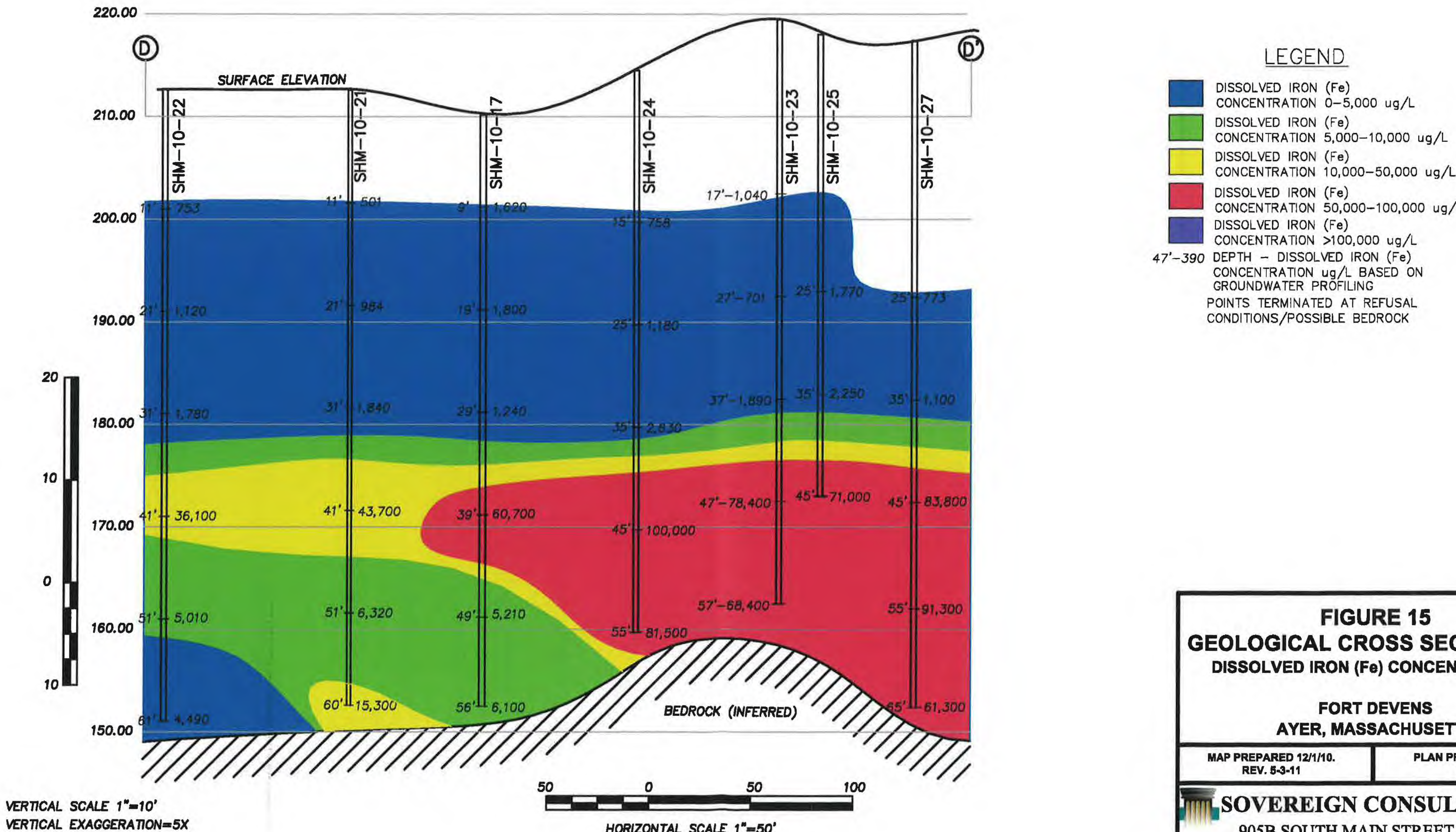

FIGURE 15

GEOLOGICAL CROSS SECTION D-D'

DISSOLVED IRON (Fe) CONCENTRATIONS

FORT DEVENS

AYER, MASSACHUSETTS

MAP PREPARED 12/1/10. REV. 5-3-11	PLAN PREPARED BY: NRS

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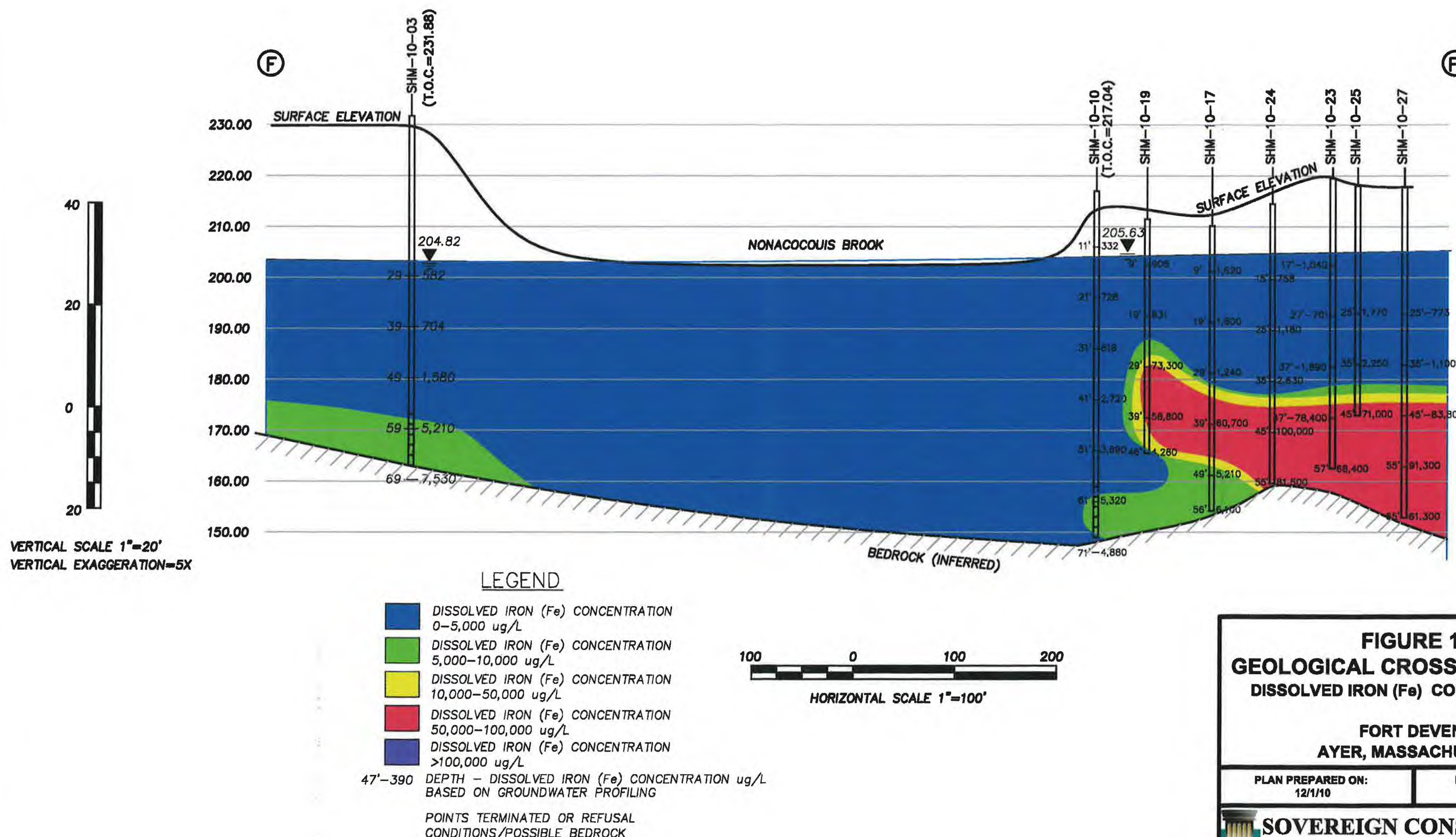

FIGURE 16
GEOLOGICAL CROSS SECTION F-F'
DISSOLVED IRON (Fe) CONCENTRATIONS

FORT DEVENS
AYER, MASSACHUSETTS

PLAN PREPARED ON:	PLAN PREPARED BY:
12/1/10	NRS

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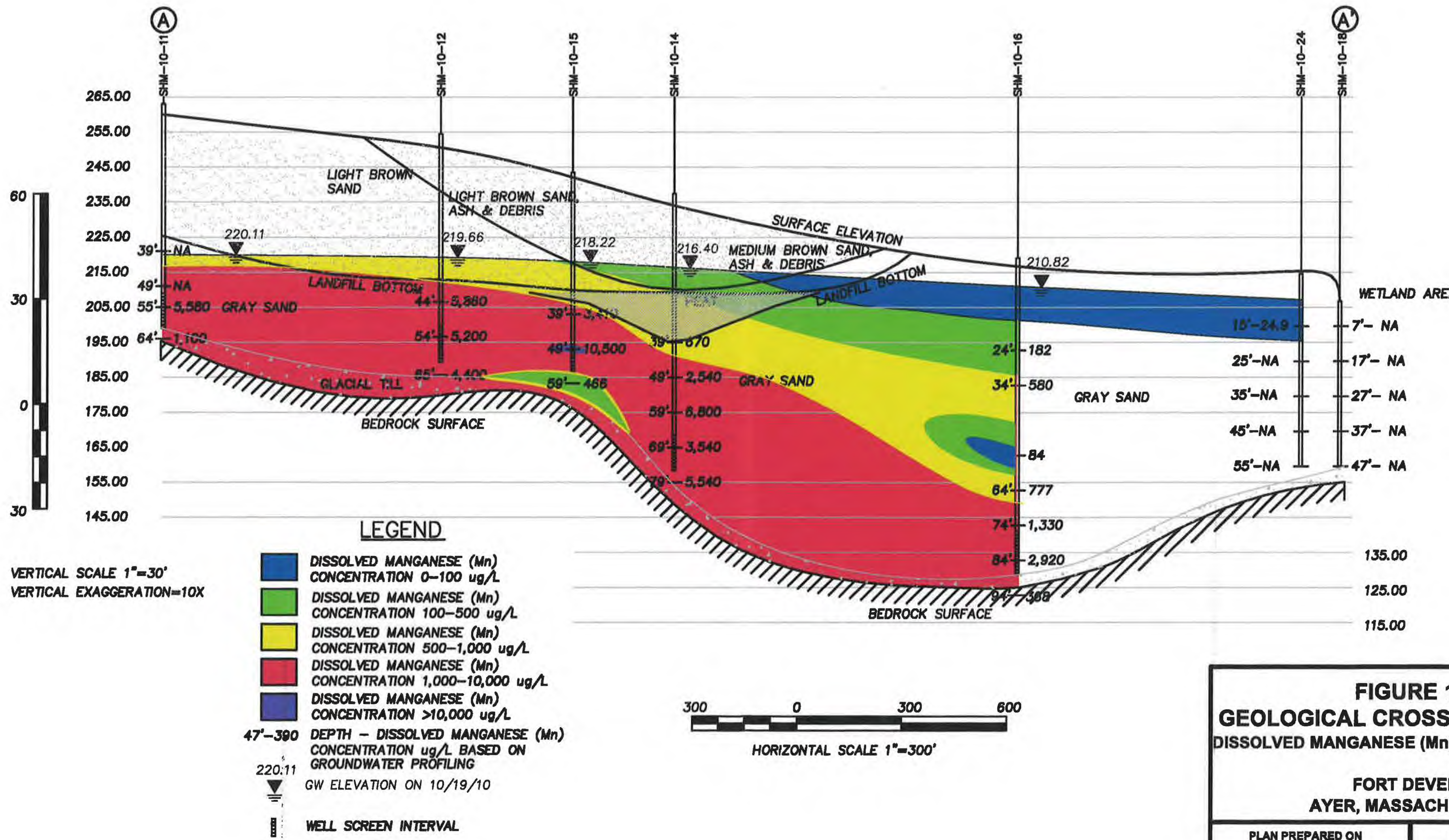

FIGURE 17
GEOLOGICAL CROSS SECTION A-A'
DISSOLVED MANGANESE (Mn) CONCENTRATIONS

FORT DEVENS
AYER, MASSACHUSETTS

PLAN PREPARED ON 12/1/10. REV. 5/16/11	PLAN PREPARED BY: NRS

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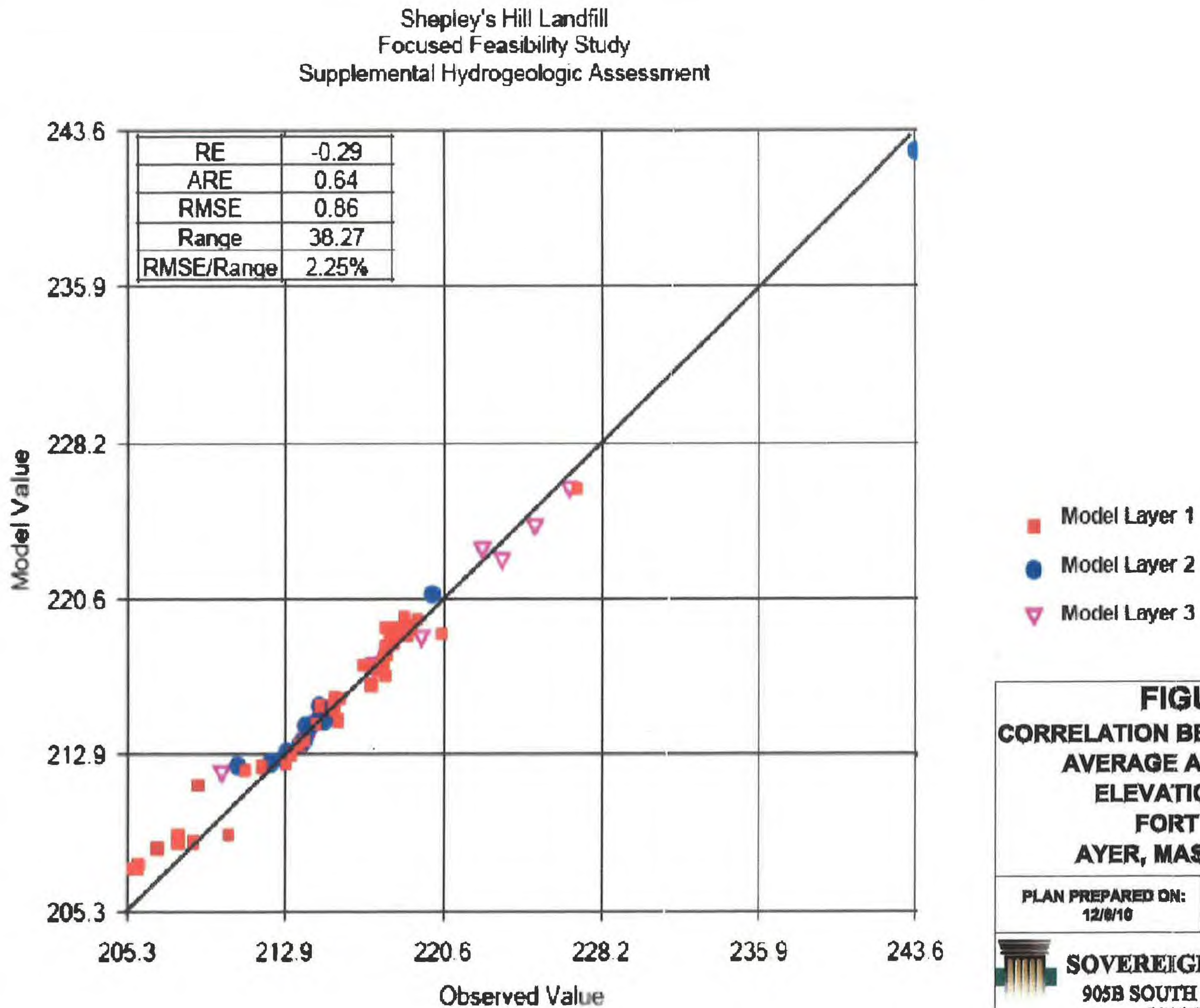

FIGURE 31

CORRELATION BETWEEN LONG TERM AVERAGE AND PREDICTED ELEVATIONS: SHL008
FORT DEVENS
AYER, MASSACHUSETTS

PLAN PREPARED ON:	PLAN PREPARED BY:
12/8/10	AMEC

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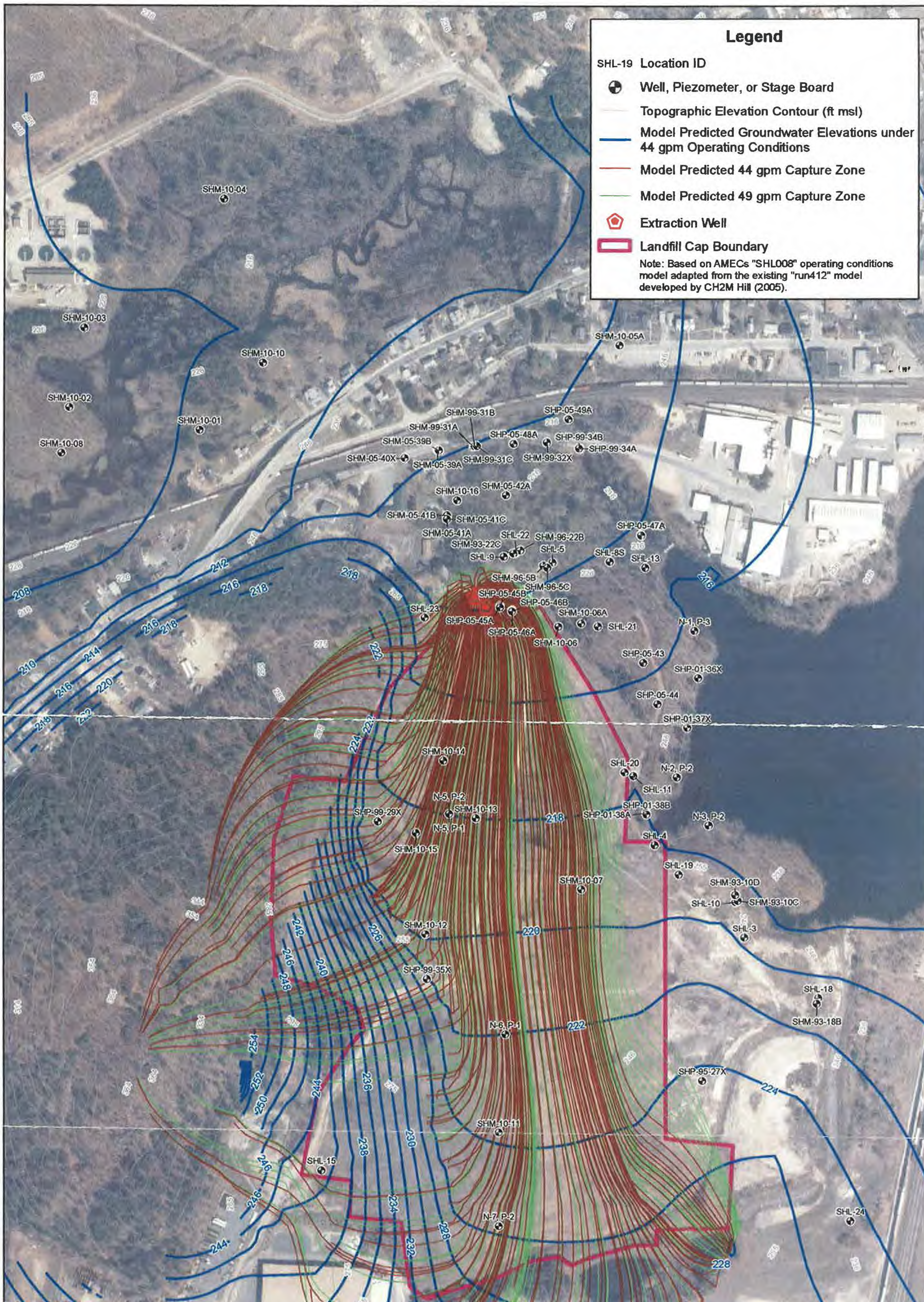


Model Predicted Capture Zones

FIGURE

32

0 350

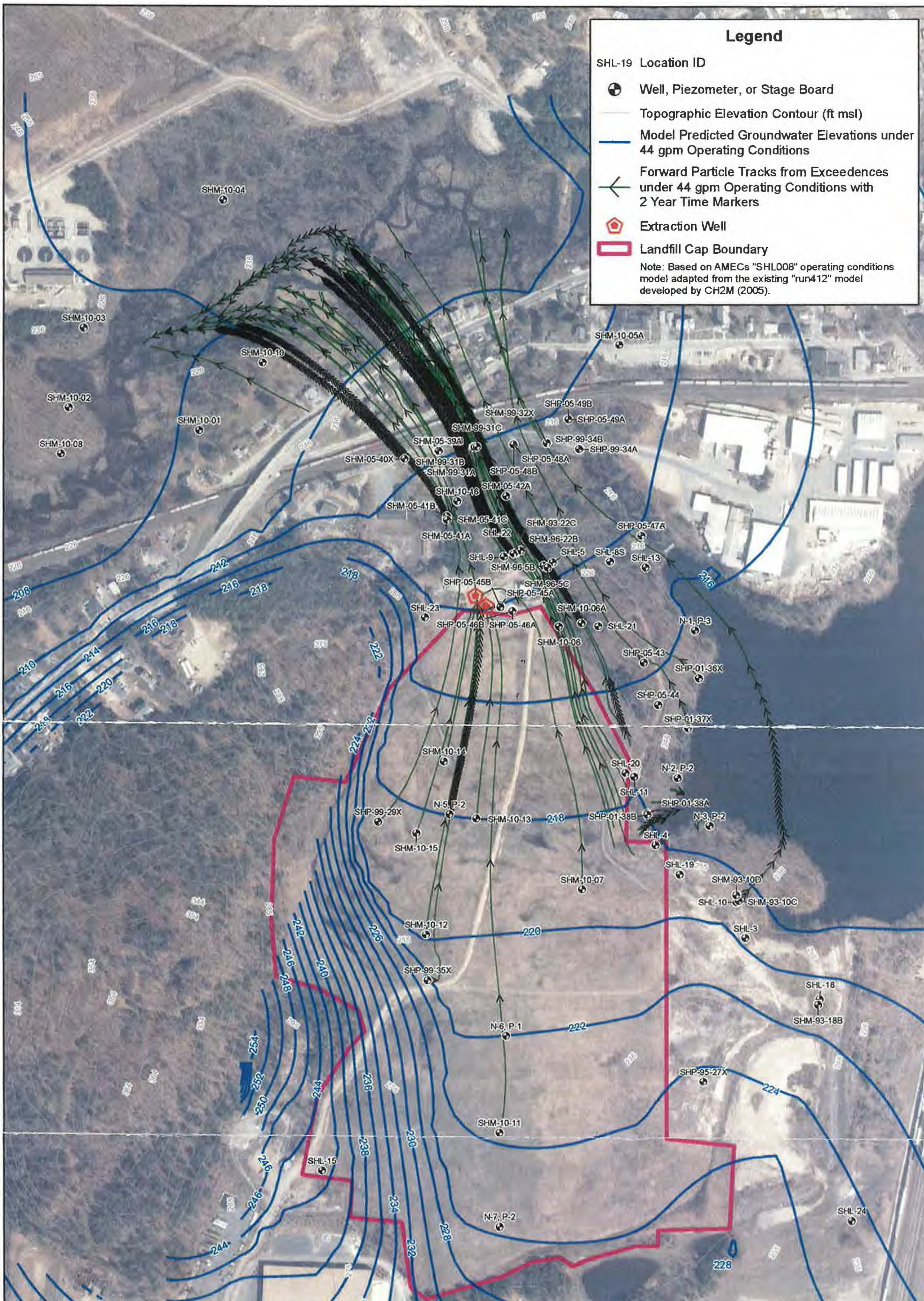
Feet

Shepley's Hill Landfill
Ayer, Massachusetts

amec

H:\ShepleyLandfill\Task24\MXD\Fig33_ModelPredictedCaptureZones.mxd December 7, 2010 DWN: JDP CHKD: AKN

Aerial Imagery: 1:5,000 Color Digital Ortho images, Mass GIS, 2005.



Forward Particle Tracks from Arsenic Exceedences under Current (Operating) Conditions

FIGURE

33

0 350

Feet

Shepley's Hill Landfill
Ayer, Massachusetts

amec

H:\ShepleyLandfill\Task36\MXD\Fig32_ForwardParticleTracksArsenicExceedences.mxd December 7, 2010 DWN: JDP CHKD: AKN

Aerial Imagery: 1:5,000 Color Digital Ortho Images, Mass GIS, 2005.

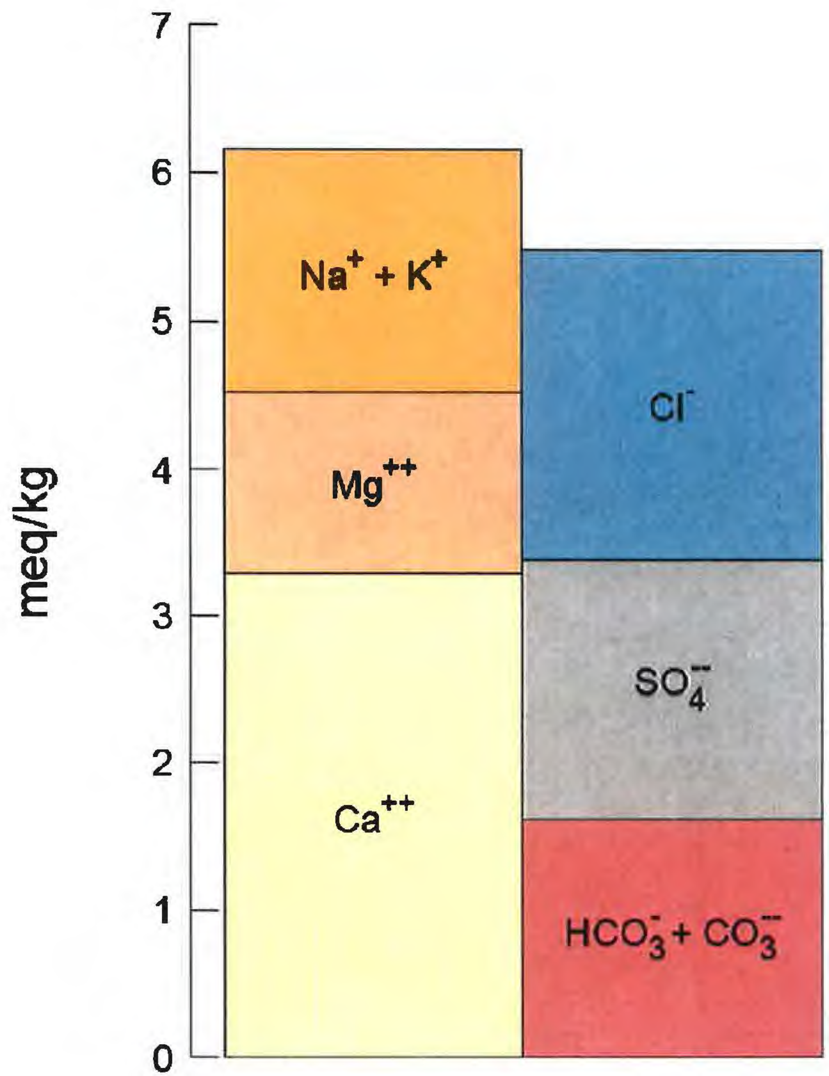


FIGURE 34

CATION-ANION BALANCE AND BICARBONATE IN SH-10-04

FORT DEVENS
AYER, MASSACHUSETTS

PLAN PREPARED ON:	PLAN PREPARED BY:
12/1/10	WJW

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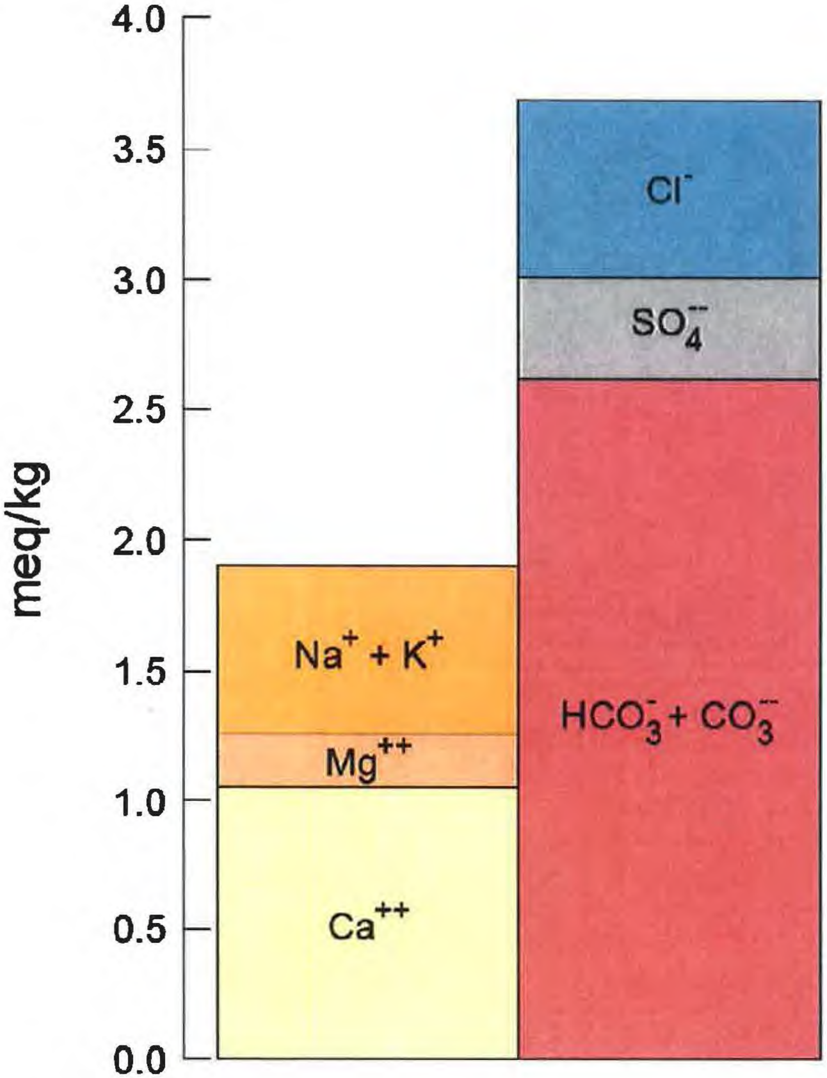

FIGURE 35

CATION-ANION BALANCE AND BICARBONATE IN SH-10-11

FORT DEVENS
AYER, MASSACHUSETTS

PLAN PREPARED ON:	PLAN PREPARED BY:
12/1/10	WJW

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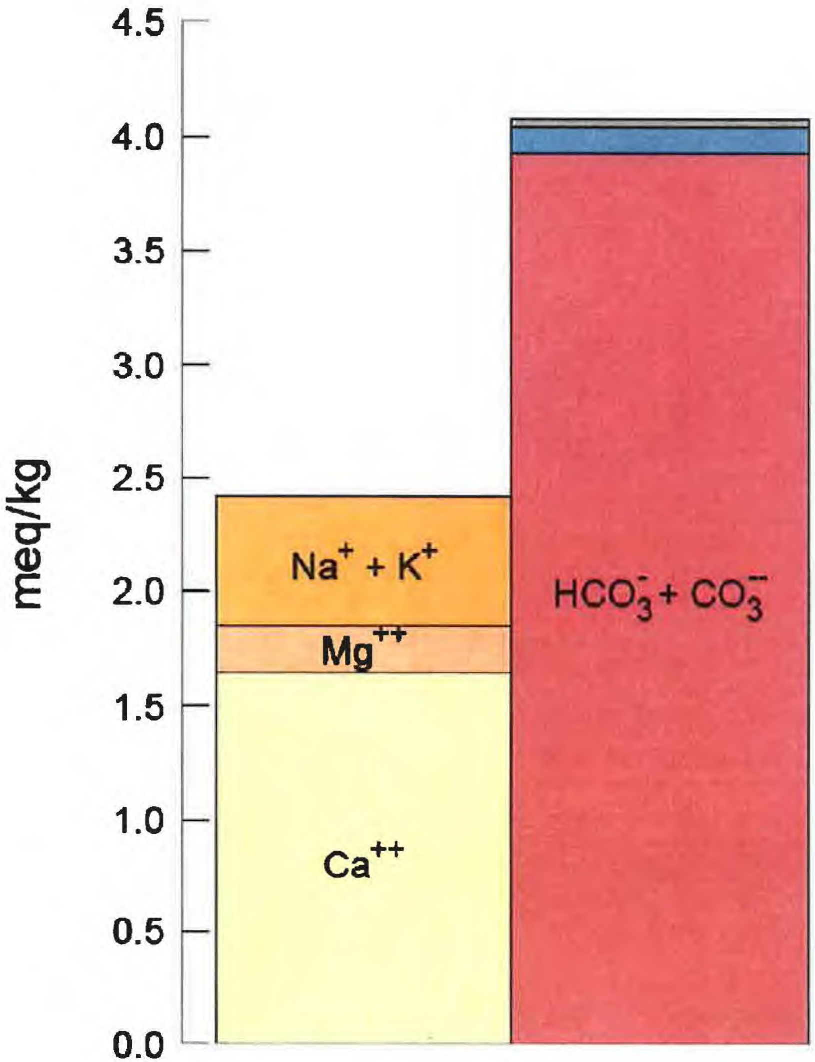

FIGURE 36

CATION-ANION BALANCE AND BICARBONATE IN SH-10-12

FORT DEVENS
AYER, MASSACHUSETTS

PLAN PREPARED ON: 12/1/10	PLAN PREPARED BY: WJW

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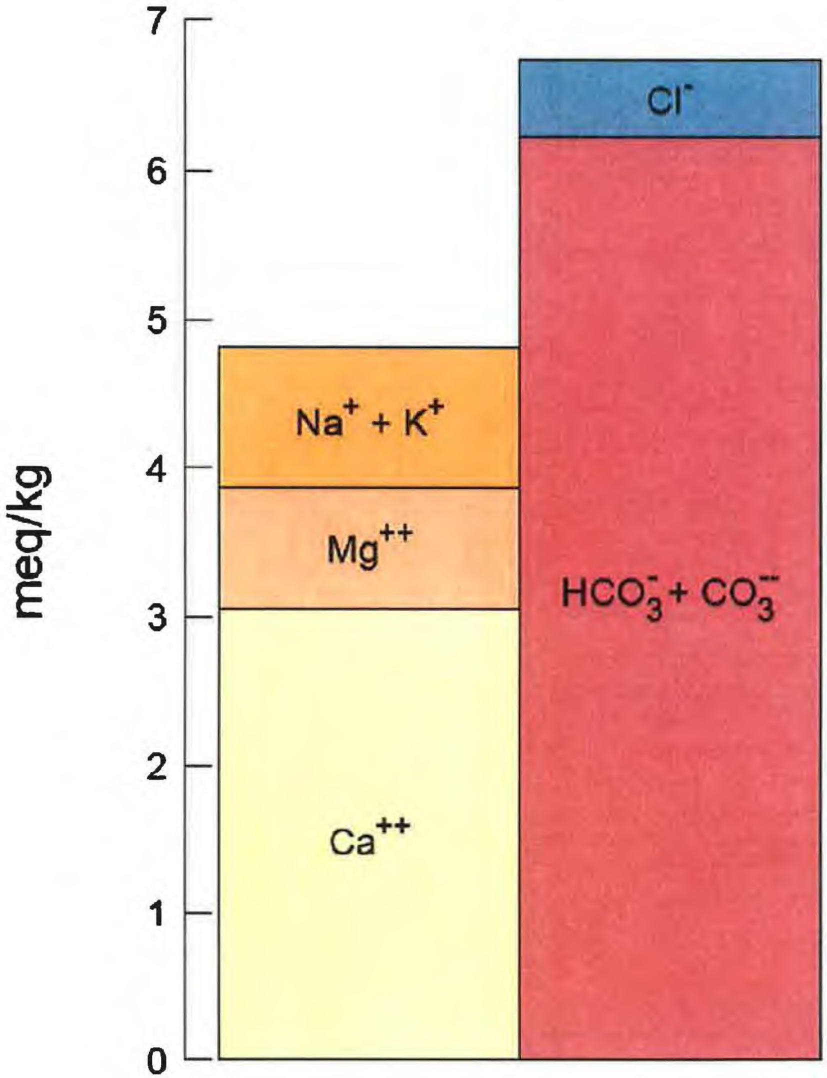

FIGURE 37

CATION-ANION BALANCE AND BICARBONATE IN SH-10-13

FORT DEVENS
AYER, MASSACHUSETTS

PLAN PREPARED ON:	PLAN PREPARED BY:
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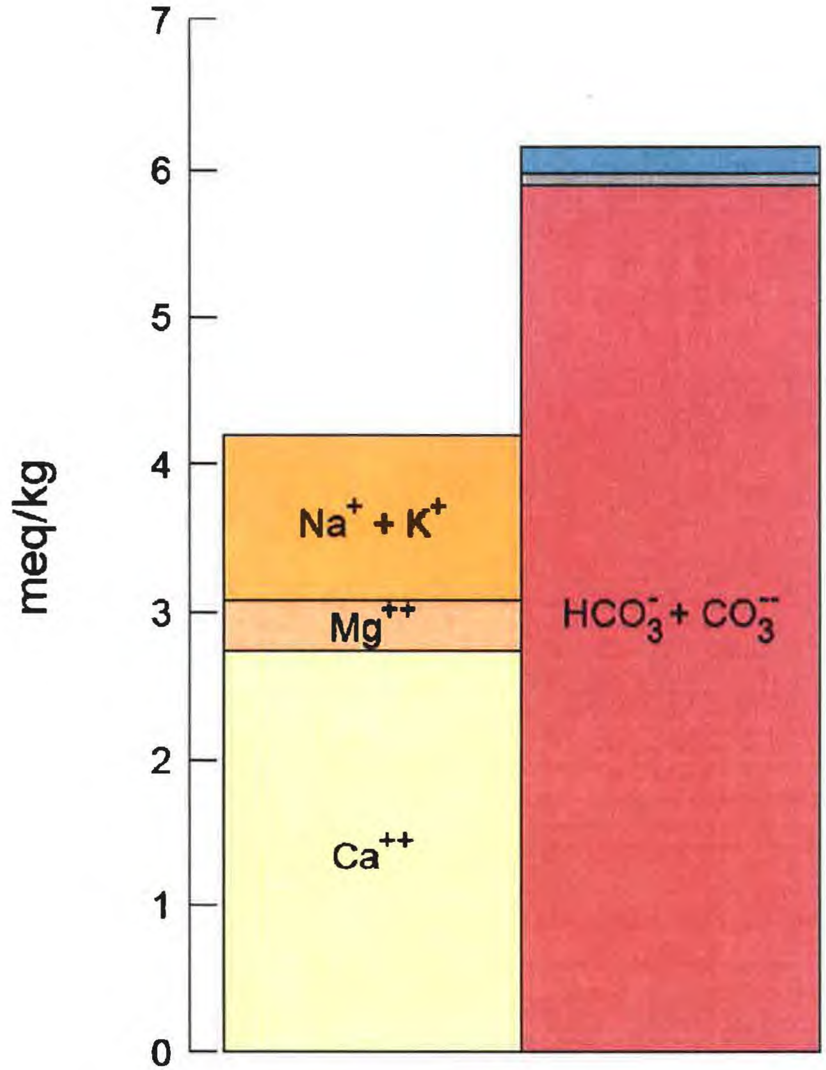

FIGURE 38

CATION-ANION BALANCE AND BICARBONATE IN SH-10-14

FORT DEVENS
AYER, MASSACHUSETTS

PLAN PREPARED ON: 12/1/10	PLAN PREPARED BY: WJW

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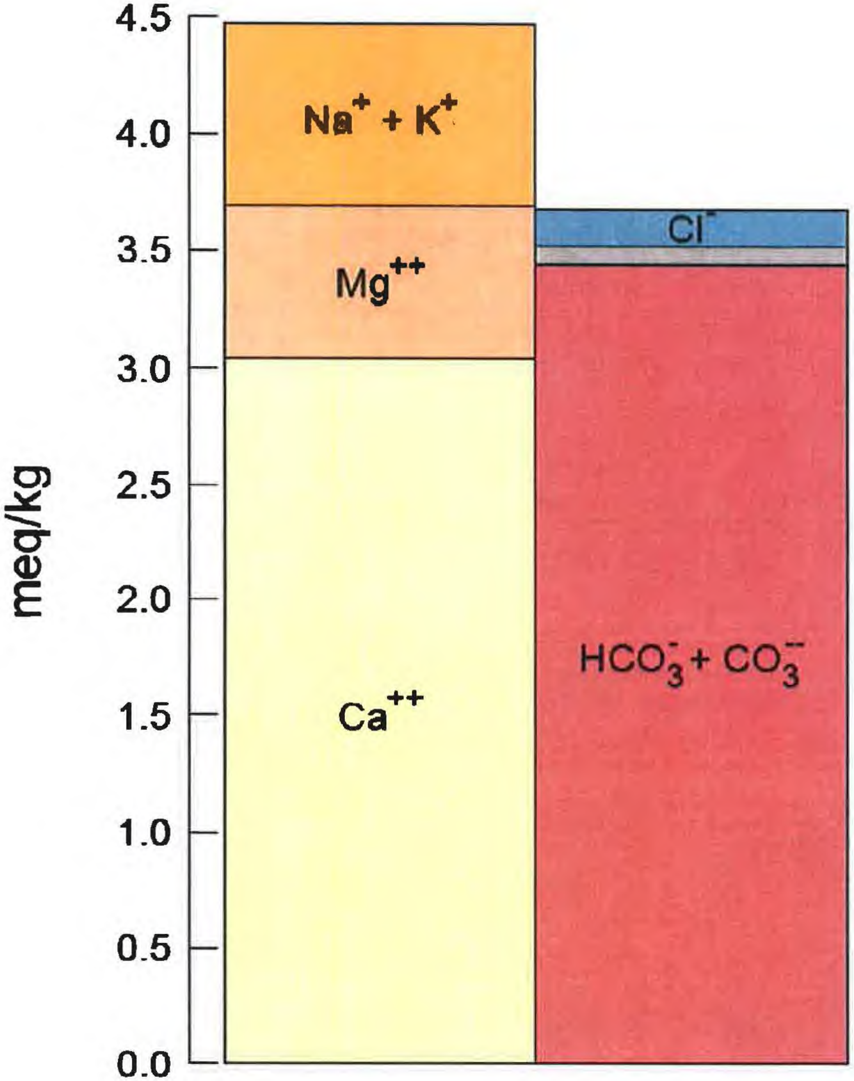

FIGURE 39

CATION-ANION BALANCE AND BICARBONATE IN SH-10-15

FORT DEVENS
AYER, MASSACHUSETTS

PLAN PREPARED ON:	PLAN PREPARED BY:
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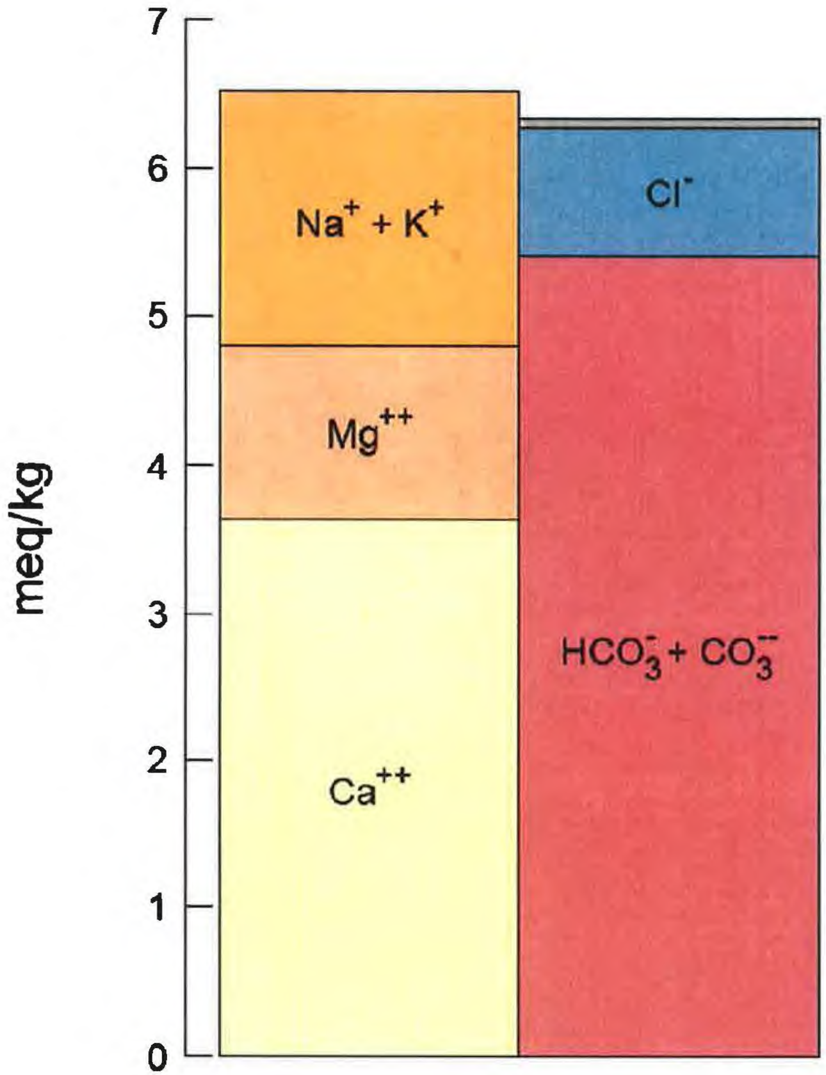

FIGURE 40

CATION-ANION BALANCE AND BICARBONATE IN SH-10-16

FORT DEVENS
AYER, MASSACHUSETTS

PLAN PREPARED ON: 12/1/10	PLAN PREPARED BY: WJW

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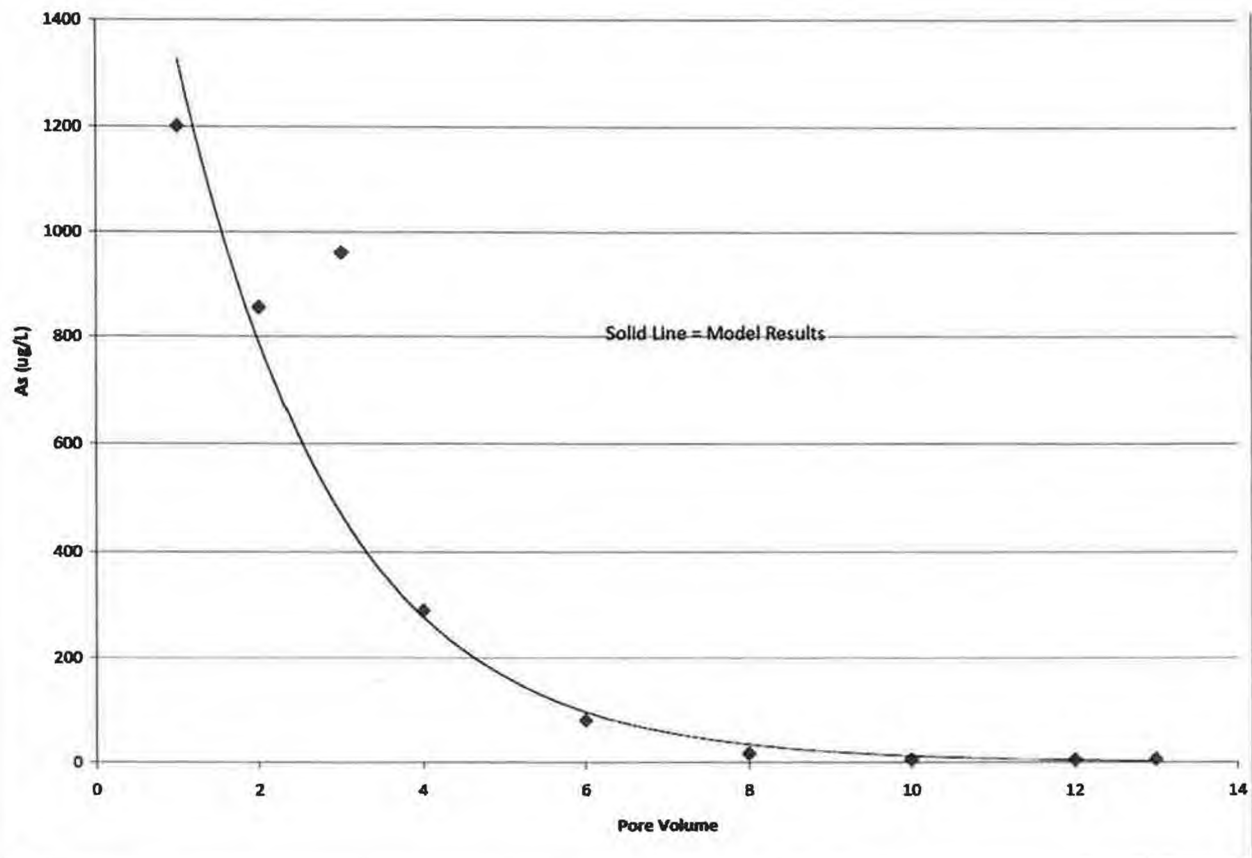

FIGURE 41

ARSENIC IN COLUMN EFFLUENT

FORT DEVENS
AYER, MASSACHUSETTS

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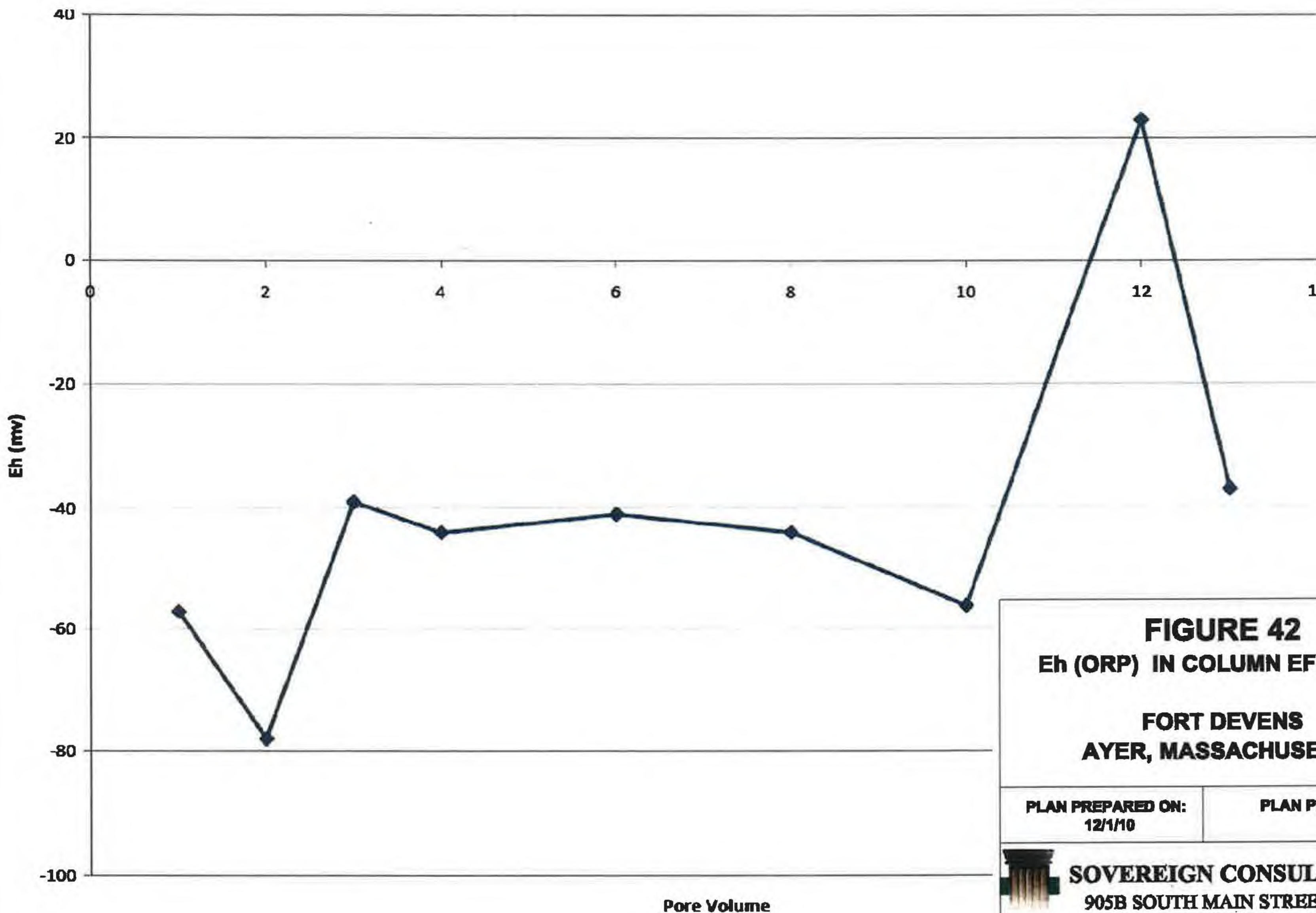

FIGURE 42

Eh (ORP) IN COLUMN EFFLUENT

FORT DEVENS
AYER, MASSACHUSETTS

PLAN PREPARED ON: 12/1/10	PLAN PREPARED BY: WJW

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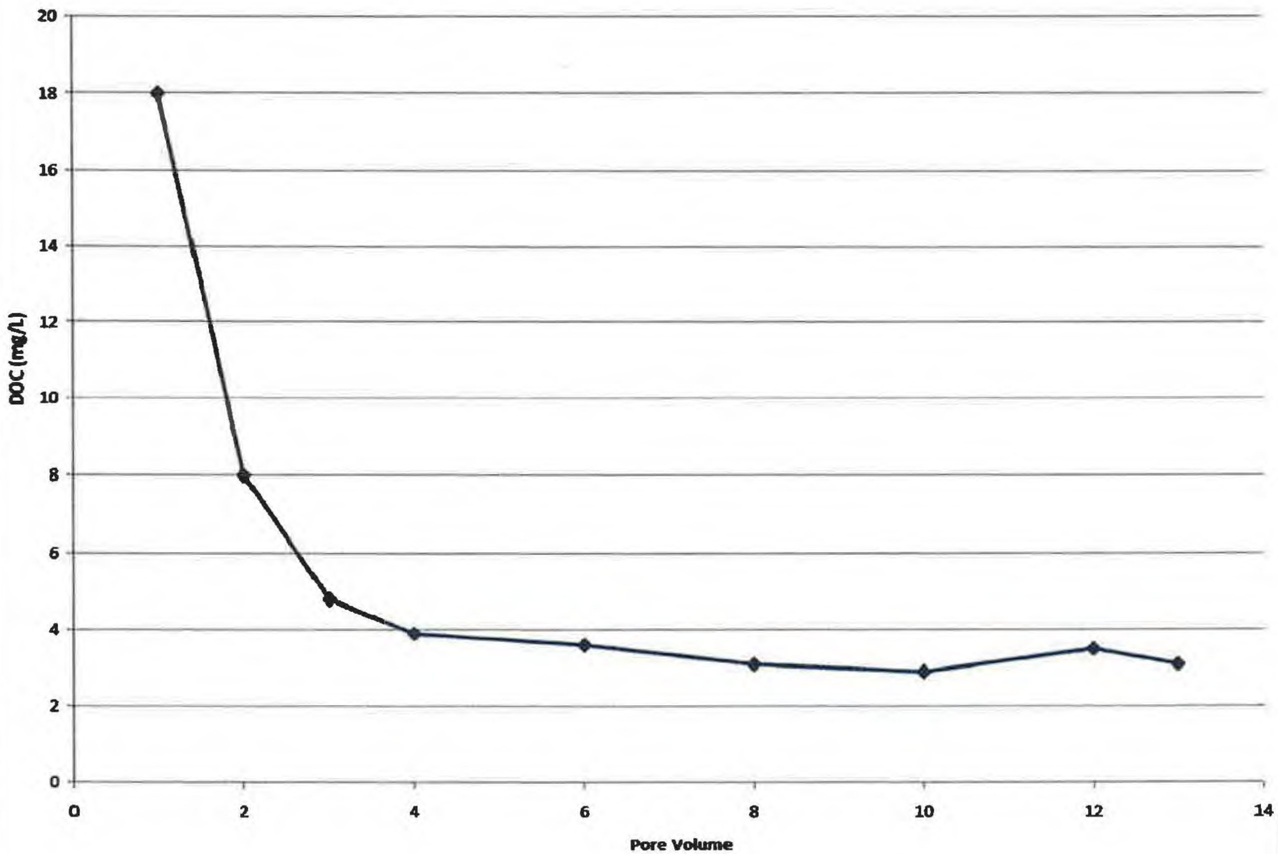

FIGURE 43
DOC IN COLUMN EFFLUENT

FORT DEVENS
AYER, MASSACHUSETTS

PLAN PREPARED ON: 12/1/10	PLAN PREPARED BY: WJW

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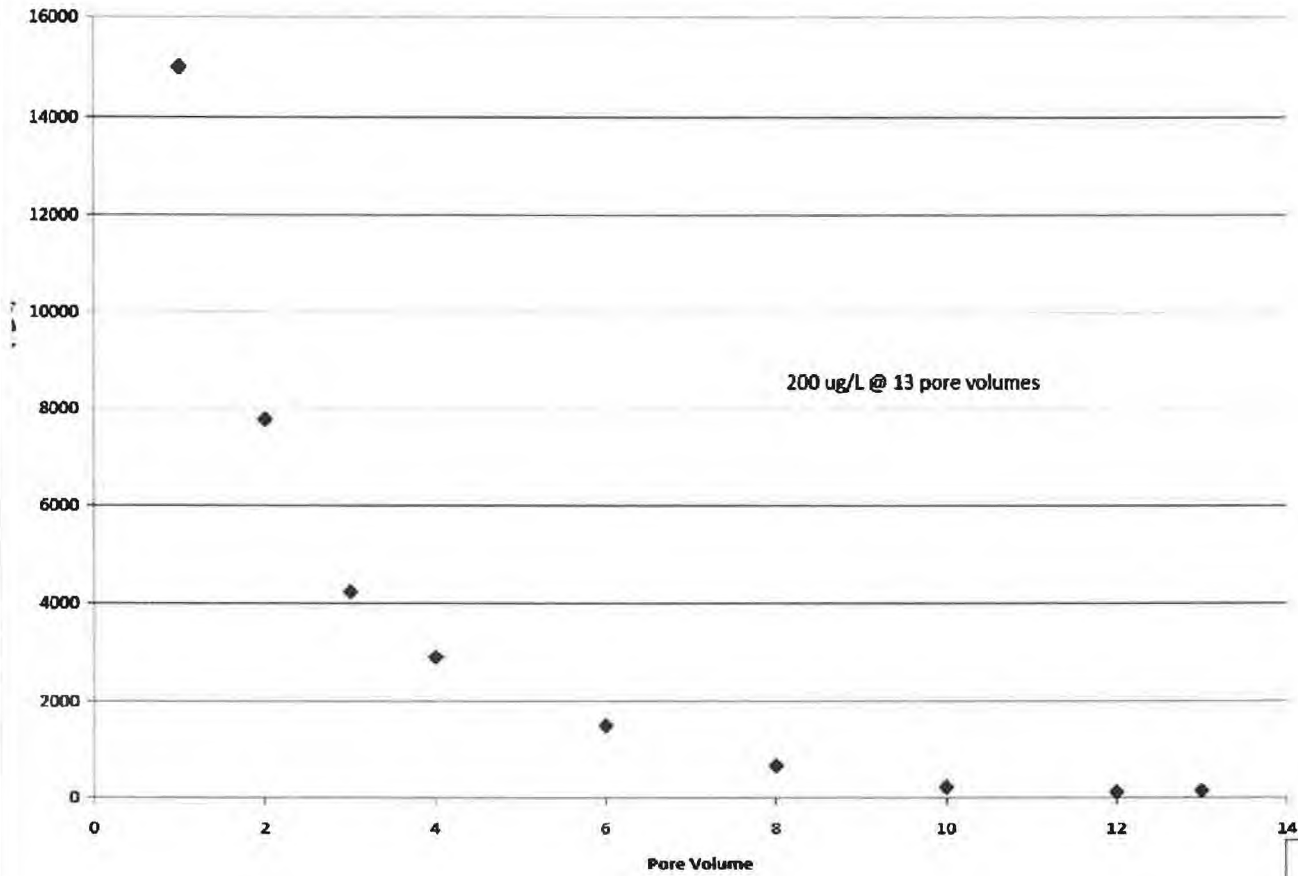

FIGURE 44

MODEL RESULTS FOR INITIAL CONCENTRATION OF 15,000 ug/l ARSENIC
FORT DEVENS
AYER, MASSACHUSETTS

PLAN PREPARED ON:	PLAN PREPARED BY:
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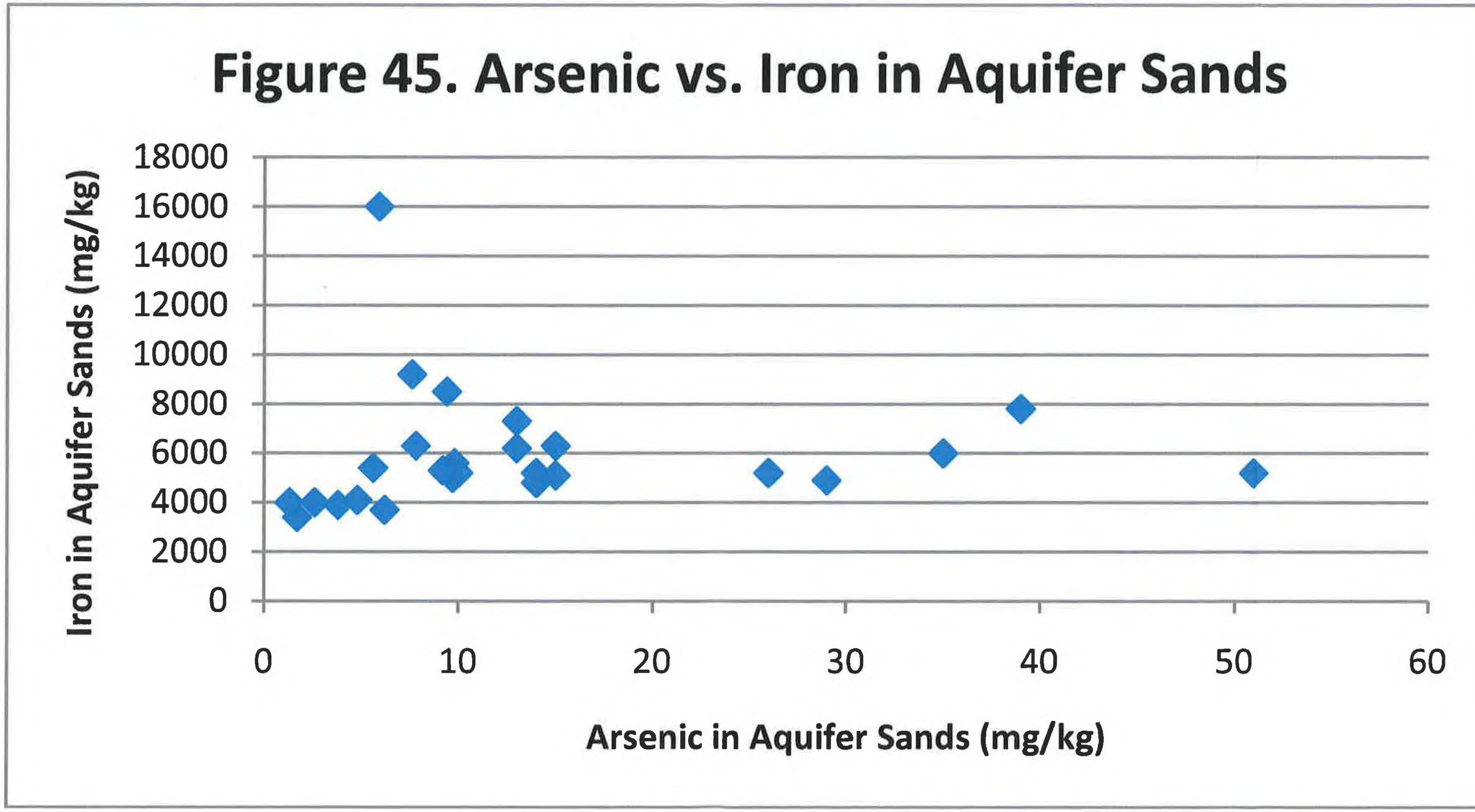
Figure 45. Arsenic vs. Iron in Aquifer Sands
Iron in Aquifer Sands (mg/kg)
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
0
10
20
30
40
50
60
Arsenic in Aquifer Sands (mg/kg)

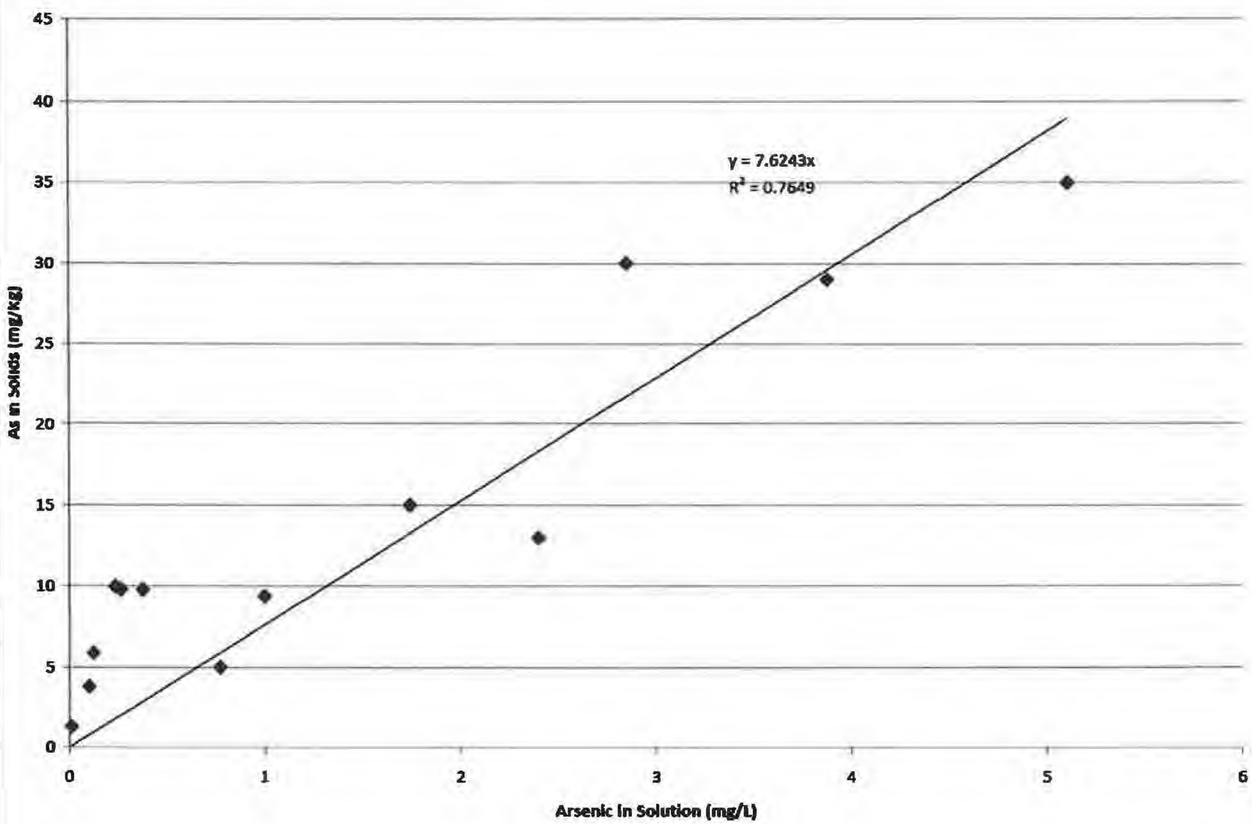

FIGURE 46

ARSENIC DISTRIBUTION IN SOLIDS VS SOLUTION (Kd=SLOPE OF LINE

FORT DEVENS
AYER, MASSACHUSETTS

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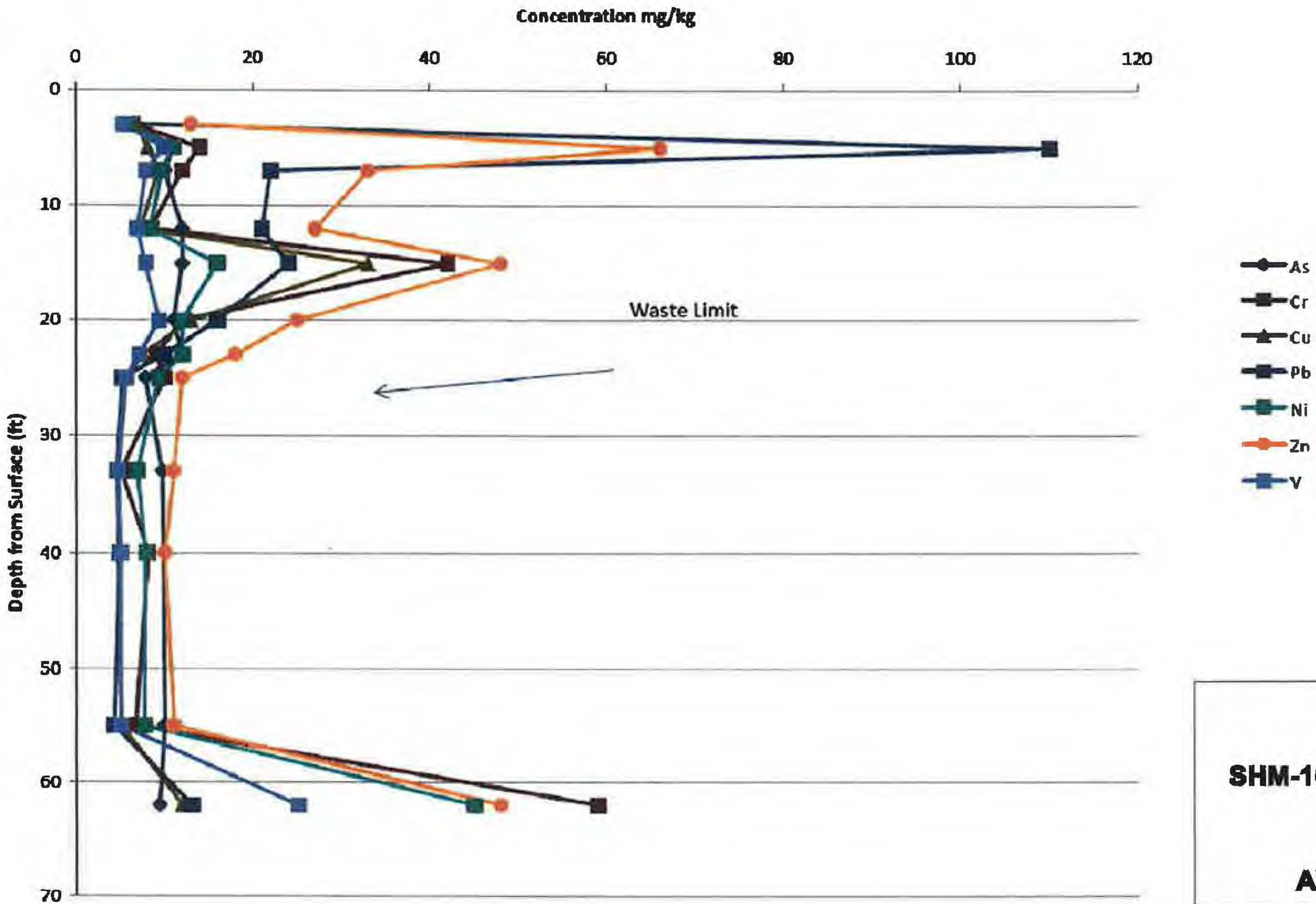

FIGURE 47

SHM-10-11 TRACE METAL PROFILE

FORT DEVENS
AYER, MASSACHUSETTS

PLAN PREPARED ON: 12/1/10	PLAN PREPARED BY: WJW

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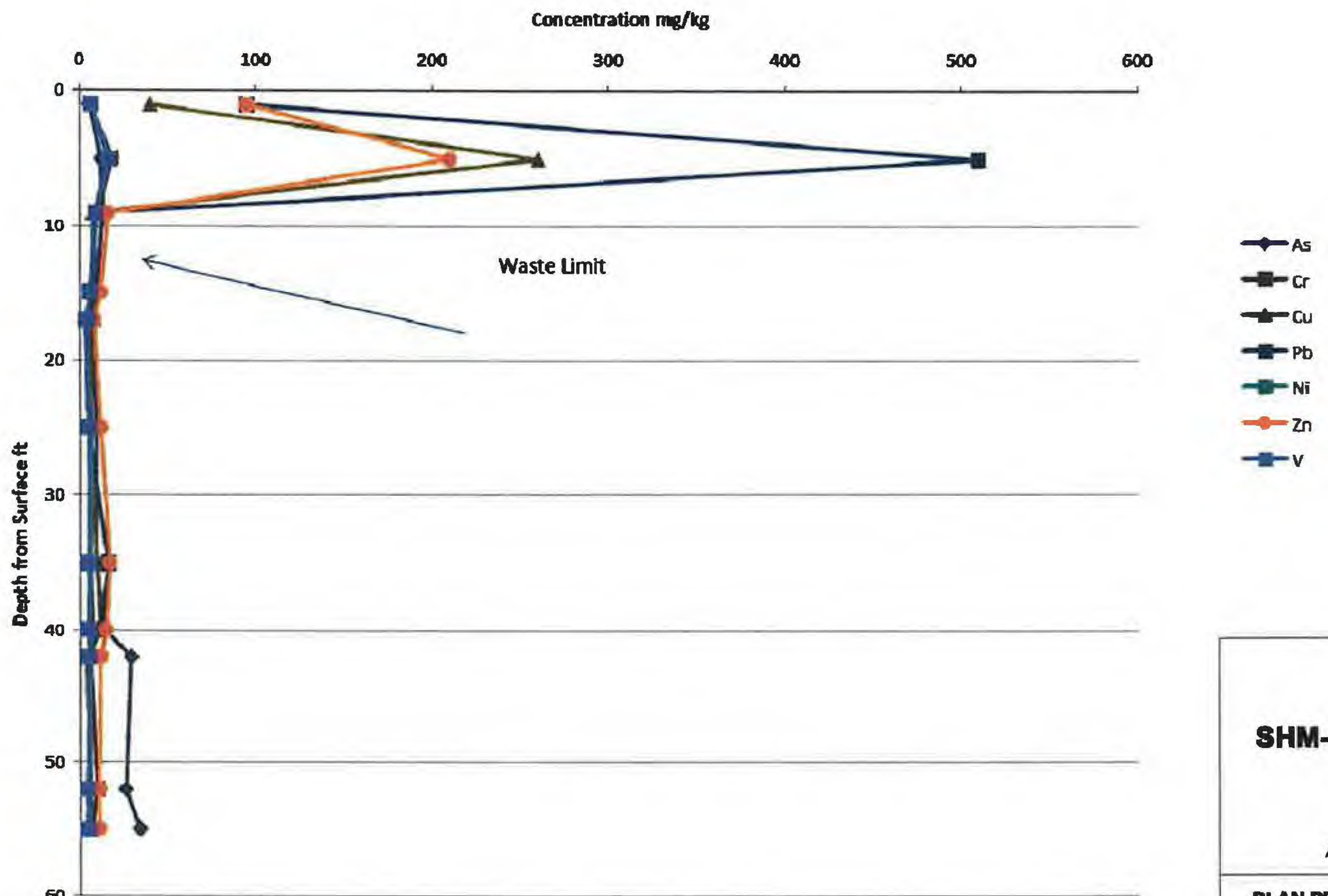

FIGURE 48

SHM-10-12 TRACE METAL PROFILE

FORT DEVENS
AYER, MASSACHUSETTS

PLAN PREPARED ON: 12/1/10	PLAN PREPARED BY: WJW

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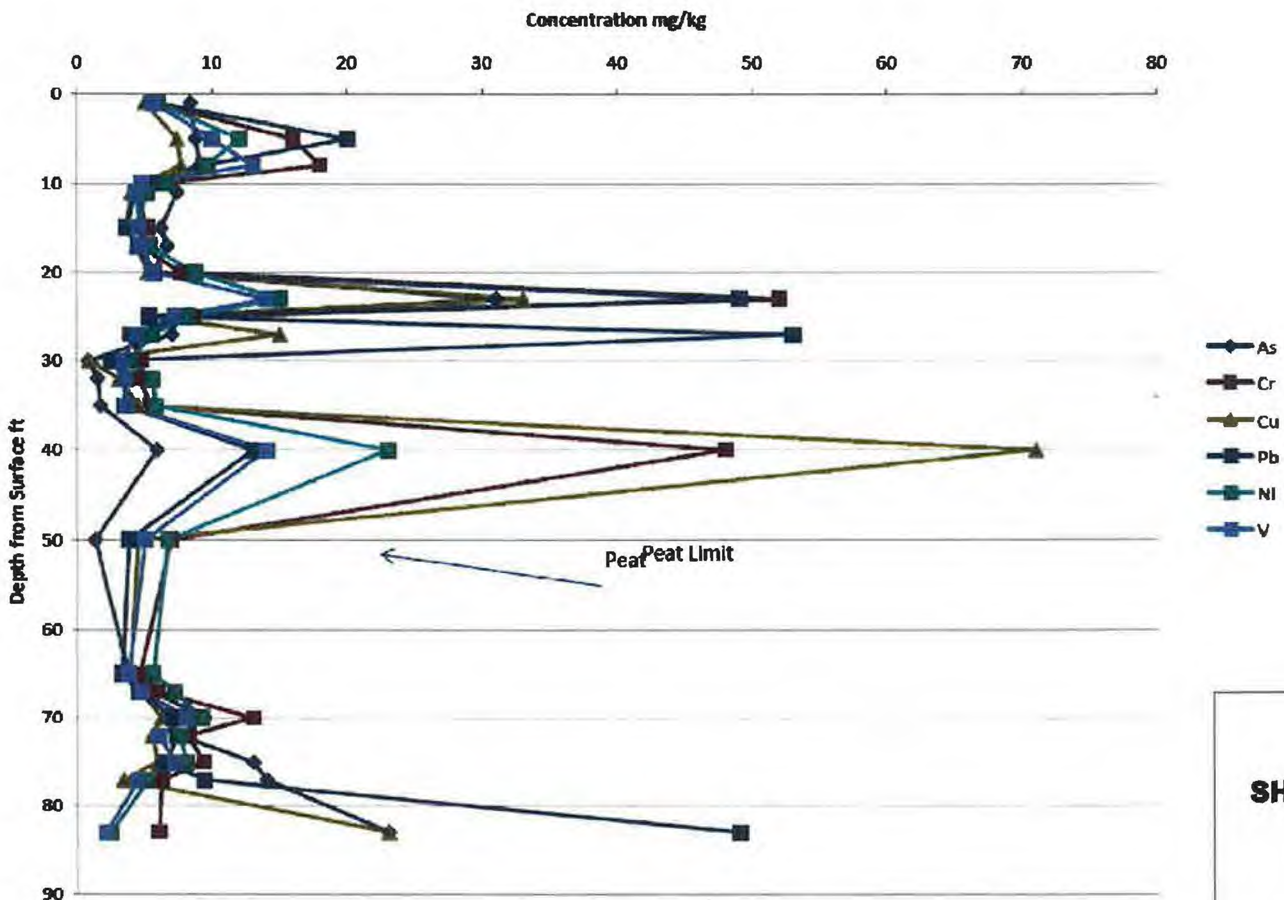

FIGURE 49

SHM-10-13 TRACE METAL PROFILE

FORT DEVENS
AYER, MASSACHUSETTS

PLAN PREPARED ON: 12/1/10	PLAN PREPARED BY: WJW

SOVEREIGN CONSULTING INC.
905B SOUTH MAIN STREET, UNIT 202
MANSFIELD, MA 02048
Tel: 508-339-3200
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WWW.SOVCON.COM

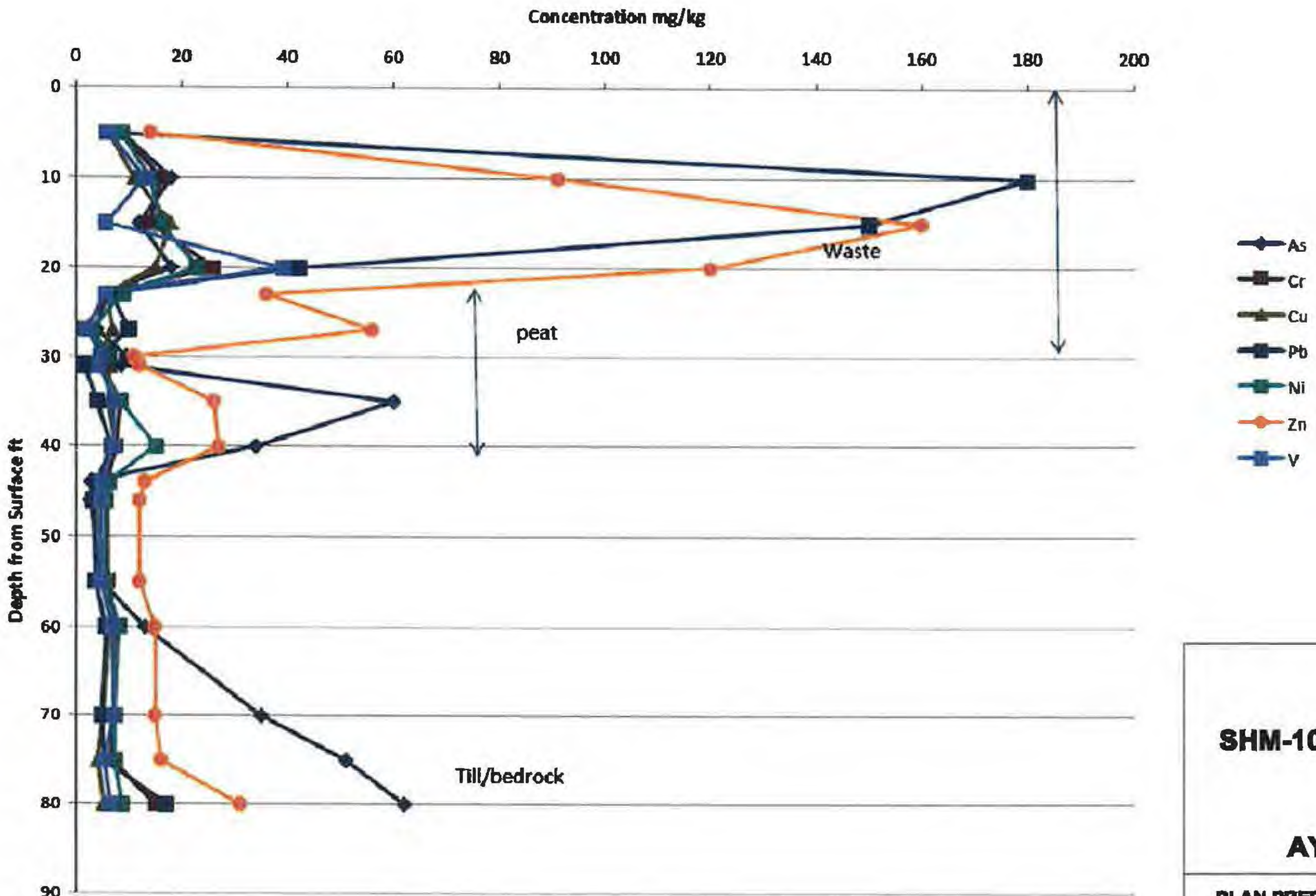

FIGURE 50

SHM-10-14 TRACE METAL PROFILE

FORT DEVENS
AYER, MASSACHUSETTS

PLAN PREPARED ON: 12/1/10	PLAN PREPARED BY: WJW

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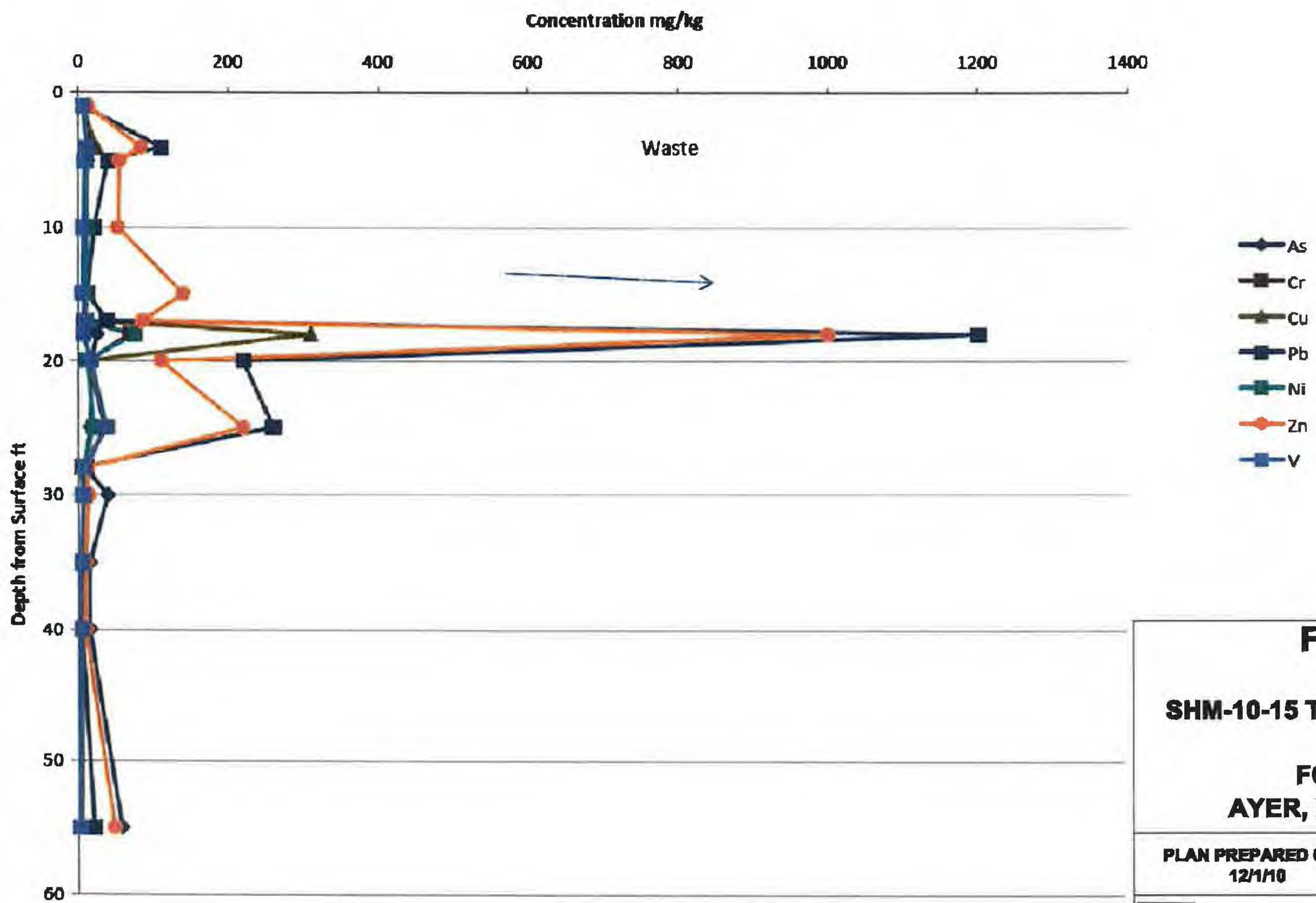

FIGURE 51

SHM-10-15 TRACE METAL PROFILE

FORT DEVENS
AYER, MASSACHUSETTS

PLAN PREPARED ON: 12/1/10	PLAN PREPARED BY: WJW

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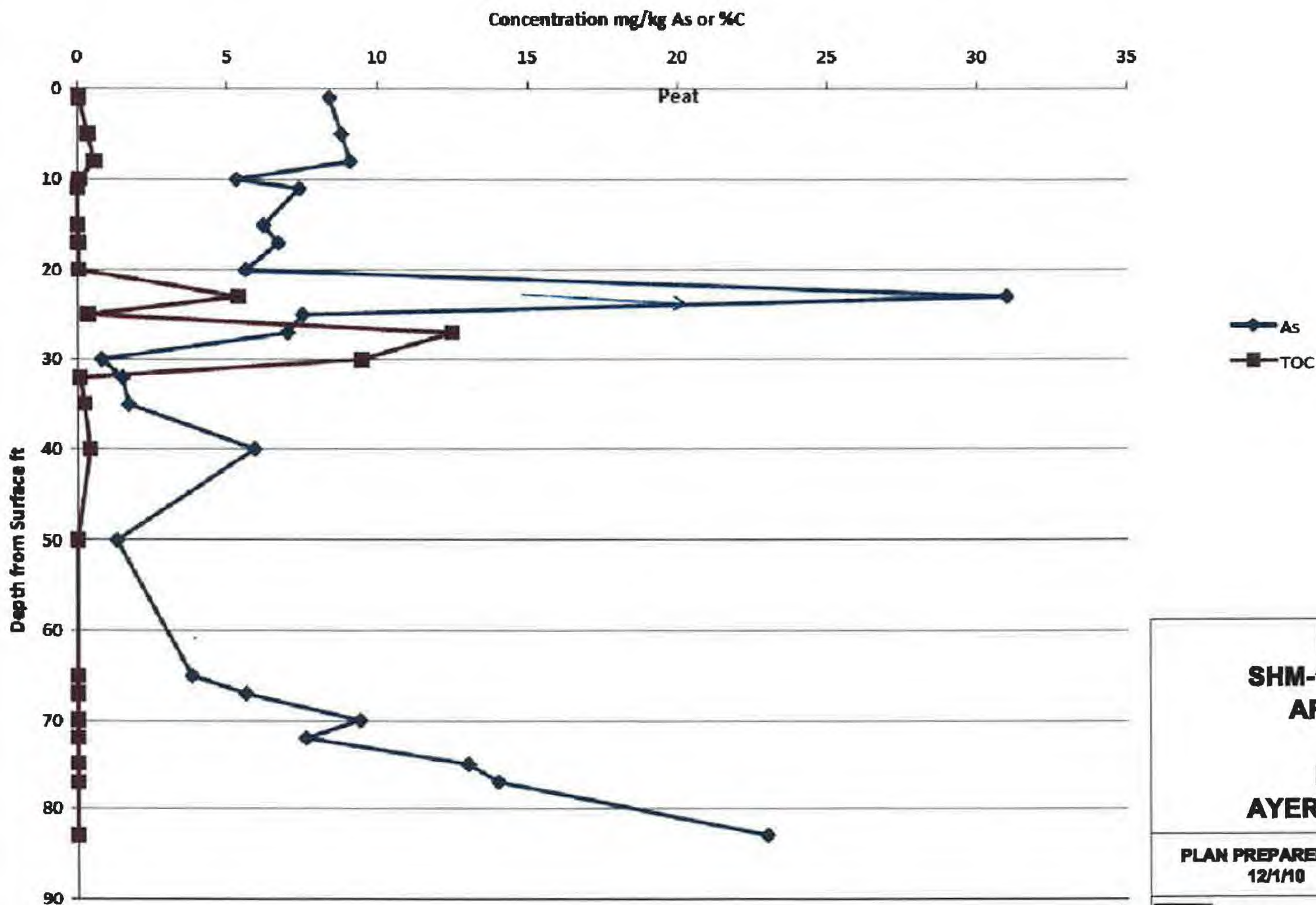

FIGURE 52

SHM-10-13 CARBON AND ARSENIC PROFILE

FORT DEVENS
AYER, MASSACHUSETTS

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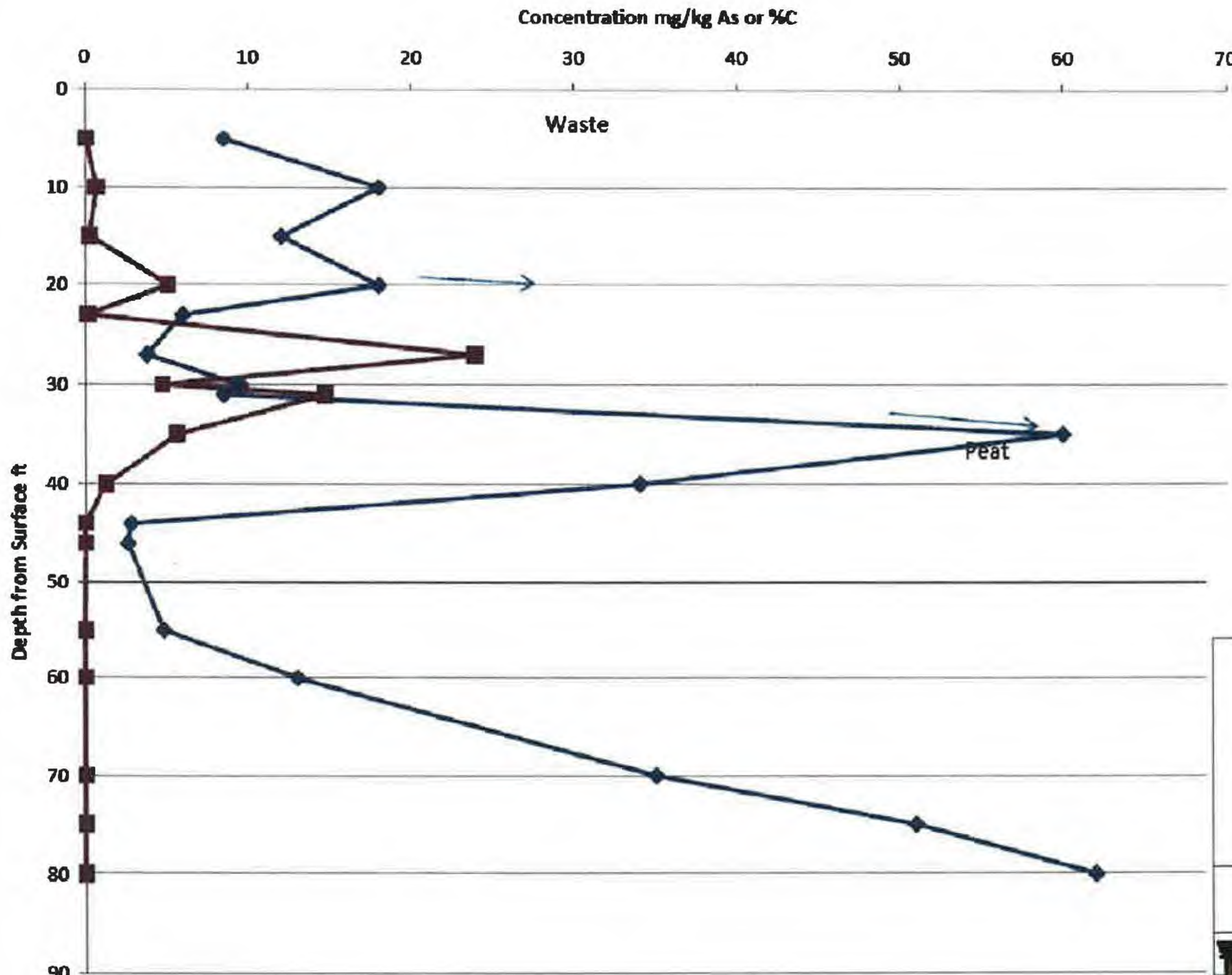

FIGURE 53

SHM-10-14 CARBON AND ARSENIC PROFILE

FORT DEVENS
AYER, MASSACHUSETTS

PLAN PREPARED ON: 12/1/10	PLAN PREPARED BY: WJW

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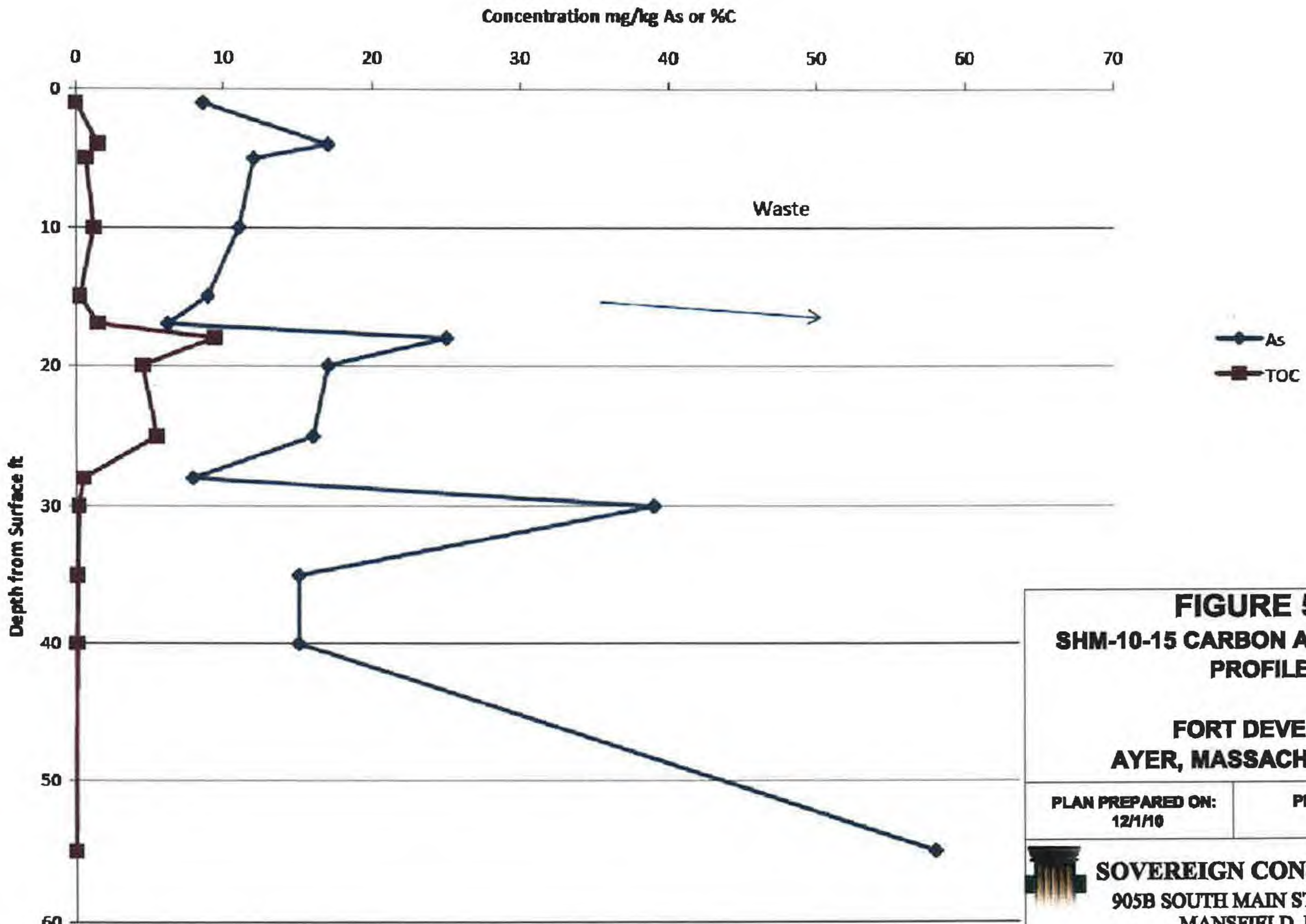

FIGURE 54

SHM-10-15 CARBON AND ARSENIC PROFILE

FORT DEVENS
AYER, MASSACHUSETTS

PLAN PREPARED ON: 12/1/10	PLAN PREPARED BY: WJW

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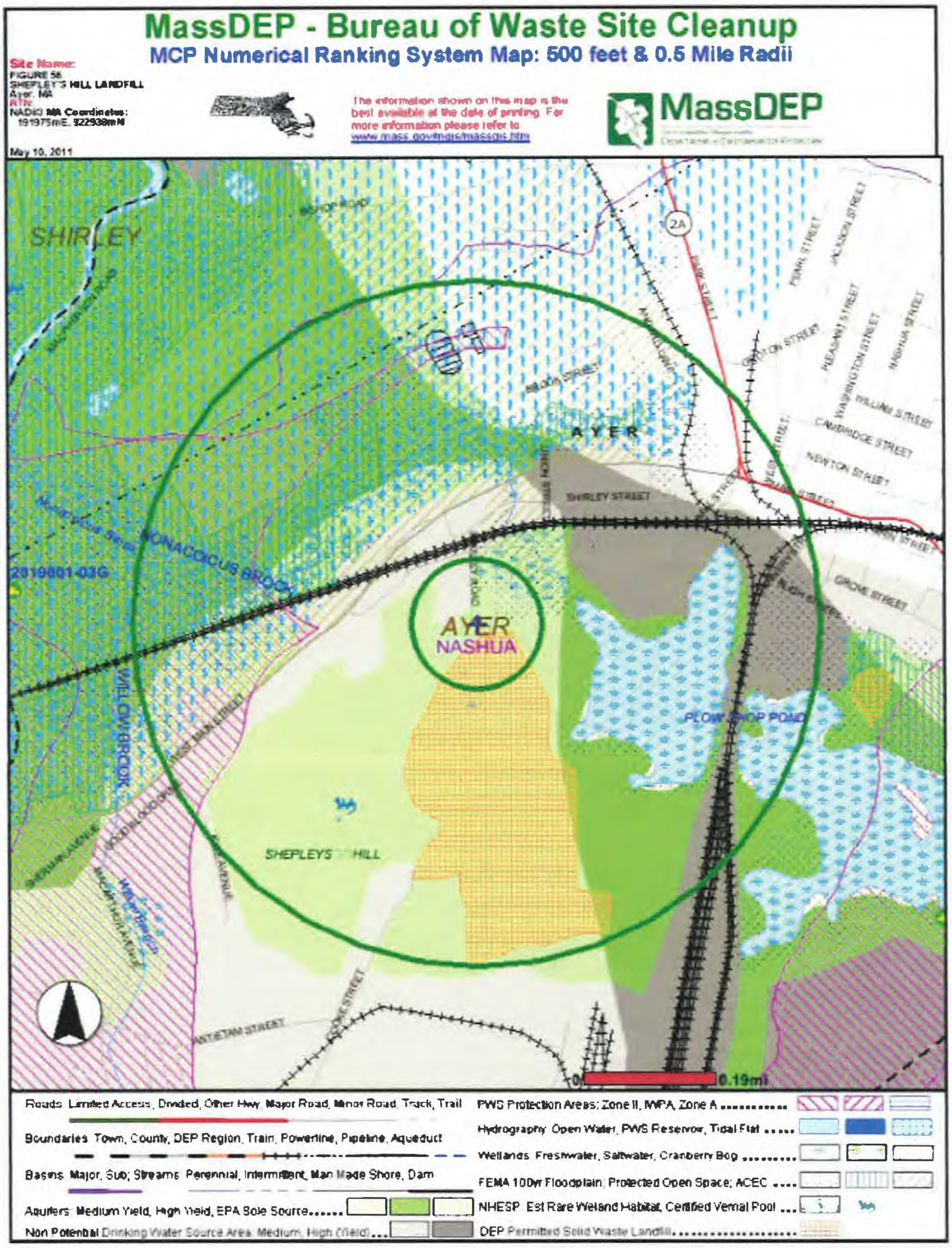

FIGURE 56
MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION PRIORITY RESOURCES (21E)

FORT DEVENS
AYER, MASSACHUSETTS

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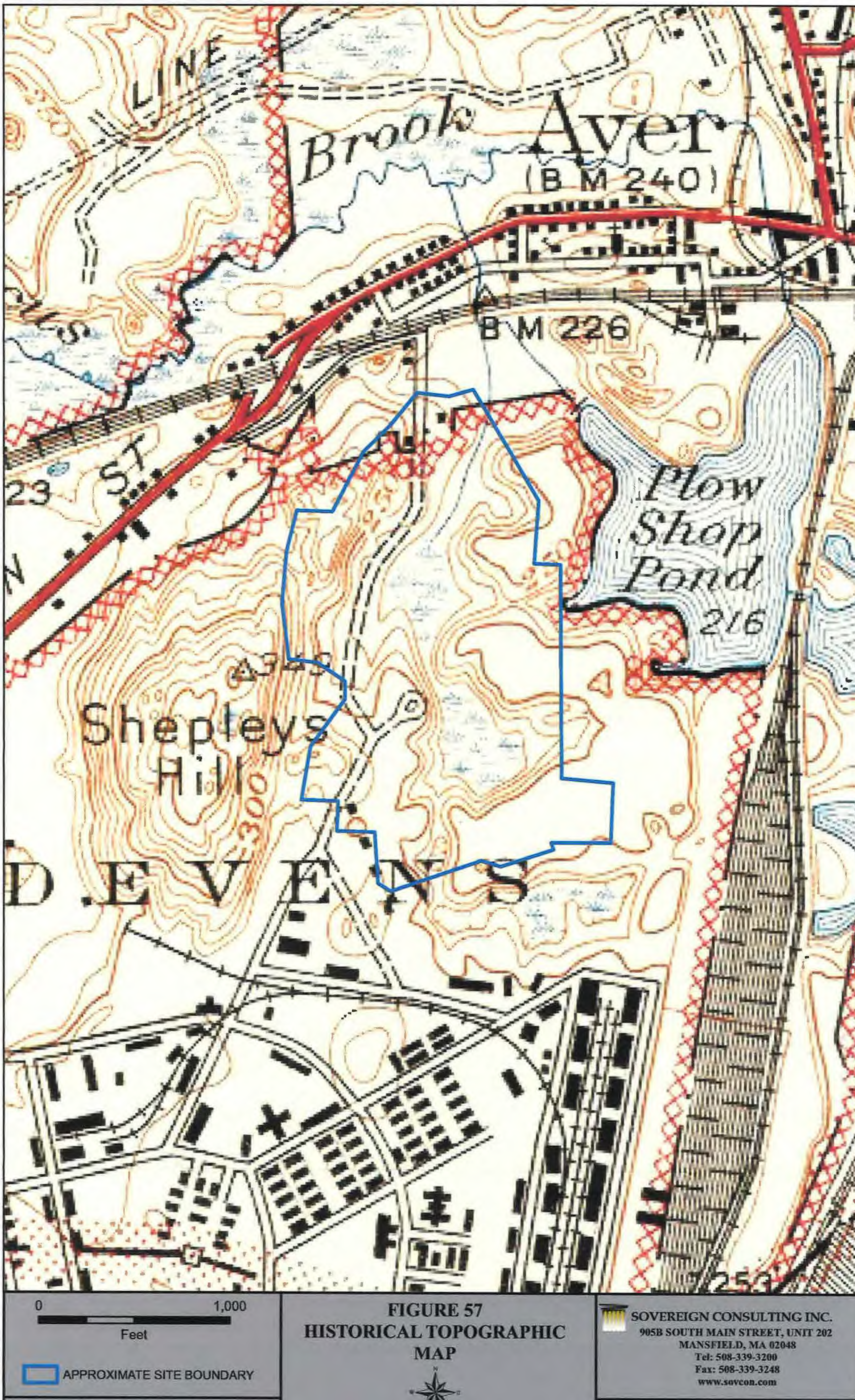

FIGURE 57
HISTORICAL TOPOGRAPHIC MAP

FORT DEVENS
AYER, MASSACHUSETTS

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SOURCE INFORMATION:
1944 AYER, MASSACHUSETTS QUADRANGLE, USGS 7.5 MINUTE SERIES. ACCESSED FROM UNIVERSITY OF NEW HAMPSHIRE DIAMOND LIBRARY IN MAY 2011 <http://docs.unh.edu/nhtopos/Ayer7.5MA.htm>

MAY 2011 ROV

NOTES:
CONTOUR INTERVAL EQUALS 10'
DATUM IS MEAN SEA LEVEL
TOPOGRAPHIC MAP SURVEYED IN 1923 AND 1935 AND REVISED IN 1944

TABLE 1

Technical Objective and Approach for Data Collection

Shepley's Hill Landfill, Devens, Massachusetts

Objective	Hypothesis	Data Gaps	Technical Approach
From EPA Additional Work Letter			
North Plume Delineation & Monitoring for Impacted Area Delineate the north plume in all directions to depth in order to establish final delineated plume boundaries. Install additional monitoring wells to be incorporated into the long-term monitoring program that will ensure that there are permanent monitoring locations for all significant areas of the plume (e.g., West Main Street) and to serve as sentry wells to ensure that the plume does not migrate further beyond the final delineated plume boundaries. Incorporate these wells into a revised long-term monitoring plan.	The plume north of the capture zone has stable limits bounded by bedrock and advective flow of unimpacted or oxygenated groundwater (GW). The plume limits in the area of Molumco Rd are near SHM-07-03 on the west and SHM-99-32X on the east; in the area of West Main St are west of DEP-08-03 and near DEP-08-08 on the east; and in the area of Nonacoicus Brook are southwest of DEP-08-07 (See Figure 1).	GW chemistry data above, below, and lateral to the plume in the following general areas: • West Main St west of DEP-08-03 • Nonacoicus Brook north west of DEP-08-05 and southwest of DEP-08-07 • North of the brook, NE of DEP-08-07 • East of SHX-01-06X	Install borings extending to bedrock in each area and collect GW samples at 10-ft intervals for arsenic and field parameters. Complete permanent wells based on profile results and sample twice for metals. Map plume in 3D based on the results
2a. North Plume Capture at Boundary Operate and/or modify the treatment system to contain the arsenic plume in the vicinity of the base boundary near the north end of the landfill and demonstrate that the arsenic plume is captured.	The latest revised GW model and other lines of evidence as presented in the 2008 Annual Report (ECC 2009) suggest that impacted GW at the toe of the landfill is fully contained, subject to some uncertainty on the eastern plume extent at the toe	GW chemistry data east of the toe of the landfill, in the area east of SHM-96-5B.	Install boring(s) extending to bedrock and collect GW samples at 10-ft intervals for metals and field parameters. Complete permanent well(s) based on profile results and sample twice for metals.
2b. North Plume Monitored Natural Attenuation (MNA) for the Impacted Area Once capture is demonstrated, establish that monitored natural attenuation will be effective at remediating the north plume (i.e., the Impacted Area) within a timeframe that is reasonable given the circumstances of the site	MNA in the Impacted Area will be effective based on immobilization of dissolved arsenic. Effectiveness depends on: (1) demonstration of a static or shrinking plume (see objective #1); (2) determining rates and mechanisms of attenuation; (3) determining stability of immobilized arsenic; and (4) establishing a monitoring plan and contingency plans (USEPA 2007). The time required for arsenic to be immobilized in the Impacted Area by MNA or by an aggressive remedy are both decades or longer.	Aquifer mineralogy and association of arsenic with the various solid phase components. Time to achieve MCLs due to flushing with unimpacted GW, both for MNA and aggressive (FFS Alternative 3B) scenarios.	Collect co-located soil and GW samples from the Impacted Area for chemical and microscopic-spectroscopic analysis of solids. Conduct flushing timeframe study similar to USGS Saco Landfill study; test cores of aquifer material from the Impacted Area and use reaction model to simulate immobilization.
3. Landfill Gas Impacts Complete an evaluation of landfill gas impacts in the area of the north plume (i.e., the Impacted Area) in accordance with the EPA Guidance for Evaluating Landfill Gas Emissions from Closed or Abandoned Facilities to ensure that methane emanating from the landfill will not cause unacceptable risks (i.e., explosive conditions) in nearby structures.	Results of monitoring perimeter soil gas probes at the north end of the landfill indicate that methane is not migrating offsite laterally through soil. Offsite structures in the Impacted Area north of the capture zone may have methane intrusion from groundwater if sufficient levels of methane volatilize from the top of the water table and migrate through the vadose zone.	None at this time.	Conduct vapor intrusion modeling based on conservative estimates of site conditions. Discuss results and need for site-specific measurements with BCT.
4. East Plume Delineation and Capture Eliminate the continuing discharge of high-arsenic groundwater to Plow Shop Pond sediments. It is expected that new groundwater monitoring wells, as recommended in EPA's October 2, 2008 letter and in Section 5.3 of ORD's Final Report, will be completed and data from these wells will be considered in this effort.	Discharge of shallow arsenic impacted groundwater from the eastern portion of the landfill to Red Cove may be controlled using GW injection, extraction, or in-situ treatment.	Arsenic GW concentrations and flow rates between SHL and Red Cove.	Update GW model based on pond flux measurements and use model for citing wells upgradient of Red Cove. Install borings extending to bedrock and collect GW samples at 10-ft intervals for metals and field parameters. Complete permanent well(s) based on profile results and sample twice for metals.
From 9/30/09 Draft FFS:			
5. Arsenic Source Strength Estimate the arsenic source strength and duration, including the quantity of arsenic that may be mobilized and the strength and duration of sources of reducing conditions.	Potential sources of arsenic in groundwater include bedrock, bedrock-derived soils, and landfill wastes, which are located above and below the water table. Arsenic is dissolved from the source materials by landfill-induced reducing conditions in groundwater. A portion of the landfill overlies a swamp where naturally-occurring reducing conditions may also have existed.	Aquifer mineralogy and association of arsenic with the various solid phase components. Time to deplete source materials due to mobilization.	Collect co-located solid and GW samples from source materials for chemical and microscopic-spectroscopic analysis of solids. Conduct flushing timeframe study; test cores of source material using reduced groundwater to simulate mobilization of metals.

Objective	Hypothesis	Data Gaps	Technical Approach
6. Air Sparging Feasibility Evaluate implementability of a horizontal sparging well installation (FFS Alternative 4) based on geologic conditions and arsenic distribution.	Air sparging may be feasible for immobilization of arsenic in groundwater flow from the landfill eastward into Red Cove.	Treatment system configuration and impacts of immobilized metals on local GW flow.	Develop a pilot test of air sparging between the landfill and Red Cove.
7. Floc Removal Feasibility Evaluate implementability, conceptual design, and costs of floc removal in Red Cove (FFS Alternative 2).	Arsenic-bearing floc accumulating in Red Cove sediments may be removed or sequestered to reduce risks to ecological receptors. The FFS alternative incorporating this remedy assumes that the source of floc is continuing.	None at this time.	Evaluate floc removal remedies in the AOC 72 FSSR.
8. Landfill Consolidation Feasibility Evaluate implementability of onsite waste management for landfill consolidation (FFS Alternative 5) based on waste volumes and footprint.	Landfill wastes may be removed from below the water table and the landfill reconstructed and lined to eliminate leaching to groundwater. This FFS alternative assumes that wastes would be relocated within the existing landfill footprint.	None at this time.	Map current waste extent based on photos, maps, and boring logs. Complete a conceptual design for the reconstructed landfill, including construction and waste management methods, sufficient for estimating costs to -30/+50% accuracy.
From Modified Workplan (MNA / SS Evaluation)			
2.3 North Plume Monitored Natural Attenuation (MNA) for the Impacted Area. Once capture is demonstrated, establish that monitored natural attenuation will be effective at remediating the north plume (i.e., the Impacted Area) within a timeframe that is reasonable given the circumstances of the site	MNA in the Impacted Area will be effective based on immobilization of dissolved arsenic. Effectiveness depends on: (1) demonstration of a static or shrinking plume (see objective #1); (2) determining rates and mechanisms of attenuation; (3) determining stability of immobilized arsenic; and (4) establishing a monitoring plan and contingency plans (USEPA 2007).	**The time to achieve MCLs or an achievable background level by aquifer flushing with upgradient groundwater,** for both for MNA and more aggressive alternative scenarios (FFS3B) The time required to deplete the landfill's ability to maintain reducing conditions resulting in trace element mobilization, and time required to meet background conditions or pre-landfill conditions	**Based on data collected to date and Tier 1 through Tier 4 elements needed to assess important MNA components, additional site** data is required for: • Plume Stability; • Plume Extent and Redox Front • Impact of Current Remediation; • Fate and Transport; To address these criterion the following is proposed: **Task 2.3 Evaluation of MNA** Task 2.3.1 Plume Stability Additional data for plume stability will be collected under Task 2.3.2 Task 2.3.2 Redox Boundary Analyze existing data Advance DPT, well points in this area as deemed necessary to supplement existing delineation work being performed Identify changes in DO, Eh (or ORP) Identify changes in total and dissolved iron and total and dissolved arsenic, TSS and DOC Evaluate redox front between plume and Brook **Task 2.3.3 Impact of Current Remediation** Additional data for effect of remediation collected under Task 1.4 and Task 1.2 Task 2.3.4 Fate and Transport Data Analysis Analyze data from the plume delineation work, the geophysical survey and the transect wells to determine redox boundary and arsenic geochemistry Determine arsenic fate in plume using transect well data and geochemical modeling

Objective	Hypothesis	Data Gaps	Technical Approach
2.3 North Plume Monitored Natural Attenuation (MNA) for the Impacted Area - Continued			Monitor for changes in redox, arsenic, iron, DOC, TSS and changes in water composition such as increase in sulfate or alkalinity. Conduct column studies for flushing time to background and determination of aquifer capacity for adsorbing arsenic. Conduct flushing timeframe study similar to USGS Saco Landfill study. Test cores of aquifer material from the Impacted Area and Use reaction model to simulate immobilization. **Groundwater sampling** Collection of groundwater from monitoring wells planned for the transect study **Task 2.3.5 Data Analysis** Analyze data, estimate arsenic uptake and based on results, redefine scope or sampling Conduct geochemical speciation calculations, modeling and statistical analysis
2.6 SourceStrength/Landfill Reducing Environment Evaluation Estimate the duration of the landfill's ability to maintain reducing / methanogenic conditions.	Arsenic, iron and other constituents are dissolved from the source materials by landfill-induced reducing conditions in groundwater. A portion of the landfill overlies a swamp where naturally-occurring reducing conditions may also have existed. While potential sources of arsenic in groundwater include bedrock, bedrock-derived soils, and possibly landfill wastes, the ultimate control is the ability of the landfill to maintain reducing conditions. Arsenic and other redox sensitive species will continue to mobilize as long as reducing conditions prevail. What time frame for achieving this is reasonable?	The time required to deplete the landfill's ability to maintain reducing conditions resulting in trace element mobilization, and time required to meet background conditions or pre-landfill conditions	**Task 2.6 Examination of Source Strength** Determine impact of landfill as a carbon source **Task 2.6.1 Vertical profiling of the landfill** Five (5) test locations in landfill to bedrock. Co-located depth sampling of water **Waste and Aquifer Solids Sampling:** The focus of the sampling will be on profiling TOC, DOC, DIC in the landfill. As long as strongly reducing conditions exist, arsenic will continue to enter groundwater: Collection of discrete samples from the waste and aquifer Collection of sands overlying bedrock Collection of the upper 5 ft of bedrock and weathered bedrock **Sample analysis** Water samples will be collected from the proposed borings. Testing will include typical field parameters (Eh, DO, Turbidity, Conductivity) Total and dissolved TAL metals, TOC, DOC, DIC, and TSS Waste samples and underlying sands and bedrock will be analyzed for Total metal(loid)s (TAL), TOC, X-ray Diffraction (XRD) for common mineralogy, Sequential Extraction, Thin-section/XRD/scanning electron microscopy for identification of arsenic and metal bearing phases.

Objective	Hypothesis	Data Gaps	Technical Approach
2.6 SourceStrength/Landfill Reducing Environment Evaluation - Continued			**Task 2.6.2 Conduct Bench Testing** Test cores of source material and groundwater to simulate mobilization degradation of carbon and effect on trace elements, especially arsenic. **Task 2.6.3 Data Analysis and Reporting** Estimation of time to depletion via carbon content (TOC, DOC, & DIC) Vertical profiling of solids and water co-collected to determine relative sources of analytes to the plume Estimation of degradation rate and time to "completion" Speciation calculations and reactive transport modeling

TABLE 2
Groundwater Profile Results
Shepley's Hill Landfill, Devens, MA

Boring Location	Sample ID	Date	Time (Military Format)	Depth	Arsenic Total (ug/L)	Arsenic Dissolved (ug/L)	Arsenic Field Kit (ug/L)	Calcium Total (ug/L)	Calcium Dissolved (ug/L)	Iron Total (ug/L)	Iron Dissolved (ug/L)	Magnesium Total (ug/L)	Magnesium Dissolved (ug/L)	Manganese Total (ug/L)	Manganese Dissolved (ug/L)
GP-10-01	GP-10-01-009	5/27/2010	10:00	9	0.48 J	0.3 J	<5	NA	10,400	NA	827	NA	1,380	NA	21.6
	GP-10-01-019	5/27/2010	10:35	19	4.61	0.32 J	<5	NA	12,400	NA	548	NA	1,430	NA	49.7
	GDUP-052710	5/27/2010	10:35	19	NA	0.27 J	NA	NA	12,700	NA	525	NA	1,440	NA	45.5
	GP-10-01-029	5/27/2010	11:20	29	11.4	0.31 J	5	NA	10,600	NA	549	NA	1,170	NA	196
	GP-10-01-039	5/27/2010	11:45	39	9.39	< 1.13	5	NA	49,000	NA	1,860	NA	4,670	NA	14,000
	GP-10-01-049	5/27/2010	12:30	49	7.39	< 1.13	5	NA	15,300	NA	863	NA	1,480	NA	6,450
	GP-10-01-059	5/27/2010	13:11	59	18.9	< 1.13	5	NA	34,600	NA	2,150	NA	3,040	NA	12,100
	GP-10-01-069	5/27/2010	15:20	69	11.3	0.97 J	5	NA	39,900	NA	4,600	NA	4,300	NA	3,570
	GP-10-01-075	5/27/2010	16:30	75	2.35	0.89 J	5	NA	26,400	NA	6,380	NA	3,870	NA	3,310
GP-10-02	GP-10-02-024	6/7/2010	9:50	24	0.41 J	0.37 J	<5	NA	90,800	NA	1,130	NA	13,100	NA	560
	GP-10-02-034	6/7/2010	10:42	34	0.67	0.33 J	<5	NA	105,000	NA	1,560	NA	15,500	NA	1,440
	GDUP-060710	6/7/2010	10:42	34	NA	< 0.226	NA	NA	102,000	NA	1,520	NA	14,800	NA	1,380
	GP-10-02-044	6/7/2010	11:35	44	1.64	0.74 J	<5	NA	113,000	NA	2,140	NA	15,900	NA	2,060
	GP-10-02-054	6/7/2010	12:27	54	2.43	0.41 J	<5	NA	107,000	NA	2,150	NA	14,800	NA	2,200
	GP-10-02-064	6/7/2010	13:08	64	5.87	0.41 J	<5	NA	110,000	NA	3,500	NA	15,000	NA	1,990
	GP-10-02-074	6/7/2010	15:05	74	36.9	0.87 J	<5	NA	252,000	NA	4,010	NA	34,300	NA	2,910
	GP-10-02-084	6/7/2010	18:12	84	24.8	4.64	<5	NA	288,000	NA	19,600	NA	38,700	NA	2,680
	GP-10-02-094	6/8/2010	9:25	94	127	0.61 J	<5	NA	229,000	NA	4,640	NA	29,300	NA	3,100
	GP-10-02-102	6/8/2010	10:10	102	84.6	8.68	5	NA	249,000	NA	25,300	NA	34,600	NA	1,270
GP-10-03	GP-10-03-029	6/10/2010	08:25	29	0.89	0.5	<5	NA	27400 J	NA	582	NA	3,580	NA	71
	GP-10-03-039	6/10/2010	9:20	39	6.79	0.61 J	<5	NA	76,800	NA	704	NA	9,840	NA	59.8
	GDUP-061010	6/10/2010	9:20	39	NA	< 0.452	NA	NA	83,800	NA	790	NA	10,900	NA	68.4
	GP-10-03-049	6/10/2010	10:00	49	14.6	< 0.565	<5	NA	110,000	NA	1,580	NA	12,900	NA	62.9
	GP-10-03-059	6/10/2010	10:40	59	42.1	0.92 J	<5	NA	103,000	NA	5,210	NA	11,400	NA	254
	GP-10-03-069	6/10/2010	11:20	69	8.74	3.17	3	NA	224,000	NA	7,530	NA	29,200	NA	633
	GDUP2-061010	6/10/2010	11:20	69	NA	3.85	NA	NA	252,000	NA	8,210	NA	32,700	NA	710
GP-10-04	GP-10-04-014	6/8/2010	12:40	14	2.26	0.18 J	<5	NA	2,200	NA	1170	NA	316	NA	210
	GP-10-04-024	6/8/2010	14:00	24	2.19	0.18 J	<5	NA	2,100	NA	256	NA	218	NA	58.1
	GDUP-060810	6/8/2010	14:00	24	NA	0.16 J	NA	NA	2,240	NA	199	NA	218	NA	63
	GP-10-04-034	6/8/2010	14:50	34	1.22	0.18 J	<5	NA	3,670	NA	438	NA	533	NA	84.4
	GP-10-04-044	6/8/2010	15:10	44	3.37	0.15 J	<5	NA	19,000	NA	629	NA	2,020	NA	86.6
	GP-10-04-054	6/8/2010	15:50	54	13.7	0.26 J	<5	NA	57,400	NA	3,040	NA	14,500	NA	811
	GP-10-04-064	6/8/2010	15:25	64	8.02	0.33 J	<5	NA	75,300	NA	1,200	NA	12,600	NA	510
	GP-10-04-074	6/8/2010	17:15	74	24.3	0.33 J	<5	NA	19,400	NA	3,000	NA	2,470	NA	433
	GP-10-04-084	6/8/2010	17:50	84	26.7	1.27	<5	NA	5,640	NA	896	NA	743	NA	91.4
	GP-10-04-094	6/8/2010	18:30	94	214	15.1	10-20	NA	154,000	NA	3,630	NA	20,300	NA	3,170
GP-10-05	GP-10-05-015	6/9/2010	9:50	15	2.08	0.31 J	<5	NA	7540 J	NA	262	NA	1,090	NA	483
	GP-10-05-025	6/9/2010	10:25	25	1.02 J	0.58 J	<5	NA	17,000	NA	1150	NA	2,590	NA	11,200
	GDUP-060910	6/9/2010	10:25	25	NA	< 0.565	NA	NA	16,800	NA	572	NA	2,600	NA	11,200
	GP-10-05-035	6/9/2010	10:53	35	130	112	150	NA	12,400	NA	12,600	NA	2,260	NA	4,610
	GP-10-05-045	6/9/2010	11:24	45	86.4	84.7	80-100	NA	18,800	NA	11,200	NA	2,550	NA	2,320
GP-10-05A	GP-10-05A-029	6/9/2010	13:20	29	0.93	0.62 J	<5	NA	8,140	NA	604	NA	878	NA	63.8
	GP-10-05A-039	6/9/2010	14:05	39	13	0.35 J	<5	NA	13,600	NA	2,310	NA	2,810	NA	221
	GDUP2-060910	6/9/2010	14:05	39	NA	0.33 J	NA	NA	13,900	NA	2,510	NA	2,850	NA	237
	GP-10-05A-049	6/9/2010	14:55	49	4.86	1.12	<5	NA	16,400	NA	3,360	NA	1,990	NA	203
	GP-10-05A-059	6/9/2010	15:57	59	3.48	0.39 J	<5	NA	17,700	NA	1,840	NA	2,060	NA	214
	GP-10-05A-069	6/9/2010	17:15	69	29.8	0.59	<5	NA	19,400	NA	797	NA	2,340	NA	466
	GP-10-05A-079	6/9/2010	18:45	79	65	2.18	<5	NA	16,500	NA	57.9	NA	1,940	NA	114
	GP-10-05A-089	6/9/2010	19:20	89	24.5	5.09	<5	NA	20,000	NA	467	NA	1,990	NA	70.3
	GP-10-05A-099	6/9/2010	19:40	99	364	4.16	<5	NA	65,800	NA	558	NA	5,740	NA	294
	GP-10-05A-109	6/9/2010	20:10	109	911	1.92	<5	NA	111,000	NA	3,730	NA	13,500	NA	1,320

TABLE 2
Groundwater Profile Results
Shepley's Hill Landfill, Devens, MA

Boring Location	Sample ID	Date	Time (Military Format)	Depth	Arsenic Total (ug/L)	Arsenic Dissolved (ug/L)	Arsenic Field Kit (ug/L)	Calcium Total (ug/L)	Calcium Dissolved (ug/L)	Iron Total (ug/L)	Iron Dissolved (ug/L)	Magnesium Total (ug/L)	Magnesium Dissolved (ug/L)	Manganese Total (ug/L)	Manganese Dissolved (ug/L)
GP-10-06	GP-10-06-024	5/24/2010	11:50	24	17.2	10	10	NA	3.100	NA	641	NA	274	NA	112
	GP-10-06-034	5/24/2010	12:40	34	120	121	150-200	NA	14.900	NA	14400 J	NA	1.480	NA	763
	GP-10-06-044	5/24/2010	13:35	44	155	129	100	NA	18.300	NA	34.400	NA	1.480	NA	982
	GP-10-06-054	5/26/2010	8:50	54	67.5	42.9	5	NA	80.700	NA	75.400	NA	10.800	NA	3.000
	GDUP-052610	5/26/2010	8:50	54	NA	49.1	NA	NA	87.800	NA	82.000	NA	11.400	NA	3.250
	GP-10-06-064	5/26/2010	9:45	64	683	750	150	NA	65.700	NA	122.000	NA	9.540	NA	2.840
	GP-10-06-074	5/26/2010	11:15	74	2.390	2070	>500	NA	53.400	NA	107.000	NA	10.100	NA	2.470
	GP-10-06-079	5/26/2010	12:00	79	2.660	2540	>500	NA	56.600	NA	72.200	NA	10.700	NA	3.490
GP-10-06A	GP-10-06A-034	5/24/2010	15:15	34	0.59	0.37 J	0	NA	2.830	NA	66.4	NA	398	NA	43.2
	GP-10-06A-044	5/24/2010	16:00	44	595	55.1	40	NA	9.030	NA	9,710	NA	737 J	NA	2.370
	GP-10-06A-054	5/24/2010	17:40	54	1090	18	10	NA	26.300	NA	6.550	NA	1.930	NA	6.920
	GP-10-06A-064	5/25/2010	9:50	64	170	36.7	20	NA	18.400	NA	28.900	NA	2.380	NA	2.780
	GDUP-052510	5/25/2010	9:50	64	NA	31.4	NA	NA	18,000	NA	28.900	NA	2.360	NA	2,830
	GP-10-06A-074	5/25/2010	11:10	74	134	58.6	30-40	NA	26,500	NA	42,200	NA	2,990	NA	2,460
	GP-10-06A-084	5/25/2010	13:00	84	186	106	60	NA	27,500	NA	42,200	NA	4,080	NA	3,050
	GP-10-06A-094	5/25/2010	14:40	94	382	< 1.13	5	NA	73,700	NA	13,300	NA	10,200	NA	17,900
	GP-10-06A-104	5/25/2010	16:30	104	405	< 1.13	0	NA	97.900	NA	5.950	NA	12.800	NA	6.530
	GP-10-06A-110	5/25/2010	17:35	110	333	1.17 J	20	NA	96.800	NA	8.640	NA	13.200	NA	6.670
GP-10-07	GP-10-07-039	5/19/2010	14:00	39	1,240	1350	>500	57.400	62.800	96.400	105.000	8.250	9.080	2,430	2.660
	GP-10-07-049	5/20/2010	13:45	49	283	58	5-10	135.000	65100 J	251000	27800 J	99900 J	11.000	9140 J	5330 J
	GPDUP-052010	5/20/2010	13:45	49	304	58.2	5-10	129.000	64.600	276000	26.800	114000	10.900	9200	5.250
GP-10-08	GP-10-08-011	6/3/2010	12:10	11	2.08	0.64	<5	NA	24.600	NA	581	NA	3.440	NA	70.7
	GDUP-060310	6/3/2010	12:10	11	NA	0.67	NA	NA	23.500	NA	565	NA	3.310	NA	69.7
	GP-10-08-021	6/3/2010	13:20	21	3.19	0.76	<5	NA	44.200	NA	679	NA	6.040	NA	199
	GP-10-08-031	6/3/2010	14:30	31	3.6	0.31 J	<5	NA	109.000	NA	2,040	NA	13.200	NA	2.340
	GP-10-08-041	6/3/2010	15:00	41	3.77	0.85 J	<5	NA	131.000	NA	2.090	NA	15.000	NA	949
	GP-10-08-051	6/3/2010	17:20	51	19.8	1.06	<5	NA	172.000	NA	3.300	NA	23.000	NA	777
	GDUP2-060310	6/3/2010	17:20	51	NA	0.92 J	NA	NA	172.000	NA	3.180	NA	23.300	NA	769
	GP-10-08-061	6/3/2010	18:05	61	2.07	0.73 J	<5	NA	142.000	NA	4.710	NA	18.500	NA	1.060
GP-10-09	GP-10-09-021	5/28/2010	9:15	21	0.45 J	0.27 J	<5	NA	4,780	NA	88.3	NA	400	NA	34.6
	GP-10-09-031	5/28/2010	10:00	31	183	0.15 J	<5	NA	10,100	NA	685	NA	895	NA	82.2
	GDUP-052810	5/28/2010	10:00	31	NA	0.17 J	NA	NA	10.700	NA	778	NA	944	NA	102
	GP-10-09-041	6/1/2010	11:30	41	12.6	0.25 J	<5	NA	17,700	NA	853	NA	1,860	NA	66
	GP-10-09-051	6/1/2010	13:00	51	13	0.27 J	<5	NA	23,500	NA	1,760	NA	2,390	NA	138
	GDUP-060110	6/1/2010	13:00	51	NA	0.23 J	NA	NA	22,300	NA	1,580	NA	2,280	NA	136
	GP-10-09-061	6/1/2010	14:20	61	6.8	0.940	<5	NA	43,800	NA	2,200	NA	5,370	NA	362
	GP-10-09-071	6/1/2010	16:45	71	23.3	0.680	<5	NA	47,200	NA	2,070	NA	5.680	NA	349
	GP-10-09-081	6/1/2010	17:50	81	15.5	0.850	<5	NA	44,000	NA	3,430	NA	5,300	NA	382
GP-10-10	GP-10-10-011	6/2/2010	14:45	11	0.34 J	0.27 J	<5	NA	8360 J	NA	332	NA	1,210	NA	34.5
	GP-10-10-021	6/2/2010	16:00	21	1.59	0.27 J	<5	NA	16,200	NA	728	NA	1,780	NA	56.5
	GDUP-060210	6/2/2010	16:00	21	NA	0.22 J	NA	NA	16.400	NA	732	NA	1,770	NA	58.2
	GP-10-10-031	6/2/2010	16:30	31	1.29 J	< 0.565	<5	NA	19.300	NA	818	NA	2,260	NA	4.370
	GP-10-10-041	6/2/2010	17:15	41	1.86 J	1.13 J	<5	NA	33,600	NA	2,720	NA	4,950	NA	10,800
	GP-10-10-051	6/2/2010	18:00	51	4.4 J	2.47 J	<5	NA	72,900	NA	3,690	NA	10,800	NA	14,300
	GP-10-10-061	6/2/2010	19:00	61	11.1	< 2.82	<5	NA	113,000	NA	5,230	NA	14,600	NA	30,700
	GP-10-10-071	6/3/2010	10:00	71	13.7	< 1.13	<5	NA	105000 J	NA	4,880	NA	14,900	NA	15,500

Notes
NA - Not Applicable
ug/L is micrograms per liter
mg/l - miligrams per liter
J means estimated results
B indicates that analyte was detected in the associated method blank

TABLE 2
Groundwater Profile Results
Shepley's Hill Landfill, Devens, MA

Boring Location	Sample ID	Date	Time (Military Format)	Depth	Potasium Total (ug/L)	Potasium Dissolved (ug/L)	Sodium Total (ug/L)	Sodium Dissolved (ug/L)	Turbidity NTU	DO mg/L	pH	Temp Celcius	Spec Cond uS/cm	ORP mV	Color
GP-10-01	GP-10-01-009	5/27/2010	10:00	9	NA	2,310	NA	35,500	10	5.34	6.35	10.08	265	107	Clear
	GP-10-01-019	5/27/2010	10:35	19	NA	2,740	NA	60,100	90	2.61	5.99	11.36	401	84.3	Clear
	GDUP-052710	5/27/2010	10:35	19	NA	2,770	NA	59,800							
	GP-10-01-029	5/27/2010	11:20	29	NA	2,730	NA	64,500	230	4.49	6.08	11.07	385	83.2	Cloudy
	GP-10-01-039	5/27/2010	11:45	39	NA	4,610	NA	53,800	80	0.37	6	11.81	671	62.7	Clear
	GP-10-01-049	5/27/2010	12:30	49	NA	2,420	NA	19,600	65	0.43	6.38	12.46	218	36.1	Clear
	GP-10-01-059	5/27/2010	13:11	59	NA	2,490	NA	11,200	170	0.23	6.25	11.68	307	15.5	Clear
	GP-10-01-069	5/27/2010	15:20	69	NA	3,240	NA	20,000	200	0.35	6.39	12.36	395	-40.6	Cloudy
	GP-10-01-075	5/27/2010	16:30	75	NA	3,750	NA	48,100	33	1.9	6.54	14.4	469	63.8	Clear
GP-10-02	GP-10-02-024	6/7/2010	9:50	24	NA	3,760	NA	45,400	2.8	0.41	6.29	11.08	776	24.3	Clear
	GP-10-02-034	6/7/2010	10:42	34	NA	4,320	NA	48,800	13.4	0.29	6.39	11.48	818	14.6	
	GDUP-060710	6/7/2010	10:42	34	NA	4,060	NA	46,300							
	GP-10-02-044	6/7/2010	11:33	44	NA	4,640	NA	58,700	41.1	0.28	6.46	11.27	777	11.3	
	GP-10-02-054	6/7/2010	12:27	54	NA	4,170	NA	52,900	85.7	0.29	6.5	12.09	757	2.6	
	GP-10-02-064	6/7/2010	13:08	64	NA	4,580	NA	83,500	454	0.71	6.55	12.01	965	-14.7	
	GP-10-02-074	6/7/2010	15:05	74	NA	7,680	NA	196,000	Max	0.32	6.41	12.07	2550	-5.5	
	GP-10-02-084	6/7/2010	18:12	84	NA	10,500	NA	236,000	Max	0.31	6.57	12.39	2863	-60.8	
	GP-10-02-094	6/8/2010	9:25	94	NA	8,450	NA	302,000	Max	1.15	570	12.54	2831	-97.9	
	GP-10-02-102	6/8/2010	10:10	102	NA	11,100	NA	155,000	Max	0.42	6.26	14.33	2345	-169.9	
GP-10-03	GP-10-03-029	6/10/2010	08:25	29	NA	2,900	NA	126000 J	3.2	7.03	607	10.01	799	79.5	
	GP-10-03-039	6/10/2010	9:20	39	NA	4,660	NA	312,000	58	2.63	6.3	10.27	1916	29.8	
	GDUP-061010	6/10/2010	9:20	39	NA	5,010	NA	345,000							
	GP-10-03-049	6/10/2010	10:00	49	NA	6,040	NA	471,000	404	2	6.85	10.36	2563	14.5	
	GP-10-03-059	6/10/2010	10:40	59	NA	7,040	NA	598,000	Max	0.86	6.53	10.68	3212	-40.4	
	GP-10-03-069	6/10/2010	11:20	69	NA	9,330	NA	156,000	68.9	0.52	6.72	10.79	3470	78.6	
	GDUP2-061010	6/10/2010	11:20	69	NA	10,500	NA	502,000							
GP-10-04	GP-10-04-014	6/8/2010	12:40	14	NA	422	NA	3,460	18.7	8.32	6.17	13.34	26	50.1	
	GP-10-04-024	6/8/2010	14:00	24	NA	716	NA	3,080	4.65	6.22	6.07	12.88	34	73.1	
	GDUP-060810	6/8/2010	14:00	24	NA	619	NA	2,920							
	GP-10-04-034	6/8/2010	14:50	34	NA	859	NA	4,090	42.1	3.47	5.73	11.22	44	58.5	
	GP-10-04-044	6/8/2010	15:10	44	NA	1,280	NA	15,800	29.3	1.52	5.13	11.57	224	114.4	
	GP-10-04-054	6/8/2010	15:50	54	NA	3,360	NA	36,700	784	0.42	5.4	11.29	644	21.9	
	GP-10-04-064	6/8/2010	15:25	64	NA	3,020	NA	73,900	245	0.57	5.4	11.58	856	30.8	
	GP-10-04-074	6/8/2010	17:15	74	NA	3,260	NA	207,000	Max	0.38	6.28	11.17	9.35	-91.6	
	GP-10-04-084	6/8/2010	17:50	84	NA	2,000	NA	181,000	Max	0.32	6.01	11.53	79.8	-40.7	
	GP-10-04-094	6/8/2010	18:30	94	NA	12,300	NA	325,000	Max	0.29	6.33	12.05	244.5	-1,509	
GP-10-05	GP-10-05-015	6/9/2010	9:50	15	NA	1,280	NA	11,200	1.08	0.74	6.32	12.82	109	102.9	Clear
	GP-10-05-025	6/9/2010	10:25	25	NA	1,700	NA	23,800	3.54	1.77	5.85	12.55	242	73	Clear
	GDUP-060910	6/9/2010	10:25	25	NA	1,580	NA	23,900							
	GP-10-05-035	6/9/2010	10:53	35	NA	1,160	NA	19,100	17.8	1.45	6.21	13.25	214	-56	Clear
	GP-10-05-045	6/9/2010	11:24	45	NA	1,710	NA	28,700	36.9	2.24	6.17	2.76	255	-68	Clear
GP-10-05A	GP-10-05A-029	6/9/2010	13:20	29	NA	3,200	NA	272,000	1.52	992	6	16.24	1194	63.2	Clear
	GP-10-05A-039	6/9/2010	14:05	39	NA	1,420	NA	27,400	57.7	2.79	5.22	14.72	209	110	Clear
	GDUP2-060910	6/9/2010	14:05	39	NA	1,490	NA	30,400							
	GP-10-05A-049	6/9/2010	14:55	49	NA	1,500	NA	18,600	39	4.87	5.81	14.29	172	76	
	GP-10-05A-059	6/9/2010	15:57	59	NA	1,980	NA	24,200	32.9	1.73	6.18	13.89	208	39	Tan/Clear
	GP-10-05A-069	6/9/2010	17:15	69	NA	1,880	NA	22,200	Hand Pumped						
	GP-10-05A-079	6/9/2010	18:45	79	NA	1,550	NA	17,700	No Readings, Silted up anc Clogged Screen						
	GP-10-05A-089	6/9/2010	19:20	89	NA	1,940	NA	17,800	No Readings, Silted up anc Clogged Screen						
	GP-10-05A-099	6/9/2010	19:40	99	NA	4,190	NA	30,800	No Readings, Silted up anc Clogged Screen						
	GP-10-05A-109	6/9/2010	20:10	109	NA	6,990	NA	104,000	No Readings, Silted up anc Clogged Screen						

TABLE 2
Groundwater Profile Results
Shepley's Hill Landfill, Devens, MA

Boring Location	Sample ID	Date	Time (Military Format)	Depth	Potasium Total (ug/L)	Potasium Dissolved (ug/L)	Sodium Total (ug/L)	Sodium Dissolved (ug/L)	Turbidity NTU	DO mg/L	pH	Temp Celcius	Spec Cond uS/cm	ORP mV	Color
GP-10-06	GP-10-06-024	5/24/2010	11:50	24	NA	817	NA	639	50	0.19	5.57	9.16	26	127.5	Clear
	GP-10-06-034	5/24/2010	12:40	34	NA	2,700	NA	2,120	31	0.39	2.99	12.66	103	-12.3	Clear
	GP-10-06-044	5/24/2010	13:35	44	NA	3,440	NA	3,730	800	0.19	5.65	15.69	194	4.9	Cloudy
	GP-10-06-054	5/26/2010	8:50	54	NA	13,900	NA	35,400	Max	0.19	6.04	12.89	880	-119.6	Cloudy
	GDUP-052610	5/26/2010	8:50	54	NA	15,300	NA	38,000							
	GP-10-06-064	5/26/2010	9:45	64	NA	18,200	NA	30,800	Max	0.14	6	11.63	827	-120	Cloudy
	GP-10-06-074	5/26/2010	11:15	74	NA	10,700	NA	19,100	Max	0.14	4.08	14.16	725	-124	Cloudy
	GP-10-06-079	5/26/2010	12:00	79	NA	12,500	NA	24,700	Max	0.19	4.34	14.89	669	-109	Cloudy
GP-10-06A	GP-10-06A-034	5/24/2010	15:15	34	NA	526	NA	2,600	2.3	10.04	5.66	16.58	24	194.9	Clear
	GP-10-06A-044	5/24/2010	16:00	44	NA	2,560	NA	1,910	140	1.54	5.79	14.66	76	27	Cloudy
	GP-10-06A-054	5/24/2010	17:40	54	NA	2,320	NA	2,800	900	1.47	5.8	14.1	166	8.1	Cloudy
	GP-10-06A-064	5/25/2010	9:50	64	NA	5,090	NA	5,810	Max	0.1	6.55	15.54	67	-134	Cloudy
	GDUP-052510	5/25/2010	9:50	64	NA	5,280	NA	6,330							
	GP-10-06A-074	5/25/2010	11:10	74	NA	7,100	NA	12,200	Max	0.14	6.37	14.54	292	-115	Cloudy
	GP-10-06A-084	5/25/2010	13:00	84	NA	8,480	NA	14,600	Max	0.17	6.34	14.83	316	-115	Cloudy
	GP-10-06A-094	5/25/2010	14:40	94	NA	10,700	NA	39,700	Max	0.21	5.81	16.77	508	-119	Cloudy
	GP-10-06A-104	5/25/2010	16:30	104	NA	7,270	NA	37,300	900	0.17	6.24	17.17	608	-392	Cloudy
	GP-10-06A-110	5/25/2010	17:35	110	NA	7,270	NA	38,800	Max	0.11	6.14	14.66	603	-352	Cloudy
GP-10-07	GP-10-07-039	5/19/2010	14:00	39	13,700	14,500	24,800	26,300							
	GP-10-07-049	5/20/2010	13:45	49	70800	23400 J	30200	27,800							
	GPDUP-052010	5/20/2010	13:45	49	75200	23,300	28700	27,500							
GP-10-08	GP-10-08-011	6/3/2010	12:10	11	NA	1,560	NA	12,000							
	GDUP-060310	6/3/2010	12:10	11	NA	1,490	NA	11,700	12.7	6.97	6.78	11.73	189	20.1	Clear
	GP-10-08-021	6/3/2010	13:20	21	NA	2,220	NA	20,400	17.5	4.68	6.5	10.46	337	31.4	Clear
	GP-10-08-031	6/3/2010	14:30	31	NA	3,240	NA	38,500	44.4	0.31	6.43	12.57	660	-3.9	Tan - clear
	GP-10-08-041	6/3/2010	15:00	41	NA	3,550	NA	39,200	64.9	0.26	6.44	12.02	764	-8.6	Clear
	GP-10-08-051	6/3/2010	17:20	51	NA	5,200	NA	48,900	321	0.24	6.56	11.6	9.64	-42	Tan / Clear
	GDUP2-060310	6/3/2010	17:20	51	NA	5,190	NA	48,000							
	GP-10-08-061	6/3/2010	18:05	61	NA	4,390	NA	40,800	37.4	0.9	6.54	15	244	-4.3	Clear
GP-10-09	GP-10-09-021	5/28/2010	9:15	21	NA	1,030	NA	4,760	1.13	10.34	6.82	11.93	62	97.1	Clear
	GP-10-09-031	5/28/2010	10:00	31	NA	2,220	NA	33,600	596	6.35	6.11	12.82	223	71.6	Cloudy
	GDUP-052810	5/28/2010	10:00	31	NA	2,350	NA	33,200							
	GP-10-09-041	6/1/2010	11:30	41	NA	3,220	NA	134000 J	178	4.97	6.05	13.05	706	50.4	Cloudy
	GP-10-09-051	6/1/2010	13:00	51	NA	2,690	NA	134,000	333	2.15	6.24	12.56	714	161	Cloudy
	GDUP-060110	6/1/2010	13:00	51	NA	2,500	NA	132,000							
	GP-10-09-061	6/1/2010	14:20	61	NA	3,300	NA	30,500	87.1	1.04	6.62	13.19	401	-56.2	Clear
	GP-10-09-071	6/1/2010	16:45	71	NA	3,470	NA	45,300	82.2	1.19	6.66	12.92	486	-58.6	Cloudy
	GP-10-09-081	6/1/2010	17:50	81	NA	3,300	NA	36,500	93.2	1.18	6.66	13.3	428	-57.3	Clear
GP-10-10	GP-10-10-011	6/2/2010	14:45	11	NA	2,690	NA	12,500	2.5	10.93	6.73	10.89	130	56.2	Clear
	GP-10-10-021	6/2/2010	16:00	21	NA	2,490	NA	54,300	11.8	7.45	6.17	11.49	375	53.9	Clear
	GDUP-060210	6/2/2010	16:00	21	NA	2,560	NA	54,200							
	GP-10-10-031	6/2/2010	16:30	31	NA	5,480	NA	88,800	10.34	0.56	6.1	12.46	561	43.5	Clear
	GP-10-10-041	6/2/2010	17:15	41	NA	8,250	NA	43,300	26.3	0.29	6.19	13.26	509	-2.8	Clear
	GP-10-10-051	6/2/2010	18:00	51	NA	5,650	NA	32,400	26	0.26	6.32	12.59	594	-35.3	Clear
	GP-10-10-061	6/2/2010	19:00	61	NA	4,170	NA	39,600	90.6	0.32	6.34	12.02	87.6	-44.3	Clear
	GP-10-10-071	6/3/2010	10:00	71	NA	5,190	NA	44,500	121	0.36	6.41	12.72	737	-85	Tan

Notes
NA - Not Applicable
ug/L is micrograms per liter
mg/l - miligrams per liter
J means estimated results
B indicates that analyte was detected in the associated method blank

DO - Dissolved Oxygen
ORP - Oxygen Reduction Potential

TABLE 2
Groundwater Profile Results
Shepley's Hill Landfill, Devens, MA

Boring Location	Sample ID	Date	Time (Military Format)	Depth	Alkalinity mg CaCO3/L	Ammonia mg/l	Nitrite mg/l	COD mg/l	Chloride mg/l	Nitrate mg/l	Sulfate mg/l	Notes
GP-10-01	GP-10-01-009	5/27/2010	10:00	9	23	0.214	< 0.002	< 7	42	3.6	18	
	GP-10-01-019	5/27/2010	10:35	19	30	0.0565 J	< 0.002	< 7	92	4.1	16	
	GDUP-052710	5/27/2010	10:35	19	31	0.241	< 0.002	< 7	90	3.7	16	
	GP-10-01-029	5/27/2010	11:20	29	31	0.0691 J	< 0.002	< 7	82	2.3	26	
	GP-10-01-039	5/27/2010	11:45	39	38	1.1	0.01 J	9.2 J	170	3.9	22	
	GP-10-01-049	5/27/2010	12:30	49	60	0.744	< 0.002	< 7	24	0.4	7.9	
	GP-10-01-059	5/27/2010	13:11	59	94	0.307	< 0.002	16 J	34	0.23	7.7	
	GP-10-01-069	5/27/2010	15:20	69	120	0.212	< 0.002	< 7	34	0.49	10	
	GP-10-01-075	5/27/2010	16:30	75	62	0.514	0.01 J	< 7	92	2.4	16	
GP-10-02	GP-10-02-024	6/7/2010	9:50	24	200	0.089	< 0.002	18 J	140	< 0.01	23	
	GP-10-02-034	6/7/2010	10:42	34	190	0.109	< 0.002	16 J	150	< 0.01	28	
	GDUP-060710	6/7/2010	10:42	34	190	0.092	< 0.002	27	150	< 0.01	29	
	GP-10-02-044	6/7/2010	11:35	44	200	0.293	< 0.002	13 J	130	< 0.01	18	
	GP-10-02-054	**6/7/2010**	**12:27**	**54**	**230**	**0.268**	**< 0.002**	**16 J**	**110**	**< 0.01**	**16**	
	GP-10-02-064	**6/7/2010**	**13:08**	**64**	**270**	**0.196**	**< 0.002**	**20**	**160**	**< 0.01**	**23**	
	GP-10-02-074	**6/7/2010**	**15:05**	**74**	**140**	**0.178**	**< 0.002**	**29**	**780**	**0.026 J**	**31**	
	GP-10-02-084	6/7/2010	18:12	84	170	0.08	< 0.002	31	880	< 0.01	32	
	GP-10-02-094	6/8/2010	9:25	94	150	0.081	< 0.002	38	840	< 0.01	34	
	GP-10-02-102	6/8/2010	10:10	102	210	0.077	< 0.002	40	640	< 0.01	30	
GP-10-03	GP-10-03-029	6/10/2010	08:25	29	46	0.0326 J	< 0.002	< 7	210	1.4	48	
	GP-10-03-039	6/10/2010	9:20	39	65	0.046 J	< 0.002	27	600	4.4	31	
	GDUP-061010	6/10/2010	9:20	39	65	< 0.025	< 0.002	22	620	4.3	33	
	GP-10-03-049	6/10/2010	10:00	49	53	0.0287 J	< 0.002	38	870	0.58	49	
	GP-10-03-059	6/10/2010	10:40	59	110	0.0264 J	< 0.002	47	1100	0.63	35	
	GP-10-03-069	6/10/2010	11:20	69	100	0.031 J	< 0.002	13	1200	0.02 J	38	
	GDUP2-061010	6/10/2010	11:20	69	100	< 0.025	< 0.002	47	1200	0.024 J	38	
GP-10-04	GP-10-04-014	6/8/2010	12:40	14	12	0.0296 J	< 0.002	< 7	5.7	0.028 J	0.74 J	
	GP-10-04-024	6/8/2010	14:00	24	11	0.0433 J	< 0.002	9 J	2	0.03 J	0.67 J	
	GDUP-060810	6/8/2010	14:00	24	11	0.0242 J	< 0.002	< 7	2.2	0.049 J	< 0.12	
	GP-10-04-034	6/8/2010	14:50	34	17	0.0205 J	< 0.002	< 7	2.1	0.1	< 0.12	
	GP-10-04-044	6/8/2010	15:10	44	22	**0.024 J**	< 0.002	< 7	23	3.6	< 0.12	
	GP-10-04-054	6/8/2010	15:50	54	100	2.67	0.01 J	11 J	67	5.8	87	
	GP-10-04-064	6/8/2010	15:25	64	120	0.103	0.01 J	20	120	3.8	97	
	GP-10-04-074	6/8/2010	17:15	74	100	0.0522 J	< 0.002	31	210	0.48	32	
	GP-10-04-084	6/8/2010	17:50	84	120	0.0319 J	< 0.002	16 J	150	0.12	34	
	GP-10-04-094	6/8/2010	18:30	94	140	0.0543 J	< 0.002	38	820	< 0.01	30	
GP-10-05	**GP-10-05-015**	6/9/2010	9:50	15	18	0.0356 J	**< 0.002**	25	19	0.64	9.9	
	GP-10-05-025	6/9/2010	10:25	25	55	0.152	< 0.002	29	48	0.012 J	6.3 B	
	GDUP-060910	6/9/2010	10:25	25	56	0.114	< 0.002	20	47	< 0.01	4.3 B	
	GP-10-05-035	6/9/2010	10:53	35	61	0.145	< 0.002	20	39	< 0.01	3.7 B	
	GP-10-05-045	6/9/2010	11:24	45	56	0.185	< 0.002	31	45	< 0.01	**1.8 B**	
GP-10-05A	**GP-10-05A-029**	6/9/2010	13:20	29	51	**0.0425 J**	< 0.002	56	380	1.9	16	
	GP-10-05A-039	6/9/2010	14:05	39	30	**0.0324 J**	< 0.002	**16 J**	34	2.1	25	
	GDUP2-060910	6/9/2010	14:05	39	32	**0.0388 J**	< 0.002	**11 J**	35	2.4	26	
	GP-10-05A-049	6/9/2010	14:55	49	44	**0.0387 J**	< 0.002	**18 J**	20	1.7	13	
	GP-10-05A-059	6/9/2010	15:57	59	44	0.092	< 0.002	< 7	43	0.72	13	
	GP-10-05A-069	6/9/2010	17:15	69	49	0.0442 J	< 0.002	< 7	30	1.2	14	
	GP-10-05A-079	6/9/2010	18:45	79	54	0.042 J	< 0.002	< 7	22	1	10	
	GP-10-05A-089	6/9/2010	19:20	89	55	0.0325 J	< 0.002	**11 J**	21	1	8.9	
	GP-10-05A-099	6/9/2010	19:40	99	170	0.082	< 0.002	< 7	56	0.26	24	
	GP-10-05A-109	6/9/2010	20:10	109	270	0.154	< 0.002	**11 J**	140	1	30	

TABLE 2
Groundwater Profile Results
Shepley's Hill Landfill, Devens, MA

Boring Location	Sample ID	Date	Time (Military Format)	Depth	Alkalinity mg CaCO3/L	Ammonia mg/l	Nitrite mg/l	COD mg/l	Chloride mg/l	Nitrate mg/l	Sulfate mg/l	Notes
GP-10-06	GP-10-06-024	5/24/2010	11:50	24	12	0.0547 J	< 0.02	< 7	0.43 J	0.009 J	1.3	0.45u Filter
	GP-10-06-034	5/24/2010	12:40	34	59	2.28	< 0.02	< 7	1	0.37	3	
	GP-10-06-044	5/24/2010	13:35	44	80	1.21	0.025 J	< 7	0.95	0.12	17	may be closer to 150, 100
	GP-10-06-054	5/26/2010	8:50	54	380	12.1	< 0.002	27	34	0.23	3.3	
	GDUP-052610	5/26/2010	8:50	54	380	12.2	< 0.002	18 J	30	0.36	2.4	
	GP-10-06-064	5/26/2010	9:45	64	330	9.04	< 0.002	32	20	0.3	0.85 J	
	GP-10-06-074	5/26/2010	11:15	74	290	2.8	< 0.002	170	14	0.024 J	1.2	Turned brown by time of test
	GP-10-06-079	5/26/2010	12:00	79	270	2.96	< 0.002	9.2 J	16	0.22	4.4	
GP-10-06A	GP-10-06A-034	5/24/2010	15:15	34	9	0.0232 J	< 0.02	< 7	1.4	0.023 J	5.6	
	GP-10-06A-044	5/24/2010	16:00	44	35	0.123	< 0.02	< 7	0.91	0.03 J	9.2	
	GP-10-06A-054	5/24/2010	17:40	54	81	1.05	< 0.02	< 7	1.5	0.05 J	16	
	GP-10-06A-064	5/25/2010	9:50	64	84	2.08	< 0.02	< 7	4.4	0.06	4.8	
	GDUP-052510	5/25/2010	9:50	64	84	2.22	< 0.02	< 7	4.8	0.08	5.6	
	GP-10-06A-074	5/25/2010	11:10	74	140	3.89	0.02 J	14 J	6.3	0.13	2.4	
	GP-10-06A-084	5/25/2010	13:00	84	140	4.92	< 0.02	11 J	5.4	0.12	3.3	
	GP-10-06A-094	5/25/2010	14:40	94	290	2.23	0.018 J	18 J	26	0.29	4.2	
	GP-10-06A-104	5/25/2010	16:30	104	360	0.947	< 0.002	18 J	28	0.32	3.6	
	GP-10-06A-110	5/25/2010	17:35	110	350	0.43	< 0.002	23	28	0.37	3.9	
GP-10-07	GP-10-07-039	5/19/2010	14:00	39	310	7.49	0.022 J	25	46	< 0.01	0.4 J	
	GP-10-07-049	5/20/2010	13:45	49	240	2.68	< 0.02	16 J	49	0.012 J	1.6	
	GPDUP-052010	5/20/2010	13:45	49	250	2.68	0.022 J	16 J	49	0.011 J	1.6	
GP-10-08	GP-10-08-011	6/3/2010	12:10	11	67	0.02 J	< 0.002	< 7	21	0.01 J	8.1	
	GDUP-060310	6/3/2010	12:10	11	66	< 0.017	< 0.002	< 7	22	0.01 J	8.5	
	GP-10-08-021	6/3/2010	13:20	21	120	< 0.017	< 0.002	< 7	42	0.08	12	
	GP-10-08-031	6/3/2010	14:30	31	290	0.0719 J	< 0.002	< 7	71	< 0.01	14	
	GP-10-08-041	6/3/2010	15:00	41	320	0.0467 J	< 0.002	9 J	90	< 0.01	16	
	GP-10-08-051	6/3/2010	17:20	51	530	0.0358 J	< 0.002	13 J	67	< 0.01	10	
	GDUP2-060310	6/3/2010	17:20	51	530	0.017 J	< 0.002	< 7	66	< 0.01	10	
	GP-10-08-061	6/3/2010	18:05	61	410	0.0201 J	< 0.002	9 J	72	< 0.01	13	
GP-10-09	GP-10-09-021	5/28/2010	9:15	21	12	0.0491 J	< 0.002	< 7	2	0.78	8.6	
	GP-10-09-031	5/28/2010	10:00	31	18	0.0384 J	< 0.002	< 7	48	2.8	13	
	GDUP-052810	5/28/2010	10:00	31	18	0.017 J	< 0.002	9 J	45	2.9	13	
	GP-10-09-041	6/1/2010	11:30	41	32	0.0225 J	< 0.002	< 7	220	1.7	13	
	GP-10-09-051	6/1/2010	13:00	51	52	0.0364 J	< 0.002	9 J	200	2.3	16	
	GDUP-060110	6/1/2010	13:00	51	52	0.0166 J	< 0.002	< 7	200	2.2	16	
	GP-10-09-061	6/1/2010	14:20	61	120	0.0208 J	< 0.002	< 7	48	0.6	15	
	GP-10-09-071	6/1/2010	16:45	71	120	0.0326 J	< 0.002	< 7	85	0.67	14	
	GP-10-09-081	6/1/2010	17:50	81	110	0.0168 J	< 0.002	< 7	68	0.74	15	
GP-10-10	GP-10-10-011	6/2/2010	14:45	11	22	< 0.017	< 0.002	< 7	17	1.1	7.4	
	GP-10-10-021	6/2/2010	16:00	21	38	0.0274 J	< 0.002	< 7	82	2.2	12	
	GDUP-060210	6/2/2010	16:00	21	38	0.0224 J	< 0.002	11 J	83	2.4	11	
	GP-10-10-031	6/2/2010	16:30	31	80	2.21	< 0.002	< 7	120	0.26	16	
	GP-10-10-041	6/2/2010	17:15	41	130	5.01	< 0.002	9 J	76	0.028 J	6 B	
	GP-10-10-051	6/2/2010	18:00	51	300	0.54	< 0.002	18 J	25	0.047 J	0.98 JB	
	GP-10-10-061	6/2/2010	19:00	61	350	0.276	< 0.002	38	82	0.11	2.1 B	
	GP-10-10-071	6/3/2010	10:00	71	330	0.512	< 0.002	22	91	0.2	2.1 B	

Notes
NA - Not Applicable
ug/L is micrograms per liter
mg/l - miligrams per liter
J means estimated results
B indicates that analyte was detected in the associated method blank

COD - Chemical Oxygen Demend

TABLE 2
Groundwater Profile Results
Shepley's Hill Landfill, Devens, MA

Boring Location	Sample ID	Date	Time (Military Format)	Depth	Aluminum Total (ug/L)	Aluminum Dissolved (ug/L)	Antimony Total (ug/L)	Antimony Dissolved (ug/L)	Arsenic Total (ug/L)	Arsenic Dissolved (ug/L)	Arsenic Field Kit (ug/L)	Barium Total (ug/L)	Barium Dissolved (ug/L)	Beryllium Total (ug/L)	Beryllium Dissolved (ug/L)	Cadmium Total (ug/L)	Cadmium Dissolved (ug/L)	Calcium Total (ug/L)	Calcium Dissolved (ug/L)
GP-10-11	GP-10-11-039	8/3/2010	14:10	39	443	NA	NA	NA	263	264	80	NA	NA	NA	NA	NA	NA	19000	NA
	GP-10-11-049	8/3/2010	15:15	49	44400	NA	NA	NA	688	375	70	NA	NA	NA	NA	NA	NA	26500	NA
	DUP3-080310	8/3/2010	15:15	49	35200	NA	NA	NA	641	396	NA	NA	NA	NA	NA	NA	NA	26100	NA
	GP-10-11-059	8/3/2010	19:00	55	49400	< 7.64	NA	1.17 J	760	236	150	NA	27.3	NA	< 0.236	NA	< 0.236	61600	44000
	GP-10-11-064	8/4/2010	11:30	64	56600	44.1 J	NA	1.19	230	19.8	< 5	NA	26.5	NA	< 0.059	NA	< 0.059	285000	44400 J
GP-10-12	GP-10-12-044	8/5/2010	13:05	44	20200	< 19.1	NA	< 1.2	4320	3880	> 500	NA	36.1	NA	< 0.059	NA	< 0.590	33600	24500
	GP-10-12-054	8/5/2010	15:00	54	NA	< 19.1	NA	< 1.2	NA	2850	> 500	NA	29.9	NA	< 0.590	NA	< 0.590	NA	39500
	GP-10-12-065	8/9/2010	8:20	65	NA	14.1 J	NA	2.39	NA	38.9	30	NA	37.6	NA	<0.236	NA	<0.236	NA	55700
GP-10-13	GP-10-13-039	8/9/2010	14:45	39	32900	17	NA	0.22 J	176	124	30	NA	123	NA	<0.059	NA	<0.059	97100	81100
	GP-10-13-049	8/9/2010	17:00	49	NA	12.5 J	NA	0.81 J	NA	12.2	< 5	NA	98.6	NA	< 0.295	NA	< 0.295	NA	103000
	GP-10-13-059	8/10/2010	9:05	59	16000	8.44 J	NA	0.19 J	120	102	100	NA	244	NA	< 0.059	NA	< 0.059	80700	84000
	GP-10-13-069	8/10/2010	11:15	69	NA	< 19.1	NA	< 1.2	NA	1060	> 500	NA	68.3	NA	< 0.59	NA	< 0.59	NA	56700
	GP-10-13-079	8/10/2010	13:10	79	NA	5.88 J	NA	0.16 J	NA	123	20	NA	12.9	NA	< 0.059	NA	< 0.059	NA	32300
GP-10-14	GP-10-14-039	8/16/2010	09:50	39	1980	4.84 J	NA	0.14 JB	39.1	14.4	5	NA	49.8	NA	<0.059	NA	< 0.059	63300	62700
	GP-10-14-049	8/16/2010	11:20	49	2400	35.8 J	NA	0.8 JB	774	772	250	NA	88	NA	< 0.236	NA	< 0.236	49100	50600
	DUP-081610	8/16/2010	11:20	49	6020	36.7 J	NA	< 0.48	792	762	NA	NA	85.4	NA	< 0.236	NA	< 0.236	49600	48500
	GP-10-14-059	8/16/2010	13:00	59	NA	< 19.1	NA	1.21 JB	NA	2400	> 500	NA	15.6	NA	< 0.59	NA	< 0.59	NA	52900
	GP-10-14-069	8/16/2010	14:35	69	5160	< 19.1	NA	< 1.20	5260	5110	> 500	NA	19.6	NA	< 0.590	NA	< 0.590	38500	36200
	GP-10-14-079	8/17/2010	07:45	79	8270	<19.1	1.73 J	<1.20	17300	15100	> 500	58.4	22.6	<0.590	<0.590	<0.590	<0.590	29900	30500
GP-10-15	GP-10-15-039	8/11/2010	9:30	39	NA	18.5 J	NA	< 0.480	NA	1740	> 500	NA	124	NA	< 0.236	NA	< 0.236	NA	45600
	GP-10-15-049	8/11/2010	11:25	49	2080	< 19.1	NA	< 1.20	17200	16600	70	NA	17.3	NA	< 0.590	NA	< 0.590	47700	49400
	GP-10-15-059	8/11/2010	14:45	59	NA	3.15	NA	0.49 J	NA	278	80	NA	7.87	NA	< 0.059	NA	< 0.059	NA	32100
GP-10-16	GP-10-16-024	8/17/2010	16:15	24	41800	7.68 JB	2.92	0.26 J	170	4.81	5	249	5.73	2.53	<0.059	0.67 J	<0.059	30600	14500
	DUP-081710	8/17/2010	16:15	24	44600	11.8 B	2.88	0.2 J	164	3.87		255	5.99	2.55	< 0.059	0.66 J	< 0.059	30600	15900
	GP-10-16-034	8/18/2010	07:55	34	79600	42.3	3.2 J	0.51	333 J	1.97	5	558	8.23	6.35	<0.059	1.36 J	<0.059	57800	15000
	GP-10-16-054	8/18/2010	11:20	54	4030	16.9	2.82	0.8	19.9	1.89	< 5	25.9	8.15	0.34 J	<0.059	0.19 J	<0.059	35200	34700
	Dup-081810	8/18/2010	11:20	54	5710	18.9	3.6	0.64	26	2.05	NA	32.5	8.34	0.45 J	<0.059	0.23 J	<0.059	33600	35000
	GP-10-16-064	8/18/2010	13:40	64	NA	4.17 J	NA	0.28 J	NA	445	100	NA	39.2	NA	<0.059	NA	<0.059	NA	31300
	GP-10-16-074	8/19/2010	07:45	74	3540	7.02 J	1	0.42 J	248 J	216 J	100	59	36.3	0.17 J	< 0.059	< 0.059	< 0.059	52200	50900
	GP-10-16-084	8/19/2010	09:40	84	906	< 7.64	1.39 J	< 0.48	256	248	100	64.3	56.6	< 0.236	< 0.236	< 0.236	< 0.236	125000	122000
	DUP-081910	8/19/2010	09:40	84	1460	14.1 J	0.81 J	< 0.48	260	249	NA	67.4	59.4	< 0.236	< 0.236	< 0.236	< 0.236	128000	121000
	GP-10-16-094	8/19/2010	12:35	94	2880	5.34 J	1.01	0.23 J	19.3	3.44	< 5	35.8	10.1	0.3 J	< 0.059	0.07 J	< 0.059	39200	34700
GP-10-17	GP-10-17-009	8/2/2010	11:40	9	NA	NA	NA	NA	0.58	0.46 J	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-17-019	8/2/2010	12:20	19	NA	NA	NA	NA	0.78	0.39 J	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	DUP-080210	8/2/2010	12:20	19	NA	NA	NA	NA	0.66	0.49 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-17-029	8/2/2010	16:00	29	NA	NA	NA	NA	0.78	0.25 J	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-17-039	8/2/2010	16:45	39	NA	NA	NA	NA	1950	1860	500	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-17-049	8/2/2010	17:30	49	NA	NA	NA	NA	17.7	20.8	5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-17-056	8/2/2010	17:45	56	NA	NA	NA	NA	26.4	5.38	5	NA	NA	NA	NA	NA	NA	NA	NA
GP-10-18	GP-10-18-007	8/2/2010	18:34	7	NA	NA	NA	NA	0.93	0.73	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-18-017	8/3/2010	8:25	17	NA	NA	NA	NA	1.87 J	1.26 J	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-18-027	8/3/2010	9:00	27	NA	NA	NA	NA	117	107	80	NA	NA	NA	NA	NA	NA	NA	NA
	DUP-080310	8/3/2010	9:00	27	NA	NA	NA	NA	118	107		NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-18-037	8/3/2010	11:00	37	NA	NA	NA	NA	274	262	60	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-18-047	8/3/2010	12:10	47	NA	NA	NA	NA	373	390	80	NA	NA	NA	NA	NA	NA	NA	NA
GP-10-19	GP-10-19-009	8/3/2010	14:35	9	NA	NA	NA	NA	0.57	0.38 J	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	DUP2-080310	8/3/2010	14:35	9	NA	NA	NA	NA	0.53	0.35 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-19-019	8/3/2010	15:15	19	NA	NA	NA	NA	3.07	0.6	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-19-029	8/3/2010	16:05	29	NA	NA	NA	NA	886	810	100	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-19-039	8/3/2010	17:00	39	NA	NA	NA	NA	690	677	100	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-19-046	8/3/2010	18:15	46	NA	NA	NA	NA	23.3	3.92	5	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 2
Groundwater Profile Results
Shepley's Hill Landfill, Devens, MA

Boring Location	Sample ID	Date	Time (Military Format)	Depth	Aluminum Total (ug/L)	Aluminum Dissolved (ug/L)	Antimony Total (ug/L)	Antimony Dissolved (ug/L)	Arsenic Total (ug/L)	Arsenic Dissolved (ug/L)	Arsenic Field Kit (ug/L)	Barium Total (ug/L)	Barium Dissolved (ug/L)	Beryllium Total (ug/L)	Beryllium Dissolved (ug/L)	Cadmium Total (ug/L)	Cadmium Dissolved (ug/L)	Calcium Total (ug/L)	Calcium Dissolved (ug/L)
GP-10-20	GP-10-20-009	8/4/2010	9:30	9	NA	NA	NA	NA	1.6	0.4 J	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-20-019	8/4/2010	10:10	19	488	5.49 J	NA	NA	2.94	1.02	< 5	NA	NA	NA	NA	NA	NA	13100	12100
	DUP-080410	8/4/2010	10:10	19	573	5.81 J	NA	0.21 J	3.11	0.066	NA	NA	32.1	NA	< 0.500	NA	0.08 J	12500	12500
	GP-10-20-029	8/4/2010	11:00	29	NA	NA	NA	NA	220	235	40	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-20-039	8/4/2010	13:00	39	NA	NA	NA	NA	446	429	50	NA	NA	NA	NA	NA	NA	NA	NA
GP-10-21	GP-10-21-011	8/4/2010	15:05	11	NA	NA	NA	NA	3.98	0.31 J	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-21-021	8/4/2010	15:45	21	446	6.21 J	NA	NA	1.71	0.62 J	< 5	NA	NA	NA	NA	NA	NA	22100	21600 J
	DUP2-080410	8/4/2010	15:45	21	344	8.05 J	NA	NA	1.48	0.63 J	NA	NA	NA	NA	NA	NA	NA	21600	22900
	GP-10-21-031	8/4/2010	16:30	31	NA	NA	NA	NA	5.05	3.64	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-21-041	8/4/2010	17:00	41	NA	NA	NA	NA	322	349	60	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-21-051	8/4/2010	18:05	51	NA	NA	NA	NA	18.7	12.3	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-21-060	8/4/2010	19:00	60	NA	NA	NA	NA	145	146	40	NA	NA	NA	NA	NA	NA	NA	NA
GP-10-22	GP-10-22-011	8/10/2010	14:40	11	NA	NA	NA	NA	0.51	0.37 J	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-22-021	8/10/2010	15:00	21	NA	NA	NA	NA	1.71	0.51	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-22-031	8/10/2010	15:50	31	NA	NA	NA	NA	2.65	0.75 J	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-22-041	8/10/2010	16:30	41	NA	NA	NA	NA	15.8	14.5	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-22-051	8/10/2010	17:30	51	NA	NA	NA	NA	5.02	< 1.13	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-22-061	8/10/2010	18:30	61	NA	NA	NA	NA	6.56	3.53	< 5	NA	NA	NA	NA	NA	NA	NA	NA
GP-10-23	GP-10-23-017	8/5/2010	11:00	17	59.8	6.6 J	NA	NA	0.52	0.38 J	< 5	NA	NA	NA	NA	NA	NA	9860	9680
	DUP-080510	8/5/2010	11:00	17	49.2	5.6 J	NA	0.15 J	1.45	1.4	NA	NA	13.5	NA	<0.059	NA	<0.059	10500	10300
	GP-10-23-027	8/5/2010	11:45	27	735	5.22 J	NA	NA	2.86	0.6 J	< 5	NA	NA	NA	NA	NA	NA	16200	16300
	GP-10-23-037	8/5/2010	12:25	37	NA	NA	NA	NA	5.38	0.28 J	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-23-047	8/5/2010	14:20	47	NA	NA	NA	NA	610	600	500	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-23-057	8/5/2010	16:05	57	2900	<9.56	NA	NA	1060	1070	500	NA	NA	NA	NA	NA	NA	83200	85000
	DUP2-080510	8/5/2010	16:05	57	4180	<9.56	NA	<0.600	1160	1100	NA	NA	43.8	NA	<0.295	NA	<0.295	90800	86500
GP-10-24	GP-10-24-015	8/9/2010	15:44	15	138	8.52 J	NA	NA	2.06	0.94 J	< 5	NA	NA	NA	NA	NA	NA	18200	17500
	DUP-080910	8/9/2010	15:44	15	112	8.15 J	NA	<0.240	1.52	0.8 J	NA	NA	43.4	NA	<0.118	NA	<0.118	18400	18600
	GP-10-24-025	8/9/2010	16:30	25	NA	NA	NA	NA	1.61	0.39 J	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-24-035	8/9/2010	17:05	35	NA	NA	NA	NA	5.03	0.89 J	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-24-045	8/9/2010	17:45	45	NA	NA	NA	NA	303	310	125	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-24-055	8/9/2010	18:30	55	NA	NA	NA	NA	629	615	250	NA	NA	NA	NA	NA	NA	NA	NA
GP-10-25	GP-10-25-025	8/10/2010	10:00	25	NA	NA	NA	NA	44	0.4 J	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-25-035	8/10/2010	10:45	35	4660	18.7 J	NA	NA	10.9	0.58 J	< 5	NA	NA	NA	NA	NA	NA	20100	18600
	DUP-081010	8/10/2010	10:45	35	4580	6.72 J	NA	< 0.24	10.9	1.18	NA	NA	38.8	NA	< 0.118	NA	< 0.118	19500	19400
	GP-10-25-045	8/10/2010	11:50	45	2060	11.3 J	NA	NA	37.3	35.1	5	NA	NA	NA	NA	NA	NA	42800	43600
	DUP2-081010	8/10/2010	11:50	45	2300	9.92 J	NA	< 0.48	38	34.9	NA	NA	51.9	NA	< 0.236	NA	< 0.236	41800	42800
GP-10-26	GP-10-26-011	8/11/2010	9:20	11	94	12.4	NA	NA	0.6	0.18 J	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-26-021	8/11/2010	10:20	21	777	12.2	NA	NA	2.07	0.39 J	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	DUP-081110	8/11/2010	10:20	21	584	9.64 J	NA	< 0.120	1.72	0.65	NA	NA	15.3	NA	< 0.059	NA	< 0.059	16100	15700
	GP-10-26-031	8/11/2010	10:35	31	NA	NA	NA	NA	2.86	0.54	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-26-041	8/11/2010	11:05	41	NA	NA	NA	NA	4	0.45 J	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-26-051	8/11/2010	12:15	51	NA	NA	NA	NA	4.86 J	< 1.13	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-26-061	8/11/2010	13:40	61	NA	NA	NA	NA	6.48	< 1.13	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-26-071	8/11/2010	14:10	71	NA	NA	NA	NA	3.58 J	1.96 J	< 5	NA	NA	NA	NA	NA	NA	NA	NA
GP-10-27	GP-10-27-025	8/11/2010	16:05	25	891	16.2	NA	NA	2.77	1.03	< 5	NA	NA	NA	NA	NA	NA	5570	5210
	DUP2-081110	8/11/2010	16:05	25	789	17.1	NA	< 0.120	1.11	0.38 J	NA	NA	14.8	NA	< 0.059	NA	< 0.059	5550	5380
	GP-10-27-035	8/11/2010	17:00	35	NA	NA	NA	NA	24.7	0.78 J	< 5	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-27-045	8/11/2010	17:25	45	NA	NA	NA	NA	199	200	70	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-27-055	8/11/2010	17:50	55	NA	NA	NA	NA	288	328	70	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-27-065	8/11/2010	18:45	65	NA	NA	NA	NA	1100	1040	> 500	NA	NA	NA	NA	NA	NA	NA	NA

Notes: NA - Not Applicable
ug/L is micrograms per liter
mg/l - miligrams per liter
J means estimated results
B indicates that analyte was detected in the associated method blank

TABLE 2
Groundwater Profile Results
Shepley's Hill Landfill, Devens, MA

Boring Location	Sample ID	Date	Time (Military Format)	Depth	Chromium Total (ug/L)	Chromium Dissolved (ug/L)	Cobalt Total (ug/L)	Cobalt Dissolved (ug/L)	Copper Total (ug/L)	Copper Dissolved (ug/L)	Iron Total (ug/L)	Iron Dissolved (ug/L)	Lead Total (ug/L)	Lead Dissolved (ug/L)	Magnesium Total (ug/L)	Magnesium Dissolved (ug/L)	Manganese Total (ug/L)	Manganese Dissolved (ug/L)	Mercury Total (ug/L)	Mercury Dissolved (ug/L)
GP-10-11	GP-10-11-039	8/3/2010	14:10	39	2.32	NA	NA	NA	NA	NA	67200	66400	0.74 J	NA	2610	NA	2120	NA	NA	NA
	GP-10-11-049	8/3/2010	15:15	49	271	NA	NA	NA	NA	NA	164000	49300	68.3	NA	13200	NA	5240	NA	NA	NA
	DUP3-080310	8/3/2010	15:15	49	254	NA	NA	NA	NA	NA	149000	52200	58	NA	9680	NA	5260	NA	NA	NA
	GP-10-11-059	8/3/2010	19:00	55	264	< 0.744	NA	19.5	NA	0.72 J	148000	28500	76.6	< 0.200	15600	3930	7700	5580	NA	0.09013 J
	GP-10-11-064	8/4/2010	11:30	64	744	0.6	NA	3.39	NA	0.49 J	180000	3440	65.2	0.18 J	30600 J	7570 J	7160	1100 J	NA	0.03814 J
GP-10-12	GP-10-12-044	8/5/2010	13:05	44	66.9	< 1.86	NA	10.9	NA	< 1.18	122000	83700	496	< 0.500	5900	2080	7180	5860	NA	0.02717 J
	GP-10-12-054	8/5/2010	15:00	54	NA	<1.86	NA	4.18 J	NA	<1.18	NA	74800	NA	<0.500	NA	2590	NA	5200	NA	0.03853 J
	GP-10-12-065	8/9/2010	8:20	65	NA	<0.744	NA	1.7 J	NA	0.66 J	NA	46600	NA	0.23 J	NA	5730	NA	4400	NA	0.1247 J
GP-10-13	GP-10-13-039	8/9/2010	14:45	39	136	2.22	NA	1.49	NA	0.32 J	148000	99500	38.9	0.05 J	17600	7600	1950	1380	NA	0.1389 J
	GP-10-13-049	8/9/2010	17:00	49	NA	2.66	NA	6.98	NA	2.62	NA	7840	NA	0.54 J	NA	19200	NA	6700	NA	< 0.012
	GP-10-13-059	8/10/2010	9:05	59	48.4	1.55	NA	0.79	NA	0.38 J	87100	74500	17	< 0.05	16400	14100	682	592	NA	< 0.012
	GP-10-13-069	8/10/2010	11:15	69	NA	< 1.86	NA	10.5	NA	< 1.18	NA	79800	NA	< 0.5	NA	7960	NA	3630	NA	< 0.012
	GP-10-13-079	8/10/2010	13:10	79	NA	0.26 J	NA	1.43	NA	0.98	NA	5580	NA	0.12 J	NA	3850	NA	218	NA	< 0.012
GP-10-14	GP-10-14-039	8/16/2010	09:50	39	15.2	0.61	NA	0.31 J	NA	0.27 J	22800	18700	4.17	< 0.050	7610	7010	783	670 J	NA	0.01239 J
	GP-10-14-049	8/16/2010	11:20	49	7.8	< 0.744	NA	1.51 J	NA	< 0.472	66000	66900	3.61	< 0.200	4370	3880	2420	2540	NA	< 0.0120
	DUP-081610	8/16/2010	11:20	49	14.2	< 0.744	NA	1.4 J	NA	< 0.472	69800	64200	9.02	< 0.200	5130	3750	2510	2440	NA	< 0.0120
	GP-10-14-059	8/16/2010	13:00	59	NA	< 1.86	NA	13	NA	< 1.18	NA	88200	NA	< 0.500	NA	4730	NA	6800	NA	< 0.012
	GP-10-14-069	8/16/2010	14:35	69	22.1	< 1.86	NA	21.5	NA	< 1.18	95400	85400	5.56	< 0.500	4250	3020	3700	3540	NA	< 0.0120
	GP-10-14-079	8/17/2010	07:45	79	20.9	<1.86	14.2	8.83	24	<1.18	80300	71800	10.3	0.59 J	5100	3390	5850	5540	<0.0120	0.05669 J
GP-10-15	GP-10-15-039	8/11/2010	9:30	39	NA	1.52 J	NA	8.62	NA	< 0.472	NA	101000	NA	< 0.200	NA	4500	NA	3410	NA	0.04278 J
	GP-10-15-049	8/11/2010	11:25	49	5.05 J	< 1.85	NA	41.2	NA	< 1.18	126000	119000	2.98 J	< 0.500	7360	6920	10500	10500	NA	0.03205 J
	GP-10-15-059	8/11/2010	11:45	59	NA	0.51	NA	0.64	NA	2.22	NA	300	NA	0.050	NA	3950	NA	466	NA	0.0120
GP-10-16	GP-10-16-024	8/17/2010	16:15	24	106	0.22 J	71	3.85	83.8	0.25 J	56700	323	40.7	<0.050	10700	1170	2500	182	0.04641 J	0.1034 J
	DUP-081710	8/17/2010	16:15	24	113	0.38 J	73.2	4.22	87.2	0.37 J	59500	349	41.2	< 0.050	117000	1290	2650	197	0.06234 J	0.1319 J
	GP-10-16-034	8/18/2010	07:55	34	289	0.22 J	122	3.2	272	0.33 J	145000	138	245	0.06 J	24700 J	2030	5080	580	0.2714 J	<0.0120
	GP-10-16-054	8/18/2010	11:20	54	25	0.43 J	3.84	0.74	23.6	1.45	8900	277	22	0.07 J	4860	3500	180	84	<0.0120	<0.0120
	Dup-081810	8/18/2010	11:20	54	30	0.38 J	4.57	0.75	27.4	1.21	11400	300	25.6	0.08 J	5310	3610	200	86	0.03683 J	<0.0120
	GP-10-16-064	8/18/2010	13:40	64	NA	0.36 J	NA	26	NA	0.47 J	NA	44700	NA	0.13 J	NA	6080	NA	777	NA	<0.0120
	GP-10-16-074	8/19/2010	07:45	74	44.2	0.75	6.41	4.66	14.3	0.86	75900	64200	4.79	0.07 J	12800	11800	1420 J	1330 J	< 0.012	< 0.012
	GP-10-16-084	8/19/2010	09:40	84	10.5	< 0.744	7.11	5.45	9.33	0.61 J	20600	17200	1.73 J	< 0.2	18900	18200	3120	2920	< 0.012	< 0.012
	DUP-081910	8/19/2010	09:40	84	12.7	< 0.744	7.3	5.56	9.19	1.04 J	21500	17400	2.23	0.2 J	19700	18300	3130	2990	< 0.012	< 0.012
	GP-10-16-094	8/19/2010	12:35	94	48.8	< 0.186	5.08	1.54	192	4.32	17500	625	8.58	0.1 J	5320	4100	620	368	< 0.012	< 0.012
GP-10-17	GP-10-17-009	8/2/2010	11:40	9	NA	NA	NA	NA	NA	NA	1800 J	1620	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-17-019	8/2/2010	12:20	19	NA	NA	NA	NA	NA	NA	1870	1800	NA	NA	NA	NA	NA	NA	NA	NA
	DUP-080210	8/2/2010	12:20	19	NA	NA	NA	NA	NA	NA	1840	1870	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-17-029	8/2/2010	16:00	29	NA	NA	NA	NA	NA	NA	1810	1240	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-17-039	8/2/2010	16:45	39	NA	NA	NA	NA	NA	NA	65200	60700	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-17-049	8/2/2010	17:30	49	NA	NA	NA	NA	NA	NA	10100	5210	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-17-056	8/2/2010	17:45	56	NA	NA	NA	NA	NA	NA	30600	6100	NA	NA	NA	NA	NA	NA	NA	NA
GP-10-18	GP-10-18-007	8/2/2010	18:34	7	NA	NA	NA	NA	NA	NA	1390	1360	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-18-017	8/3/2010	8:25	17	NA	NA	NA	NA	NA	NA	1190	857	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-18-027	8/3/2010	9:00	27	NA	NA	NA	NA	NA	NA	35400	32000	NA	NA	NA	NA	NA	NA	NA	NA
	DUP-080310	8/3/2010	9:00	27	NA	NA	NA	NA	NA	NA	34600	32800	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-18-037	8/3/2010	11:00	37	NA	NA	NA	NA	NA	NA	21300	18800	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-18-047	8/3/2010	12:10	47	NA	NA	NA	NA	NA	NA	35200	32300	NA	NA	NA	NA	NA	NA	NA	NA
GP-10-19	GP-10-19-009	8/3/2010	14:35	9	NA	NA	NA	NA	NA	NA	1040	908	NA	NA	NA	NA	NA	NA	NA	NA
	DUP2-080310	8/3/2010	14:35	9	NA	NA	NA	NA	NA	NA	1030	982	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-19-019	8/3/2010	15:15	19	NA	NA	NA	NA	NA	NA	3680	831	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-19-029	8/3/2010	16:05	29	NA	NA	NA	NA	NA	NA	89800	73300	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-19-039	8/3/2010	17:00	39	NA	NA	NA	NA	NA	NA	65600	58800	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-19-046	8/3/2010	18:15	46	NA	NA	NA	NA	NA	NA	14400	4280	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 2
Groundwater Profile Results
Shepley's Hill Landfill, Devens, MA

Boring Location	Sample ID	Date	Time (Military Format)	Depth	Chromium Total (ug/L)	Chromium Dissolved (ug/L)	Cobalt Total (ug/L)	Cobalt Dissolved (ug/L)	Copper Total (ug/L)	Copper Dissolved (ug/L)	Iron Total (ug/L)	Iron Dissolved (ug/L)	Lead Total (ug/L)	Lead Dissolved (ug/L)	Magnesium Total (ug/L)	Magnesium Dissolved (ug/L)	Manganese Total (ug/L)	Manganese Dissolved (ug/L)	Mercury Total (ug/L)	Mercury Dissolved (ug/L)
GP-10-20	GP-10-20-009	8/4/2010	9:30	9	NA	NA	NA	NA	NA	NA	2000	1260	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-20-019	8/4/2010	10:10	19	3.25	0.51	NA	NA	NA	NA	2910	1500	0.79 J	0.06 J	1840	1570	989	920	NA	NA
	DUP-080410	8/4/2010	10:10	19	3.31	0.43 J	NA	2.09	NA	1	2630	1630	0.99 J	< 0.050	1750	1620	949	933	NA	< 0.0120
	GP-10-20-029	8/4/2010	11:00	29	NA	NA	NA	NA	NA	NA	53000	56800	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-20-039	8/4/2010	13:00	39	NA	NA	NA	NA	NA	NA	16800	13300	NA	NA	NA	NA	NA	NA	NA	NA
GP-10-21	GP-10-21-011	8/4/2010	15:05	11	NA	NA	NA	NA	NA	NA	2550	501	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-21-021	8/4/2010	15:45	21	3.23	0.43 J	NA	NA	NA	NA	1730	984	0.53 J	< 0.010	2760	2580	1050	1020 J	NA	NA
	DUP2-080410	8/4/2010	15:45	21	2.76	0.52 J	NA	NA	NA	NA	1550	1030	0.9 J	< 0.100	2690	2780	1020	1080	NA	NA
	GP-10-21-031	8/4/2010	16:30	31	NA	NA	NA	NA	NA	NA	3100	1840	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-21-041	8/4/2010	17:00	41	NA	NA	NA	NA	NA	NA	42500	43700	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-21-051	8/4/2010	18:05	51	NA	NA	NA	NA	NA	NA	11900	6320	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-21-060	8/4/2010	19:00	60	NA	NA	NA	NA	NA	NA	21200	15300	NA	NA	NA	NA	NA	NA	NA	NA
GP-10-22	GP-10-22-011	8/10/2010	14:40	11	NA	NA	NA	NA	NA	NA	844	753	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-22-021	8/10/2010	15:00	21	NA	NA	NA	NA	NA	NA	2310	1120	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-22-031	8/10/2010	15:50	31	NA	NA	NA	NA	NA	NA	3240	1780	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-22-041	8/10/2010	16:30	41	NA	NA	NA	NA	NA	NA	35300	36100	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-22-051	8/10/2010	17:30	51	NA	NA	NA	NA	NA	NA	7580	5010	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-22-061	8/10/2010	18:30	61	NA	NA	NA	NA	NA	NA	6750	4490	NA	NA	NA	NA	NA	NA	NA	NA
GP-10-23	GP-10-23-017	8/5/2010	11:00	17	0.33 J	0.2 J	NA	NA	NA	NA	1110	1040	0.12 J	0.06 J	1450	1450	23	21.1	NA	NA
	DUP-080510	8/5/2010	11:00	17	0.46 J	0.22 J	NA	0.37 J	NA	0.49 J	1180	1070	0.11 J	<0.050	1540	1530	23.9	21.8	NA	0.1147 J
	GP-10-23-027	8/5/2010	11:45	27	5.24	<0.372	NA	NA	NA	NA	2170	701	1.62	<0.100	1760	1640	189	172	NA	NA
	GP-10-23-037	8/5/2010	12:25	37	NA	NA	NA	NA	NA	NA	5400	1890	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-23-047	8/5/2010	14:20	47	NA	NA	NA	NA	NA	NA	78500	78400	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-23-057	8/5/2010	16:05	57	32.4	<0.930	NA	NA	NA	NA	72200	68400	3.15	<0.250	15700	15400	3660	3730	NA	NA
	DUP2-080510	8/5/2010	16:05	57	45	0.95 J	NA	27.5	NA	<0.590	82000	70000	4.25	<0.250	17300	15600	4050	3820	NA	0.07912 J
							NA													
GP-10-24	GP-10-24-015	8/9/2010	15:44	15	0.57 J	<0.372	NA	NA	NA	NA	928	758	0.16 J	<0.100	2220	2090	28.1	24.9	NA	NA
	DUP-080910	8/9/2010	15:44	15	0.51 J	<0.372	NA	0.42 J	NA	0.62 J	880	765	0.16 J	<0.100	2200	2210	26.7	30.6	NA	<0.0120
	GP-10-24-025	8/9/2010	16:30	25	NA	NA	NA	NA	NA	NA	2260	1180	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-24-035	8/9/2010	17:05	35	NA	NA	NA	NA	NA	NA	5550	2630	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-24-045	8/9/2010	17:45	45	NA	NA	NA	NA	NA	NA	99000	100000	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-24-055	8/9/2010	18:30	55	NA	NA	NA	NA	NA	NA	91100	81500	NA	NA	NA	NA	NA	NA	NA	NA
GP-10-25	GP-10-25-025	8/10/2010	10:00	25	NA	NA	NA	NA	NA	NA	35700	1770 J	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-25-035	8/10/2010	10:45	35	74.3	1.08	NA	NA	NA	NA	15600	2250	25.5	0.15 J	3420	2200	801	618	NA	
	DUP-081010	8/10/2010	10:45	35	74.1	0.94 J	NA	1.15	NA	0.72 J	15300	2320	25.7	< 0.1	3350	2280	772	658	NA	< 0.012
	GP-10-25-045	8/10/2010	11:50	45	55	0.78 J	NA	NA	NA	NA	76700	71000	13.8	< 0.2	5530	5170	4540	4550	NA	
	DUP2-081010	8/10/2010	11:50	45	57.4	< 0.744	NA	45.2	NA	< 0.472	76700	69000	12.5	< 0.2	5510	5070	4460	4430	NA	< 0.012
GP-10-26	GP-10-26-011	8/11/2010	9:20	11	NA	< 0.186	NA	NA	NA	NA	854	716 J	0.14 J	0.08 J	1240	1190	67.1	59.8	NA	NA
	GP-10-26-021	8/11/2010	10:20	21	NA	0.32 J	NA	NA	NA	NA	2090	1170	0.63	0.13 J	1960	1990	129	103	NA	NA
	DUP-081110	8/11/2010	10:20	21	3.99	0.22 J	NA	1.31	NA	0.63	1800	1140	0.54	< 0.050	1820	1900	120	103	NA	< 0.0120
	GP-10-26-031	8/11/2010	10:35	31	NA	NA	NA	NA	NA	NA	4180	1350	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-26-041	8/11/2010	11:05	41	NA	NA	NA	NA	NA	NA	6290	1940	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-26-051	8/11/2010	12:15	51	NA	NA	NA	NA	NA	NA	7180	3140	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-26-061	8/11/2010	13:40	61	NA	NA	NA	NA	NA	NA	11900	3840	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-26-071	8/11/2010	14:10	71	NA	NA	NA	NA	NA	NA	6430	3310	NA	NA	NA	NA	NA	NA	NA	NA
GP-10-27	GP-10-27-025	8/11/2010	16:05	25	3.71	0.34 J	NA	NA	NA	NA	1640	773	2.03	0.08 J	1140	960	56.2	44.9	NA	NA
	DUP2-081110	8/11/2010	16:05	25	3.16	0.33 J	NA	0.56	NA	0.44 J	1510	804	1.73	0.06 J	1120	984	53	45.5	NA	< 0.0120
	GP-10-27-035	8/11/2010	17:00	35	NA	NA	NA	NA	NA	NA	15000	1100	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-27-045	8/11/2010	17:25	45	NA	NA	NA	NA	NA	NA	88800	83800	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-27-055	8/11/2010	17:50	55	NA	NA	NA	NA	NA	NA	84100	91300	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-27-065	8/11/2010	18:45	65	NA	NA	NA	NA	NA	NA	73400	61300	NA	NA	NA	NA	NA	NA	NA	NA

Notes: NA - Not Applicable; ug/L is micrograms per liter; mg/l - miligrams per liter; J means estimated results; B indicates that analyte was detected in the associated method blank

TABLE 2
Groundwater Profile Results
Shepley's Hill Landfill, Devens, MA

Boring Location	Sample ID	Date	Time (Military Format)	Depth	Nickel Total (ug/L)	Nickel Dissolved (ug/L)	Potasium Total (ug/L)	Potasium Dissolved (ug/L)	Selenium Total (ug/L)	Selenium Dissolved (ug/L)	Silver Total (ug/L)	Silver Dissolved (ug/L)	Sodium Total (ug/L)	Sodium Dissolved (ug/L)	Thallium Total (ug/L)	Thallium Dissolved (ug/L)	Vanadium Total (ug/L)	Vanadium Dissolved (ug/L)	Zinc Total (ug/L)	Zinc Dissolved (ug/L)
GP-10-11	GP-10-11-039	8/3/2010	14:10	39	9.34	NA	3070	NA	NA	NA	NA	NA	8650	NA	NA	NA	NA	NA	NA	NA
	GP-10-11-049	8/3/2010	15:15	49	134	NA	11900	NA	NA	NA	NA	NA	16600	NA	NA	NA	NA	NA	NA	NA
	DUP3-080310	8/3/2010	15:15	49	112	NA	10700	NA	NA	NA	NA	NA	16000	NA	NA	NA	NA	NA	NA	NA
	GP-10-11-059	8/3/2010	19:00	55	142	5.81	10500	4240	NA	< 1.62	NA	< 0.340	25300	20000	NA	< 0.124	NA	< 0.308	NA	8.81 J
	GP-10-11-064	8/4/2010	11:30	64	207	7.33	40200	25400 J	NA	0.42 J	NA	< 0.085	61200	49200 J	NA	< 0.031	NA	0.2 J	NA	1.81 J
GP-10-12	GP-10-12-044	8/5/2010	13:05	44	56.1	20.3	7630	4670	NA	< 4.06	NA	< 0.850	5160	3650	NA	< 0.310	NA	< 0.770	NA	44.4 J
	GP-10-12-054	8/5/2010	15:00	54	NA	10.6	NA	7340	NA	<4.06	NA	<0.850	NA	8450	NA	<0.310	NA	<0.770	NA	38.2 J
	GP-10-12-065	8/9/2010	8:20	65	NA	8.34	NA	17200	NA	<1.62	NA	<0.340	NA	31000	NA	<0.124	NA	<0.308	NA	24.5
GP-10-13	GP-10-13-039	8/9/2010	14:45	39	72.1	4.85	19000	14300	NA	0.57 J	NA	<0.085	19400	16800	NA	<0.031	NA	0.71	NA	4.39 J
	GP-10-13-049	8/9/2010	17:00	49	NA	6.88	NA	19200	NA	< 2.03	NA	< 0.425	NA	51600	NA	< 0.155	NA	< 0.385	NA	12.9 J
	GP-10-13-059	8/10/2010	9:05	59	35.4	4.75	18400	17400	NA	0.57 J	NA	< 0.085	26900	24600	NA	< 0.031	NA	0.34 J	NA	1.98 J
	GP-10-13-069	8/10/2010	11:15	69	NA	9.15	NA	9000	NA	< 4.06	NA	< 0.85	NA	13900	NA	< 0.31	NA	< 0.77	NA	26.6 J
	GP-10-13-079	8/10/2010	13:10	79	NA	4.42	NA	4700	NA	< 0.406	NA	< 0.085	NA	35900	NA	< 0.031	NA	0.14 J	NA	7.59
GP-10-14	GP-10-14-039	8/16/2010	09:50	39	11.2	3	4860	4160	NA	0.54 J	NA	< 0.085	16800	17800	NA	< 0.031	NA	0.36 J	NA	4.59 J
	GP-10-14-049	8/16/2010	11:20	49	9.25	3.05	7640	7140	NA	< 1.62	NA	< 0.340	7280	7780	NA	< 0.124	NA	1.81 J	NA	< 6.50
	DUP-081610	8/16/2010	11:20	49	18.1	2.95	8080	6940	NA	< 1.62	NA	< 0.340	7600	7390	NA	< 0.124	NA	1.62 J	NA	< 6.50
	GP-10-14-059	8/16/2010	13:00	59	NA	4.75 J	NA	6940	NA	< 4.06	NA	< 0.850	NA	14000	NA	< 0.310	NA	< 0.770	NA	23.6 J
	GP-10-14-069	8/16/2010	14:35	69	21.2	8.73	7860	6680	NA	< 4.06	NA	< 0.850	5580	5180	NA	< 0.310	NA	< 0.770	NA	< 16.2
	GP-10-14-079	8/17/2010	07:45	79	27.6	14	5480	3780	<4.06	<4.06	<0.850	<0.850	6270	5720	<0.310	<0.310	10.1	<0.770	73.2	40.2 J
GP-10-15	GP-10-15-039	8/11/2010	9:30	39	NA	8.06	NA	8240	NA	< 1.62	NA	< 0.340	NA	7280	NA	< 0.124	NA	< 0.308	NA	9.26 J
	GP-10-15-049	8/11/2010	11:25	49	23.5	19.5	8130	7520	NA	< 4.06	NA	< 0.850	12200	12000	NA	< 0.310	NA	< 0.770	NA	18.7 J
	GP-10-15-059	8/11/2010	14:45	59	NA	2.19	NA	6110	NA	<0.406	NA	<0.085	NA	32300	NA	0.04 J	NA	2.23	NA	3.05 J
GP-10-16	GP-10-16-024	8/17/2010	16:15	24	130	4.82	8990	2520	3.17 J	<0.406	0.38 J	<0.085	4950	2960	0.64 J	0.04 J	46.6	0.13 J	157	3.53 J
	DUP-081710	8/17/2010	16:15	24	136	5.22	9420	2700	2.9 J	< 0.406	< 0.34	< 0.085	4880	3060	0.61 J	< 0.031	50.2	0.14 J	160	3.36 J
	GP-10-16-034	8/18/2010	07:55	34	229	2.93	17100	6630	6.39 J	<0.406	0.58 J	<0.085	17600	9100	1.91 J	0.1 J	109	0.2 J	298	3.37 J
	GP-10-16-054	8/18/2010	11:20	54	14.4	2.21	5840	4810	0.82 J	0.43 J	0.29 J	<0.085	35600	36000	0.1 J	0.04 J	7.83	0.29 J	40.2	6.01
	Dup-081810	8/18/2010	11:20	54	18	2.27	6060	5040	0.93 J	<0.406	<0.085	<0.085	35800	36700	0.1 J	<0.031	10.4	0.42 J	47.5	4.15 J
	GP-10-16-064	8/18/2010	13:40	64	NA	12.8	NA	12000	NA	<0.406	NA	<0.085	NA	16600	NA	<0.031	NA	0.21 J	NA	3.97 J
	GP-10-16-074	8/19/2010	07:45	74	24.6	16.6	21500 J	20400 J	0.64 J	0.47 J	< 0.085	< 0.085	33000 J	31700 J	0.06 J	< 0.031	3.08	0.1 J	24	6.87
	GP-10-16-084	8/19/2010	09:40	84	12.2	7.8	6240	5370	< 1.62	< 1.62	< 0.34	< 0.34	45200	42200	< 0.124	< 0.124	1.71 J	< 0.308	13.9 J	14.2 J
	DUP-081910	8/19/2010	09:40	84	13.7	8.2	6570	5500	< 1.62	< 1.62	< 0.34	< 0.34	45200	42100	< 0.124	< 0.124	2.54	< 0.308	13.9 J	14.4 J
	GP-10-16-094	8/19/2010	12:35	94	23.3	8.07	6660	5210	0.58 J	< 0.406	< 0.085	< 0.085	36600	34200	0.07 J	< 0.031	3.78	0.22 J	24.7	4.84 J
GP-10-17	GP-10-17-009	8/2/2010	11:40	9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-17-019	8/2/2010	12:20	19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	DUP-080210	8/2/2010	12:20	19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-17-029	8/2/2010	16:00	29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-17-039	8/2/2010	16:45	39	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-17-049	8/2/2010	17:30	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-17-056	8/2/2010	17:45	56	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP-10-18	GP-10-18-007	8/2/2010	18:34	7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-18-017	8/3/2010	8:25	17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-18-027	8/3/2010	9:00	27	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	DUP-080310	8/3/2010	9:00	27	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-18-037	8/3/2010	11:00	37	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-18-047	8/3/2010	12:10	47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP-10-19	GP-10-19-009	8/3/2010	14:35	9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	DUP2-080310	8/3/2010	14:35	9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-19-019	8/3/2010	15:15	19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-19-029	8/3/2010	16:05	29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-19-039	8/3/2010	17:00	39	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-19-046	8/3/2010	18:15	46	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 2
Groundwater Profile Results
Shepley's Hill Landfill, Devens, MA

Boring Location	Sample ID	Date	Time (Military Format)	Depth	Nickel Total (ug/L)	Nickel Dissolved (ug/L)	Potasium Total (ug/L)	Potasium Dissolved (ug/L)	Selenium Total (ug/L)	Selenium Dissolved (ug/L)	Silver Total (ug/L)	Silver Dissolved (ug/L)	Sodium Total (ug/L)	Sodium Dissolved (ug/L)	Thallium Total (ug/L)	Thallium Dissolved (ug/L)	Vanadium Total (ug/L)	Vanadium Dissolved (ug/L)	Zinc Total (ug/L)	Zinc Dissolved (ug/L)
GP-10-20	GP-10-20-009	8/4/2010	9:30	9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-20-019	8/4/2010	10:10	19	8.04	4.71	4290	3700	NA	NA	NA	NA	129000	119000	NA	NA	NA	NA	NA	NA
	DUP-080410	8/4/2010	10:10	19	7.24	5.21	4170	3700	NA	0.59 J	NA	< 0.085	128000	122000	NA	0.07 J	NA	0.15 J	NA	5.18
	GP-10-20-029	8/4/2010	11:00	29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-20-039	8/4/2010	13:00	39	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP-10-21	GP-10-21-011	8/4/2010	15:05	11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-21-021	8/4/2010	15:45	21	8.51	7.25	4690	4520	NA	NA	NA	NA	155000	153000	NA	NA	NA	NA	NA	NA
	DUP2-080410	8/4/2010	15:45	21	8.01	7.48	4540	4790	NA	NA	NA	NA	147000	149000	NA	NA	NA	NA	NA	NA
	GP-10-21-031	8/4/2010	16:30	31	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-21-041	8/4/2010	17:00	41	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-21-051	8/4/2010	18:05	51	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-21-060	8/4/2010	19:00	60	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP-10-22	GP-10-22-011	8/10/2010	14:40	11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-22-021	8/10/2010	15:00	21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-22-031	8/10/2010	15:50	31	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-22-041	8/10/2010	16:30	41	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-22-051	8/10/2010	17:30	51	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-22-061	8/10/2010	18:30	61	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP-10-23	GP-10-23-017	8/5/2010	11:00	17	1.94	1.83	2260	2130	NA	NA	NA	NA	67100	65000	NA	NA	NA	NA	NA	NA
	DUP-080510	8/5/2010	11:00	17	2.04	1.87	2330	2300	NA	<0.406	NA	<0.085	71000	69100	NA	<0.031	NA	0.12 J	NA	1.95 J
	GP-10-23-027	8/5/2010	11:45	27	3.88	2.13	4670	4640	NA	NA	NA	NA	218000	217000 J	NA	NA	NA	NA	NA	NA
	GP-10-23-037	8/5/2010	12:25	37	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-23-047	8/5/2010	13:20	47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-23-057	8/5/2010	16:05	57	34.6	24.4	12000	11300	NA	NA	NA	NA	36600	36100	NA	NA	NA	NA	NA	NA
	DUP2-080510	8/5/2010	16:05	57	39.9	25	13300	11500	NA	<2.03	NA	<0.425	38000	37200	NA	<0.155	NA	<0.385	NA	32.6
GP-10-24	GP-10-24-015	8/9/2010	15:44	15	1.5	1.34	3890	3690	NA	NA	NA	NA	147000	135000	NA	NA	NA	NA	NA	NA
	DUP-080910	8/9/2010	15:44	15	1.52	1.37	3810	3920	NA	<0.812	NA	<0.170	147000	143000	NA	<0.062	NA	<0.154	NA	6.33 J
	GP-10-24-025	8/9/2010	16:30	25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-24-035	8/9/2010	17:05	35	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-24-045	8/9/2010	17:45	45	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-24-055	8/9/2010	18:30	55	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP-10-25	GP-10-25-025	8/10/2010	10:00	25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-25-035	8/10/2010	10:45	35	28.2	6.42	6650	5240	NA	NA	NA	NA	198000	186000	NA	NA	NA	NA	NA	NA
	DUP-081010	8/10/2010	10:45	35	27.4	6.51	6500	5590	NA	< 0.812	NA	< 0.17	196000	202000	NA	0.11 J	NA	< 0.154	NA	15.7
	GP-10-25-045	8/10/2010	11:50	45	23.5	9.54	7680	7120	NA	NA	NA	NA	52500	51900	NA	NA	NA	NA	NA	NA
	DUP2-081010	8/10/2010	11:50	45	24.5	9.69	7790	7040	NA	< 1.62	NA	< 0.34	50700	52600	NA	0.21 J	NA	< 0.308	NA	35.9
GP-10-26	GP-10-26-011	8/11/2010	9:20	11	3.15	2.99	3570	3390	NA	NA	NA	NA	13100	14300	NA	NA	NA	NA	NA	NA
	GP-10-26-021	8/11/2010	10:20	21	5.68	4.15	3160	3280	NA	NA	NA	NA	33100	35000	NA	NA	NA	NA	NA	NA
	DUP-081110	8/11/2010	10:20	21	4.99	3.98	3020	3210	NA	0.79 J	NA	< 0.085	37300	34200	NA	< 0.031	NA	0.19 J	NA	11.8
	GP-10-26-031	8/11/2010	10:35	31	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-26-041	8/11/2010	11:05	41	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-26-051	8/11/2010	12:15	51	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-26-061	8/11/2010	13:40	61	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-26-071	8/11/2010	14:10	71	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP-10-27	GP-10-27-025	8/11/2010	16:05	25	3.71	2.37	3180	3260	NA	NA	NA	NA	55200	52600	NA	NA	NA	NA	NA	NA
	DUP2-081110	8/11/2010	16:05	25	3.48	2.17	3160	3210	NA	< 0.406	NA	< 0.085	57400	53000	NA	< 0.031	NA	0.21 J	NA	3.27 J
	GP-10-27-035	8/11/2010	17:00	35	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-27-045	8/11/2010	17:25	45	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-27-055	8/11/2010	17:50	55	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-27-065	8/11/2010	18:45	65	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes: NA - Not Applicable; ug/L is micrograms per liter; mg/l - miligrams per liter; J means estimated results; B indicates that analyte was detected in the associated method blank

TABLE 2
Groundwater Profile Results
Shepley's Hill Landfill, Devens, MA

Boring Location	Sample ID	Date	Time (Military Format)	Depth	Turbidity NTU	DO mg/L	pH	Temp Celcius	Spec Cond uS/cm	ORP mV	Color	Hardness mg/l	Alkalinity mg CaCO3/L	TDS mg/l	TSS mg/l	Chloride mg/l	Ammonia mg/l	Nitrite mg/l	Nitrate mg/l
GP-10-11	GP-10-11-039	8/3/2010	14:10	39	14.5	0.44	5.61	16.26	302	56.2	Clear	NA	170	NA	200	21	2.29	< 0.002	0.031 J
	GP-10-11-049	8/3/2010	15:15	49	5373	0.27	6.2	18.09	278	-43.7	Cloudy	NA	180	NA	7700	13	3.36	< 0.002	0.046 J
	DUP3-080310	8/3/2010	15:15	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-11-059	8/3/2010	19:00	55	203	0.78	6.3	24.09	354	-46.3	Cloudy	NA	210	NA	13000	25	0.0281 J	< 0.002	0.04 J
	GP-10-11-064	8/4/2010	11:30	64	Max	0.11	7.74	20.99	439	-150.4	Silty	NA	380	NA	55000	22	1.29	< 0.002	0.045 J
GP-10-12	GP-10-12-044	8/5/2010	13:05	44	203	0.43	5.97	18.23	385	17.6	Sl Cloudy	NA	230	NA	1300	3.3	3.6	< 0.002	0.028 J
	GP-10-12-054	8/5/2010	15:00	54	Max	0.16	6.11	21.93	368	-17.1	Silty	NA	220	NA	NA	7.6	3.14	<0.002	0.05
	GP-10-12-065	8/9/2010	8:20	65	Max	0.13	6.79	12.95	543	-103.3	Silty	NA	240	NA	NA	26	1.09	0.01 J	0.14
GP-10-13	GP-10-13-039	8/9/2010	14:45	39	1409	0.18	5.36	21.58	740	101.2	Cloudy	NA	460	NA	2500	11	14.2	<0.002	0.03 J
	GP-10-13-049	8/9/2010	17:00	49	144	0.48	6.17	21.68	858	45.5	Cloudy	NA	490	NA	NA	46	17.3	< 0.002	0.024 J
	GP-10-13-059	8/10/2010	9:05	59	565	0.16	6.4	18.34	800	-33.3	Cloudy	NA	470	NA	890	17	14.3	< 0.002	0.06
	GP-10-13-069	8/10/2010	11:15	69	151	0.81	6.09	21.32	545	-2.1	Cloudy	NA	310	NA	NA	20	5.91	< 0.002	0.07
	GP-10-13-079	8/10/2010	13:10	79	128	8.68	6.37	21.89	338	15.9	Cloudy	NA	77	NA	NA	66	0.384	0.01 J	0.37
GP-10-14	GP-10-14-039	8/16/2010	09:50	39	49.9	0.36	5.54	15.86	510	50.8	Cloudy	NA	300	NA	270	11	11.5	< 0.002	0.04 J
	GP-10-14-049	8/16/2010	11:20	49	22.5	0.41	5.86	15.99	474	14.9	Clear	NA	290	NA	320	4.6	7.44	< 0.002	0.028 J
	DUP-081610	8/16/2010	11:20	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-14-059	8/16/2010	13:00	59	1129	0.17	5.86	16.31	553	-0.9	Silty	NA	340	NA	NA	9.6	6.46	< 0.002	0.03 J
	GP-10-14-069	8/16/2010	14:35	69	111	0.18	5.82	17.71	444	-8.7	Cloudy	NA	270	NA	620	3.3	4.65	< 0.002	0.014 J
	GP-10-14-079	8/17/2010	07:45	79	38.8	0.31	6.18	14.71	395	34.2	Clear	NA	210	NA	170	5.7	2.67	0.01 J	<0.01
GP-10-15	GP-10-15-039	8/11/2010	9:30	39	25.52	0.25	5.81	17.99	543	-6.4	Silty	NA	340	NA	NA	5	7.52	< 0.002	0.06
	GP-10-15-049	8/11/2010	11:25	49	41.3	0.45	6	20.68	589	-40.5	Clear	NA	330	NA	190	12	2.61	< 0.002	0.05
	GP-10-15-059	8/11/2010	11:45	59	207	5.11	8.3	21.89	313	181.1	Cloudy	NA	89	NA	NA	59	0.508	0.01 J	0.48
GP-10-16	GP-10-16-024	8/17/2010	16:15	24	1235	3.06	6.27	12.58	107	101.1	Silty	NA	33	NA	3900	3.6	0.0455 J	<0.002	0.65
	DUP-081710	8/17/2010	16:15	24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-16-034	8/18/2010	07:55	34	609	12.11	8.25	13.91	350	78.3	Silty	NA	51	NA	3000	15	0.079	<0.002	0.24
	GP-10-16-054	8/18/2010	11:20	54	101.4	12.62	7.43	16.85	398	27.4	Cloudy	NA	74	NA	160	64	0.173	0.01 J	0.44
	Dup-081810	8/18/2010	11:20	54	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-16-064	8/18/2010	13:40	64	21.5	2.45	6.57	14.73	492	-78.8	Clear	210	210	NA	NA	7.1	6.98	< 0.002	< 0.01
	GP-10-16-074	8/19/2010	07:45	74	122	0.66	6.94	11.26	720	-140.3	Cloudy	NA	160	NA	390	56	1.71	0.01 J	0.43
	GP-10-16-084	8/19/2010	09:40	84	16.6	0.9	6.95	14.92	837	-104.8	Clear	NA	420	NA	290	43	0.224	0.01 J	< 0.01
	DUP-081910	8/19/2010	09:40	84	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-16-094	8/19/2010	12:35	94	180	5.06	6.9	17.45	382	-21.4	Cloudy	NA	110	NA	170	68	0.159	0.02	0.48
GP-10-17	GP-10-17-009	8/2/2010	11:40	9	20.1	4.91	1.65	14.07	1035	178.2	Clear	NA	NA	NA	9.8	NA	NA	NA	NA
	GP-10-17-019	8/2/2010	12:20	19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	43	NA	NA	NA	NA
	DUP-080210	8/2/2010	12:20	19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	11	NA	NA	NA	NA
	GP-10-17-029	8/2/2010	16:00	29	6.06	2.17	6.01	13.72	747	63.4	Clear	NA	NA	NA	8.5	NA	NA	NA	NA
	GP-10-17-039	8/2/2010	16:45	39	37.9	0.26	6.83	13.9	542	-138.2	Clear	NA	NA	NA	95	NA	NA	NA	NA
	GP-10-17-049	8/2/2010	17:30	49	65.6	1.4	6.52	14.8	670	-28.3	Little Cloudy	NA	NA	NA	290	NA	NA	NA	NA
	GP-10-17-056	8/2/2010	17:45	56	660	0.24	6.73	14.68	666	-84.3	Cloudy	NA	NA	NA	1700	NA	NA	NA	NA
GP-10-18	GP-10-18-007	8/2/2010	18:34	7	18.3	0.27	6.06	17.64	729	58.7	Clear	NA	NA	NA	13	NA	NA	NA	NA
	GP-10-18-017	8/3/2010	8:25	17	10.6	0.44	6.14	12.87	673	55.8	Clear	NA	NA	NA	7.5	NA	NA	NA	NA
	GP-10-18-027	8/3/2010	9:00	27	199	0.44	6.3	13.55	681	-45.1	Little Cloudy	NA	NA	NA	65	NA	NA	NA	NA
	DUP-080310	8/3/2010	9:00	27	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-18-037	8/3/2010	11:00	37	84.7	0.44	6.4	13.61	628	-45.5	Little Cloudy	NA	NA	NA	48	NA	NA	NA	NA
	GP-10-18-047	8/3/2010	12:10	47	127	0.45	6.54	14.6	809	-80.7	Little Cloudy	NA	NA	NA	160	NA	NA	NA	NA
GP-10-19	GP-10-19-009	8/3/2010	14:35	9	1.1	3.55	5.85	17.73	174	98.5	Clear	NA	NA	NA	<5.0	NA	NA	NA	NA
	DUP2-080310	8/3/2010	14:35	9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-19-019	8/3/2010	15:15	19	141	2.19	6.01	14.88	759	90.4	Clear	NA	NA	NA	70	NA	NA	NA	NA
	GP-10-19-029	8/3/2010	16:05	29	66.6	0.53	6.64	13.88	682	-111	Clear	NA	NA	NA	160	NA	NA	NA	NA
	GP-10-19-039	8/3/2010	17:00	39	36.6	1.65	6.6	15.59	736	-77.7	Clear	NA	NA	NA	89	NA	NA	NA	NA
	GP-10-19-046	8/3/2010	18:15	46	< 1000	1.88	650	14.58	737	-44.1	Cloudy	NA	NA	NA	440	NA	NA	NA	NA

TABLE 2
Groundwater Profile Results
Shepley's Hill Landfill, Devens, MA

Boring Location	Sample ID	Date	Time (Military Format)	Depth	Turbidity NTU	DO mg/L	pH	Temp Celcius	Spec Cond uS/cm	ORP mV	Color	Hardness mg/l	Alkalinity mg CaCO3/L	TDS mg/l	TSS mg/l	Chloride mg/l	Ammonia mg/l	Nitrite mg/l	Nitrate mg/l
GP-10-20	GP-10-20-009	8/4/2010	9:30	9	12.5	6.46	6.22	16.7	262	60.4	Clear	NA	NA	NA	150	NA	NA	NA	NA
	GP-10-20-019	8/4/2010	10:10	19	17.2	0.67	6.09	14.35	609	50.6	Clear	NA	NA	NA	16	NA	NA	NA	NA
	DUP-080410	8/4/2010	10:10	19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-20-029	8/4/2010	11:00	29	139	0.33	6.7	13.44	521	-92.8	sl. Cloudy	NA	NA	NA	180	NA	NA	NA	NA
	GP-10-20-039	8/4/2010	13:00	39	91.6	0.37	6.49	13.51	649	-38.8	Clear	NA	NA	NA	120	NA	NA	NA	NA
GP-10-21	GP-10-21-011	8/4/2010	15:05	11	54.1	6.33	6.14	15.57	182	101.5	Clear	NA	NA	NA	88	NA	NA	NA	NA
	GP-10-21-021	8/4/2010	15:45	21	134	1.43	6.07	14.29	728	97.5	Little Cloudy	NA	NA	NA	53	NA	NA	NA	NA
	DUP2-080410	8/4/2010	15:45	21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-21-031	8/4/2010	16:30	31	34.7	1.54	6.35	13.78	503	44.9	Clear	NA	NA	NA	50	NA	NA	NA	NA
	GP-10-21-041	8/4/2010	17:00	41	83.7	0.42	6.66	14.14	627	-80.2	Clear	NA	NA	NA	130	NA	NA	NA	NA
	GP-10-21-051	8/4/2010	18:05	51	315	0.32	6.56	16.8	277	60.9	Silty	NA	NA	NA	240	NA	NA	NA	NA
	GP-10-21-060	8/4/2010	19:00	60	<1000	0.72	6.68	16.59	828	-64.2	Silty	NA	NA	NA	240	NA	NA	NA	NA
GP-10-22	GP-10-22-011	8/10/2010	14:40	11	6.27	7.43	5.92	14.7	306	115.8	Clear	NA	NA	NA	< 5	NA	NA	NA	NA
	GP-10-22-021	8/10/2010	15:00	21	45	0.63	6.19	13.42	440	75.5	Clear	NA	NA	NA	48	NA	NA	NA	NA
	GP-10-22-031	8/10/2010	15:50	31	54	0.72	6.22	13.22	766	68.1	Clear	NA	NA	NA	51	NA	NA	NA	NA
	GP-10-22-041	8/10/2010	16:30	41	85.4	0.99	6.38	13.3	434	-32.9	Clear	NA	NA	NA	68	NA	NA	NA	NA
	GP-10-22-051	8/10/2010	17:30	51	83.5	0.88	6.55	13.57	585	-20.9	Clear	NA	NA	NA	160	NA	NA	NA	NA
	GP-10-22-061	8/10/2010	18:30	61	29.9	1.02	6.77	13.28	75	-51.1	Clear	NA	NA	NA	670	NA	NA	NA	NA
GP-10-23	GP-10-23-017	8/5/2010	11:00	17	5.37	4.03	5.99	14.46	380	76.2	Clear	NA	NA	NA	<5.0	NA	NA	NA	NA
	DUP-080510	8/5/2010	11:00	17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA
	GP-10-23-027	8/5/2010	11:45	27	58.5	3.35	6.08	13.1	1060	94.3	Clear	NA	NA	NA	24	NA	NA	NA	NA
	GP-10-23-037	8/5/2010	12:25	37	58.4	3.41	5.96	13.75	961	90.9	Clear	NA	NA	NA	95	NA	NA	NA	NA
	GP-10-23-047	8/5/2010	14:20	47	374	3.31	[illegible]	[illegible]	490	-95.1	Cloudy	NA	NA	NA	500	NA	NA	NA	NA
	GP-10-23-057	8/5/2010	16:05	57	254	0.86	6.65	14.51	743	-100.2	Little Cloudy	NA	NA	NA	300	NA	NA	NA	NA
	DUP2-080510	8/5/2010	16:05	57	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP-10-24	GP-10-24-015	8/9/2010	15:44	15	37.4	3.1	5.94	14.28	762	116.3	Clear	NA	NA	NA	7.4	NA	NA	NA	NA
	DUP-080910	8/9/2010	15:44	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-24-025	8/9/2010	16:30	25	44.9	5.21	6.05	13.23	710	104.8	Clear	NA	NA	NA	36	NA	NA	NA	NA
	GP-10-24-035	8/9/2010	17:05	35	45.3	1.12	5.94	14.08	9.14	92.4	Clear	NA	NA	NA	64	NA	NA	NA	NA
	GP-10-24-045	8/9/2010	17:45	45	98.6	1.07	6.54	13.61	1332	-71.5	Clear	NA	NA	NA	96	NA	NA	NA	NA
	GP-10-24-055	8/9/2010	18:30	55	< 1000	0.77	6.61	13.41	914	-95.3	Cloudy	NA	NA	NA	440	NA	NA	NA	NA
GP-10-25	GP-10-25-025	8/10/2010	10:00	25	889	3.57	6.03	13.07	506	69.3	Cloudy	NA	NA	NA	730	NA	NA	NA	NA
	GP-10-25-035	8/10/2010	10:45	35	223	1.69	5.94	13.1	745	69.3	Little Cloudy	NA	NA	NA	240	NA	NA	NA	NA
	DUP-081010	8/10/2010	10:45	35	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-25-045	8/10/2010	11:50	45	137	1.13	6.56	12.86	6.22	-74.4	Little Cloudy	NA	NA	NA	160	NA	NA	NA	NA
	DUP2-081010	8/10/2010	11:50	45	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GP-10-26	GP-10-26-011	8/11/2010	9:20	11	9.11	6.78	5.59	14.08	123	139.4	Clear	NA	NA	NA	13	NA	NA	NA	NA
	GP-10-26-021	8/11/2010	10:20	21	33.7	3.01	6.05	12.5	275	84.4	Clear	NA	NA	NA	22	NA	NA	NA	NA
	DUP-081110	8/11/2010	10:20	21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-26-031	8/11/2010	10:35	31	84.8	2.67	6.04	11.74	652	84.5	Clear	NA	NA	NA	56	NA	NA	NA	NA
	GP-10-26-041	8/11/2010	11:05	41	207	0.72	6.05	12.11	631	61.5	Little Cloudy	NA	NA	NA	320	NA	NA	NA	NA
	GP-10-26-051	8/11/2010	12:15	51	76.1	1.02	6.27	12.65	485	36.3	Clear	NA	NA	NA	120	NA	NA	NA	NA
	GP-10-26-061	8/11/2010	13:40	61	376	1.49	6.45	12.74	741	-6.8	Little Cloudy	NA	NA	NA	2300	NA	NA	NA	NA
	GP-10-26-071	8/11/2010	14:10	71	< 1000	0.95	6.58	13.96	860	-36.1	Cloudy	NA	NA	NA	160	NA	NA	NA	NA
GP-10-27	GP-10-27-025	8/11/2010	16:05	25	21.6	1.33	6.46	14.8	332	47.7	Clear	NA	NA	NA	40	NA	NA	NA	NA
	DUP2-081110	8/11/2010	16:05	25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-27-035	8/11/2010	17:00	35	101.1	1.07	5.87	13.44	1022	76.8	Clear	NA	NA	NA	470	NA	NA	NA	NA
	GP-10-27-045	8/11/2010	17:25	45	339	0.71	6.58	13.58	647	-93.6	Cloudy	NA	NA	NA	620	NA	NA	NA	NA
	GP-10-27-055	8/11/2010	17:50	55	294	0.95	6.65	13.28	644	-108.8	Little Cloudy	NA	NA	NA	2300	NA	NA	NA	NA
	GP-10-27-065	8/11/2010	18:45	65	<1000	1.1	6.66	13.37	766	-93.3		NA	NA	NA	980	NA	NA	NA	NA

Notes: NA - Not Applicable; ug/L is micrograms per liter; mg/l - miligrams per liter; J means estimated results; B indicates that analyte was detected in the associated method blank; TDS - Total Dissolved Solids; TSS - Total Suspended Solids; DO - Dissolved Oxygen; ORP - Oxygen Reduction Potential

TABLE 2
Groundwater Profile Results
Shepley's Hill Landfill, Devens, MA

Boring Location	Sample ID	Date	Time (Military Format)	Depth	Sulfide mg/l	Sulfate mg/l	COD mg/l	TOC mg/l	DOC mg/l	DIC mg/l	Notes
GP-10-11	GP-10-11-039	8/3/2010	14:10	39	< 0.10	6.5	< 7	NA	3.6	63	
	GP-10-11-049	8/3/2010	15:15	49	< 0.1	19	160	NA	2.8	52	
	DUP3-080310	8/3/2010	15:15	49	NA	NA	NA	NA	NA	NA	
	GP-10-11-059	8/3/2010	19:00	55	< 0.10	49	180	NA	3.1	37	
	GP-10-11-064	8/4/2010	11:30	64	< 0.10	32	160	NA	2.8	44	
GP-10-12	GP-10-12-044	8/5/2010	13:05	44	< 0.10	1.6	13 J	NA	4.1	72	
	GP-10-12-054	8/5/2010	15:00	54	< 0.10	3.1	7.0	NA	4.7	66	
	GP-10-12-065	8/9/2010	8:20	65	<0.10	9.2	38	NA	7.1	56	
GP-10-13	GP-10-13-039	8/9/2010	14:45	39	<0.10	<0.12	40	NA	6.8	160	
	GP-10-13-049	8/9/2010	17:00	49	< 0.1	0.58 J	36	NA	7.7	170	
	GP-10-13-059	8/10/2010	9:05	59	< 0.1	< 0.12	38	NA	7.8	130	
	GP-10-13-069	8/10/2010	11:15	69	< 0.1	0.56 J	47	NA	5.2	100	
	GP-10-13-079	8/10/2010	13:10	79	< 0.1	8.7	13 J	NA	1.7	20	
GP-10-14	GP-10-14-039	8/16/2010	09:50	39	< 0.10	< 0.12	26	NA	6.1	78	
	GP-10-14-049	8/16/2010	11:20	49	< 0.10	0.51 J	38	NA	6	77	
	DUP-081610	8/16/2010	11:20	49	NA	NA	NA	NA	NA	NA	
	GP-10-14-059	8/16/2010	13:00	59	< 0.10	2	43	NA	4.7	82	
	GP-10-14-069	8/16/2010	14:35	69	< 0.10	1.4	41	NA	3.9	76	
	GP-10-14-079	8/17/2010	07:45	79	<0.10	3.8	33	NA	4.2	53	
GP-10-15	GP-10-15-039	8/11/2010	9:30	39	< 0.10	0.58 J	25	NA	4.9	150	
	GP-10-15-049	8/11/2010	11:25	49	< 0.1	4.2	40	NA	3	64	
	GP-10-15-059	8/11/2010	14:15	59	< 0.10	15	22	NA	1	20	
GP-10-16	GP-10-16-024	8/17/2010	16:15	24	<0.10	8.8	9.7 J	NA	<1.0	12	
	DUP-081710	8/17/2010	16:15	24	NA	NA	NA	NA	NA	NA	
	GP-10-16-034	8/18/2010	07:55	34	<0.10	11	19 J	NA	4.2	12	
	GP-10-16-054	8/18/2010	11:20	54	<0.10	12	22	NA	2.1	14	
	Dup-081810	8/18/2010	11:20	54	NA	NA	NA	NA	NA	NA	
	GP-10-16-064	8/18/2010	13:40	64	< 0.01	7.3	24	NA	3.7	46	
	GP-10-16-074	8/19/2010	07:45	74	< 0.1	9.7	790	NA	15	47	
	GP-10-16-084	8/19/2010	09:40	84	< 0.1	0.59 J	43	NA	5.6	86	
	DUP-081910	8/19/2010	09:40	84	NA	NA	NA	NA	NA	NA	
	GP-10-16-094	8/19/2010	12:35	94	< 0.1	11	48	NA	7.3	32	
GP-10-17	GP-10-17-009	8/2/2010	11:40	9	NA	NA	NA	NA	2.8	13	
	GP-10-17-019	8/2/2010	12:20	19	NA	NA	NA	NA	1.2	14	
	DUP-080210	8/2/2010	12:20	19	NA	NA	NA	NA	1.2	13	
	GP-10-17-029	8/2/2010	16:00	29	NA	NA	NA	NA	1.1	12	
	GP-10-17-039	8/2/2010	16:45	39	NA	NA	NA	NA	4.1	72	
	GP-10-17-049	8/2/2010	17:30	49	NA	NA	NA	NA	3.6	72	
	GP-10-17-056	8/2/2010	17:45	56	NA	NA	NA	NA	3.7	77	
GP-10-18	GP-10-18-007	8/2/2010	18:34	7	NA	NA	NA	NA	1.4	24	
	GP-10-18-017	8/3/2010	8:25	17	NA	NA	NA	NA	1.6	32	
	GP-10-18-027	8/3/2010	9:00	27	NA	NA	NA	NA	3.6	76	
	DUP-080310	8/3/2010	9:00	27	NA	NA	NA	NA			
	GP-10-18-037	8/3/2010	11:00	37	NA	NA	NA	NA	5	57	
	GP-10-18-047	8/3/2010	12:10	47	NA	NA	NA	NA	6.6	98	
GP-10-19	GP-10-19-009	8/3/2010	14:35	9	NA	NA	NA	NA	1.1	6.4	
	DUP2-080310	8/3/2010	14:35	9	NA	NA	NA	NA	NA	NA	
	GP-10-19-019	8/3/2010	15:15	19	NA	NA	NA	NA	1	26	
	GP-10-19-029	8/3/2010	16:05	29	NA	NA	NA	NA	4.7	62	
	GP-10-19-039	8/3/2010	17:00	39	NA	NA	NA	NA	5.1	71	
	GP-10-19-046	8/3/2010	18:15	46	NA	NA	NA	NA	4.9	85	

TABLE 2
Groundwater Profile Results
Shepley's Hill Landfill, Devens, MA

Boring Location	Sample ID	Date	Time (Military Format)	Depth	Sulfide mg/l	Sulfate mg/l	COD mg/l	TOC mg/l	DOC mg/l	DIC mg/l	Notes
GP-10-20	GP-10-20-009	8/4/2010	9:30	9	NA	NA	NA	NA	1.2	9.8	
	GP-10-20-019	8/4/2010	10:10	19	NA	NA	NA	NA	1.6	37	
	DUP-080410	8/4/2010	10:10	19	NA	NA	NA	NA	NA	NA	
	GP-10-20-029	8/4/2010	11:00	29	NA	NA	NA	NA	4.2	61	
	GP-10-20-039	8/4/2010	13:00	39	NA	NA	NA	NA	4.9	82	
GP-10-21	GP-10-21-011	8/4/2010	15:05	11	NA	NA	NA	NA	< 1	9.1	
	GP-10-21-021	8/4/2010	15:45	21	NA	NA	NA	NA	1.2	27	
	DUP2-080410	8/4/2010	15:45	21	NA	NA	NA	NA	NA	NA	
	GP-10-21-031	8/4/2010	16:30	31	NA	NA	NA	NA	3.9	65	
	GP-10-21-041	8/4/2010	17:00	41	NA	NA	NA	NA	5.2	79	
	GP-10-21-051	8/4/2010	18:05	51	NA	NA	NA	NA	4.7	100	
	GP-10-21-060	8/4/2010	19:00	60	NA	NA	NA	NA	4.4	84	
GP-10-22	GP-10-22-011	8/10/2010	14:40	11	NA	NA	NA	NA	1.4	15	
	GP-10-22-021	8/10/2010	15:00	21	NA	NA	NA	NA	2.4	24	
	GP-10-22-031	8/10/2010	15:50	31	NA	NA	NA	NA	1.5	26	
	GP-10-22-041	8/10/2010	16:30	41	NA	NA	NA	NA	2.8	36	
	GP-10-22-051	8/10/2010	17:30	51	NA	NA	NA	NA	3	68	
	GP-10-22-061	8/10/2010	18:30	61	NA	NA	NA	NA	2.3	63	
GP-10-23	GP-10-23-017	8/5/2010	11:00	17	NA	NA	NA	NA	1.9	22	
	DUP-080510	8/5/2010	11:00	17	NA	NA	NA	NA	NA	NA	
	GP-10-23-027	8/5/2010	11:45	27	NA	NA	NA	NA	2.1	20	
	GP-10-23-037	8/5/2010	12:25	37	NA	NA	NA	NA	1.1	26	
	GP-10-23-047	8/5/2010	14:20	47	NA	NA	NA	NA	4.1	52	
	GP-10-23-057	8/5/2010	16:05	57	NA	NA	NA	NA	6	87	
	DUP2-080510	8/5/2010	16:05	57	NA	NA	NA	NA	NA	NA	
GP-10-24	GP-10-24-015	8/9/2010	15:44	15	NA	NA	NA	NA	<1.0	20	
	DUP-080910	8/9/2010	15:44	15	NA	NA	NA	NA	NA	NA	
	GP-10-24-025	8/9/2010	16:30	25	NA	NA	NA	NA	< 1	15	
	GP-10-24-035	8/9/2010	17:05	35	NA	NA	NA	NA	1.5	37	
	GP-10-24-045	8/9/2010	17:45	45	NA	NA	NA	NA	4.4	60	
	GP-10-24-055	8/9/2010	18:30	55	NA	NA	NA	NA	5.9	96	
GP-10-25	GP-10-25-025	8/10/2010	10:00	25	NA	NA	NA	NA	1.4	13	
	GP-10-25-035	8/10/2010	10:45	35	NA	NA	NA	NA	1.6	43	
	DUP-081010	8/10/2010	10:45	35	NA	NA	NA	NA	NA	NA	
	GP-10-25-045	8/10/2010	11:50	45	NA	NA	NA	NA	3.6	61	
	DUP2-081010	8/10/2010	11:50	45	NA	NA	NA	NA	NA	NA	
GP-10-26	GP-10-26-011	8/11/2010	9:20	11	NA	NA	NA	NA	< 1	14	
	GP-10-26-021	8/11/2010	10:20	21	NA	NA	NA	NA	< 1	17	
	DUP-081110	8/11/2010	10:20	21	NA	NA	NA	NA	NA	NA	
	GP-10-26-031	8/11/2010	10:35	31	NA	NA	NA	NA	< 1	22	
	GP-10-26-041	8/11/2010	11:05	41	NA	NA	NA	NA	1.7	26	
	GP-10-26-051	8/11/2010	12:15	51	NA	NA	NA	NA	2.4	48	
	GP-10-26-061	8/11/2010	13:40	61	NA	NA	NA	NA	4.5	98	
	GP-10-26-071	8/11/2010	14:10	71	NA	NA	NA	NA	3.9	110	
GP-10-27	GP-10-27-025	8/11/2010	16:05	25	NA	NA	NA	NA	< 1	12	
	DUP2-081110	8/11/2010	16:05	25	NA	NA	NA	NA	NA	NA	
	GP-10-27-035	8/11/2010	17:00	35	NA	NA	NA	NA	1.3	25	
	GP-10-27-045	8/11/2010	17:25	45	NA	NA	NA	NA	4.4	64	
	GP-10-27-055	8/11/2010	17:50	55	NA	NA	NA	NA	4.5	60	
	GP-10-27-065	8/11/2010	18:45	65	NA	NA	NA	NA	5.7	71	

Notes: NA - Not Applicable; ug/L is micrograms per liter; mg/l - miligrams per liter; J means estimated results; COD - Chemical Oxygen Demend; TOC - Total Organic Carbon; DOC - Dissolved Organic Carbon; DIC - Dissolved Inorganic Carbon

TABLE 3
GROUNDWATER MONITORING WELL RESULTS
Sheple'y Hill Landfill, Devens Massachusetts

Boring Location	Sample ID	Date	Aluminum Total (ug/L)	Aluminum Dissolved (ug/L)	Antimony Total (ug/L)	Antimony Dissolved (ug/L)	Arsenic Total (ug/L)	Arsenic Dissolved (ug/L)	Barium Total (ug/L)	Barium Dissolved (ug/L)	Beryllium Total (ug/L)	Beryllium Dissolved (ug/L)	Cadmium Total (ug/L)	Cadmium Dissolved (ug/L)	Calcium Total (ug/L)	Calcium Dissolved (ug/L)
SHM-10-01	SHM-10-01-071310	7/13/2010	76.2	< 7.64	NA	NA	1.16 J	0.68 J	NA	NA	NA	NA	NA	NA	42400	42700
	SHM-10-01	8/12/2010	NA	<19.1	NA	NA	NA	3.51 J	NA	NA	NA	NA	NA	NA	NA	41600
	SHM-10-01-090810	9/8/2010	33.3 J	< 19.1	NA	NA	8.15	7.87	NA	NA	NA	NA	NA	NA	43100	43500
SHM-10-02	SHM-10-02-071510	7/15/2010	236	2.09 J	NA	NA	0.74	0.43 J	NA	NA	NA	NA	NA	NA	113000	117000
	Dup-071510	7/15/2010	189	2.02 J	NA	NA	0.59	0.45 J	NA	NA	NA	NA	NA	NA	114000	117000
	SHM010-02-090710	9/7/2010	85.3	4.15 J	NA	NA	1.11	1.07	NA	NA	NA	NA	NA	NA	115000 J	114000 J
SHM-10-03	SHM-10-03-071410	7/14/2010	388	< 7.64	NA	NA	2.36	0.78 J	NA	NA	NA	NA	NA	NA	112000	109000
	DUP-071410	7/14/2010	810	< 7.64	NA	NA	4.59	0.5 J	NA	NA	NA	NA	NA	NA	112000	111000
	SHM-10-03-090710	9/7/2010	168	< 7.64	NA	NA	1.47 J	0.51 J	NA	NA	NA	NA	NA	NA	153000	157000
	DUP-090710	9/7/2010	208	< 7.64	NA	NA	1..51 J	0.71 J	NA	NA	NA	NA	NA	NA	149000	154000
SHM-10-04	SHM-10-04-071410	7/14/2010	473	3.21 J	NA	NA	1.62	0.64	NA	NA	NA	NA	NA	NA	60300 J	57800
	SHM-10-04-090710	9/7/2010	87.2	< 7,.64	NA	NA	1 J	0.79 J	NA	NA	NA	NA	NA	NA	72100	72800
SHM-10-05A	SHM-10-05A-071510	7/15/2010	35	2.83 J	NA	NA	4.7	4.6	NA	NA	NA	NA	NA	NA	14200	14500
	SHM-10-05A-090810	9/8/2010	43.2	3.8 J	NA	NA	5.68	5.21	NA	NA	NA	NA	NA	NA	14100	14200
SHM-10-06	SHM-10-06-070810	7/8/2010	1150	3.44 J	NA	NA	2210 J	1680 J	NA	NA	NA	NA	NA	NA	40900	41000 J
	DUP-070810	7/8/2010	1270	2.13 J	NA	NA	2520	1520	NA	NA	NA	NA	NA	NA	46500	41100
	SHM-10-06-090810	9/8/2010	< 19.1	< 19.1	NA	NA	2580	2710	NA	NA	NA	NA	NA	NA	48200	50300
SHM-10-06A	SHM-10-06A-070710	7/7/2010	38.7 J	12.2	NA	NA	64.8	61	NA	NA	NA	NA	NA	NA	15700	15300 J
	DUP-070710	7/7/2010	27.7	12.4	NA	NA	65.1	60.1	NA	NA	NA	NA	NA	NA	15800	15500
	SHM-1--06A-090910	9/9/2010	1910	11.6 J	NA	NA	102	94.2	NA	NA	NA	NA	NA	NA	33000	33300
	DUP-090910	9/9/2010	1990	8.97 J	NA	NA	102	83	NA	NA	NA	NA	NA	NA	31800	25300
SHM-10-07	SHM-10-07-052710	5/27/2010	3870	< 19.1	NA	NA	816 J	818 J	NA	NA	NA	NA	NA	NA	62200 J	60600 J
	DUP-052710	5/27/2010	3640	< 19.1	NA	NA	827	825	NA	NA	NA	NA	NA	NA	62600	61100
	SHM-10-07-090910	9/9/2010	538	4.17 J	NA	NA	979	918	NA	NA	NA	NA	NA	NA	47400	43200
SHM-10-08	SHM-10-08-071510	7/15/2010	591	< 3.82	NA	NA	2.72	0.73 J	NA	NA	NA	NA	NA	NA	160000	152000
	SHM-10-08-090710	9/7/2010	33.2	< 3.82	NA	NA	1.4	1.55	NA	NA	NA	NA	NA	NA	182000	195000
SHM-10-10	SHM-10-10-071310	7/13/2010	88 J	< 19.1	NA	NA	2 J	1.25 J	NA	NA	NA	NA	NA	NA	95100	92800
	DUP-071310	7/13/2010	79 J	< 19.1	NA	NA	1.34 J	1.13 J	NA	NA	NA	NA	NA	NA	92400	94600
	SHM-10-10	8/12/2010		<19.1	NA	NA		3.62 J	NA	NA	NA	NA	NA	NA		83800
	SHM-10-10-090810	9/8/2010	27.6 J	< 19.1	NA	NA	2.57 J	2.4 J	NA	NA	NA	NA	NA	NA	107000	96800
	DUP-090810	9/8/2010	86.6 J	< 19.1	NA	NA	2.58 J	6.66	NA	NA	NA	NA	NA	NA	96300	101000

TABLE 3
GROUNDWATER MONITORING WELL RESULTS
Sheple'y Hill Landfill, Devens Massachusetts

Boring Location	Sample ID	Date	Aluminum Total (ug/L)	Aluminum Dissolved (ug/L)	Antimony Total (ug/L)	Antimony Dissolved (ug/L)	Arsenic Total (ug/L)	Arsenic Dissolved (ug/L)	Barium Total (ug/L)	Barium Dissolved (ug/L)	Beryllium Total (ug/L)	Beryllium Dissolved (ug/L)	Cadmium Total (ug/L)	Cadmium Dissolved (ug/L)	Calcium Total (ug/L)	Calcium Dissolved (ug/L)
SHM-10-11	SHM-10-11	8/30/2010	113	10.2 J	0.26 J	0.53 J	356	342 J	40.3	36.5	<0.118	<0.118	<0.118	<0.118	23900	21200 J
	SHM-10-11-101910	10/19/2010	111	< 7.64	0.68 J	0.78 J	470	463	43.2	42.6	< 0.236	< 0.236	< 0.236	< 0.236	21900	22200
SHM-10-12	SHM-10-12	8/30/2010	50.2 J	27.6 J	1.38 J	2.99 J	2880	3560	44.1	55.7	<0.590	<0.590	<0.590	<0.590	25000	33000
	DUP-083010	8/30/2010	112	27.5 J	<1.20	1.56 J	3210	3410	50.6	53.7	<0.590	<0.590	<0.590	<0.590	27900	30600
	SHM-10-12-102010	10/20/2010	10.8 J	57.4	< 0.6	0.6	2980	3120	42.4	42.6	< 0.295	< 0.295	< 0.295	< 0.295	29000	29000
	DUP-102010	10/20/2010	50.2	< 9.56	< 0.600	< 0.600	3160	3000	42.8	41.9	< 0.295	< 0.295	< 0.295	< 0.295	29200	28300
SHM-10-13	GP-10-13-090110	9/1/2010	233	6.02 J	0.19 J	0.17 J	619 J	575	160	153	<0.059	<0.059	<0.059	<0.059	68000	61400
	SHM-10-13-101910	10/19/2010	305	< 7.64	< 0.48	< 0.48	700	672	154	154	< 0.236	< 0.236	< 0.236	< 0.236	67200	65000
	DUP-101910	10/19/2010	343	< 7.64	, 0.480	0.48 J	648	674	138	154	< 0.236	< 0.236	< 0.236	< 0.236	60300	64200
SHM-10-14	SHM-10-14-090210	9/2/2010	262	≤ 19.1	< 1.2	< 1.2	4280	4100	80.5	53.8	< 0.59	< 0.059	< 0.59	< 0.059	69300	55300
	SHM-10-14-101910	10./19/10	811	< 9.56	0.67 J	< 0.600	5990 J	5860	87.5	43.4	< 0.295	< 0.295	< 0.295	< 0.295	70800	57900
SHM-10-15	GP-10-15-090110	9/1/2010	125	<19.1	1.93 J	1.87 J	7930	8110	55	52.4	<0.590	<0.590	<0.590	<0.590	61300	61500
	SHM-10-15-090110		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	DUP-090110	9/1/2010	284	<19.1	<1.20	1.25 J	7610	6460	50.7	39.1	<0.590	<0.590	<0.590	<0.590	58500	46800
	SHM-10-15-102010	10/20/2010	312	< 19.1	< 1.20	< 1.20	6090	6230	42.4	43	< 0.59	< 0.59	< 0.59	< 0.59	51200	51800
SHM-10-16	SHM-10-16-090210	9/2/2010	1180	3.59 J	0.37 J	0.24 J	487	495	72.8	73.4	0.07 J	< 0.059	< 0.059	< 0.059	69700	73900
	DUP-090210	9/2/2010	1360	3.27 J	0.32 J	0.17 J	542	489	82.1	69.4	0.07 J	< 0.059	0.059	0.059	76800	70700
	SHM-10-16-102010	10/20/2010	487	2.53 J	< 0.120	0.16 J	1180	1090	59.2	51.6	< 0.059	0.06 J	< 0.059	0.06 J	73200	68100
SHL-23	SHL-23	8/12/2010	NA	20.8	NA	NA	NA	0.14 J	NA	NA	NA	NA	NA	NA	NA	2230
SHM-05-39A	SHM-05-39A	8/12/2010	NA	3.57 J	NA	NA	NA	236	NA	NA	NA	NA	NA	NA	NA	16600
SHM-07-03	SHM-07-03	8/12/2010	NA	11	NA	NA	NA	0.29 J	NA	NA	NA	NA	NA	NA	NA	6580
	DUP2-081210	8/12/2010	NA	9.63 J	NA	NA	NA	0.77	NA	NA	NA	NA	NA	NA	NA	6860
SHM-07-05	SHM-07-05	8/12/2010	NA	<9.56	NA	NA	NA	3180	NA	NA	NA	NA	NA	NA	NA	21500
	DUP-081210	8/12/2010	NA	< 9.56	NA	NA	NA	3220	NA	NA	NA	NA	NA	NA	NA	21700
SHM-99-31B	SHM-99-31B	8/12/2010	NA	35.8	NA	NA	NA	28.8	NA	NA	NA	NA	NA	NA	NA	16500
SHM-05-041B	SHM-05-041B	8/9/2010	147	2.59 J	NA	NA	1440	1130	NA	NA	NA	NA	NA	NA	16000	14500 J
SHM-05-42A	SHM-05-42A	8/12/2010	NA	6.06 J	NA	NA	NA	1.25	NA	NA	NA	NA	NA	NA	NA	6700
SHP-05-045A	SHP-05-045A	8/9/2010	NA	NA	NA	NA	36.4	33.7	NA	NA	NA	NA	NA	NA	NA	NA
SHP-05-046B	SHP-05-046B	8/9/2010	NA	NA	NA	NA	50.6	81.4	NA	NA	NA	NA	NA	NA	NA	NA

Notes
NA - Not Applicable
ug/L is micrograms per liter
mg/l - miligrams per liter
J means estimated results
B indicates that analyte was detected in the associated method blank

TABLE 3
GROUNDWATER MONITORING WELL RESULTS
Sheple'y Hill Landfill, Devens Massachusetts

Boring Location	Sample ID	Date	Chromium Total (ug/L)	Chromium Dissolved (ug/L)	Cobalt Total (ug/L)	Cobalt Dissolved (ug/L)	Copper Total (ug/L)	Copper Dissolved (ug/L)	Iron Total (ug/L)	Iron Dissolved (ug/L)	Lead Total (ug/L)	Lead Dissolved (ug/L)	Magnesium Total (ug/L)	Magnesium Dissolved (ug/L)	Manganese Total (ug/L)	Manganese Dissolved (ug/L)
SHM-10-01	SHM-10-01-071310	7/13/2010	< 0.744	< 0.744	NA	NA	NA	NA	508	373	0.2 J	< 0.2	3700	3680	10500 J	10600
	SHM-10-01	8/12/2010	NA	<1.86	NA	NA	NA	NA	NA	886	NA	<0.500	NA	3530	NA	10700
	SHM-10-01-090810	9/8/2010	< 1.86	< 1.86	NA	NA	NA	NA	1740	1680	< 0.500	< 0.500	3680	3780	10200	10300
SHM-10-02	SHM-10-02-071510	7/15/2010	1.54	0.31 J	NA	NA	NA	NA	1190	881	0.42 J	0.05 J	15700	16100	2110	2180
	Dup-071510	7/15/2010	1.28	0.32 J	NA	NA	NA	NA	1170	890	0.35 J	0.05 J	15600	16100	2130	2170
	SHM010-02-090710	9/7/2010	0.68 J	< 0.372	NA	NA	NA	NA	973	843	0.18 J	< 0.1	16000	16000	2190	2190
SHM-10-03	SHM-10-03-071410	7/14/2010	2.97	< 0.744	NA	NA	NA	NA	1630	866	3.43	1.12 J	12900	12600	122	153
	DUP-071410	7/14/2010	4.68	< 0.744	NA	NA	NA	NA	2440	843	4.04	2.08	13000	127000	151	134
	SHM-10-03-090710	9/7/2010	2.01	< 0.744	NA	NA	NA	NA	1420	1030	0.49 J	< 0.200	18200	18500	72.8	44
	DUP-090710	9/7/2010	1.99 J	< 0.744	NA	NA	NA	NA	1480	1040	0.58 J	< 0.200	17700	18000	70.2	51.7
SHM-10-04	SHM-10-04-071410	7/14/2010	4.77	0.49 J	NA	NA	NA	NA	3800 J	5190	0.59	< 0.05	12300 J	11800	2190	2500
	SHM-10-04-090710	9/7/2010	0.95 J	< 0.744	NA	NA	NA	NA	1880	1650	0.2 J	< 0.200	14500	14600	3210	3100
SHM-10-05A	SHM-10-05A-071510	7/15/2010	0.38 J	0.24 J	NA	NA	NA	NA	1970	1880	0.07 J	< 0.05	1660	1670	590	620
	SHM-10-05A-090810	9/8/2010	0.59	< 0.186	NA	NA	NA	NA	790	677	0.14 J	0.09 J	1600	1600	105	122
SHM-10-06	SHM-10-06-070810	7/8/2010	4.65	0.21	NA	NA	NA	NA	130000 J	117000	1.76 J	< 0.05	7360	7140	724	699
	DUP-070810	7/8/2010	5.33	0.25 J	NA	NA	NA	NA	149000	117000	3.34	< 0.05	8400	7200	829	712
	SHM-10-06-090810	9/8/2010	< 1.86	< 1.86	NA	NA	NA	NA	144000	145000	< 0.500	0.57 J	8270	8800	9.54	9.63
SHM-10-06A	SHM-10-06A-070710	7/7/2010	0.58	0.31 J	NA	NA	NA	NA	20900 J	19900 J	0.22 J	0.06 J	2090	2030	1650 J	1620
	DUP-070710	7/7/2010	0.59	0.38 J	NA	NA	NA	NA	21200	20200	0.13 J	0.07 J	2080	2070	1660	1650
	SHM-1--06A-090910	9/9/2010	6.92	< 0.744	NA	NA	NA	NA	44600	42900	2.7	< 0.200	4940	4640	3940	4080
	DUP-090910	9/9/2010	7.16	< 0.744	NA	NA	NA	NA	42700	32300	2.69	< 0.200	4810	3280	3820	3130
SHM-10-07	SHM-10-07-052710	5/27/2010	15.8	< 1.86	NA	NA	NA	NA	75800 J	70600 J	4.72	0.74 J	12200	9590	3230 J	3110 J
	DUP-052710	5/27/2010	15.9	< 1.86	NA	NA	NA	NA	75800	71800	4.62	< 0.5	12100	9660	3280	3130
	SHM-10-07-090910	9/9/2010	2.82	< 0.372	NA	NA	NA	NA	62300	56800	0.95 J	< 0.100	6360	5610	2050	1940
SHM-10-08	SHM-10-08-071510	7/15/2010	4.56	< 0.372	NA	NA	NA	NA	2610	1310 J	0.8 J	0.18 J	21100	19900 J	910	885 J
	SHM-10-08-090710	9/7/2010	0.43 J	< 0.372	NA	NA	NA	NA	1270	1260	< 0.100	< 0.100	23600	25000	359	376
SHM-10-10	SHM-10-10-071310	7/13/2010	< 1.86	< 1.86	NA	NA	NA	NA	1020	799	< 0.5	< 0.5	12100	11900	24600	24200
	DUP-071310	7/13/2010	< 1.86	< 1.86	NA	NA	NA	NA	925	804	< 0.5	< 0.5	11800	12100	24100	24800
	SHM-10-10	8/12/2010	NA	<1.86	NA	NA	NA	NA	NA	1180	NA	<0.500	NA	10700	NA	22000
	SHM-10-10-090810	9/8/2010	< 1.86	< 1.86	NA	NA	NA	NA	833	700	1.6 J	< 0.500	13200	12000	27400	25200
	DUP-090810	9/8/2010	< 1.86	< 1.86	NA	NA	NA	NA	825	929	< 0.500	< 0.500	11900	12600	27400	25800

TABLE 3
GROUNDWATER MONITORING WELL RESULTS
Sheple'y Hill Landfill, Devens Massachusetts

Boring Location	Sample ID	Date	Chromium Total (ug/L)	Chromium Dissolved (ug/L)	Cobalt Total (ug/L)	Cobalt Dissolved (ug/L)	Copper Total (ug/L)	Copper Dissolved (ug/L)	Iron Total (ug/L)	Iron Dissolved (ug/L)	Lead Total (ug/L)	Lead Dissolved (ug/L)	Magnesium Total (ug/L)	Magnesium Dissolved (ug/L)	Manganese Total (ug/L)	Manganese Dissolved (ug/L)
SHM-10-11	SHM-10-11	8/30/2010	1.44	0.52 J	6.28	5.94	0.75 J	0.45 J	60600	55700	0.34 J	0.15 J	2770	2530	2490	2320
	SHM-10-11-101910	10/19/2010	1.15 J	< 0.744	11	10.9	0.64 J	< 0.472	60500	61000	0.36 J	0.2 J	2840	2900	2160	2260
SHM-10-12	SHM-10-12	8/30/2010	<1.86	<1.86	6.36	8.34	<1.18	<1.18	78600	104000	<0.500	<0.500	1940	2500	5400	7000
	DUP-083010	8/30/2010	<1.86	<1.86	6.88	7.64	<1.18	<1.18	89700	96000	0.59 J	<0.500	2190	2360	6120	6520
	SHM-10-12-102010	10/20/2010	< 0.93	1.19 J	7.08	7.38	< 0.59	0.73 J	88700	90000	< 0.25	0.79J	2180	2200	6070	6200
	DUP-102010	10/20/2010	0.97 J	< 0.93	7.33	6.98	0.62 J	< 0.59	90900	87400	0.7 J	0.27 J	2240	2120	6320	6030
SHM-10-13	GP-10-13-090110	9/1/2010	2.66	0.73	0.84	0.73	0.74	0.34 J	88600	84100	0.13 J	<0.05	10500	9900	1900	1850 J
	SHM-10-13-101910	10/19/2010	4.17	< 0.744	0.87 J	0.75 J	1.17 J	< 0.472	95500	94600	0.42 J	0.32 J	9840	10100	2100	2060
	DUP-101910	10/19/2010	4.15	< 0.744	0.89 J	0.74 J	1.27 J	2.06	87500	94700	0.44 J	< 0.200	8720	9920	1960	2090
SHM-10-14	SHM-10-14-090210	9/2/2010	< 1.86	< 1.86	16	15.6	1.53 J	1.3 J	75200	73000	0.76 J	< 0.5	4310	4150	4700	4720
	SHM-10-14-101910	10./19/10	3.25	< 0.930	23.8	20	4.67	< 0.590	98300	92700	2.27 J	< 0.250	3980	3720	4350 J	4180
SHM-10-15	GP-10-15-090110	9/1/2010	<1.86	<1.86	28.6	29.3	<1.18	<1.18	62500	63300	0.79 J	<0.500	7700	7880	10400	10700
	SHM-10-15-090110		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	DUP-090110	9/1/2010	<1.86	<1.86	27	22.4	1.37 J	<1.18	58700	48900	1.09 J	<0.500	7470	6050	9900	8240
	SHM-10-15-102010	10/20/2010	< 1.86	< 1.86	22.3	23.3	1.2 J	< 1.18	50400	52000	1.48 J	0.7 J	6440	6530	8440	8680
SHM-10-16	SHM-10-16-090210	9/2/2010	7.12	0.32 J	5.27	4.97	5.87	0.36 J	50200	53100	1.65	< 0.05	13800	14100	1710	1790
	DUP-090210	9/2/2010	8.28	0.3 J	5.81	4.85	0.88	0.34 J	55100	51100	1.97	0.05	15000	13500	1800	1680
	SHM-10-16-102010	10/20/2010	3.5	0.28 J	6.56	5.51	2.73	0.54	51800	46900	0.91	0.08 J	13100	12000	1250	1150
SHL-23	SHL-23	8/12/2010	NA	<0.186	NA	NA	NA	NA	NA	16.9 J	NA	<0.050	NA	163	NA	6.87
SHM-05-39A	SHM-05-39A	8/12/2010	NA	<0.186	NA	NA	NA	NA	NA	24500	NA	<0.050	NA	1860	NA	680
SHM-07-03	SHM-07-03	8/12/2010	NA	<0.186	NA	NA	NA	NA	NA	53.8	NA	0.05 J	NA	550	NA	9.68
	DUP2-081210	8/12/2010	NA	< 0.186	NA	NA	NA	NA	NA	58	NA	0.05 J	NA	568	NA	9.66
SHM-07-05	SHM-07-05	8/12/2010	NA	<0.930	NA	NA	NA	NA	NA	22500	NA	<0.250	NA	2990	NA	544
	DUP-081210	8/12/2010	NA	< 0.930	NA	NA	NA	NA	NA	22700	NA	< 0.250	NA	2960	NA	545
SHM-99-31B	SHM-99-31B	8/12/2010	NA	0.56	NA	NA	NA	NA	NA	14600	NA	0.09 J	NA	1930	NA	478
SHM-05-041B	SHM-05-041B	8/9/2010	0.5	<0.186	NA	NA	NA	NA	35200	28000	0.6	<0.050	2400	2080	736	656 J
SHM-05-42A	SHM-05-42A	8/12/2010	NA	<0.186	NA	NA	NA	NA	NA	388	NA	<0.050	NA	1160	NA	140
SHP-05-045A	SHP-05-045A	8/9/2010	NA	NA	NA	NA	NA	NA	21600	22100	NA	NA	NA	NA	NA	NA
SHP-05-046B	SHP-05-046B	8/9/2010	NA	NA	NA	NA	NA	NA	26800	34800	NA	NA	NA	NA	NA	NA

Notes
NA - Not Applicable
ug/L is micrograms per liter
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TABLE 3
GROUNDWATER MONITORING WELL RESULTS
Sheple'y Hill Landfill, Devens Massachusetts

Boring Location	Sample ID	Date	Mercury Total (ug/L)	Mercury Dissolved (ug/L)	Nickel Total (ug/L)	Nickel Dissolved (ug/L)	Potassium Total (ug/L)	Potassium Dissolved (ug/L)	Selenium Total (ug/L)	Selenium Dissolved (ug/L)	Silver Total (ug/L)	Silver Dissolved (ug/L)	Sodium Total (ug/L)	Sodium Dissolved (ug/L)	Thallium Total (ug/L)	Thallium Dissolved (ug/L)
SHM-10-01	SHM-10-01-071310	7/13/2010	NA	NA	6.07	5.77	2300	2290	NA	NA	NA	NA	9340	9160	NA	NA
	SHM-10-01	8/12/2010	NA	NA	NA	5.75	NA	2230	NA	NA	NA	NA	NA	11100	NA	NA
	SHM-10-01-090810	9/8/2010	NA	NA	4.09 J	4.31 J	2220	2280	NA	NA	NA	NA	8880	8770	NA	NA
SHM-10-02	SHM-10-02-071510	7/15/2010	NA	NA	9.98	9.79	3880	4010	NA	NA	NA	NA	49500	53300	NA	NA
	Dup-071510	7/15/2010	NA	NA	10.2	9.71	3980	4000	NA	NA	NA	NA	51400	53100	NA	NA
	SHM010-02-090710	9/7/2010	NA	NA	9.58	9.3	4020	4040	NA	NA	NA	NA	48100	50700	NA	NA
SHM-10-03	SHM-10-03-071410	7/14/2010	NA	NA	6.24	5.36	6490	6000	NA	NA	NA	NA	474000	473000	NA	NA
	DUP-071410	7/14/2010	NA	NA	7.44	5.18	6580	6060	NA	NA	NA	NA	483000	474000	NA	NA
	SHM-10-03-090710	9/7/2010	NA	NA	6.6	5.67	6920	6880	NA	NA	NA	NA	536000	536000	NA	NA
	DUP-090710	9/7/2010	NA	NA	6.35	5.68	6670	6840	NA	NA	NA	NA	510000	526000	NA	NA
SHM-10-04	SHM-10-04-071410	7/14/2010	NA	NA	9.98	11.6	4230	5220	NA	NA	NA	NA	33400 J	35400	NA	NA
	SHM-10-04-090710	9/7/2010	NA	NA	8.1	7.66	4050	3990	NA	NA	NA	NA	35800	35200	NA	NA
SHM-10-05A	SHM-10-05A-071510	7/15/2010	NA	NA	4.02	4.43	1990	1990	NA	NA	NA	NA	22800	23900	NA	NA
	SHM-10-05A-090810	9/8/2010	NA	NA	1.68	1.72	1770	1830	NA	NA	NA	NA	19600	19700	NA	NA
SHM-10-06	SHM-10-06-070810	7/8/2010	NA	NA	11.6	8.11	11700	11800	NA	NA	NA	NA	18200	17900	NA	NA
	DUP-070810	7/8/2010	NA	NA	12.6	8.27	13100	12300	NA	NA	NA	NA	20700	19000	NA	NA
	SHM-10-06-090810	9/8/2010	NA	NA	9.11	9.4	13500	13800	NA	NA	NA	NA	22800	23700	NA	NA
SHM-10-06A	SHM-10-06A-070710	7/7/2010	NA	NA	2.22	1.13	4700	4520	NA	NA	NA	NA	7490	7260	NA	NA
	DUP-070710	7/7/2010	NA	NA	1.16	1.12	4740	4680	NA	NA	NA	NA	7640	7560	NA	NA
	SHM-1--06A-090910	9/9/2010	NA	NA	7.73	2.34	8130	7640	NA	NA	NA	NA	13200	13200	NA	NA
	DUP-090910	9/9/2010	NA	NA	7.97	1.68 J	7970	5990	NA	NA	NA	NA	12900	9240	NA	NA
SHM-10-07	SHM-10-07-052710	5/27/2010	NA	NA	18.5	6.4	17900	16000	NA	NA	NA	NA	36400	35100 J	NA	NA
	DUP-052710	5/27/2010	NA	NA	17.5	6.3	18100	16100	NA	NA	NA	NA	36900	35700	NA	NA
	SHM-10-07-090910	9/9/2010	NA	NA	7.34	5.28	13200	11400	NA	NA	NA	NA	26400	24400	NA	NA
SHM-10-08	SHM-10-08-071510	7/15/2010	NA	NA	11.3	9.55	5370	4590	NA	NA	NA	NA	44300 J	44500	NA	NA
	SHM-10-08-090710	9/7/2010	NA	NA	8.27	8.57	5240	5470	NA	NA	NA	NA	46400	NA	NA	NA
SHM-10-10	SHM-10-10-071310	7/13/2010	NA	NA	21.5	21.2	3580	3600	NA	NA	NA	NA	26500	26100	NA	NA
	DUP-071310	7/13/2010	NA	NA	21	21.5	3490	3610	NA	NA	NA	NA	26500	27500	NA	NA
	SHM-10-10	8/12/2010	NA	NA		20.8		3590	NA	NA	NA	NA		28500	NA	NA
	SHM-10-10-090810	9/8/2010	NA	NA	23.5	21.5	3750	3410	NA	NA	NA	NA	29600	27100	NA	NA
	DUP-090810	9/8/2010	NA	NA	21.4	22.2	3380	3560	NA	NA	NA	NA	26600	28500	NA	NA

TABLE 3
GROUNDWATER MONITORING WELL RESULTS
Sheple'y Hill Landfill, Devens Massachusetts

Boring Location	Sample ID	Date	Mercury Total (ug/L)	Mercury Dissolved (ug/L)	Nickel Total (ug/L)	Nickel Dissolved (ug/L)	Potassium Total (ug/L)	Potassium Dissolved (ug/L)	Selenium Total (ug/L)	Selenium Dissolved (ug/L)	Silver Total (ug/L)	Silver Dissolved (ug/L)	Sodium Total (ug/L)	Sodium Dissolved (ug/L)	Thallium Total (ug/L)	Thallium Dissolved (ug/L)
SHM-10-11	SHM-10-11	8/30/2010	<0.0120	0.01443 J	5.92	5.43	5410	5150	<0.812	<0.812	<0.170	<0.170	12400	11800	<0.062	<0.062
	SHM-10-11-101910	10/19/2010	0.09993 J	0.1268 J	6.62	6.8	5310	5390	< 1.62	< 1.62	< 0.340	< 0.340	12700	13000	< 0.124	< 0.124
SHM-10-12	SHM-10-12	8/30/2010	<0.0120	<0.0120	11	13.9	5480	7040	<4.06	<4.06	<0.850	<0.850	7090	8780	<0.310	<0.310
	DUP-083010	8/30/2010	0.03627 J	0.01933 J	12.3	12.4	6190	6480	<4.06	<4.06	<0.850	<0.850	7880	8610	<0.310	<0.310
	SHM-10-12-102010	10/20/2010	0.06209 J	0.09511 J	11.7	12.3	482-	4900	< 2.03	< 2.03	< 0.425	< 0.425	5220	5060	< 0.155	< 0.155
	DUP-102010	10/20/2010	0.1153 J	0.0624 J	12.3	11.4	4940	4670	< 2.03	< 2.03	< 0.425	< 0.425	5210	4870	< 0.155	< 0.155
SHM-10-13	GP-10-13-090110	9/1/2010	<0.0120	<0.0120	3	2.6	12500	12200	0.54 J	<0.406	<0.085	<0.085	15300	14500	<0.031	<0.031
	SHM-10-13-101910	10/19/2010	0.07162 J	0.07162 J	2.95	2.54	12300	12500	< 1.62	< 1.62	< 0.340	< 0.340	15600	15900	< 0.124	< 0.124
	DUP-101910	10/19/2010	0.1218 J	0.1059 J	2.87	2.48	11000	12200	< 1.62	< 1.62	< 0.340	< 0.340	13900	16100	< 0.124	< 0.124
SHM-10-14	SHM-10-14-090210	9/2/2010	< 0.012	< 0.012	8.07	9.16	18800	17600 J	< 4.06	< 4.06	< 0.85	< 0.85	15500	15200	< 0.31	< 0.31
	SHM-10-14-101910	10/19/10	0.0965 J	0.1246 J	11.2	7.62	11400	101000	< 2.03	< 2.03	< 0.425	< 0.425	8500	8080	< 0.155	< 0.155
SHM-10-15	GP-10-15-090110	9/1/2010	<0.0120	<0.0120	20	20.3	6910	6880	<4.06	<4.06	<0.850	<0.850	13700	13900	<0.310	<0.310
	SHM-10-15-090110															
	DUP-090110	9/1/2010	<0.0120	<0.0120	18.5	15.3	6390	5200	<4.06	<4.06	<0.850	<0.850	13100	11200	< 0.310	<0.310
	SHM-10-15-102010	10/20/2010	0.07762 J	0.0551 J	16.2	15.8	5350	5500	< 4.06	< 4.06	< 0.850	< 0.850	11600	12400	< 0.310	< 0.31
SHM-10-16	SHM-10-16-090210	9/2/2010	0.102776 J	< 0.012	6.39	3.54	14600	15500	0.59 J	0.7 J	< 0.85	< 0.085	30800	31400	0.05 J	0.05 J
	DUP-090210	9/2/2010	0.01466 J	< 0.012	7.06	3.37	15800	14700	0.71 J	0.61 J	< 0.085	< 0.085	32400	9.05	0.05 J	1.85
	SHM-10-16-102010	10/20/2010	0.09046 J	0.03837 J	5.28	3.06	12500	11800	0.43 J	0.44 J	< 0.085	< 0.085	31500	30700	< 0.031	0.06 J
SHL-23	SHL-23	8/12/2010	NA	NA	NA	1.13	NA	990	NA	NA	NA	NA	NA	1400	NA	NA
SHM-05-39A	SHM-05-39A	8/12/2010	NA	NA	NA	2.46	NA	6530	NA	NA	NA	NA	NA	12300	NA	NA
SHM-07-03	SHM-07-03	8/12/2010	NA	NA	NA	0.28 J	NA	841	NA	NA	NA	NA	NA	11600	NA	NA
	DUP2-081210	8/12/2010	NA	NA	NA	0.27 J	NA	893	NA	NA	NA	NA	NA	12100	NA	NA
SHM-07-05	SHM-07-05	8/12/2010	NA	NA	NA	9.23	NA	4530	NA	NA	NA	NA	NA	11500	NA	NA
	DUP-081210	8/12/2010	NA	NA	NA	9.53	NA	4540	NA	NA	NA	NA	NA	11500	NA	NA
SHM-99-31B	SHM-99-31B	8/12/2010	NA	NA	NA	0.93	NA	3860	NA	NA	NA	NA	NA	8460	NA	NA
SHM-05-041B	SHM-05-041B	8/9/2010	NA	NA	4.83	3.78	10000	8770 J	NA	NA	NA	NA	14900	12800 J	NA	NA
SHM-05-42A	SHM-05-42A	8/12/2010	NA	NA	NA	0.88	NA	1470	NA	NA	NA	NA	NA	2040	NA	NA
SHP-05-045A	SHP-05-045A	8/9/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SHP-05-046B	SHP-05-046B	8/9/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes
NA - Not Applicable
ug/L is micrograms per liter
mg/l - miligrams per liter
J means estimated results
B indicates that analyte was detected in the a

TABLE 3
GROUNDWATER MONITORING WELL RESULTS
Shepley Hill Landfill, Devens Massachusetts

Boring Location	Sample ID	Date	Vanadium Total (ug/L)	Vanadium Dissolved (ug/L)	Zinc Total (ug/L)	Zinc Dissolved (ug/L)	Turbidity NTU	DO mg/L	pH	Temp Celcius	Spec Cond uS/cm	ORP mV	Color	Hardness mg/l	Alkalinity mg CaCO3/L	TDS mg/l	TSS mg/l
SHM-10-01	SHM-10-01-071310	7/13/2010	NA	NA	NA	NA	3.34	0.18	6.19	12.38	297	63.5	Clear	120	130	190	< 5
	SHM-10-01	8/12/2010	NA	NA	NA	NA	NA	0.49	6.61	11.86	291	42.2	NA	NA	130	NA	NA
	SHM-10-01-090810	9/8/2010	NA	NA	NA	NA	0.15	0.12	6.31	12.68	299	11.3	Clear	120	140	210	< 5
SHM-10-02	SHM-10-02-071510	7/15/2010	NA	NA	NA	NA	3.47	0.45	6.42	12.24	836	80.8	Clear	370	250	570	< 5
	Dup-071510	7/15/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	360	250	610	5.2
	SHM010-02-090710	9/7/2010	NA	NA	NA	NA	0.64	0.87	5.94	12.45	881	-258.3	Clear	330	260	480	< 5
SHM-10-03	SHM-10-03-071410	7/14/2010	NA	NA	NA	NA	31.7	1.47	6.60	16.09	3331	75.7	Clear	310	96	1,900	28
	DUP-071410	7/14/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	320	95	1,900	17
	SHM-10-03-090710	9/7/2010	NA	NA	NA	NA	13.4	1.72	6.31	11.93	3341	148.1	Clear	420	78	1,900	28
	DUP-090710	9/7/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	410	75	1,900	7.8
SHM-10-04	SHM-10-04-071410	7/14/2010	NA	NA	NA	NA	17.7	0.23	6.37	10.82	630	9.9	Clear	200	99	380	34
	SHM-10-04-090710	9/7/2010	NA	NA	NA	NA	4.28	0.23	5.99	12.1	656	43.7	Clear	220	100	390	5.2
SHM-10-05A	SHM-10-05A-071510	7/15/2010	NA	NA	NA	NA	5.12	1.42	6.29	19.06	186	31.7	Clear	43	43	120	< 5
	SHM-10-05A-090810	9/8/2010	NA	NA	NA	NA	8.92	3.2	5.27	20.2	200	-29	Clear	41	36	110	< 5
SHM-10-06	SHM-10-06-070810	7/8/2010	NA	NA	NA	NA	21.4	0.55	6.62	21.74	754	-93.8	Cloudy	130	360	310	94
	DUP-070810	7/8/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	130	370	320	90
	SHM-10-06-090810	9/8/2010	NA	NA	NA	NA	3.72	2.83	6.16	11.59	783	-64.3	Clear	130	300	330	62
SHM-10-06A	SHM-10-06A-070710	7/7/2010	NA	NA	NA	NA	5.38	1.49	6.51	19.74	209	-22.6	Clear	48	100	120	< 5
	DUP-070710	7/7/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	52	97	130	< 5
	SHM-1--06A-090910	9/9/2010	NA	NA	NA	NA	40.6	0.39	5.94	10.65	431	-157.3	Cloudy	97	190	200	330
	DUP-090910	9/9/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	94	150	180	270
SHM-10-07	SHM-10-07-052710	5/27/2010	NA	NA	NA	NA	237	0.15	6.97	13.43	751	-195	Cloudy	210	300	320	120
	DUP-052710	5/27/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	210	280	370	640
	SHM-10-07-090910	9/9/2010	NA	NA	NA	NA	15.4	0.43	6.54	12.39	635	-105.6	Clear	130	240	300	53
SHM-10-08	SHM-10-08-071510	7/15/2010	NA	NA	NA	NA	7.15	0.21	6.73	10.95	917	33.7	Clear	480	480	630	12
	SHM-10-08-090710	9/7/2010	NA	NA	NA	NA	1.37	3.61	6.19	12.1	1079	-233	Clear	490	500	630	< 5
SHM-10-10	SHM-10-10-071310	7/13/2010	NA	NA	NA	NA	4.52	0.85	6.61	12.10	658	28.7	Clear	270	350	400	< 5
	DUP-071310	7/13/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	270	350	400	< 5
	SHM-10-10	8/12/2010	NA	NA	NA	NA	NA	0.76	6.57	11.27	622	-9.1	NA	NA	320	NA	NA
	SHM-10-10-090810	9/8/2010	NA	NA	NA	NA	0.71	0.16	6.55	13.13	617	63.3	Clear	260	320	380	< 5
	DUP-090810	9/8/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	260	330	350	< 5

TABLE 3
GROUNDWATER MONITORING WELL RESULTS
Sheple'y Hill Landfill, Devens Massachusetts

Boring Location	Sample ID	Date	Vanadium Total (ug/L)	Vanadium Dissolved (ug/L)	Zinc Total (ug/L)	Zinc Dissolved (ug/L)	Turbidity NTU	DO mg/L	pH	Temp Celcius	Spec Cond uS/cm	ORP mV	Color	Hardness mg/l	Alkalinity mg CaCO3/L	TDS mg/l	TSS mg/l
SHM-10-11	SHM-10-11	8/30/2010	0.31 J	<0.154	10.9	13.8	4.05	1.68	6.12	13.19	419	-32	Clear	NA	160	NA	15
	SHM-10-11-101910	10/19/2010	< 0.308	< 0.308	17.6 J	17.9 J	4.28	0.41	6.28	11.57	4.14	-42.1	Cloudy		140		17
SHM-10-12	SHM-10-12	8/30/2010	<0.770	<0.770	35.2 J	37.7 J	8.43	3.55	6.04	14.41	460	-34.9	Clear	NA	240	NA	12
	DUP-083010	8/30/2010	<0.770	<0.770	46.8 J	36.5 J	NA	NA	NA	NA	NA	NA	NA				
	SHM-10-12-102010	10/20/2010	0.385	0.385	26.7	29.2	1.6	0.32	5.93	10.92	432	-14.5	Clear	NA	240	NA	16
	DUP-102010	10/20/2010	<0.385	< 0.385	25.2	27.8	NA	NA	NA	NA	NA	NA	NA	NA	230	NA	14
SHM-10-13	GP-10-13-090110	9/1/2010	0.62	0.22 J	3.49 J	4.66 J	18.8	2.76	6.32	13.57	782	-68.6	Clear		380		43
	SHM-10-13-101910	10/19/2010	0.75 J	< 0.308	14.9 J	17.9 J	12	0.12	6.27	12.48	743	-52.5	Clear		360		62
	DUP-101910	10/19/2010	0.64 J	< 0.308	14.7 J	17.8 J	NA	NA	NA	NA	NA	NA	NA		360		56
SHM-10-14	SHM-10-14-090210	9/2/2010	< 0.77	< 0.77	54.6	30.6 J	34.7	0.18	6.35	14.48	645	-87.4	Clear	NA	360	NA	72
	SHM-10-14-101910	10/19/10	0.81 J	< 0.385	41	26.9	34.5	0.36	6.35	11.99	693	-38.6	Little Cloudy		320		130
SHM-10-15	GP-10-15-090110	9/1/2010	<0.770	<0.770	29.7 J	26.4 J	16.3	0.25	6.21	16.02	503	-52.7	Clear	NA	210	NA	170
	SHM-10-15-090110						16.3	0.25	6.21	16.02	503	-52.7	Clear	NA	240	NA	36
	DUP-090110	9/1/2010	<0.770	<0.770	22.7 J	20.1 J	NA	NA	NA	NA	NA	NA	NA				
	SHM-10-15-102010	10/20/2010	< 0.770	< 0.77	33.6 J	42.8 J	59.5	0.36	5.94	11.95	510	-10.9	Cloudy	NA	230	NA	140
SHM-10-16	SHM-10-16-090210	9/2/2010	1.65	0.08 J	7.99	5.39	78.5	0.17	6.98	11.4	784	-233.8	Little Cloudy	NA	330	NA	150
	DUP-090210	9/2/2010	1.85	0.08 J	9.34	3.91 J	NA	NA	NA	NA	NA	NA	NA				
	SHM-10-16-102010	10/20/2010	0.81	0.13 J	36.7	13	34.6	0.34	6.77	10.63	793	-129.2	Cloudy	NA	320	NA	170
SHL-23	SHL-23	8/12/2010	NA	NA	NA	NA	NA	10.06	6.45	10.42	25	209.8	NA	NA	4.3	NA	NA
SHM-05-39A	SHM-05-39A	8/12/2010	NA	NA	NA	NA	NA	0.35	6.45	11.37	263	-52.9	NA	NA	100	NA	NA
SHM-07-03	SHM-07-03	8/12/2010	NA	NA	NA	NA	NA	6.61	5.81	12.25	81	133.9	NA	NA	18	NA	NA
	DUP2-081210	8/12/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
SHM-07-05	SHM-07-05	8/12/2010	NA	NA	NA	NA	NA	0.40	6.45	11.43	256	-21.5	NA	NA	94	NA	NA
	DUP-081210	8/12/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
SHM-99-31B	SHM-99-31B	8/12/2010	NA	NA	NA	NA	NA	0.19	6.03	10.74	186	33.9	NA	NA	86	NA	NA
SHM-05-041B	SHM-05-041B	8/9/2010	NA	NA	NA	NA	NA	0.32	6.43	11.75	310	42.6	NA	NA	NA	NA	45
SHM-05-42A	SHM-05-42A	8/12/2010	NA	NA	NA	NA	NA	1.20	6.50	10.39	61	89.5	NA	NA	18	NA	NA
SHP-05-045A	SHP-05-045A	8/9/2010	NA	NA	NA	NA	NA	0.30	6.20	13.97	294	-32.2	NA	NA	NA	NA	15
SHP-05-046B	SHP-05-046B	8/9/2010	NA	NA	NA	NA	NA	0.81	5.71	12.93	662	3	NA	NA	NA	NA	11

Notes
NA - Not Applicable
ug/L is micrograms per liter
mg/l - miligrams per liter
J means estimated results
B indicates that analyte was detected in the a

DO - Dissolved Oxygen
ORP - Oxygen Reduction Potential

TDS - Total Dissolved Solids
TSS - Total Suspended Solids

TABLE 3
GROUNDWATER MONITORING WELL RESULTS
Sheple'y Hill Landfill, Devens Massachusetts

Boring Location	Sample ID	Date	Ammonia mg/l	Nitrite mg/l	Sulfide mg/l	COD mg/l	TOC mg/l	Chloride mg/l	Nitrate mg/l	Sulfate mg/l	DOC mg/l	DIC mg/l	Notes
SHM-10-01	SHM-10-01-071310	7/13/2010	0.264	< 0.002	< 0.1	11 J	1.3	12	< 0.01	6.8	NA	NA	
	SHM-10-01	8/12/2010	0.241	<0.002	<0.10	<7.0	NA	14	<0.01	7.0	1.5	31	Test Kit (Filtered) < 5
	SHM-10-01-090810	9/8/2010	0.344	< 0.002	< 0.1	12 J	1.6	11	< 0.01	8.7	1.6	37	
SHM-10-02	SHM-10-02-071510	7/15/2010	0.248	< 0.002	< 0.1	< 7	2.4	160	< 0.01	20	NA	NA	
	Dup-071510	7/15/2010	0.231	< 0.002	< 0.1	< 7	2.5	160	< 0.01	21	NA	NA	
	SHM010-02-090710	9/7/2010	0.238	< 0.002	< 0.1	< 7	2.6	120	< 0.01	19	2.5	62	
SHM-10-03	SHM-10-03-071410	7/14/2010	0.035 J	0.02	< 0.1	25	0.64	1000	0.52	38	NA	NA	
	DUP-071410	7/14/2010	0.0269 J	0.02	< 0.1	47	0.73	1000	0.51	36	NA	NA	
	SHM-10-03-090710	9/7/2010	0.0392 J	< 0.002	< 0.1	43	0.66	1100	0.55	39	< 1	26	
	DUP-090710	9/7/2010	0.0204 J	< 0.002	< 0.1	31	0.66	1100	0.6	39	NA	NA	
SHM-10-04	SHM-10-04-071410	7/14/2010	0.0666 J	0.11	< 0.1	13 J	2.7	74	3.8	84	NA	NA	
	SHM-10-04-090710	9/7/2010	0.0585 J	0.5	< 0.1	< 7	2.6	92	3.7	87	2.7	43	
SHM-10-05A	SHM-10-05A-071510	7/15/2010	0.0184 J	0.01 J	< 0.1	< 7	0.93	34	0.38	10	NA	NA	
	SHM-10-05A-090810	9/8/2010	0.0335 J	< 0.002	< 0.1	55	0.96	29	0.46	11	< 1	20	
SHM-10-06	SHM-10-06-070810	7/8/2010	5.5	< 0.002	< 0.1	29	4.8	17	0.03	0.89	NA	NA	
	DUP-070810	7/8/2010	5.58	< 0.002	< 0.1	25	4.7	17	0.033	0.84	NA	NA	
	SHM-10-06-090810	9/8/2010	5.13	< 0.002	< 0.1	33	4.2	15	0.13	0.49 J	5	93	
SHM-10-06A	SHM-10-06A-070710	7/7/2010	2.69	< 0.002	< 0.1	16 J	3.4	3.4	0.03 J	2.5 B	NA	NA	
	DUP-070710	7/7/2010	2.59	< 0.002	< 0.1	20	3.3	3.4	0.032 J	2.9 B	NA	NA	
	SHM-1--06A-090910	9/9/2010	3.9	< 0.002	< 0.1	17 J	4	11	< 0.01	3.2	3.3	58	
	DUP-090910	9/9/2010	5.05	< 0.002	< 0.1	19 J	4.4	11	< 0.01	3.2	NA	NA	
SHM-10-07	SHM-10-07-052710	5/27/2010	6.02	< 0.002	< 0.1	45	3.6	48	0.008 J	8.6	NA	NA	
	DUP-052710	5/27/2010	5.78	< 0.002	< 0.1	58	3.5	48	0.013 J	9.3	NA	NA	
	SHM-10-07-090910	9/9/2010	5.6	< 0.002	< 0.1	29	3.8	41	< 0.01	2.3	3.5	52	
SHM-10-08	SHM-10-08-071510	7/15/2010	< 0.017	< 0.002	< 0.1	< 7	4	71	< 0.01	15	NA	NA	
	SHM-10-08-090710	9/7/2010	0.084	< 0.002	< 0.1	17 J	4.1	79	< 0.01	15	3.8	110	
SHM-10-10	SHM-10-10-071310	7/13/2010	0.155	< 0.002	< 0.1	29	3.6	19	< 0.01	0.56 J	NA	NA	
	DUP-071310	7/13/2010	0.145	< 0.002	< 0.1	40	3.6	18	< 0.01	0.38 J	NA	NA	
	SHM-10-10	8/12/2010	0.201	<0.002	<0.10	25		23	<0.01	0.79 J	3.9	70	
	SHM-10-10-090810	9/8/2010	0.148	< 0.002	< 0.1	55	3.7	17	< 0.01	0.34 J	3.8	76	
	DUP-090810	9/8/2010	0.168	< 0.02	< 0.1	45	3.9	17	0.019 J	0.26 J	NA	NA	

TABLE 3
GROUNDWATER MONITORING WELL RESULTS
Sheple'y Hill Landfill, Devens Massachusetts

Boring Location	Sample ID	Date	Ammonia mg/l	Nitrite mg/l	Sulfide mg/l	COD mg/l	TOC mg/l	Chloride mg/l	Nitrate mg/l	Sulfate mg/l	DOC mg/l	DIC mg/l	Notes
SHM-10-11	SHM-10-11	8/30/2010	2.79	<0.002	<0.10	22	NA	24	0.019 J	19	3.3	62	
	SHM-10-11-101910	10/19/2010	3.13	0.01 J	< 0.10	19		23	< 0.01	19 J	3.4	71	
SHM-10-12	SHM-10-12	8/30/2010	3.7	<0.002	<0.10	31	NA	3.7	0.035 J	1.7	4.1	110	
	DUP-083010	8/30/2010											
	SHM-10-12-102010	10/20/2010	3.8	< 0.02	< 0.10	33	NA	4.4	0.01	1.4	4.3	130	
	DUP-102010	10/20/2010	3.61	< 0.002	< 0.10	41	NA	4.4	< 0.01	1.3	4.5	140	
SHM-10-13	GP-10-13-090110	9/1/2010	9.7	< 0.002	< 0.1	33	NA	18	0.01 J	< 0.12	5.6	140	
	SHM-10-13-101910	10/19/2010	9.36	0.01 J	< 0.10	36		21	< 0.01	< 0.12	8.7	140	
	DUP-101910	10/19/2010	9.13	< 0.002	< 0.10	36		20	< 0.01	0.25 J	6.8	150	
SHM-10-14	SHM-10-14-090210	9/2/2010	3.96	< 0.002	<0.10	43	NA	6.3	< 0.01	3.7	8.7	120	
	SHM-10-14-101910	10/19/10	5.28	0.01 J	< 0.10	62		4.8	0.08	0.67 J	62	140	
SHM-10-15	GP-10-15-090110	9/1/2010	2.67	0.01	<0.10	33	NA	5.7	<0.01	3.8	4.2	82	
	SHM-10-15-090110		2.26	< 0.002	< 0.10	22	NA	11	< 0.01	8.4	3.2	NA	
	DUP-090110	9/1/2010											
	SHM-10-15-102010	10/20/2010	2.15	0.01 J	< 0.10	64	NA	12	< 0.01	10	4	95	
SHM-10-16	SHM-10-16-090210	9/2/2010	3.31	< 0.002	< 0.1	36	NA	31	< 0.01	2.9	5.3	91	
	DUP-090210	9/2/2010											
	SHM-10-16-102010	10/20/2010	3.34	< 0.002	< 0.10	57	NA	28	< 0.01	3.2	10	100	
SHL-23	SHL-23	8/12/2010	0.0496 J	<0.002	<0.10	<7.0	NA	1.3	0.07	4.9	<1.0	<8	Test Kit (Filtered) < 5
SHM-05-39A	SHM-05-39A	8/12/2010	4.01	<0.002	<0.10	11 J	NA	7.1	0.009 J	6	2.9	27	Test Kit (Filtered) 100
SHM-07-03	SHM-07-03	8/12/2010	0.0239 J	<0.002	<0.10	<7.0	NA	8.2	0.59	10	<1.0	12	Test Kit (Filtered) < 5
	DUP2-081210	8/12/2010											
SHM-07-05	SHM-07-05	8/12/2010	2.42	0.01 J	<0.10	<7.0	NA	8.9	0.06	8.1	2	24	Test Kit (Filtered) > 500
	DUP-081210	8/12/2010											
SHM-99-31B	SHM-99-31B	8/12/2010	4.1	<0.002	<0.10	11 J	NA	4	<0.01	3	6.5	28	Test Kit (Filtered) 5
SHM-05-041B	SHM-05-041B	8/9/2010	NA	NA	NA	NA	NA	NA	NA	NA	2.6	32	Test Kit (Filtered) 500
SHM-05-42A	SHM-05-42A	8/12/2010	0.0189 J	<0.002	<0.10	<7.0	NA	1.6	<0.01	5.6	<1.0	9.4	Test Kit (Filtered) < 5
SHP-05-045A	SHP-05-045A	8/9/2010	NA	NA	NA	NA	NA	NA	NA	NA	3.6	48	Test Kit (Filtered) 10
SHP-05-046B	SHP-05-046B	8/9/2010	NA	NA	NA	NA	NA	NA	NA	NA	14	150	Test Kit (Filtered) 80

Notes
NA - Not Applicable
ug/L is micrograms per liter
mg/l - miligrams per liter
J means estimated results
B indicates that analyte was detected in the a

COD - Chemical Oxygen Demend
TOC - Total Organic Carbon

DOC - Dissolved Organic Carbon
DIC - Dissolved Inorganic Carbon

TABLE 4
SOIL SAMPLING RESULTS
Shepley's Hill Landfill, Devens Massachusetts

Boring Location	Sample ID	Date	Depth	Silver (mg/kg)	Sodium (mg/kg)	Thallium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)	TOC % Replicate 1	TOC % Replicate 2	Total Solids %
SP-10-07	SP-10-07-029	5/21/2010	29	< 0.092	48 J	< 0.262	5.33	14.2	0.01	0.011	83
	SDUP-052110	5/21/2010	29	< 0.086	45 J	< 0.246	4.57	13.6	0.012	< 0.01	84
	SP-10-07-041	5/21/2010	41	< 0.083	120	< 0.238	10.1	28.8	0.012	0.02	91
	SP-10-07-053	5/21/2010	53	< 0.766	510 J	< 2.19	49	109	0.032	0.032	99
SP-10-11	SP-10-11-003	8/12/2010	3	3.5	<24	<0.26	5.3	13	0.055	0.065	92
	SP-10-11-005	8/12/2010	5	1	120	<0.25	10	66	0.45	0.618	94
	SP-10-11-007	8/12/2010	7	2.2	61 J	<0.27	7.9	33	0.904	0.805	88
	SP-10-11-012	8/12/2010	12	0.24 J	92	<0.25	6.9	27	0.469	0.397	96
	SP-10-11-015	8/12/2010	15	14	85	<0.25	7.8	48	1.2	1.12	95
	SP-10-11-020	8/12/2010	20	0.84	73 J	<0.24	9.4	25 J	1.52	1.55	99
	SDUP-081210	8/12/2010	20	0.3 J	59 J	<0.24	9.2	22	--	--	98
	SP-10-11-023	8/12/2010	23	0.24 J	66 J	<0.25	7.1	18	0.03	0.043	95
	SP-10-11-025	8/12/2010	25	0.063 J	43 J	<0.27	5.6	12	0.025	0.025	89
	SDUP8-081210	8/12/2010	25	0.67	24 J	<0.25	8.2	14	--	--	94
	SP-10-11-033	8/12/2010	33	0.041 J	44 J	<0.30	4.7	11	<0.01	<0.01	79
	SP-10-11-040	8/12/2010	40	0.063 J	57 J	<0.27	5	10	0.036	0.036	90
	SP-10-11-055	8/12/2010	55	0.1 J	59 J	<0.27	5	11	<0.01	0.014	90
	SP-10-11-062	8/12/2010	62	6.4	180	<0.25	25	48	0.017	0.018	96
SP-10-12	SP-10-12-001	8/12/2010	1	0.2 J	61 J	<0.25	6.2	95	3.83	3.97	97
	SP-10-12-005	8/12/2010	5	0.82	240	<0.27	16	210	5.87	7.56	89
	SP-10-12-009	8/12/2010	9	0.23 J	<23	<0.25	8.4	16	0.744	0.714	98
	SP-10-12-015	8/12/2010	15	0.59	32 J	<0.26	5.3	12	0.185	0.129	94
	SP-10-12-017	8/12/2010	17	0.13 J	51 J	<0.26	3.8	8.5	0.094	0.058	91
	SP-10-12-025	8/12/2010	25	0.13 J	30 J	<0.26	4.7	12	<0.010	<0.010	91
	SP-10-12-035	8/12/2010	35	0.041 J	40 J	<0.30	4.9	17	0.062	0.152	81
	SDUP2-081210	8/12/2010	35	0.038 J	48 J	<0.29	4.9	17	--	--	84
	SP-10-12-040	8/12/2010	40	<0.03	50 J	<0.26	4.6	15	0.117	0.089	91
	SDUP3-081210	8/12/2010	40	0.032 J	28 J	<0.26	4.6	16	--	--	90
	SP-10-12-042	8/12/2010	42	<0.03	<26	<0.28	5	12	<0.010	<0.010	86
	SP-10-12-052	8/12/2010	52	<0.03	66 J	<0.26	4.3	11	0.019	<0.010	89
	SP-10-12-055	8/12/2010	55	0.029 J	<27	<0.29	4.6	11	<0.010	<0.010	81

TABLE 4
SOIL SAMPLING RESULTS
Shepley's Hill Landfill, Devens Massachusetts

Boring Location	Sample ID	Date	Depth	Silver (mg/kg)	Sodium (mg/kg)	Thallium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)	TOC % Replicate 1	TOC % Replicate 2	Total Solids %
SP-10-13	SP-10-13-001	8/12/2010	1	0.091 J	<21	<0.23	5.7	11	0.057	0.061	100
	SP-10-13-005	8/12/2010	5	0.16 J	130	<0.26	10	22	0.332	0.320	93
	SP-10-13-008	8/12/2010	8	0.12 J	<24	<0.26	13	29	0.570	0.396	94
	SP-10-13-010	8/12/2010	10	0.15 J	42 J	<0.25	4.8	13	0.075	0.090	93
	SP-10-13-011	8/12/2010	11	0.026 J	<23	<0.25	4.4	9.7	<0.010	0.014	99
	SP-10-13-015	8/12/2010	15	0.22 J	44 J	<0.26	4.6	9	0.020	0.023	93
	SP-10-13-017	8/12/2010	17	0.027 J	27 J	<0.23	4.8	11	0.036	0.039	99
	SP-10-13-020	8/12/2010	20	0.1 J	38 J	<0.25	5.6	13	0.061	0.073	95
	SP-10-13-023	8/12/2010	23	0.68	3200	<0.52	14	13000	5.37	5.5	90
	SP-10-13-025	8/12/2010	25	0.051 J	<25	<0.27	7.2	20	0.343	0.324	89
	SP-10-13-027	8/12/2010	27	0.35 J	700	<0.44	4.3	2000	12.5	12.2	55
	SP-10-13-030	8/12/2010	30	0.042 J	<24	<0.26	3.4	10	9.48	7.37	93
	SP-10-13-032	8/12/2010	32	0.074 J	<23	<0.25	3.6	9.8	0.102	0.082	96
	SDUP4-081210	0812/2010	32	<0.03	<23	<0.25	3.4	9.1	--	--	94
	SP-10-13-035	8/12/2010	35	<0.03	43 J	<0.29	3.7	9.5	0.225	0.166	79
	SP-10-13-040	8/12/2010	40	0.08 J	150	<0.33	14	34	0.412	0.410	73
	SP-10-13-050	8/12/2010	50	<0.03	<24	<0.26	5	12	<0.010	<0.010	90
	SP-10-13-065	8/12/2010	65	<0.03	<24	<0.26	3.8	8.1	<0.010	<0.010	92
	SP-10-13-067	8/12/2010	67	<0.03	25 J	<0.27	4.8	10	<0.010	<0.010	84
	SDUP5-081210	8/12/2010	67	<0.03	<26	<0.28	4.5	9.8	--	--	85
	SP-10-13-070	8/12/2010	70	0.13 J	<22	<0.24	8.1	15	<0.010	0.017	96
	SP-10-13-072	8/12/2010	72	0.1 J	47 J	<0.25	6	13	<0.010	<0.010	94
	SP-10-13-075	8/12/2010	75	0.28 J	52 J	<0.27	7.2	16	<0.010	<0.010	90
	SP-10-13-077	8/12/2010	77	0.093 J	52 J	<0.27	4.5	22	<0.010	<0.010	89
	SP-10-13-083	8/12/2010	83	2.2	420	<0.26	2.1	85	<0.010	<0.010	91
SP-10-14	SP-10-14-005	8/17/2010	5	0.067 J	40 J	<0.26	6.1	14	0.077	0.073	93
	SP-10-14-010	8/17/2010	10	0.37 J	100	<0.25	13	91	0.752	0.858	93
	SP-10-14-015	8/17/2010	15	0.15 J	130	<0.30	5.7	160	0.293	0.287	80
	SP-10-14-020	8/17/2010	20	0.31 J	84 J	<0.26	39	120	5.11	4.63	91
	SP-10-14-023	8/17/2010	23	0.034 J	28 J	<0.28	5.6	36	0.160	0.127	86
	SP-10-14-027	8/17/2010	27	<0.09	260 J	<0.90	2	56	23.9	25.0	27
	SP-10-14-030	8/17/2010	30	<0.03	34 J	<0.32	4.8	11	4.76	5.41	72
	SDUP-081710	8/17/2010	30	<0.03	<27	<0.29	6.1	16	--	--	81
	SP-10-14-031	8/17/2010	31	<0.10	150 J	<0.98	4.4	12	14.7	14.3	24
	SP-10-14-035	8/17/2010	35	<0.05	82 J	<0.51	7.1	26	5.63	5.58	46
	SP-10-14-040	8/17/2010	40	<0.03	41 J	<0.34	7.2	27	1.26	1.23	70
	SP-10-14-044	8/17/2010	44	0.044 J	<25	<0.27	4.8	13	0.039	0.043	85
	SP-10-14-046	8/17/2010	46	<0.03	<25	<0.28	4.6	12	0.046	0.073	87
	SP-10-14-055	8/17/2010	55	<0.03	<26	<0.28	4.7	12	0.013	0.016	85
	SDUP2-081710	8/17/2010	55	<0.03	32 J	<0.28	4	11	--	--	85
	SP-10-14-060	8/17/2010	60	<0.03	<27	<0.29	6.8	15	<0.010	0.017	81
	SP-10-14-070	8/17/2010	70	<0.03	<26	<0.29	7.2	15	<0.010	<0.010	80
	SP-10-14-075	8/17/2010	75	<0.03	28 J	<0.28	5.3	16	0.011	0.013	84
	SP-10-14-080	8/17/2010	80	0.54	350	<0.25	6.5	31	0.032	0.025	93

TABLE 4
SOIL SAMPLING RESULTS
Shepley's Hill Landfill, Devens Massachusetts

Boring Location	Sample ID	Date	Depth	Silver (mg/kg)	Sodium (mg/kg)	Thallium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)	TOC % Replicate 1	TOC % Replicate 2	Total Solids %
SP-10-15	SP-10-15-001	8/12/2010	1	0.1 J	<22	<0.24	6	13	0.034	0.027	99
	SP-10-15-004	8/12/2010	4	1.3	95	<0.25	12	83	1.50	1.81	96
	SP-10-15-005	8/12/2010	5	0.71	85	<0.25	8.8	55	0.742	0.618	98
	SP-10-15-010	8/12/2010	10	12	100	<0.30	6.2	53	1.24	1.53	83
	SP-10-15-015	8/12/2010	15	1.1	120	<0.30	5.6	140	0.341	0.499	80
	SP-10-15-017	8/12/2010	17	0.32 J	100	<0.26	10	86	1.52	2.45	93
	SP-10-15-018	8/12/2010	18	1.2 J	940	<1.8	6.4	1000	9.38	7.54	65
	SP-10-15-020	8/12/2010	20	3	93	<0.27	17	110	4.47	7.27	88
	SP-10-15-025	8/12/2010	25	0.8	210	<0.31	37	220	5.45	4.80	76
	SDUP6-081210	8/12/2010	25	0.72	210	<0.32	30	380	--	--	76
	SP-10-15-028	8/12/2010	28	0.037 J	27 J	<0.29	8.5	11	0.473	0.358	80
	SP-10-15-030	8/12/2010	30	0.15 J	51 J	<0.31	5.6	13	0.188	0.038	78
	SDUP7-081210	8/12/2010	30	0.074 J	40 J	<0.30	4.6	11	--	--	80
	SP-10-15-035	8/12/2010	35	0.034 J	55 J	<0.29	4.4	9.5	0.111	0.074	81
	SP-10-15-040	8/12/2010	40	0.033 J	41 J	<0.31	4	9.7	0.056	0.026	77
	SP-10-15-055	8/12/2010	55	1.2	220	<0.26	2.2	48	0.039	0.027	91
SP-10-16	SP-10-16-036	9/1/2010	36	0.098 J	25 J	<0.26	16	29	0.037	0.036	92
	SDUP-081910	9/1/2010	36	0.098 J	<24	<0.26	19	34	-	-	93
	SP-10-16-050	9/1/2010	50	<0.03	<27	<0.29	4.8	12	<0.010	0.018	84
	SP-10-16-053	9/1/2010	53	<0.03	36 J	<0.26	4.8	13	0.02	0.014	88
	SP-10-16-060	9/1/2010	60	0.038 J	39 J	<0.27	8.5	18	0.015	0.016	87
	SP-10-16-065	9/1/2010	65	<0.03	39 J	<0.26	4.6	13	<0.010	0.014	90
	SDUP2-081910	9/1/2010	65	0.032 J	34 J	<0.27	5.5	13	-	-	90
	SP-10-16-070	9/1/2010	70	0.041 J	41 J	<0.26	9.7	18	0.022	0.021	93
	SP-10-16-080	9/1/2010	80	0.047 J	64 J	<0.27	7.6	16	<0.01	0.013	85
	SP-10-16-093	9/1/2010	93	0.45	380	<0.26	9.9	33	0.04	0.045	90

← 220 ppm

Notes:
mg/kg means milligrams per kilograms
ug/kg means micrograms per kilograms
J means estimated results
B indicates that analyte was detected in the associated meth
< means less than > means greater than

TOC - Total Organic Carbon

TABLE 4
SOIL SAMPLING RESULTS
Shepley's Hill Landfill, Devens Massachusetts

Boring Location	Sample ID	Date	Depth	Aluminum (mg/kg)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Calcium (mg/kg)	Chromium (mg/kg)	Cobalt (mg/kg)
SP-10-15	SP-10-15-001	8/12/2010	1	3,700	<0.17	8.6	10	0.34	<0.03	420	6.8	2.7
	SP-10-15-004	8/12/2010	4	5,500	0.66 J	17	25	0.49	0.7	930	16	2.9
	SP-10-15-005	8/12/2010	5	4,300	0.47 J	12	20	0.34	0.24 J	2,700	9.7	2.6
	SP-10-15-010	8/12/2010	10	4,300	0.35 J	11	16	0.27	0.14 J	920	11	2.7
	SP-10-15-015	8/12/2010	15	3,800	0.41 J	8.9	12	0.24 J	<0.04	830	11	2.4
	SP-10-15-017	8/12/2010	17	4,300	0.64 J	6.2	41	0.3	0.26 J	790	8.4	2.1
	SP-10-15-018	8/12/2010	18	9,300	11 J	25	120	<0.09	<0.24	9,000	69	14
	SP-10-15-020	8/12/2010	20	6,000	5.9	17	38	0.46	0.14 J	3,000	14	3.8
	SP-10-15-025	8/12/2010	25	4,900	4.0	16	170	0.35	0.27 J	4,500	35	4.5
	SDUP6-081210	8/12/2010	25	5,800	2.5 J	18	140	0.54	0.26 J	5,600	36	6.1
	SP-10-15-028	8/12/2010	28	4,800	<0.20	7.9	12	0.27	<0.04	340	10	1.5
	SP-10-15-030	8/12/2010	30	3,600	0.71 J	39	7.6	0.32	<0.04	390	7 J	2.3
	SDUP7-081210	8/12/2010	30	3,000	0.25 J	22	7	0.29	<0.04	490	5	1.9
	SP-10-15-035	8/12/2010	35	2,900	<0.21	15	6.4	0.23 J	<0.04	540	5.9	2
	SP-10-15-040	8/12/2010	40	2,700	0.27 J	15	5.8	0.2 J	<0.04	450	5.4	1.6
	SP-10-15-055	8/12/2010	55	3,600	0.26 J	58	14	0.78	0.19 J	1,500	4.4	1.6
SP-10-16	SP-10-16-036	9/1/2010	36	8,800	0.24 J	4.2	19	0.66	<0.03	920	32	5.7
	SDUP-081910	9/1/2010	36	9,600	0.24 J	6	23	0.76	0.03	770	32	6.5
	SP-10-16-050	9/1/2010	50	3,100	0.24 J	1.1	4.9	0.21 J	<0.04	330	7.6	2.1
	SP-10-16-053	9/1/2010	53	3,100	0.32 J	1.2	6.5	0.24	<0.04	400	8.8	2
	SP-10-16-060	9/1/2010	60	4,800	0.5 J	5	9.2	0.38	<0.04	490	16	3.5
	SP-10-16-065	9/1/2010	65	3,200	0.21 J	1.2	7.3	0.24	<0.03	390	8	2.4
	SDUP2-081910	9/1/2010	65	3,500	0.2 J	1.3	7.1	0.26	<0.04	390	9	2.6
	SP-10-16-070	9/1/2010	70	5,300	0.47 J	8.8	7.5	0.34	<0.03	520 J	16 J	3.4
	SP-10-16-080	9/1/2010	80	3,900	0.21 J	4.8	12	0.39	<0.04	880	12	2.6
	SP-10-16-093	9/1/2010	93	5,300	0.51	J	33	0.92	<0.03	3,700	17	4.3

Notes:
mg/kg means milligrams per kilograms
ug/kg means micrograms per kilograms
J means estimated results
B indicates that analyte was detected in the associated method blank
< means less than > means greater than

TABLE 4
SOIL SAMPLING RESULTS
Shepley's Hill Landfill, Devens Massachusetts

Boring Location	Sample ID	Date	Depth	Copper (mg/kg)	Iron (mg/kg)	Lead (mg/kg)	Magnesium (mg/kg)	Manganese (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Potassium (mg/kg)	Selenium (mg/kg)
SP-10-07	SP-10-07-029	5/21/2010	29	3.69	4,400	2.1	900 J	47.7	< 0.003	5.6	690	< 0.169
	SDUP-052110	5/21/2010	29	3.6	4,000	2.22	750	42.3	< 0.003	5.11	570	< 0.158
	SP-10-07-041	5/21/2010	41	9.8	9,100	5.36	3,100	129	< 0.003	16.2	1,400	0.175 J
	SP-10-07-053	5/21/2010	53	29.6	41,000	29.3	21,000	740	< 0.002	101	11,000	1.45 J
SP-10-11	SP-10-11-003	8/12/2010	3	6.8	5,300	5.9	1200	89	<0.02	6.1	500	<0.12
	SP-10-11-005	8/12/2010	5	8.1	9,700	110	2500	190	0.15	11	880	<0.12
	SP-10-11-007	8/12/2010	7	9.3	7,700	22	1,900	180	<0.02	9.7	710	<0.12
	SP-10-11-012	8/12/2010	12	7.3	6,600	21	1,400	150	<0.02	8.4	570	0.14 J
	SP-10-11-015	8/12/2010	15	33	12,000	24	1,600	130	0.03 J	16	570	0.12 J
	SP-10-11-020	8/12/2010	20	13 J	9,200	16	2,600	110 J	<0.02	12	680 J	0.24 J
	SDUP-081210	8/12/2010	20	11	8,400	17	1,800	88	<0.01	12	720	0.33 J
	SP-10-11-023	8/12/2010	23	7.5	7,900	10	2,000	150	<0.02	12	660	<0.12
	SP-10-11-025	8/12/2010	25	5.7	6,300	5.2	1,800	120	<0.02	9.3	400	<0.12
	SDUP8-081210	8/12/2010	25	6.2	7,700	6.3	2,500	120	<0.02	12	490	<0.12
	SP-10-11-033	8/12/2010	33	4.7	5,000	4.6	940	120	<0.02	6.9	380	<0.14
	SP-10-11-040	8/12/2010	40	4.7	5,600	4.9	1,400	100	<0.02	7.8	350	0.14 J
	SP-10-11-055	8/12/2010	55	5.1	5,200	4.3	1,200	62	<0.02	7.7	450	<0.12
	SP-10-11-062	8/12/2010	62	12	19,000	13	11,000	440	<0.02	45	5,600	<0.23
SP-10-12	SP-10-12-001	8/12/2010	1	40	7,500	95	980	110	0.068 J	6.6	350	0.32 J
	SP-10-12-005	8/12/2010	5	260	31,000	510	2200	410	0.75	17	890	0.84 J
	SP-10-12-009	8/12/2010	9	7.3	8,500	8.5	1,900	76	<0.02	9.3	410	0.26 J
	SP-10-12-015	8/12/2010	15	6.6	5,100	7.9	990	62	<0.01	5.6	620	<0.12
	SP-10-12-017	8/12/2010	17	7.9	3,700	3.5	660	43	<0.02	3.2	490	<0.12
	SP-10-12-025	8/12/2010	25	4.7	5,300	4.6	920	90	<0.02	5.8	490	<0.12
	SP-10-12-035	8/12/2010	35	9.7	5,300	16	1,200	80	0.43	5.9	330	0.18 J
	SDUP2-081210	8/12/2010	35	9	5,300	14	1,200	84	0.48	5.9	440	0.14 J
	SP-10-12-040	8/12/2010	40	12	5,200	12	1,100	70	0.22	5.8	360	<0.12
	SDUP3-081210	8/12/2010	40	14	4,800	16	1,000	70	0.79	5.7	390	0.13 J
	SP-10-12-042	8/12/2010	42	4	4,900	4.4	1,100	84	<0.02	5.9	480	<0.13
	SP-10-12-052	8/12/2010	52	5.4	5,200	4.8	970	120	0.017 J	5.9	460	0.13 J
	SP-10-12-055	8/12/2010	55	4.5	4,600	4.1	1,200	57	<0.02	6.1	330	<0.13

TABLE 4
SOIL SAMPLING RESULTS
Shepley's Hill Landfill, Devens Massachusetts

Boring Location	Sample ID	Date	Depth	Copper (mg/kg)	Iron (mg/kg)	Lead (mg/kg)	Magnesium (mg/kg)	Manganese (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Potassium (mg/kg)	Selenium (mg/kg)
SP-10-13	SP-10-13-001	8/12/2010	1	5	6,000	5.9	1200	97	<0.02	6	470	<0.11
	SP-10-13-005	8/12/2010	5	7.4	7,400	20	2300	120	<0.02	12	1000	<0.12
	SP-10-13-008	8/12/2010	8	7.7	9,000	9.4	2,700	130	1.6	9.6	1,500	0.14 J
	SP-10-13-010	8/12/2010	10	4.9	5,000	5.8	1,200	62	<0.02	6.7	360	0.21 J
	SP-10-13-011	8/12/2010	11	4	4,700	4.3	870	89	<0.02	5.2	430	0.12 J
	SP-10-13-015	8/12/2010	15	3.6	4,200	3.7	880	71	<0.02	4.4	560	<0.12
	SP-10-13-017	8/12/2010	17	4.4	5,100	4.5	1,000	96	<0.02	5.4	520	0.15 J
	SP-10-13-020	8/12/2010	20	5.2	6,000	5.7	1,400	100	<0.02	8.7	440	0.12 J
	SP-10-13-023	8/12/2010	23	33	17,000	49	2,100	3000	0.18	15	1,200	1.5
	SP-10-13-025	8/12/2010	25	5.3	6,100	5.3	1,600	64	<0.02	8.2	480	0.14 J
	SP-10-13-027	8/12/2010	27	15	9,700	53	990	660	0.17	5.5	280	3.0
	SP-10-13-030	8/12/2010	30	0.83	3,100	2.5	940	35	<0.02	3.9	160	0.14 J
	SP-10-13-032	8/12/2010	32	3.1	3,200	3.6	930	34	<0.02	5.6	320	<0.12
	SDUP4-081210	0812/2010	32	2.7	3,100	3.5	900	34	<0.02	5.3	310	<0.12
	SP-10-13-035	8/12/2010	35	4.5	3,400	3.5	1,000	32	<0.02	5.8	330	<0.14
	SP-10-13-040	8/12/2010	40	71	16,000	13	3,400	150	<0.02	23	1,400	<0.16
	SP-10-13-050	8/12/2010	50	4.5	4,000	3.8	1400 J	44 J	<0.02	6.7	400	<0.12
	SP-10-13-065	8/12/2010	65	3.9	3900 J	3.3	930 J	33 J	<0.02	5.6	320	<0.12
	SP-10-13-067	8/12/2010	67	4.7	5,400	4.5	1,200	42	<0.02	7.2	380	<0.13
	SDUP5-081210	8/12/2010	67	4.5	4,900	4	1,100	39	<0.02	6.7	430	<0.13
	SP-10-13-070	8/12/2010	70	6.2	8,500	7.1	2,200	82	<0.02	9.2	450	<0.11
	SP-10-13-072	8/12/2010	72	5.5	9,200	7.3	1,600	130	<0.02	7.6	390	<0.12
	SP-10-13-075	8/12/2010	75	5.9	7,300	6.6	1,700	170	<0.02	8	600	<0.13
	SP-10-13-077	8/12/2010	77	3.4	4,800	9.4	1,100	230	<0.02	5.2	610	<0.12
	SP-10-13-083	8/12/2010	83	23	5,700	49	510	600	<0.02	2.5	2,000	<0.12
SP-10-14	SP-10-14-005	8/17/2010	5	6.2	6,600	6.0	1600	98	<0.02	8.5	520	0.16 J
	SP-10-14-010	8/17/2010	10	11	9,600	180	2500	140	0.23	14	790	0.16 J
	SP-10-14-015	8/17/2010	15	18	21,000	150	1,300	160	<0.02	16	300	0.44 J
	SP-10-14-020	8/17/2010	20	15	13,000	42	4,100	130	<0.02	23	1,500	0.14 J
	SP-10-14-023	8/17/2010	23	5.9	5,400	6.6	1,400	65	<0.02	8.8	460	<0.13
	SP-10-14-027	8/17/2010	27	6.9	9,300	10	1,500	400	<0.06	3 J	260 J	2.1 J
	SP-10-14-030	8/17/2010	30	4.6	4,100	4.7	1,200	41	<0.02	6.1	260	0.35 J
	SDUP-081710	8/17/2010	30	4.6	5,800	6	1,400	58	<0.02	7.9	280	0.14 J
	SP-10-14-031	8/17/2010	31	6.4	950	1.6 J	430	22	<0.07	4.2	<140	1.4 J
	SP-10-14-035	8/17/2010	35	6.1	4,900	3.9 J	1,200	57	<0.03	8.4	230	0.63 J
	SP-10-14-040	8/17/2010	40	7.3	8,000	6.6	1,400	54	<0.02	15	480	0.8 J
	SP-10-14-044	8/17/2010	44	4.5	4,100	4	1,300	39	<0.02	6.1	400	<0.13
	SP-10-14-046	8/17/2010	46	3.3	4,000	3.2	1,200	46	<0.02	5.5	450	<0.13
	SP-10-14-055	8/17/2010	55	6	4,100	3.7	1,200	44	<0.02	5.6	310	<0.13
	SDUP2-081710	8/17/2010	55	5	3,600	4.1	1,100	37	<0.02	5.5	270	<0.13
	SP-10-14-060	8/17/2010	60	6.3	6,200	5.6	1,400	60	<0.02	8.1	550	<0.14
	SP-10-14-070	8/17/2010	70	5.2	6,000	4.9	1,300	86	<0.02	7.3	850	<0.13
	SP-10-14-075	8/17/2010	75	4.1	5,200	5.3	1,400	170	<0.02	7.3	600	<0.13
	SP-10-14-080	8/17/2010	80	5.3	6,900	17	1,700	230	<0.02	8.7	2,200	<0.12

TABLE 4
SOIL SAMPLING RESULTS
Shepley's Hill Landfill, Devens Massachusetts

Boring Location	Sample ID	Date	Depth	Copper (mg/kg)	Iron (mg/kg)	Lead (mg/kg)	Magnesium (mg/kg)	Manganese (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Potassium (mg/kg)	Selenium (mg/kg)
SP-10-15	SP-10-15-001	8/12/2010	1	5.9	5,900	5.7	1400	110	<0.02	7.1	470	<0.11
	SP-10-15-004	8/12/2010	4	24	9,400	110	2100	120	0.33	12	810	0.19 J
	SP-10-15-005	8/12/2010	5	10	11,000	39	1,600	230	0.049 J	9.3	550	0.16 J
	SP-10-15-010	8/12/2010	10	8.2	8,100	21	1,800	100	0.037 J	11	410	0.16 J
	SP-10-15-015	8/12/2010	15	7.1	7,000	12	1,600	81	<0.02	9.6	330	0.17 J
	SP-10-15-017	8/12/2010	17	11	12,000	38	1,400	130	0.17	9.0	420	0.33 J
	SP-10-15-018	8/12/2010	18	310	140,000	1200	600	1100	0.44	75	380 J	2.9 J
	SP-10-15-020	8/12/2010	20	14	9,900	220	1,800	110	0.067 J	12	530	0.39 J
	SP-10-15-025	8/12/2010	25	38	24,000	260	1,900	240	0.32	20	480	0.46 J
	SDUP6-081210	8/12/2010	25	41	23,000	390	2,600	240	0.15	23	930	0.44 J
	SP-10-15-028	8/12/2010	28	3.7	5,800	5.3	2,000	58	<0.02	6.3	320	<0.13
	SP-10-15-030	8/12/2010	30	5.6	7,800	5.8	1400 J	64 J	<0.02	7.8	360	0.27 J
	SDUP7-081210	8/12/2010	30	4.4	5,600	4.6	1,100	50	<0.02	6.3	350	<0.14
	SP-10-15-035	8/12/2010	35	5	5,100	4.6	1,200	62	<0.02	6.6	300	<0.14
	SP-10-15-040	8/12/2010	40	4.1	6,300	4.8	1,200	310	<0.02	5.9	270	<0.14
	SP-10-15-055	8/12/2010	55	4.3	4,100	21	590	680	<0.02	2.5	1,200	<0.12
SP-10-16	SP-10-16-036	9/1/2010	36	13	12,000	9.6	5700	100	<0.02	20	1400	<0.12
	SDUP-081910	9/1/2010	36	13	13,000	12	6400	120	<0.02	24	2000	<0.12
	SP-10-16-050	9/1/2010	50	3.1	4,300	3.9	1500	40	<0.02	8.7	330	<0.14
	SP-10-16-053	9/1/2010	53	3.8	4,100	4	1,600	40	<0.02	9.6	420	<0.12
	SP-10-16-060	9/1/2010	60	18	8,800	8.2	2,700	72	<0.02	15	520	<0.12
	SP-10-16-065	9/1/2010	65	4.3	4,000	3.8	1,500	37	<0.02	9.7	420	<0.12
	SDUP2-081910	9/1/2010	65	5.2	4,500	5.2	1,800	43	<0.02	11	430	<0.12
	SP-10-16-070	9/1/2010	70	6.6	9,400	8.2	3,100	82 J	<0.02	14.0	500	<0.12
	SP-10-16-080	9/1/2010	80	4.8	7,100	6.4	2,200	100	<0.02	9.4	900	<0.13
	SP-10-16-093	9/1/2010	93	12	12,000	14	2,700	310	<0.02	7.9	2,300	<0.12

Notes:
mg/kg means milligrams per kilograms
ug/kg means micrograms per kilograms
J means estimated results
B indicates that analyte was detected in the associated meth
< means less than > means greater than

TABLE 4
SOIL SAMPLING RESULTS
Shepley's Hill Landfill, Devens Massachusetts

Boring Location	Sample ID	Date	Depth	Silver (mg/kg)	Sodium (mg/kg)	Thallium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)	TOC %	TOC %	Total Solids %
SP-10-07	SP-10-07-029	5/21/2010	29	< 0.092	48 J	< 0.262	5.33	14.2	0.01	0.011	83
	SDUP-052110	5/21/2010	29	< 0.086	45 J	< 0.246	4.57	13.6	0.012	< 0.01	84
	SP-10-07-041	5/21/2010	41	< 0.083	120	< 0.238	10.1	28.8	0.012	0.02	91
	SP-10-07-053	5/21/2010	53	< 0.766	510 J	< 2.19	49	109	0.032	0.032	99
SP-10-11	SP-10-11-003	8/12/2010	3	3.5	<24	<0.26	5.3	13	0.055	0.065	92
	SP-10-11-005	8/12/2010	5	1	120	<0.25	10	66	0.45	0.618	94
	SP-10-11-007	8/12/2010	7	2.2	61 J	<0.27	7.9	33	0.904	0.805	88
	SP-10-11-012	8/12/2010	12	0.24 J	92	<0.25	6.9	27	0.469	0.397	96
	SP-10-11-015	8/12/2010	15	14	85	<0.25	7.8	48	1.2	1.12	95
	SP-10-11-020	8/12/2010	20	0.84	73 J	<0.24	9.4	25 J	1.52	1.55	99
	SDUP-081210	8/12/2010	20	0.3 J	59 J	<0.24	9.2	22	--	--	98
	SP-10-11-023	8/12/2010	23	0.24 J	66 J	<0.25	7.1	18	0.03	0.043	95
	SP-10-11-025	8/12/2010	25	0.063 J	43 J	<0.27	5.6	12	0.025	0.025	89
	SDUP8-081210	8/12/2010	25	0.67	24 J	<0.25	8.2	14	--	--	94
	SP-10-11-033	8/12/2010	33	0.041 J	44 J	<0.30	4.7	11	<0.01	<0.01	79
	SP-10-11-040	8/12/2010	40	0.063 J	57 J	<0.27	5	10	0.036	0.036	90
	SP-10-11-055	8/12/2010	55	0.1 J	59 J	<0.27	5	11	<0.01	0.014	90
	SP-10-11-062	8/12/2010	62	6.4	180	0.25	25	48	0.017	0.018	96
SP-10-12	SP-10-12-001	8/12/2010	1	0.2 J	61 J	<0.25	6.2	95	3.83	3.97	97
	SP-10-12-005	8/12/2010	5	0.82	240	<0.27	16	210	5.87	7.56	89
	SP-10-12-009	8/12/2010	9	0.23 J	<23	<0.25	8.4	16	0.744	0.714	98
	SP-10-12-015	8/12/2010	15	0.59	32 J	<0.26	5.3	12	0.185	0.129	94
	SP-10-12-017	8/12/2010	17	0.13 J	51 J	<0.26	3.8	8.5	0.094	0.058	91
	SP-10-12-025	8/12/2010	25	0.13 J	30 J	<0.26	4.7	12	<0.010	<0.010	91
	SP-10-12-035	8/12/2010	35	0.041 J	40 J	<0.30	4.9	17	0.062	0.152	81
	SDUP2-081210	8/12/2010	35	0.038 J	48 J	<0.29	4.9	17	--	--	84
	SP-10-12-040	8/12/2010	40	<0.03	50 J	<0.26	4.6	15	0.117	0.089	91
	SDUP3-081210	8/12/2010	40	0.032 J	28 J	<0.26	4.6	16	--	--	90
	SP-10-12-042	8/12/2010	42	<0.03	<26	<0.28	5	12	<0.010	<0.010	86
	SP-10-12-052	8/12/2010	52	<0.03	66 J	<0.26	4.3	11	0.019	<0.010	89
	SP-10-12-055	8/12/2010	55	0.029 J	<27	<0.29	4.6	11	<0.010	<0.010	81

TABLE 4
SOIL SAMPLING RESULTS
Shepley's Hill Landfill, Devens Massachusetts

Boring Location	Sample ID	Date	Depth	Silver (mg/kg)	Sodium (mg/kg)	Thallium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)	TOC %	TOC %	Total Solids %
SP-10-13	SP-10-13-001	8/12/2010	1	0.091 J	<21	<0.23	5.7	11	0.057	0.061	100
	SP-10-13-005	8/12/2010	5	0.16 J	130	<0.26	10	22	0.332	0.320	93
	SP-10-13-008	8/12/2010	8	0.12 J	<24	<0.26	13	29	0.570	0.396	94
	SP-10-13-010	8/12/2010	10	0.15 J	42 J	<0.25	4.8	13	0.075	0.090	93
	SP-10-13-011	8/12/2010	11	0.026 J	<23	<0.25	4.4	9.7	<0.010	0.014	99
	SP-10-13-015	8/12/2010	15	0.22 J	44 J	<0.26	4.6	9	0.020	0.023	93
	SP-10-13-017	8/12/2010	17	0.027 J	27 J	<0.23	4.8	11	0.036	0.039	99
	SP-10-13-020	8/12/2010	20	0.1 J	38 J	<0.25	5.6	13	0.061	0.073	95
	SP-10-13-023	8/12/2010	23	0.68	3200	<0.52	14	13000	5.37	5.5	90
	SP-10-13-025	8/12/2010	25	0.051 J	<25	<0.27	7.2	20	0.343	0.324	89
	SP-10-13-027	8/12/2010	27	0.35 J	700	<0.44	4.3	2000	12.5	12.2	55
	SP-10-13-030	8/12/2010	30	0.042 J	<24	<0.26	3.4	10	9.48	7.37	93
	SP-10-13-032	8/12/2010	32	0.074 J	<23	<0.25	3.6	9.8	0.102	0.082	96
	SDUP4-081210	0812/2010	32	<0.03	<23	<0.25	3.4	9.1	--	--	94
	SP-10-13-035	8/12/2010	35	<0.03	43 J	<0.29	3.7	9.5	0.225	0.166	79
	SP-10-13-040	8/12/2010	40	0.08 J	150	<0.33	14	34	0.412	0.410	73
	SP-10-13-050	8/12/2010	50	<0.03	<24	<0.26	5	12	<0.010	<0.010	90
	SP-10-13-065	8/12/2010	65	<0.03	<24	<0.26	3.8	8.1	<0.010	<0.010	92
	SP-10-13-067	8/12/2010	67	<0.03	25 J	<0.27	4.8	10	<0.010	<0.010	84
	SDUP5-081210	8/12/2010	67	<0.03	<26	<0.28	4.5	9.8	--	--	85
	SP-10-13-070	8/12/2010	70	0.13 J	<22	<0.24	8.1	15	<0.010	0.017	96
	SP-10-13-072	8/12/2010	72	0.1 J	47 J	<0.25	6	13	<0.010	<0.010	94
	SP-10-13-075	8/12/2010	75	0.28 J	52 J	<0.27	7.2	16	<0.010	<0.010	90
	SP-10-13-077	8/12/2010	77	0.093 J	52 J	<0.27	4.5	22	<0.010	<0.010	89
	SP-10-13-083	8/12/2010	83	2.2	420	<0.26	2.1	85	<0.010	<0.010	91
SP-10-14	SP-10-14-005	8/17/2010	5	0.067 J	40 J	<0.26	6.1	14	0.077	0.073	93
	SP-10-14-010	8/17/2010	10	0.37 J	100	<0.25	13	91	0.752	0.858	93
	SP-10-14-015	8/17/2010	15	0.15 J	130	<0.30	5.7	160	0.293	0.287	80
	SP-10-14-020	8/17/2010	20	0.31 J	84 J	<0.26	39	120	5.11	4.63	91
	SP-10-14-023	8/17/2010	23	0.034 J	28 J	<0.28	5.6	36	0.160	0.127	86
	SP-10-14-027	8/17/2010	27	<0.09	260 J	<0.90	2	56	23.9	25.0	27
	SP-10-14-030	8/17/2010	30	<0.03	34 J	<0.32	4.8	11	4.76	5.41	72
	SDUP-081710	8/17/2010	30	<0.03	<27	<0.29	6.1	16	--	--	81
	SP-10-14-031	8/17/2010	31	<0.10	150 J	<0.98	4.4	12	14.7	14.3	24
	SP-10-14-035	8/17/2010	35	<0.05	82 J	<0.51	7.1	26	5.63	5.58	46
	SP-10-14-040	8/17/2010	40	<0.03	41 J	<0.34	7.2	27	1.26	1.23	70
	SP-10-14-044	8/17/2010	44	0.044 J	<25	<0.27	4.8	13	0.039	0.043	85
	SP-10-14-046	8/17/2010	46	<0.03	<25	<0.28	4.6	12	0.046	0.073	87
	SP-10-14-055	8/17/2010	55	<0.03	<26	<0.28	4.7	12	0.013	0.016	85
	SDUP2-081710	8/17/2010	55	<0.03	32 J	<0.28	4	11	--	--	85
	SP-10-14-060	8/17/2010	60	<0.03	<27	<0.29	6.8	15	<0.010	0.017	81
	SP-10-14-070	8/17/2010	70	<0.03	<26	<0.29	7.2	15	<0.010	<0.010	80
	SP-10-14-075	8/17/2010	75	<0.03	28 J	<0.28	5.3	16	0.011	0.013	84
	SP-10-14-080	8/17/2010	80	0.54	350	<0.25	6.5	31	0.032	0.025	93

TABLE 4
SOIL SAMPLING RESULTS
Shepley's Hill Landfill, Devens Massachusetts

Boring Location	Sample ID	Date	Depth	Aluminum (mg/kg)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Calcium (mg/kg)	Chromium (mg/kg)	Cobalt (mg/kg)
SP-10-07	SP-10-07-029	5/21/2010	29	2,800	< 0.381	5.61	14.2	0.183 J	< 0.039	640 J	4.7	2.1
	SDUP-052110	5/21/2010	29	2,500	< 0.357	5.15	12	0.172 J	< 0.036	700	4	1.92
	SP-10-07-041	5/21/2010	41	5,900	0.469 J	12.2	19.3	0.298	0.0613 J	1,400	15	4.15
	SP-10-07-053	5/21/2010	53	30,000	< 3.18	32.4	74.6	1.01 J	< 0.322	25,000	68	21.2
SP-10-11	SP-10-11-003	8/12/2010	3	3,300	<0.19	6.6	8.9	0.32	<0.04	320	6.4	2.1
	SP-10-11-005	8/12/2010	5	5,600	0.3 J	11	86	0.52	0.21 J	1000	14	3.5
	SP-10-11-007	8/12/2010	7	4,800	<0.19	10	14	0.39	<0.04	760	12	2.8
	SP-10-11-012	8/12/2010	12	4,400	<0.18	12	14	0.38	<0.03	610	8.4	2.5
	SP-10-11-015	8/12/2010	15	4,500	0.43 J	12	15	0.44	220	860	42	3
	SP-10-11-020	8/12/2010	20	5,400	0.25 J	11	38 J	0.44	2.1 J	680 J	12 J	2.7
	SDUP-081210	8/12/2010	20	4,700	<0.17	13	20	0.42	0.16 J	580	9.7	2.8
	SP-10-11-023	8/12/2010	23	4,500	<0.18	12	12	0.36	0.05 J	430	9.1	4.9
	SP-10-11-025	8/12/2010	25	3,200	<0.19	7.8	7.2	0.25	<0.04	490	10	2.1
	SDUP8-081210	8/12/2010	25	4,300	<0.18	8	8.6	0.35	0.17 J	700	22	2.9
	SP-10-11-033	8/12/2010	33	3,000	<0.22	9.7	11	0.31	<0.04	800	5.1	1.8
	SP-10-11-040	8/12/2010	40	3,100	<0.19	9.8	8.9	0.26	<0.04	410	8.1	1.8
	SP-10-11-055	8/12/2010	55	3,000	<0.19	10	8.4	0.28	<0.04	520	6.7	2.0
	SP-10-11-062	8/12/2010	62	17,000	<0.18	9.4	58	1.8	<0.03	24,000	59	9.6
SP-10-12	SP-10-12-001	8/12/2010	1	3,200	0.35 J	5.4	13	0.24	<0.03	630	6.4	2.5
	SP-10-12-005	8/12/2010	5	6,900	2.2 J	12	78	0.59	<0.04	4200	18	5.8
	SP-10-12-009	8/12/2010	9	7,100	0.22 J	13	9.5	0.42	<0.03	560	9.8	2.6
	SP-10-12-015	8/12/2010	15	3,400	<0.18	9.6	10	0.35	<0.03	690	5.6	2.2
	SP-10-12-017	8/12/2010	17	2,200	<0.19	6.2	9.3	0.25	<0.04	700	3.8	1.5
	SP-10-12-025	8/12/2010	25	2,600	<0.19	9.0	9.2	0.25	<0.04	760	4.8	2.4
	SP-10-12-035	8/12/2010	35	3,100	<0.22	9.4	8.1	0.2 J	<0.04	480	6.3	1.7
	SDUP2-081210	8/12/2010	35	3,200	<0.21	9.2	9	0.24	<0.04	580	6.1	1.7
	SP-10-12-040	8/12/2010	40	3,000	0.2 J	14	7.7	0.21 J	<0.04	660	7	1.8
	SDUP3-081210	8/12/2010	40	2,800	<0.19	15	8.7	0.24	<0.04	640	7.4	1.8
	SP-10-12-042	8/12/2010	42	3,100	<0.20	29	8.6	0.31	<0.04	560	5.7	1.7
	SP-10-12-052	8/12/2010	52	2,800	<0.19	26	8.4	0.28	<0.04	480	10	2
	SP-10-12-055	8/12/2010	55	2,900	<0.21	34	6.3	0.28	<0.04	330	6.7	1.6

TABLE 4
SOIL SAMPLING RESULTS
Shepley's Hill Landfill, Devens Massachusetts

Boring Location	Sample ID	Date	Depth	Aluminum (mg/kg)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Calcium (mg/kg)	Chromium (mg/kg)	Cobalt (mg/kg)
SP-10-13	SP-10-13-001	8/12/2010	1	3,500	0.2 J	8.4	9.4	0.28	<0.03	500	5.6	2.3
	SP-10-13-005	8/12/2010	5	5,100	<0.18	8.8	18	0.45	<0.03	1100	16	3.2
	SP-10-13-008	8/12/2010	8	6,200	<0.19	9.1	18	0.66	<0.04	490	18	2.9
	SP-10-13-010	8/12/2010	10	3,400	<0.18	5.3	7.2	0.28	<0.03	570	6.4	1.9
	SP-10-13-011	8/12/2010	11	2,700	<0.18	7.4	8.5	0.27	<0.03	560	4.4	2
	SP-10-13-015	8/12/2010	15	2,800	<0.18	6.2	11	0.29	<0.03	560	5.2	1.8
	SP-10-13-017	8/12/2010	17	3,000	<0.17	6.7	10	0.28	<0.03	520	4.8	1.9
	SP-10-13-020	8/12/2010	20	3,300	<0.18	5.6	12	0.26	<0.03	490	7.6	3.3
	SP-10-13-023	8/12/2010	23	5,600	4.4	31	43	0.49	3.5	2,100	52	4.5
	SP-10-13-025	8/12/2010	25	4,200	<0.19	7.5	12	0.31	<0.04	460	8.6	2.5
	SP-10-13-027	8/12/2010	27	1,900	0.9 J	7	81	0.26 J	0.65 J	14,000	3.9	1.6
	SP-10-13-030	8/12/2010	30	2,600	<0.19	0.8	5.3	0.13 J	<0.04	390	4.7	1.4
	SP-10-13-032	8/12/2010	32	2,600	<0.18	1.5	5.4	0.19 J	<0.03	550	4.6	1.4
	SDUP4-081210	0812/2010	32	2,500	<0.18	1.6	5.2	0.19 J	<0.03	600	4.4	1.3
	SP-10-13-035	8/12/2010	35	2,800	<0.21	1.7	5.9	0.19 J	<0.04	380	5.4	1.4
	SP-10-13-040	8/12/2010	40	9,300	<0.24	5.9	27	0.84	<0.05	2,500	48	5.9
	SP-10-13-050	8/12/2010	50	3,200	<0.19	1.3	8.5	0.27	<0.04	480 J	6.9	2.3
	SP-10-13-065	8/12/2010	65	2500 J	<0.18	3.8	9.1	0.19 J	<0.03	420	4.6 J	1.4
	SP-10-13-067	8/12/2010	67	3,200	<0.20	5.6	12	0.23	<0.04	450	5.9	1.7
	SDUP5-081210	8/12/2010	67	3,000	<0.20	5.4	13	0.24	<0.04	500	5.3	1.8
	SP-10-13-070	8/12/2010	70	4,900	<0.17	9.4	12	0.33	<0.03	360	13	4.3
	SP-10-13-072	8/12/2010	72	3,600	0.22 J	7.6	8.6	0.26	<0.03	680	8.2	1.8
	SP-10-13-075	8/12/2010	75	4,000	<0.20	13	10	0.34	<0.04	560	9.3	2.3
	SP-10-13-077	8/12/2010	77	2,700	<0.19	14	9.9	0.49	<0.04	1,100	6.2	1.7
	SP-10-13-083	8/12/2010	83	3,800	<0.19	23	15	0.94	0.3 J	1,600	6	1.4
SP-10-14	SP-10-14-005	8/17/2010	5	4,100	0.28 J	8.5	10	0.32	<0.03	250	8.6	2.7
	SP-10-14-010	8/17/2010	10	7,400	0.64 J	18	27	0.55	0.059 J	3900	16	4.1
	SP-10-14-015	8/17/2010	15	4,800	1.5 j	12	200	0.29	<0.04	1,400	14	4.6
	SP-10-14-020	8/17/2010	20	8,000	0.43 J	18	32	0.72	<0.04	1,100	26	4.6
	SP-10-14-023	8/17/2010	23	3,300	0.46 J	6.0	13	0.28	<0.04	770	6.8	2.4
	SP-10-14-027	8/17/2010	27	1,400	0.88 J	3.8	63	0.24 J	<0.12	19,000	1.5	1.2 J
	SP-10-14-030	8/17/2010	30	4,200	0.25 J	9.5	12	0.33	<0.04	1,800	6.2	1.4
	SDUP-081710	8/17/2010	30	5,200	0.35 J	11	9.8	0.37	<0.04	550	7.6	1.7
	SP-10-14-031	8/17/2010	31	3,000	<0.70	8.5	35	0.35 J	<0.13	6,300	4.8	0.95 J
	SP-10-14-035	8/17/2010	35	3,600	0.38 J	60	13	0.33 J	<0.07	1,700	8.4	4.9
	SP-10-14-040	8/17/2010	40	3,400	0.59 J	34	10	0.37	<0.05	1,100	7.6	4.3
	SP-10-14-044	8/17/2010	44	3,100	0.41 J	2.8	7.5	0.22	<0.04	440	5.9	2
	SP-10-14-046	8/17/2010	46	2,900	0.3 J	2.6	6.8	0.23	<0.04	760	5.8	1.6
	SP-10-14-055	8/17/2010	55	3,000	0.25 J	4.8	5.8	0.24	<0.04	490	6	1.4
	SDUP2-081710	8/17/2010	55	2,700	0.22 J	5	5.4	0.22 J	<0.04	540	5.6	1.3
	SP-10-14-060	8/17/2010	60	4,800	0.22 J	13	11	0.51	<0.04	890	7.7	3
	SP-10-14-070	8/17/2010	70	4,400	<0.21	35	15	0.5	<0.04	1,100	7.2	2.1
	SP-10-14-075	8/17/2010	75	3,400	0.32 J	51	11	0.37	<0.04	760	6.7	2.2
	SP-10-14-080	8/17/2010	80	5,700	0.26 J	62	20	0.86	<0.03	1,300	15	2.7

TABLE 4
SOIL SAMPLING RESULTS
Shepley's Hill Landfill, Devens Massachusetts

Boring Location	Sample ID	Date	Depth	Silver (mg/kg)	Sodium (mg/kg)	Thallium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)	TOC %	TOC %	Total Solids %
SP-10-15	SP-10-15-001	8/12/2010	1	0.1 J	<22	<0.24	6	13	0.034	0.027	99
	SP-10-15-004	8/12/2010	4	1.3	95	<0.25	12	83	1.50	1.81	96
	SP-10-15-005	8/12/2010	5	0.71	85	<0.25	8.8	55	0.742	0.618	98
	SP-10-15-010	8/12/2010	10	12	100	<0.30	6.2	53	1.24	1.53	83
	SP-10-15-015	8/12/2010	15	1.1	120	<0.30	5.6	140	0.341	0.499	80
	SP-10-15-017	8/12/2010	17	0.32 J	100	<0.26	10	86	1.52	2.45	93
	SP-10-15-018	8/12/2010	18	1.2 J	940	<1.8	6.4	1000	9.38	7.54	65
	SP-10-15-020	8/12/2010	20	3	93	<0.27	17	110	4.47	7.27	88
	SP-10-15-025	8/12/2010	25	0.8	210	<0.31	37	220	5.45	4.80	76
	SDUP6-081210	8/12/2010	25	0.72	210	<0.32	30	380	--	--	76
	SP-10-15-028	8/12/2010	28	0.037 J	27 J	<0.29	8.5	11	0.473	0.358	80
	SP-10-15-030	8/12/2010	30	0.15 J	51 J	<0.31	5.6	13	0.188	0.038	78
	SDUP7-081210	8/12/2010	30	0.074 J	40 J	<0.30	4.6	11	--	--	80
	SP-10-15-035	8/12/2010	35	0.034 J	55 J	<0.29	4.4	9.5	0.111	0.074	81
	SP-10-15-040	8/12/2010	40	0.033 J	41 J	<0.31	4	9.7	0.056	0.026	77
	SP-10-15-055	8/12/2010	55	1.2	220	<0.26	2.2	48	0.039	0.027	91
SP-10-16	SP-10-16-036	9/1/2010	36	0.098 J	25 J	<0.26	16	29	0.037	0.036	92
	SDUP-081910	9/1/2010	36	0.098 J	<24	<0.26	19	34	-	-	93
	SP-10-16-050	9/1/2010	50	<0.03	<27	<0.29	4.8	12	<0.010	0.018	84
	SP-10-16-053	9/1/2010	53	<0.03	36 J	<0.26	4.8	13	0.02	0.014	88
	SP-10-16-060	9/1/2010	60	0.038 J	39 J	<0.27	8.5	18	0.015	0.016	87
	SP-10-16-065	9/1/2010	65	<0.03	39 J	<0.26	4.6	13	<0.010	0.014	90
	SDUP2-081910	9/1/2010	65	0.032 J	34 J	<0.27	5.5	13	-	-	90
	SP-10-16-070	9/1/2010	70	0.041 J	41 J	<0.26	9.7	18	0.022	0.021	93
	SP-10-16-080	9/1/2010	80	0.047 J	64 J	<0.27	7.6	16	<0.01	0.013	85
	SP-10-16-093	9/1/2010	93	0.45	380	<0.26	9.9	33	0.04	0.045	90

Notes:
mg/kg means milligrams per kilograms
ug/kg means micrograms per kilograms
J means estimated results
B indicates that analyte was detected in the associated meth
< means less than
> means greater than

TOC - Total Organic Carbon

TABLE 5
Arsenic Comparison And Field Sampling Parameters
Shepley's Hill Landfill, Devens, MA

Boring Location	Sample ID	Date	Time (Military Format)	Depth	Arsenic Total (ug/L)	Arsenic Dissolved (ug/L)	Arsenic Field Kit (ug/L)	Iron Total (ug/L)	Iron Dissolved (ug/L)	Manganese Total (ug/L)	Manganese Dissolved (ug/L)	Turbidity NTU	DO mg/L	pH	Temp Celcius	Spec Cond uS/cm	ORP mV
GP-10-01	GP-10-01-009	5/27/2010	10:00	9	0.48 J	0.3 J	<5	NA	827	NA	21.6	10	5.34	6.35	10.08	265	107
	GP-10-01-019	5/27/2010	10:35	19	4.61	0.32 J	<5	NA	548	NA	49.7	90	2.61	5.99	11.36	401	84.3
	GDUP-052710	5/27/2010	10:35	19	NA	0.27 J	NA	NA	525	NA	45.5	See GP-10-01-019					
	GP-10-01-029	5/27/2010	11:20	29	11.4	0.31 J	5	NA	549	NA	196	230	4.49	6.08	11.07	385	83.2
	GP-10-01-039	5/27/2010	11:45	39	9.39	< 1.13	5	NA	1,860	NA	14,000	80	0.37	6.00	11.81	671	62.7
	GP-10-01-049	5/27/2010	12:30	49	7.39	< 1.13	5	NA	863	NA	6,450	65	0.43	6.38	12.46	218	36.1
	GP-10-01-059	5/27/2010	13:11	59	18.9	< 1.13	5	NA	2,150	NA	12,100	170	0.23	6.25	11.68	307	15.5
	GP-10-01-069	5/27/2010	15:20	69	11.3	0.97 J	5	NA	4,600	NA	3,570	200	0.35	6.39	12.36	395	-40.6
	GP-10-01-075	5/27/2010	16:30	75	2.35	0.89 J	5	NA	6,380	NA	3,310	33	1.9	6.54	14.4	469	63.8
GP-10-02	GP-10-02-024	6/7/2010	9:50	24	0.41 J	0.37 J	<5	NA	1,130	NA	560	2.8	0.41	6.29	11.08	776	24.3
	GP-10-02-034	6/7/2010	10:42	34	0.67	0.33 J	<5	NA	1,560	NA	1,440	13.4	0.29	6.39	11.48	818	14.6
	GDUP-060710	6/7/2010	10:42	34	NA	< 0.226	NA	NA	1,520	NA	1,380	See GP-10-02-034					
	GP-10-02-044	6/7/2010	11:35	44	1.64	0.74 J	<5	NA	2,140	NA	2,060	41.1	0.28	6.46	11.27	777	11.3
	GP-10-02-054	6/7/2010	12:27	54	2.43	0.41 J	<5	NA	2,150	NA	2,200	85.7	0.29	6.5	12.09	757	2.6
	GP-10-02-064	6/7/2010	13:08	64	5.87	0.41 J	<5	NA	3,500	NA	1,990	454	0.71	6.55	12.01	965	-14.7
	GP-10-02-074	6/7/2010	15:05	74	36.9	0.87 J	<5	NA	4,010	NA	2,910	Max	0.32	6.41	12.07	2550	-5.5
	GP-10-02-084	6/7/2010	18:12	84	24.8	4.64	<5	NA	19,600	NA	2,680	Max	0.31	6.57	12.39	2863	-60.8
	GP-10-02-094	6/8/2010	9:25	94	127	0.61 J	5	NA	4,040	NA	3,100	Max	1.15	570	12.54	2831	-97.9
	GP-10-02-102	6/8/2010	10:10	102	84.6	8.68	5	NA	25,300	NA	1,270	Max	0.42	6.26	14.33	2345	-169.9
GP-10-03	GP-10-03-029	6/10/2010	08:25	29	0.89	0.5	<5	NA	582	NA	71	3.2	7.03	607	10.01	799	79.5
	GP-10-03-039	6/10/2010	9:20	39	6.79	0.61 J	<5	NA	704	NA	59.8	58	2.63	6.3	10.27	1916	29.8
	GDUP-061010	6/10/2010	9:20	39	NA	< 0.452	NA	NA	790	NA	68.4	See GP-10-03-039					
	GP-10-03-049	6/10/2010	10:00	49	14.6	< 0.565	<5	NA	1,580	NA	62.9	404	2	6.85	10.36	2563	14.5
	GP-10-03-059	6/10/2010	10:40	59	42.1	0.92 J	<5	NA	5,210	NA	254	Max	0.86	6.53	10.68	3212	-40.4
	GP-10-03-069	6/10/2010	11:20	69	8.74	3.47	<5	NA	7,530	NA	633	68.9	0.52	6.72	10.79	3470	-78.6
	GDUP2-061010	6/10/2010	11:20	69	NA	3.85	NA	NA	8,210	NA	710	See GP-10-03-069					
GP-10-04	GP-10-04-014	6/8/2010	12:40	14	2.26	0.18 J	<5	NA	1170	NA	210	18.7	8.32	6.17	13.34	26	50.1
	GP-10-04-024	6/8/2010	14:00	24	2.19	0.18 J	<5	NA	256	NA	58.1	4.65	6.22	6.07	12.88	34	73.1
	GDUP-060810	6/8/2010	14:00	24	NA	0.16 J	NA	NA	199	NA	63	See GP-10-04-024					
	GP-10-04-034	6/8/2010	14:50	34	1.22	0.18 J	<5	NA	438	NA	84.4	42.1	3.47	5.73	11.22	44	58.5
	GP-10-04-044	6/8/2010	15:10	44	3.37	0.15 J	<5	NA	629	NA	86.6	29.3	1.52	5.13	11.57	224	114.4
	GP-10-04-054	6/8/2010	15:50	54	13.7	0.26 J	<5	NA	3,040	NA	811	784	0.42	5.4	11.29	644	21.9
	GP-10-04-064	6/8/2010	15:25	64	8.02	0.33 J	<5	NA	1,200	NA	510	245	0.57	5.4	11.58	856	30.8
	GP-10-04-074	6/8/2010	17:15	74	24.3	0.33 J	<5	NA	3,000	NA	433	Max	0.38	6.28	11.17	9.35	-91.6
	GP-10-04-084	6/8/2010	17:50	84	26.7	1.27	<5	NA	896	NA	91.4	Max	0.32	6.01	11.53	79.8	-40.7
	GP-10-04-094	6/8/2010	18:30	94	214	15.1	10-20	NA	3,630	NA	3,170	Max	0.29	6.33	12.05	244.5	-1.509
GP-10-05	GP-10-05-015	6/9/2010	9:50	15	2.08	0.31 J	<5	NA	262	NA	483	1.08	0.74	6.32	12.82	109	102.9
	GP-10-05-025	6/9/2010	10:25	25	1.02 J	0.58 J	<5	NA	1150	NA	11,200	3.54	1.77	5.85	12.55	242	73
	GDUP-060910	6/9/2010	10:25	25	NA	< 0.565	NA	NA	572	NA	11,200	See GP-10-05-025					
	GP-10-05-035	6/9/2010	10:53	35	130	112	150	NA	12,600	NA	4,610	17.8	1.45	6.21	13.25	214	-56
	GP-10-05-045	6/9/2010	11:24	45	86.4	84.7	80-100	NA	11,200	NA	2,320	36.9	2.24	6.17	2.76	255	-68

TABLE 5
Arsenic Comparison And Field Sampling Parameters
Shepley's Hill Landfill, Devens, MA

Boring Location	Sample ID	Date	Time (Military Format)	Depth	Arsenic Total (ug/L)	Arsenic Dissolved (ug/L)	Arsenic Field Kit (ug/L)	Iron Total (ug/L)	Iron Dissolved (ug/L)	Manganese Total (ug/L)	Manganese Dissolved (ug/L)	Turbidity NTU	DO mg/L	pH	Temp Celcius	Spec Cond uS/cm	ORP mV
GP-10-05A	GP-10-05A-029	6/9/2010	13:20	29	0.93	0.62 J	<5	NA	604	NA	63.8	1.52	992	6	16.24	1194	63.2
	GP-10-05A-039	6/9/2010	14:05	39	13	0.35 J	<5	NA	2,310	NA	221	57.7	2.79	5.22	14.72	209	110
	GDUP2-060910	6/9/2010	14:05	39	NA	0.33 J	NA	NA	2,510	NA	237	See GP-10-05A-039					
	GP-10-05A-049	6/9/2010	14:55	49	4.86	1.12	<5	NA	3,360	NA	203	39	4.87	5.81	14.29	172	76
	GP-10-05A-059	6/9/2010	15:57	59	3.48	0.39 J	<5	NA	1,840	NA	214	32.9	1.73	6.18	13.89	208	39
	GP-10-05A-069	6/9/2010	17:15	69	29.8	0.59	<5	NA	797	NA	466	Hand Pumped					
	GP-10-05A-079	6/9/2010	18:45	79	65	2.18	<5	NA	57.9	NA	114	No Readings, Silted up anc Clogged Screen					
	GP-10-05A-089	6/9/2010	19:20	89	24.5	5.09	<5	NA	467	NA	70.3	No Readings, Silted up anc Clogged Screen					
	GP-10-05A-099	6/9/2010	19:40	99	364	4.16	<5	NA	558	NA	294	No Readings, Silted up anc Clogged Screen					
	GP-10-05A-109	6/9/2010	20:10	109	911	1.92	<5	NA	3,730	NA	1,320	No Readings, Silted up anc Clogged Screen					
GP-10-06	GP-10-06-024	5/24/2010	11:50	24	17.2	10	10	NA	641	NA	112	50	0.19	5.57	9.16	26	127.5
	GP-10-06-034	5/24/2010	12:40	34	120	121	150-200	NA	14400 J	NA	763	31	0.39	2.99	12.66	103	-12.3
	GP-10-06-044	5/24/2010	13:35	44	155	129	100	NA	34,400	NA	982	800	0.19	5.65	15.69	194	4.9
	GP-10-06-054	5/26/2010	8:50	54	67.5	42.9	5	NA	75,400	NA	3,000	Max	0.19	6.04	12.89	880	-119.6
	GDUP-052610	5/26/2010	8:50	54	NA	49.1	NA	NA	82,000	NA	3,250	See GP-10-06-054					
	GP-10-06-064	5/26/2010	9:45	64	683	750	150	NA	122,000	NA	2,840	Max	0.14	6	11.63	827	-120
	GP-10-06-074	5/26/2010	11:15	74	2,390	2070	>500	NA	107,000	NA	2,470	Max	0.14	4.08	14.16	725	-124
	GP-10-06-079	5/26/2010	12:00	79	2,660	2540	500	NA	72,200	NA	3,490	Max	0.19	4.34	14.89	669	-109
GP-10-06A	GP-10-06A-034	5/24/2010	15:15	34	0.59	0.37 J	0	NA	66.4	NA	43.2	2.3	10.04	5.66	16.58	24	194.9
	GP-10-06A-044	5/24/2010	16:00	44	595	55.1	40	NA	9,710	NA	2,370	140	1.54	5.79	14.66	76	27
	GP-10-06A-054	5/24/2010	17:40	54	1090	18	10	NA	6,550	NA	6,920	900	1.47	5.8	14.1	166	8.1
	GP-10-06A-064	5/25/2010	9:50	64	170	36.7	20	NA	28,900	NA	2,780	Max	0.1	6.55	15.54	67	-134
	GDUP-052510	5/25/2010	9:50	64	NA	31.4	NA	NA	28,900	NA	2,830	See GP-10-06A-064					
	GP-10-06A-074	5/25/2010	11:10	74	134	58.6	30-40	NA	42,200	NA	2,460	Max	0.14	6.37	14.54	292	-115
	GP-10-06A-084	5/25/2010	13:00	84	186	106	60	NA	42,200	NA	3,050	Max	0.17	6.34	14.83	316	-115
	GP-10-06A-094	5/25/2010	14:40	94	382	< 1.13	5	NA	13,300	NA	17,900	Max	0.21	5.81	16.77	508	-119
	GP-10-06A-104	5/25/2010	16:30	104	405	< 1.13	0	NA	5,950	NA	6,530	900	0.17	6.24	17.17	608	-392
	GP-10-06A-110	5/25/2010	17:35	110	333	1.17 J	20	NA	8,640	NA	6,670	Max	0.11	6.14	14.66	603	-352
GP-10-07	GP-10-07-039	5/19/2010	14:00	39	1,240	1350	>500	96,400	105,000	2,430	2,660	20	1.15	6.49	12.54	757	-69.6
	GP-10-07-049	5/20/2010	13:45	49	283	58	5-10	251000	27800 J	9140 J	5330 J	NA	0.3	7.31	1.32	637	-242.2
	GPDUP-052010	5/20/2010	13:45	49	304	58.2	5-10	276000	26,800	9200	5,250	See GP-10-07-049					
GP-10-08	GP-10-08-011	6/3/2010	12:10	11	2.08	0.64	<5	NA	581	NA	70.7	12.7	6.97	6.78	11.73	189	20.1
	GDUP-060310	6/3/2010	12:10	11	NA	0.67	NA	NA	565	NA	69.7	See GP-10-08-011					
	GP-10-08-021	6/3/2010	13:20	21	3.19	0.76	<5	NA	679	NA	199	17.5	4.68	6.5	10.46	337	31.4
	GP-10-08-031	6/3/2010	14:30	31	3.6	0.31 J	<5	NA	2,040	NA	2,340	44.4	0.31	6.43	12.57	660	-3.9
	GP-10-08-041	6/3/2010	15:00	41	3.77	0.85 J	<5	NA	2,090	NA	949	64.9	0.26	6.44	12.02	764	-8.6
	GP-10-08-051	6/3/2010	17:20	51	19.8	1.06	<5	NA	3,300	NA	777	321	0.24	6.56	11.6	9.64	-42
	GDUP2-060310	6/3/2010	17:20	51	NA	0.92 J	NA	NA	3,180	NA	769	See GP-10-08-051					
	GP-10-08-061	6/3/2010	18:05	61	2.07	0.73 J	<5	NA	4,710	NA	1,060	37.4	0.9	6.54	15	244	-4.3

TABLE 5
Arsenic Comparison And Field Sampling Parameters
Shepley's Hill Landfill, Devens, MA

Boring Location	Sample ID	Date	Time (Military Format)	Depth	Arsenic Total (ug/L)	Arsenic Dissolved (ug/L)	Arsenic Field Kit (ug/L)	Iron Total (ug/L)	Iron Dissolved (ug/L)	Manganese Total (ug/L)	Manganese Dissolved (ug/L)	Turbidity NTU	DO mg/L	pH	Temp Celcius	Spec Cond uS/cm	ORP mV
GP-10-09	GP-10-09-021	5/28/2010	9:15	21	0.45 J	0.27 J	<5	NA	88.3	NA	34.6	1.13	10.34	6.82	11.93	62	97.1
	GP-10-09-031	5/28/2010	10:00	31	183	0.15 J	<5	NA	685	NA	82.2	596	6.35	6.11	12.82	223	71.6
	GDUP-052810	5/28/2010	10:00	31	NA	0.17 J	NA	NA	778	NA	102	SS GP-10-09-031					
	GP-10-09-041	6/1/2010	11:30	41	12.6	0.25 J	<5	NA	853	NA	66	178	4.97	6.05	13.05	706	50.4
	GP-10-09-051	6/1/2010	13:00	51	13	0.27 J	<5	NA	1,760	NA	138	333	2.15	6.24	12.56	714	161
	GDUP-060110	6/1/2010	13:00	51	NA	0.23 J	NA	NA	1,580	NA	136	See GP-10-09-051					
	GP-10-09-061	6/1/2010	14:20	61	6.8	0.940	<5	NA	2,200	NA	362	87.1	1.04	6.62	13.19	401	-56.2
	GP-10-09-071	6/1/2010	16:45	71	23.3	0.680	<5	NA	2,070	NA	349	82.2	1.19	6.66	12.92	486	-58.6
	GP-10-09-081	6/1/2010	17:50	81	15.5	0.850	<5	NA	3,430	NA	382	93.2	1.18	6.66	13.3	428	-57.3
GP-10-10	GP-10-10-011	6/2/2010	14:45	11	0.34 J	0.27 J	<5	NA	332	NA	34.5	2.5	10.93	6.73	10.89	130	56.2
	GP-10-10-021	6/2/2010	16:00	21	1.59	0.27 J	<5	NA	728	NA	56.5	11.8	7.45	6.17	11.49	375	53.9
	GDUP-060210	6/2/2010	16:00	21	NA	0.22 J	NA	NA	732	NA	58.2	See GP-10-10-021					
	GP-10-10-031	6/2/2010	16:30	31	1.29 J	< 0.565	<5	NA	818	NA	4,370	10.34	0.56	6.1	12.46	561	43.5
	GP-10-10-041	6/2/2010	17:15	41	1.86 J	1.13 J	<5	NA	2,720	NA	10,800	26.3	0.29	6.19	13.26	509	-2.8
	GP-10-10-051	6/2/2010	18:00	51	4.4 J	2.47 J	<5	NA	3,690	NA	14,300	26	0.26	6.32	12.59	594	-35.3
	GP-10-10-061	6/2/2010	19:00	61	11.1	< 2.82	<5	NA	5,230	NA	30,700	90.6	0.32	6.34	12.02	87.6	-44.3
	GP-10-10-071	6/3/2010	10:00	71	13.7	< 1.13	<5	NA	4,880	NA	15,500	121	0.36	6.41	12.72	737	-85
GP-10-11	GP-10-11-039	8/3/2010	14:10	39	263	264	80	67200	66400	2120	NA	14.5	0.11	5.61	16.26	302	56.2
	GP-10-11-049	8/3/2010	15:15	49	688	375	70	164000	49300	5240	NA	5373	0.27	6.2	18.09	278	-43.7
	DUP3-080310	8/3/2010	15:15	49	641	396	NA	149000	52200	5260	NA	NA	NA	NA	NA	NA	NA
	GP-10-11-059	8/3/2010	19:00	55	760	236	150	148000	28500	7700	5580	203	0.78	6.3	24.09	354	-46.3
	GP-10-11-064	8/4/2010	11:30	64	230	19.8	< 5	180000	3440	7160	1100 J	Max	0.11	7.74	20.99	439	-150.4
GP-10-12	GP-10-12-044	8/5/2010	13:05	44	4320	3880	> 500	122000	83700	7180	5860	203	0.43	5.97	18.23	385	17.6
	GP-10-12-054	8/5/2010	15:00	54	NA	2850	> 500	NA	74800	NA	5200	Max	0.16	6.11	21.93	368	-17.1
	GP-10-12-065	8/9/2010	8:20	65	NA	38.9	30	NA	46600	NA	4400	Max	0.13	6.79	12.95	543	-103.3
GP-10-13	GP-10-13-039	8/9/2010	14:45	39	176	124	30	148000	99500	1950	1380	1409	0.18	5.36	21.58	740	101.2
	GP-10-13-049	8/9/2010	17:00	49	NA	12.2	< 5	NA	7840	NA	6700	144	0.48	6.17	21.68	858	45.5
	GP-10-13-059	8/10/2010	9:05	59	120	102	100	87100	74500	682	592	565	0.16	6.4	18.34	800	-33.3
	GP-10-13-069	8/10/2010	11:15	69	NA	1060	> 500	NA	79800	NA	3630	151	0.81	6.09	21.32	545	-2.1
	GP-10-13-079	8/10/2010	13:10	79	NA	123	20	NA	5580	NA	218	128	8.68	6.37	21.89	338	15.9
GP-10-14	GP-10-14-039	8/16/2010	09:50	39	39.1	14.4	5	22800	18700	783	670 J	49.9	0.36	5.54	15.86	510	50.8
	GP-10-14-049	8/16/2010	11:20	49	774	772	250	66000	66900	2420	2540	22.5	0.41	5.86	15.99	474	14.9
	DUP-081610	8/16/2010	11:20	49	792	762	NA	69800	64200	2510	2440	NA	NA	NA	NA	NA	NA
	GP-10-14-059	8/16/2010	13:00	59	NA	2400	> 500	NA	88200	NA	6800	1129	0.17	5.86	16.31	553	-0.9
	GP-10-14-069	8/16/2010	14:35	69	5260	5110	> 500	95400	85400	3700	3540	111	0.18	5.82	17.71	444	-8.7
	GP-10-14-079	8/17/2010	07:45	79	17300	15100	> 500	80300	71800	5850	5540	38.8	0.31	6.18	14.71	395	34.2
GP-10-15	GP-10-15-039	8/11/2010	9:30	39	NA	1740	> 500	NA	101000	NA	3410	25.52	0.25	5.81	17.99	543	-6.4
	GP-10-15-049	8/11/2010	11:25	49	17200	16600	70	126000	119000	10500	10500	41.3	0.45	6	20.68	589	-40.5
	GP-10-15-059	8/11/2010	14:45	59	NA	278	80	NA	300	NA	466	207	5.11	8.3	21.89	313	181.1

TABLE 5
Arsenic Comparison And Field Sampling Parameters
Shepley's Hill Landfill, Devens, MA

Boring Location	Sample ID	Date	Time (Military Format)	Depth	Arsenic Total (ug/L)	Arsenic Dissolved (ug/L)	Arsenic Field Kit (ug/L)	Iron Total (ug/L)	Iron Dissolved (ug/L)	Manganese Total (ug/L)	Manganese Dissolved (ug/L)	Turbidity NTU	DO mg/L	pH	Temp Celcius	Spec Cond uS/cm	ORP mV
GP-10-16	GP-10-16-024	8/17/2010	16:15	24	170	4.81	5	56700	323	2500	182	1235	3.06	6.27	12.58	107	101.1
	DUP-081710	8/17/2010	16:15	24	164	3.87		59500	349	2650	197	NA	NA	NA	NA	NA	NA
	GP-10-16-034	8/18/2010	07:55	34	333 J	1.97	5	145000	138	5080	580	609	12.11	8.25	13.91	350	78.3
	GP-10-16-054	8/18/2010	11:20	54	19.9	1.89	< 5	8900	277	180	84	101.4	12.62	7.43	16.85	398	27.4
	Dup-081810	8/18/2010	11:20	54	26	2.05	NA	11400	300	200	86	NA	NA	NA	NA	NA	NA
	GP-10-16-064	8/18/2010	13:40	64	NA	445	100	NA	44700	NA	777	21.5	2.45	6.57	14.73	492	-78.8
	GP-10-16-074	8/19/2010	07:45	74	248 J	216 J	100	75900	64200	1420 J	1330 J	122	0.66	6.94	11.26	720	-140.3
	GP-10-16-084	8/19/2010	09:40	84	256	248	100	20600	17200	3120	2920	16.6	0.9	6.95	14.92	837	-104.8
	DUP-081910	8/19/2010	09:40	84	260	249	NA	21500	17400	3130	2990	NA	NA	NA	NA	NA	NA
	GP-10-16-094	8/19/2010	12:35	94	19.3	3.44	< 5	17500	625	620	368	180	5.06	6.9	17.45	382	-21.4
GP-10-17	GP-10-17-009	8/2/2010	11:40	9	0.58	0.46 J	< 5	1800 J	1620	NA	NA	20.1	4.91	1.65	14.07	1036	178.2
	GP-10-17-019	8/2/2010	12:20	19	0.78	0.39 J	< 5	1870	1800	NA	NA	NA	NA	NA	NA	NA	NA
	DUP-080210	8/2/2010	12:20	19	0.66	0.49 J	NA	1840	1870	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-17-029	8/2/2010	16:00	29	0.78	0.25 J	< 5	1810	1240	NA	NA	6.06	2.17	6.01	13.72	747	63.4
	GP-10-17-039	8/2/2010	16:45	39	1950	1860	500	65200	60700	NA	NA	37.9	0.26	6.83	13.9	542	-138.2
	GP-10-17-049	8/2/2010	17:30	49	17.7	20.8	5	10100	5210	NA	NA	65.6	1.4	6.52	14.8	670	-28.3
	GP-10-17-056	8/2/2010	17:45	56	26.4	5.38	5	30600	6100	NA	NA	660	0.24	6.73	14.68	666	-84.3
GP-10-18	GP-10-18-007	8/2/2010	18:34	7	0.93	0.73	NA	1390	1360	NA	NA	18.3	0.27	6.06	17.64	729	58.7
	GP-10-18-017	8/3/2010	8:25	17	1.87 J	1.26 J	< 5	1190	857	NA	NA	10.6	0.44	6.14	12.87	673	55.8
	GP-10-18-027	8/3/2010	9:00	27	117	107	80	35400	32000	NA	NA	199	0.44	6.3	13.55	681	-45.1
	DUP-080310	8/3/2010	9:00	27	118	107		34600	32800	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-18-037	8/3/2010	11:00	37	274	262	60	21300	18800	NA	NA	84.7	0.44	6.4	13.61	628	-45.5
	GP-10-18-047	8/3/2010	12:10	47	373	390	80	35200	32300	NA	NA	127	0.45	6.54	14.6	809	-80.7
GP-10-19	GP-10-19-009	8/3/2010	14:35	9	0.57	0.38 J	< 5	1040	908	NA	NA	1.1	3.55	5.85	17.73	174	98.5
	DUP2-080310	8/3/2010	14:35	9	0.53	0.35 J	NA	1030	982	NA	NA	NA	NA	NA	NA	NA	NA
	GP-10-19-019	8/3/2010	15:15	19	3.07	0.6	< 5	3680	831	NA	NA	141	2.19	6.01	14.88	759	904
	GP-10-19-029	8/3/2010	16:05	29	886	810	100	89800	73300	NA	NA	66.6	0.53	6.64	13.88	682	-111
	GP-10-19-039	8/3/2010	17:00	39	690	677	100	65600	58800	NA	NA	36.6	1.65	6.6	15.59	736	-77.7
	GP-10-19-046	8/3/2010	18:15	46	23.3	3.92	5	14400	4280	NA	NA	< 1000	1.88	650	14.58	737	-44.1
GP-10-20	GP-10-20-009	8/4/2010	9:30	9	1.6	0.4 J	< 5	2000	1260	NA	NA	12.5	6.46	6.22	16.7	262	60.4
	GP-10-20-019	8/4/2010	10:10	19	2.94	1.02	< 5	2910	1500	989	920	17.2	0.67	6.09	14.35	609	50.6
	DUP-080410	8/4/2010	10:10	19	3.11	0.066	NA	2630	1630	949	933	NA	NA	NA	NA	NA	NA
	GP-10-20-029	8/4/2010	11:00	29	220	235	40	53000	56800	NA	NA	139	0.33	6.7	13.44	521	-92.8
	GP-10-20-039	8/4/2010	13:00	39	446	429	50	16800	13300	NA	NA	91.6	0.37	6.49	13.51	649	-38.8

TABLE 5
Arsenic Comparison And Field Sampling Parameters
Shepley's Hill Landfill, Devens, MA

Boring Location	Sample ID	Date	Time (Military Format)	Depth	Arsenic Total (ug/L)	Arsenic Dissolved (ug/L)	Arsenic Field Kit (ug/L)	Iron Total (ug/L)	Iron Dissolved (ug/L)	Manganese Total (ug/L)	Manganese Dissolved (ug/L)	Turbidity NTU	DO mg/L	pH	Temp Celcius	Spec Cond uS/cm	ORP mV
GP-10-21	GP-10-21-011	8/4/2010	15:05	11	3.98	0.31 J	< 5	2550	501	NA	NA	54.1	6.33	6.14	15.57	182	101.5
	GP-10-21-021	8/4/2010	15:45	21	1.71	0.62 J	< 5	1730	984	1050	1020 J	134	1.43	6.07	14.29	728	97.5
	DUP2-080410	8/4/2010	15:45	21	1.48	0.63 J	NA	1550	1030	1020	1080	NA	NA	NA	NA	NA	NA
	GP-10-21-031	8/4/2010	16:30	31	5.05	3.64	< 5	3100	1840	NA	NA	34.7	1.54	6.35	13.78	503	44.9
	GP-10-21-041	8/4/2010	17:00	41	322	349	60	42500	43700	NA	NA	83.7	0.42	6.66	14.14	627	-80.2
	GP-10-21-051	8/4/2010	18:05	51	18.7	12.3	< 5	11900	6320	NA	NA	315	0.32	6.56	16.8	277	60.9
	GP-10-21-060	8/4/2010	19:00	60	145	146	40	21200	15300	NA	NA	<1000	0.72	6.68	16.59	828	-64.2
GP-10-22	GP-10-22-011	8/10/2010	14:40	11	0.51	0.37 J	< 5	844	753	NA	NA	6.27	7.43	5.92	14.7	306	115.8
	GP-10-22-021	8/10/2010	15:00	21	1.71	0.51	< 5	2310	1120	NA	NA	45	0.63	6.19	13.42	440	75.5
	GP-10-22-031	8/10/2010	15:50	31	2.65	0.75 J	< 5	3240	1780	NA	NA	54	0.72	6.22	13.22	766	68.1
	GP-10-22-041	8/10/2010	16:30	41	15.8	14.5	< 5	35300	36100	NA	NA	85.4	0.99	6.38	13.3	434	-32.9
	GP-10-22-051	8/10/2010	17:30	51	5.02	< 1.13	< 5	7580	5010	NA	NA	83.5	0.88	6.55	13.57	585	-20.9
	GP-10-22-061	8/10/2010	18:30	61	6.56	3.53	< 5	6750	4490	NA	NA	29.9	1.02	6.77	13.28	75	-51.1
GP-10-23	GP-10-23-017	8/5/2010	11:00	17	0.52	0.38 J	< 5	1110	1040	23	21.1	5.37	4.03	5.99	14.46	380	76.2
	DUP-080510	8/5/2010	11:00	17	1.45	1.4	NA	1180	1070	23.9	21.8	NA	NA	NA	NA	NA	NA
	GP-10-23-027	8/5/2010	11:45	27	2.86	0.6 J	< 5	2170	701	189	172	58.5	3.35	6.08	13.1	1060	94.3
	GP-10-23-037	8/5/2010	12:25	37	5.38	0.28 J	< 5	5400	1890	NA	NA	58.4	3.41	5.96	13.75	961	90.9
	GP-10-23-047	8/5/2010	14:20	47	610	666	> 500	78500	78400	NA	NA	374	1.34	6.6	15.76	490	-95.1
	GP-10-23-057	8/5/2010	16:05	57	1060	1070	500	72200	68400	3660	3730	254	0.86	6.65	14.51	743	-100.2
	DUP2-080510	8/5/2010	16:05		1160	1100	NA	82000	70000	4050	3820	NA	NA	NA	NA	NA	NA
GP-10-24	GP-10-24-015	8/9/2010	15:44	15	2.06	0.94 J	< 5	928	758	28.1	24.9	37.4	3.1	5.94	14.28	762	116.3
	DUP-080910	8/9/2010	15:44	15	1.52	0.8 J	NA	880	765	26.7	30.6	NA	NA	NA	NA	NA	NA
	GP-10-24-025	8/9/2010	16:30	25	1.61	0.39 J	< 5	2260	1180	NA	NA	44.9	5.21	6.05	13.23	710	104.8
	GP-10-24-035	8/9/2010	17:05	35	5.03	0.89 J	< 5	5550	2630	NA	NA	45.3	1.12	5.94	14.08	9.14	92.4
	GP-10-24-045	8/9/2010	17:45	45	303	310	125	99000	100000	NA	NA	98.6	1.07	6.54	13.61	1332	-71.5
	GP-10-24-055	8/9/2010	18:30	55	629	615	250	91100	81500	NA	NA	< 1000	0.77	6.61	13.41	914	-95.3
GP-10-25	GP-10-25-025	8/10/2010	10:00	25	44	0.4 J	< 5	35700	1770 J	NA	NA	889	3.57	6.03	13.07	506	69.3
	GP-10-25-035	8/10/2010	10:45	35	10.9	0.58 J	< 5	15600	2250	801	618	223	1.69	5.94	13.1	745	69.3
	DUP-081010	8/10/2010	10:45	35	10.9	1.18	NA	15300	2320	772	658	NA	NA	NA	NA	NA	NA
	GP-10-25-045	8/10/2010	11:50	45	37.3	35.1	5	76700	71000	4540	4550	137	1.13	6.56	12.86	6.22	-74.4
	DUP2-081010	8/10/2010	11:50	45	38	34.9	NA	76700	69000	4460	4430	NA	NA	NA	NA	NA	NA
GP-10-26	GP-10-26-011	8/11/2010	9:20	11	0.6	0.18 J	< 5	854	716 J	67.1	59.8	9.11	6.78	5.59	14.08	123	139.4
	GP-10-26-021	8/11/2010	10:20	21	2.07	0.39 J	< 5	2090	1170	129	103	33.7	3.01	6.05	12.5	275	84.4
	DUP-081110	8/11/2010	10:20	21	1.72	0.65	NA	1800	1140	120	103	NA	NA	NA	NA	NA	NA
	GP-10-26-031	8/11/2010	10:35	31	2.86	0.54	< 5	4180	1350	NA	NA	84.8	2.67	6.04	11.74	652	84.5
	GP-10-26-041	8/11/2010	11:05	41	4	0.45 J	< 5	6290	1940	NA	NA	207	0.72	6.05	12.11	631	61.5
	GP-10-26-051	8/11/2010	12:15	51	4.86 J	< 1.13	< 5	7180	3140	NA	NA	76.1	1.02	6.27	12.65	485	36.3
	GP-10-26-061	8/11/2010	13:40	61	6.48	< 1.13	< 5	11900	3840	NA	NA	376	1.49	6.45	12.74	741	-6.8
	GP-10-26-071	8/11/2010	14:10	71	3.58 J	1.96 J	< 5	6430	3310	NA	NA	< 1000	0.95	6.58	13.96	860	-36.1

TABLE 5
Arsenic Comparison And Field Sampling Parameters
Shepley's Hill Landfill, Devens, MA

Boring Location	Sample ID	Date	Time (Military Format)	Depth	Arsenic Total (ug/L)	Arsenic Dissolved (ug/L)	Arsenic Field Kit (ug/L)	Iron Total (ug/L)	Iron Dissolved (ug/L)	Manganese Total (ug/L)	Manganese Dissolved (ug/L)	Turbidity NTU	DO mg/L	pH	Temp Celcius	Spec Cond uS/cm	ORP mV
GP-10-27	GP-10-27-025	8/11/2010	16:05	25	2.77	1.03	< 5	1640	773	56.2	44.9	21.6	1.33	6.46	14.8	332	47.7
	DUP2-081110	8/11/2010	16:05	25	1.11	0.38 J	NA	1510	804	53	45.5	NA	NA	NA	NA	NA	NA
	GP-10-27-035	8/11/2010	17:00	35	24.7	0.78 J	< 5	15000	1100	NA	NA	101.1	1.07	5.87	13.44	1022	76.8
	GP-10-27-045	8/11/2010	17:25	45	199	200	70	88800	83800	NA	NA	339	0.71	6.58	13.58	647	-93.6
	GP-10-27-055	8/11/2010	17:50	55	288	328	70	84100	91300	NA	NA	294	0.95	6.65	13.28	644	-108.8
	GP-10-27-065	8/11/2010	18:45	65	1100	1040	> 500	73400	61300	NA	NA	<1000	1.1	6.66	13.37	766	-93.3

Notes
NA - Not Applicable
ug/L is micrograms per liter
mg/l - miligrams per liter
J means estimated results
B indicates that analyte was detected in the associated method blank

DO - Dissolved Oxygen
ORP - Oxygen Reduction Potential

Table 6
Water Level Calibration Targets and Residuals
Shepley's Hill Landfill
Focused Feasibility Study
Supplemental Hydrogeologic Assessment

Monitoring Well	Layer	Observed Groundwater Elevation	Computed Groundwater Elevation	Residual
N-3_P-1	3	217.29	217.44	-0.15
N-3_P-2	1	216.67	217.34	-0.67
N-5_P-2	1	220.49	218.91	1.58
N-6_P-1	3	223.42	222.60	0.82
N-7_P-1	3	226.71	226.06	0.65
N-7_P-2	1	227.04	226.00	1.04
SHL-10	1	218.87	218.81	0.06
SHL-11	1	218.14	218.51	-0.37
SHL-13	1	215.37	215.07	0.30
SHL-15	2	243.55	242.52	1.03
SHL-19	1	219.05	219.11	-0.06
SHL-20	1	218.26	218.38	-0.12
SHL-21	1	215.37	215.75	-0.38
SHL-22	3	214.28	214.39	-0.11
SHL-23	3	215.58	215.73	-0.15
SHL-24	3	225.02	224.27	0.75
SHL-3	1	218.65	219.69	-1.04
SHL-4	1	217.99	218.79	-0.80
SHL-5	1	215.54	214.61	0.93
SHL-8D	2	214.84	214.70	0.14
SHL-8S	2	214.91	214.66	0.25
SHL-9	1	214.47	214.48	-0.01
SHM-05-39A	1	211.84	212.35	-0.51
SHM-05-39B	2	210.65	212.40	-1.75
SHM-05-40X	1	211.03	212.16	-1.13
SHM-05-41A	1	213.93	213.63	0.30
SHM-05-41B	3	213.91	213.63	0.28
SHM-05-41C	3	214.00	213.68	0.32
SHM-05-42A	1	213.66	213.44	0.22
SHM-05-42B	2	213.69	213.46	0.23
SHM-93-10C	3	219.51	218.77	0.74
SHM-93-18B	2	220.03	220.83	-0.80
SHM-93-22C	3	214.35	214.40	-0.05
SHM-96-22B	2	213.96	214.36	-0.40
SHM-96-5B	2	214.88	214.60	0.28
SHM-96-5C	2	214.57	214.64	-0.07
SHM-99-31A	1	213.00	212.50	0.50
SHM-99-31B	2	212.23	212.51	-0.28
SHM-99-31C	2	212.26	212.51	-0.25
SHM-99-32X	2	212.90	212.76	0.14
SHP-01-36X	1	217.75	216.85	0.90
SHP-01-37X	1	217.17	217.24	-0.07
SHP-01-38A	1	217.95	218.50	-0.55
SHP-01-38B	2	218.09	218.44	-0.35
SHP-05-43	1	217.11	216.36	0.75
SHP-05-44	1	217.40	217.17	0.23
SHP-05-45A	1	214.62	215.34	-0.72
SHP-05-45B	2	214.66	215.29	-0.63
SHP-05-46A	1	215.23	215.40	-0.17
SHP-05-46B	2	214.62	215.36	-0.74
SHP-99-34A	1	213.27	212.96	0.31
SHP-99-34B	2	213.04	213.06	-0.02
SHP-99-35X	3	222.47	223.13	-0.66
SHP-07-03C	1	205.85	207.58	-1.73
SHP-07-03E	1	205.28	207.37	-2.09
SHP-07-03B	1	205.83	207.39	-1.56
SHP-07-01BS	1	210.24	208.97	1.27
SHP-07-01BD	1	207.74	208.97	-1.23
SHP-07-01CS	1	208.52	208.64	-0.12
SHP-07-01CD	1	207.73	208.64	-0.91
SHP-07-01DS	1	206.73	208.31	-1.58
SHP-07-01DD	1	206.75	208.31	-1.56
SHP-07-01_22-27	1	206.71	208.33	-1.62
SHP-07-01_15-20	1	206.80	208.35	-1.55
SHW-07-05	3	209.88	212.14	-2.26
SHW-07-03	1	208.72	211.43	-2.71
RSK12	1	218.35	219.19	-0.84
RSK15	1	218.27	218.63	-0.36
RSK19	1	217.84	218.20	-0.36
RSK24	1	219.29	219.58	-0.29
RSK25	1	218.80	219.03	-0.23
RSK26	1	218.69	219.39	-0.70
RSK27	1	218.80	219.26	-0.46
RSK28	1	218.60	218.99	-0.39
RSK29	1	218.40	218.89	-0.49
RSK30	1	218.18	218.69	-0.51
RSK33	1	217.89	218.13	-0.24
RSK34	1	217.89	217.91	-0.02
RSK35	1	217.67	217.76	-0.09
RSK37	1	217.66	217.44	0.22
RSK48	1	217.84	219.19	-1.35
RSK49	1	218.02	218.41	-0.39
RSK7	1	217.62	217.58	0.04
			Residual Mean	-0.29
			Res. Std. Dev.	0.81
			Sum of Squares	61.29
			Abs. Res. Mean	0.64
			Min. Residual	-2.71
			Max. Residual	1.58
			Range	38.27
			Std/Range	0.02

Table 7
Waste Occurrence in Shepley's Hill Landfill Borings

Boring	Waste	Compound and Concentrations (mg/kg)													
		Arsenic		Cadmium		Copper		Chromium		Nickel		Lead		Zinc	
		High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
SHM-10-11	Paper/plastic/ash/wood (5 to 23 ft bgs)	13	10	220	0.05	33	7.3	42	9.1	16	6	110	10	66	18
SHM-10-12	Ash and sand mixed w/ash 5 to 9 ft bgs	13	12	< 0.04	< 0.03	260	7.3	18	9.8	72	9.3	510	8.5	210	16
SHM-10-13	Ash and Sand 23 to 27 ft bgs	31	7	3.5	< 0.04	33	5.3	52	3.9	15	5.5	53	5.3	13,000	20
SHM-10-13	Peat 27 to 35 ft bgs	7	0.8	< 0.03		71	0.8	48	4.6	23	4	13	2.5	34	9.5
SHM-10-14	Waste (paper/minor ash) and waste sand mix 10 to 23 ft bgs	18	6	< 0.04		18	5.9	26	6.8	23	8.8	180	6.6	160	36
SHM-10-14	Peat and sand/peat 30 to 44 ft bgs	60	2.8	< 0.04		7.3	4.5	8.4	4.8	15	4.2	6.6	1.6	27	12
SHM-10-15	Waste (ash/paper/plastic /wood) 5 to 28 ft bgs	25	6.2	0.27	0.04	310	3.7	69	8.4	75	6.3	1,200	5.3	1,000	11

Note: The values in yellow represent enrichment with respect to normal soil ranges
mg/kg - means milligrams per kilogram
bgs - below ground surface
ft - feet

ATTACHMENTS

ATTACHMENTS

Attachment A

Attachment A

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-01**

Client:	USACE	Drilling Co.:	Geosearch
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT
Project Number:	AC001	Drill Method:	Direct Push
Location:	Fort Devens, Ayer, MA	Foreman:	Rodney Kaddy
		SCI Inspector:	Danielle Eastman
		Start Date:	6/15/2010
		Completion Date:	6/16/2010

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 209.88 - NGVD 29'
Surface Elevation: 206.3+/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-1	60/40	0-5	NA	NA			Topsoil (21-inches)	TOPSOIL		Standpipe is 3' ags
2								Light brown, dry to wet, MEDIUM TO COARSE SAND (well sorted)			Cement 0-2'
4							▼				
6	S-2	60/26	5-10	NA	NA			Grey, saturated, FINE TO MEDIUM SAND	SAND		
								Orange, COARSE SAND, some (angular) gravel			
8					<5			As Field Testing Results		1	
10	S-3	60/22	10-15	NA	NA			Light brown, saturated, COARSE SAND to FINE TO MEDIUM SAND (gradational layering, well sorted)			
12											2" [illegible] PVC Riser [illegible]
14											
16	S-4	60/29	15-20	NA	NA			Light brown, saturated, COARSE SAND to FINE TO MEDIUM SAND (gradational layering, well sorted)	SAND		
18					<5			As Field Testing Results		1	
20	S-5	60/28	20-25	NA	NA			Brown, saturated, COARSE SAND, some (angular) gravel			Grout 2'-55.5'
22									SAND & GRAVEL		
24											

Notes
1) Direct Push groundwater profile sampling conducted on 5/27/10
2) Groundwater profile sampler refusal @ 75'
3)
4)
5)
6)

Key
- Cement
- Drill Cuttings Native Soils
- Bentonite Grout
- Sand
- Screen
- Riser

Remarks
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample
▼= Approximate water table NA=Not Applicable NR=No Recovery bgs=below ground surface ags=above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-01**

Client:	USACE	Drilling Co.:	Geosearch
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT
Project Number:	AC001	Drill Method:	Direct Push
Location:	Fort Devens Ayer, MA	Foreman:	Rodney Kaddy
		SCI Inspector:	Danielle Eastman
		Start Date:	6/15/2010
		Completion Date:	6/16/2010

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 209.88 - NGVD 29'
Surface Elevation: 206.3+/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-11	60/34	50-55	NA	NA			Brown, saturated, COARSE SAND, some (rounded) gravel	SAND & GRAVEL		1.5" Schedule 40 PVC Riser 0-60.5'
52											
54											Grout 2'-55.5'
56	S-12	60/32	55-60	NA	NA			Brown, saturated, COARSE SAND, some medium sand, trace fine sand and silt	SAND		Bentonite 55.5'-57.5'
58											
					5			As Field Testing Results		1	
60	S-13	60/31	60-65	NA	NA			Light brown, saturated, MEDIUM TO COARSE SAND, with layers of fine sand and silt			
62											2 Silica Sand
64											
66	S-14	60/28	65-70	NA	NA			Light brown, saturated, FINE TO MEDIUM SAND, some gravel, dense (Till)	GLACIAL TILL		1.5" Schedule 40 PVC Well screen - 0.01" slot 60.5'-70.5'
68											
					5			As Field Testing Results		1	
70								Limited recovery. SAND & GRAVEL, dense, rock in tip of sampling spoon. (Till)			
								SAMPLER REFUSAL @ 70.5'			CASING REFUSAL @ 70.5'
72											
74											
					5			As Field Testing Results		2	

Notes
1) Direct Push groundwater profile sampling conducted on 5.27.10
2) Groundwater profile sampler refusal @ 75'
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample
▼= Approximate water table NA=Not Applicable NR=No Recovery bgs=below ground surface ags=above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-02**

Client:	USACE	Drilling Co.:	Geosearch		
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT	Casing	Sampler
Project Number:	AC001	Drill Method:	Direct Push	Type: Steel	Geoprobe Spoon
Location:	Fort Devens	Foreman:	Rodney Kaddy	Size: 3.25"	60"
	Ayer, MA	SCI Inspector:	Danielle Eastman	Hammer: NA lbs	Fall: NA"
		Start Date:	6/30/2010	Casing Elevation:	222.86 - NGVD 29'
		Completion Date:	7/1/2010	Surface Elevation:	220.0+/- NGVD 29'
				Wellhead Type:	Standpipe

Sample Information

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
26	S-6	60/26	25-30	NA	NA			Gray, saturated, FINE SAND, some medium to coarse sand, little (angular) rock fragments (gradational layering of sands with depth)			
28											
30											
32	S-7	60/22	30-35	NA	NA			Gray, saturated, MEDIUM TO COARSE SAND, some (angular) gravel, trace fine sand	SAND		1.5" Schedule 40 PVC Riser 0-53'
34					<5			As Field Testing Results		1	
36	S-8	60/21	35-40	NA	NA			Gray, saturated, MEDIUM TO COARSE SAND, some (angular) gravel, trace fine sand			
38											
40											
42	S-9	60/22	40-45	NA	NA			Gray, saturated, MEDIUM TO COARSE SAND, some (angular) gravel, trace fine sand			Grout 2'-48'
44					<5			As Field Testing Results		1	
46	S-10	60/29	45-50	NA	NA			Gray, saturated, MEDIUM TO COARSE SAND, some (angular) gravel, trace fine sand	SAND		
48											
50											Bentonite 48'-50'

Notes
1) Direct Push groundwater profile sampling conducted on 6/7/10 & 6/8/10
2) Groundwater profile sampler refusal @ 102'. As <5 ug/L @ 102'
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table. NA=Not Applicable. NR: No Recovery. bgs: below ground surface. ags: above ground surface

Table 7
Waste Occurrence in Shepley's Hill Landfill Borings

Boring	Waste	Compound and Concentrations (mg/kg)													
		Arsenic		Cadmium		Copper		Chromium		Nickel		Lead		Zinc	
		High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
SHM-10-11	Paper/plastic/ash/wood (5 to 23 ft bgs)	12	6	220	0.04	33	7	42	6	16	6	110	6	48	13
SHM-10-12	Ash and sand mixed w/ash 5 to 9 ft bgs	13	12	0.03	0.02	260	7	18	9.8	72	9.3	510	8.5	210	16
SHM-10-13	Ash and Sand 23 to 27 ft bgs	31	7	3.5	0.03	33	5.3	52	4	15	5.5	53	5.3	13,000	20
SHM-10-13	Peat 27 to 35 ft bgs	5.9	0.8	< 0.03		71	0.8	48	4.6	23	4	13	2.5	34	9.5
SHM-10-14	Waste (paper/minor ash) and waste sand mix 10 to 23 ft bgs	18	3.8	< 0.04		11	5.9	16	6.8	23	8.5	180	6.6	160	36
SHM-10-14	Peat and sand/peat 30 to 44 ft bgs	60	2.8	< 0.04		7.3	4.6	8.4	5.9	15	4.2	6.6	1.6	27	11
SHM-10-15	Waste (ash/paper/plastic /wood) 5 to 28 ft bgs	25	6.2	0.26	0.04	310	3.7	69	10	75	6.3	1,200	12	1,000	53

Note: The values in yellow represent enrichment with respect to normal soil ranges
mg/kg – means milligrams per kilogram
bgs – below ground surface
ft - feet

ATTACHMENTS

Attachment A

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-01**

Client:	USACE	Drilling Co.:	Geosearch
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT
Project Number:	AC001	Drill Method:	Direct Push
Location:	Fort Devens Ayer, MA	Foreman:	Rodney Kaddy
		SCI Inspector:	Danielle Eastman
		Start Date:	6/15/2010
		Completion Date:	6/16/2010

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 209.88 - NGVD 29'
Surface Elevation: 206.3+/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-1	60/40	0-5	NA	NA			Topsoil (21-inches)	TOPSOIL		Standpipe is 3' ags
2								Light brown, dry to wet, MEDIUM TO COARSE SAND (well sorted)			Cement 0-2'
4							▼				
6	S-2	60/26	5-10	NA	NA			Grey, saturated, FINE TO MEDIUM SAND	SAND		
								Orange, COARSE SAND, some (angular) gravel			
8											
10					<5			As Field Testing Results		1	
12	S-3	60/22	10-15	NA	NA			Light brown, saturated, COARSE SAND to FINE TO MEDIUM SAND (gradational layering, well sorted)			
14											1" Schedule 40 PVC Riser [illegible]
16	S-4	60/29	15-20	NA	NA			Light brown, saturated, COARSE SAND to FINE TO MEDIUM SAND (gradational layering, well sorted)	SAND		
18											
20					<5			As Field Testing Results		1	
22	S-5	60/28	20-25	NA	NA			Brown, saturated, COARSE SAND, some (angular) gravel			Grout 2'-55.5'
24									SAND & GRAVEL		

Notes:
1) Direct Push groundwater profile sampling conducted on 5/27/10.
2) Groundwater profile sampler refusal @ 75'
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks:
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ = Approximate water table NA=Not Applicable NR=No Recovery bgs=below ground surface ags=above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-01**

Client:	USACE	Drilling Co.:	Geosearch		
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT		
Project Number:	AC001	Drill Method:	Direct Push		
Location:	Fort Devens Ayer, MA	Foreman:	Rodney Kaddy		
		SCI Inspector:	Danielle Eastman		
		Start Date:	6/15/2010	Casing Elevation:	209.88 - NGVD 29'
		Completion Date:	6/16/2010	Surface Elevation:	206.3+/- NGVD 29'
				Wellhead Type:	Standpipe

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
	Hammer	Fall
	NA lbs	NA"

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
26	S-6	60/26	25-30	NA	NA			Brown, saturated, COARSE SAND			
28											
30					5			As Field Testing Results		1	
32	S-7	60/22	30-35	NA	NA			Brown, saturated, COARSE SAND, some (rounded) gravel	SAND & GRAVEL		
34											
36	S-8	60/21	35-40	NA	NA			Brown, saturated, COARSE SAND, some (rounded) gravel			
38											[illegible] Schedule [illegible] PVC Riser
40					5			As Field Testing Results		1	
42	S-9	60/22	40-45	NA	NA			Brown, saturated, COARSE SAND, some (rounded) gravel			Grout 2'-55.5'
44											
46	S-10	60/29	45-50	NA	NA			Brown, saturated, COARSE SAND, some (rounded) gravel	SAND & GRAVEL		
48											
50					5			As Field Testing Results		1	

Notes:
1) Direct Push groundwater profile sampling conducted on 5/27/10
2) Groundwater profile sampler refusal at 75'
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks:
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table NA: Not Applicable NR: No Recovery bgs: below ground surface ags: above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: SHM-10-01

Client:	USACE	Drilling Co.:	Geosearch
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT
Project Number:	AC001	Drill Method:	Direct Push
Location:	Fort Devens	Foreman:	Rodney Kaddy
	Ayer, MA	SCI Inspector:	Danielle Eastman
		Start Date:	6/15/2010
		Completion Date:	6/16/2010

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 209.88 - NGVD 29'
Surface Elevation: 206.3+/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-11	60/34	50-55	NA	NA			Brown, saturated, COARSE SAND, some (rounded) gravel	SAND & GRAVEL		1.5" Schedule 40 PVC Riser 0-60.5'
52											
54											Grout 2'-55.5'
56	S-12	60/32	55-60	NA	NA			Brown, saturated, COARSE SAND, some medium sand, trace fine sand and silt.	SAND		Bentonite 55.5'-57.5'
58											
					5			As Field Testing Results		1	
60	S-13	60/31	60-65	NA	NA			Light brown, saturated, MEDIUM TO COARSE SAND, with layers of fine sand and silt			
62											
64											
66	S-14	60/28	65-70	NA	NA			Light brown, saturated, FINE TO MEDIUM SAND, some gravel, dense (Till)	GLACIAL TILL		
68											1.5" Schedule 40 PVC Well screen - 0.01" slot 60.5'-70.5'
					5			As Field Testing Results		1	
70								Limited recovery. SAND & GRAVEL, dense, rock in tip of sampling spoon. (Till)			
								SAMPLER REFUSAL @ 70.5'			CASING REFUSAL @ 70.5'
72											
74											
					5			As Field Testing Results		2	

Notes:
1) Direct Push groundwater profile sampling conducted on 5/27/10
2) Groundwater profile sampler refusal @ 75'
3)
4)
5)
6)

Key:
- Cement
- Drill Cuttings/Native Soils
- Bentonite Grout
- Sand
- Screen
- Riser

Remarks:
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼= Approximate water table NA=Not Applicable NR=No Recovery bgs=below ground surface ags=above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-02**

Client:	USACE	Drilling Co.:	Geosearch	Casing	Sampler
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT	Type: Steel	Geoprobe Spoon
Project Number:	AC001	Drill Method:	Direct Push	Size: 3.25"	60"
Location:	Fort Devens Ayer, MA	Foreman:	Rodney Kaddy	Hammer	Fall
		SCI Inspector:	Danielle Eastman	NA lbs	NA"
		Start Date:	6/30/2010	Casing Elevation:	222.86 - NGVD 29'
		Completion Date:	7/1/2010	Surface Elevation:	220.0+/- NGVD 29'
				Wellhead Type:	Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-1	60/19	0-5	NA	NA			Topsoil (4-inches)	TOPSOIL		Standpipe is 3' ags
2								Brown, dry, FINE TO MEDIUM SAND, little (angular) rock fragments			Cement 0-2'
4											
6	S-2	60/12	5-10	NA	NA			Brown, dry, FINE TO MEDIUM SAND, little (angular) rock fragments	SAND		
8											
10	S-3	60/4	10-15	NA	NA			Brown, dry, FINE TO MEDIUM SAND, little (angular) rock fragments			
12											
14											
16	S-4	60/56	15-20	NA	NA			0"- 15" Brown, dry, MEDIUM SAND, some (angular) gravel, trace fine sand	SAND		
								15"- 18" Light Brown, dry, FINE SAND, trace silt			
18							▼	18"- 49" Brown, moist, FINE SAND AND SILT	FINE SAND & SILT		
								49"- 56" Grey, saturated, SILT, trace Clay			
20	S-5	60/[illegible]	20-25	NA	NA			Light brown, saturated, MEDIUM TO COARSE SAND, some (angular) gravel, trace fine sand	SAND		Grout 2'-48'
22											
24					5			As Field Testing Results		1	

Notes
1) Direct Push groundwater profile sampling conducted on 6/7/10 & 6/8/10
2) Groundwater profile sampler refusal @ 102'. As = 5 ug/L @ 102'
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ = Approximate water table NA: Not Applicable NR: No Recovery bgs=below ground surface ags=above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-02**

Client:	USACE	Drilling Co.:	Geosearch
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT
Project Number:	AC001	Drill Method:	Direct Push
Location:	Fort Devens	Foreman:	Rodney Kaddy
	Ayer, MA	SCI Inspector:	Danielle Eastman
		Start Date:	6/30/2010
		Completion Date:	7/1/2010

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 222.86 - NGVD 29'
Surface Elevation: 220.0+/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
26	S-6	60/26	25-30	NA	NA			Gray, saturated, FINE SAND, some medium to coarse sand, little (angular) rock fragments (gradational layering of sands with depth)			
28											
30	S-7	60/22	30-35	NA	NA			Gray, saturated, MEDIUM TO COARSE SAND, some (angular) gravel, trace fine sand			
32									SAND		1.5" Schedule 40 PVC Riser 0-53'
34					<5			As Field Testing Results		1	
36	S-8	60/21	35-40	NA	NA			Gray, saturated, MEDIUM TO COARSE SAND, some (angular) gravel, trace fine sand			
38											
40	S-9	60/22	40-45	NA	NA			Gray, saturated, MEDIUM TO COARSE SAND, some (angular) gravel, trace fine sand			
42											Grout 2-48'
44					<5			As Field Testing Results		1	
46	S-10	60/29	45-50	NA	NA			Gray, saturated, MEDIUM TO COARSE SAND, some (angular) gravel, trace fine sand	SAND		
48											Bentonite 48-50'
50											

Notes:
1) Direct Push groundwater profile sampling conducted on 6.7.10 & 6.8.10
2) Groundwater profile sampler refusal @ 102'. As <5 ug/L @ 102'
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks:
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the some depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table. NA: Not Applicable. NR: No Recovery. bgs: below ground surface. ags: above ground surface

Sovereign Consulting Inc. 905B South Main Street Mansfield, Massachusetts	Boring/Well ID: **SHM-10-02**	Sheet 3 of 4
Client: USACE Project: SHL - Fort Devens Project Number: AC001 Location: Fort Devens, Ayer, MA	Drilling Co.: Geosearch Drill Rig: Geoprobe 6610DT Drill Method: Direct Push Foreman: Rodney Kaddy SCI Inspector: Danielle Eastman	Casing: Type Steel, Size 3.25", Hammer NA lbs Sampler: Geoprobe Spoon, 60", Fall NA"
	Start Date: 6/30/2010 Completion Date: 7/1/2010	Casing Elevation: 222.86 - NGVD 29' Surface Elevation: 220.0+/- NGVD 29' Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-11	60/12	50-55	NA	NA			Gray, saturated, MEDIUM TO COARSE SAND, some (angular) gravel, trace fine sand			#2 Morie Sand 50'-63'
52											
54					<5			As Field Testing Results		1	
	S-12	60/23	55-60	NA	NA			Gray, saturated, MEDIUM TO COARSE SAND, some (angular) gravel, trace fine sand	SAND		
56											
58								Bottom - Light brown to gray, saturated, FINE SAND			1.5" Schedule 40 PVC Well screen - 0.01" slot 53'-63'
60											
	S-13	60/26	60-65	NA	NA			Light brown to gray, Wet, MEDIUM TO COARSE SAND, some (angular) gravel, trace fine sand			
62											
64					5			As Field Testing Results		1	
	S-14	60/23	65-70	NA	NA			Light brown to gray, saturated, FINE SAND, some medium sand, trace coarse sand	SAND		
66											CASING REFUSAL @ 65'
68											
70											
	S-15	60/42	70-75	NA	NA			Light brown, saturated, FINE SAND, trace medium sand and silt			
72									SAND		
74					5			As Field Testing Results		1	

Notes:
1) Direct Push groundwater profile sampling conducted on 6/7/10 & 6/8/10
2) Groundwater profile sampler refusal @ 102'. As <5 ug/L @ 102'
3)
4)
5)
6)

Key: Cement; Drill Cuttings/Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks:
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ - Approximate water table NA - Not Applicable NR=No Recovery bgs below ground surface ags above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-02**

Client:	USACE	Drilling Co.:	Geosearch
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT
Project Number:	AC001	Drill Method:	Direct Push
Location:	Fort Devens	Foreman:	Rodney Kaddy
	Ayer, MA	SCI Inspector:	Danielle Eastman
		Start Date:	6/30/2010
		Completion Date:	7/1/2010

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 222.86 - NGVD 29'
Surface Elevation: 220.0+/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
76	S-16	36/13	75-78	NA	NA			Light brown, saturated, FINE SAND, trace medium sand and silt	SAND		
78								Grey, moist, FINE SAND, (angular) rock fragments, rock in tip of spoon			
								SAMPLER REFUSAL @ 78'			
80											
82											
84					<5			As Field Testing Results		1	
86											
88											
90											
92											
94					<5			As Field Testing Results		1	
96											
98											
100										2	

Notes
1) Direct Push groundwater profile sampling conducted on 6.7.10 & 6.8.10
2) Groundwater profile sampler refusal @ 102'. As <5 ug/L @ 102'
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ = Approximate water table   NA: Not Applicable   NR=No Recovery   bgs=below ground surface ags=above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-03**

Client:	USACE	Drilling Co.:	Geosearch
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT
Project Number:	AC001	Drill Method:	Direct Push
Location:	Fort Devens, Ayer, MA	Foreman:	Rodney Kaddy
		SCI Inspector:	Danielle Eastman
		Start Date:	6/23/2010
		Completion Date:	6/23/2010

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 231.88 - NGVD 29'
Surface Elevation: 229.6+/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-1	60/32	0-5	NA	NA			Topsoil	TOPSOIL		Standpipe is 3' ags
2								Brown, dry, MEDIUM TO COUARSE SAND, some gravel.			Cement 0-2'
4											
6	S-2	60/25	5-10	NA	NA			Light brown, dry, MEDIUM TO COARSE SAND, some Gravel. (large angular rock fragments in spoon)	SAND		
8											
10											
12	S-3	60/60	10-15	NA	NA			Light brown, dry, MEDIUM TO COARSE SAND, some (sub-angular) gravel, trace fine sand. (gradational layering, large angular rock fragments)	SAND		
14											
16	S-4	60/60	15-20	NA	NA			0"-21" Brown, moist, MEDIUM SAND, trace coarse sand, with (sub-rounded) gravel			
18								22"-60" Brown, moist, COARSE SAND, and (sub-angular) gravel.	SAND		
20											
22	S-5	60/28	20-25	NA	NA			Brown, wet, COARSE SAND, some (sub-angular) gravel			Grout 2'-53.5'
24											

Notes:
1) Direct Push groundwater profile sampling conducted on 6/10/10
2) Groundwater profile sampler refusal of 70'
3)
4)
5)
6)

Key:
Cement
Drill Cuttings/Native Soils
Bentonite Grout
Sand
Screen
Riser

Remarks:
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table. NA: Not Applicable. NR: No Recovery. bgs: below ground surface. ags: above ground surface.

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-03**

Client: USACE	Drilling Co.: Geosearch		Casing / Sampler
Project: SHL - Fort Devens	Drill Rig: Geoprobe 6610DT	Type	Steel / Geoprobe Spoon
Project Number: AC001	Drill Method: Direct Push	Size	3.25" / 60"
Location: Fort Devens, Ayer, MA	Foreman: Rodney Kaddy		Hammer / Fall
	SCI Inspector: Danielle Eastman		NA lbs / NA"
	Start Date: 6/23/2010	Casing Elevation:	231.88 - NGVD 29'
	Completion Date: 6/23/2010	Surface Elevation:	229.6+/- NGVD 29'
		Wellhead Type:	Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
26	S-6	60/25	25-30	NA	NA			Brown, wet, COARSE SAND, some (sub-angular) gravel			
							▼				
28									SAND		
					<5			As Field Testing Results		1	
30	S-7	60/30	30-35	NA	NA			Brown, wet, COARSE SAND, some (sub-angular) gravel			
32											
34											
36	S-8	60/36	35-40	NA	NA			Brown, saturated, FINE TO MEDIUM SAND, trace coarse sand			
									37.5'		1.5" Schedule 40 PVC Riser
					5			As Field Testing Results		1	
40	S-9	60/14	40-45	NA	NA			Brown, saturated, MEDIUM TO COARSE SAND, trace fine sand			
42											Grout 2'-53.5'
44											
46	S-10	60/27	45-50	NA	NA			0"-8" Brown, saturated, COARSE SAND AND GRAVEL with angular rock fragments	SAND		
48								9"-27" Brown, saturated, FINE TO MEDIUM SAND, trace coarse sand			
50					-			As Field Testing Results		1	

Notes
1) Direct Push groundwater profile sampling conducted on 6/10/10
2) Groundwater profile sampler refusal @ 70'
3)
4)
5)
6)

Key: Cement; Drill Cuttings/Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table NA: Not Applicable XR: No Recovery bgs: below ground surface ags: above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-03**

Client: USACE
Project: SHL - Fort Devens
Project Number: AC001
Location: Fort Devens, Ayer, MA

Drilling Co.: Geosearch
Drill Rig: Geoprobe 6610DT
Drill Method: Direct Push
Foreman: Rodney Kaddy
SCI Inspector: Danielle Eastman
Start Date: 6/23/2010
Completion Date: 6/23/2010

	Casing	Sampler
Type	PVC	Geoprobe Spoon
Size	1.5"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 231.88 - NGVD 29'
Surface Elevation: 229.6+/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-11	60/25	50-55	NA	NA			Light brown, saturated, FINE TO MEDIUM SAND, with (sub-rounded) gravel			1.5" Schedule 40 PVC Riser 0-58.5'; Grout 2'-53.5'
52											
54											Bentonite 53.5'-55.5'
56	S-12	60/30	55-60	NA	NA			Light brown to gray, saturated, MEDIUM TO COARSE SAND, trace fine sand	SAND		#2 Morie Sand 55.5'-68.5'
58								Brown, saturated, FINE SAND, some medium sand			
					<5			As Field Testing Results		1	
60	S-13	60/25	60-65	NA	NA			Light brown, moist, FINE SAND, trace Silt			
62								Light [illegible] saturated, MEDIUM-[illegible] SAND			[illegible] PVC Well screen [illegible] 58.5'-68.5'
64											
66	S-14	60/29	65-70	NA	NA			Light brown to Gray, saturated, MEDIUM SAND, some coarse sand, trace fine sand	SAND		
68											
					<5			As Field Testing Results		1	CASING REFUSAL @ 68.5'
70	[illegible]							[illegible]		2	
	S-15	24/24	70-72	NA	NA			Light brown, dry, FINE TO MEDIUM SAND	GLACIAL TILL		
72								SAMPLER REFUSAL @ 72'			
74											

Notes:
1) Direct Push groundwater profile sampling conducted on 6/10/10
2) Groundwater profile sampler refusal @ 70'
3)
4)
5)
6)

Key: Cement; Drill Cuttings/Native Soils; Bentonite Grout; Sand; Screen; Riser

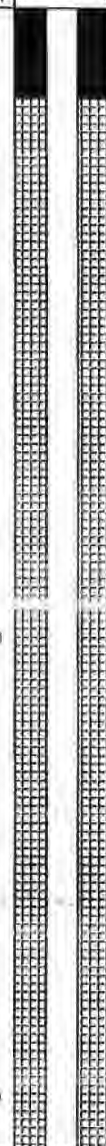
Remarks:
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table NA Not Applicable NR No Recovery bgs below ground surface ags above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-04**

Client: USACE	Drilling Co.: Geosearch		Casing / Sampler
Project: SHL - Fort Devens	Drill Rig: Geoprobe 6610DT	Type:	Steel / Geoprobe Spoon
Project Number: AC001	Drill Method: Direct Push	Size:	1.25" / 60"
Location: Fort Devens, Ayer, MA	Foreman: Rodney Kaddy		Hammer / Fall
	SCI Inspector: Danielle Eastman		NA lbs / NA"
	Start Date: 6/24/2010		Casing Elevation: 212.37 - NGVD 29'
	Completion Date: 6/24/2010		Surface Elevation: 209.8+/- NGVD 29'
			Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-1	60/38	0-5	NA	NA			Topsoil (7-inches)	TOPSOIL		Standpipe is 3' ags
2								Dark brown to brown, dry, FINE SAND, some silt, trace medium to coarse sand			Cement 0-2'
4											
6	S-2	60/56	5-10	NA	NA		▼	Brown, saturated, MEDIUM TO COARSE SAND, trace of fine sand and gravel	SAND		
8											1.5" Schedule 40 PVC Riser 0-55'
10	S-3	60/51	10-15	NA	NA			Brown, saturated, COARSE SAND, some medium sand, trace fine sand and gravel			
12											
14					5			As Field Testing Results	SAND	1	
16	S-4	60/56	15-20	NA	NA			Brown, saturated, MEDIUM TO COARSE SAND, trace of fine sand and gravel			
18											
20	[illegible]	[illegible]	20-25	NA	NA			Brown, saturated, MEDIUM TO COARSE SAND, trace of fine sand and gravel	SAND		Grout 2'-10'
22								Bottom 8" - Brown, saturated, FINE TO MEDIUM SAND, trace silt			
24					5			As Field Testing Results		1	



Notes
1) Direct Push groundwater profile sampling conducted on 6/8/10
2) Groundwater profile sampler refusal @ 95'
3)
4)
5)
6)

Key: Cement; Drill Cuttings/Native Soil; Bentonite Grout; Sand; Screen; Riser

Remarks
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ - Approximate water table NA - Not Applicable NR - No Recovery bgs - below ground surface ags - above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-04**

Client:	USACE	Drilling Co.:	Geosearch
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT
Project Number:	AC001	Drill Method:	Direct Push
Location:	Fort Devens	Foreman:	Rodney Kaddy
	Ayer, MA	SCI Inspector:	Danielle Eastman
		Start Date:	6/24/2010
		Completion Date:	6/24/2010

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 212.37 - NGVD 29'
Surface Elevation: 209.8+/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
26	S-6	60/60	25-30	NA	NA			Brown, saturated, FINE TO MEDIUM SAND, little coarse sand, trace silt			
28											
30									SAND		1.5" Schedule 40 PVC Riser 0-55'
	S-7	60/60	30-35	NA	NA			Brown, saturated, FINE TO MEDIUM SAND, little coarse sand, trace silt			
32											
34					<5			As Field Testing Results		1	
36	S-8	60/60	35-40	NA	NA			Brown, saturated, FINE TO MEDIUM SAND, little coarse sand, trace silt			
38									SAND		
40											
	S-9	60/16	40-45	NA	NA			Brown, saturated, FINE TO MEDIUM SAND, little coarse sand, trace silt			
42											Grout 2'-49'
44					<5			As Field Testing Results		1	
46	S-10	60/33	45-50	NA	NA			Brown, saturated, MEDIUM TO COARSE SAND, trace fine sand (some orange coloring)	SAND		
48											
50											Bentonite 49'-52'

Notes:
1) Direct Push groundwater profile sampling conducted on 6/8/10
2) Groundwater profile sampler refusal @ 95'
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks:
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table NA=Not Applicable NR=No Recovery bgs=below ground surface ags=above ground surface

Sovereign Consulting Inc. 905B South Main Street Mansfield, Massachusetts	Boring/Well ID: **SHM-10-04**	Sheet 3 of 4

Client:	USACE	Drilling Co.:	Geosearch		Casing	Sampler		
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT	Type	Steel	Geoprobe Spoon		
Project Number:	AC001	Drill Method:	Direct Push	Size	3.25"	60"		
Location:	Fort Devens Ayer, MA	Foreman:	Rodney Kaddy		Hammer	Fall		
		SCI Inspector:	Danielle Eastman		NA lbs	NA"		
		Start Date:	6/24/2010		Casing Elevation:	212.37 - NGVD 29'		
		Completion Date:	6/24/2010		Surface Elevation:	209.8+/- NGVD 29'		
					Wellhead Type:	Standpipe		

Sample Information

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-11	60/5	50-55	NA	NA			Brown, saturated, FINE TO MEDIUM SAND, trace silt			Bentonite 49'-52'
52											
54					5			As Field Testing Results		1	#2 Morie Sand 52'-65'
									SAND		
56	S-12	60/23	55-60	NA	NA			Brown, saturated, COARSE TO MEDIUM SAND, little fine sand (increasing percentage with depth)			1.5" Schedule 40 PVC Well screen - 0.01" slot 55'-65'
58											
60											
	S-13	60/24	60-65	NA	NA			Brown, saturated, FINE TO MEDIUM SAND (some orange coloring)			
62									SAND		
64					5			As Field Testing Results		1	
											CASING REFUSAL @ 65'
66	S-14	60/35	65-70	NA	NA			Brown, saturated, FINE TO MEDIUM SAND (some orange coloring)			
68											
70									SAND		
	S-15	60/24	70-75	NA	NA			Brown, saturated, FINE TO MEDIUM SAND (some orange coloring)			
72											
74					5			As Field Testing Results		1	

Notes
1) Direct Push groundwater profile sampling conducted on 6/8/10
2) Groundwater profile sampler refusal @ 95'
3)
4)
5)
6)

Key
- Cement
- Drill Cuttings Native Soils
- Bentonite Grout
- Sand
- Screen
- Riser

Remarks
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table NA Not Applicable NR= No Recovery bgs below ground surface ags above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-04**

Client:	USACE	Drilling Co.:	Geosearch
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT
Project Number:	AC001	Drill Method:	Direct Push
Location:	Fort Devens	Foreman:	Rodney Kaddy
	Ayer, MA	SCI Inspector:	Danielle Eastman
		Start Date:	6/24/2010
		Completion Date:	6/24/2010

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 212.37 - NGVD 29'
Surface Elevation: 209.8+/- NGVD 29'
Wellhead Type: Standpipe

Sample Information

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
76	S-16	60/19	75-80	NA	NA			Brown and orange, wet, COARSE TO MEDIUM SAND, trace gravel, dense			
78								Bottom 2" - Gray, saturated, Fine Sand	GLACIAL TILL		
80											
82	S-17	60/38	80-85	NA	NA			Dark brown to brown, saturated, MEDIUM TO COARSE SAND, trace gravel and fine sand, dense (some orange coloring)			
84					<5			As Field Testing Results		1	
86	S-18	60/18	85-90	NA	NA			Brown, saturated, MEDIUM TO COARSE SAND, trace fine gravel and fine sand, dense			
									GLACIAL TILL		
90											
92	S-19	60/20	90-95	NA	NA			0"-10" - Brown, saturated, MEDIUM TO COARSE SAND, little fine sand 10"-14" - Brown, saturated, FINE SAND AND SILT			
94								14" - 16" Gray, saturated, MEDIUM TO COARSE SAND, little fine gravel and fine sand, trace silt, dense			
					10-20			As Field Testing Results		1 2	
96								SAMPLER REFUSAL @ 95'			
98											
100											

Notes:
1) Direct Push groundwater profile sampling conducted on 6/8/10
2) Groundwater profile sampler refusal @ 95'
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks:
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
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3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ = Approximate water table NA- Not Applicable NR=No Recovery bgs=below ground surface ags=above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-05A**

Client:	USACE	Drilling Co.:	Geosearch
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT
Project Number:	AC001	Drill Method:	Direct Push
Location:	Fort Devens	Foreman:	Rodney Kaddy
	Ayer, MA	SCI Inspector:	Carolyn Hardt
		Start Date:	7/2/2010
		Completion Date:	7/2/2010

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 234.92 - NGVD 29'
Surface Elevation: NA
Wellhead Type: Flush Mount

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
								Asphalt Pavement (3-inches)	ASPHALT		
2											Cement 0-2'
								Location pre-cleared of utilities by vacuum truck to 8' bgs			
4											
6											
8	S-1	24/22	8-10	NA	NA			Dark brown, moist, FINE SAND, trace medium and coarse sand. (well sorted)	SAND		
10	S-2	60/48	10-15	NA	NA			Brown, moist, FINE SAND, trace medium sand			
12											[illegible]
14									SAND		
	S-3	60/60	15-20	NA	NA			Brown, moist, FINE SAND, trace medium sand			
16											
18											
20	S-4	60/51	20-25	NA	NA			Light brown, moist, FINE SAND, some medium sand, trace gravel. (increasing percentages of medium sand with depth)	SAND		Grout 2'-45'
22											
24											

Notes:
1) Direct Push groundwater profile sampling conducted on 6/9/10
2) Groundwater profile sampler refusal @ 110'. As = 5 ug/L @ 109'
3)
4)
5)
6)

Key: Cement; Drill Cuttings/Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks:
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample
▼ Approximate water table. NA: Not Applicable. NR: No Recovery. bgs: below ground surface. ags: above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-05A**

Client:	USACE	Drilling Co.:	Geosearch	Casing	Sampler
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT	Type: Steel	Geoprobe Spoon
Project Number:	AC001	Drill Method:	Direct Push	Size: 3.25"	60"
Location:	Fort Devens	Foreman:	Rodney Kaddy	Hammer	Fall
	Ayer, MA	SCI Inspector:	Carolyn Hardt	NA lbs	NA"
		Start Date:	7/2/2010	Casing Elevation:	234.92 - NGVD 29'
		Completion Date:	7/2/2010	Surface Elevation:	NA
				Wellhead Type:	Flush Mount

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
26	S-5	60/56	25-30	NA	NA		▼	Light brown to dark brown, moist to wet, FINE TO MEDIUM SAND; trace coarse sand and gravel			
28											
					5			As Field Testing Results		1	
30	S-6	60/60	30-35	NA	NA			Dark brown to light brown, wet, FINE TO MEDIUM SAND, trace coarse sand and gravel	SAND		
32											
34											
36		60/0	35-40	NA	NA			NO RECOVERY			
											2" Schedule 40 PVC Riser
					5			As Field Testing Results	SAND	1	
40	S-7	60/23	40-45	NA	NA			Light brown, saturated, FINE SAND			
42											Grout 2'-45'
44											
46	S-8	60/24	45-50	NA	NA			Light brown, saturated, FINE SAND	SAND		Bentonite 45'-47'
48											#2 Morie Sand 47'-60'
50					5			As Field Testing Results		1	

Notes
1) Direct Push groundwater profile sampling conducted on 6/9/10
2) Groundwater profile sampler refusal @ 110' As = 5 ug/L @ 109'
3)
4)
5)
6)

Key: Cement; Drill Cuttings/Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ = Approximate water table; NA: Not Applicable; NR: No Recovery; bgs: below ground surface; ags: above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-05A**

Client:	USACE	Drilling Co.:	Geosearch
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT
Project Number:	AC001	Drill Method:	Direct Push
Location:	Fort Devens Ayer, MA	Foreman:	Rodney Kaddy
		SCI Inspector:	Carolyn Hardt
		Start Date:	7/2/2010
		Completion Date:	7/2/2010

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 234.92 - NGVD 29'
Surface Elevation: NA
Wellhead Type: Flush Mount

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-9	60/30	50-55	NA	NA			Light brown, saturated, FINE SAND			
52											#2 Morie Sand 47'-60'
54									SAND		
56	S-10	60/13	55-60	NA	NA			Light brown, saturated, FINE SAND			
58											1.5" Schedule 40 PVC Well screen - 0.01" slot 50'-60'
					<5			As Field Testing Results		1	
60	S-11	60/50	60-65	NA	NA			Light brown, saturated, FINE SAND			CASING REFUSAL @ 60'
62											
64									SAND		
66	S-13	60/30	65-70	NA	NA			Light brown, saturated, FINE SAND			
68											
					<5			As Field Testing Results		1	
70								SAMPLER REFUSAL @ 70'			
72											
74											

Notes:
1) Direct Push groundwater profile sampling conducted on 6/9/10
2) Groundwater profile sampler refusal @ 110'. As < 5 ug/L @ 109'
3)
4)
5)
6)

Key: Cement; Drill Cuttings/Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks:
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table NA: Not Applicable NR: No Recovery bgs: below ground surface ags: above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-05A**

Client:	USACE	Drilling Co.:	Geosearch		
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT		
Project Number:	AC001	Drill Method:	Direct Push		
Location:	Fort Devens, Ayer, MA	Foreman:	Rodney Kaddy		
		SCI Inspector:	Carolyn Hardt		
		Start Date:	7/2/2010	Casing Elevation:	234.92 - NGVD 29'
		Completion Date:	7/2/2010	Surface Elevation:	NA
				Wellhead Type:	Flush Mount

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
	Hammer	Fall
	NA lbs	NA"

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
76											
78					5					1	
80											
82											
84											
86											
88					5					1	
90											
92											
94											
96											
98					5					1	
100										2	

Notes:
1) Direct Push groundwater profile sampling conducted on 6/9/10
2) Groundwater profile sampler refusal @ 110'. As = 5 ug/L @ 109'
3)
4)
5)
6)

Key: Cement; Drill Cuttings/Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks:
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ = Approximate water table. NA: Not Applicable. NR: No Recovery. bgs: below ground surface. ags: above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

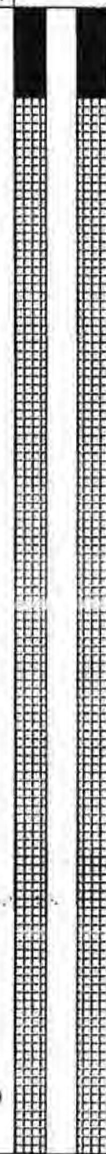
Boring/Well ID: **SHM-10-06**

Client:	USACE	Drilling Co.:	Geosearch
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT
Project Number:	AC001	Drill Method:	Direct Push
Location:	Fort Devens Ayer, MA	Foreman:	Rodney Kaddy
		SCI Inspector:	Danielle Eastman
		Start Date:	6/21/2010
		Completion Date:	6/21/2010

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 232.77 - NGVD 29'
Surface Elevation: 229.8+/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-1	60/42	0-5	NA	NA			Topsoil	TOPSOIL		Standpipe is 3' ags
2								Light brown to gray, dry, COARSE SAND, some medium sand			Cement 0-2'
4											
6	S-2	60/41	5-10	NA	NA			Light brown to gray, dry, COARSE SAND, (well sorted)	SAND		
8											
10	S-3	60/53	10-15	NA	NA			Light brown to gray, dry, COARSE SAND, (well sorted)			
12											
14											
16	S-4	60/40	15-20	NA	NA			Brown, moist to wet, COARSE SAND, (well sorted)	SAND		
18											1.5" Schedule 40 PVC Riser 0-69.5'
20							▼				
	S-5	60/48	20-25	NA	NA			Brown, saturated, COARSE SAND, (well sorted)			Grout 2'-64.5'
22											
24					10			As Field Testing Results		1	



Notes
1) Direct Push groundwater profile sampling conducted on 5/24/10 & 5/26/10
2) Groundwater profile sampler refusal @ 80'
3)
4)
5)
6)

Key: Cement; Drill Cuttings/Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table   NA -Not Applicable   NR -No Recovery   bgs -below ground surface   ags -above ground surface

Sovereign Consulting Inc. **905B South Main Street** **Mansfield, Massachusetts**	Boring/Well ID: **SHM-10-06**	Sheet 2 of 4

Client:	USACE	Drilling Co.:	Geosearch		Casing	Sampler
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT	Type	Steel	Geoprobe Spoon
Project Number:	AC001	Drill Method:	Direct Push	Size	3.25"	60"
Location:	Fort Devens	Foreman:	Rodney Kaddy		Hammer	Fall
	Ayer, MA	SCI Inspector:	Danielle Eastman		NA lbs	NA"
		Start Date:	6/21/2010	Casing Elevation:	232.77 - NGVD 29'	
		Completion Date:	6/21/2010	Surface Elevation:	229.8+/- NGVD 29'	
				Wellhead Type:	Standpipe	

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
26	S-6	60/43	25-30	NA	NA			Brown, saturated, COARSE SAND AND GRAVEL, some medium sand			
28											
30									SAND		
	S-7	60/0	30-35	NA	NA			NO RECOVERY			
32											
34					150-200			As Field Testing Results		1	
36	S-8	60/0	35-40	NA	NA			NO RECOVERY			
38											1.5" Schedule [illegible] PVC Riser
40											
	S-9	60/26	40-45	NA	NA			0"-12" Light brown to gray, saturated, COARSE SAND			
42											Grout 2'-64.5'
								12"-26" Light Brown to Gray, Saturated, FINE - MEDIUM SAND			
44					100			As Field Testing Results		1	
46	S-10	60/60	45-50	NA	NA			Light brown to gray, wet, FINE TO MEDIUM SAND, trace silt, (well sorted)			
48									SAND		
50											

Notes:
1) Direct Push groundwater profile sampling conducted on 5/24/10 & 5/26/10
2) Groundwater profile sampler refusal @ 80'
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks: 1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table NA=Not Applicable NR=No Recovery bgs=below ground surface ags=above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-06**

Client:	USACE	Drilling Co.:	Geosearch
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT
Project Number:	AC001	Drill Method:	Direct Push
Location:	Fort Devens Ayer, MA	Foreman:	Rodney Kaddy
		SCI Inspector:	Danielle Eastman
		Start Date:	6/21/2010
		Completion Date:	6/21/2010

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
Hammer	NA lbs	Fall NA"

Casing Elevation: 232.77 - NGVD 29'
Surface Elevation: 229.8+/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-11	60-16	50-55	NA	NA			Light brown to gray, wet, FINE TO MEDIUM SAND, trace silt. (well sorted)			
52											
54					5			As Field Testing Results		1	1.5" Schedule 40 PVC Riser 0-69.5'
56	S-12	60-28	55-60	NA	NA			Light brown to gray, wet, FINE TO MEDIUM SAND, trace silt. (well sorted)	SAND		
58											Grout 2'-64.5'
60											
62	S-13	60-20	60-65	NA	NA			Light brown to gray, moist, FINE TO MEDIUM SAND, trace silt, rock fragments at bottom, dense. (well sorted)	SAND		
64					150			As Field Testing Results		1	
66	S-14	60-8	65-70	NA	NA			Light brown to gray, moist, FINE TO MEDIUM SAND, rock fragments, dense			Bentonite 64.5'-66.5'
68											
70									SAND		#2 Morie Sand 69.5'-79.5'
	S-15	60-24	70-75	NA	NA			Light brown to gray, moist, FINE TO MEDIUM SAND			
72											
74					500			As Field Testing Results		1	

Notes:
1) Direct Push groundwater profile sampling conducted on 5.24.10 & 5.26.10
2) Groundwater profile sampler refusal @ 80'
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks: 1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table   NA=Not Applicable   NR=No Recovery   bgs=below ground surface   ags=above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring Well ID: **SHM-10-06**

Client:	USACE	Drilling Co.:	Geosearch		Casing / Sampler
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT	Type	Steel / Geoprobe Spoon
Project Number:	AC001	Drill Method:	Direct Push	Size	3.25" / 60"
Location:	Fort Devens, Ayer, MA	Foreman:	Rodney	Hammer	NA lbs / Fall NA"
		SCI Inspector:	Danielle Eastman		
		Start Date:	6/21/2010	Casing Elevation:	232.77 - NGVD 29'
		Completion Date:	6/21/2010	Surface Elevation:	229.8+/- NGVD 29'
				Wellhead Type:	Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
76	S-16	60/40	75-80	NA	NA			Light brown to gray, moist, FINE TO MEDIUM SAND, rock fragments, dense			
78									SAND		1.5" Schedule 40 PVC Well screen - 0.01" slot 69.5'-79.5'
					>500			As Field Testing Results		1	
80								SAMPLER REFUSAL @ 80'		2	CASING REFUSAL @ 79.5'
82											
84											
86											
88											
90											
92											
94											
96											
98											

Notes
1) Direct Push groundwater profile sampling conducted on 5 24 10 & 5 26 10
2) Groundwater profile sampler refusal @ 80'
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ - Approximate water table NA Not Applicable NR No Recovery bgs=below ground surface ags above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-06A**

Client:	USACE	Drilling Co.:	Geosearch
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT
Project Number:	AC001	Drill Method:	Direct Push
Location:	Fort Devens, Ayer, MA	Foreman:	Rodney Kaddy
		SCI Inspector:	Danielle Eastman
		Start Date:	6/16/2010
		Completion Date:	6/18/2010

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
Hammer	NA lbs	
Fall		NA"

Casing Elevation:	248.39 - NGVD 29'
Surface Elevation:	245.7 +/- NGVD 29'
Wellhead Type:	Standpipe

Sample Information

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-1	60/40	0-5	NA	NA			0"-7" Dark brown, dry, Topsoil	TOPSOIL		Standpipe is 3' ags
2								7"-16" Light brown to gray, dry, MEDIUM TO COARSE SAND, with gravel			Cement 0-2'
4								16"-21" Light brown, dry, FINE TO MEDIUM SAND			
6	S-2	60/46	5-10	NA	NA			Light brown to gray, dry, FINE TO MEDIUM SAND, trace gravel	SAND		
8											1.5" Schedule 40 PVC Riser 0-77'
10											
	S-3	60/53	10-15	NA	NA			Light brown to gray, moist, FINE TO MEDIUM SAND, trace gravel			
12											
14											
16	S-4	60/50	15-20	NA	NA			Light brown to gray, moist, FINE TO MEDIUM SAND, trace gravel	SAND		Grout 2'-72'
18											
20											
	S-5	60/60	20-25	NA	NA			0"-32" Light brown to gray, dry, MEDIUM TO COARSE SAND			
22								32"-60" Light brown, moist, MEDIUM TO COARSE SAND, some gravel			
24											

Notes:
1) Direct Push groundwater profile sampling conducted on 5/24/10 & 5/25/10
2) Groundwater profile sampler refusal @ 110.5'. As = 0 ug/L @ 104' and As = 20 ug/L @ 110'
3)
4)
5)
6)

Key: Cement; Drill Cuttings/Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks:
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table NA=Not Applicable NR=No Recovery bgs=below ground surface ags=above ground surface

Sovereign Consulting Inc. 905B South Main Street Mansfield, Massachusetts	Boring/Well ID: **SHM-10-06A**	Sheet 2 of 4

Client:	USACE	Drilling Co.:	Geosearch
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT
Project Number:	AC001	Drill Method:	Direct Push
Location:	Fort Devens	Foreman:	Rodney Kaddy
	Ayer, MA	SCI Inspector:	Danielle Eastman
		Start Date:	6/16/2010
		Completion Date:	6/18/2010

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 248.39 - NGVD 29'
Surface Elevation: 245.7 +/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
26	S-6	60/60	25-30	NA	NA			Light brown to gray, dry, FINE TO MEDIUM SAND			
28											
30	S-7	60/56	30-35	NA	NA			Light brown, moist, MEDIUM SAND, some fine and coarse sand, trace gravel	SAND		
32											1.5" Schedule 40 PVC Riser 0-77'
34					5			As Field Testing Results		1	
36	S-8	60/[illegible]	35-40	NA	NA		▼	Light brown, wet, MEDIUM SAND, some fine and coarse sand, trace gravel			
38											
40	S-9	60/22	40-45	NA	NA			Light brown, wet, MEDIUM SAND, some fine and coarse sand, trace gravel			Grout 2'-72'
42									SAND		
44					40			As Field Testing Results		1	
46	S-10	60/18	45-50	NA	NA			Brown, moist, FINE TO MEDIUM SAND, trace coarse sand			
48											
50											

Notes:
1) Direct Push groundwater profile sampling conducted on 5.24.10 & 5.25.10
2) Groundwater profile sampler refusal @ 110.5'. As 0 ug/L @ 104' and As 20 ug/L @ 110'
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks:
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table NA=Not Applicable NR: No Recovery bgs: below ground surface ags: above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-06A**

Client:	USACE	Drilling Co.:	Geosearch		
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT		
Project Number:	AC001	Drill Method:	Direct Push		
Location:	Fort Devens Ayer, MA	Foreman:	Rodney Kaddy		
		SCI Inspector:	Danielle Eastman		
		Start Date:	6/16/2010	Casing Elevation:	248.39 - NGVD 29'
		Completion Date:	6/18/2010	Surface Elevation:	245.7 +/- NGVD 29'
				Wellhead Type:	Standpipe

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
	Hammer	Fall
	NA lbs	NA"

Sample Information

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-11	60/30	50-55	NA	NA			0"-14" Light brown to gray, wet, MEDIUM TO COARSE SAND, (well sorted)			
52								14"-30" Orange, moist, MEDIUM SAND, trace coarse sand			
54					10			As Field Testing Results		1	
56	S-12	60/32	55-60	NA	NA			Gray, wet, MEDIUM SAND, some coarse, (well sorted)	SAND		
58											1.5" Schedule 40 PVC Riser 0-77'
60											
62	S-13	60/22	60-65	NA	NA			Gray, wet to saturated, FINE TO MEDIUM SAND, dense			
64					20			As Field Testing Results		1	Grout 2'-72'
66	S-14	60/23	65-70	NA	NA			Gray, wet to saturated, FINE TO MEDIUM SAND, dense			
68											
70									SAND ▼		
	S-15	60/[illegible]	70-75	NA	NA			Gray, wet, FINE TO MEDIUM SAND, dense			
72											Bentonite 72'-74'
74					30-40			As Field Testing Results		1	
											#2 Morie Sand 74'-87'

Notes:
1) Direct Push groundwater profile sampling conducted on 5/24/10 & 5/25/10
2) Groundwater profile sampler refusal @ 110.5'. As - 40 ug/L @ 104' and As - 20 ug/L @ 110'
3)
4)
5)
6)

Key:
- Cement
- Drill Cuttings/Native Soils
- Bentonite Grout
- Sand
- Screen
- Riser

Remarks:
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table   NA=Not Applicable   NR=No Recovery   bgs=below ground surface   ags=above ground surface

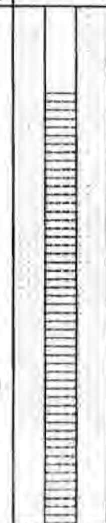
Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-06A**

Client:	USACE	Drilling Co.:	Geosearch		Casing / Sampler
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT	Type	Steel / Geoprobe Spoon
Project Number:	AC001	Drill Method:	Direct Push	Size	3.25" / 60"
Location:	Fort Devens	Foreman:	Rodney Kaddy		Hammer / Fall
	Ayer, MA	SCI Inspector:	Danielle Eastman		NA lbs / NA"
		Start Date:	6/16/2010	Casing Elevation:	248.39 - NGVD 29'
		Completion Date:	6/18/2010	Surface Elevation:	245.7 +/- NGVD 29'
				Wellhead Type:	Standpipe

Sample Information

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
76	S-16	60/14	75-80	NA	NA			Light gray to brown, saturated, FINE TO MEDIUM SAND, dense			#2 Morie Sand 74'-87'
78											
80	S-17	60/34	80-85	NA	NA			Light gray to brown, saturated, FINE TO MEDIUM SAND, dense	SAND		
82											1.5" Schedule 40 PVC Well screen - 0.01" slot 77'-87'
84					60			As Field Testing Results		1	
86	S-18	60/14	85-90	NA	NA			Light gray to brown, saturated, FINE TO MEDIUM SAND, dense			
88											
90								SAMPLER REFUSAL @ 90'			CASING REFUSAL @ 90'
92											
94					5			Arsenic Field Testing Results		1	
96											
98											
100										2	



Notes:
1) Direct Push groundwater profile sampling conducted on 5/24/10 & 5/25/10
2) Groundwater profile sampler refusal @ 110.5'. As = 0 ug/L @ 104' and As = 20 ug/L @ 110'
3)
4)
5)
6)

Key: Cement; Drill Cuttings/Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks:
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ = Approximate water table NA = Not Applicable NR = No Recovery bgs=below ground surface ags= above ground surface

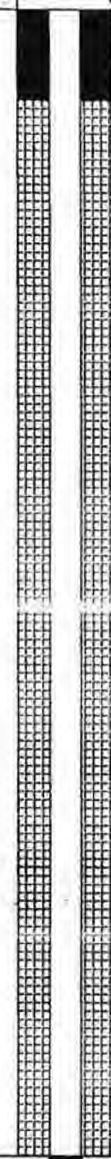
Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-07**

Client:	USACE	Drilling Co.:	Boart Longyear		Casing / Sampler
Project:	SHL - Fort Devens	Drill Rig:	Mini Sonic	Type	Steel / Core Barrel
Project Number:	AC001	Drill Method:	Rotary-Vibratory	Size	6" / 60"
Location:	Fort Devens Ayer, MA	Foreman:	Rob Danckert		Hammer: NA lbs / Fall: NA"
		SCI Inspector:	PJV		
		Start Date:	5/19/2010	Casing Elevation:	246.59 - NGVD 29'
		Completion Date:	5/20/2010	Surface Elevation:	244.6+/- NGVD 29'
				Wellhead Type:	Standpipe

Sample Information

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-1	60/36	0-5	NA	NA			0"-16" Brown, dry, MEDIUM TO COARSE SAND, little fine gravel, trace coarse gravel			Standpipe is 3' ags
2								16"-19" Dark brown, FINE SAND, organic materials (leaves & wood)			Cement 0-2'
4								19"-36" Gray, dry, FINE TO MEDIUM SAND, some coarse sand to fine gravel, trash (metal fragments)			
6	S-2	60/53	5-10	NA	NA			0"-12" Brown, moist, MEDIUM TO COARSE SAND, little fine gravel	SAND		
8								12"-53" Light brown, moist, FINE TO MEDIUM SAND, little coarse sand, trace fine gravel			
10	S-3	60/51	10-15	NA	NA			Brown, moist to wet, FINE TO MEDIUM SAND			
12											PVC Riser
14											
16	S-4	60/36	15-20	NA	NA			Brown, moist to wet, FINE TO MEDIUM SAND	SAND		Grout 2-30'
18											
20	S-5	60/30	20-25	NA	NA			Brown, wet, FINE TO MEDIUM SAND			
22											
24											



Notes
1) Groundwater profile sampling conducted with a bladder pump
2) Soil sample collected for laboratory analysis
3)
4)
5)
6)

Key: Cement; Drill Cuttings/Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks: 1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ - Approximate water table NA=Not Applicable NR=No Recovery bgs=below ground surface ags=above ground surface

Sovereign Consulting Inc. 905B South Main Street Mansfield, Massachusetts	Boring Well ID: **SHM-10-07**	

Client:	USACE	Drilling Co.:	Boart Longyear		Casing	Sampler
Project:	SHL - Fort Devens	Drill Rig:	Mini Sonic	Type	Steel	Core Barrel
Project Number:	AC001	Drill Method:	Rotary-Vibratory	Size	6"	60"
Location:	Fort Devens	Foreman:			Hammer	Fall
	Ayer, MA	SCI Inspector:	PJV		NA lbs	NA"
		Start Date:	5/19/2010	Casing Elevation:	246.59 - NGVD 29'	
		Completion Date:	5/20/2010	Surface Elevation:	244.6+/- NGVD 29'	
				Wellhead Type:	Standpipe	

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
26	S-6	60/46	25-30	NA	NA			0"-22" Brown, wet, FINE TO MEDIUM SAND			
28							▼	22"-46" Gray, saturated, FINE TO MEDIUM SAND		2	2" Schedule 40 PVC Riser 0-40'
30-32	S-7	60/54	30-35	NA	NA			Gray, saturated, FINE TO MEDIUM SAND	SAND		Grout 2'-36'
34-36	S-8	60/30	35-40	NA	NA			Brown, saturated, FINE TO MEDIUM SAND			
38											Bentonite 37'-38'
40					5.0			As Field Testing Results		1	#2 Morie Sand 38'-50'
42	S-9	60/54	40-45	NA	NA			0"-10" Brown, saturated, FINE TO MEDIUM SAND 10"-25" Brown, moist, FINE TO COARSE SAND AND FINE TO COARSE GRAVEL, little silt, dense 25"-30" COBBLES AND ROCK FRAGMENTS 30"-51" Gray, moist, FINE TO COARSE SAND AND FINE TO COARSE GRAVEL, little silt, dense		2	2" Schedule 40 PVC Well screen - 0.01" slot 40'-50'
44-48	S-10	60/48	45-50	NA	NA			0-36" Gray, moist, FINE TO COARSE SAND AND FINE TO COARSE GRAVEL, little silt, dense	GLACIAL TILL		
50					[illegible]			36"-48" ROCK FRAGMENTS AND ROCK DUST [illegible]	[illegible]	1	

Notes
1) Groundwater profile sampling conducted with a bladder pump
2) Soil sample collected for laboratory analysis
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table. NA: Not Applicable. NR: No Recovery. bgs: below ground surface. ags: above ground surface.

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-07**

Client:	USACE	Drilling Co.:	Boart Longyear
Project:	SHL - Fort Devens	Drill Rig:	Mini Sonic
Project Number:	AC001	Drill Method:	Rotary-Vibratory
Location:	Fort Devens, Ayer, MA	Foreman:	
		SCI Inspector:	PJV
		Start Date:	5/19/2010
		Completion Date:	5/20/2010

	Casing	Sampler
Type	Steel	Core Barrel
Size	6"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 246.59 - NGVD 29'
Surface Elevation: 244.6+/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-11	60/45	50-55	NA	NA			ROCK FRAGMENTS AND ROCK DUST 1" - 5" Thick Rock "Pucks" in Bottom	BEDROCK	2	
52											
54											
								END BORING @ 55 FEET			
56											
58											
60											
62											
64											
66											
68											
70											
72											
74											

Notes:
1) Groundwater profile sampling conducted with a bladder pump
2) Soil sample collected for laboratory analysis
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks: 1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table NA=Not Applicable NR=No Recovery bgs=below ground surface ags=above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-08**

Client:	USACE	Drilling Co.:	Geosearch
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT
Project Number:	AC001	Drill Method:	Direct Push
Location:	Fort Devens	Foreman:	Rodney Kaddy
	Ayer, MA	SCI Inspector:	Danielle Eastman
		Start Date:	6/29/2010
		Completion Date:	6/29/2010

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 214.21 - NGVD 29'
Surface Elevation: 211.6+/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-1	60/34	0-5	NA	NA			Topsoil (4 inches)	TOPSOIL		Standpipe is 3' ags
2								Brown, moist, FINE SAND, trace medium to coarse sand, trace silt, (well sorted)			Cement 0-2'
4											
6	S-2	60/36	5-10	NA	NA			Brown, moist, MEDIUM TO COARSE SAND, trace silt and fine sand, with rock fragments	SAND		
								Brown, moist, FINE SAND, trace medium sand and silt			
8								Brown, wet, MEDIUM TO COARSE SAND, some gravel (sub-rounded)			1.5" Schedule 40 PVC Riser 0-46'
10							▼				
	S-3	60/50	10-15	NA	NA			0"-11" Brown, wet, FINE TO MEDIUM SAND, trace silt		1	
12					8			As Field Testing Results			
								11"-[illegible] MEDIUM TO COARSE SAND [illegible]			
14								2[illegible]"-[illegible] Dark [illegible] saturated [illegible] some coarse sand			
								27"-50" Brown, saturated, FINE SAND			
16	S-4	60/26	15-20	NA	NA			Brown, saturated, FINE SAND, some medium sand, trace silt	SAND		
18											
20											Grout 2'-41'
	S-5	60/60	20-25	NA	NA			Dark brown, saturated, MEDIUM TO COARSE SAND, some gravel (sub-rounded)		1	
22					15			As Field Testing Results	SAND		
								Brown, saturated, MEDIUM TO FINE SAND, trace coarse sand			
24								[illegible] MEDIUM SAND [illegible]			
								Grayish brown, SAND, well sorted. Wet			

Notes:
1) Direct Push groundwater profile sampling conducted on 6/3/10
2) Groundwater profile sampler refusal @ 62.5'
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks: 1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼: Approximate water table NA: Not Applicable NR=No Recovery bgs=below ground surface ags=above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring Well ID: **SHM-10-08**

Client:	USACE	Drilling Co.:	Geosearch
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT
Project Number:	AC001	Drill Method:	Direct Push
Location:	Fort Devens	Foreman:	Rodney Kaddy
	Ayer, MA	SCI Inspector:	Danielle Eastman
		Start Date:	6/29/2010
		Completion Date:	6/29/2010

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 214.21 - NGVD 29'
Surface Elevation: 211.6+/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
26	S-6	60/14	25-30	NA	NA			Light brown, saturated, FINE TO MEDIUM SAND, trace silt (percent of fine sand increasing with depth)			
28											1.5" Schedule 40 PVC Riser 0-46'
30											
32	S-7	60/27	30-35	NA	NA 5			Light brown to gray, saturated, MEDIUM TO FINE SAND, trace silt and coarse sand As Field Testing Results	SAND	1	
34											
36	S-8	60/22	35-40	NA	NA			Light brown, saturated, FINE SAND, trace silt			Grout 2'-41'
38								Light brown, saturated, MEDIUM SAND, trace fine sand			
40								Brown, saturated, FINE SAND, trace silt	SAND		
42	S-9	60/35	40-45	NA	NA 5			Brown, saturated, MEDIUM TO COARSE SAND, trace gravel, fine sand, and silt As Field Testing Results		1	Bentonite 41'-43'
44								Orange brown, saturated, MEDIUM TO COARSE SAND AND GRAVEL, (sub-angular to sub-rounded)			
46	S-10	60/30	45-50	NA	NA			Brown, saturated, MEDIUM TO COARSE SAND, some gravel (angular)	SAND		#2 Morie Sand 43'-56'
48								Brown, saturated, FINE SAND, some medium sand, trace silt			1.5" Schedule 40 PVC Well screen 0.01" slot 46-56'
50											

Notes
1) Direct Push groundwater profile sampling conducted on 6/3/10
2) Groundwater profile sampler refusal @ 62.5'
3)
4)
5)
6)

Key
- Cement
- Drill Cuttings/Native Soils
- Bentonite Grout
- Sand
- Screen
- Riser

Remarks
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table NA=Not Applicable NR=No Recovery bgs=below ground surface ags=above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-08**

Client:	USACE	Drilling Co.:	Geosearch
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT
Project Number:	AC001	Drill Method:	Direct Push
Location:	Fort Devens	Foreman:	Rodney Kaddy
	Ayer, MA	SCI Inspector:	Danielle Eastman
		Start Date:	6/29/2010
		Completion Date:	6/29/2010

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 214.21 - NGVD 29'
Surface Elevation: 211.6+/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-11	60/30	50-55	NA	NA			Light brown, saturated, FINE SAND, some gravel and coarse sand, trace silt	SAND		#2 Morie Sand 43'-56'
					5			As Field Testing Results		1	
52											
54											1.5" Schedule 40 PVC Well screen - 0.01" slot 46'-56'
	S-12	24/12	55-57	NA	NA			Brown, saturated, MEDIUM TO COARSE SAND, some fine sand			
56								Gray, dry, FINE SAND, some silt, with rock fragments (angular) (Till)	GLACIAL TILL		CASING REFUSAL @ 56'
								SAMPLER REFUSAL @ 57'			
58											
60											
					5			As Field Testing Results		1	
62											
64											
66											
68											
70											
72											
74											

Notes:
1) Direct Push groundwater profile sampling conducted on 6/3/10
2) Groundwater profile sampler refusal @ 62.5'
3)
4)
5)
6)

Key: Cement; Drill Cuttings/Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks:
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table. NA= Not Applicable. NR =No Recovery. bgs=below ground surface. ags=above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-09**

Client:	USACE	Drilling Co.:	Geosearch
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT
Project Number:	AC001	Drill Method:	Direct Push
Location:	Fort Devens Ayer, MA	Foreman:	Rodney Kaddy
		SCI Inspector:	Danielle Eastman
		Start Date:	6/14/2010
		Completion Date:	6/15/2010

	Casing	Sampler
Type	Steel	Geoprobe/ Spoon
Size	3.25"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: NA
Surface Elevation: NA
Wellhead Type: Standpipe

Sample Information

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-1	60/35	0-5	NA	NA			Topsoil (6-inches)	TOPSOIL		NO WELL INSTALLED
2								6"-14" Light brown, dry, FINE TO MEDIUM SAND (Orange Tint)	SAND & GRAVEL		
4								14"-35" Light gray, moist, MEDIUM TO COARSE SAND AND GRAVEL (rounded), some angular fragments			
6	S-2	60/38	5-10	NA	NA			0"-9" Light gray, moist, MEDIUM TO COARSE SAND AND GRAVEL (rounded), some angular fragments			
8								9"-38" Brown, moist, MEDIUM TO COARSE SAND AND GRAVEL			
10											
12	S-3	60/56	10-15	NA	NA			0"-28" Brown, dry, FINE TO MEDIUM SAND, some gravel (sub-rounded) 28"-[illegible]" Brown, moist, SAND AND GRAVEL (rounded) some angular rock fragments	SAND & GRAVEL		
14								[illegible] Brown [illegible]			
16	S-4	60/31	15-20	NA	NA			0"-12" Light Gray, moist, FINE SAND, (mottled)			
18								12"-15" GRAVEL AND ROCK FRAGMENTS 15"-31" Brown, moist to wet, FINE SAND			
20							▼		SAND & GRAVEL		
22	S-5	60/50	20-25	NA	NA 5			0"-19" Brown, saturated, FINE TO COARSE SAND AND GRAVEL . (well sorted) As Field Testing Results		1	
24								19"-30" Brown, saturated, FINE SAND			

Notes
1) Direct Push groundwater profile sampling conducted on 5/28/10 & 6/1/10
2) Groundwater profile sampler refusal @ 82'. As = 5 ug/L @ 81'
3)
4)
5)
6)

Key: Cement; Drill Cuttings/Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼= Approximate water table NA: Not Applicable NR=No Recovery bgs: below ground surface ags=above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-09**

Client:	USACE	Drilling Co.:	Geosearch	Casing	Sampler
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT	Type: Steel	Geoprobe Spoon
Project Number:	AC001	Drill Method:	Direct Push	Size: 3.25"	60"
Location:	Fort Devens, Ayer, MA	Foreman:	Rodney Kaddy	Hammer	Fall
		SCI Inspector:	Danielle Eastman	NA lbs.	NA"
		Start Date:	6/14/2010	Casing Elevation:	NA
		Completion Date:	6/15/2010	Surface Elevation:	NA
				Wellhead Type:	Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
26	S-6	60/30	25-30	NA	NA			Light brown, saturated, MEDIUM SAND, some coarse sand			
28											
30									SAND		
32	S-7	60/16	30-35	NA	NA 5			Light brown, saturated, MEDIUM TO COARSE SAND, (well sorted) As Field Testing Results		1	
34											
36	S-8	60/23	35-40	NA	NA			Light brown, saturated, MEDIUM TO COARSE SAND, (well sorted)			NO WELL INSTALLED
38									SAND		
40											
42	S-9	60/26	40-45	NA	NA 5			Light brown, saturated, MEDIUM SAND, some coarse sand (well sorted) As Field Testing Results		1	
44											
46	S-10	60/32	45-50	NA	NA			Brown, saturated, FINE TO MEDIUM SAND AND SILT, little coarse sand	SAND		
48											
50											

Notes:
1) Direct Push groundwater profile sampling conducted on 5/28/10 & 6/1/10
2) Groundwater profile sampler refusal @ 82'. As = 5 ug/L @ 81'
3)
4)
5)
6)

Key: Cement; Drill Cuttings/Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks: 1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼= Approximate water table NA=Not Applicable NR=No Recovery bgs=below ground surface ags=above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-09**

Client:	USACE	Drilling Co.:	Geosearch
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT
Project Number:	AC001	Drill Method:	Direct Push
Location:	Fort Devens, Ayer, MA	Foreman:	Rodney Kaddy
		SCI Inspector:	Danielle Eastman
		Start Date:	6/14/2010
		Completion Date:	6/15/2010

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: NA
Surface Elevation: NA
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-11	60/25	50-55	NA	NA			Brown, saturated, MEDIUM TO COARSE SAND, some gravel (rounded)	SAND		NO WELL INSTALLED
52					< 5			As Field Testing Results		1	
54											
56	S-12	60/33	55-60	NA	NA			0"-9" Brown, saturated, FINE SAND, trace silt 9"-33" Brown, saturated, COARSE SAND, some gravel (angular)			
58											
60	S-13	60/20	60-65	NA	NA			Grey, saturated, FINE SAND, some rock fragments (angular) (TILL)	GLACIAL TILL		
62					< 5			As Field Testing Results		1	
64											
66								SAMPLER REFUSAL @ 65'			CASING REFUSAL @ 65'
68											
70											
72					< 5					1	
74										2	

Notes:
1) Direct Push groundwater profile sampling conducted on 5/28/10 & 6/1/10
2) Groundwater profile sampler refusal @ 82'. As < 5 ug/L @ 81'
3)
4)
5)
6)

Key: Cement; Drill Cuttings/Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks:
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ = Approximate water table. NA: Not Applicable. NR: No Recovery. bgs: below ground surface. ags= above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-10**

Client:	USACE	Drilling Co.:	Geosearch
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT
Project Number:	AC001	Drill Method:	Direct Push
Location:	Fort Devens, Ayer, MA	Foreman:	Rodney Kaddy
		SCI Inspector:	Danielle Eastman
		Start Date:	6/2/2010
		Completion Date:	6/3/2010

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 217.04 - NGVD 29'
Surface Elevation: 215.0+/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-1	60/23	0-5	NA	NA			Topsoil (6-inches)	TOPSOIL		Standpipe is 3' ags
2								Light brown, dry, FINE TO MEDIUM SAND, some gravel	Sand		Cement 0-2'
4											
6	S-2	60/29	5-10	NA	NA			Light brown, dry, COARSE SAND AND GRAVEL, some medium sand, trace fine sand	SAND & GRAVEL		
8											
10											1.5" Schedule 40 PVC Riser 0-56'
	S-3	60/22	10-15	NA	NA <5		▼	0"-14" Light brown, dry, MEDIUM TO COARSE SAND AND GRAVEL, trace fine sand. As Field Testing Results		1	
12								[illegible]			
14											
16	S-4	60/43	15-20	NA	NA			0"-20" Light brown, dry, COARSE TO MEDIUM SAND AND GRAVEL			
18								20"-43" Light brown, wet, COARSE SAND AND GRAVEL (sub-angular to sub-rounded), some medium sand			
20											Grout 2'-51'
	S-5	60/4	20-25	NA	NA <5			Brown, saturated, COARSE SAND AND GRAVEL (sub-rounded to rounded), rock fragments. As Field Testing Results	SAND & GRAVEL	1	
22											
24											

Notes
1) Direct Push groundwater profile sampling conducted on 6/2/10 & 6/3/10
2) Groundwater profile sampler refusal @ 72'
3)
4)
5)
6)

Key
Cement
Drill Cuttings/Native Soils
Bentonite Grout
Sand
Screen
Riser

Remarks
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼= Approximate water table. NA=Not Applicable. NR=No Recovery. bgs=below ground surface. ags=above ground surface.

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

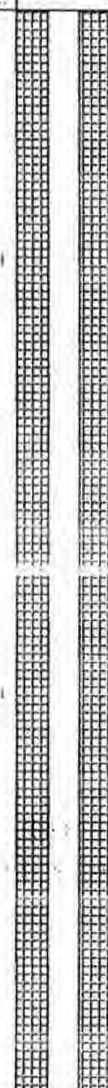
Boring Well ID: **SHM-10-10**

Client:	USACE	Drilling Co.:	Geosearch	Casing	Sampler
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT	Type: Steel	Geoprobe Spoon
Project Number:	AC001	Drill Method:	Direct Push	Size: 3.25"	60"
Location:	Fort Devens	Foreman:	Rodney Kaddy	Hammer	Fall
	Ayer, MA	SCI Inspector:	Danielle Eastman	NA lbs	NA"
		Start Date:	6/2/2010	Casing Elevation:	217.04 - NGVD 29'
		Completion Date:	6/3/2010	Surface Elevation:	215.0+/- NGVD 29'
				Wellhead Type:	Standpipe

Sample Information

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes
26	S-6	60/15	25-30	NA	NA			Brown, saturated, COARSE SAND AND GRAVEL (sub-rounded to rounded), rock fragments		
28									SAND & GRAVEL	
30	S-7	60/15	30-35	NA	NA <5			As Field Testing Results Brown, saturated, COARSE SAND AND GRAVEL (sub-rounded to rounded), rock fragments		1
32										
34										
36	S-8	60/17	35-40	NA	NA			Brown, saturated, COARSE SAND AND GRAVEL (sub-rounded to rounded), rock fragments		
38									SAND & GRAVEL	
40	S-9	60/22	40-45	NA	NA 8			As Field Testing Results Brown, saturated, COARSE SAND AND GRAVEL (sub-rounded to rounded), rock fragments		1
42										
44										
46	S-10	60/22	45-50	NA	NA			Brown, saturated, MEDIUM TO COARSE SAND, some fine sand, trace gravel	SAND	
48										
50										

Test Boring/ Monitoring Well Construction



Notes:
1) Direct Push groundwater profile sampling conducted on 6/2/10 & 6/3/10
2) Groundwater profile sampler refusal @ 72'
3)
4)
5)
6)

Key: Cement; Drill Cuttings/Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks:
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table NA: Not Applicable NR: No Recovery bgs: below ground surface ags: above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-10**

Client:	USACE	Drilling Co.:	Geosearch
Project:	SHL - Fort Devens	Drill Rig:	Geoprobe 6610DT
Project Number:	AC001	Drill Method:	Direct Push
Location:	Fort Devens Ayer, MA	Foreman:	Rodney Kaddy
		SCI Inspector:	Danielle Eastman
		Start Date:	6/2/2010
		Completion Date:	6/3/2010

	Casing	Sampler
Type	Steel	Geoprobe Spoon
Size	3.25"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 217.04 - NGVD 29'
Surface Elevation: 215.0+/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-11	60/29	50-55	NA				0"-15" Light brown, saturated, FINE SAND, trace silt, (mottled)	SAND		Grout 2'-51'
					5			As Field Testing Results		1	
52								15"-29" Light brown, saturated, MEDIUM TO COARSE SAND, trace fine sand, (well sorted)			Bentonite 51'-53'
54											#2 Morie Sand 53'-66'
56	S-12	60/18	55-60	NA	NA			Brown, saturated, FINE TO MEDIUM SAND, trace coarse sand			
58											
60											
	S-13	60/26	60-65	NA	NA 5			As Field Testing Results		1	
62								0"-1?" Brown, saturated, FINE TO MEDIUM SAND, trace coarse sand			
64								[illegible] FINE SAND with rock fragments (angular)	GLACIAL TILL		1.5" Schedule 40 PVC Well screen - 0.01" slot 56'-66'
66	S-14	24/15	65-67	NA	NA			Gray, moist, FINE SAND, with rock fragments (angular) (Till)			CASING REFUSAL @ 66'
68								SAMPLER REFUSAL @ 67'			
70											
					5			As Field Testing Results		1	
72										2	
74											

Notes
1) Direct Push groundwater profile sampling conducted on 6/2/10 & 6/3/10
2) Groundwater profile sampler refusal @ 72'
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼= Approximate water table NA=Not Applicable NR No Recovery bgs below ground surface ags above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-11**

Client:	USACE	Drilling Co:	Boart Longyear
Project:	SHL - Fort Devens	Drill Rig:	Mini Sonic
Project Number:	AC001	Drill Method:	Rotary-Vibratory
Location:	Fort Devens, Ayer, MA	Foreman:	Fred Lavoie
		SCI Inspector:	JJC/WJW
		Start Date:	8/3/2010
		Completion Date:	8/4/2010

	Casing	Sampler
Type	Steel	Core Barrel
Size	6"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 260.99 - NGVD 29'
Surface Elevation: 260.35 +/- NGVD 29'
Wellhead Type: Standpipe

Sample Information

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-1	60	0-5	NA	NA			Topsoil	TOPSOIL		Standpipe is 3' ags
2								Light brown, MEDIUM TO COARSE SAND, with pebbles	SAND & GRAVEL		Cement 0-2'
4											
6	S-2	60	5-10 5-7	NA	NA			Light brown, MEDIUM SAND, with waste	SAND & WASTE		
8	S-3		7-12	NA	NA			COMPACTED WASTE (paper), some light brown medium sand			
10											2" Schedule 40 PVC Riser 0-50'
12		60	10-15	NA	NA						
14	S-4		12-15					[illegible] COARSE SAND			
16	S-5	60	15-20	NA	NA			Light brown, COARSE SAND, with wood fragments			
18											
20	[illegible]	[illegible]	[illegible]					[illegible]	[illegible]		Grout 2'-46'
22	S-6	60	20-25 20-23	NA	NA			Dark brown to grey, COARSE SAND	SAND		
24	S-7		23-25					[illegible] MEDIUM SAND			

Notes: 1) Groundwater profile sampling conducted with a bladder pump
2)
3)
4)
5)
6)

Key: Cement; Drill Cuttings/Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks: 1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼= Approximate water table NA=Not Applicable NR=No Recovery bgs=below ground surface ags=above ground surface

Sovereign Consulting Inc. 905B South Main Street Mansfield, Massachusetts	Boring Well ID: SHM-10-11	Sheet 2 of 3
Client: USACE Project: SHL - Fort Devens Project Number: AC001 Location: Fort Devens Ayer, MA	Drilling Co.: Boart Longyear Drill Rig: Mini Sonic Drill Method: Rotary-Vibratory Foreman: Fred Lavoie SCI Inspector: JJC/WJW	Casing / Sampler Type: PVC / Core Barrel Size: 6" / 60" Hammer: NA lbs / Fall: NA"
Sample Information	Start Date: 8/3/2010 Completion Date: 8/4/2010	Casing Elevation: 260.99 - NGVD 29' Surface Elevation: 260.35 +/- NGVD 29' Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
26		60/	25-30	NA	NA						
	S-8		25-33					Light brown, COARSE SAND			
28									SAND		
30		60/	30-35	NA	NA						
32											2" Schedule 40 PVC Riser 0-50'
34	S-9		33-35					Light brown, FINE SAND			
36		60/	35-40	NA	NA			NO RECOVERY			
38									SAND		
40					80		▼	As Field Testing Results		1	
		60/	40-45	NA	NA						
42	S-10		50-55					Light brown, COARSE SAND (speckled)			Grout 2'-46'
44											
46		60/	45-50	NA	NA				SAND		
48											Bentonite 46'-48'
50					70			As Field Testing Results		1	

Notes:
1) Groundwater profile sampling conducted with a bladder pump
2)
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks:
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼= Approximate water table NA: Not Applicable NR: No Recovery bgs: below ground surface ags: above ground surface

Sovereign Consulting Inc. 905B South Main Street Mansfield, Massachusetts	Boring/Well ID: **SHM-10-11**	

Client:	USACE	Drilling Co.:	Boart Longyear		Casing / Sampler
Project:	SHL - Fort Devens	Drill Rig:	Mini Sonic	Type	PVC / Core Barrel
Project Number:	AC001	Drill Method:	Rotary-Vibratory	Size	2" / 6.0"
Location:	Fort Devens Ayer, MA	Foreman:	Fred Lavoie	Hammer / Fall	NA lbs / NA"
		SCI Inspector:	JJC/WJW		
		Start Date:	8/3/2010	Casing Elevation:	260.99 - NGVD 29'
		Completion Date:	8/4/2010	Surface Elevation:	260.35 +/- NGVD 29'
				Wellhead Type:	Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
		60	50-55	NA					SAND		2" Schedule 40 PVC Well screen - 0.01" slot 50'-60'
52											
54											
56	S-11	60	55-60	NA	NA			Light brown, MEDIUM SAND			
58											
60					150			As Field Testing Results		1	
	S-12	60	60-65	NA	NA			GLACIAL TILL overlying Bedrock	GLACIAL TILL		
62								BEDROCK is approximately 61 feet			
64									BEDROCK		
					0			As Field Testing Results		1	
66								END OF BORING 65 FEET			
68											
70											
72											
74											

Notes: 1) Groundwater profile sampling conducted with a bladder pump
2)
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks: 1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table NA: Not Applicable NR=No Recovery bgs: below ground surface ags: above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-12**

Client:	USACE	Drilling Co.:	Boart Longyear
Project:	SHL - Fort Devens	Drill Rig:	Mini Sonic
Project Number:	AC001	Drill Method:	Rotary-Vibratory
Location:	Fort Devens	Foreman:	Fred Lavoie
	Ayer, MA	SCI Inspector:	JJC/WJW
		Start Date:	8/5/2010
		Completion Date:	8/9/2010

	Casing	Sampler
Type	Steel	Core Barrel
Size	6"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 254.39 - NGVD 29'
Surface Elevation: 251.41 +/- NGVD 29'
Wellhead Type: Standpipe

Sample Information

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-1	60	0-5	NA	NA			Topsoil	TOPSOIL		Standpipe is 3' ags
2								Dark brown (5Y 4/3), SAND (poorly sorted)			Cement 0-2'
4											
6	S-2	60/	5-10 5-9	NA	NA			Light grey to dark gray (5Y 5/1), SAND AND ASH, some debris	SAND & ASH DEBRIS		
8											
10	S-3		9-10					Light brown (5Y 7/2), MEDIUM SAND (poorly sorted), some Ash			2" Schedule 40 PVC Riser 0-45'
	S-4	60	10-15	NA	NA			No recovery			
12											
14											
16	S-5	60	15-20 15-17	NA	NA			Light brown, (5Y 8/3), MEDIUM SAND (poorly sorted)			
18	S-6		17-20					Light brown, (5Y 8/3), MEDIUM SAND			
20											Grout 2'-41'
	S-7	60	20-25	NA	NA			Light brown (5Y 8/3), FINE SAND (well sorted)	SAND		
22											
24											

Notes:
1) Groundwater profile sampling conducted with a bladder pump
2)
3)
4)
5)
6)

Key:
Cement
Drill Cuttings Native Soils
Bentonite Grout
Sand
Screen
Riser

Remarks:
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ = Approximate water table NA: Not Applicable NR: No Recovery bgs=below ground surface ags=above ground surface

Sovereign Consulting Inc. 905B South Main Street Mansfield, Massachusetts	Boring/Well ID: SHM-10-12	Sheet 2 of 3

Client:	USACE	Drilling Co.:	Boart Longyear		Casing	Sampler
Project:	SHL - Fort Devens	Drill Rig:	Mini Sonic	Type	PVC	Core Barrel
Project Number:	AC001	Drill Method:	Rotary-Vibratory	Size	6"	60"
Location:	Fort Devens Ayer, MA	Foreman:	Fred Lavoie		Hammer	Fall
		SCI Inspector:	JJC/WJW		NA lbs	NA"
		Start Date:	8/5/2010	Casing Elevation:	254.39 - NGVD 29'	
		Completion Date:	8/9/2010	Surface Elevation:	251.41 +/- NGVD 29'	
				Wellhead Type:	Standpipe	

Sample Information

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
26	S-8	60	25-30	NA	NA			Light brown (5Y 8/2), MEDIUM SAND (well sorted)			
28									SAND		
30	S-9	60	30-35	NA	NA			Light brown (5Y 8/2), MEDIUM SAND (well sorted)			
32											2" Schedule 40 PVC Riser 0-45'
34							▼				
36	S-10	60	35-40	NA	NA			Grey brown to medium grey (5Y 6/1) MEDIUM SAND			
38									SAND		
40	S-11	60	40-45 40-42	NA	NA			Light Grey (5Y 6/2) MEDIUM SAND			
42	S-12		42-45					Medium grey (5Y 6/2), COARSE SAND (well sorted)			Bentonite 41'-43'
44					> 500			As Field Testing Results		1	#2 Morie Sand 43'-55'
46		60	45-50	NA	NA				SAND		
46	S-13		45-52					Medium grey (5Y 6/2) COARSE SAND (well sorted)			
48											2" Schedule 40 PVC Well Screen Slot 45-55'
50											

Notes:
1) Groundwater profile sampling conducted with a bladder pump
2)
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks:
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Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-12**

Client:	USACE	Drilling Co.:	Boart Longyear		
Project:	SHL - Fort Devens	Drill Rig:	Mini Sonic		
Project Number:	AC001	Drill Method:	Rotary-Vibratory		
Location:	Fort Devens, Ayer, MA	Foreman:	Fred Lavoie		
		SCI Inspector:	JJC/WJW		
		Start Date:	8/5/2010	Casing Elevation:	254.39 - NGVD 29'
		Completion Date:	8/9/2010	Surface Elevation:	251.41 +/- NGVD 29'
				Wellhead Type:	Standpipe

	Casing	Sampler
Type	PVC	Core Barrel
Size	6"	60"
	Hammer	Fall
	NA lbs	NA"

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
		60	50-55	NA	NA						#2 Morie Sand 43'-55'
52	S-14		52-55					Light brown (5Y 8/3), MEDIUM SAND			
54					>500			As Field Testing Results		1	2" Schedule 40 PVC Well screen - 0.01" slot 45'-55'
56	S-15	60	55-60	NA	NA			Light brown (5Y 8/3), COARSE SAND	SAND		
58											
60	S-16	60	60-65	NA	NA			GLACIAL TILL	GLACIAL TILL		
62											
64					30			As Field Testing Results		1	
66		60	65-70	NA	NA			GLACIAL TILL overlying Bedrock			
								BEDROCK approximately 70 feet			
68											
70									BEDROCK		
								END OF BORING 70 FEET			
72											
74											

Notes
1) Groundwater profile sampling conducted with a bladder pump
2)
3)
4)
5)
6)

Key
Cement
Drill Cuttings Native Soils
Bentonite Grout
Sand
Screen
Riser

Remarks
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
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Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-13**

Client:	USACE	Drilling Co.:	Boart Longyear
Project:	SHL - Fort Devens	Drill Rig:	Mini Sonic
Project Number:	AC001	Drill Method:	Rotary-Vibratory
Location:	Fort Devens	Foreman:	Fred Lavoie
	Ayer, MA	SCI Inspector:	JJC/WJW
		Start Date:	8/9/2010
		Completion Date:	8/10/2010

	Casing	Sampler
Type	Steel	Core Barrel
Size	6"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 244.52- NGVD 29'
Surface Elevation: 241.18 +/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-1	60	0-5	NA	NA			Medium gray (5Y 7 2), COARSE SAND, with pebbles (poorly sorted)	SAND		Standpipe is 3' ags Cement 0-2'
6	S-2	60	5-10 5-8	NA	NA			Dark gray (5Y 6 2), COARSE SAND			
8	S-3		8-10					(5Y 7 2), COARSE SAND, with wood and ash	SAND & ASH		2" Schedule 40 PVC Riser 0-60'
	S-4	60	10-15 10-11	NA	NA			Light gray (5Y 7 2), COARSE SAND, with pebbles	SAND & GRAVEL		
12	[illegible]		[illegible]					[illegible] MEDIUM SAND [illegible]			
16	S-6	60	15-20 15-17	NA	NA			Light (5Y 8 2), MEDIUM SAND, with pebbles			
18	S-7		17-20					Light grey (5Y 8/1), FINE SAND			
20	S-8	60	20-25 20-23	NA	NA			Light brown (5Y 6 2), MEDIUM SAND	SAND, ASH & DEBRIS		Grout 2'-56'
22	S-9		23-25					Dark grey (5Y 5 1), MEDIUM SAND, with ash and glass			

Notes:
1) Groundwater profile sampling conducted with a bladder pump
2)
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks:
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
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▼ Approximate water table NA=Not Applicable NR=No Recovery bgs=below ground surface ags=above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-13**

Client:	USACE	Drilling Co.:	Boart Longyear
Project:	SHL - Fort Devens	Drill Rig:	Mini Sonic
Project Number:	AC001	Drill Method:	Rotary-Vibratory
Location:	Fort Devens, Ayer, MA	Foreman:	Fred Lavoie
		SCI Inspector:	JJC/WJW
		Start Date:	8/9/2010
		Completion Date:	8/10/2010

	Casing	Sampler
Type	PVC	Core Barrel
Size	6"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 244.52- NGVD 29'
Surface Elevation: 241.18 +/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
26	S-10	60	25-30 25-27	NA	NA		▼	Brown (5Y 8/2), MEDIUM SAND	SAND		
28	S-11		27-30					Dark brown (5Y 4/2) PEAT (thick)	PEAT		
30											
32	S-12	60	30-35 30-32	NA	NA			Dark brown (5Y 4/3), PEAT, with medium SAND			2" Schedule 40 PVC Riser 0-60'
34	S-13		32-35					Medium brown (5Y 5/6), PEAT, with medium sand, (less peat 25%)			
36	S-14	60	35-40	NA	NA			Medium brown grey (5Y 6/2) MEDIUM SAND (well sorted)	SAND		
38											
40					30			As Field Testing Results		1	
42	S-15	60	40-45	NA	NA			Medium brown grey (5Y 6/2) FINE SAND (well sorted)			
44											Grout 2-56'
46		60	45-50	NA	NA			POOR RECOVERY	SAND		
48											
50					0			As Field Testing Results		1	

Notes
1) Groundwater profile sampling conducted with a bladder pump
2)
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
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3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ - Approximate water table NA- Not Applicable NR - No Recovery bgs- below ground surface ags- above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-13**

Client:	USACE	Drilling Co.:	Boart Longyear
Project:	SHL - Fort Devens	Drill Rig:	Mini Sonic
Project Number:	AC001	Drill Method:	Rotary-Vibratory
Location:	Fort Devens	Foreman:	Fred Lavoie
	Ayer, MA	SCI Inspector:	JJC/WJW
		Start Date:	8/9/2010
		Completion Date:	8/10/2010

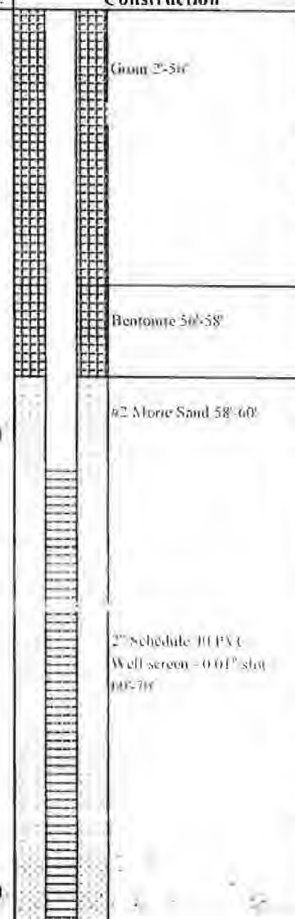
	Casing	Sampler
Type	PVC	Core Barrel
Size	6"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 244.52- NGVD 29'
Surface Elevation: 241.18 +/- NGVD 29'
Wellhead Type: Standpipe

Sample Information

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes
	S-16	60	50-55	NA	NA			Light brown grey (5Y 8/1), FINE SAND (well sorted)		
52										
54										
56		60	55-60	NA	NA				SAND	
58	S-17		55-67					Light grey (5Y 7/2), COARSE SAND		
60					100			As Field Testing Results		1
62		60	60-65	NA	NA				SAND	
64										
66		60	65-70	NA	NA					
68	S-18		67-70					Light brown yellow (5Y 8/3), FINE SAND		
70					>500			As Field Testing Results		1
72	S-19	60	70-72	NA	NA			Medium brown (5Y 7/3), MEDIUM SAND, with pebbles	SAND & GRAVEL	
74	[illegible]		[illegible]					[illegible]		

Test Boring/ Monitoring Well Construction



Notes: 1) Groundwater profile sampling conducted with a bladder pump
2)
3)
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6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks: 1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table NA: Not Applicable NR: No Recovery bgs: below ground surface ags: above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring Well ID: **SHM-10-13**

Client:	USACE	Drilling Co.:	Boart Longyear		Casing / Sampler
Project:	SHL - Fort Devens	Drill Rig:	Mini Sonic	Type	PVC / Core Barrel
Project Number:	AC001	Drill Method:	Rotary-Vibratory	Size	6" / 60"
Location:	Fort Devens	Foreman:	Fred Lavoie		Hammer / Fall
	Ayer, MA	SCI Inspector:	JJC/WJW		NA lbs / NA"
		Start Date:	8/9/2010	Casing Elevation:	244.52- NGVD 29'
		Completion Date:	8/10/2010	Surface Elevation:	241.18 +/- NGVD 29'
				Wellhead Type:	Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
76		60	75-80	NA	NA				SAND & GRAVEL		
	S-21		75-77					Medium brown (5Y 7 4), MEDIUM SAND, with pebbles			
78	S-22		77-80					Medium brown (5Y 7 2), MEDIUM SAND	SAND		
					20			As Field Testing Results		1	
80		60	80-85	NA	NA			GLACIAL TILL (5Y 8 3)	GLACIAL TILL		
82											
84								BEDROCK			
		24	85-87	NA	NA				BEDROCK		
86											
								END OF BORING 87 FEET			
90											
92											
94											
96											
98											

Notes: 1) Groundwater profile sampling conducted with a bladder pump
2)
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks: 1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ - Approximate water table NA=Not Applicable NR=No Recovery bgs below ground surface ags above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-14**

Client:	USACE	Drilling Co.:	Boart Longyear	Casing	Sampler
Project:	SHL - Fort Devens	Drill Rig:	Mini Sonic	Type: Steel	Core Barrel
Project Number:	AC001	Drill Method:	Rotary-Vibratory	Size: 6"	60"
Location:	Fort Devens Ayer, MA	Foreman:	Fred Lavoie	Hammer	Fall
		SCI Inspector:	JJC/WJW	NA lbs	NA"
		Start Date:	8/16/2010	Casing Elevation:	237.43 - NGVD 29'
		Completion Date:	8/17/2010	Surface Elevation:	234.62 +/- NGVD 29'
				Wellhead Type:	Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
		60"	0-5	NA	NA			Medium brown (5Y 7/2), COARSE SAND, with pebbles (poorly sorted)			Standpipe is 3' ags
2											Cement 0-2'
									SAND & GRAVEL		
4											
6	S-1	60	5-10	NA	NA			Medium brown (5Y 7/8), SAND, with pebbles			
8											
10											2" Schedule 40 PVC Riser 0-60'
	S-2	60	10-15	NA	NA			Medium brown (5Y 4/1), SAND, with waste, paper and glass			
12											
									[illegible] WASTE		
14											
16	S-3	60	15-20	NA	NA			Dark grey (5Y 4/3), WASTE (paper and glass) with sand			
18											
20							▼				Grout 2'-56'
		60	20-25	NA	NA						
22	S-4		20-23					Dark grey (5Y 4/3), SAND, Ash, waste, glass	SAND, ASH & WASTE		
24	[illegible]		[illegible]					[illegible] SAND			

Notes: 1) Groundwater profile sampling conducted with a bladder pump
2)
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks: 1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ = Approximate water table. NA = Not Applicable. NR=No Recovery. bgs= below ground surface. ags=above ground surface.

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-14**

Client:	USACE	Drilling Co.:	Boart Longyear		
Project:	SHL - Fort Devens	Drill Rig:	Mini Sonic		
Project Number:	AC001	Drill Method:	Rotary-Vibratory		
Location:	Fort Devens, Ayer, MA	Foreman:	Fred Lavoie		
		SCI Inspector:	JJC/WJW		

	Casing	Sampler
Type	PVC	Core Barrel
Size	6"	60"
	Hammer	Fall
	NA lbs	NA"

Start Date: 8/16/2010
Completion Date: 8/17/2010

Casing Elevation: 237.43 - NGVD 29'
Surface Elevation: 234.62 +/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
26		60	25-30	NA	NA						
28	S-6		27-30					Dark (5Y 4 2), PEAT	PEAT		
30											
		60/	30-35	NA	NA						
32	S-7		30-31					(5Y 4 4) PEAT AND SAND			2" Schedule 40 PVC Riser 0-60'
34	S-8		31-35					Dark (5Y 4 2), PEAT			
36	S-9	60	35-40	NA	NA			Dark (5Y 4 1), PEAT, some sand			
40					5			As Field Testing Results		1	
42	S-10	60	40-45 40-44	NA	NA			Dark Grey (5Y 5 1), MEDIUM SAND			
											Grout 2'-56'
44	S-11		44-46					Light (5Y 8/1), COARSE SAND			
46		60'	45-50	NA	NA				SAND		
48	S-12		46-53					Gray (5Y 7/2), FINE SAND			
50								As Field Testing Results			

Notes
1) Groundwater profile sampling conducted with a bladder pump
2)
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks: 1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table NA Not Applicable NR=No Recovery bgs below ground surface ags above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-14**

Client:	USACE	Drilling Co.:	Boart Longyear
Project:	SHL - Fort Devens	Drill Rig:	Mini Sonic
Project Number:	AC001	Drill Method:	Rotary-Vibratory
Location:	Fort Devens, Ayer, MA	Foreman:	Fred Lavoie
		SCI Inspector:	JJC/WJW
		Start Date:	8/16/2010
		Completion Date:	8/17/2010

	Casing	Sampler
Type	Steel	Core Barrel
Size	6"	60"
Hammer	NA lbs	
Fall		NA"

Casing Elevation: 237.43 - NGVD 29'
Surface Elevation: 234.62 +/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
		60	50-55	NA	NA						
52											Grout 2'-56'
54	S-13		53-55					Light (5Y 8 2), MEDIUM SAND			
56	S-14	60	55-60	NA	NA			Light (5Y 8 2), MEDIUM SAND	SAND		
58											Bentonite 56'-58'
60					>500			As Field Testing Results		1	#2 Morie Sand 58'-80'
	S-15	60	60-65	NA	NA			Light (5Y 5 2), FINE SAND			
62											
64											2" Schedule 40 PVC Well screen - 0.01" slot 60-80'
66	S-16	60	65-70	NA	NA			Light (5Y 5 2), FINE SAND	SAND		
68											
70					>500			As Field Testing Results		1	
	S-17	60	70-75	NA	NA			Light (5Y 7 2), FINE SAND			
72											
74											

Notes:
1) Groundwater profile sampling conducted with a bladder pump
2)
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks: 1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table NA=Not Applicable NR=No Recovery bgs below ground surface ags above ground surface

Sovereign Consulting Inc. 905B South Main Street Mansfield, Massachusetts	Boring Well ID: **SHM-10-14**	Sheet 4 of 4
Client: USACE Project: SHL - Fort Devens Project Number: AC001 Location: Fort Devens Ayer, MA	Drilling Co.: Boart Longyear Drill Rig: Mini Sonic Drill Method: Rotary-Vibratory Foreman: Fred Lavoie SCI Inspector: JJC/WJW	Casing: Type Steel, Size 6", Hammer NA lbs Sampler: Core Barrel, 60", Fall NA"
	Start Date: 8/16/2010 Completion Date: 8/17/2010	Casing Elevation: 237.43 - NGVD 29' Surface Elevation: 234.62 +/- NGVD 29' Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
76	S-18	60/	75-80	NA	NA			Light (5Y 7/2) FINE SAND	SAND		#2 Morie Sand 58'-80'
78											2" Schedule 40 PVC Well screen / 0.01" slot 60'-80'
80					500			As Field Testing Results		1	
82		60/	80-85	NA	NA			GLACIAL TILL (5Y 8/3)	GLACIAL TILL		
84											
86		60/	85-90	NA	NA			GLACIAL TILL (5Y 8/3)			
90											
92		60/	90-95	NA	NA			BEDROCK (7.5Y 7/1)	BEDROCK		
94											
96											
98								END OF BORING 96 FEET			

Notes
1) Groundwater profile sampling conducted with a bladder pump
2)
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼= Approximate water table NA=Not Applicable NR=No Recovery bgs=below ground surface ags=above ground surface

Sovereign Consulting Inc. 905B South Main Street Mansfield, Massachusetts	Boring/Well ID: **SHM-10-15**	Sheet 1 of 3
Client: USACE Project: SHL - Fort Devens Project Number: AC001 Location: Fort Devens Ayer, MA	Drilling Co.: Boart Longyear Drill Rig: Mini Sonic Drill Method: Rotary-Vibratory Foreman: Fred Lavoie SCI Inspector: JJC/WJW	Casing / Sampler Type: Steel / Core Barrel Size: 6" / 60" Hammer: NA lbs / Fall: NA"
	Start Date: 8/11/2010 Completion Date: 8/11/2010	Casing Elevation: 243.47 - NGVD 29' Surface Elevation: 241.89 +/- NGVD 29' Wellhead Type: Standpipe

Sample Information

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-1	60	0-5 0-4	NA	NA			Light (5Y 7/1), MEDIUM SAND (poorly sorted)	SAND		Standpipe is 3' ags Cement 0-2'
2											
4	S-2		4-5					Light (5Y 7/1), WASTE AND SAND			
	S-3	60	5-10	NA	NA			Light (5Y 7/1), WASTE AND SAND	SAND & WASTE		
6											
8											
10											2" Schedule 40 PVC Riser 0-45'
	S-4	60	10-15	NA	NA			Light (5Y 5/1), WASTE AND ASH	SAND, ASH & WASTE		
12											
14											
16	S-5	60	15-20 15-17	NA	NA			(5Y 4/4), MEDIUM SAND, some waste			
	S-6		17-18					(5Y 5/6), MEDIUM SAND, some waste	SAND & WASTE		
18	S-7		18-20					(5Y 4/2), MEDIUM SAND, some waste			
20											Grout 2-41'
	S-8	60	20-25	NA	NA			Dark brown (5Y [illegible]) SAND, with pebbles, some waste			
22											
24							▼				

Notes
1) Groundwater profile sampling conducted with a bladder pump
2)
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

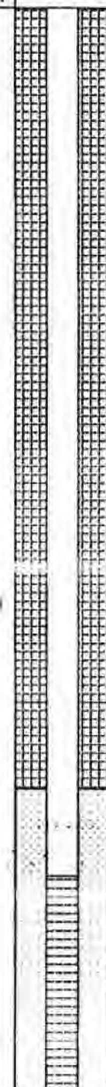
Remarks
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼: Approximate water table NA: Not Applicable NR: No Recovery bgs=below ground surface ags: above ground surface

Sovereign Consulting Inc.	Boring/Well ID: SHM-10-15	Sheet 2 of 3
905B South Main Street, Mansfield, Massachusetts		

Client:	USACE	Drilling Co.:	Boart Longyear		
Project:	SHL - Fort Devens	Drill Rig:	Mini Sonic		Casing / Sampler
Project Number:	AC001	Drill Method:	Rotary-Vibratory	Type	PVC / Core Barrel
Location:	Fort Devens	Foreman:	Fred Lavoie	Size	6" / 60"
	Ayer, MA	SCI Inspector:	JJC/WJW		Hammer / Fall
					NA lbs / NA"
		Start Date:	8/11/2010	Casing Elevation:	243.47 - NGVD 29'
		Completion Date:	8/11/2010	Surface Elevation:	241.89 +/- NGVD 29'
				Wellhead Type:	Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes
26	S-9	60/	25-30 25-28	NA	NA			Black (5Y 3/1), MEDIUM SAND, with pebbles, odor (creosote)	SAND & WASTE	
28	S-10		28-30					Brown (5Y 6/2), MEDIUM SAND	SAND	
30	S-11	60/	30-35	NA	NA			Brown (5Y 7/6), MEDIUM SAND (orange stains)		
32										
34										
36	S-12	60/	35-40	NA	NA			Brown (5Y 7/4), MEDIUM SAND (orange stains)	SAND	
38					500			As Field Testing Results		1
40	S-13	60/	40-45	NA	NA			Light Brown (5Y 5/1), MEDIUM SAND		
42										
44										
46	[illegible]	60/	45-50	NA	NA			Light Brown (5Y 7/4), MEDIUM SAND	SAND	
48					[illegible]			As [illegible]		
50										

Test Boring/ Monitoring Well Construction



Notes
1) Groundwater profile sampling conducted with a bladder pump
2)
3)
4)
5)
6)

Key: Cement; Drill Cuttings/Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼= Approximate water table NA=Not Applicable NR=No Recovery bgs=below ground surface ags=above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-15**

Client: USACE
Project: SHL - Fort Devens
Project Number: AC001
Location: Fort Devens, Ayer, MA

Drilling Co.: Boart Longyear
Drill Rig: Mini Sonic
Drill Method: Rotary-Vibratory
Foreman: Fred Lavoie
SCI Inspector: JJC/WJW
Start Date: 8/11/2010
Completion Date: 8/11/2010

	Casing	Sampler
Type	PVC	Core Barrel
Size	6"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 243.47 - NGVD 29'
Surface Elevation: 241.89 +/- NGVD 29'
Wellhead Type: Standpipe

Sample Information

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
		60	50-55	NA				Light Brown (5Y 7 4), MEDIUM SAND	SAND		#2 Morie Sand 43'-55
52											2" Schedule 40 PVC Well screen - 0.01" slot 45'-55'
54											
	S-14	60	55-60	NA	NA			Light Tan (7.5Y 8 1), GLACIAL TILL	GLACIAL TILL		
56											
58					80			As Field Testing Results		1	
60		36	60-65	NA	NA			BEDROCK	BEDROCK		
62								END OF BORING - [illegible]			
64											
66											
68											
70											
72											
74											

Notes
1) Groundwater profile sampling conducted with a bladder pump
2)
3)
4)
5)
6)

Key
- Cement
- Drill Cuttings Native Soils
- Bentonite Grout
- Sand
- Screen
- Riser

Remarks
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table NA=Not Applicable NR=No Recovery bgs=below ground surface ags=above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-16**

Client:	USACE	Drilling Co.:	Boart Longyear
Project:	SHL - Fort Devens	Drill Rig:	Mini Sonic
Project Number:	AC001	Drill Method:	Rotary-Vibratory
Location:	Fort Devens, Ayer, MA	Foreman:	Fred Lavoie
		SCI Inspector:	JJC/WJW
		Start Date:	8/17/2010
		Completion Date:	8/19/2010

	Casing	Sampler
Type	Steel	Core Barrel
Size	6"	60"
Hammer	NA lbs	
Fall		NA"

Casing Elevation: 219.04 - NGVD 29'
Surface Elevation: 216.50 +/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
	S-1	60	0-5	NA	NA			Dark brown (5Y 3/2), MEDIUM SAND			Standpipe is 3' ags
2											Cement 0-2'
4									SAND		
6		60	5-10	NA	NA			Light (5Y 7/3), MEDIUM SAND			
8	S-2		5-15					Light (5Y 7/3), MEDIUM SAND			
							▼				2" Schedule 40 PVC Riser 0-75'
10		60	10-15	NA	NA						
12									SAND		
14											
16		60	15-20	NA	NA						
	S-3		15-25					Light (5Y 7/4), FINE SAND			
18											
20											Grout 2'-71'
		60	20-25	NA	NA				SAND		
22											
24											
					8			As Field Testing Results		1	

Notes:
1) Groundwater profile sampling conducted with a bladder pump
2)
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks:
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼: Approximate water table NA: Not Applicable NR: No Recovery bgs: below ground surface ags: above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring Well ID: **SHM-10-16**

Client:	USACE	Drilling Co.:	Boart Longyear
Project:	SHL - Fort Devens	Drill Rig:	Mini Sonic
Project Number:	AC001	Drill Method:	Rotary-Vibratory
Location:	Fort Devens	Foreman:	Fred Lavoie
	Ayer, MA	SCI Inspector:	JJC/WJW
		Start Date:	8/17/2010
		Completion Date:	8/19/2010

	Casing	Sampler
Type	PVC	Core Barrel
Size	6"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 219.04 - NGVD 29'
Surface Elevation: 216.50 +/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
26	S-4	60	25-30 25-29	NA	NA			Dark (5Y 5/4), COARSE SAND			
28									SAND		
30	S-5		29-30					Orange (5Y 6/8), COARSE SAND			
32	S-6	60	30-35 30-36	NA	NA			Yellow (5Y 8/3), COARSE SAND			2" Schedule 40 PVC Riser 0-75'
34					5			As Field Testing Results		1	
36	S-7	60	35-40 36-40	NA	NA			Light grey (5Y 7/1), MEDIUM SAND	SAND		
38											
40		60	40-45	NA	NA			ROCK (5Y 7/1)			
42									BOULDER		Grout 2-71'
44											
46		60	45-50	NA	NA			ROCK (5Y 7/1)			
48											
50											

Notes 1) Groundwater profile sampling conducted with a bladder pump
2)
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks 1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼: Approximate water table NA=Not Applicable NR=No Recovery bgs: below ground surface ags: above ground surface

Sovereign Consulting Inc.
905B South Main Street
Mansfield, Massachusetts

Boring/Well ID: **SHM-10-16**

Client:	USACE	Drilling Co.:	Boart Longyear
Project:	SHL - Fort Devens	Drill Rig:	Mini Sonic
Project Number:	AC001	Drill Method:	Rotary-Vibratory
Location:	Fort Devens, Ayer, MA	Foreman:	Fred Lavoie
		SCI Inspector:	JJC/WJW
		Start Date:	8/17/2010
		Completion Date:	8/19/2010

	Casing	Sampler
Type	PVC	Core Barrel
Size	6"	60"
	Hammer	Fall
	NA lbs	NA"

Casing Elevation: 219.04 - NGVD 29'
Surface Elevation: 216.50 +/- NGVD 29'
Wellhead Type: Standpipe

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
		60	50-55	NA	NA						
52	S-8		50-53					Light (5Y 7/1), COARSE SAND			Grout 2'-71'
									SAND		
54					0			As Field Testing Results		1	
	S-9		53-60					Light (5Y 7/1), MEDIUM SAND			
56		60	55-60	NA	NA						
58											
60											
	S-10	60	60-65	NA	NA			Light (5Y 7/3), MEDIUM SAND			
62											
									[illegible]		
64					100			As Field Testing Results		1	2" Schedule 40 PVC Riser 0-75'
66	S-11	60	65-70	NA	NA			Light (5Y 7/1), MEDIUM SAND			
68											
70											
		60	70-75	NA	NA						
	S-12		70-80					Light (5Y 7/1), MEDIUM SAND			
72											Bentonite 71'-73'
									SAND		
74					100			As Field Testing Results		1	#2 Morie Sand 73'-85'

Notes
1) Groundwater profile sampling conducted with a bladder pump.
2)
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks
1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table. NA: Not Applicable. NR: No Recovery. bgs: below ground surface. ags: above ground surface.

Sovereign Consulting Inc. 905B South Main Street Mansfield, Massachusetts	Boring/Well ID: **SHM-10-16**	Sheet 4 of 4

Client:	USACE	Drilling Co.:	Boart Longyear		Casing	Sampler
Project:	SHL - Fort Devens	Drill Rig:	Mini Sonic	Type	PVC	Core Barrel
Project Number:	AC001	Drill Method:	Rotary-Vibratory	Size	6"	60"
Location:	Fort Devens Ayer, MA	Foreman:	Fred Lavoie		Hammer	Fall
		SCI Inspector:	JJC/WJW		NA lbs	NA"
		Start Date:	8/17/2010	Casing Elevation:	219.04 - NGVD 29'	
		Completion Date:	8/19/2010	Surface Elevation:	216.50 +/- NGVD 29'	
				Wellhead Type:	Standpipe	

Depth	Sample ID	Pen./Rec. (in.)	Interval (Ft.)	Blow/6"	Field As Testing	Sample Type	Water Detected	Sample Description	Stratum Change (ft.)	Notes	Test Boring/ Monitoring Well Construction
76		60	75-80	NA	NA						#2 Morie Sand 73'-85'
78									SAND		2" Schedule 40 PVC Well screen - 0.01" slot 75'-85'
80	S-13	60/	80-85 80-93	NA	NA			Light (5Y 7/1), MEDIUM SAND			
82											
84					100			As Field Testing Results		1	
86		60	85-90	NA	NA						
88									SAND		
90		72	90-96	NA	NA						
92											
94					0			As Field Testing Results GLACIAL TILL (5Y 7/3) BEDROCK (5Y 7/1)	GLACIAL TILL BEDROCK	1	
96								END OF BORING 96 FEET			
98											

Notes: 1) Groundwater profile sampling conducted with a bladder pump
2)
3)
4)
5)
6)

Key: Cement; Drill Cuttings Native Soils; Bentonite Grout; Sand; Screen; Riser

Remarks: 1) Stratification lines represent approximate boundaries between soil types and the transition may be gradual. Water level readings were completed at times and under conditions stated. Fluctuations of groundwater may occur due to factors other than those present at the time measurements were made.
2) Field As testing values represent arsenic concentrations in ug/L collected using Industrial Test Systems Arsenic Quick Test Kits. Additionally, samples were collected at the same depth interval and submitted to a laboratory for testing. Please see tables for laboratory data.
3) Sample is designated as either "C" for composite or "G" for a discrete grab sample.
▼ Approximate water table NA=Not Applicable NR=No Recovery bgs below ground surface ags above ground surface

Attachment B

Attachment B

Seismic Refraction Survey Report
Devens
Ayer, Massachusetts

Prepared for
SOVEREIGN CONSULTING, INC.
July 2010

GEOPHYSICAL APPLICATIONS

GEOPHYSICAL
APPLICATIONS
INCORPORATED

July 29, 2010

Mr. Neil Schofield
SOVEREIGN CONSULTING, INC.
905B South Main Street
Unit 202
Mansfield, MA 02048

Subject: Seismic Refraction Survey Report
Devens
Ayer, Massachusetts

Dear Mr. Schofield:

Geophysical Applications, Inc. conducted a seismic refraction survey to help ascertain bedrock depths and elevations at specific locations designated by Sovereign, at the above-noted site.

METHODS OF INVESTIGATION

Survey Control

Sovereign's surveyor pre-staked three seismic lines prior to data acquisition. Along these three seismic lines, Geophysical Applications' personnel marked the seismic shot points with spray paint (on pavement or other hard surfaces) and labeled pin flags (on soft ground). Horizontal survey control along the seismic traverses (approximately every 100 feet) was provided by Sovereign's surveyors. Vertical control was provided by Geophysical Applications.

The three seismic traverse locations are shown as red lines on Figure 1. Note that the distance stations in red on Figure 1 are those utilized by our field personnel: they represent distances along the ground surface, as determined by our geophone cables.

Distance stations noted on the surveyor's stakes are shown along the ground surface on each seismic cross section. Distance stations used during data acquisition and modeling are shown at the bottom of each seismic cross section. Note that the surveyor's stations along Line B, northeast of approximately geophone station 1125, have a minus sign as a prefix.

Seismic Refraction Profiling

Refraction profiling was performed along each designated traverse to profile stratigraphic horizons, particularly the bedrock surface.

Refraction data were acquired along 3,900 linear feet of traverse using an EG&G Strataveiw seismograph. Each 24-channel geophone array was 250 feet long with 10-foot geophone spacings. Geophones were coupled to the ground surface with spike bases on soft ground, and tripod bases on pavement or hard ground.

Either a Betsy seisgun or a 450-pound accelerated weight-drop device generated seismic energy at each shot point for this survey. Whenever possible we used the 450-pound weightdrop as the energy source.

A Betsy firing rod was used primarily at shot points that were inaccessible to the trailer-mounted weight-drop device. The firing rod was placed in shot holes driven 1 or 2 feet deep with a steel bar and sledgehammer to enhance recorded energy and minimize airborne noise. The weight-drop device strikes an aluminum impact plate on the ground surface. A geophone on the Betsy firing rod or adjacent to the weight-drop impact plate initiated seismic data recording.

Refraction seismograms were recorded using 0.25-millisecond sampling intervals, with record length of 256 milliseconds. Seismograms were reviewed in the field, and stored on the Strataveiw's internal hard drive and on floppy diskette for backup data storage.

Shot points were usually located at roughly 85-foot intervals along each traverse, with additional shots placed outside the traverse endpoints (where possible) to more accurately profile bedrock near the traverse endpoints. Five to seven shot points were occupied along each geophone array to provide reversed seismic profiles. Each shot point was marked with either spray paint or a labeled pin flag. These labels and flags were left in place at the survey's conclusion.

Refraction data analysis was performed by measuring compressional (P-wave) first-arrival times with WinSism11 software, followed by modeling with Rimrock Geophysics' SIPT2 delay-time interpretation software. This software uses a ray-tracing algorithm, in which calculated layer thickness beneath each geophone is varied to optimize agreement between observed and modeled arrival times. Time-distance plots were reviewed and selected layer depths manually calculated with the crossover-distance technique as a quality assurance check.

SURVEY LIMITATIONS

The southwest section of this site had large changes in ground surface elevation that could have caused some error in layer-depth calculations. We surveyed vertical elevation along each seismic line to within ½ foot to minimize ground surface elevation effect on the model.

Seismic survey depth calculations are typically accurate within $\pm$ 10% (or $\pm$ 3 feet, whichever is larger) for cross sections presented in this report.

Weathered bedrock or overburden layers (especially glacial till) too thin to be detected by seismic profiling may be present along any of the interpreted bedrock surfaces shown on the attached cross sections.

Seismic velocity values shown on the cross sections were calculated over 24-channel geophone arrays, and therefore represent averaged subsurface conditions. Localized low-velocity zones (e.g. discrete bedrock joints or fractures) occur naturally and may be present at this site.

RESULTS

Three seismic traverses covering 3,900 linear feet were performed during this survey, at positions represented by red lines on Sovereign's accompanying plan map (Figure 1). Cross sections depicting interpreted subsurface stratigraphy are presented on Figures 2 through 4. Gaps along each traverse (e.g. Line A between Stations 250 through 412 feet) were due to flooded swampland.

Most seismic cross sections show three interpreted velocity layers. The uppermost layer exhibited compressional seismic velocity values of approximately 1,000 to 1,500 feet per second (ft/sec), probably representing dry, unconsolidated overburden or fill.

Calculated velocity values for the second layer were approximately 5,000 ft/sec. This velocity is judged to represent water-saturated overburden.

The deepest layer is interpreted to represent bedrock, with velocity values averaging mostly between approximately 15,100 to 16,400 feet per second, indicative of competent bedrock with little weathering or fracturing.

Note that the overall range of seismically-inferred bedrock depths and elevations exhibit good agreement with bedrock refusal depths observed at direct-push wells SHM10-2, SHM10-03, SHM10-04, and SHM10-08.

Variances between seismically-modeled bedrock depths and push-rod refusals depths may be due to the following;

1) the push rods may have either bent or deflected slightly along the bedrock surface, thus giving slightly deeper "apparent" refusal depths;

2) ground elevations at each well were not known at the time this report was prepared, therefore we assumed approximate ground elevations at each well; and

3) most wells were offset slightly from the seismic traverses.

* * * * *

Please call the undersigned at 508/429-2430 if you have questions regarding our report. We appreciate this opportunity to provide geophysical services to Sovereign and we welcome inquiries regarding this survey.

Sincerely,

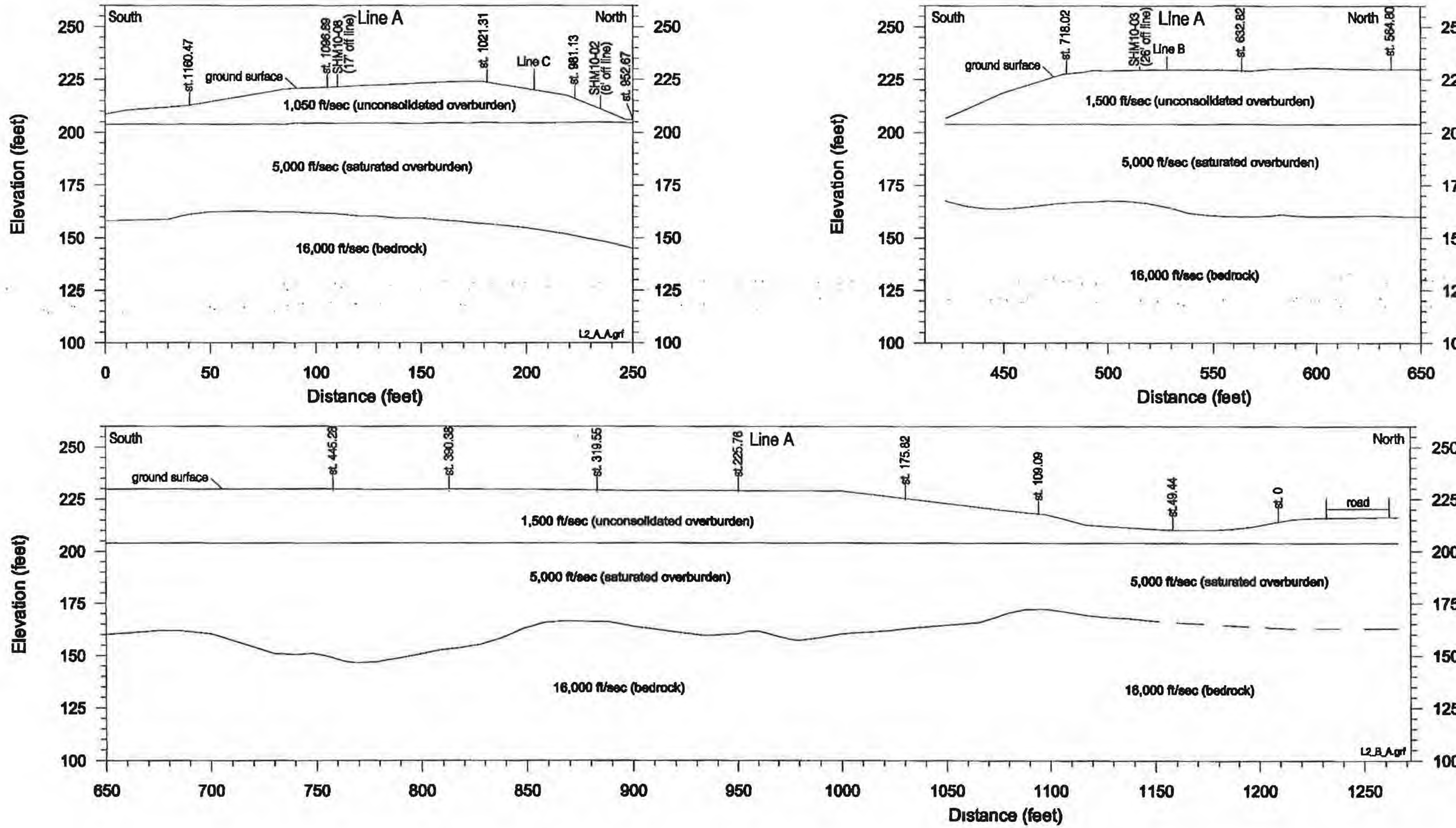
GEOPHYSICAL APPLICATIONS, INC.

Pete Giger — M. Blackey

Peter Giger
Geophysicist

Mark Blackey
Principal and Geophysicist

1101225



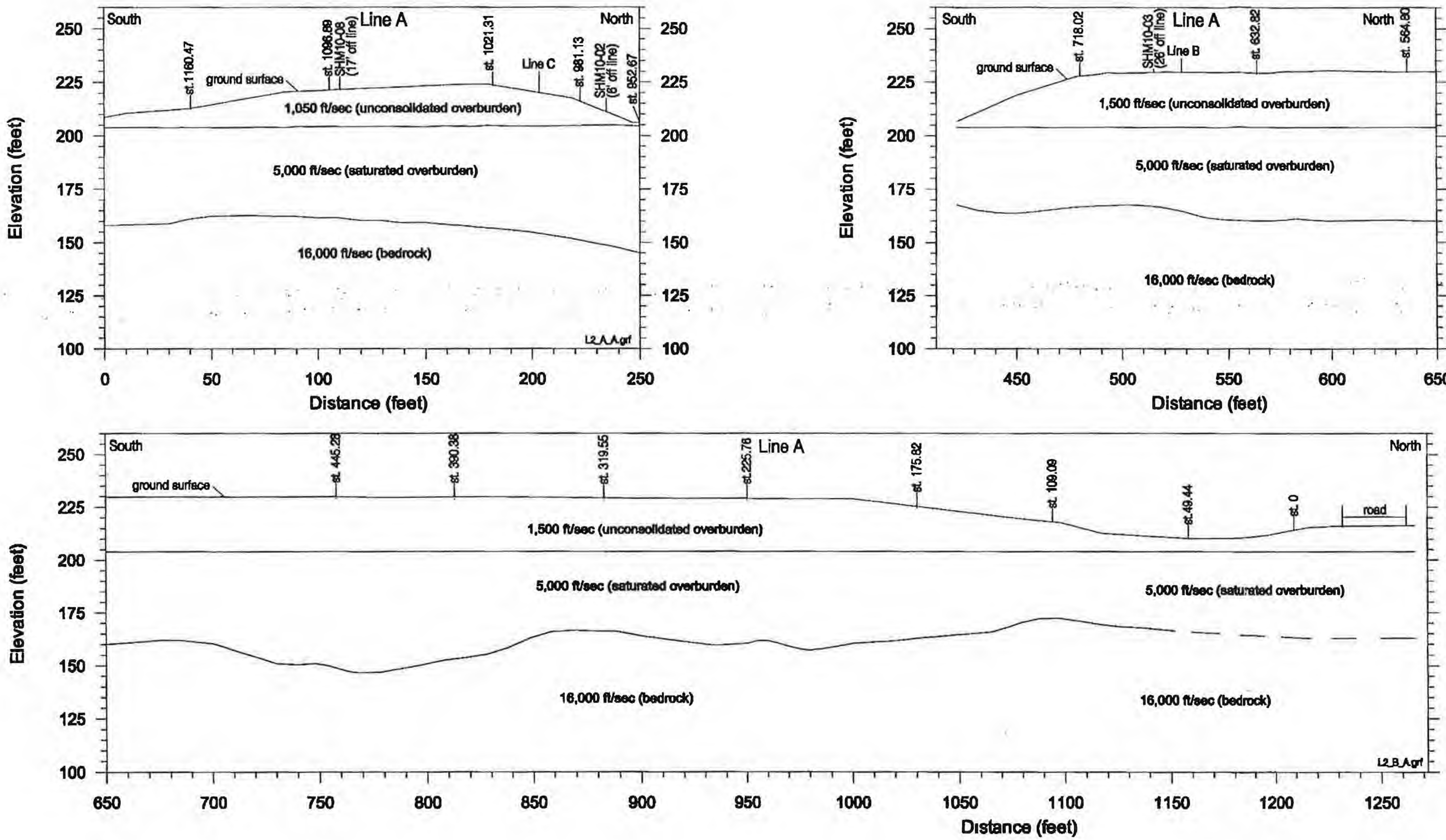
Notes:
1) Seismic velocity values are in units of feet per second (ft/sec)
2) Horizontal scale, 1 inch = 50 feet
Vertical scale, 1 inch = 50 feet
Vertical exaggeration 1:1

3) Elevations were referenced to TBM A2, A3, and C1
TBM A2 elevation is 230.74 feet
TBM A3 elevation is 222.70 feet
TBM C1 elevation is 239.62 feet

1101226 - 1101225cross.dwg
last modified 07/21/10

GEOPHYSICAL APPLICATIONS INCORPORATED

Figure 2, Line A
Seismic Cross Sections
Devens
Ayer, Massachusetts
prepared for
SOVEREIGN CONSULTING, INC.



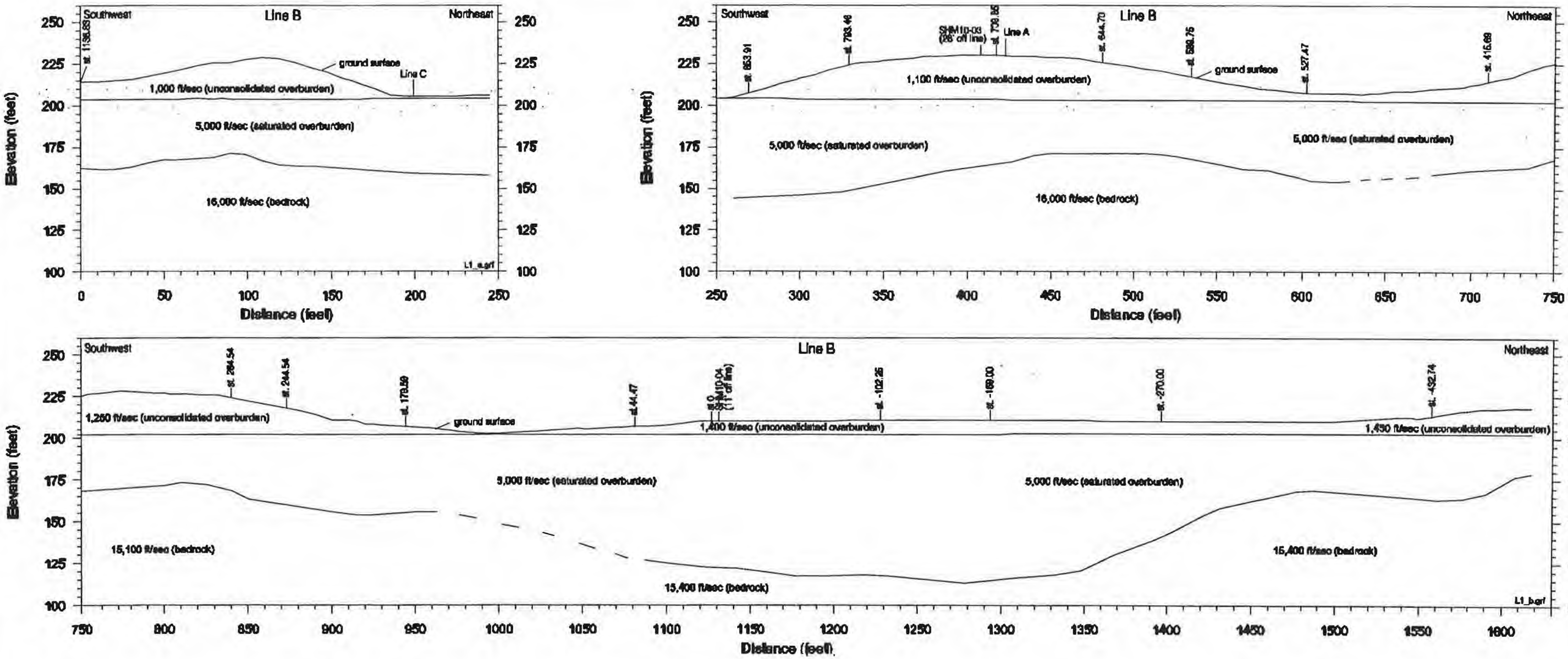
Notes:
1) Seismic velocity values are in units of feet per second (ft/sec)
2) Horizontal scale, 1 inch = 50 feet
Vertical scale, 1 inch = 50 feet
Vertical exaggeration 1:1

3) Elevations were referenced to TBM A2, A3, and C1
TBM A2 elevation is 230.74 feet
TBM A3 elevation is 222.70 feet
TBM C1 elevation is 239.62 feet

1101226 - 1101225cross.dwg
last modified 07/21/10

GEOPHYSICAL APPLICATIONS INCORPORATED

Figure 2, Line A
Seismic Cross Sections
Devens
Ayer, Massachusetts
prepared for
SOVEREIGN CONSULTING, INC.



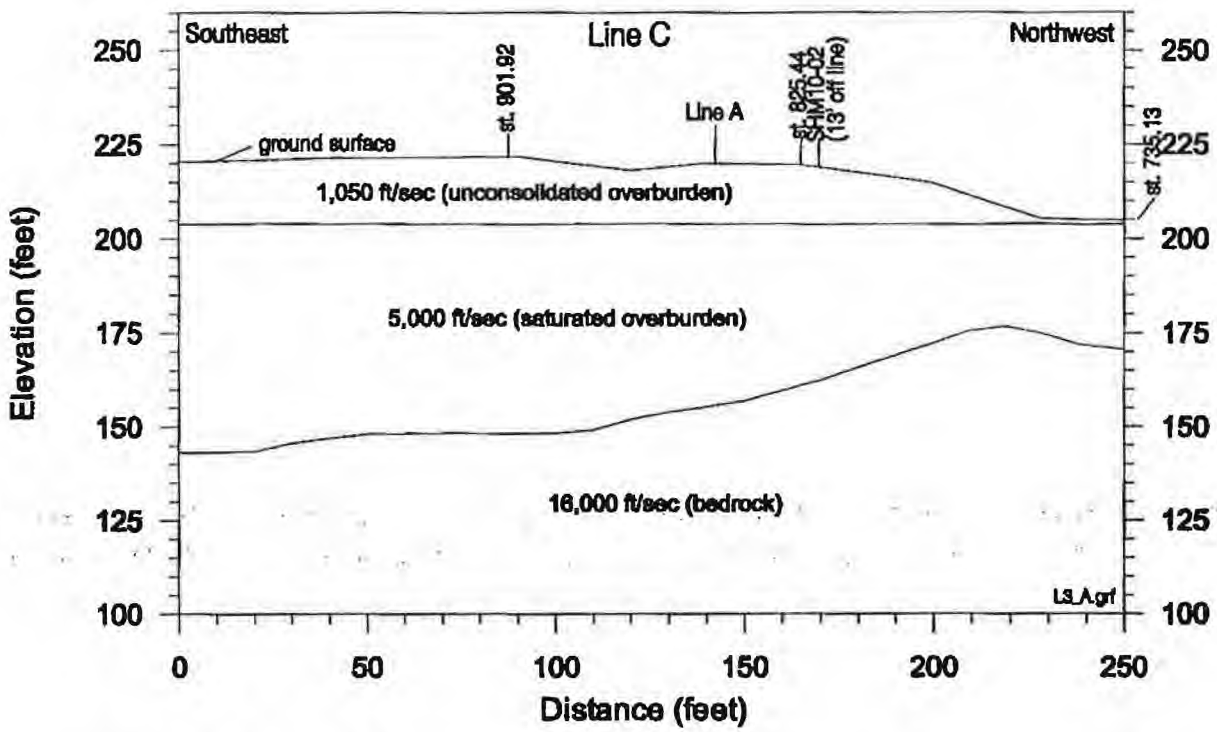
Notes:
1) Seismic velocity values are in units of feet per second (ft/sec)
2) Horizontal scale, 1 inch = 60 feet
Vertical scale, 1 inch = 60 feet
Vertical exaggeration 1:1

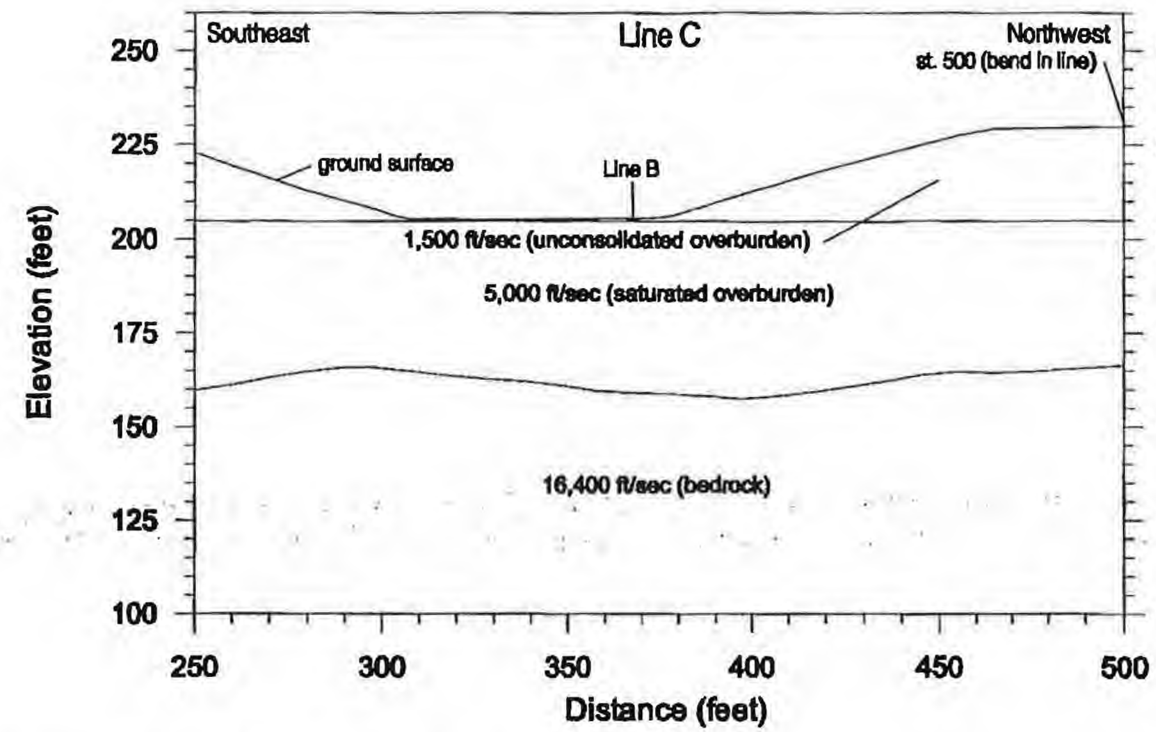
3) Elevations were referenced to TBM A2, A3, and C1
TBM A2 elevation is 230.74 feet
TBM A3 elevation is 230.74 feet
TBM C1 elevation is 239.62 feet

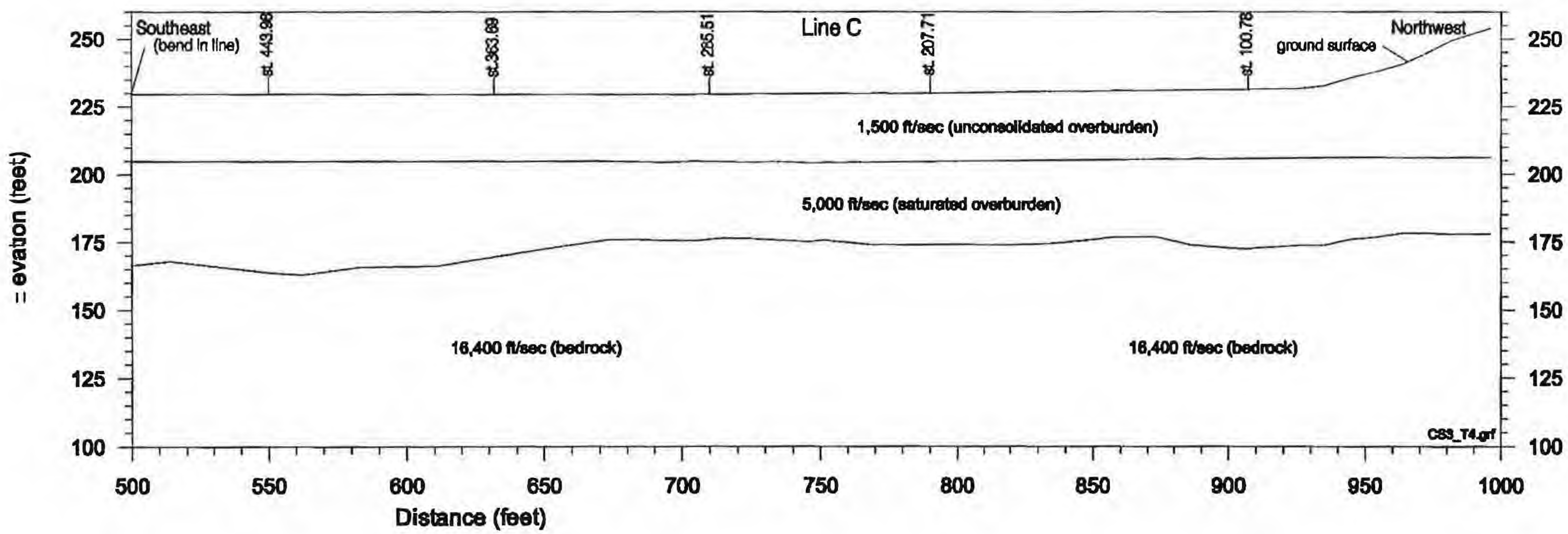
1101228 - 1101228cross.dwg
last modified 07/21/10

GEOPHYSICAL APPLICATIONS INCORPORATED

Figure 3, Line B
Seismic Cross Sections
Devens
Ayer, Massachusetts
prepared for
SOVEREIGN CONSULTING, INC.







Notes:
1) Seismic velocity values are in units of feet per second (ft/sec)
2) Horizontal scale, 1 inch = 50 feet
Vertical scale, 1 inch = 50 feet
Vertical exaggeration 1:1

3) Elevations were referenced to TBM A3, and C1
TBM A2 elevation is 230.74 feet
TBM C1 elevation is 239.62 feet

1101225 - 1101225cross.dwg
last modified 07/21/10

GEOPHYSICAL APPLICATIONS INCORPORATED

Figure 4, Line C
Seismic Cross Sections
Devens
Ayer, Massachusetts
prepared for
SOVEREIGN CONSULTING, INC.

Attachment C

Attachment C

SHM-10-07
Well Development

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
USACE-DEVENS		5/24/10	SHM-10-07

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
	2"	26.31		

PURGING DATA

TUBING DIAMETER (inches) | TUBING MATERIAL CODE (See below) | PURGE PUMP TYPE | PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY | GALLONS | LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 | 1 GALLON = 3.785 LITERS | TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet): | INITIAL PUMP OR TUBING DEPTH IN WELL (feet) | FINAL PUMP OR TUBING DEPTH IN WELL (feet) | PURGING INITIATED AT | PURGING ENDED AT | GALLONS | LITERS

WATER LEVEL STABLIZATION | DEPTH TO WATER WITH PUMP (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
9:40	—	—	856	0.42	6.77	12.90	476	-165.6	cloudy	None
9:50	—	—	270	0.34	6.70	12.53	482	-167.6	cloudy	none
9:55	—	—	39	0.32	6.69	12.46	490	-166.2	little cloudy	None
10:06	—	—	26	0.28	6.66	12.75	497	-158.2	clear	none
10:10	—	—	11	0.25	6.65	12.78	498	-162.1	Clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: | SAMPLER(S) SIGNATURES | SAMPLING INITIATED AT | SAMPLING ENDED AT

PUMP OR TUBING DEPTH IN WELL (feet): | SAMPLE PUMP FLOW RATE (mL per minute) | FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION: Y N | FIELD-FILTERED: Y N | FILTER SIZE: ____ µm | Filtration Equipment Type: | DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe | General Condition: Good / Needs Repair | Well Caps: Good / Broken / None | Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC?: Y / N | Is Well Plumb?: Y / N | PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well?: Y / N | Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc
[illegible] Main Street [illegible]
Mansfield, MA 02048
508-339-[illegible]

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc
4 [illegible] Square Way Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AUD01-002	PROJECT LOCATION:			DATE: 5/27/10	WELL ID: SHM-10-07
PROJECT NUMBER: Ft Devens	WELL DIAMETER (inches): 2"	DEPTH TO WATER (feet): 26.36	DEPTH TO BOTTOM (feet): 50.20		PID READING (ppmv): N/A

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder	PUMP EQUIPMENT MODEL & SERIAL #s: Unknown	
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS: 3.81	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88			1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 40'-50'	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 45'	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 1210	PURGING ENDED AT:	GALLONS: / LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet) 26.84

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0-5	400 ml/min	3 sec refill, 4 sec discharge	26.84	26.88	y	
10 15	400 ml/min	10 sec refill 5 sec discharge	26.88	26.80	y	

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
12:20	400	26.80	314	0.25	6.55	12.21	780	-133.6	cloudy	none
1235	400	26.81	109.7	0.32	6.56	12.18	784	-139.4	clear	none
1258	400	26.82	51.2	0.28	6.58	12.20	781	-145.2	clear	none
1305	400	26.75	25.7	0.29	6.58	12.41	775	-141.3	clear	none
1400	400	26.75	16.3	0.24	6.58	12.49	771	-143.2	clear	none
1405	400	26.74	18.8	0.27	6.57	12.36	770	-141.9	clear	none
1408	400	26.75	18.4	0.28	6.58	12.57	771	-140.9	clear	none
1412	400	26.74	19.0	0.28	6.57	12.54	771	-139.5	clear	none
Turbidity ↑, DTW ↓, Attempted RESTABILIZATION:										
1610	225	26.36	345	0.14	6.99	13.06	751	-196.4	cloudy	none
1613	225	26.36	286	0.14	6.98	13.21	751	-197.7	cloudy	none
1616	225	26.31	237	0.15	6.97	13.43	751	-195.6	cloudy	none
			No Stabilization after 4 HRS, per SOP began sampling							

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Laura Simkins - SovCon	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 1620	SAMPLING ENDED AT: 1730
PUMP OR TUBING DEPTH IN WELL (feet): 45'	SAMPLE PUMP FLOW RATE (mL per minute): 225	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s: YSI 600XL	
FIELD DECONTAMINATION: Y N	FIELD FILTERED: Y N FILTER SIZE: ___ µm Filtration Equipment Type:		DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s); cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb?: Y / N   PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: USACE-DEVENS | PROJECT LOCATION: Ayer, MA | DATE: 5/24/10 | WELL ID: SHM-10-06-025'

PROJECT NUMBER: ACOOL-002- | WELL DIAMETER (inches): 1" | DEPTH TO WATER (feet): ~25 | DEPTH TO BOTTOM (feet): N/A | PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4 | TUBING MATERIAL CODE (see below): PE | PURGE PUMP TYPE: Peristaltic | PUMP EQUIPMENT MODEL & SERIAL #s: Geopump 2

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY | GALLONS: | LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 | 1 GALLON = 3.785 LITERS | TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet): 23-25 | INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 24 | FINAL PUMP OR TUBING DEPTH IN WELL (feet): same | PURGING INITIATED AT: | PURGING ENDED AT: | GALLONS: | LITERS:

WATER LEVEL STABLIZATION | DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
10 Min	300 ML/Minute		N/A -	Pushing		

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
5	450	N/A	240	0.40	7.04	10.17	28	96.7	CLR	None
10	450	N/A	240	0.30	6.67	9.68	28	106.4	CLR/CLD	None
15	450	N/A	170	0.24	6.12	9.44	27	115.7	CLR/CLD	None
20	450	N/A	100	0.20	5.77	9.18	26	122.2	CLR	None
25	450	N/A	50	0.19	5.57	9.16	26	127.4	CLR	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: | SAMPLER(S) SIGNATURES: | SAMPLING INITIATED AT: | SAMPLING ENDED AT:

PUMP OR TUBING DEPTH IN WELL (feet): | SAMPLE PUMP FLOW RATE (mL per minute): | FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION: Y N | FIELD-FILTERED: Y N | FILTER SIZE: ___ µm | Filtration Equipment Type: | DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s); cross out if not applicable)

Type: Flush Mount / Stand Pipe | General Condition: Good / Needs Repair | Well Caps: Good / Broken / None | Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N | Is Well Plumb?: Y / N | PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N | Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
USACE Devens	Ayer	5-24-10	SHM-10-06-03

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
	3/4	NA	NA	NA

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)*	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
1/4	Polyethylene	Geopump	

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS / LITERS

WELL CAPACITY (Gallons Per Foot): 0.75 = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
33-35'	34'	34'	12:20	~~13~~ 1235	GALLONS 2 / LITERS

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
	500/min					

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1225	500		70	.85	6.07	13.74	135	-13.8	Clear	None
1230	500		45	.44	6.01	12.72	104	-12.1	Clear	None
1235	500		31	.39	5.99	12.66	103	-12.3	Clear	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
Erin Foley / Sov Con	Eri F	1235	1237

PUMP OR TUBING DEPTH IN WELL (feet): SAMPLE PUMP FLOW RATE (mL per minute): FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION Y N   FIELD-FILTERED Y N   FILTER SIZE: ___ µm   Filtration Equipment Type: DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb?: Y / N   PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
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Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: US ACE Devens	PROJECT LOCATION: Ayer			DATE: 5-24-10	WELL ID: SHM-10-06-044
PROJECT NUMBER:	WELL DIAMETER (inches): ~~NA~~ 3/4	DEPTH TO WATER (feet): NA	DEPTH TO BOTTOM (feet): NA		PID READING (ppmv): NA

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump		PUMP EQUIPMENT MODEL & SERIAL #s:
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY				GALLONS: / LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88				1 GALLON = 3.785 LITERS / TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 43-45	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 44'	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 44'	PURGING INITIATED AT: 1300	PURGING ENDED AT: 1330 / GALLONS: / LITERS:

WATER LEVEL STABLIZATION DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1305	800									
1306	450		290	.45	5.66	13.85	188	4.2	Cloudy ~~clear~~	None
1310	450		400	.33	5.62	14.16	193	6.2	Cloudy	None
1315	450		550	.27	5.53	14.01	192	8.3	Cloudy	None
1320	250		750	.21	5.65	16.12	194	5.1	cloudy	None
1325	250		800	.19	5.65	15.69	194	4.9	Cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Erin Foley Sovcon	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 1330	SAMPLING ENDED AT: 1335
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION Y N	FIELD-FILTERED Y N FILTER SIZE ___ µm Filtration Equipment Type:		DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass CG = Clear Glass PE = Polyethylene PP = Polypropylene S = Silicone T = Teflon O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well!? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905 South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
1 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: US ACE Devens	PROJECT LOCATION: ~~Dev~~ Ayer MA		DATE: 5-26-10	WELL ID: SHM-10-06
PROJECT NUMBER:	WELL DIAMETER (inches): 3/4	DEPTH TO WATER (feet): NA	DEPTH TO BOTTOM (feet): NA	FID READING (ppmv): NA

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #:	
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88			1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED
WELL SCREEN INTERVAL DEPTH (feet): 53-55'	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 54'	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 54'	PURGING INITIATED AT: 0750 / PURGING ENDED AT:	GALLONS: / LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
0800	250		max	.74	5.87	14.79	886	-69.5	~~Trace~~ cloudy	None
0810	250		max	.22	6.00	13.53	885	-103.8	Cloudy	None
0820	250		max	.19	6.04	12.89	880	-119.6	cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Erin Foley Sov Con.	SAMPLER(S) SIGNATURES: Erin Foley	SAMPLING INITIATED AT: 825	SAMPLING ENDED AT: 835
PUMP OR TUBING DEPTH IN WELL (feet): 54'	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N; FILTER SIZE: ____ µm; Filtration Equipment Type:	DUPLICATE: Y N	

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb?: Y / N   PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905D South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
1 Open Square Way, Suite #207
Holyoke, MA 01040
413-540-0650

PROJECT NAME: US ACE Devens	PROJECT LOCATION: Ayer MA		DATE: 5 26 10	WELL ID: SHM-10 [illegible]
PROJECT NUMBER:	WELL DIAMETER (inches): 3/4	DEPTH TO WATER (feet): NA	DEPTH TO BOTTOM (feet): NA	PID READING (ppmv): NA

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump		PUMP EQUIPMENT MODEL & SERIAL #:
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88			1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED
WELL SCREEN INTERVAL DEPTH (feet): 63-65'	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 64'	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 64'	PURGING INITIATED AT: 0910	PURGING ENDED AT:	GALLONS: LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
915	250		1100	.59	6.03	12.78	828	-113	Cloudy	None
925	250		Max	.21	5.89	12.28	828	-117	Cloudy	None
935	250		max	.14	5.95	11.63	827	-120	Cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Erin Foley Sov. Con.	SAMPLER(S) SIGNATURES: Erin Foley	SAMPLING INITIATED AT: 940	SAMPLING ENDED AT: 950
PUMP OR TUBING DEPTH IN WELL (feet): 64'	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: ___ µm Filtration Equipment Type:		DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass CG = Clear Glass PE = Polyethylene PP = Polypropylene S = Silicone T = Teflon O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
US ACE Devens	Ayer, MA	5 26 10	SHM 10 06

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
	3/4	NA	NA	NA

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED: GALLONS / LITERS
73-75	74	74	1020		GALLONS: 3

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.33')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1030	300		max	.19	4.40	14.46	726	-132	cloudy	None
1040	300		max	.16	3.90	13.88	~~724~~ 725	-124	Cloudy	None
1050	300		max	.14	4.08	14.16	725	-124	Cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504, April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
Erin Foley Sov Con	Erin Foley	1055	1105

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION (Y) (N) — FIELD-FILTERED: Y N — FILTER SIZE: ___ µm — Filtration Equipment Type: — DUPLICATE: (Y) (N) Circ

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
2 Open Square Way, Suite 317
Holyoke, MA 01040
413-540-0650

PROJECT NAME: US ACE Devens	PROJECT LOCATION: Ayer, MA		DATE: 5-26-16	WELL ID: SHM-10-06
PROJECT NUMBER:	WELL DIAMETER (inches): 3/4	DEPTH TO WATER (feet): NA	DEPTH TO BOTTOM (feet): NA	PID READING (ppmv): NA

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS: / LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
79-80'	79.5	79.5'	1155		GALLONS: 3 / LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1200	300		max	.41	5.00	16.25	670	-129	cloudy	None
1210	300		max	.24	4.50	15.36	670	-115	cloudy	None
1220	300		max	.19	4.34	14.89	669	-109	cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Erin Foley Sovcon	SAMPLER(S) SIGNATURES: Erin Foley	SAMPLING INITIATED AT: 1225	SAMPLING ENDED AT: 1215
PUMP OR TUBING DEPTH IN WELL (feet): 79.5'	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y / N	FIELD-FILTERED: Y / N — Filtration Equipment Type:	FILTER SIZE: ___ µm	DUPLICATE: Y / N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb? Y / N   PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: USACE DEVENS | PROJECT LOCATION: AYER, MA | DATE: 5/24/2010 | WELL ID: SHM-10-06A-034

PROJECT NUMBER: | WELL DIAMETER (inches): 3/4" | DEPTH TO WATER (feet): NA | DEPTH TO BOTTOM (feet): NA | PID READING (ppmv): NA

PURGING DATA

TUBING DIAMETER (inches): 1/4 | TUBING MATERIAL CODE (see below): POLY | PURGE PUMP TYPE: Geo Pump | PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY | GALLONS | LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 | 1 GALLON = 3.785 LITERS | TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet): 33-35 | INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 34 | FINAL PUMP OR TUBING DEPTH IN WELL (feet): 34 | PURGING INITIATED AT: 2:30 | PURGING ENDED AT: | GALLONS: | LITERS:

WATER LEVEL STABLIZATION | DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
2:45	125		6.5	10.30	6.00	17.23	32	160.4	clear	none
2:48	125		5.3	10.29	5.81	16.31	30	171.2	Clear	none
2:51	125		2.3	10.04	5.66	16.58	29	194.9	Clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Carolyn Hardt | SAMPLER(S) SIGNATURES: Carolyn Hardt | SAMPLING INITIATED AT: 2:55 | SAMPLING ENDED AT: 3:00

PUMP OR TUBING DEPTH IN WELL (feet): | SAMPLE PUMP FLOW RATE (mL per minute): | FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION Y N | FIELD FILTERED Y N FILTER SIZE ____ µm Filtration Equipment Type: | DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass CG = Clear Glass PE = Polyethylene PP = Polypropylene S = Silicone T = Teflon O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s); cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 310
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
US ACE Devens	Ayer, MA	5-24/10	SHM-10-06A-044

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
	3/4	NA	NA	NA

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #:
1/4	Poly	Geopump	(Geopump 2

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS / LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED GALLONS / LITERS
43-45	44	44'	~~3:20~~ 1600	16:2	

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1604	850	NA								
1605	450		Max	0.31	5.66	13.05	85	34.4	Cloudy	none
1610	450		800	0.37	Problem w/ YSI - silted in					
1615	450		650	YSI Cleaning - No readings						
16:20	450		140	1.54	5.79	14.66	76	27.0	Cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
		16:25	16:30

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION: Y N — FIELD-FILTERED: Y N — FILTER SIZE: ___ µm — Filtration Equipment Type: — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
[illegible] South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
[illegible] Square Way, Suite [illegible]
Holyoke, MA 01040
413-540-0650

PROJECT NAME: USACE - Devens	PROJECT LOCATION: Ayer	DATE: 5/24/10	WELL ID: SHM-10-06-05
PROJECT NUMBER: ACOOL-002	WELL DIAMETER (inches): 3/4	DEPTH TO WATER (feet): N/A	DEPTH TO BOTTOM (feet):	PID READING (ppmv): —

PURGING DATA

TUBING DIAMETER (inches): 3/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Peristaltic	PUMP EQUIPMENT MODEL & SERIAL #: Geopump 2

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT:	PURGING ENDED AT:	GALLONS: / LITERS:
53-55' BGS	054'	054'	16:40		

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
Purge -	1 Gallon					

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1705	400		Max	.25	5.93	14.47	150	-25.6	Cloudy	None
1715	400		Max	.20	5.71	14.26	152	-5.9	cloudy	None
1720	400		Max	1.4	5.79	15.11	157	-3.1	Cloudy	None
1725	400		900	1.47	5.80	14.10	166	8.1	Cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1725	SAMPLING ENDED AT: 1730
PUMP OR TUBING DEPTH IN WELL (feet): 54'	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N — Filtration Equipment Type:	FILTER SIZE: µm 0.45 um	DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 203
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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
1 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
USECH Devens	Ayer	5-25-10	AIM-10-06A

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
	3/4	NA	NA	NA

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
1/4	Poly	Geopump	

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
63-65'	64'	64'	0855	0920	GALLONS: 3 Gal; LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µs/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
0900	400		max	.23	6.75	12.70	81	-57.4	Cloudy	None
0910	400		max	.21	6.53	13.66	73	-71.8	Cloudy	None
0920	400		max	.10	6.55	15.54	67	-134.0	Cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
Erin Toby Sovereign	Erin Toby	0925	0945

PUMP OR TUBING DEPTH IN WELL (feet): — SAMPLE PUMP FLOW RATE (mL per minute): — FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION Y N — FIELD-FILTERED Y N — FILTER SIZE ___ µm — Filtration Equipment Type: — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (Circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905E South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
USFCH Devens	Ayer MA	5 25 10	SHM-10-06A

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
	3/4	NA	NA	NA

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
1/4	Poly	Geopump	

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
73-75	74'	74'	1020	1050	GALLONS 2 gal; LITERS

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1030	125		max	.18	6.42	16.68	305	-109	cloudy	None
1040	125		Max	.14	6.36	15.08	291	-107	Cloudy	None
1050	125		max	.14	6.37	14.51	292	-115	Cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
Erin Foley	Erin Foley	1055	1105

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION Y N — FIELD-FILTERED Y N — Filtration Equipment Type — FILTER SIZE ____ µm — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: US ACE "Devens"	PROJECT LOCATION: Ayer MA	DATE: 5-25-10	WELL ID: SHM-10-004
PROJECT NUMBER:	WELL DIAMETER (inches): 3/4	DEPTH TO WATER (feet): NA	DEPTH TO BOTTOM (feet): NA	PID READING (ppmv): NA

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:
WELL VOLUME PURGE 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY		GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88		1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED
WELL SCREEN INTERVAL DEPTH (feet): 83 - 85	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 84	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 84'	PURGING INITIATED AT: ~~1135~~ EF 1155	PURGING ENDED AT: 1220	GALLONS: 3 LITERS:

WATER LEVEL STABLIZATION DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1200	200		max	.16	6.41	17.27	313	-117	Cloudy	None
1210	200		max	.24	6.40	15.37	318	-114	Cloudy	None
1220	200		max	.17	6.34	14.83	316	-115	Cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Erin Foley Sovcon	SAMPLER(S) SIGNATURES: Erin Foley	SAMPLING INITIATED AT: 1225	SAMPLING ENDED AT: 1235
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION (Y) N	FIELD FILTERED Y (N) Filtration Equipment Type:	FILTER SIZE: ___ µm	DUPLICATE Y (N)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well!? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
USACE Devens	Ayer MA	5-25-10	SHM-10-11A

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
	3/4	NA	NA	NA

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #
1/4	Poly	Geopump	

WELL VOLUME PURGE 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: 3 — LITERS:

WELL CAPACITY (Gallons Per Foot) 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
93-95	94'	94'	1355		GALLONS: LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
1405						

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1410	300		max	.28	5.94	15.81	496	5.4	cloudy	None
1420	300		max	.22	5.77	16.66	504	-25.8	cloudy	None
1430	300		max	.21	5.81	16.77	508	-119	Cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
Erin Foley	Erin Foley	1435	1445

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION Y N — FIELD FILTERED Y N — FILTER SIZE um — Filtration Equipment Type — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass CG = Clear Glass PE = Polyethylene PP = Polypropylene S = Silicone T = Teflon O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

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Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: US ACE Devens
PROJECT LOCATION: Ayer MA
DATE: 5-25-16
WELL ID: SHM-10-06A
PROJECT NUMBER:
WELL DIAMETER (inches): 3/4
DEPTH TO WATER (feet):
DEPTH TO BOTTOM (feet):
PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4
TUBING MATERIAL CODE (see below): Poly
PURGE PUMP TYPE: Geopump
PUMP EQUIPMENT MODEL & SERIAL #:
GALLONS / LITERS

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02 1" = 0.04 1.25" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65 5" = 1.02 6" = 1.47 12" = 5.88
1 GALLON = 3.785 LITERS
TOTAL VOLUME PURGED: GALLONS / LITERS

WELL SCREEN INTERVAL DEPTH (feet): 103-105
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 104'
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 104'
PURGING INITIATED AT: 31525
PURGING ENDED AT:

WATER LEVEL STABLIZATION
DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1545 ~~1535~~	200		max	87	6.66	21.82	692	-354	Cloudy	None
1555	200		900	.26	6.33	17.76	633	-305	Cloudy	None
1605	200		900	.17	6.24	17.17	608	-392	Cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Erin Foley Sovereign
SAMPLER(S) SIGNATURES: Erin Foley
SAMPLING INITIATED AT: 1610
SAMPLING ENDED AT: 1620

PUMP OR TUBING DEPTH IN WELL (feet): 104'
SAMPLE PUMP FLOW RATE (mL per minute):
FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s: YSI 600XL

FIELD DECONTAMINATION: Y N
FIELD FILTERED: Y N
FILTER SIZE: ___ µm
Filtration Equipment Type:
DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass CG = Clear Glass PE = Polyethylene PP = Polypropylene S = Silicone T = Teflon O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb?: Y / N   PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: US ACE Devens	PROJECT LOCATION: Ayer MA			DATE: 5-25-10	WELL ID: SHM-10-O6
PROJECT NUMBER:	WELL DIAMETER (inches): 3/4	DEPTH TO WATER (feet): NA	DEPTH TO BOTTOM (feet): NA	PID READING (ppmv): NA	

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump		PUMP EQUIPMENT MODEL & SERIAL #s	
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY				GALLONS	LITERS
WELL CAPACITY (Gallons Per Foot): 0.75 = 0.02; 1" = 0.04; 1.25 = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88				1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 108.5 - 110.5	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 110.5	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 110.5	PURGING INITIATED AT: 1700	PURGING ENDED AT: 1725	GALLONS: 3 LITERS:
WATER LEVEL STABLIZATION	DEPTH TO WATER WITH PUMP (feet):				

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1705	300		max	.29	6.00	16.19	607	-256	cloudy	None
1715	300		max	.13	6.18	14.59	603	-339	cloudy	None
GF ~~1725~~	300		max	.11	6.14	14.66	603	-352	cloudy	None
1735										

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Erin Foley Sov Con	SAMPLER(S) SIGNATURES: Erin Foley		SAMPLING INITIATED AT: 1730 1740	SAMPLING ENDED AT: 1740 1750
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s		
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N Filtration Equipment Type:	FILTER SIZE: ___ μm	DUPLICATE:	Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb?: Y / N   PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS

Sovereign Consulting Inc.
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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
1 Open Square Way, Suite 1307
Holyoke, MA 01040
413-540-0550

PROJECT NAME: US ACE Devens	PROJECT LOCATION: Ayer	DATE: 5.27.10	WELL ID: 10-01
PROJECT NUMBER:	WELL DIAMETER (inches): 3/4	DEPTH TO WATER (feet): NA	DEPTH TO BOTTOM (feet): NA
PID READING (ppmv): NA			

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
8-10'	9'	9'	0850	0906	GALLONS: LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (/min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
0900	300		26	5.53	7.34	11.26	266	113	Clear	None
0903	300		16	5.38	6.75	1104	265	109	Clear	None
0906	300		10	5.34	6.35	10.80	265	107	Clear	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Erin Foley Sovcon	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 0910	SAMPLING ENDED AT: 0930
PUMP OR TUBING DEPTH IN WELL (feet): 9'	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD FILTERED: Y N FILTER SIZE: ___ µm Filtration Equipment Type:	DUPLICATE: Y N MS/MSD	

MATERIAL CODES: AG = Amber Glass CG = Clear Glass PE = Polyethylene PP = Polypropylene S = Silicone T = Teflon O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
Holyoke, MA 01040
413-540-0650

PROJECT NAME: US ACE Devens	PROJECT LOCATION: Ayer MA			DATE: 5-27-10		WELL ID: 10-01
PROJECT NUMBER:	WELL DIAMETER (inches): 3/4	DEPTH TO WATER (feet): NA		DEPTH TO BOTTOM (feet): NA		PID READING (ppmv): NA

PURGING DATA

TUBING DIAMETER (inches): 18-20	TUBING MATERIAL CODE (see below): 19	PURGE PUMP TYPE: 19		PUMP EQUIPMENT MODEL & SERIAL #s:
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY				GALLONS / LITERS
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88				1 GALLON = 3.785 LITERS; TOTAL VOLUME PURGED
WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT: 935; GALLONS / LITERS

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
940	300		320	3.07	6.22	12.05	401	91.4	white cloudy	None
945	300		500	2.49	6.12	11.62	401	75.9	cloudy	None
955	300		260	2.58	6.04	11.40	401	76.5	little cloudy	None
1000	300		140	2.58	6.01	11.35	400	82.0	Clear	None
1005	300		90	2.61	5.99	11.36	401	84.3	Clear	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Erin Foley SOV Con	SAMPLER(S) SIGNATURE(S): Erin Foley	SAMPLING INITIATED AT: 1010	SAMPLING ENDED AT: 1025
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N; Filtration Equipment Type:	FILTER SIZE: ___ µm	DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
[illegible] South Main Street, Suite 202
Mansfield, MA 02048
508 339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
1 Open Square Way, Suite [illegible]
Holyoke, MA 01040
[illegible]

PROJECT NAME: US ACE Devens	PROJECT LOCATION: Ayer		DATE: 5-29-10		WELL ID: SHM-10-01
PROJECT NUMBER:	WELL DIAMETER (inches): 3/4	DEPTH TO WATER (feet): NA	DEPTH TO BOTTOM (feet): NA		PID READING (ppmv): NA

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump		PUMP EQUIPMENT MODEL & SERIAL #s:	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY				GALLONS: 3	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88				1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 28-30	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 29	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 29	PURGING INITIATED AT: 1030	PURGING ENDED AT:	GALLONS: LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1035	300		270	6.27	6.26	11.94	377	98.9	little cloudy	None
1040	300		600	4.53	6.13	11.21	380	87.2	Cloudy	None
1045	300		500	4.51	6.11	11.17	381	84.0	cloudy	None
1055	300		230	4.49	6.08	11.07	385	83.2	little cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Erin Foley Sov Con	SAMPLER(S) SIGNATURES: Eri Fly	SAMPLING INITIATED AT: 1100	SAMPLING ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet): 29	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N; Filtration Equipment Type:	FILTER SIZE: ___ μm	DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb? Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905 South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
Holyoke, MA 01040

PROJECT NAME: US ACE Devens
PROJECT LOCATION: Ayer
DATE: 5-27-10
WELL ID: 10-01
PROJECT NUMBER:
WELL DIAMETER (inches): 3/4
DEPTH TO WATER (feet): NA
DEPTH TO BOTTOM (feet): NA
PID READING (ppmv): NA

PURGING DATA

TUBING DIAMETER (inches): 1/4
TUBING MATERIAL CODE (see below): Poly
PURGE PUMP TYPE: Geopump
PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
GALLONS: 3
LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
1 GALLON = 3.785 LITERS
TOTAL VOLUME PURGED: GALLONS: LITERS:

WELL SCREEN INTERVAL DEPTH (feet): 38-40
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 39'
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 39'
PURGING INITIATED AT: ~~1105~~ 1110
PURGING ENDED AT: 1125

WATER LEVEL STABLIZATION
DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1115	300		110	.56	5.98	12.43	673	84.2	Clear	None
1120	300		100	.43	5.98	12.14	673	69.3	Clear	None
1125	300		80	.37	6.00	11.81	671	62.7	Clear	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Erin Foley Sov Con
SAMPLER(S) SIGNATURES: Erin Foley
SAMPLING INITIATED AT: 1130
SAMPLING ENDED AT: 1140
PUMP OR TUBING DEPTH IN WELL (feet): 39'
SAMPLE PUMP FLOW RATE (mL per minute):
FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:
FIELD DECONTAMINATION Y N
FIELD-FILTERED Y N
FILTER SIZE ___ µm
Filtration Equipment Type:
DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb? Y / N   PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
US ACE Devens	Ayer	5.27.10	10-01

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
	3/4	NA	NA	NA

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
1/4	POLY	Geopump	

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: 3 — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED GALLONS / LITERS
~~3~~ 48-50	49'	49'	1145		

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1150	300		170	.56	6.43	12.78	216	48.3	clear	None
1155	300		80	.59	6.41	12.53	216	43.1	Clear	None
1200			65	.43	6.38	12.46	218	36.1	Clear	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
Erin Foley Sov Con	Erin Foley	1205	1210

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
49'		

FIELD DECONTAMINATION: (Y) N — FIELD FILTERED: Y (N) — Filtration Equipment Type: — FILTER SIZE: ___ µm — DUPLICATE: Y (N)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
Marshfield, MA

MONITORING WELL SAMPLING LOG

Low Flow Sampling

PROJECT NAME: US ACE Devens	PROJECT LOCATION: Ayer			DATE: 5.27.10	WELL ID: [illegible]
PROJECT NUMBER:	WELL DIAMETER (inches): 3/4	DEPTH TO WATER (feet): NA	DEPTH TO BOTTOM (feet): NA		PID READING (ppmv): NA

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump		PUMP EQUIPMENT MODEL & SERIAL #s:	
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY				GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88				1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED
WELL SCREEN INTERVAL DEPTH (feet): 58-60	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 59'	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 59'	PURGING INITIATED AT: 1215	PURGING ENDED AT:	GALLONS: 3 LITERS:

WATER LEVEL STABLIZATION DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1225	300		140	1.19	6.41	12.18	290	48.3	Clear	None
1230	300		130	.35	6.27	11.78	299	32.8	Clear	None
1235	300		200	.26	6.25	11.68	304	22.3	Clear	None
1240	300		220	.24	6.25	11.57	307	17.0	Clear	None
1245	300		170	.23	6.25	11.68	307	15.5	clear	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Erin Foley Sov Con	SAMPLER(S) SIGNATURES: Erin Foley	SAMPLING INITIATED AT: 1250	SAMPLING ENDED AT: 1300
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N Filtration Equipment Type:	FILTER SIZE: ____ µm	DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
Marshfield, MA 02048

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
Holyoke, MA 01040

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
US ACE Devens	Ayer	5.27.10	10-01

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
	3/4	NA	NA	NA

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
1/4	PDY	Geopump	

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS — LITERS

WELL CAPACITY (Gallons Per Foot): 0.75 = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
68-70	69	69	1350 ~~1400~~		GALLONS: 3 LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1415	300		450	2.04	6.50	13.81	378	-34.2	cloudy	None
1420	300		550	.88	6.45	13.22	372	-33.2	cloudy	None
1430	300		400	.39	6.39	12.49	397	-39.1	cloudy	None
1435	300		200	.35	6.39	12.36	395	-40.6	cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURE(S)	SAMPLING INITIATED AT	SAMPLING ENDED AT
Erin Foley Sovcon	Eri Fo	1440	1455

PUMP OR TUBING DEPTH IN WELL (feet) — SAMPLE PUMP FLOW RATE (mL per minute) — FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION: Y N — FIELD-FILTERED: Y N — Filtration Equipment Type: — FILTER SIZE: ___ μm — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS

Sovereign Consulting Inc.
9650 South Main Street, Suite 207
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
1 Open Square Way, Suite #207
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
US ACE Devens	Ayer	5-27-10	SHM-10-01

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
	~~NA~~ 3/4	NA	NA	NA

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
1/4	Poly	Geopump	

WELL VOLUME PURGE: 1 WELL VOLUME (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
74-76	75'	75'	1515		GALLONS: 3; LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1530	300		150	2.04	6.56	14.84	459	-60.2	Clear	None
1535	300		60	1.87	6.54	14.35	466	-59.9	Clear	None
1540	300		33	1.90	6.54	14.11	469	-63.8	Clear	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
Erik Foley Sov Con	[signature]	1545	1555

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
75'		

FIELD DECONTAMINATION (Y) N — FIELD-FILTERED Y (N) — FILTER SIZE ___ µm — Filtration Equipment Type: — DUPLICATE Y (N)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: US ACE Devons	PROJECT LOCATION: Ayer			DATE: 5.28.10	WELL ID: 10-09
PROJECT NUMBER:	WELL DIAMETER (inches): 3/4	DEPTH TO WATER (feet): NA	DEPTH TO BOTTOM (feet): NA		PID READING (ppmv): NA

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump		PUMP EQUIPMENT MODEL & SERIAL #s:	
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY				GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88				1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED
WELL SCREEN INTERVAL DEPTH (feet): 20-22	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 21'	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 21'	PURGING INITIATED AT: 0800	PURGING ENDED AT: 0836	GALLONS: 3 LITERS:

WATER LEVEL STABLIZATION DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.33)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
830	ER ~~42.1~~	300	42.1	10.43	7.42	12.22	71	76.6	Clear	None
833	~~3.47~~	300	3.47	10.33	6.87	11.97	62	95.4	Clear	None
836	~~1.13~~	300	1.13	10.34	6.82	11.95	62	97.1	Clear	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Erin Foley Sov Con	SAMPLER(S) SIGNATURES: Erin Foley	SAMPLING INITIATED AT: 840	SAMPLING ENDED AT: 850
PUMP OR TUBING DEPTH IN WELL (feet): 21'	SAMPLE PUMP FLOW RATE (mL per minute): 300	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD FILTERED: Y N Filtration Equipment Type:	FILTER SIZE: μm	DUPLICATE: Y N msmsD

MATERIAL CODES: AG = Amber Glass CG = Clear Glass PE = Polyethylene PP = Polypropylene S = Silicone T = Teflon O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905-C South Main Street Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
Open Square Way Suite 4063
Holyoke, MA 01040
413-540-0650

PROJECT NAME: US ACE Devens
PROJECT LOCATION: Ayer MA
DATE: 5.28.10
WELL ID: 10-09
PROJECT NUMBER:
WELL DIAMETER (inches): 3/4
DEPTH TO WATER (feet): NA
DEPTH TO BOTTOM (feet): NA
PID READING (ppmv): NA

PURGING DATA

TUBING DIAMETER (inches): 1/4
TUBING MATERIAL CODE (see below): Poly
PURGE PUMP TYPE: Geopump
PUMP EQUIPMENT MODEL & SERIAL #s:
GALLONS / LITERS

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
1 GALLON = 3.785 LITERS
TOTAL VOLUME PURGED: GALLONS 3; LITERS

WELL SCREEN INTERVAL DEPTH (feet): 30-32
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 31'
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 31'
PURGING INITIATED AT: 0910
PURGING ENDED AT: 0940

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
920	300		832	6.82	6.56	14.72	213	64.6	Cloudy	None
925	300		1071	6.06	6.26	13.63	214	58.8	Cloudy	None
930	300		927	6.04	6.17	13.23	219	64.3	Cloudy	None
940	300		596	6.35	6.11	12.82	223	71.6	Cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Erin Foley Sovcon
SAMPLER(S) SIGNATURES: Erin Foley
SAMPLING INITIATED AT: 0945
SAMPLING ENDED AT: 1000
PUMP OR TUBING DEPTH IN WELL (feet): 31'
SAMPLE PUMP FLOW RATE (mL per minute): 300
FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:
FIELD DECONTAMINATION (Y) N
FIELD FILTERED Y (N) FILTER SIZE ___ µm
Filtration Equipment Type:
DUPLICATE (Y) N

MATERIAL CODES: AG = Amber Glass CG = Clear Glass PE = Polyethylene PP = Polypropylene S = Silicone T = Teflon O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb? Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
CANCE - Devens	Ayer, MA	6-1-2010	10-09

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
	2			

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
1/4	Poly	Geopump	

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
10-42	41	41	1026	1108	GALLONS ~5 / LITERS

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1038	350	/	1042	4.32	5.99	13.95	703	42.9	Cloudy	None
1042	350	/	816	4.65	6.00	13.57	704	39.4	Cloudy	None
1047	350	/	587	4.70	6.00	13.68	704	40.7	Cloudy	None
1051	350	/	434	4.83	6.02	13.35	704	41.9	Cloudy	None
1055	350	/	344	4.76	6.03	13.52	702	43.5	Cloudy	None
1100	350	/	263	4.85	6.04	13.13	706	46.6	Cloudy	None
1105	350	/	199	4.58	6.09	13.30	701	48.8	Cloudy	None
1108	350	/	178	4.97	[illegible]	13.15	[illegible]	[illegible]	Cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
Josh Clifford Sovereign	[signature]	1110	1125

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
41	350	

FIELD DECONTAMINATION Y N — FIELD-FILTERED Y N — Filtration Equipment Type: — FILTER SIZE: .45 µm — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass CG = Clear Glass PE = Polyethylene PP = Polypropylene S = Silicone T = Teflon O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s); cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
Mansfield, MA 02048

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
Holyoke, MA 01040

PROJECT NAME: USACE - Devens	PROJECT LOCATION: Ayer, MA	DATE: 6-1-2010	WELL ID: 10-05
PROJECT NUMBER:	WELL DIAMETER (inches): 3/4	DEPTH TO WATER (feet): N/A	DEPTH TO BOTTOM (feet): N/A	PID READING (ppmv): N/A

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: GeoPump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02, 1" = 0.04, 1.25" = 0.06, 2" = 0.16, 3" = 0.37, 4" = 0.65, 5" = 1.02, 6" = 1.47, 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
50 - 52	51	51	1140	1223	GALLONS: ~5.5 LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1152	400	/	above [illegible] lim.	1.91	6.19	13.10	714	13.0	Clear	None
1158	400	/	" "	1.76	6.20	12.95	715	5.7	Cloudy	None
1203	400	/	1028	1.88	6.22	12.97	710	6.4	Cloudy	None
1208	400	/	725	2.00	6.23	12.78	714	4.3	Cloudy	None
1213	400	/	464	2.08	6.24	12.80	714	11.8	Cloudy	None
1218	400	/	371	2.12	6.24	12.66	713	14.1	Clear	None
1223	400	/	333	2.15	6.24	12.58	714	16.1	Clear	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
Ian Chaffee / Sovereign	[signature]	1225	1243

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
51	400	

FIELD DECONTAMINATION (Y) N — FIELD FILTERED (Y) N — Filtration Equipment Type: — FILTER SIZE: 45 µm — DUPLICATE: Y ( ) N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905 B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
USACE Devens	Ayer, MA	6-1-10	10-04

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
	3/4	N/A	N/A	N/A

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
1/4	Poly	Geopump	

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
60 - 62	61	61	1325	1358	GALLONS: ~5 LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1343	275	/	210	1.10	6.57	13.40	406	-54.0	Cloudy	None
1348	275	/	143	0.91	6.58	13.35	404	-55.2	Cloudy	None
1353	275	/	83.7	0.85	6.60	13.79	401	-57.0	Clear	None
1358	275	/	67.1	1.04	6.62	13.79	401	-58.3	Clear	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
Jonathan Chaffee / Sovereign	[signature]	1410	1415

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
61	275	

FIELD DECONTAMINATION: (Y) N — FIELD-FILTERED: (Y) N — FILTER SIZE: 45μm — Filtration Equipment Type: — DUPLICATE: Y (N)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

* Sampling area of gravel

Sovereign Consulting Inc.
5850 South Main Street, Suite 212
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
Holyoke, MA

PROJECT NAME: USACE - Devens	PROJECT LOCATION: Ayer, MA	DATE: 6-1-16	WELL ID: 16-09
PROJECT NUMBER:	WELL DIAMETER (inches): 3/4	DEPTH TO WATER (feet): NA	DEPTH TO BOTTOM (feet): NA
PID READING (ppmv): NA			

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED
70-72	71	71	1545	1625	GALLONS: 5; LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1605	450	NA	405	1.20	6.72	13.35	495	-48.8	Cloudy	None
1610	450	NA	275	1.08	6.69	13.23	445	-54.8	Cloudy	None
1615	450	NA	215	1.12	6.67	13.05	491	-58.4	Cloudy	None
1620	450	NA	93.0	1.17	6.66	13.10	489	-58.8	Clear	None
1625	450	NA	82.2	1.19	6.66	12.92	486	-58.6	Clear	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Timothy Chaffee / Sovereign	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1630	SAMPLING ENDED AT: 1640
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y / N	FIELD FILTERED: Y / N — FILTER SIZE: .45 µm — Filtration Equipment Type:	DUPLICATE: Y / N	

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
Mansfield, MA

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
USACE - Devens	Ayer, MA	6-1-16	10-09

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
	3/4"	NA	NA	NA

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
1/4	Poly	Geopump	

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS — LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	GALLONS / LITERS
80 - 82	81	81	1655	1730	

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 ml/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1700	400	NA	above 1750 limit	0.22	6.78	14.35	470	-33.3	Cloudy/Brown	None
1705	400	NA	791	0.88	6.72	13.68	435	-51.0	Cloudy	None
1712	400	NA	189	1.17	6.68	13.32	430	-53.8	Cloudy	None
1717	400	NA	107.8	1.15	6.67	13.44	428	-55.3	Cloudy	None
1725	400	NA	102.7	1.20	6.66	13.19	428	-57.1	Clear	None
~~1727~~	~~400~~	~~NA~~								
1730	400	NA	93.2	1.18	6.66	13.30	428	-57.3	Clear	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
Jonathan Challis / Sovereign		1735	

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (ml per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
81		

FIELD DECONTAMINATION (Y) N — FIELD-FILTERED (Y) N — FILTER SIZE 45 um — Filtration Equipment Type: — DUPLICATE Y (N)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc
Sovereign Consulting Inc

MONITORING WELL SAMPLING LOG

Low Flow Sampling

PROJECT NAME: DEVENS	PROJECT LOCATION: 139 W Main St., Ayer	DATE: 6.2.2010	WELL ID: 10-10
PROJECT NUMBER: AC001002	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):
PID READING (ppmv):			

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Peristaltic	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet): 10-12	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 11	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 14:15	PURGING ENDED AT:	TOTAL VOLUME PURGED: GALLONS / LITERS

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
14:20	700		50.1	10.75	7.35	12.56	142	50.5	Clear	—
14:24			11.8	10.74	6.99	11.18	133	45.3	Clear	—
14:28			2.50	10.93	6.73	10.89	130	56.2	Clear	—

* EPA stabilization parameters from EPA/540/S-95/504, April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Matt Crosby / SOVCON	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	

FIELD DECONTAMINATION Y N — FIELD FILTERED Y N — FILTER SIZE ___ µm — Filtration Equipment Type: — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
Crystal Springs Way, Suite # 201
Holyoke, MA 01040
413-540-0650

PROJECT NAME: DEVENS	PROJECT LOCATION: 139 W Main St. Ayer MA	DATE: 6-2-2010	WELL ID: 10-10
PROJECT NUMBER: ACOO1002	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):
PID READING (ppmv):			

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Peristaltic	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
20-22	21		14:55		GALLONS: LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
14:58	300		227	7.09	6.27	13.61	359	42.8	~~Clear~~ Foggy	—
15:06			29.6	7.31	6.21	11.97	375	47.0	Clear	—
15:10			17.1	7.39	6.19	11.75	376	50.9	Clear	—
15:13			11.8	7.45	6.17	11.49	375	53.9	Clear	—

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
Matt Crosby / SovCon			

PUMP OR TUBING DEPTH IN WELL (feet): — SAMPLE PUMP FLOW RATE (mL per minute): — FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION: Y / N — FIELD FILTERED: Y N — FILTER SIZE: µm — Filtration Equipment Type: — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.

PROJECT NAME: DEVENS	PROJECT LOCATION: 139 W. Main St. Ayer MA	DATE: 6·2·2010	WELL ID: 10·10
PROJECT NUMBER: AC001002	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet): / PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Peristaltic	PUMP EQUIPMENT MODEL & SERIAL #s:
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY		GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88		1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED
WELL SCREEN INTERVAL DEPTH (feet): 30-32	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 31	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 15:45 / PURGING ENDED AT: / GALLONS: / LITERS:

WATER LEVEL STABLIZATION DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
15:48	450		402	6.74	6.07	15.49	501	54.4	FOGGY	—
15:52			112	3.11	6.09	12.78	560	44.7	FOGGY	—
15:56			30.5	1.30	6.10	12.30	562	44.0	Clear	—
15:59			18.3	0.79	6.10	12.22	562	43.8	Clear	—
16:03			10.39	0.56	6.10	12.46	561	43.5	Clear	—

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Matt Coohn / Sovcon	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: ___ µm Filtration Equipment Type:		DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb? Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: DEVENS	PROJECT LOCATION: 139 W Main St. Ayer, MA	DATE: 6-2-2010	WELL ID: 10-10
PROJECT NUMBER: ACOO1 002	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet): / PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Peristaltic	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
40-42	41		16:15		GALLONS: LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
16:24	350		71.9	0.77	6.19	1358	517	10.1	Clear	—
16:28			35.7	0.39	6.19	1345	508	0.6	Clear	—
16:31			26.3	0.29	6.19	13.26	509	-3.8	Clear	—

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Matt Crosby / SOVCON	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION Y N	FIELD FILTERED Y N FILTER SIZE ____ µm Filtration Equipment Type:		DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
[illegible] South Main Street, Suite 20[illegible]
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite [illegible]
Holyoke, MA 01040
413-540-0650

PROJECT NAME: DEVENS		PROJECT LOCATION: 139 W Main St. Ayer, MA			DATE: 6-2-2010		WELL ID: 10.10
PROJECT NUMBER: AC001 002		WELL DIAMETER (inches):	DEPTH TO WATER (feet):		DEPTH TO BOTTOM (feet):	PID READING (ppmv):	

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Peristaltic		PUMP EQUIPMENT MODEL & SERIAL #s:
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88			1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED
WELL SCREEN INTERVAL DEPTH (feet): 50-52	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 51	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 16:52	PURGING ENDED AT:	GALLONS: / LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.33')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (us/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
17:05	450		257	0.64	6.26	14.00	588	-23.0	FOGGY	—
17:13			30.6	0.27	6.31	12.54	592	-32.5	Clear	—
17:16			23.1	0.26	6.31	1253	592	-338	Clear	—
17:19			260	0.26	6.32	12.59	594	-353	Clear	—

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Matt Costa / SAICON	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: ___ μm Filtration Equipment Type:		DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb? Y / N   PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
5056 South Main Street, Suite 202
Mansfield, MA 02048
508 339 3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413 540 0650

PROJECT NAME: DEVENS	PROJECT LOCATION: 139 W Main St. Ayer	DATE: 6.2.2010	WELL ID: 10-10
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Peristaltic	PUMP EQUIPMENT MODEL & SERIAL #s
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS: / LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88			1 GALLON = 3.785 LITERS / TOTAL VOLUME PURGED
WELL SCREEN INTERVAL DEPTH (feet): 60-62	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 61	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 17:56 [illegible] 18:15 / PURGING ENDED AT: / GALLONS: / LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
18:16	350		80.8	0.36	6.35	11.83	871	-37.6	Clear	—
18:21			95.0	0.32	6.34	12.06	877	-34.9	Clear	—
18:26			90.6	0.32	6.34	12.02	876	-44.3	Clear	—

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Matt Cot[illegible] SOVCON	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s	
FIELD DECONTAMINATION Y N	FIELD FILTERED Y N; Filtration Equipment Type:	FILTER SIZE: ___ µm	DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905D South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
1 Open Square Way, Suite 430
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
USACE DEVEN	Ayer, MA	6/3/10	10-10

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
AC001-002	3/4	NA	NA	NA

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #
1/4	Poly	geopump	

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	GALLONS / LITERS
70-72	71	71'	0810	08:32	

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

	TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) [+/- 0.33]*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH [+/- 0.1]*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
8:32	00:00	600	—	793	3.63	7.18	13.98	805	-2.4	tan	
:37	5		—	Er 3	0.47	6.51	13.00	800	-66	tan	
:42	10		—	Er 2	0.39	6.44	12.89	774	-82	tan	
:47	15			348	0.38	6.44	12.73	756	-87	tan	
:52	20			409	0.36	6.43	12.75	746	-84	tan	
57	25			228	0.36	6.41	12.78	739	-87	tan	
9:02	30			121	0.36	6.41	12.72	737	-85	tan	

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
WJB		09:05	

PUMP OR TUBING DEPTH IN WELL (feet): — SAMPLE PUMP FLOW RATE (mL per minute): — FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #:

FIELD DECONTAMINATION Y / N — FIELD-FILTERED Y N — FILTER SIZE: ___ µm — Filtration Equipment Type: — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Depth 071 — Refusal @ 72 or 73'

only 2 ft past last sample location and refusal

Sovereign Consulting Inc.
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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION			DATE	WELL ID
USACE - Devens	Ayer MA			6/3/10	10-08
PROJECT NUMBER: AC001-002	WELL DIAMETER (inches): 3/4	DEPTH TO WATER (feet): NA	DEPTH TO BOTTOM (feet): NA		PID READING (ppmv): NA

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
1/4	poly	geopump	

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	GALLONS / LITERS
	11'		11:15	11:26	

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

	TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
11:26	00:00	400	—	116	7.65	7.59	15.19	220	2.9	tan	
:31	5		—	65	6.99	7.25	12.37	193	7.0	tan	
:36	10			18.5	6.91	6.94	12.15	189	16.1	tan/clear	
:41	15			12.7	6.97	6.78	11.73	189	20.1	clear	

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT	SAMPLING ENDED AT
		11:43	

PUMP OR TUBING DEPTH IN WELL (feet) — SAMPLE PUMP FLOW RATE (mL per minute) — FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION (Y) N — FIELD FILTERED Y N — FILTER SIZE ____ µm — Filtration Equipment Type: — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

11'

Sovereign Consulting Inc.
905 South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
1 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: USACE - Devens	PROJECT LOCATION: Ayer, MA			DATE: 6/3/10	WELL ID: 10-08
PROJECT NUMBER: AC001-002	WELL DIAMETER (inches): 3/4	DEPTH TO WATER (feet): NA	DEPTH TO BOTTOM (feet): NA		PID READING (ppmv): NA

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: geopump	PUMP EQUIPMENT MODEL & SERIAL #s
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS / LITERS
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88		1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED
WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 21	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 12:04 / PURGING ENDED AT: 12:09 / GALLONS / LITERS

WATER LEVEL STABLIZATION DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

	TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
12:11	0	600		319	5.70	6.81	12.39	336	41.3	tanish	
12:16	5			816	4.67	6.65	10.99	335	32.1	tan	
12:21	10			110	4.67	6.56	10.89	334	32.6	tan	
12:26	15			81.5	4.67	6.53	10.75	335	32.4	tan/clear	
12:31	20			37.4	4.67	6.51	10.57	336	32.0	Clear	
	25			17.5	4.68	6.50	10.46	337	31.4	clear	
12:36											

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 12:38	SAMPLING ENDED AT: 12:46
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: ___ µm; Filtration Equipment Type:		DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb? Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905 D South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: USACE - Devens	PROJECT LOCATION: Ayer, MA	DATE: 10/3/16	WELL ID: 10-08
PROJECT NUMBER: AC001-002	WELL DIAMETER (inches): 3/4	DEPTH TO WATER (feet): NA	DEPTH TO BOTTOM (feet): NA · PID READING (ppmv): NA

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY		GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88		1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED
WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 31'	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 12:58 · PURGING ENDED AT: 13:27 · GALLONS: · LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

	TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
13:28	00:00	400		155	3.07	6.63	13.93	662	31.3	tan/clear	
13:33	5			133	0.50	6.48	12.81	660	6.2		
13:38	10			78.8	0.37	6.44	12.42	661	0.3		
13:43	15			62.9	0.32	6.44	12.08	661	-2.9		
13:48	20			44.4	0.31	6.43	12.57	660	-3.9		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 13:50	SAMPLING ENDED AT: 14:02
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N · FILTER SIZE: ___ µm · Filtration Equipment Type:		DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
1 Open Square Way, Suite 4102
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
USACE - Devens	Ayer, MA	6/3/10	10-08

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
AC001-002	3/4	NA	NA	NA

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
1/4	Poly	geopump	

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot) 0.75" = 0.02, 1" = 0.04, 1.25" = 0.06, 2" = 0.16, 3" = 0.37, 4" = 0.65, 5" = 1.02, 6" = 1.47, 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	GALLONS / LITERS
	41'		14:05	14:16	

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

	TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
14:17	00:00	600		430	0.64	6.44	14.30	757	-6.5	tan	
:22	5			254	0.27	6.43	12.01	767	-11.3	tan	
:27	10			173	0.27	6.43	12.17	768	-10.7	tan	
:32	15			92.2	0.26	6.43	12.01	765	-9.5	tan/clear	
:37	20			89.1	0.26	6.43	12.08	765	-10.1	clear	
:42	25			64.9	0.26	6.44	12.02	764	-8.6	clear	

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT	SAMPLING ENDED AT
		14:43	

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION (Y) N — FIELD-FILTERED Y N — FILTER SIZE ____ µm — Filtration Equipment Type — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass, CG = Clear Glass, PE = Polyethylene, PP = Polypropylene, S = Silicone, T = Teflon, O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905 South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: USACE - Devens	PROJECT LOCATION: Ayer, MA	DATE: 6/3/10	WELL ID: 10-08
PROJECT NUMBER: 4000-002 #4	WELL DIAMETER (inches): PVC, 3/4	DEPTH TO WATER (feet): NA	DEPTH TO BOTTOM (feet): NA
PID READING (ppmv): NA			

PURGING DATA

TUBING DIAMETER (inches): .14	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: geopump	PUMP EQUIPMENT MODEL & SERIAL #s: ----
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) x WELL CAPACITY		GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88		1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED
WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 51'	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 15:03
PURGING ENDED AT: 15:30	GALLONS:	LITERS:	

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

	TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
15:32	00:00	600		84.1	0.56	6.49	13.99	946	-18	tan	
:37	5			221	0.31	6.53	12.15	968	-28	tan/clear	
:42	10			~~[illegible]~~	0.30	6.54	11.20	967	-38	tan/clear	
:47	15			535	0.29	6.55	11.83	966	-44	tan	
:52	20			380	0.24	6.55	11.75	965	-46	tan	
	25			344	0.24	6.57	11.78	965	-47	tan/clear	
16:02	30			321	0.24	6.56	11.60	964	-42	tan/clear	

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 16:04	SAMPLING ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N; FILTER SIZE: μm; Filtration Equipment Type:	DUPLICATE: Y N	

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb?: Y / N   PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
MONITORING WELL SAMPLING LOG
Low Flow Sampling

PROJECT NAME: USACE - ~~Ayer~~ Devens		PROJECT LOCATION: Ayer, MA			DATE: 6/3/10		WELL ID: 10-08
PROJECT NUMBER: AC001-007		WELL DIAMETER (inches): 3/4	DEPTH TO WATER (feet): NA		DEPTH TO BOTTOM (feet): NA		PID READING (ppmv): NA

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: geopump		PUMP EQUIPMENT MODEL & SERIAL #:	
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY				GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75 = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88				1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED
WELL SCREEN INTERVAL DEPTH (feet): 61'	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 16:10	PURGING ENDED AT: 17:00 (rain sto...)	GALLONS: LITERS:

WATER LEVEL STABLIZATION DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
17:09	NM		19.4	1.10	6.63	15.18	846	-41	Clear	
:14			14.3	0.98	6.61	15.17	831	-42	Clear	
:19			37.4	0.90	6.59	15.00	344	-43	Clear	

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 17:20	SAMPLING ENDED AT: 17:43
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (ml per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #:	
FIELD DECONTAMINATION: Y N	FIELD FILTERED: Y N Filtration Equipment Type:	FILTER SIZE: μm	DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Refusal at 64', EOB

Sovereign Consulting Inc.
905C South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: SHL - USACE	PROJECT LOCATION: Ayer, MA	DATE: 6/7/10	WELL ID: IC C2
PROJECT NUMBER: ACCU F 002	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet): / PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches):	TUBING MATERIAL CODE (see below):	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet): 23-25	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 024	PURGING INITIATED AT:	PURGING ENDED AT:	GALLONS: LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
0925	500	—	28.4	2.12	5.98	11.96	844	77.1	Clear	NA
0930	500	—	13.2	0.78	6.16	11.32	778	41.1	"	"
0935	"	—	4.87	0.55	6.23	11.24	776	30.2	"	"
0940	"	—	2.48	0.43	6.27	11.20	777	25.6	"	"
0945	"	—	2.80	0.41	6.29	11.08	776	24.3	"	"

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 0950	SAMPLING ENDED AT: —

PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION: Y N — FIELD FILTERED: Y N — FILTER SIZE: .45 µm — Filtration Equipment Type: — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
5008 South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: USACE - DEVENS	PROJECT LOCATION: Ayer MA		DATE:	WELL ID: 10-02
PROJECT NUMBER: 1C001-002	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet): NA	PID READING (ppmv): NA

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: geopump	PUMP EQUIPMENT MODEL & SERIAL #: NA
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS: / LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88			1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED
		034		10:50	GALLONS: LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µs/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1015	500	—	915	1.50	6.48	12.10	824	18.3		
1023	—	—	303	0.50	6.40	11.66	819	11.9		
1027	—	—	107.7	0.45	6.39	11.63	819	13.7		
1030	—	—	56.0	0.39	6.39	11.54	818	15.0		
1034	—	—	27.6	0.34	6.39	11.37	819	14.8		
1037	—	—	17.5	0.31	6.39	11.59	818	14.6		
1040	—	—	13.4	0.29	6.39	11.48	818	14.6		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1042	SAMPLING ENDED AT: 1050
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: ___ µm Filtration Equipment Type:		DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb?: Y / N   PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

MONITORING WELL SAMPLING LOG

Low Flow Sampling

PROJECT NAME: LSACL DEVENS	PROJECT LOCATION: Ayer, MA	DATE: 6/7/2010	WELL ID: 10-02
PROJECT NUMBER: A001-002	WELL DIAMETER (inches): 3/4	DEPTH TO WATER (feet): NA	DEPTH TO BOTTOM (feet): NA
PID READING (ppmv): NA			

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): poly	PURGE PUMP TYPE: geopump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.66; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED GALLONS / LITERS
		0441			

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1105	600	—	Max out of range	0.97	6.56	12.00	789	16.0	cloudy	
1111	—	—	out of range	0.60	6.49	11.74	787	6.2	cloudy	
1114	—	—	out of range	0.51	6.47	11.78	786	2.6	cloudy	
1117	—	—	782	0.42	6.46	11.60	782	3.9		
1120	—	—	484	0.41	6.46	11.64	782	4.7		
1123	—	—	208	0.37	6.46	11.56	778	9.0		
1126	—	—	113	0.34	6.45	11.44	777	10.0		
1130	—	—	65.2	0.29	6.45	11.30	778	10.8		
1133	—	—	41.1	0.28	6.46	11.27	777	11.3		

* EPA stabilization parameters from EPA/540/S-95/504, April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
		1135	1140

PUMP OR TUBING DEPTH IN WELL (feet): — SAMPLE PUMP FLOW RATE (mL per minute): — FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION: Y N — FIELD-FILTERED: Y N — FILTER SIZE: µm — Filtration Equipment Type: — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.

PROJECT NAME: USACE - Devens	PROJECT LOCATION: Ayer, MA	DATE: 6/7/2010	WELL ID: 10-02
PROJECT NUMBER: Pool Ool	WELL DIAMETER (inches): 3/4	DEPTH TO WATER (feet): NA	DEPTH TO BOTTOM (feet): NA
PID READING (ppmv): NA			

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: geopump	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS / LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02, 1" = 0.04, 1.25" = 0.06, 2" = 0.16, 3" = 0.37, 4" = 0.65, 5" = 1.02, 6" = 1.47, 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 054	PURGING INITIATED AT	PURGING ENDED AT	GALLONS / LITERS

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.33)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1157	500	—	MAX OUT ~~800~~ Range	2.48	6.72	12.34	764	20.2		
1200	—	—	OUT OF ~~800~~ Range	0.76	6.59	12.34	764	3.5		
1203	—	—	OUT OF ~~800~~ Range	0.59	6.55	12.28	764	-1.2		
1206	—	—	OUT OF ~~800~~ Range	0.50	6.53	12.31	764	-4.6		
1210	—	—	714	0.44	6.51	12.24	762	-4.7		
1213	—	—	436	0.39	6.51	11.84	761	-2.6		
1217	—	—	205	0.36	6.51	11.68	757	0.1		
1220	—	—	137	0.32	6.51	11.79	758	1.3		
1223	—	—	87.3	0.30	6.51	12.08	758	2.2		
1225	—	—	85.7	0.29	6.50	12.09	757	2.6		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996.

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT: 1127	SAMPLING ENDED AT: 1132
PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s	

FIELD DECONTAMINATION (Y) N — FIELD FILTERED Y N — FILTER SIZE ___ µm — Filtration Equipment Type — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass CG = Clear Glass PE = Polyethylene PP = Polypropylene S = Silicone T = Teflon O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
[illegible] South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: USACE-Devens	PROJECT LOCATION: Ayer, MA	DATE: 6/7/2016	WELL ID: 10-02
PROJECT NUMBER: AL001-002	WELL DIAMETER (inches): 3/4	DEPTH TO WATER (feet): N/A	DEPTH TO BOTTOM (feet): [illegible]
PID READING (ppmv): NA			

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: geopump	PUMP EQUIPMENT MODEL & SERIAL #s:
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY		GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88		1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED
WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 064	PURGING INITIATED AT:
PURGING ENDED AT:	GALLONS:	LITERS:	

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1245	400	—	452	1.57	6.66	12.36	973	16.5		
1250	—	—	Out of range	1.35	6.62	12.36	971	9.8		
1255	—	—	Out of range	0.77	6.55	12.21	965	-16.1		
1300	—	—	1012	0.59	6.55	12.13	967	-16.5		
1305	—	—	660	0.66	6.55	11.99	967	-15.1		
1307	—	—	454	0.71	6.55	12.01	965	-14.7		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1308	SAMPLING ENDED AT: 1313
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD FILTERED: Y N — Filtration Equipment Type:	FILTER SIZE: ____ µm	DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well!? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: USACE - Devens	PROJECT LOCATION: Ayer, MA		DATE: 6/7/2010	WELL ID: 10-02
PROJECT NUMBER: AL001-002	WELL DIAMETER (inches): 3/4	DEPTH TO WATER (feet): N/A	DEPTH TO BOTTOM (feet):	PID READING (ppmv): NA

PURGING DATA

TUBING DIAMETER (inches): 1/2	TUBING MATERIAL CODE (see below): poly	PURGE PUMP TYPE: geopump		PUMP EQUIPMENT MODEL & SERIAL #s:
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88			1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED
WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 074	PURGING INITIATED AT:	PURGING ENDED AT: / GALLONS: / LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1440	400	—	out of range	1.55	6.78	13.29	2575	28.4		
1445	—	—	out of range	0.74	6.49	12.41	2565	16.5		
1450	—	—	out of range	0.62	6.48	12.30	2561	14.1		
1455	—	—	out of range	0.48	6.47	12.15	2547	5.2		
1500	—	—	out of range	0.36	6.46	12.13	2547	-3.2		
1503	—	—	out of range	0.32	6.47	12.07	2550	-5.5		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:		SAMPLING INITIATED AT: 1505	SAMPLING ENDED AT: 1510
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:		
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N / Filtration Equipment Type:	FILTER SIZE: μm	DUPLICATE: Y N	

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb?: Y / N   PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS

Sovereign Consulting Inc. [illegible]

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc. [illegible]

PROJECT NAME: USACE Devens	PROJECT LOCATION: Ayer, MA		DATE: 6/7/2010	WELL ID: 10-02
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches):	TUBING MATERIAL CODE (see below): poly	PURGE PUMP TYPE: geopump	PUMP EQUIPMENT MODEL & SERIAL #s:	
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88			1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED
WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 084	PURGING INITIATED AT: / PURGING ENDED AT:	GALLONS: / LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1745	400	—	out of range	0.96	6.55	13.02	2857	-49.0		
1748	—	—	out of range	0.88	6.54	12.96	2858	-50.2		
1752	—	—	out of range	0.73	6.54	12.70	2862	-52.3		
1756	—	—	out of range	0.54	6.55	12.63	2866	-54.2		
1800	—	—	out of range	0.48	6.56	12.52	2869	-55.7		
1805	—	—	987	0.37	6.57	12.55	2865	-58.3		
1810	—	—	out of range	0.31	6.57	12.37	2863	-60.8		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1812	SAMPLING ENDED AT: 1817
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION Y N	FIELD-FILTERED: Y N FILTER SIZE: ___ µm Filtration Equipment Type:		DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb?: Y / N   PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

...gn Consulting Inc.
...th Main Street, Suite 202
...nstead, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

	PROJECT LOCATION			DATE 6/8/2010	WELL ID SHM-10-02
...MBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)	

PURGING DATA

...G DIAMETER (...es)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS — LITERS

WELL CAPACITY (Gallons Per Foot): 0.75' = 0.02; 1' = 0.04; 1.25' = 0.06; 2' = 0.16; 3' = 0.37; 4' = 0.65; 5' = 1.02; 6' = 1.47; 12' = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
		94	8:50		GALLONS: LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
0	300		278	2.06	5.42	13.27	2573	-6.9		
5			144	1.59	5.51	12.87	2842	-12.9		
10			484	1.40	5.54	12.78	2877	-22.2		
15			out of range	1.23	5.59	12.65	2832	-61.9		
20			"	1.17	5.63	12.54	2823	-57.9		
25			"	1.16	5.67	12.57	2826	-75.9		
30			"	1.15	5.70	12.54	2831	-77.9		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
		9:25	

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION Y N — FIELD FILTERED: Y N — FILTER SIZE ___ µm — Filtration Equipment Type: — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
1 Open Square Way, Suite 030
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION		DATE 6/8/2010	WELL ID SHM-10-02
PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	GALLONS: / LITERS:
		102	9:45		

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
5			out of range	1.00	5.91	14.95	2762	-142.8		
10				0.91	6.04	15.02	2734	-222.1		
15				0.88	6.11	17.14	2622	-155.5		
				0.82	6.26	14.33	2345	-169.9		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT 10:10	SAMPLING ENDED AT
PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s	

FIELD DECONTAMINATION: Y N — FIELD-FILTERED: Y N — FILTER SIZE: ___ µm — Filtration Equipment Type: — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
1 Open Square Way Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE 6/8/2010	WELL ID SHM-10-01

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS — LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet) ~~10~~ 14	PURGING INITIATED AT 12:25	PURGING ENDED AT	GALLONS / LITERS

WATER LEVEL STABLIZATION DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (mS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
5	100		59.8	8.5	6.38	14.16	33	44.0		
10			61.8	8.13	6.22	13.40	33	49.9		
15			18.7	8.32	6.17	13.39	26	50.1		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT: 1240	SAMPLING ENDED AT

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION Y N — FIELD FILTERED Y N — FILTER SIZE ___ μm — Filtration Equipment Type — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass CG = Clear Glass PE = Polyethylene PP = Polypropylene S = Silicone T = Teflon O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb?: Y / N   PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION		DATE 6/4/2010	WELL ID SHM-10-04
PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s	
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS	LITERS
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88			1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 24	PURGING INITIATED AT 1:45 / PURGING ENDED AT	GALLONS / LITERS

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
5	300		44.3	6.30	6.25	13.35	.33	66.7		
10			10.30	6.20	6.16	13.21	.33	68.1		
15			4.05	6.22	6.07	12.88	.34	73.4		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT: 1400	SAMPLING ENDED AT
PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION Y N	FIELD FILTERED Y N FILTER SIZE ___ μm Filtration Equipment Type:		DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb? Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME:	PROJECT LOCATION:	DATE: 6/5/2010	WELL ID: SHM-10-04
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02, 1" = 0.04, 1.25" = 0.06, 2" = 0.16, 3" = 0.37, 4" = 0.65, 5" = 1.02, 6" = 1.47, 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED: GALLONS: / LITERS:
		34	1425		

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
5	400		131	4.97	6.04	12.35	45	65.1		
10			102.7	3.62	5.86	11.67	44	62.3		
15			169	3.49	5.80	11.24	44	63.2		
20			109	3.47	5.77	11.18	44	58.1		
25			617	3.48	5.74	11.16	44	55.9		
30			421	3.17	5.73	11.22	44	59.5		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
		1450	

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION Y N — FIELD-FILTERED Y N — FILTER SIZE ____ µm — Filtration Equipment Type: — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass CG = Clear Glass PE = Polyethylene PP = Polypropylene S = Silicone T = Teflon O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well!? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME		PROJECT LOCATION		DATE 6/5/2006	WELL ID SHM-16-09
PROJECT NUMBER		WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (See below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS / LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
		44	1455		GALLONS: LITERS

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
5	400		15.4	2.01	5.27	11.60	209	103.1		
10			10.54	1.65	5.18	11.76	224	113.4		
15			29.3	1.52	5.13	11.57	224	114.4		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
		1510	

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION Y N — FIELD-FILTERED Y N — FILTER SIZE ___ um — Filtration Equipment Type — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass CG = Clear Glass PE = Polyethylene PP = Polypropylene S = Silicone T = Teflon O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
1 Fourth Street Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
		6/8/2015	SHM-10-07

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED GALLONS: / LITERS:
		54	1515		

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
5	300		69.7	2.41	5.18	12.41	566	53.1		
10			186.2	0.75	5.31	12.11	633	54.8		
15			91.8	0.56	5.34	11.67	645	52.0		
20			654	0.43	5.39	11.43	641	27.6		
25			795	0.43	5.39	11.45	643	22.7		
30			784	0.42	5.46	11.29	644	21.9		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT:	SAMPLING ENDED AT
		~~[illegible]~~ 1550	

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION Y N — FIELD-FILTERED Y N — Filtration Equipment Type: — FILTER SIZE ___ um — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
Sovereign Consulting Inc.

MONITORING WELL SAMPLING LOG

Low Flow Sampling

PROJECT NAME	PROJECT LOCATION			DATE 6/18/2016	WELL ID SHMW-GW
PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)	

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE		PUMP EQUIPMENT MODEL & SERIAL #	
WELL VOLUME PURGE: 1 WELL VOLUME (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY				GALLONS	LITERS
WELL CAPACITY (Gallons Per Foot) 0.75 = 0.02, 1" = 0.04, 1.25" = 0.06, 2" = 0.16, 3" = 0.37, 4" = 0.65, 5" = 1.02, 6" = 1.47, 12" = 5.88				1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED
WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet) 60	PURGING INITIATED AT 1600	PURGING ENDED AT	GALLONS / LITERS

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 ml/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1612	400	—	450	1.60	5.57	13.37	837	149		
1617	"	—	458	0.75	5.47	12.18	855	269	Cloudy	—
1620	"	—	375	0.69	5.44	11.97	859	298	"	
1623	"	—	175	0.55	5.42	11.66	856	306		
1625	"		245	0.57	5.40	11.58	856	308		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT @ 1625	SAMPLING ENDED AT
PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #	
FIELD DECONTAMINATION Y N	FIELD FILTERED Y N FILTER SIZE ___ μm; Filtration Equipment Type		DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb? Y / N   PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
90-B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
5 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE 6/8/2010	WELL ID SHM-16-04

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT:	PURGING ENDED AT	GALLONS: / LITERS:
		~14	1042		

WATER LEVEL STABLIZATION DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1045	500		out of Range	0.62	5.97	12.97	903	-103.5		
1048			out of Range	0.37	6.29	12.42	929	-88.7		
1051			1.35	0.48	6.36	11.65	940	-81.3		
1054			2.50	0.46	6.33	11.51	939	-80.7		
1057			3.07	0.46	6.34	11.42	938	-81.2		
1701			70.3	0.43	6.31	11.28	937	-84.0		
1706			out of Range	0.40	6.30	11.23	935	-88.5		
1711				0.36	6.26	11.17	935	-91.6		

* EPA stabilization parameters from EPA/540/S-95/504, April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
		1715	

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION Y N — FIELD FILTERED Y N — FILTER SIZE ___ µm — Filtration Equipment Type: — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicon; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

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Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION		DATE	WELL ID
			6/6/2016	SHM-16-04

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
		34	1720		GALLONS: LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1733	500		out of range	1.77	6.32	13.36	605	-36.1		
1738			368	0.40	6.13	11.39	603	-23.7		
1743			out of range	0.35	6.06	11.51	605	-31.1		
1748				0.32	6.01	11.53	798	-46.7		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
		1750	

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION: Y N — FIELD-FILTERED: Y N — FILTER SIZE: ___ µm — Filtration Equipment Type: — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
[illegible] Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
[illegible] Way, Suite [illegible]
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
		6/28/2022	SHM-[illegible]

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED GALLONS / LITERS
		94	1500		

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1505	500		out of range	0.46	6.18	12.47	1024	-70.9		
1510				0.33	6.24	12.72	1107	-95.0		
1515				0.30	6.26	12.73	1513	-117.1		
1520				0.29	6.28	12.51	2057	-124.2		
1525				0.29	6.29	12.37	2153	-144.6		
1530				0.29	6.33	12.05	2445	-150.9		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
		1530	

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION: Y N — FIELD-FILTERED: Y N — FILTER SIZE: ____ µm — Filtration Equipment Type: — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC?: Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well?: Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.

PROJECT NAME:	PROJECT LOCATION:			DATE: 6/9/2010	WELL ID: SHM-10-05
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):	

PURGING DATA

TUBING DIAMETER (inches):	TUBING MATERIAL CODE (see below):	PURGE PUMP TYPE:	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02, 1" = 0.04, 1.25" = 0.06, 2" = 0.16, 3" = 0.37, 4" = 0.65, 5" = 1.02, 6" = 1.47, 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 15	PURGING INITIATED AT: 945	PURGING ENDED AT: 9:47	GALLONS: LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

	TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
09:47	0:00	500		3.23	1.67	8.03	14.52	115	36.5	Clear	
:52	5			3.01	0.69	7.00	13.06	109	80.3	clear	
:57	10			1.08	0.79	6.32	12.82	109	100.9	clear	

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: WJB / CMH	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 09:58	SAMPLING ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION Y N	FIELD FILTERED Y N FILTER SIZE ___ µm; Filtration Equipment Type:		DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC?: Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well?: Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
Mansfield, MA

Sovereign Consulting Inc.

MONITORING WELL SAMPLING LOG

Low Flow Sampling

PROJECT NAME	PROJECT LOCATION	DATE 6/9/10	WELL ID [illegible]-05

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED GALLONS: / LITERS:
	25'		10:10	10:12	

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

	TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (mS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
10:12	0	500		13.6	4.90	6.52	17.45	218	84	tan	
10:17	5			4.98	1.78	6.01	13.03	242	77	tan/clear	
10:22	10			3.54	1.77	5.85	12.55	242	73	Clear	

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
WJB / CMH		10:25	

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION Y N — FIELD-FILTERED Y N — FILTER SIZE ___ μm — Filtration Equipment Type: — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS

Sovereign Consulting Inc.
[illegible]
Mansfield, MA [illegible]
[illegible]

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
[illegible]
Holyoke, MA [illegible]
[illegible]

PROJECT NAME	PROJECT LOCATION		DATE 6/9/10	WELL ID 10-05
PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s	
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS	LITERS
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88			1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED
WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 35'	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT: 10:36 / PURGING ENDED AT: 10:41	GALLONS / LITERS

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

	TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
10:41	0	500		53.8	3.65	6.38	17.80	240	-19	tan/clear	
:46	5			23.9	1.43	6.26	13.64	214	-51	clear	
:51	10			17.8	1.45	6.21	13.25	214	-56	clear	

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: LJB	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT: 10:53	SAMPLING ENDED AT
PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s	
FIELD DECONTAMINATION Y N	FIELD FILTERED Y N FILTER SIZE ____ µm; Filtration Equipment Type		DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS

Sovereign Consulting Inc.
[illegible]
Mansfield, MA 02048
[illegible]

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
[illegible]
Holyoke, MA 01040
[illegible]

PROJECT NAME	PROJECT LOCATION	DATE 6/9/10	WELL ID 10-05
PROJECT NUMBER	WELL DIAMETER (inches) / DEPTH TO WATER (feet) / DEPTH TO BOTTOM (feet)		PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS — LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED GALLONS / LITERS
	45'		11:04	11:06	

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

	TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
11:06	0	575		152	4.52	6.23	15.60	254	-50	greenish-tan	sulfuric
11:11	05			54.7	2.15	6.18	13.24	256	-60	greenish-tan / clear	
11:16	10			47.2	2.28	6.17	[illegible].20	255	-64	clear	
11:21	15			36.9	2.24	6.17	[illegible].76	255	-68	clear	

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
WJB		11:24	

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION: Y N — FIELD FILTERED: Y N — FILTER SIZE: ___ µm — Filtration Equipment Type: — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
[illegible]
[illegible]
[illegible]

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
[illegible]
Holyoke, MA 01040
[illegible]

PROJECT NAME	PROJECT LOCATION	DATE 6/9/16	WELL ID 10-05
PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet) / PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #
WELL VOLUME PURGE: 1 WELL VOLUME (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY		GALLONS	LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	GALLONS / LITERS
	55'				

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)

* EPA stabilization parameters from EPA/540/S-95/504, April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: µm Filtration Equipment Type:		DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS

* OB due to concentrations detected in 35'
sample slop @ 54-55'.

Sovereign Consulting Inc
Mansfield, MA

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc

PROJECT NAME	PROJECT LOCATION		DATE 6/4/10	WELL ID [illegible]-05A
PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS | LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02, 1" = 0.04, 1.25" = 0.06, 2" = 0.16, 3" = 0.37, 4" = 0.65, 5" = 1.02, 6" = 1.47, 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	GALLONS / LITERS
	29'		13:03	13:07	

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

	TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µs/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
13:07	0	400		11.0	9.45	6.55	21.89	740	62.9	clear	
13:12	5			1.53	9.70	6.13	17.04	1150	57.8	clear	
13:17	10			1.52	9.42	6.00	16.24	1194	63.2	clear	

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
WJB		13:20	

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION Y N — FIELD-FILTERED Y N — FILTER SIZE: ___ µm — Filtration Equipment Type: — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: DTW ~28'

Sovereign Consulting Inc.
Mansfield, MA

Sovereign Consulting Inc.
Holyoke, MA 01040

MONITORING WELL SAMPLING LOG

Low Flow Sampling

PROJECT NAME	PROJECT LOCATION	DATE 6/4/10	WELL ID ?-05A
PROJECT NUMBER	WELL DIAMETER (inches) / DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS — LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	GALLONS: / LITERS:
	39'		13:33	13:38	

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

	TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
13:38	0	500		615	3.77	5.95	15.63	236	77	tan	
13:43	5			209	3.09	5.41	15.06	190	98	tan	
13:48	10			265	2.85	5.74	15.12	193	107	tan	
13:53	15			11.4	3.01	5.29	14.65	196	110	tan/clear	
13:58	20			16.7	2.96	5.74	14.84	194	117	tan/clear	
14:03	25			57.7	2.79	5.22	14.72	209	110	clear	

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
WJB		14:05	

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION: Y N — FIELD-FILTERED: Y N — FILTER SIZE: µm — Filtration Equipment Type: — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
[illegible]
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
[illegible]
[illegible] MA [illegible]

PROJECT NAME	PROJECT LOCATION	DATE 6/9/10	WELL ID 11-05A

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
	49'		14:20	14:26	GALLONS: LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

	TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
14:26	0	400		462	8.13	5.75	16.06	207	54		
:31	5			742	6.74	5.85	14.91	186	43		
:36	10			270	6.10	5.85	14.65	180	55		
:41	15			92.2	5.56	5.81	14.57	178	69		
:46	20			48.7	5.14	5.77	[illegible].34	177	74		
	25			39.0	4.87	5.81	14.29	177	76		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
WJB		14:55	

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION: Y N — FIELD FILTERED: Y N — FILTER SIZE: ___ µm — Filtration Equipment Type: — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc
[illegible]
Mansfield, MA 02048
[illegible]

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc
[illegible]
Holyoke, MA 01040
[illegible]

PROJECT NAME	PROJECT LOCATION	DATE 6/9/10	WELL ID 10-05A

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
	59'		15:14	15:04	GALLONS: LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

	TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
15:24	0	400		Er 1	3.58	6.17	14.77	206	43	tan	
15:29	5			Er 2	1.61	6.20	14.68	211	32	tan	
15:34	10			Er 1	1.67	6.13	14.57	210	32	tan	
15:39	15	replaced batteries		~~Er~~ 164	1.65	6.03	14.10	211	28	tan	
15:44	20			44.3	1.72	5.99	14.07	209	35	tan/clear	
15:49	25			33.7	1.75	6.19	13.95	209	35	tan/clear	
15:54	30			32.9	1.73	6.18	13.89	208	21	tan/clear	

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
		15:57	

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #S

FIELD DECONTAMINATION Y N — FIELD-FILTERED Y N — FILTER SIZE ___ µm — Filtration Equipment Type — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.

PROJECT NAME	PROJECT LOCATION	DATE 6/9/10	WELL ID 10-05A
PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS — LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	GALLONS / LITERS
	69'		16:10		

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)

* Unable to get location to produce H_2O consistently - needed to hand pump to collect sample

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
WJB		1715	

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION Y N — FIELD FILTERED Y N — FILTER SIZE ___ µm — Filtration Equipment Type — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Everidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

MONITORING WELL SAMPLING LOG

Low Flow Sampling

PROJECT NAME	PROJECT LOCATION	DATE 6/9/10	WELL ID 10-05A

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS — LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	GALLONS / LITERS
	79'		18:00		

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)

* EPA stabilization parameters from EPA/540/S-95/504, April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION Y N — FIELD FILTERED Y N — FILTER SIZE ___ µm — Filtration Equipment Type — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: No readings, silted up clogged screen
stopped @ 18:45

Sovereign Consulting Inc. / Mansfield, MA — Sovereign Consulting Inc. / Holyoke, MA

MONITORING WELL SAMPLING LOG

Low Flow Sampling

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
		6/9/10	10-05A

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED: GALLONS / LITERS
-	89-		19:07		

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
WTD		19:20	

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION Y N — FIELD-FILTERED Y N — FILTER SIZE: ___ μm — Filtration Equipment Type: — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sampled @ 19:20 : Sample w/ no readings due to siltation

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE 6/9/10	WELL ID 10-05A

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS — LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED GALLONS / LITERS
	99'		19:30		

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
WJB		19:40	

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #

FIELD DECONTAMINATION: Y N — FIELD-FILTERED: Y N — FILTER SIZE: ___ um — Filtration Equipment Type: — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: no readings

Monitoring Well Sample Log

Low Flow Sampling

Client/Project Name:		Sovereign Consulting Inc. 4 Open Square Way Suite #307 Holyoke, MA 01040 413-540-0650
Project Location:	PROJECT #:	
	WELL ID: 10-05A	

109'

Purge Data

Date:

Start time:_____ **Stop time:**_____ **Sample time:**_____
Pump Rate:_____ (ml/m) **Depth Sampled:**_____
Total time purged:_____ **Sampler:**_____
Volume Purged:_____ (ltr)
Purge Device: Dedicated / Nondedicated **Weather:**_____
Device Type: Bladder / Peristaltic / Submersible
Appearance:
Well Yield: High / Moderate / Low / Dry
Comments:

Sample Data

Container	Quantity	Preservative

Refusal @ 110.5' EOB

Field Parameter Data

Instrument ID#

Water Level (ft)	Time	Flow Rate (ml/min)	Turbidity (ntu)	Dissolved Oxygen (mg/L)	pH	Temp. (deg C)	Specific Conductivity (uS/cm)	ORP(mV)
	Sampled		@					

Well Condition Checklist (circle appropriate item(s), cross out if not applicable)

General Condition: Good / Needs Repair
Well Cap: Good / Broken / None
Evidence of rain water between steel and PVC?: Y / N
Evidence of ponding around well?: Y / N
Gopher type holes around collar?: Y / N
Comments:

Is well plumb?: Y / N
Lock: Good / Broken / None
PVC Riser: Good / Damaged / None
Concrete collar: OK / Cracked / Leaking / None

Sovereign Consulting Inc.
Mansfield, MA

Sovereign Consulting Inc.

MONITORING WELL SAMPLING LOG

Low Flow Sampling

PROJECT NAME	PROJECT LOCATION	DATE 6/10/2011	WELL ID 003

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS — LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	GALLONS / LITERS
		29	800		

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
815	300		5.77	6.28	6.72	10.30	748	128.4		
820			3.77	6.93	6.14	10.12	797	52.6		
825			63.20	7.03	6.07	10.01	799	79.5		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
		825	

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION Y N — FIELD-FILTERED Y N — FILTER SIZE ___ um — Filtration Equipment Type: — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS

3

MONITORING WELL SAMPLING LOG

Low Flow Sampling

PROJECT NAME	PROJECT LOCATION	DATE 6/[illegible]/2010	WELL ID SHM 10-03
PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet) / PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS / LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED: GALLONS / LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT:	PURGING ENDED AT:
		39	845	

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
847	300		456	422	5.96	10.79	1533	56.8		
851			745	2.71	6.09	10.77	1497	31.6		
856			616	2.39	6.19	10.57	1495	11.1		
901			442	2.43	6.24	10.45	1903	10.6		
906			196	2.50	6.28	10.37	1913	17.7		
911			901	2.57	6.29	10.50	1916	24.2		
915			59.8	2.03	6.30	10.27	1916	29.4		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
		920	

PUMP OR TUBING DEPTH IN WELL (feet) — SAMPLE PUMP FLOW RATE (mL per minute) — FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION Y / N — FIELD-FILTERED: Y N — FILTER SIZE: µm — Filtration Equipment Type: — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s); cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
Holyoke, MA 01040

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
		6/16/20[illegible]	[illegible]

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	GALLONS / LITERS
		49	930		

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (μS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
935	300		333	1.95	6.26	10.97	2396	27.5		
940			42.5	2.19	6.29	10.65	2574	33.0		
945			749	2.00	6.31	10.41	2565	17.6		
950			798	1.91	6.32	10.41	2563	12.[illegible]		
955			628	1.97	6.34	10.35	2560	13.0		
1000			401	2.00	6.35	10.36	2563	11.5		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
		[illegible]	

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION Y N — FIELD-FILTERED Y N — FILTER SIZE ___ μm — Filtration Equipment Type: — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS

Sovereign Consulting Inc. [illegible]

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc. 4 Open Square Way, Suite #307, Holyoke, MA [illegible]

PROJECT NAME	PROJECT LOCATION		DATE 6/14/2020	WELL ID SHMW-03
PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE:	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS — LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
		59	1010		GALLONS / LITERS

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1020	500		out of range	1.39	6.35	11.12	3215	-56.5		
1025			453	0.88	6.45	11.11	3252	-15.5		
1030			out of range	0.92	6.49	10.87	3220	-27.4		
1035			out of range	0.85	6.51	10.74	3207	-39.7		
1040			out of range	0.86	6.53	10.69	3212	-10.7		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT	SAMPLING ENDED AT
		1040	

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION Y N — FIELD FILTERED Y N — FILTER SIZE ___ µm — Filtration Equipment Type: — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Mansfield, MA 02048

MONITORING WELL SAMPLING LOG

Low Flow Sampling

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
		6/28/2010	SMW-203

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS — LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
		69	1050		GALLONS: LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1100	500		out of range	2.03	6.61	11.23	3382	-71.7		
1105			out of range	0.54	6.64	11.06	3491	-69.7		
1110			out of range	0.53	6.67	11.03	3462	-75.8		
1115			184	0.51	6.70	10.82	3475	-79.4		
1120			65.9	0.52	6.72	10.79	3476	-78.6		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
		1120	

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s

FIELD DECONTAMINATION Y N — FIELD FILTERED Y N — FILTER SIZE ____ µm — Filtration Equipment Type — DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

WELL DEVELOPMENT DATA FORM

WELL ID: SHM-10-06

SITE: Devens Fort

PROJECT NO.: AC001

PUMP TYPE & MODEL: Waterra Hydrolift I

START TEAM MEMBER: PJV + CMH

DATE: 6/24/[illegible]

TIME: 0915

WEATHER: 85° Sunny + Humid

1. INITIAL READINGS

START TIME: 1430

Stickup ≈ 2.80 ft

WELL DIAMETER (INCHES)	PID WELL HEAD (PPM)	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	PRODUCT THICKNESS (FEET)	DEPTH TO SCREEN (FEET)	PUMP DEPTH (FEET)	WELL VOLUME (Gallons) (Milliliters)
1.5	NA	1989	76.60	NA	NA	70	75 start	5.2

2. DEVELOPMENT READINGS

	TIME (MINUTES)	RATE (gal/min) (ml/min)	DEPTH TO WATER (FEET)	ORP (mV)	D.O. (mg/L)	pH (S.U.)	TEMP (degrees C)	SP COND. (uS/cm)	Turb (NTU)	Volume (gal) (ml)	Appearance (Silty) (Clear)
	15										Silty
	[illegible]									3.5	
[illegible]	32	0.35								7	
[illegible]	[illegible]									10.5	
	[illegible]									14.0	
[illegible]	58									17.5	
[illegible]	62			-92.9	0.70	5.80	11.20	758	Er 2	19.5	
[illegible]	73			-134.9	1.96	6.43	11.29	725	OR	24.5	
34.6	80			-133.3	1.74	6.50	11.27	711	OR	27.5	
951	83			-140.9	1.59	6.52	11.37	696	OR	28.0	
254	86			-145.4	0.84	6.53	11.42	688	OR	29.0	
400	90			-148.4	0.94	6.55	11.37	680	OR	31.5	

3. POST-DEVELOPMENT

END TIME: 1600

TOTAL TIME (MINUTES)	TOTAL VOL (gallons) (millilietrs)	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)
90	31.5	19.92	81.2

ADDITIONAL NOTES:
Er2/OR = Out of Range

WELL DEVELOPMENT DATA FORM

WELL ID: SHM-10-06A

SITE: Fort Devens SHL

PROJECT NO.: AC001

PUMP TYPE & MODEL: Waterra HydroLift II

START TEAM MEMBER: PJV / GMH

DATE: 6/30/10

TIME: 0930

WEATHER: 75° Sunny

1. INITIAL READINGS

START TIME: 0938

Stickup ≈ 2.5'

WELL DIAMETER (INCHES)	PID WELL HEAD (PPM)	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	PRODUCT THICKNESS (FEET)	DEPTH TO SCREEN (FEET)	PUMP DEPTH (FEET)	WELL VOLUME (Gallons) (Milliliters)
1.5	NA	35.28	87.30	NA	NA	77	≈82 1.5 start	4.8

2. DEVELOPMENT READINGS

TIME (MINUTES)	RATE (gal/min) (ml/min)	DEPTH TO WATER (FEET)	ORP (mV)	D.O. (mg/L)	pH (S.U.)	TEMP (degrees C)	Sp COND. (uS/cm)	Turb (NTU)	Volume (gal) (ml)	Appearance (Silty) (Clear)
10	0.35								3.5	Silty
16	0.58								7.0	
22									10.5	
28									14.0	
33									17.5	
38	0.7								21.0	Cloudy
¥ 43									24.5	Cloudy
48									28.0	Silty
53									31.5	Silty
58								492	35.0	Cloudy
63								397	38.5	Cloudy
→ 68									42.0	
73			-31.4	2.68	6.34	10.68	342	802	——	
80			-38.6	0.72	6.37	10.62	305	854	45.5	
88			-43.3	0.49	6.37	10.67	280	795	49.0	
92			-44.1	1.43	6.39	10.67	285	795	50.0	
94			-43.7	2.40	6.37	10.63	280	653	51.0	

3. POST-DEVELOPMENT

END TIME: 1115

TOTAL TIME (MINUTES)	TOTAL VOL (gallons) (millilietrs)	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)
95	51.0	35.3	84.1

ADDITIONAL NOTES:

¥ Lowered Pump Inlet

→ Put onto Flow Cell of YSI

WELL DEVELOPMENT DATA FORM

WELL ID: SHM-10-01

SITE: Fort Devens S/L

PROJECT NO.: ACOO1

PUMP TYPE & MODEL: Waterra Hydro Lift II

START TEAM MEMBER: PSV + CMH

DATE: 6/30/10

TIME: 1350

WEATHER: 75° Sunny

1. INITIAL READINGS

START TIME: 1352

WELL DIAMETER (INCHES)	PID WELL HEAD (PPM)	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	PRODUCT THICKNESS (FEET)	DEPTH TO SCREEN (FEET)	PUMP DEPTH (FEET)	WELL VOLUME (Gallons) (Millileters)
1.5	NA	4.57	67.7	NA	NA	60	65 start	3.9

Stick up 3.51

2. DEVELOPMENT READINGS

TIME (MINUTES)	RATE (gal/min) (ml/min)	DEPTH TO WATER (FEET)	ORP (mV)	D.O. (mg/L)	pH (S.U.)	TEMP (degrees C)	SP COND. (uS/cm)	Turb (NTU)	Volume (gal) (ml)	Appearance (Silty) (Clear)
5	0.7								3.5	Brown
8	1.2								7.0	Cloudy
* 12	0.88								10.5	Clear
16									14.0	Silty
20									17.5	Cloudy
24									21.0	Cloudy
27	1.2								24.5	
30									28.0	
→ 40			33.8	0.70	5.92	11.22	315	OR	30.5	RB Tint
42			12.8	0.54	6.09	11.22	315	OR	31.5	
~~2:45~~ 47	0.7		-0.9	0.42	6.19	11.24	315	OR	35.0	
52			-6.0	0.65	6.22	11.29	315	1016	38.5	
58			-8.4	0.72	6.24	11.23	315	732	42.0	
60			-8.2	0.96	6.24	11.24	315	688	43.5	

3. POST-DEVELOPMENT

END TIME: 1452

TOTAL TIME (MINUTES)	TOTAL VOL (gallons) (millilietrs)	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)
60	43.5	4.55	71.8

ADDITIONAL NOTES:

* Lowered Pump Inlet

→ Connected YSI

OR = Out of Range

WELL DEVELOPMENT DATA FORM

WELL ID: ~~SM~~ SHM-10-03

SITE: Fort Devens

PROJECT NO.: AC001

PUMP TYPE & MODEL: Waterra Hydrolift I

START TEAM MEMBER: PSV, CMH

DATE: 7/1/2010

TIME: 1230

WEATHER: Sunny, 75°F

1. INITIAL READINGS

START TIME: 1305

WELL DIAMETER (INCHES)	PID WELL HEAD (PPM)	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	PRODUCT THICKNESS (FEET)	DEPTH TO SCREEN (FEET)	PUMP DEPTH (FEET)	WELL VOLUME (Gallons) (Milliliters)
1.5	NA	26.71	~~26.71~~ 67.25	NA	NA	60	65 START	3.8

Stickup 2'

2. DEVELOPMENT READINGS

TIME (MINUTES)	RATE (gal/min) (ml/min)	DEPTH TO WATER (FEET)	ORP (mV)	D.O. (mg/L)	pH (S.U.)	TEMP (degrees C)	COND. (uS/cm)	Turb (NTU)	Volume (gal) (ml)	Appearance (Silty) (Clear)
7									35	Silty
13	058								70	
* 24									140	Cloudy
30									175	Silty
34								904	210	Cloudy
1400 Restart after refilling Generator w/ Gas										
44								980	280	Cloudy
→ 52								216	350	Clear
63								976	385	Cloudy
74			-28.1	37.82	6.57	10.33	3580	OR	420	
80			-32.8	36.78	6.57	10.37	3584	OR	450	
83			-34.0	47.87	6.57	10.31	3583	OR	460	
86			-34.9	44.09	6.57	10.33	3581	OR	475	
90			-34.5	52.76	6.57	10.34	3579	OR	490	

3. POST-DEVELOPMENT

END TIME: 1455

TOTAL TIME (MINUTES)	TOTAL VOL (gallons) (millilietrs)	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)
90	490	26.77	64.30

ADDITIONAL NOTES:

* Lowered Pump Inlet

→ Connected YSI

OR = Over Range

WELL DEVELOPMENT DATA FORM

WELL ID: SHM 10 10

SITE: Fort Devens

PROJECT NO.: AC001

PUMP TYPE & MODEL: Waterra Hydrolift I

START TEAM MEMBER: PJV + CMH

DATE: 7/1/10

TIME: 0930

WEATHER: 75° Sunny

1. INITIAL READINGS

START TIME: 0438

WELL DIAMETER (INCHES)	PID WELL HEAD (PPM)	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	PRODUCT THICKNESS (FEET)	DEPTH TO SCREEN (FEET)	PUMP DEPTH (FEET)	WELL VOLUME (Gallons) (Milliliters)
1.5	NA	11.07	61.05	NA	NA	56	60 Start	4.6

Stickup = 2'

2. DEVELOPMENT READINGS

	TIME (MINUTES)	RATE (gal/min) (ml/min)	DEPTH TO WATER (FEET)	ORP (mV)	D.O. (mg/L)	pH (S.U.)	TEMP (degrees C)	Sp COND. (uS/cm)	Turb (NTU)	Volume (gal) (ml)	Appearance (Silty) (Clear)
	8	0.44								3.5	Silty
	12	0.88								7.0	Silty
	15									10.5	
	20									14.0	
	24									17.5	Cloudy
	28									21.0	Clear
*	33									24.5	Silty
	36									28.0	Cloudy
*	40									31.5	Cloudy
	44									35.0	
	48									38.5	
	53								OR	42.0	
→	58									45.5	Cloudy
	60			-31.0	2.76	6.55	11.17	740	OR	46.5	
	63			-57.9	4.46	6.12	11.21	730	OR	48.0	
	66			-66.7	3.13	6.16	11.18	726	OR	49.0	
	69			-86.2	5.50	6.35	11.12	722	OR	51.0	
	72			-94.4	2.11	6.40	11.12	716	OR	52.5	
	75			-96.2	1.57	6.42	11.15	711	OR	54.0	

3. POST-DEVELOPMENT

END TIME: 1055

TOTAL TIME (MINUTES)	TOTAL VOL (gallons) (millilietrs)	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)
75	54.0	11.07	66.40

ADDITIONAL NOTES:
* Lowered Pump Inlet
→ Connected YSI
OR = OUT of Range

WELL DEVELOPMENT DATA FORM

WELL ID: SHM-10-08

SITE: Fort Devens

PROJECT NO.: ACOOI

PUMP TYPE & MODEL: Waterra Hydro Lift I

START TEAM MEMBER: PJV

DATE: 7/2/10

TIME: 0815

WEATHER: 75° Sunny

1. INITIAL READINGS

START TIME: 0825

WELL DIAMETER (INCHES)	PID WELL HEAD (PPM)	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	PRODUCT THICKNESS (FEET)	DEPTH TO SCREEN (FEET)	PUMP DEPTH (FEET)	WELL VOLUME (Gallons) (Millileters)
1.5	NA	9.99	54.35	NA	NA	46	53 START	4

Stickup = 2'

2. DEVELOPMENT READINGS

TIME (MINUTES)	RATE (gal/min) (ml/min)	DEPTH TO WATER (FEET)	ORP (mV)	D.O. (mg/L)	pH (S.U.)	TEMP (degrees C)	COND. (uS/cm)	Turb (NTU)	Volume (gal) (ml)	Appearance (Silty) (Clear)
5									3.5	Silty
9	0.78								7.0	Silty
21									17.5	Cloudy
25	0.88								21.0	
* 28								827	24.5	
32									28.0	Silty
42								687	38.5	Cloudy
45								908	42	
48								469	45.5	Clear
51								273	49.0	
→ 56			-19.2	0.86	6.35	10.43	1141	OR	51.0	Silty
60			-36.2	1.45	6.38	10.43	1143	OR	53.0	
63			-48.7	5.90	6.41	10.43	1142	OR	55.0	Cloudy
67			-57.2	1.67	6.41	10.42	11.43	OR	57.0	
70			-63.4	1.19	6.40	10.42	11.43	OR	59.0	

3. POST-DEVELOPMENT

END TIME: 0935

TOTAL TIME (MINUTES)	TOTAL VOL (gallons) (millilietrs)	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)
70	59.0	9.45	56.2

ADDITIONAL NOTES:

* Lowered Pump Inlet

→ Connected YSI

OR - Out of Range

High Pressure on gripper cap - Initial DTW may be high

Sovereign Consulting Inc
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: Fort Devens SHL	PROJECT LOCATION: Devens, MA		DATE: 7-7-10	WELL ID: SHM06A
PROJECT NUMBER: AC001	WELL DIAMETER (inches): 1.5"	DEPTH TO WATER (feet): ~~35.2~~ 35.28	DEPTH TO BOTTOM (feet): 89.1	PID READING (ppmv): NA

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder Pump	PUMP EQUIPMENT MODEL & SERIAL #s: QED Controller -1057

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: 4.6 — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet): 89-79'	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 84'	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 84'	PURGING INITIATED AT: 0800	PURGING ENDED AT: 0850	TOTAL VOLUME PURGED GALLONS: LITERS: .25

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet): 35.28

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
20 min	25	R-22 D-8 50PSI 125ft Reg 200 PSI	35.28	35.28	Yes	500

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
825	25	35.28	20.9	1.68	6.51	19.33	205	-20.1	Clear	None
830	25	35.28	14.2	1.77	6.51	19.46	206	-20.5	Clear	None
835	25	35.28	11.3	1.78	6.51	19.48	206	-20.9	Clear	None
840	25	35.28	8.15	1.38	6.50	19.59	207	-21.5	Clear	None
845	25	35.28	6.44	1.52	6.51	19.67	209	-22.5	Clear	None
850	25	35.28	5.38	1.49	6.51	19.74	209	-22.6	Clear	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: ERIN FOLEY Sov Con	SAMPLER(S) SIGNATURES: Erin Foley	SAMPLING INITIATED AT: 0850	SAMPLING ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet): 35.28	SAMPLE PUMP FLOW RATE (mL per minute): 25 ml/min	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	

FIELD DECONTAMINATION: Y N — FIELD-FILTERED: Y N — Filtration Equipment Type: — FILTER SIZE: ____ µm — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Temp wells Sample Time 0900

Sovereign Consulting Inc.
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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: Fort Devens SHL	PROJECT LOCATION: Ayer MA			DATE: 7/8/10	WELL ID: 10-06
PROJECT NUMBER: AC001	WELL DIAMETER (inches): 1.5	DEPTH TO WATER (feet): 19.99	DEPTH TO BOTTOM (feet): 81.2		PID READING (ppmv): NA

PURGING DATA

TUBING DIAMETER (inches): 1.5	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder		PUMP EQUIPMENT MODEL & SERIAL #s: QED Controller - 1057	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY				GALLONS	LITERS
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88				1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 71-81	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 75	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 75	PURGING INITIATED AT: 0715	PURGING ENDED AT: 0835	GALLONS: LITERS 0.9

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet): 20.00

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
20	25	R-8 D-4 50/125 Reg PSI -200	20.00	20.00	Yes	150
30	25	" " "	20.00	20.00	Yes	750

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.33')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
0:50	25 ml/min	20.00	33.3	1.23	6.61	21.06	740	-88	Cloudy	None
0:55	25	20.00	25.3	0.78	6.61	21.50	744	-90.7	Cloudy	None
0:60	25	20.00	14.0	0.87	6.61	21.58	752	-91.1	Cloudy	None
1:05	25	20.00	17.0	0.68	6.61	21.63	752	-91.7	Cloudy	None
1:10	25	20.00	19.3	0.73	6.61	21.70	754	-92.1	Cloudy	None
1:15	25	20.00	21.4	0.55	6.62	21.74	754	-93.8	Cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Brittany Smith Sovereign	SAMPLER(S) SIGNATURES: [signature] Sovereign	SAMPLING INITIATED AT: 0840	SAMPLING ENDED AT: 0915
PUMP OR TUBING DEPTH IN WELL (feet): 75	SAMPLE PUMP FLOW RATE (ml per minute): 25	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s: YSI 556 Lamott 2020e - PN26858	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: 45 µm Filtration Equipment Type: Inline		DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: H_2O turned Reddish after some time

WELL DEVELOPMENT DATA FORM

WELL ID: SHM-10-04
SITE: A(001-002
PROJECT NO.: Ft. Devens
PUMP TYPE & MODEL: Waterra

START TEAM MEMBER: BAS, DEE
DATE: 7/6/10
TIME: 1430pm -
WEATHER: 95°F Sunny

1. INITIAL READINGS START TIME: 1450

WELL DIAMETER (INCHES)	PID WELL HEAD (PPM)	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	PRODUCT THICKNESS (FEET)	DEPTH TO SCREEN (FEET)	PUMP DEPTH (FEET)	WELL VOLUME (Gallons) (Millileters)
1½	—	7.86	53.30	—	—			~4

2. DEVELOPMENT READINGS

TIME (MINUTES)	RATE (gal/min) (ml/min)	DEPTH TO WATER (FEET)	ORP (mV)	D.O. (mg/L)	pH (S.U.)	TEMP (degrees C)	Spec COND. (uS/cm³)	Turb (NTU)	Volume (gal) (ml)	Appearance (Silty) (Clear)
5	0.70								3.5	~~Cloudy~~ S
7	1.75								8 7	Silty
* 13	1.17								14	
19	1.17								21	
* 31	~~0.23~~ 1.17								28	Cloudy
* 37	1.17								35	Silty backing
* 43	1.17								42	
→ 54	1.17		35.6	28.10	5.91	10.95	498	MAX	45	Silty
61	1.17		33.5	4.08	5.97	10.91	501	MAX	48	
65	~~1.17~~		28.8	1.78	6.00	11.28	502	MAX	50	
70			27.7	1.67	6.01	11.30	503	MAX	52	
75			19.9	1.83	6.02	11.33	505	MAX	55	

3. POST-DEVELOPMENT END TIME:

TOTAL TIME (MINUTES)	TOTAL VOL (gallons) (millilietrs)	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)
75	55	6.72	64.26

ADDITIONAL NOTES:
* lowered tubing
→ hooked up YSI

WELL DEVELOPMENT DATA FORM

WELL ID: SHM-10-02
SITE: A00-002
PROJECT NO.: Ft. Devens
PUMP TYPE & MODEL: Waterra

START TEAM MEMBER: BAS, DEE
DATE: 7/6/10
TIME: 1030 hrs - 1300 hrs
WEATHER: 95°F Sunny

1. INITIAL READINGS

START TIME: 1110

WELL DIAMETER (INCHES)	PID WELL HEAD (PPM)	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	PRODUCT THICKNESS (FEET)	DEPTH TO SCREEN (FEET)	PUMP DEPTH (FEET)	WELL VOLUME (Gallons) (Millileters)
1 1/2	—	18.06	60.20	—	—			~4

2. DEVELOPMENT READINGS

TIME (MINUTES)	RATE (gal/min) (ml/min)	DEPTH TO WATER (FEET)	ORP (mV)	D.O. (mg/L)	pH (S.U.)	TEMP (degrees C)	Spec. COND. (uS/cm³)	Turb (NTU)	Volume (gal) (ml)	Appearance (Silty) (Clear)
8	0.44								3.5	Silty
17	0.41								7.0	Silty
36	0.37								14.0	Silty
* 55	0.37								21.0	Cloudy
70	0.20		80.5	3.34	6.17	13.78	849	MAX	24.0	Cloudy
75	0.20		19.5	4.73	6.28	14.41	850	1023	25.0	Cloudy
80	0.20		26.0	[illegible]	6.24	14.28	852	718	26	less cloudy
85	0.40		14.5	2.03	6.32	14.09	881	770	28	less cloudy
90	0.20		14.2	3.66	6.31	14.80	850	800	29	
95	0.20		12.7	4.90	6.34	14.36	850	658	30	
100	0.20		12.8	6.70	6.33	14.50	851	871	31	
~~105~~									~~32~~	
~~110~~									~~33~~	
				3.04						

3. POST-DEVELOPMENT

END TIME: ~~1300~~ DE 1250

TOTAL TIME (MINUTES)	TOTAL VOL (gallons) (millilietrs)	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)
100	31	18.09	64.57

ADDITIONAL NOTES:
* hooked up YSI

WELL DEVELOPMENT DATA FORM

WELL ID: SHM-10-05A

SITE: Ft. Devens

PROJECT NO.: AC001-002

PUMP TYPE & MODEL: Waterra

START TEAM MEMBER:

DATE: 7/7/10

TIME: 0925 - 1040

WEATHER:

1. INITIAL READINGS

START TIME: 0925

WELL DIAMETER (INCHES)	PID WELL HEAD (PPM)	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	PRODUCT THICKNESS (FEET)	DEPTH TO SCREEN (FEET)	PUMP DEPTH (FEET)	WELL VOLUME (Gallons) (Millileters)
1½	—	25.86	58.30	—	—	50	55-60	3

2. DEVELOPMENT READINGS

TIME (MINUTES)	RATE (gal/min) (ml/min)	DEPTH TO WATER (FEET)	ORP (mV)	D.O. (mg/L)	pH (S.U.)	TEMP (degrees C)	spec. COND. (uS/cm)	Turb (NTU)	Volume (gal) (ml)	Appearance (Silty) (Clear)
5									3.5	Silty → Cloudy
10									7	Cloudy
30			~~88.6~~	~~9.71~~	~~5.29~~				28	Cloudy
35			88.6	9.71	5.29	16.10	229	MAX	29	
40			56.1	10.55	5.71	14.95	228	MAX	30	
45			49.0	10.36	5.78	15.69	223	MAX	31	
50			40.4	10.28	5.92	15.25	222	MAX	32	
55			36.6	10.17	5.98	15.45	220	MAX	33	
60			33.3	11.75	6.03	15.73	218	MAX	34	
65			33.6	10.07	6.02	15.01	218	MAX	35	
70			33.1	10.76	6.03	15.28	220	MAX	36	
75			31.5	10.68	6.03	15.32	220	MAX	37	

3. POST-DEVELOPMENT

END TIME: 1040

TOTAL TIME (MINUTES)	TOTAL VOL (gallons) (millilietrs)	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)
75	37	25.86	59.90

ADDITIONAL NOTES:

* moved tubing to furthest depth

→ Set up YSI

Sovereign Consulting Inc.
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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: Fort Deven's	PROJECT LOCATION: Ayer MA	DATE: 7/13/10	WELL ID: SHM-10-b
PROJECT NUMBER: ACOO1	WELL DIAMETER (inches): 1.5	DEPTH TO WATER (feet): 11.14	DEPTH TO BOTTOM (feet): 66.4	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/2	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Peristaltic	PUMP EQUIPMENT MODEL & SERIAL #s: Geopump 509

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: 3.32 LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet): 56-66	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 60	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 60	PURGING INITIATED AT: 1414	PURGING ENDED AT: 1514	TOTAL VOLUME PURGED: GALLONS: LITERS: 36

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
5	450	600 RPM Drive - 75% Speed	11.14	11.18		2L
10	450	" "	11.18	11.18	Y	5L
15	450	" "	11.18	11.18	Y	7L

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
20	450	11.18	6.25	0.95	7.05	12.10	655	24.2	Clear	None
25	450	11.18	5.57	0.80	6.70	11.79	657	30.5	"	"
30	450	11.18	5.64	0.91	6.63	12.06	658	24.3		
35	450	11.18	6.61	0.68	6.62	11.83	660	21.4		
40	"	"	7.11	0.84	6.61	11.90	659	22.9		
45	"	"	8.02	0.88	6.60	12.13	658	22.6		
50	"	"	6.84	0.89	6.61	12.12	657	25.6		
55	"	"	5.34	0.88	6.61	12.08	658	26.6		
60	"	"	4.52	0.85	6.61	12.10	658	28.7		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Philip Villeneuve SovCon	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: ~~1515~~ 1515	SAMPLING ENDED AT: 1600
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s: YSI 556 30F08]H01 Lamotte 2020 ME14843	
FIELD DECONTAMINATION: Y N (Y circled)	FIELD-FILTERED: Y N (Y circled) FILTER SIZE: 0.45 µm; Filtration Equipment Type: Inline		DUPLICATE: Y N (Y circled)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s); circle N if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: DUP - D71310-U+F

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: ~~AC001~~ Ft. Devens | PROJECT LOCATION: Ayer, MA | DATE: 7/13/10 | WELL ID: SHM-10-01

PROJECT NUMBER: AC001 | WELL DIAMETER (inches): | DEPTH TO WATER (feet): 4.57 | DEPTH TO BOTTOM (feet): 71.8 | PID READING (ppmv): NA

PURGING DATA

TUBING DIAMETER (inches): 1/2 | TUBING MATERIAL CODE (see below): PE | PURGE PUMP TYPE: Peristaltic | PUMP EQUIPMENT MODEL & SERIAL #s: Geopump 509

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY | GALLONS: 6.2 | LITERS: 23.5

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 | 1 GALLON = 3.785 LITERS | TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet): 62-72 | INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 65 | FINAL PUMP OR TUBING DEPTH IN WELL (feet): 65 | PURGING INITIATED AT: 1020 | PURGING ENDED AT: 1025 | GALLONS: 7.4 | LITERS: 28

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
5	450	0-600 RPM drive, 63% speed	4.57	4.61		3L
~~10~~ 5	400	0-600 RPM drive 63% speed dial	4.61	4.61	Y	5L
5	400	"	461	461	Y	7L

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
~~1025~~	~~450~~									
25	400	4.61	15.1	2.24	6.62	12.86	299	58.8	Clear	None
30	400	4.61	13.6	0.46	6.08	12.59	298	76.1	Clear	None
35	400	4.61	10.45	0.32	5.98	12.66	298	72.3	Clear	None
40	400	4.61	7.10	0.26	6.00	12.48	298	70.7	"	"
45	400	4.61	6.41	0.23	6.09	12.40	297	68.1	"	"
50	400	4.61	5.44	0.20	6.11	12.42	298	66.7	"	"
55	400	4.61	4.83	0.18	6.14	12.37	298	66.4	"	"
60	400	4.61	4.89	0.19	6.18	12.39	297	65.4	"	"
65	400	4.61	3.34	0.18	6.19	12.35	297	63.5	"	"

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Philip Villeneuve SovCon | SAMPLER(S) SIGNATURES: | SAMPLING INITIATED AT: 1125 | SAMPLING ENDED AT: 1205

PUMP OR TUBING DEPTH IN WELL (feet): 65 | SAMPLE PUMP FLOW RATE (mL per minute): 400 ml/min | FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s: YSI 30F08H01 Lamotte 2020e ME 14843

FIELD DECONTAMINATION: (Y) N | FIELD-FILTERED: (Y) N | FILTER SIZE: 0.45 µm | Filtration Equipment Type: Inline Flow | DUPLICATE: Y (N)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s) correct if not complete)

Type: Flush Mount (Stand Pipe) | General Condition: (Good) / Needs Repair | Well Caps: (Good) / Broken / None | Lock: Good / Broken / (None)

Evidence of Rain Water Between Steel & PVC? Y / (N) | Is Well Plumb? (Y) / N | PVC Riser: (Good) / Damaged / None

Evendence of Ponding Around Welll? (Y) / N | Concrete Collar: (Good) / Cracked / Leaking / None

REMARKS: MS/MSD

Sovereign Consulting Inc.
905B South Main Street, Suite 202
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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: Fort Deven's	PROJECT LOCATION: Ayer Mass	DATE: 7/14/10	WELL ID: 10-04
PROJECT NUMBER: ACOO1	WELL DIAMETER (inches): 1.5	DEPTH TO WATER (feet): 6.61	DEPTH TO BOTTOM (feet): 65
PID READING (ppmv): NA			

PURGING DATA

TUBING DIAMETER (inches): 1/2 | TUBING MATERIAL CODE (see below): PE | PURGE PUMP TYPE: Peristaltic | PUMP EQUIPMENT MODEL & SERIAL #s: Geopump 509

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY | GALLONS: 3.50 | LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 | 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
55-65	60	60	0950	1100	GALLONS: LITERS: 32

WATER LEVEL STABLIZATION DEPTH TO WATER WITH PUMP (feet): 6.61

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0-10	500	0-350 RPM Drive 75% Speed	6.61	6.73		5L
10-15	500	" "	6.73	6.73	Y	2.5L
15-20	500	" "	6.73	6.73	Y	2.5L

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
25	500	6.73	5.76	0.64	654	11.18	677	26.6	Clear	None
30	500	6.73	5.26	0.48	6.52	10.92	674	24.5	"	"
35	500	6.72	7.32	0.27	6.47	10.94	665	21.5		
40	500	6.72	8.09	0.26	644	10.94	659	19.7		
45	500	6.72	6.95	0.26	6.42	11.03	653	19.3		
50	500	6.72	15.20	0.21	638	10.88	646	18.4		
55	500	6.73	20.70	0.31	6.39	10.92	639	14.2		
60	500	6.73	16.70	0.22	6.37	10.85	637	11.9		
63	500	6.73	17.4	0.23	637	10.80	632	11.4		
66	500	6.73	18.7	0.25	6.36	10.84	630	10.1		
69	500	6.73	17.7	0.23	6.37	10.82	630	9.9		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Philip V. Lenarue Sov Con	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 1100	SAMPLING ENDED AT: 1130
PUMP OR TUBING DEPTH IN WELL (feet): 60	SAMPLE PUMP FLOW RATE (mL per minute): 500	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s: YSI 556 30F08H01 Lamotte 2020e ME 14843	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N Filtration Equipment Type: Inline	FILTER SIZE: 0.45 µm	DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s); cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS: MS/MSD

Sovereign Consulting Inc.
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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: Ft Devens | PROJECT LOCATION: Ayer MA | DATE: 7/14/2010 | WELL ID: SHM-10-03

PROJECT NUMBER: AC001.02 | WELL DIAMETER (inches): 1.5 | DEPTH TO WATER (feet): 26.42 | DEPTH TO BOTTOM (feet): 70 | PID READING (ppmv): NA

PURGING DATA

TUBING DIAMETER (inches): 1/2 | TUBING MATERIAL CODE (see below): PE | PURGE PUMP TYPE: Peristaltic | PUMP EQUIPMENT MODEL & SERIAL #s: Geopump 509

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY | GALLONS: 2.59 | LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 | 1 GALLON = 3.785 LITERS | TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet): 60-70 | INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 65 | FINAL PUMP OR TUBING DEPTH IN WELL (feet): 65 | PURGING INITIATED AT: ~~1345~~ 1400 | PURGING ENDED AT: 1526 | GALLONS: | LITERS: 5L

WATER LEVEL STABLIZATION | DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0-5	100	600 RPM Drive Full speed Check Valve	26.82	26.83		1 L
5-10	20	" " "	26.83	26.83	Y	350ml
10-15	70	" " "	26.83	26.83	Y	350ml

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
30	70	26.83	525	2.21	6.62	16.61	3339	82.9	Clear	None
37	70	26.83	44.4	3.31	6.62	16.37	3336	89.0	"	"
44	70	26.83	39.3	4.23	6.61	16.44	3332	89.6	"	"
51	70	26.83	40.8	3.43	6.60	16.01	3366	89.4	"	"
58	70	26.83	39.6	3.35	6.62	15.56	3343	80.7	"	"
65	70	26.43	35.5	1.54	6.62	15.78	3332	77.2	"	"
72	70	26.83	31.4	1.45	6.61	15.97	3328	75.9	"	"
79	70	26.83	32.3	1.51	6.61	15.98	3339	75.7	"	"
86	70	26.83	31.7	1.47	6.60	16.09	3331	75.7	"	"

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Philip Villeneuve SovCon | SAMPLER(S) SIGNATURES: | SAMPLING INITIATED AT: 1530 | SAMPLING ENDED AT:

PUMP OR TUBING DEPTH IN WELL (feet): 65 | SAMPLE PUMP FLOW RATE (mL per minute): 70 | FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s: YSI 556 30F0 8H01 Lamotte 2020e ME14843

FIELD DECONTAMINATION: Y N | FIELD FILTERED: Y N | FILTER SIZE: 0.45 µm | Filtration Equipment Type: Inline | DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe | General Condition: Good / Needs Repair | Well Caps: Good / Broken / None | Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N | Is Well Plumb?: Y / N | PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N | Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

DUP-071410-F+U

Sovereign Consulting Inc.
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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
AC001	Ft Devens, Ayer, MA	7/15/10	SHM-10-05A

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
	1.5"	25.88	59.80	

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
3/4"	PE	PERI	

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
50-60	55'	55'	0935	10:58	GALLONS: LITERS: 5

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
10	170	0.600rpm, speed dial 100%	25.88	25.91		5 L
15	100	" "	25.91	25.91		1L
20	100	" "	25.91	25.91		2L

	TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
10:05	30	100	25.91	11.3	2.75	6.36	17.71	220	20.3	clear	none
10	35	100	25.91	11.6	2.27	6.32	17.60	205	22.8		
15	40	100	25.91	7.86	2.03	6.27	17.90	196	25.1		
20	45	80	25.91	6.61	1.96	6.27	18.21	190	27.2		
25	50	80	2591	5.10	1.75	6.27	18.43	188	28.0		
(	55	80	25.91	5.17	1.46	6.30	18.64	187	29.6		
35	60	90	2591	5.37	1.43	6.29	18.87	187	31.3		
40	65	90	25.91	5.12	1.42	6.29	19.06	186	31.7		

* EPA stabilization parameters from EPA/540/S-95/504, April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
Carolyn Hoadley Sovereign	Carolyn Hoadley	10:40	1125

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
55	90	

FIELD DECONTAMINATION (Y) N — FIELD-FILTERED (Y) N — FILTER SIZE: ___ µm — Filtration Equipment Type: — DUPLICATE Y (N)

MATERIAL CODES AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: (Flush Mount) / Stand Pipe — General Condition: (Good) / Needs Repair — Well Caps: (Good) / Broken / None — Lock: Good / Broken / (None)

Evidence of Rain Water Between Steel & PVC? Y / (N) — Is Well Plumb? (Y) N — PVC Riser: Good / Damaged / (None)

Evendence of Ponding Around Well? Y / (N) — Concrete Collar: (Good) / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
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Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: Fort Devens	PROJECT LOCATION: Ayer MA		DATE: 7/15/10	WELL ID: SHM-10-08
PROJECT NUMBER: AC001	WELL DIAMETER (inches): 1.5	DEPTH TO WATER (feet): 9.41	DEPTH TO BOTTOM (feet): 56.2	PID READING (ppmv): NA

PURGING DATA

TUBING DIAMETER (inches): 1/2	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Peristaltic		PUMP EQUIPMENT MODEL & SERIAL #s: Geopump 466

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: 2.4 — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
46-56	50	50	1410	1505	GALLONS: LITERS: 27.5

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0-5	600	600 RPM Drive 75% speed	9.41	9.46		4L
5-10	500	600 RPM Drive 66% Speed	9.46	9.46	Y	2.5L
10-15	500	" "	9.46	9.46	Y	2.5L

TIME	FLOW RATE (mL/min)	DEPTH TO WATER (feet)	TURBIDITY (NTU)	DISSOLVED OXYGEN (mg/L)	pH	TEMP (°C)	SPECIFIC CONDUCTIVITY (uS/cm)	ORP (mV)	COLOR (describe)	ODOR (describe)
(3-5 minutes)*	(100-500 mL/min)*	(+/- 0.3')*	(+/- 10%)*	(+/- 10%)*	(+/- 0.1)*	(+/- 3%)*	(+/- 3%)*	(+/- 10mV)*	-	-
20	500	9.46	71.9	0.53	7.18	11.27	915	28.0	Clear	None
25	500	9.46	39.2	0.27	6.92	11.02	918	32.9	"	"
30	500	9.46	24.4	0.26	6.85	10.93	915	27.8	"	"
35	500	9.46	18.0	0.21	6.80	10.93	915	28.9	"	"
40	500	9.46	9.85	0.20	6.77	10.92	917	29.5	"	"
45	500	9.46	7.33	0.20	6.75	10.94	916	31.1	"	"
50	500	9.46	7.51	0.22	6.73	10.96	916	34.4	"	"
55	500	9.46	7.15	0.21	6.73	10.95	917	33.7	"	"

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Philip Villeneuve	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1505	SAMPLING ENDED AT: 1530
PUMP OR TUBING DEPTH IN WELL (feet): 50	SAMPLE PUMP FLOW RATE (mL per minute): 500	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s: YSI 556 30F08M01 Lamotte 2020 ME-14842	

FIELD DECONTAMINATION: (Y) N — FIELD-FILTERED: (Y) N — FILTER SIZE: 0.45 µm — Filtration Equipment Type: — DUPLICATE: Y (N)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / (Stand Pipe) — General Condition: (Good) / Needs Repair — Well Caps: (Good) / Broken / None — Lock: Good / Broken / (None)

Evidence of Rain Water Between Steel & PVC? Y / (N) — Is Well Plumb?: Y / (N) — PVC Riser: (Good) / Damaged / None

Evendence of Ponding Around Well!? Y / (N) — Concrete Collar: Good / Cracked / Leaking / (None)

REMARKS:

MS/MSD

Sovereign Consulting Inc.
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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: Fort Devens | PROJECT LOCATION: Ayer MA | DATE: 7/15/10 | WELL ID: SHM-10-02

PROJECT NUMBER: AC001 | WELL DIAMETER (inches): 1.5 | DEPTH TO WATER (feet): 18.03 | DEPTH TO BOTTOM (feet): 64. | PID READING (ppmv): N/A

PURGING DATA

TUBING DIAMETER (inches): 1/2 | TUBING MATERIAL CODE (see below): PE | PURGE PUMP TYPE: Peristaltic | PUMP EQUIPMENT MODEL & SERIAL #s: Geopump 466

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY | GALLONS: 2.710 | LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 | 1 GALLON = 3.785 LITERS | TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet): 55-65 | INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 60 | FINAL PUMP OR TUBING DEPTH IN WELL (feet): 60 | PURGING INITIATED AT: 1158 | PURGING ENDED AT: 1248 | GALLONS: | LITERS: 25

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0-5	500	600RPM Drive 66% Speed	18.03	18.07		3L
5-10	500	" "	1807	18.07	Y	2.5L
10-15	500	" "	1807	18.07	Y	2.5L

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
20	500	18.07	3.72	0.33	6.54	12.53	837	69.7	Clear	None
25	500	18.07	3.94	0.45	6.53	12.36	834	77.1	"	"
30	500	18.07	3.32	0.31	6.50	12.33	832	78.3	"	"
35	500	18.07	3.61	0.47	6.45	12.32	835	79.5	"	"
40	500	1807	3.81	0.43	6.44	12.21	836	79.6	"	"
43	500	18.07	3.70	0.42	6.43	12.19	837	80.6	"	"
46	500	1807	3.84	0.44	6.43	12.23	838	80.1	"	"
50	500	18.07	3.47	0.45	6.42	12.24	836	80.8	"	"

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Philip V. Meneau SovCon | SAMPLER(S) SIGNATURE(S): [signature] | SAMPLING INITIATED AT: 1250 | SAMPLING ENDED AT: 1335

PUMP OR TUBING DEPTH IN WELL (feet): 60 | SAMPLE PUMP FLOW RATE (mL per minute): 500 | FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s: YSI 556 30F08 1401 Lamotte ME 14843

FIELD DECONTAMINATION: (Y) N | FIELD-FILTERED: (Y) N | FILTER SIZE: 0.45 µm | Filtration Equipment Type: | DUPLICATE: (Y) N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / (Stand Pipe) | General Condition: (Good) / Needs Repair | Well Caps: (Good) / Broken / None | Lock: Good / Broken / (None)

Evidence of Rain Water Between Steel & PVC? Y / (N) | Is Well Plumb?: Y / (N) | PVC Riser: (Good) / Damaged / None

Evendence of Ponding Around Well? Y / (N) | Concrete Collar: Good / Cracked / Leaking / (None)

REMARKS: DUP · 071510 - U + F

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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: Fort Devens	PROJECT LOCATION: Devens / Ayer	DATE: 08/02/2010	WELL ID: SHM-10-17
PROJECT NUMBER: AC001.002	WELL DIAMETER: (inches) 1/2" / DEPTH TO WATER: (feet) 8 - 10	DEPTH TO BOTTOM: (feet)	PID READING: (ppmv)

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE: (see below) POLY	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY

GALLONS: LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED:
8-10	~~8-10'~~ 9	~~1005~~ 9'	1005	1033	GALLONS: LITERS:

WATER LEVEL STABLIZATION DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

Sample Time Orig/MSD 1033

Sample Time (1138 Dup)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1009	300	8-10'	3.64	4.90	3.64	17.03	368	131.7	clear	none
1017	300	8-10'	3.45	4.68	3.15	16.81	370	141.5	clear	none
1027	300	8-10'	1.03	4.90	2.71	15.59	438	164.0	clear	none
1100	325	18-20'	1,081	4.65	3.37	15.38	1007	164.4	silty	none
1109	325	18-20'	887	4.64	2.61	14.88	1040	162.8	silty	none
11:20	325	18-20'	20.1	4.91	1.65	14.07	1036	178.2	Clear	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Julie Burnham Sovereign	SAMPLER(S) SIGNATURES: [signature] for Julie B.	SAMPLING INITIATED AT: 10:33/1138	SAMPLING ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet): 9'/19'	SAMPLE PUMP FLOW RATE (mL per minute): 300/325	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N Filtration Equipment Type:	FILTER SIZE: ___ µm	DUPLICATE: Y N & ms/msD

MATERIAL CODES AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS: MS/MSD 1030 DUP 1138
GP-10-17-009-U F

Did a PH check & Readings Came back Normal.

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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001.002	PROJECT LOCATION: Devens/Ayer			DATE: 8/2/2010	WELL ID: SHM-10-17
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):		PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): POLY	PURGE PUMP TYPE: Geopump		PUMP EQUIPMENT MODEL & SERIAL #s:	
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY				GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88				1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 20-30	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 29'	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 29' 28-30'	PURGING INITIATED AT: 1430	PURGING ENDED AT: 1443	GALLONS: LITERS:

WATER LEVEL STABLIZATION DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1435	325	28-30	10.04	2.31	6.11	14.14	751	52.4	clear	none
1439	325	28-30'	4.79	2.25	6.04	13.70	749	58.6	clear	none
1442	325	28-30	6.06	2.17	6.01	13.72	747	63.4	clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Solr Morrism Sovcon	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 14:45	SAMPLING ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet): 29	SAMPLE PUMP FLOW RATE (mL per minute): 325	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: (Y) N FILTER SIZE: ___ µm Filtration Equipment Type:	DUPLICATE: Y (N)	

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

GP-10-17-029-U
F

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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
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Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001.002	PROJECT LOCATION: Devens/Ayer		DATE: 8/2/2010		WELL ID: SHM-10-17
PROJECT NUMBER:	WELL DIAMETER: (inches)	DEPTH TO WATER: (feet)	DEPTH TO BOTTOM: (feet)		PID READING: (ppmv)

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE: (see below) Poly	PURGE PUMP TYPE: Geopump		PUMP EQUIPMENT MODEL & SERIAL #s:	
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY				GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75 = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88				1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 36-40	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 39	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 39	PURGING INITIATED AT: 1510	PURGING ENDED AT: 1535	GALLONS: LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1520	350	39'	34.3	0.75	6.75	15.22	542	-134.6	Clear	None
1527	350	39'	24.0	0.31	6.82	14.08	541	-141.8	Clear	none
15:34	350	39'	37.9	0.26	6.83	13.90	542	-138.2	Clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Julie Robson, Sovcon	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1536	SAMPLING ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet): 39	SAMPLE PUMP FLOW RATE (mL per minute): 350	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: (Y) N Filtration Equipment Type:	FILTER SIZE: ___ µm	DUPLICATE: Y (N)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe | General Condition: Good / Needs Repair | Well Caps: Good / Broken / None | Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N | Is Well Plumb?: Y / N | PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N | Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

GP-10-17-39-U
F

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MONITORING WELL SAMPLING LOG

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Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001.002 | PROJECT LOCATION: DEVENS/AYER | DATE: 8/2/2010 | WELL ID: SHM-10-17

PROJECT NUMBER: | WELL DIAMETER: (inches) | DEPTH TO WATER (feet) | DEPTH TO BOTTOM (feet) | PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches): 1/4" | TUBING MATERIAL CODE (see below): Poly | PURGE PUMP TYPE: Geopump | PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY | GALLONS: | LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 | 1 GALLON = 3.785 LITERS | TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet): 45-50 | INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 49 | FINAL PUMP OR TUBING DEPTH IN WELL (feet): 49 | PURGING INITIATED AT: 1600 | PURGING ENDED AT: 1623 | GALLONS: | LITERS:

WATER LEVEL STABILIZATION | DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1600	300	49'	414	0.87	6.53	14.84	644	-25.1	little Cloudy	None
1610	300	49'	232	1.16	6.53	15.61	663	-33.0	silty	none
1622	300	49'	65.6	1.40	6.52	14.80	670	-28.3	little cloudy	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Julie Robsnam, Sovcon | SAMPLER(S) SIGNATURES: Julie R | SAMPLING INITIATED AT: 1624 | SAMPLING ENDED AT:

PUMP OR TUBING DEPTH IN WELL (feet): 49 | SAMPLE PUMP FLOW RATE (mL per minute): 300 | FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION: Y N | FIELD-FILTERED: Y N | FILTER SIZE: ___ µm | Filtration Equipment Type: | DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb?: Y / N   PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

GP-10-17-49-U
F

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MONITORING WELL SAMPLING LOG

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Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001.002	PROJECT LOCATION: DEVENS/AYER			DATE: 8/2/2010	WELL ID: SHM-10-17
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):		PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: G.eopump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
55-57	56	56	1650	1715	GALLONS: LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1650	275	56'	<1,000	0.37	6.69	15.49	668	-52.7	cloudy	none
1704	275	56'	<1,000	0.21	6.74	14.93	671	-90.1	cloudy	none
1714	275	56'	660	0.04	6.73	14.68	666	-84.3	cloudy	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Sulir Mobsham, Sovereign	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 1716	SAMPLING ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet): 56	SAMPLE PUMP FLOW RATE (mL per minute): 275	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	

FIELD DECONTAMINATION: Y N — FIELD-FILTERED: Y N — FILTER SIZE: ____ μm — Filtration Equipment Type: — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-17-056-U
F

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MONITORING WELL SAMPLING LOG

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4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001002 | PROJECT LOCATION: DEVENS/ AYER | DATE: 8-2-200 | WELL ID: SHM-10-18

PROJECT NUMBER: | WELL DIAMETER: (inches) | DEPTH TO WATER: (feet) 6-8' | DEPTH TO BOTTOM: (feet) | PID READING: (ppmv)

PURGING DATA

TUBING DIAMETER (inches): 1/4" | TUBING MATERIAL CODE: (see below) POLY | PURGE PUMP TYPE: Geopump | PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY | GALLONS: | LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 | 1 GALLON = 3.785 LITERS | TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet): 6-8 | INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 7 | FINAL PUMP OR TUBING DEPTH IN WELL (feet): 7 | PURGING INITIATED AT: 1815 | PURGING ENDED AT: 1834 | GALLONS: | LITERS:

WATER LEVEL STABILIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1825	300	7'	74.2	0.31	6.14	17.89	731	58.3	little cloudy	none
1830	300	7'	39.5	0.28	6.09	17.69	730	58.1	clear	none
1834	300	7'	18.3	0.27	6.06	17.64	729	58.7	clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Julie Robsham, Sovereign | SAMPLER(S) SIGNATURES: Carlyn Henrl Sov Julie R. | SAMPLING INITIATED AT: 1835 | SAMPLING ENDED AT:

PUMP OR TUBING DEPTH IN WELL (feet): 7 | SAMPLE PUMP FLOW RATE (mL per minute): 300 | FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION: Y N | FIELD-FILTERED: Y N | FILTER SIZE: ____ μm | Filtration Equipment Type: | DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe | General Condition: Good / Needs Repair | Well Caps: Good / Broken / None | Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N | Is Well Plumb?: Y / N | PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N | Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

GP-10-18 09 7 - U F

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: Arcadia 2	PROJECT LOCATION: Devens/Ayer		DATE: 8/3/10	WELL ID: SHM-10-18
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4" | TUBING MATERIAL CODE (see below): Poly | PURGE PUMP TYPE: Geopump | PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY | GALLONS: | LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 | 1 GALLON = 3.785 LITERS | TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	GALLONS: / LITERS:
16-18	16 17	16-18' 17	08:00	08:50	

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
0818	400	17'	23.50	0.47	6.14	13.02	674	55.6	clear	none
0820	400	17'	18.50	0.45	6.15	12.92	678	55.1	clear	none
0825	400	17'	10.60	0.44	6.14	12.87	673	55.8	clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 08:30	SAMPLING ENDED AT: 08:50
PUMP OR TUBING DEPTH IN WELL (feet): 17'	SAMPLE PUMP FLOW RATE (mL per minute): 400	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	

FIELD DECONTAMINATION Y N | FIELD-FILTERED: Y N | Filtration Equipment Type: | FILTER SIZE: ___ µm | DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

GP-10-18-017-U
F

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: ACO01002	PROJECT LOCATION: Devens / Ayer		DATE: 8/3/2010		WELL ID: SHM-10-18
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):	

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump		PUMP EQUIPMENT MODEL & SERIAL #s:	
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY				GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88				1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED: GALLONS: LITERS:
WELL SCREEN INTERVAL DEPTH (feet): 26-28	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 27	FINAL PUMP OR TUBING DEPTH IN WELL (feet): ~~26-28~~ 27	PURGING INITIATED AT: 08:55	PURGING ENDED AT: 10:00	
WATER LEVEL STABLIZATION	DEPTH TO WATER WITH PUMP (feet):				

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
09:00	350	27'	<1,000	1.47	630	14.45	685	-31.8	cloudy	none
09:10	350	27'	509	0.45	6.30	13.71	682	-42.7	cloudy	none
09:17	350	27'	199	0.44	6.30	13.55	681	-45.1	little cloudy	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Sovcon	SAMPLER(S) SIGNATURES: [signature]		SAMPLING INITIATED AT: 9:28	SAMPLING ENDED AT: 10:00
PUMP OR TUBING DEPTH IN WELL (feet): 27'	SAMPLE PUMP FLOW RATE (mL per minute): 350	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:		
FIELD DECONTAMINATION: Y N	FIELD FILTERED: Y N Filtration Equipment Type:	FILTER SIZE: ____ µm	DUPLICATE:	Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

DUP-080310-F
-U

GP-10-18-027-U
-F

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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: ACOO1.002	PROJECT LOCATION: Devens/Ayer	DATE: 8/8/10	WELL ID: SHM-10-18
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): PON	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	GALLONS / LITERS
36-38	37	37 ~~36-38'~~	10:05	10:50	

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME [3-5 minutes]*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
9:55	425	37'	521	0.59	6.38	13.71	629	-28.9	cloudy	none
10:06	425	37'	337	0.45	6.40	13.78	628	-40.6	Cloudy	none
10:20	425	37'	84.7	0.44	6.40	13.61	628	-45.5	little cloudy	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 10:25	SAMPLING ENDED AT: 10:50
PUMP OR TUBING DEPTH IN WELL (feet): 37	SAMPLE PUMP FLOW RATE (mL per minute): 425	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N — Filtration Equipment Type:	FILTER SIZE: ___ µm	DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-18-037-U
-F

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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: ACOO1002
PROJECT LOCATION: Devens/Ayer
DATE: 8/3/2010
WELL ID: SHM-10-18
PROJECT NUMBER:
WELL DIAMETER (inches):
DEPTH TO WATER (feet):
DEPTH TO BOTTOM (feet):
PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"
TUBING MATERIAL CODE (see below): Poly
PURGE PUMP TYPE: Geopump
PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY
GALLONS:
LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
1 GALLON = 3.785 LITERS
TOTAL VOLUME PURGED: GALLONS: LITERS:

WELL SCREEN INTERVAL DEPTH (feet): 46-48
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 47
FINAL PUMP OR TUBING DEPTH IN WELL (feet): ~~47~~ 46-48'
PURGING INITIATED AT: 10:55
PURGING ENDED AT: 11:43

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-6 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.33')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
11:08	300	47'	801	0.65	6.52	15.28	808	-68.2	cloudy	none
11:15	300	47'	469	0.42	6.53	14.76	791	-77.1	cloudy	none
11:23	300	47'	288	0.44	6.54	14.73	809	-80.1	cloudy	none
11:27	300	47'	127	0.45	6.54	14.60	809	-80.7	little cloudy	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon
SAMPLER(S) SIGNATURES: OR
SAMPLING INITIATED AT: 11:30
SAMPLING ENDED AT: 11:43
PUMP OR TUBING DEPTH IN WELL (feet): 47
SAMPLE PUMP FLOW RATE (mL per minute): 300
FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:
FIELD DECONTAMINATION: Y N
FIELD-FILTERED: Y N
Filtration Equipment Type
FILTER SIZE: ___ µm
DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None
Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None
Evidence of Ponding Around Well? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:
GP-10-18-047 -U
-F

Sovereign Consulting Inc.
905B South Main Street, Suite 202
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MONITORING WELL SAMPLING LOG

Low Flow Sampling
Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: ACOOL002		PROJECT LOCATION: Devens / Ayer			DATE: 8/3/10		WELL ID: STIM-10-19
PROJECT NUMBER:		WELL DIAMETER: (inches)	DEPTH TO WATER: (feet)		DEPTH TO BOTTOM: (feet)		PID READING: (ppmv)

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE: (see below) Poly	PURGE PUMP TYPE: Geopump		PUMP EQUIPMENT MODEL & SERIAL #s:	
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY				GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88				1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 6-10	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 9	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 9 8-10'	PURGING INITIATED AT: 13:40	PURGING ENDED AT: 14:18	GALLONS: LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
13:45	300	9'	100.1	3.46	6.05	18.91	177	80.7	little cloudy	none
13:55	300	9'	2.82	3.42	5.87	18.08	175	93.7	clear	none
14:05	300	9'	1.10	3.65	5.85	17.73	174	98.5	clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES: [signature]		SAMPLING INITIATED AT: 14:05	SAMPLING ENDED AT: 14:18
PUMP OR TUBING DEPTH IN WELL (feet): 9	SAMPLE PUMP FLOW RATE (mL per minute): 300	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:		
FIELD DECONTAMINATION: Y N	FIELD FILTERED: Y N Filtration Equipment Type:	FILTER SIZE: ___ µm	DUPLICATE	Y N Metals

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-19-0 -U -F & DUP-080310-F -U

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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001.002	PROJECT LOCATION: Devens/Ayer			DATE: 8/3/10	WELL ID: SHM-10-19
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):	

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED: GALLONS: LITERS:

WELL SCREEN INTERVAL DEPTH (feet): 16-20	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 19	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 19 18-20'	PURGING INITIATED AT: 14:24	PURGING ENDED AT: 15:10	

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
14:35	350	19'	561	1.96	6.01	14.83	744	96.9	little cloudy	none
14:42	350	19'	217	2.02	6.03	15.18	754	87.7	little cloudy	none
14:50	350	19'	188	2.10	6.02	15.34	756	88.4	clear	none
14:55	350	19'	141	2.19	6.01	14.88	759	90.4	clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 15:00	SAMPLING ENDED AT: 15:10
PUMP OR TUBING DEPTH IN WELL (feet): 19	SAMPLE PUMP FLOW RATE (mL per minute): 350	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N (Y circled)	FIELD-FILTERED: Y N (Y circled) Filtration Equipment Type:	FILTER SIZE: ____ µm	DUPLICATE: Y N (N circled)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

GP-10-19-019-U
-F

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MONITORING WELL SAMPLING LOG

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Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001.002	PROJECT LOCATION: Devens/Ayer		DATE: 8/3/10		WELL ID: SHM-10-19
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet): 29'	DEPTH TO BOTTOM (feet):		PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): POLY	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:	
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS:	LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
26-30	29	29 28-30'	1520	15:55	GALLONS: LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1525	400	29'	144	0.47	6.60	14.54	683	-109.2	clear	none
1530	400	29'	167	0.48	6.61	14.08	682	-108.9	clear	none
1540	400	29'	79.0	0.48	6.63	13.97	683	-112.8	clear	none
1545	400	29'	66.6	0.53	6.64	13.88	682	-111.0	clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 15:48	SAMPLING ENDED AT: 15:55
PUMP OR TUBING DEPTH IN WELL (feet): 29	SAMPLE PUMP FLOW RATE (mL per minute): 400	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	

FIELD DECONTAMINATION: Y / N (Y circled) — FIELD FILTERED: Y / N (Y circled) — FILTER SIZE: ____ µm — Filtration Equipment Type: — DUPLICATE: Y / N (N circled)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

GP-10-19-029-U
-F

Sovereign Consulting Inc
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: ACOL002	PROJECT LOCATION: Devens/Ayer			DATE: 8/3/10	WELL ID: SHM-10-19
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet): 39'	DEPTH TO BOTTOM (feet):		PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE: (see below) Poly	PURGE PUMP TYPE: Geopump		PUMP EQUIPMENT MODEL & SERIAL #s:	
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY				GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75 = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88				1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 38-40	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 39	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 38-40', 39	PURGING INITIATED AT: 16:00	PURGING ENDED AT: 16:50	GALLONS: LITERS:

WATER LEVEL STABLIZATION DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 ml/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
16:15	275	39'	67.9	1.30	6.61	15.58	738	-85.5	Clear	none
16:23	275	39'	62.3	1.48	6.61	15.47	748	-82.1	clear	none
16:26	275	39'	36.6	1.65	6.60	15.59	736	-77.7	clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES: GR	SAMPLING INITIATED AT: 16:30	SAMPLING ENDED AT: 16:50
PUMP OR TUBING DEPTH IN WELL (feet): 39	SAMPLE PUMP FLOW RATE (mL per minute): 275	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: (Y) N Filtration Equipment Type:	FILTER SIZE: ____ µm	DUPLICATE: Y (N)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

GP-10-19-039-U

-F

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: ACO01002	PROJECT LOCATION: Devens/Ayer	DATE: 8/3/10	WELL ID: SHM-10-19
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet): 46'	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED:
45-47	46	46 45-47'	16:55	17:35	GALLONS: LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
17:04	300	46'	<1,000	1.73	6.49	14.63	737	-26.3	cloudy	none
17:13	300	46'	<1,000	1.83	6.51	14.45	739	-48.0	cloudy	none
17:20	300	46'	<1,000	1.88	6.50	14.58	737	-44.1	cloudy	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
SovCon	OK	17:28	17:35

PUMP OR TUBING DEPTH IN WELL (feet): 46 — SAMPLE PUMP FLOW RATE (mL per minute): 300 — FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION: (Y) N — FIELD-FILTERED: (Y) N — FILTER SIZE: ____ µm — Filtration Equipment Type: — DUPLICATE: Y (N)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

GP-10-19-046-F
-U

Sovereign Consulting Inc.
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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

Vertical Profiling - Peristaltic

PROJECT NAME: SHL	PROJECT LOCATION: SHM-10-11		DATE: 8/3/10	WELL ID: SHM-10-11
PROJECT NUMBER: AC001002	WELL DIAMETER (inches): 4"	DEPTH TO WATER (feet): 39.46	DEPTH TO BOTTOM (feet): @ ~~39~~ 40	PID READING (ppmv): 0

PURGING DATA

TUBING DIAMETER (inches): 5/8	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder / Stainless	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED
38-40	39	39	11:50AM	1220	GALLONS: ~2.35 LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet): 38.1

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
11:50AM	400	4CPM / 75psi	39.46	—	N/A	N/A
12:00	400	4CPM / 75psi	39.69		No	4Liters
12:10	350	4CPM / 70psi	39.92	—	Yes	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
11:55	400	39.46	259	4.96	6.64	19.68	307	171.0	CLDY	None
12:00	400	39.69	47.4	2.11	6.06	18.42	305	160.3	CLDY	None
12:10	350	39.92	27.6	0.87	5.72	16.90	301	95.1	Clear	None
1215	250	39.93	18.7	0.60	5.66	16.40	301	68.4	Clear	None
1220	250	39.92	14.5	0.44	5.61	16.26	302	57.2	Clear	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
EDS / SC		1225	1250

PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
39	250	

FIELD DECONTAMINATION: Y N — FIELD-FILTERED: Y N — FILTER SIZE: ____ µm — Filtration Equipment Type: — DUPLICATE: 0.5/1250 Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - Photoionic

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: SHL	PROJECT LOCATION: SHM-10-11		DATE: 8/3/10	WELL ID: SHM-10-11
PROJECT NUMBER: AC00602	WELL DIAMETER (inches): 4"	DEPTH TO WATER (feet): 39.01	DEPTH TO BOTTOM (feet): 50	PID READING (ppmv): N/A

PURGING DATA

TUBING DIAMETER (inches): 5/8	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder/ Stainless Sell	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet): 48-50	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 49	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 49	PURGING INITIATED AT: 1340	PURGING ENDED AT: 14:20	TOTAL VOLUME PURGED: GALLONS: 3.50 LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
13:50	290mL	4CPM / 120psi	40.01	—	—	—
13:55	280mL	4CPM / 130psi	40.01	39.41	NO	NIL
14:10	300mL	4CPM / 140psi	39.41	39.35	Almost	N/C

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
14:00	250	39.30	2646	0.20	6.25	18.16	274	-44.5	Cloudy	None
14:05	250	39.15	3319	0.26	6.20	20.40	275	-45.8	Cloudy	None
14:10	260	39.25	5807	0.53	6.25	18.94	274	-45.1	Cloudy	None
14:15	300	39.45	6105	0.20	6.19	18.42	274	-43.4	Cloudy	None
14:20	300	39.31	5373	0.27	6.20	18.09	278	-43.7	Cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: EDS, SCC	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 14:25	SAMPLING ENDED AT: 14:50
PUMP OR TUBING DEPTH IN WELL (feet): 49'	SAMPLE PUMP FLOW RATE (mL per minute): 300mL/ Min	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s: YSI-600 cal sheet	
FIELD DECONTAMINATION: Y N	FIELD FILTERED: Y N — Filtration Equipment Type: Both	FILTER SIZE: .45 μm	DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profile - Hydrasonic

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: SHL	PROJECT LOCATION: Landfill	DATE: 8/3/2010	WELL ID: SHM-10-11
PROJECT NUMBER: AC001.002	WELL DIAMETER (inches): 4"	DEPTH TO WATER (feet): 47.56	DEPTH TO BOTTOM (feet): 60' / PID READING (ppmv): 0

PURGING DATA

TUBING DIAMETER (inches): 5/8	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS: —

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED: GALLONS: 2 Gals LITERS:

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT
58-60	59.0	59.0	15:36	16:20

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
15150	200	CPM 4	47.56	—	Yes	NA

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1555	200	42.92	153	2.9	6.31	22.43	353	-54.2	Cloudy	None
1600	200	42.69	106.2	1.07	6.30	22.3[illegible]	353	-32.7	Clear	None
1605	200	42.06	113	1.55	6.28	22.43	353	-43.6	Cloudy	None
1610	200	41.63	139	1.33	6.29	22.75	354	[illegible]	Cloudy	None
1615	200	41.29	203	0.78	6.30	24.09	354	-46.3	Cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jonathan Chaffee	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT: 1625	SAMPLING ENDED AT: 18:00
PUMP OR TUBING DEPTH IN WELL (feet): 59	SAMPLE PUMP FLOW RATE (mL per minute): 200	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	

FIELD DECONTAMINATION: Y / N — FIELD-FILTERED: Y / N — FILTER SIZE: .45 µm — Filtration Equipment Type: — DUPLICATE: Y / N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None — NA

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - Molosemic

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: SHL	PROJECT LOCATION: Landfill		DATE: 8/4/10	WELL ID: SHM-10-11
PROJECT NUMBER: 1C001.002	WELL DIAMETER (inches): —	DEPTH TO WATER (feet): 60.95	DEPTH TO BOTTOM (feet):	PID READING (ppmv): —

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder / Stainless	PUMP EQUIPMENT MODEL & SERIAL #s:
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY		GALLONS: —	LITERS: —
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88		1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 63-65	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 64	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 64	PURGING INITIATED AT: 0920 / PURGING ENDED AT: 0945 / GALLONS: ~2.5 / LITERS: —

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0923	200	CPM 4 / 10.0 / 5.0	60.29	—	Yes	

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
0925	200	60.10	> Instrument	0.18	7.85	20.15	425	-53.0	Silty	None
0930	200	60.70	> Instrument	0.10	7.69	19.55	425	-99.9	Silty	None
0935	200	62.57	> Instrument	0.09	7.70	19.31	428	-115.1	SILTY	NONE
0940	200	63.25	> Instrument	0.06	7.71	19.42	436	-126.5	SILTY	NONE
0945	200	63.30	> Instrument	0.11	7.74	20.99	439	-150.7	SILTY	NONE

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jonathan Chatter	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 0950	SAMPLING ENDED AT: 1305
PUMP OR TUBING DEPTH IN WELL (feet): 64	SAMPLE PUMP FLOW RATE (mL per minute): 200	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: (Y) N — Filtration Equipment Type:	FILTER SIZE: 45 µm	MS/MSD DUPLICATE: (Y) N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profile - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001.002	PROJECT LOCATION: Devens/Ayer	DATE: 8/4/10	WELL ID: SHM-10-20
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
8-10	9	~~8-10'~~ 9	8:01	9:13	GALLONS: LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
8:09	300	9'	75.6	7.10	6.21	16.00	264	85.9	Clear	none
8:17	300	9'	25.1	69.6	6.18	16.39	260	79.6	Clear	none
8:25	300	9'	12.5	6.46	6.22	16.70	262	60.4	Clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
SovCon	[signature]	8:50	9:13

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
9	300	

FIELD DECONTAMINATION: Y N (Y circled) — FIELD FILTERED: Y N (Y circled) — Filtration Equipment Type: — FILTER SIZE: ____ μm — DUPLICATE: Y N (N circled)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

GP-10-20-009-F
-U

Sovereign Consulting Inc.
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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profile - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001.002	PROJECT LOCATION: Devens/Ayer		DATE: 8/4/10	WELL ID: SHM-10-20
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY		GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88		1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 15-20	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 19	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 19 ~~18-20'~~	PURGING INITIATED AT: 9:23 / PURGING ENDED AT: 10:00 / GALLONS: / LITERS:

WATER LEVEL STABLIZATION DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
9:33	325	19'	29.0	0.77	6.08	15.00	608	67.8	Clear	None
9:37	325	19'	19.6	0.72	6.09	14.58	610	69.8	clear	none
9:42	325	19'	17.2	0.67	6.09	14.55	609	50.6	clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 9:45	SAMPLING ENDED AT: 10:00
PUMP OR TUBING DEPTH IN WELL (feet): 19	SAMPLE PUMP FLOW RATE (mL per minute): 325	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: (Y) N FILTER SIZE: ___ µm Filtration Equipment Type:	DUPLICATE: (Y) N Metals	

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-20-019-F -U OR DUP-080410-F -U

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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: ACO01002	PROJECT LOCATION: Devens/Ayer		DATE: 8/4/10	WELL ID: SHM-10-20
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY | GALLONS: | LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 | 1 GALLON = 3.785 LITERS | TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet): 26-30	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 29	FINAL PUMP OR TUBING DEPTH IN WELL (feet): ~~28-30~~ 29	PURGING INITIATED AT: 10:05	PURGING ENDED AT: 10:50	GALLONS: / LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
10:13	350	29'	126	0.37	6.63	14.10	522	-81.1	little cloudy	none
10:17	360	29'	225	0.36	6.65	13.92	523	-85.7	cloudy	none
10:27	350	29'	318	0.34	6.68	13.85	522	-91.1	cloudy	none
10:35	350	29'	139	0.33	6.70	13.44	521	-92.8	slightly cloudy	none

*EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES: QR	SAMPLING INITIATED AT: 10:37	SAMPLING ENDED AT: 10:50
PUMP OR TUBING DEPTH IN WELL (feet): 29	SAMPLE PUMP FLOW RATE (mL per minute): 350	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	

FIELD DECONTAMINATION: Y N | FIELD FILTERED: Y N | Filtration Equipment Type: | FILTER SIZE: ____ µm | DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

GP-10-20-029-F
-U

Sovereign Consulting Inc.
905B South Main Street, Suite 202
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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

Vertical Profiling - DPT

PROJECT NAME: ACC01.002	PROJECT LOCATION: Devens/Ayer	DATE: 8/4/10	WELL ID: SHM-10-20
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"
TUBING MATERIAL CODE (see below): Poly
PURGE PUMP TYPE: Geopump
PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
GALLONS: LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet): 36-40
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 39
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 38-40 39
PURGING INITIATED AT: 10:55
PURGING ENDED AT:
TOTAL VOLUME PURGED: GALLONS: LITERS:

WATER LEVEL STABLIZATION
DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
11:06	425	39'	596	0.39	6.50	12.98	674	-34.5	Cloudy	none
11:15	425	39'	297	0.38	6.50	13.62	666	-38.0	Cloudy	none
11:18	425	39'	121	0.37	6.49	13.92	650	-38.2	little cloudy	none
11:24	425	39'	91.6	0.37	6.49	13.51	649	-38.8	Clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Sov Co
SAMPLER(S) SIGNATURES: QR
SAMPLING INITIATED AT: 11:26
SAMPLING ENDED AT: 11:40

PUMP OR TUBING DEPTH IN WELL (feet): 39
SAMPLE PUMP FLOW RATE (mL per minute): 425
FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION: Y N
FIELD-FILTERED: Y N
FILTER SIZE: ____ µm
Filtration Equipment Type:
DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb?: Y / N   PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS:
GP-10-20-039-F
-U

Sovereign Consulting Inc.
905B South Main Street, Suite 202
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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: ACMI002	PROJECT LOCATION: Devens/Ayer		DATE: 8/4/10	WELL ID: SWM-10-21
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88			1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 10-12	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 11	FINAL PUMP OR TUBING DEPTH IN WELL (feet): ~~10-12~~ 11	PURGING INITIATED AT: 14:05 / PURGING ENDED AT: 14:42	GALLONS: / LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
14:08	450	11'	1074	5.87	6.11	16.89	180	86.0	cloudy	none
14:15	450	11'	285	5.69	6.10	16.14	180	95.0	cloudy	none
14:22	450	11'	129	6.34	6.13	15.84	181	99.5	little cloudy	none
14:28	450	11'	54.1	6.33	6.14	15.57	182	101.5	Clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 14:32	SAMPLING ENDED AT: 14:42
PUMP OR TUBING DEPTH IN WELL (feet): 11	SAMPLE PUMP FLOW RATE (mL per minute): 450	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD FILTERED: Y N / Filtration Equipment Type:	FILTER SIZE: ___ μm	DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

GP-10-21-011-F
-U

Sovereign Consulting Inc.
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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: ACO01.002	PROJECT LOCATION: Devens / Ayer		DATE: 8/4/10	WELL ID: SHM-10-21
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE: (see below) Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:	
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88			1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 20-22 21	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 21	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 21 20-22'	PURGING INITIATED AT: 14:45	PURGING ENDED AT: 15:25 / GALLONS: / LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
14:48	350	21'	<1,000	5.13	6.05	15.94	695	93.8	cloudy/silty	none
14:55	350	21'	790	2.77	6.08	15.36	725	88.4	cloudy	none
15:06	350	21'	134	1.43	6.07	14.27	728	97.5	little cloudy	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SaCan	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 15:15	SAMPLING ENDED AT: 15:25
PUMP OR TUBING DEPTH IN WELL (feet): 21	SAMPLE PUMP FLOW RATE (mL per minute): 350	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y / N	FIELD FILTERED: Y / N Filtration Equipment Type:	FILTER SIZE: ___ μm	DUPLICATE: Y / N Metals

MATERIAL CODES AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

GP-10-21-021-F
-U

& DUP2-080410-U
-F

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001002 | PROJECT LOCATION: Devens/Ayer | DATE: 8/4/10 | WELL ID: SHM-10-21

PROJECT NUMBER: | WELL DIAMETER (inches): | DEPTH TO WATER (feet): | DEPTH TO BOTTOM (feet): | PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4" | TUBING MATERIAL CODE (see below): Poly | PURGE PUMP TYPE: Geopump | PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY | GALLONS: | LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 | 1 GALLON = 3.785 LITERS | TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet): 30-32 | INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 31 | FINAL PUMP OR TUBING DEPTH IN WELL (feet): ~~30-32~~ 31 | PURGING INITIATED AT: 15:33 | PURGING ENDED AT: 16:10 | GALLONS: | LITERS:

WATER LEVEL STABLIZATION | DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
15:36	475	31'	434	0.83	6.33	14.46	501	59.0	cloudy	none
15:45	475	31'	87.6	1.31	6.35	13.94	502	51.1	little cloudy	none
15:56	475	31'	34.7	1.54	6.35	13.78	503	44.9	clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon | SAMPLER(S) SIGNATURES: [signature] | SAMPLING INITIATED AT: 15:57 | SAMPLING ENDED AT: 16:10

PUMP OR TUBING DEPTH IN WELL (feet): 31 | SAMPLE PUMP FLOW RATE (mL per minute): 475 | FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION: (Y) N | FIELD-FILTERED: (Y) N | Filtration Equipment Type: | FILTER SIZE: ____ µm | DUPLICATE: Y (N)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe | General Condition: Good / Needs Repair | Well Caps: Good / Broken / None | Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N | Is Well Plumb?: Y / N | PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N | Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

GP-10-21-031-U
-F

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: A0001.002	PROJECT LOCATION: Devens/Ayer	DATE: 8/4/10	WELL ID: SHM-10-21
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"
TUBING MATERIAL CODE (see below): Poly
PURGE PUMP TYPE: Geopump
PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY
GALLONS: LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
1 GALLON = 3.785 LITERS
TOTAL VOLUME PURGED: GALLONS: LITERS:

WELL SCREEN INTERVAL DEPTH (feet): 40-42
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 41
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 41 40-42
PURGING INITIATED AT: 16:14
PURGING ENDED AT: 16:44

WATER LEVEL STABLIZATION
DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
16:15	300	41'	591	2.04	6.51	14.97	617	-22.9	cloudy	none
16:25	300	41'	144	0.98	6.64	14.51	687	-73.9	little cloudy	none
16:30	300	41'	83.7	0.42	6.66	14.14	627	-80.2	clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon
SAMPLER(S) SIGNATURES: QL
SAMPLING INITIATED AT: 16:35
SAMPLING ENDED AT: 16:44

PUMP OR TUBING DEPTH IN WELL (feet): 41
SAMPLE PUMP FLOW RATE (mL per minute): 300
FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION: (Y) N
FIELD-FILTERED: (Y) N
FILTER SIZE: ___ µm
Filtration Equipment Type:
DUPLICATE: Y (N)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None
Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb?: Y / N   PVC Riser: Good / Damaged / None
Evidence of Ponding Around Well? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

GP-10-21-041 -U
-F

Sovereign Consulting Inc.
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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001002	PROJECT LOCATION: Devens/Ayer		DATE: 8/4/10	WELL ID: SHM-10-21
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet): 50-52	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 51	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 51 50-52	PURGING INITIATED AT: 16:50	PURGING ENDED AT:	TOTAL VOLUME PURGED: GALLONS: LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
17:05	425	51'	<1,000	0.98	6.55	16.16	283	21.3	Silty	none
17:10	425	51'	<1,000	0.78	6.54	16.45	279	58.5	Silty	none
17:14	425	51'	1084	0.43	6.55	16.65	278	51.0	silty	none
17:17	425	51'	315	0.32	6.56	16.80	277	60.9	silty	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES: GK	SAMPLING INITIATED AT: 1730	SAMPLING ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet): 51	SAMPLE PUMP FLOW RATE (mL per minute): 425	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s	

FIELD DECONTAMINATION: Y N — FIELD-FILTERED: Y N — FILTER SIZE: ____ μm — Filtration Equipment Type: — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass CG = Clear Glass PE = Polyethylene PP = Polypropylene S = Silicone T = Teflon O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

GP-10-21-051

Sovereign Consulting Inc.
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Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001.002	PROJECT LOCATION: Devens/Ayer		DATE: 8/4/10	WELL ID: SHM-10-21
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:	
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS:	LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75 = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet): 54-61	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 60	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 60'	PURGING INITIATED AT: 17:40	PURGING ENDED AT: 1825	TOTAL VOLUME PURGED: GALLONS: LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
18:05	300	60'	<1,000	0.67	6.72	17.60	890	-60.9	silty	none
18:16	300	60'	<1,000	0.76	6.71	16.69	832	-63.8	silty	none
18:23	300	60'		0.72	6.68	16.59	828	-64.2		

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Carolyn Harold, Sovereign	SAMPLER(S) SIGNATURES: Carolyn Harold	SAMPLING INITIATED AT: 1826	SAMPLING ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet): 60	SAMPLE PUMP FLOW RATE (mL per minute): 300	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N — Filtration Equipment Type:	FILTER SIZE: ___ µm	DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-21-060-F
-U

Sovereign Consulting Inc.
905B South Main Street, Suite 202
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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001.002	PROJECT LOCATION: Devens/Ayer			DATE: 8/5/2010	WELL ID: SHM-10-23
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):		PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump		PUMP EQUIPMENT MODEL & SERIAL #s:
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY				GALLONS: / LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88				1 GALLON = 3.785 LITERS
WELL SCREEN INTERVAL DEPTH (feet): 16-18	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 17	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 17 16-18'	PURGING INITIATED AT: 10:08	PURGING ENDED AT: / TOTAL VOLUME PURGED GALLONS: LITERS:

WATER LEVEL STABLIZATION DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
10:07	350	17'	23.5	3.55	5.97	16.26	393	79.5	clear	none
10:16	350	17'	8.09	3.87	5.98	14.65	386	74.8	clear	none
10:25	350	17'	5.37	4.03	5.99	14.46	380	76.2	clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES: OR	SAMPLING INITIATED AT: 10:28	SAMPLING ENDED AT: 10:40
PUMP OR TUBING DEPTH IN WELL (feet): 17	SAMPLE PUMP FLOW RATE (mL per minute): 350	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N Filtration Equipment Type:	FILTER SIZE: ___ µm	DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass CG = Clear Glass PE = Polyethylene PP = Polypropylene S = Silicone T = Teflon O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-23-017-F -U & DUP-080510-F -U

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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001.002	PROJECT LOCATION: Devens/Ayer		DATE: 8/5/10	WELL ID: SHM-10-23
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump		PUMP EQUIPMENT MODEL & SERIAL #s:
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY				GALLONS: / LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88				1 GALLON = 3.785 LITERS
WELL SCREEN INTERVAL DEPTH (feet): 26-28	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 27	FINAL PUMP OR TUBING DEPTH IN WELL (feet): ~~27~~ 26-28'	PURGING INITIATED AT: 10:52	PURGING ENDED AT: 11:26
				TOTAL VOLUME PURGED: GALLONS: LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
10:54	350	27'	<1,000	2.74	6.11	14.52	1,028	73.1	cloudy	none
10:57	350	27'	797	2.38	6.13	13.99	1,042	66.2	cloudy	none
11:04	350	27'	202	3.23	6.11	12.89	1,063	75.9	cloudy	none
11:15	350	27'	58.5	3.55	6.08	18.10	1,060	94.3	clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES: JK	SAMPLING INITIATED AT: 11:17	SAMPLING ENDED AT: 11:26
PUMP OR TUBING DEPTH IN WELL (feet): 27	SAMPLE PUMP FLOW RATE (mL per minute): 350	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION (Y) N	FIELD-FILTERED: (Y) N Filtration Equipment Type:	FILTER SIZE: ____ µm	DUPLICATE: Y (N)

MATERIAL CODES: AG = Amber Glass CG = Clear Glass PE = Polyethylene PP = Polypropylene S = Silicone T = Teflon O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evidence of Ponding Around Welll? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-23-027-F

-U MS/MSD

Sovereign Consulting Inc
905B South Main Street, Suite 202
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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001.002	PROJECT LOCATION: Devens/Ayer	DATE: 8/5/10	WELL ID: SHM-10-23
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): POLY	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS: / LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88			1 GALLON = 3.785 LITERS
WELL SCREEN INTERVAL DEPTH (feet): 36-38	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 37	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 37	PURGING INITIATED AT: 11:40	PURGING ENDED AT: 12:15	TOTAL VOLUME PURGED GALLONS: LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
11:44	350	37'	215	3.19	5.91	13.32	942	113.8	little cloudy	none
11:49	350	37'	136	3.46	5.95	13.67	959	91.7	little cloudy	none
11:58	350	37'	58.4	3.41	5.96	13.75	961	90.9	clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Sov Con	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 12:02	SAMPLING ENDED AT: 12:15
PUMP OR TUBING DEPTH IN WELL (feet): 37	SAMPLE PUMP FLOW RATE (mL per minute): 350	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N — Filtration Equipment Type:	FILTER SIZE: ____ μm	DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

GP-10-23-037-F
-U

Sovereign Consulting Inc.
905D South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001.002	PROJECT LOCATION: Devens/Ayer	DATE: 8/5/10	WELL ID: SHM-10-23
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below):	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
46-48	47	47 46-48'	13:20	14:00	GALLONS: LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
13:25	300	47'	60.6	1.47	6.49	16.93	486	-92.7	clear	none
13:31	300	47'	754	1.83	6.56	16.41	494	-95.2	cloudy	none
13:37	300	47'	374	1.34	6.60	15.76	490	-95.1	cloudy	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 13:46	SAMPLING ENDED AT: 14:00
PUMP OR TUBING DEPTH IN WELL (feet): 47	SAMPLE PUMP FLOW RATE (mL per minute): 300	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	

FIELD DECONTAMINATION: Y N — FIELD-FILTERED: Y N — FILTER SIZE: ___ µm — Filtration Equipment Type: — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

GP-10-23-047-U
-F

Sovereign Consulting Inc.
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Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001002	PROJECT LOCATION: Devens/Ayer	DATE: 8/5/10	WELL ID: SHM-10-28
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED: GALLONS: LITERS:

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT
56-58	57	~~57~~ 56-58	14:07	14:35

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
14:15	275	57	773	0.63	6.63	15.59	749	-113.8	cloudy	none
14:23	275	57	739	0.48	6.67	14.57	746	-121.1	cloudy	none
14:33	275	57	254	0.86	6.65	14.51	743	-100.2	little cloudy	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 14:36	SAMPLING ENDED AT: 14:50
PUMP OR TUBING DEPTH IN WELL (feet): 57	SAMPLE PUMP FLOW RATE (mL per minute): 275	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	

FIELD DECONTAMINATION: (Y) N — FIELD-FILTERED: (Y) N — Filtration Equipment Type: — FILTER SIZE: ____ µm — DUPLICATE: (Y) N Metals

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: DUP2-080510-U
-F

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - Photosonic

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: Acool.002	PROJECT LOCATION: Fort Devens		DATE: 8/5/10	WELL ID: SHM-10-12
PROJECT NUMBER:	WELL DIAMETER (inches): —	DEPTH TO WATER (feet): 34.0	DEPTH TO BOTTOM (feet): 45	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE:	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS: —

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet): 43-45	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 44	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 44	PURGING INITIATED AT: 1130	PURGING ENDED AT:	GALLONS: LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
1130	400	CPM 4 / 10.0 - 5.0	32.7	—	Yes	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1135	400	33.4	193	0.80	6.45	17.86	396	-11.6	Clear	None
1140	400	33.5	75	0.37	5.89	17.28	386	7.4	slightly cloudy	NONE
1145	400	33.8	147	0.47	5.91	17.73	387	10.3	clear	NONE
1150	400	33.9	192	0.47	5.94	17.95	388	6.0	clear	NONE
1155	400	33.7	203	0.43	5.97	18.23	385	17.6	slightly cloudy	NONE

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jonathan Chaffee	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1200	SAMPLING ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet): 44	SAMPLE PUMP FLOW RATE (mL per minute): 400	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	

FIELD DECONTAMINATION: Y / N — FIELD-FILTERED: Y / N — FILTER SIZE: .45 µm — Filtration Equipment Type: — DUPLICATE: Y / N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - Photoacoustic

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001.002	PROJECT LOCATION: Fort Devens		DATE: 8/5/10		WELL ID: SHM-10-12
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet): 33.8	DEPTH TO BOTTOM (feet): 55'		PID READING (ppmv): —

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE:		PUMP EQUIPMENT MODEL & SERIAL #s:	
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY				GALLONS: —	LITERS: —
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88				1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 53-55	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 54	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 54	PURGING INITIATED AT: 1345	PURGING ENDED AT:	GALLONS: ~25 LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
1345	175	CPM4 / 10.0 - 5.0	33.8		Yes	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1350	175	33.8	917	0.38	6.56	24.92	358	-19.3	Slightly silty	NONE
1355	175	33.85	3313	0.22	6.24	23.32	354	1.6	slightly silty	NONE
1400	175	33.85	3607	0.20	6.16	23.11	359	-14.7	slightly silty	NONE
1405	175	33.85	1752	0.18	6.13	22.50	364	-13.1	cloudy	NONE
1410	175	33.85	> Instrument	0.16	6.11	21.93	368	-17.1	silty	NONE

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jonathan Chuffy	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 14:15	SAMPLING ENDED AT: 1510
PUMP OR TUBING DEPTH IN WELL (feet): 54	SAMPLE PUMP FLOW RATE (mL per minute): 175	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y / N	FIELD-FILTERED: Y / N FILTER SIZE: 75 µm Filtration Equipment Type:	DUPLICATE: Y / N	

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb?: Y / N   PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

Project Name: AC001.002

Date: 8/9/10

Project Location: Ft Devens

Project #:

Sampler Name(s): UMH, SJV

WELL IDENTIFICATION: SHP-05-046B

Well Integrity

	YES	NO	N/A
Protective Casing Secure			
Concrete Pad Intact			
PVC Casing Intact			
Well Gripper Present			
Bolts Present (Pad Wells)			
Locked (Stickup Wells)			

Well Information

Diameter: 2"

Material: PVC

	B	A
Depth to Water:	17.00	16.49
Depth to Well Bottom:	27.20	75.74

Type of Sampling: Pump, Disposable Bailer, Field Filtered, Other

Pump Type (if applicalbe): Inertial, Submersible, Peristaltic, Other

WELL VOLUME PURGE: 1 WELL VOLUME = (DEPTH TO BOTTOM – DEPTH TO WATER) X WELL CAPACITY (SEE BELOW)

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

Calculation of One (1) Purge Volume: 1.63

4.89 = 3 well volumes

Purge Start Time: 9:20

Purge End Time: 9:51

Field Water Quality Measurements

Time	9:38	9:43	9:50		
Temperature (°C)	12.21	12.87	12.93		
Specific Conductivity (uS/cm)	592	656	662		
Dissolved Oxygen (mg/L)	0.98	0.77	0.81		
pH (S.U.)	5.69	5.69	5.71		
ORP (mV)	16.5	6.1	3.0		
Volume Purged (gal)	2	3.5	5.0		

Sample Time: 9:55

NOTES (include well repairs performed and well repairs needed):

Signature of Sampler: [signature]

Date: 8/8/10

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

Project Name: AC001.002 Date: 8/9/10

Project Location: Fort Devens Project #:

Sampler Name(s): MMH, SSV

WELL IDENTIFICATION: SHM-05-41B(ABC)

Well Integrity

	YES	NO	N/A
Protective Casing Secure			
Concrete Pad Intact			
PVC Casing Intact			
Well Gripper Present			
Bolts Present (Pad Wells)			
Locked (Stickup Wells)			

Well Information

Diameter: 2" Material: PVC

	A	B	C
Depth to Water:		11.83	
Depth to Well Bottom:		64.00	92.6

Type of Sampling: Pump / Disposable Bailer / Field Filtered / Other

Pump Type (if applicalbe): Inertial / Submersible / Peristaltic / Other

WELL VOLUME PURGE: 1 WELL VOLUME = (DEPTH TO BOTTOM - DEPTH TO WATER) X WELL CAPACITY (SEE BELOW)
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

Calculation of One (1) Purge Volume: 8.34

Purge Start Time: 1235 Purge End Time: 1300

Field Water Quality Measurements

Time	1245	1250			
Temperature (°C)	11.57	11.75	11.75	11.74	11.75
Specific Conductivity (mS/cm)	230	310	311	311	310
Dissolved Oxygen (mg/L)	0.40	0.37	0.36	0.38	0.32
pH (S.U.)	6.23	~~6.~~ 6.35	6.38	6.43	6.43
ORP (mV)	-33.4	-34.8	-37.2	42.5	42.6
Volume Purged (gal)	2.5				

Sample Time: 1305

NOTES (Include well repairs performed and well repairs needed):

MS/MSD

Signature of Sampler: [signature] Date: 8/9/10

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

Project Name: AP001.002 Date: 5/9/10

Project Location: Ft Devens Project #:

Sampler Name(s): CMH, SSV

WELL IDENTIFICATION: SHP-05-045A

Well Integrity

	YES	NO	N/A
Protective Casing Secure			
Concrete Pad Intact			
PVC Casing Intact			
Well Gripper Present			
Bolts Present (Pad Wells)			
Locked (Stickup Wells)			

Well Information ~~A~~ B | ~~B~~ A

Diameter: 2"
Material: PVC
Depth to Water: 18.1 | 17.66
Depth to Well Bottom: 75.70 | 27.19

Type of Sampling: Pump (circled) Disposable Bailer Field Filtered Other

Pump Type (if applicalbe): Inertial Submersible Peristaltic (circled) Other

WELL VOLUME PURGE: 1 WELL VOLUME = (DEPTH TO BOTTOM - DEPTH TO WATER) X WELL CAPACITY (SEE BELOW)
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

Calculation of One (1) Purge Volume: 1.52 3 well volumes = 4.57

Purge Start Time: 1020 Purge End Time: 1110

Field Water Quality Measurements

Time	~~102~~ 1034	1105			
Temperature (°C)	13.22	13.95	13.97		
Specific Conductivity (uS/cm)	296	294	294		
Dissolved Oxygen (mg/L)	0.39	0.30	0.30		
pH (S.U.)	6.18	6.20	6.20		
ORP (mV)	-16.8	-32.0	-32.2		
Volume Purged (gal)	2	6	6.5		

Sample Time: 1115

NOTES (Include well repairs performed and well repairs needed):

Signature of Sampler: [signature] Date: 5/5/10

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

Project Name: Devens/Ayer

Date: 8/12/2010

Project Location:

Project #: AC001.002

Sampler Name(s): Matt Crosby, Julie Robsham

WELL IDENTIFICATION: SHM-07-05

Well Integrity

	YES	NO	N/A
Protective Casing Secure	X		
Concrete Pad Intact		X	
PVC Casing Intact	X		
Well Gripper Present	X		
Bolts Present (Pad Wells)	X		
Locked (Stickup Wells)			X

Well Information

Diameter: 2"

Material: PVC

Depth to Water: ~~15.41~~ 15.35

Depth to Well Bottom: ~~65.5~~ 33.68

Type of Sampling: (Pump) Disposable Bailer Field Filtered Other

Pump Type (if applicalbe): Inertial Submersible (Peristaltic) Other

WELL VOLUME PURGE: 1 WELL VOLUME = (DEPTH TO BOTTOM - DEPTH TO WATER) X WELL CAPACITY (SEE BELOW)
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.08; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

Calculation of One (1) Purge Volume: 2.93

Purge Start Time: 9:47

Purge End Time: 10:00

Field Water Quality Measurements

Time	9:53	9:56	10:00		
Temperature (°C)	11.41	11.53	11.43		
Specific Conductivity (uS/cm)	201	240	256		
Dissolved Oxygen (mg/L)	0.38	0.41	0.40		
pH (S.U.)	6.09	6.20	6.45		
ORP (mV)	50.6	26.1	-21.5		
Volume Purged (gal)	1	2	3		

Sample Time: 10:00

NOTES (include well repairs performed and well repairs needed):

SHM-05-40X (next to SHM-07-05) requires new concrete pad.
(DTW: 15.41) (DTB: 65.5)

Signature of Sampler: JR

Date: 8/12/2010

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Mansfield, MA 02048
508-339-3200

Project Name: Devens, Ayers
Date: 8-12-2010
Project Location:
Project #: 1C001.002
Sampler Name(s): Matt Cody + Jake Robsham

WELL IDENTIFICATION: SHM-05-42A

Well Integrity

	YES	NO	N/A
Protective Casing Secure	✓		
Concrete Pad Intact	✓		n/a
PVC Casing Intact	✓		
Well Gripper Present	✓		
Bolts Present (Pad Wells)			✓
Locked (Stickup Wells)		✓	

Well Information

Diameter: 1"
Depth to Water: 6.21
Material: PVC
Depth to Well Bottom: 44.18

Type of Sampling: Pump   Disposable Bailer   Field Filtered   Other

Pump Type (if applicalbe): Inertial   Submersible   Peristaltic   Other

WELL VOLUME PURGE: 1 WELL VOLUME = (DEPTH TO BOTTOM - DEPTH TO WATER) X WELL CAPACITY (SEE BELOW)
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

Calculation of One (1) Purge Volume: 1.5

Purge Start Time: 13:20   Purge End Time: 13:35

Field Water Quality Measurements

Time	13:25	13:30	13:35		
Temperature (°C)	10.62	10.46	10.39		
Specific Conductivity (uS/cm)	66	63	61		
Dissolved Oxygen (mg/L)	2.76	1.93	1.20		
pH (S.U.)	6.78	6.64	6.50		
ORP (mV)	88.1	90.4	89.5		
Volume Purged (gal)	0.5	1	1.5		

Sample Time: 13:35

NOTES (include well repairs performed and well repairs needed):

Signature of Sampler:
Date: 8-12-2010

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Mansfield, MA 02048
508-339-3200

Project Name: Shepley's Hill Landfill Dred Date: 8/12/10

Project Location: Fort Devens, MA Project #: ACO01

Sampler Name(s): Jonathan Chaffee, Ryder Musselman

WELL IDENTIFICATION: SHM-07-03

Well Integrity

	YES	NO	N/A
Protective Casing Secure			X
Concrete Pad Intact	X		
PVC Casing Intact	X		
Well Gripper Present	X		
Bolts Present (Pad Wells)		X	
Locked (Stickup Wells)			X

Well Information

Diameter: 2"
Depth to Water: 20.60
Material: PVC
Depth to Well Bottom: 33.47

Type of Sampling: Pump (circled) Disposable Bailer Field Filtered Other

Pump Type (if applicalbe): Inertial Submersible Peristaltic Other Bladder

WELL VOLUME PURGE: 1 WELL VOLUME = (DEPTH TO BOTTOM - DEPTH TO WATER) X WELL CAPACITY (SEE BELOW)
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

Calculation of One (1) Purge Volume: 2.08

Purge Start Time: 1200 Purge End Time: 1220

Field Water Quality Measurements

Time	1205	1210	1215	1220	
Temperature (°C)	13.00	12.59	12.31	12.25	
Specific Conductivity (mS/cm)	76	77	79	81	
Dissolved Oxygen (mg/L)	6.84	6.52	6.53	6.61	
pH (S.U.)	6.64	6.10	5.91	5.81	
ORP (mV)	-103.5	127.2	132.2	133.4	
Volume Purged (gal)	~0.25	~0.5	~0.75	~1.0	

Sample Time: 1220

NOTES (include well repairs performed and well repairs needed):

Signature of Sampler: [signature] Date: 8/12/10

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Project Name: Shepley's Hill Landfill Invest. Date: 8/12/10

Project Location: Fort Devens, MA Project #: AC001

Sampler Name(s): Jonathan Chaffee, Ryder Musselman

WELL IDENTIFICATION: SHM-99-31B

Well Integrity

	YES	NO	N/A
Protective Casing Secure	X		
Concrete Pad Intact			✓
PVC Casing Intact	X		
Well Gripper Present	X		
Bolts Present (Pad Wells)			X
Locked (Stickup Wells)		✓	

Well Information

Diameter: 2"
Depth to Water: 5.15
Material: PVC
Depth to Well Bottom: 61.5

Type of Sampling: **Pump** (circled) Disposable Bailer Field Filtered Other________

Pump Type (if applicable): Inertial Submersible **Peristaltic** (circled) Other________

WELL VOLUME PURGE: 1 WELL VOLUME = (DEPTH TO BOTTOM − DEPTH TO WATER) X WELL CAPACITY (SEE BELOW)
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

Calculation of One (1) Purge Volume: ~9

Purge Start Time: 1042 Purge End Time: 1110

Field Water Quality Measurements

Time	1050	1055	1100	1105	1110
Temperature (°C)	10.81	10.73	10.69	10.77	10.74
Specific Conductivity (mS/cm)	168	182	184	186	186
Dissolved Oxygen (mg/L)	0.35	0.21	0.21	0.20	0.19
pH (S.U.)	6.05	5.98	5.99	6.00	6.03
ORP (mV)	76.6	47.7	44.2	37.8	33.9
Volume Purged (gal)	~1	~2	~3	~4	~5

Sample Time: 1110

NOTES (include well repairs performed and well repairs needed):

Signature of Sampler: [signature] Date: 8/12/10

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508-339-3200

Project Name: Shepley's Landfill Investigation Date: 8/12/10

Project Location: Fort Devens, MA Project #: AC.001

Sampler Name(s): Jonathan Chaffee, Lydia Misselman

WELL IDENTIFICATION: SHL-23

Well Integrity

	YES	NO	N/A
Protective Casing Secure	X		
Concrete Pad Intact			X
PVC Casing Intact	X		
Well Gripper Present	X		
Bolts Present (Pad Wells)			X
Locked (Stickup Wells)		X	

Well Information

Diameter: 4"
Depth to Water: 29.95
Material: PVC
Depth to Well Bottom: 36.0

Type of Sampling: Pump (circled) Disposable Bailer Field Filtered Other Bladder Pump

Pump Type (if applicalbe): Inertial Submersible (circled) Peristaltic Other

WELL VOLUME PURGE: 1 WELL VOLUME = (DEPTH TO BOTTOM – DEPTH TO WATER) X WELL CAPACITY (SEE BELOW)
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

Calculation of One (1) Purge Volume: 3.9

Purge Start Time: 0835 Purge End Time: 0915

Field Water Quality Measurements Flow Rate: 250 mL/minute

Time	0845	0855	0905	0915	
Temperature (°C)	10.89	10.93	10.36	10.42	
Specific Conductivity (mS/cm)	31	26	25	25	
Dissolved Oxygen (mg/L)	10.01	10.07	10.02	10.06	
pH (S.U.)	8.52	7.61	6.74	6.45	
ORP (mV)	170.4	188.1	202.1	209.8	
Volume Purged (gal)	~1.0	~1.5	~2.0	~2.5	

Sample Time: 0915

NOTES (include well repairs performed and well repairs needed):

Signature of Sampler: [signature] Date: 8/12/10

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508-339-3200

Project Name: Devens/Ayer

Date: 8/12/2010

Project Location:

Project #: ACO01.002

Sampler Name(s): Matt Crosby, Julie Robsham

WELL IDENTIFICATION: SHM-05-39A

Well Integrity

	YES	NO	N/A
Protective Casing Secure		X	
Concrete Pad Intact		X	
PVC Casing Intact	X		
Well Gripper Present	X		
Bolts Present (Pad Wells)		X	
Locked (Stickup Wells)			X

Well Information

Diameter: 2"

Depth to Water: 12.68

Material: PVC

Depth to Well Bottom: 38.70

Type of Sampling: (Pump) Disposable Bailer Field Filtered Other

Pump Type (if applicalbe): Inertial Submersible (Peristaltic) Other

WELL VOLUME PURGE: 1 WELL VOLUME = (DEPTH TO BOTTOM - DEPTH TO WATER) X WELL CAPACITY (SEE BELOW)
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

Calculation of One (1) Purge Volume: 4.16

Purge Start Time: 8:52

Purge End Time: 9:20

Field Water Quality Measurements

Time	9:00	9:15	9:20		
Temperature (°C)	11.59	11.35	11.37		
Specific Conductivity (uS/cm)	252	263	263		
Dissolved Oxygen (mg/L)	0.34	0.35	0.35		
pH (S.U.)	6.33	6.44	6.45		
ORP (mV)	-19.5	-50.8	-52.9		
Volume Purged (gal)	2	4	5		

Sample Time: 9:20

NOTES (include well repairs performed and well repairs needed):

Well repairs needed.
SHM-05-39B DTW: 13.22'

Signature of Sampler: Julie Robsham

Date: 8/12/2010

Sovereign Consulting Inc.
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Mansfield, MA 02048
508-339-3200

Project Name: Devens/Ayer

Date: 8/12/2010

Project Location:

Project #: AC001.002

Sampler Name(s): Matt Crosby, Julie Robsham

WELL IDENTIFICATION: SHM-10-10

Well Integrity

	YES	NO	N/A
Protective Casing Secure		X	
Concrete Pad Intact			X
PVC Casing Intact	X		
Well Gripper Present	X		
Bolts Present (Pad Wells)			X
Locked (Stickup Wells)		X	

Well Information

Diameter: 1.5"

Depth to Water: 11.26

Material: PVC

Depth to Well Bottom: 66.50

Type of Sampling: Pump (circled) Disposable Bailer Field Filtered Other

Pump Type (if applicalbe): Inertial Submersible Peristaltic (circled) Other

WELL VOLUME PURGE: 1 WELL VOLUME = (DEPTH TO BOTTOM – DEPTH TO WATER) X WELL CAPACITY (SEE BELOW)
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

Calculation of One (1) Purge Volume: 3.30

Purge Start Time: 11:17

Purge End Time: 11:33

Field Water Quality Measurements

Time	11:23	11:27	11:33		
Temperature (°C)	11.39	11.28	11.27		
Specific Conductivity (uS/cm)	662	621	622		
Dissolved Oxygen (mg/L)	0.60	0.70	0.76		
pH (S.U.)	6.52	6.56	6.57		
ORP (mV)	21.5	-2.3	-9.1		
Volume Purged (gal)	1	2	3		

Sample Time: 11:33

NOTES (include well repairs performed and well repairs needed):

No lock on stick-up well.

Signature of Sampler: [signature]

Date: 8/12/10

Sovereign Consulting Inc.
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Mansfield, MA 02048
508-339-3200

Project Name: Devens/Ayer

Date: 8/12/2010

Project Location:

Project #: AC001.002

Sampler Name(s): Matt Crosby, Julie Robsham

WELL IDENTIFICATION: SHM-10-01

Well Intenrity

	YES	NO	N/A
Protective Casing Secure	✓		
Concrete Pad Intact			✓
PVC Casing Intact	✓		
Well Gripper Present	✓		
Bolts Present (Pad Wells)			✓
Locked (Stickup Wells)		✓	

Well Information

Diameter: 1.5" Depth to Water: 4.66

Material: PVC Depth to Well Bottom: 71.86

Type of Sampling: Pump (circled) Disposable Bailer Field Filtered Other

Pump Type (if applicalbe): Inertial Submersible Peristaltic Other

WELL VOLUME PURGE: 1 WELL VOLUME = (DEPTH TO BOTTOM – DEPTH TO WATER) X WELL CAPACITY (SEE BELOW)
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

Calculation of One (1) Purge Volume: 4 Gal.

Purge Start Time: 12:25 Purge End Time: 12:40

Field Water Quality Measurements

Time	12:30	12:35	12:40		
Temperature (°C)	12.30	11.93	11.86		
Specific Conductivity (uS/cm)	297	292	291		
Dissolved Oxygen (mg/L)	1.38	0.58	0.49		
pH (S.U.)	7.04	6.76	6.61		
ORP (mV)	42.3	41.7	42.2		
Volume Purged (gal)	1.5	2.5	4		

Sample Time: 12:40

NOTES (Include well repairs performed and well repairs needed):

Signature of Sampler:

Date: 8.12.2010

Sovereign Consulting Inc.
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Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

Vertical Profiling - Potassium

PROJECT NAME: ACOO1002	PROJECT LOCATION: Fort Devens		DATE: 6/9/10		WELL ID: WM-10-R
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet): 32.0	DEPTH TO BOTTOM (feet): 66	PID READING (ppmv): —	

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder / Stainless		PUMP EQUIPMENT MODEL & SERIAL #s:
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY				GALLONS: — LITERS: —

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
64-65	65	65	0730	0810	GALLONS: 3.0 LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0730	400	CPM 4 / 10.0 - 5.0	34.4	—	N	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
0750	400	34.4	>D Limit	0.08	6.55	14.60	528	-74.4	Silty	None
0755	400	35.5	>D Limit	0.15	6.57	13.24	570	-112.3	Silty	None
0800	400	36.5	>D Limit	0.13	6.53	13.04	563	-107.8	Silty	None
0805	400	38.1	>D Limit	0.12	6.62	13.02	556	-104.3	Silty	None
0810	400	39.2	>D Limit	0.13	6.79	12.95	543	-103.3	Silty	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jonathan Chaffee	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 0815	SAMPLING ENDED AT: 0910
PUMP OR TUBING DEPTH IN WELL (feet): 65	SAMPLE PUMP FLOW RATE (mL per minute): 400	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: (Y) N Filtration Equipment Type:	FILTER SIZE: .45 µm	DUPLICATE: (Y) N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: ACOO1 002	PROJECT LOCATION: Devens/Ayer		DATE: 8/9/10		WELL ID: SHM-10-24
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):		PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS: LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
14-16	15	15 14-16'	14:45	15:30	GALLONS: LITERS:

WATER LEVEL STABILIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
14:53	450	15'	764	2.39	5.91	15.61	766	87.1	cloudy	none
15:04	450	15'	45.2	2.98	5.92	14.42	763	110.7	clear	none
15:14	450	15'	37.4	3.10	5.94	14.28	762	116.3	clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 15:21	SAMPLING ENDED AT: 15:30
PUMP OR TUBING DEPTH IN WELL (feet): 15	SAMPLE PUMP FLOW RATE (mL per minute): 450	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: (Y) N Filtration Equipment Type:	FILTER SIZE: ___ µm	DUPLICATE: (Y) N Metals

MATERIAL CODES: AG = Amber Glass CG = Clear Glass PE = Polyethylene PP = Polypropylene S = Silicone T = Teflon O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-24-015-F & DUP-080910-F
-U -U

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
AC001002	Devens/Ayer	8/9/10	SHM-10-24

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
1/4"	Poly	Geopump	

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	GALLONS / LITERS
24-26	25	~~24-26~~ 25	15:39	16:08	

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
15:45	475	25	248	4.97	6.05	13.90	715	105.2	little cloudy	none
15:49	475	25	96.3	5.23	6.05	13.39	712	104.9	little cloudy	none
15:58	475	25	44.9	5.21	6.05	13.23	710	104.8	clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
SovCon	[signature]	16:01	16:08

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
25	475	

FIELD DECONTAMINATION: Y / N (Y circled) — FIELD-FILTERED: Y / N (Y circled) — Filtration Equipment Type — FILTER SIZE: ___ µm — DUPLICATE: Y / N (N circled)

MATERIAL CODES: AG = Amber Glass CG = Clear Glass PE = Polyethylene PP = Polypropylene S = Silicone T = Teflon O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-24-025-F
-U

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
ACCO1 062	Devens/Ayer	8/9/10	SHM-10-24

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
1/4"	Poly	Geopump	

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
34-36	35	~~35~~ 34-36	16:12	16:43	GALLONS: LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
16:17	400	35'	379	2.29	5.95	15.05	916	92.4	cloudy	none
16:25	400	35'	59.7	1.31	5.94	14.92	919	95.1	Clear	none
16:31	400	35'	45.3	1.12	5.94	14.08	914	92.4	Clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
Sov Con	GK	16:33	16:43

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
35	400	

FIELD DECONTAMINATION: Y N — FIELD-FILTERED: Y N — Filtration Equipment Type — FILTER SIZE: ____ µm — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass CG = Clear Glass PE = Polyethylene PP = Polypropylene S = Silicone T = Teflon O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-24-035-F
-U

Sovereign Consulting Inc.
905B South Main Street, Suite 202
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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION		DATE	WELL ID
ACOOL002	Devens/Ayer		8/9/10	SHM-10-24
PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
1/4"	Poly	Geopump	

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY | GALLONS | LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 | 1 GALLON = 3.785 LITERS | TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	GALLONS: / LITERS:
44-46	45	44-46' 45	16:45	17:25	

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
16:48	400	45'	<1,000	1.60	6.41	14.19	1304	-45.5	cloudy	none
16:57	400	45'	159	1.14	6.48	13.75	1335	-63.4	little cloudy	none
17:07	400	45'	98.6	1.07	6.54	13.61	1332	-71.6	clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
SovCon	[signature]	17:12	17:25

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
45	400	

FIELD DECONTAMINATION Y N (Y circled) | FIELD-FILTERED Y N (Y circled) FILTER SIZE ___ µm | Filtration Equipment Type | DUPLICATE Y N (N circled)

MATERIAL CODES: AG = Amber Glass CG = Clear Glass PE = Polyethylene PP = Polypropylene S = Silicone T = Teflon O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb? Y / N   PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-24-045-F
-U

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: ACOOLOO2 | PROJECT LOCATION: Devens/Ayer | DATE: 8/9/10 | WELL ID: SHM-10-24

PROJECT NUMBER: | WELL DIAMETER (inches): | DEPTH TO WATER (feet): | DEPTH TO BOTTOM (feet): | PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4" | TUBING MATERIAL CODE (see below): Poly | PURGE PUMP TYPE: Geopump | PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY | GALLONS: | LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75 = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 | 1 GALLON = 3.785 LITERS | TOTAL VOLUME PURGED: GALLONS: LITERS:

WELL SCREEN INTERVAL DEPTH (feet): 54-56 | INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 55 | FINAL PUMP OR TUBING DEPTH IN WELL (feet): 55 | PURGING INITIATED AT: 17:30 | PURGING ENDED AT: 18:05

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
17:35	500	55'	<1,000	0.87	6.50	14.65	893	-77.5	cloudy	none
17:41	500	55'	<1,000	0.69	6.55	14.15	921	-90.4	cloudy	none
17:47	500	55'	<1,000	0.77	6.61	13.41	914	-95.3	cloudy	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon | SAMPLER(S) SIGNATURES: OK | SAMPLING INITIATED AT: 17:58 | SAMPLING ENDED AT: 18:05

PUMP OR TUBING DEPTH IN WELL (feet): 55 | SAMPLE PUMP FLOW RATE (mL per minute): 500 | FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION: Y N | FIELD-FILTERED: Y N | Filtration Equipment Type: | FILTER SIZE: ___ µm | DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe | General Condition: Good / Needs Repair | Well Caps: Good / Broken / None | Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N | Is Well Plumb?: Y / N | PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N | Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT Rotosonic

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: ACM1.002		PROJECT LOCATION: Fort Devens			DATE: 8/9/10		WELL ID: SHM-10-13
PROJECT NUMBER:		WELL DIAMETER (inches):	DEPTH TO WATER (feet): 24.45	DEPTH TO BOTTOM (feet): 40		PID READING (ppmv): —	

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder / Stainless	PUMP EQUIPMENT MODEL & SERIAL #s:	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS: —	LITERS: —
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88			1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 38-40	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 39	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 39	PURGING INITIATED AT: 1330 / PURGING ENDED AT: 1400	GALLONS: ~2 / LITERS: —

WATER LEVEL STABLIZATION | DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
1330	200	CPM 4 - 10.5/5.0	24.8	—	N	—
			25.0	—		

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1335	200	25.05	1882	0.24	6.41	24.43	735	103.4	Cloudy	None
1340	200	25.10	5513	0.16	5.92	23.87	729	36.7	Cloudy	None
1345	200	25.10	5219	0.16	5.72	22.67	731	107.5	Cloudy	None
1350 ~~1400~~	200	25.10	5930	0.18	5.57	22.28	736	115.4	Cloudy	None
1355 ~~1405~~	200	25.13	2935	0.20	5.47	22.01	742	104.7	Cloudy	None
1400	200	25.11	1409	0.18	5.36	21.58	740	101.2	Cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jonathan Chatke	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1405	SAMPLING ENDED AT: 1435
PUMP OR TUBING DEPTH IN WELL (feet): 39	SAMPLE PUMP FLOW RATE (mL per minute): 200	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N Filtration Equipment Type:	FILTER SIZE: .45 µm	DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb? Y / N   PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - Ptolasonic

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: ACOOL.002	PROJECT LOCATION: Fort Devens			DATE: 8/9/10	WELL ID: SPM-10-13
PROJECT NUMBER:	WELL DIAMETER (inches): —	DEPTH TO WATER (feet): 24.6	DEPTH TO BOTTOM (feet):	PID READING (ppmv): —	

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder / Stainless		PUMP EQUIPMENT MODEL & SERIAL #s	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY				GALLONS: —	LITERS: —
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88				1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED
WELL SCREEN INTERVAL DEPTH (feet): 48-50	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 49	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 49	PURGING INITIATED AT: 1530	PURGING ENDED AT: 1600	GALLONS: ~3 LITERS: —
WATER LEVEL STABLIZATION	DEPTH TO WATER WITH PUMP (feet):				

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
1530	300	CPM 4 / 10.0 - 5.0	24.6	—	N	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 1°C)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1535	300	25.70	1345	0.26	6.35	25.20	858	146.8	CLOUDY	NONE
1540	300	25.55	314	0.29	6.24	23.54	861	128.8	CLOUDY	NONE
1545	300	25.32	983	0.37	6.20	22.93	863	118.5	CLOUDY	NONE
1550	300	25.21	225	0.40	6.20	22.60	864	114.8	CLOUDY	NONE
1555	300	25.18	198	0.44	6.18	22.45	863	105.2	SLIGHTLY CLOUDY	NONE
1600	300	25.21	144	0.48	6.17	21.68	858	45.5	CLOUDY	NONE

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jonathan Chaffee	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1605	SAMPLING ENDED AT: 1630
PUMP OR TUBING DEPTH IN WELL (feet): 49	SAMPLE PUMP FLOW RATE (mL per minute): 300	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N Filtration Equipment Type:	FILTER SIZE: 0.45 µm	DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb? Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - Photoscopic

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
AC001.002	Fort Devens	8/10/2010	SHM-10-13

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
	—	25.93	60	—

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
1/4	PE	Bladder / Stainless	

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS — LITERS —

WELL CAPACITY (Gallons Per Foot): 0.75 = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
58 - 60	59	59	0755	0825	GALLONS ~25; LITERS —

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0755	300	LPM: 4 10.0 - 5.0	25.93	—	N	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-400 mL/min)*	DEPTH TO WATER (feet) (+/- 0.33)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
0800	300	26.59	506	1.91	7.02	19.92	738	-35.1	Cloudy	None
0805	300	27.15	323	0.53	6.53	19.66	793	-47.9	Cloudy	None
0810	300	27.67	492	0.38	6.47	19.21	805	-46.6	cloudy	NONE
0815	300	27.90	698	0.17	6.42	18.73	802	-36.7	CLOUDY	NONE
0820	300	28.15	691	0.15	6.40	18.44	803	-33.3	CLOUDY	NONE
0825	300	28.40	565	0.16	6.40	18.34	800	-33.3	CLOUDY	NONE

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
Jonathan Chaffee	[signature]	0830	0850

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
59	300	

FIELD DECONTAMINATION: (Y) N — FIELD-FILTERED: (Y) N — Filtration Equipment Type — FILTER SIZE: .45 µm — DUPLICATE: Y (N)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Positing - Photosonic

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: ACOOL.002	PROJECT LOCATION: Fort Devens			DATE: 8/10/2010	WELL ID: 34M-10-13
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet): 23.7	DEPTH TO BOTTOM (feet): 70	PID READING (ppmv): —	

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder / Stainless	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS: —

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
65 - 70	69	69	1015	1045	GALLONS: ~2.5 LITERS: —

WATER LEVEL STABUZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
1015	300	CPM 4 - 10.5 / 5.0	23.7	—	N	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1020	300	24.1	> Limit	0.57	7.31	24.29	594	-27.7	Silty	None
1025	300	24.1	> Limit	0.22	6.59	23.40	555	-39.3	Silty	NONE
1030	300	24.1	> Limit	0.14	6.37	22.83	561	-24.1	Silty	None
1035	300	24.1	165	0.66	6.24	22.31	544	-14.3	CLOUDY	NONE
1040	300	24.12	172	1.29	6.14	21.48	541	-7.3	CLOUDY	NONE
1045	300	24.1	151	0.81	6.09	21.32	545	-2.1	CLOUDY	NONE

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jonathan Chitty	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 1050	SAMPLING ENDED AT: 1105
PUMP OR TUBING DEPTH IN WELL (feet): 69	SAMPLE PUMP FLOW RATE (mL per minute): 300	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s	

FIELD DECONTAMINATION: Y / N — FIELD-FILTERED: Y N — FILTER SIZE: 0.45 µm — Filtration Equipment Type — DUPLICATE: Y / N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well!? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low-Flow Sampling

Vertical Profiling - Protosmic

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: A0001.002	PROJECT LOCATION: Fort Devens		DATE: 8/10/2010	WELL ID: SHM-10-13
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet): 37.0	DEPTH TO BOTTOM (feet): 80	PID READING (ppmv): —

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder / Stainless	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS: —

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
78 - 80	79	79	~~1145~~ 1140	1210	GALLONS: LITERS: —

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
1140	~~200~~ 250	CPM4/ 10.0-5.0	37.0	—	N	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1145	250	37.6	1344	5.78	6.76	25.49	352	-16.3	Cloudy	None
1150	250	38.3	530	6.10	6.58	24.44	342	-5.6	Cloudy	None
1155	250	38.75	624	6.50	6.49	25.58	338	3.1	Cloudy	None
1200	250	40.3	146	7.55	6.46	23.01	337	9.1	CLOUDY	NONE
1205	250	42.0	137	7.67	6.39	22.37	338	14.9	CLOUDY	NONE
1210	250	42.58	128	8.68	6.37	21.89	338	15.9	CLOUDY	NONE

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jonathan Chuffer	SAMPLER(S) SIGNATURES: J. Chuffer	SAMPLING INITIATED AT: 12:15	SAMPLING ENDED AT: 1235
PUMP OR TUBING DEPTH IN WELL (feet): 79	SAMPLE PUMP FLOW RATE (mL per minute): 250	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y / N (Y circled)	FIELD-FILTERED: Y / N (Y circled) Filtration Equipment Type:	FILTER SIZE: 0.45 µm	DUPLICATE: Y / N (N circled)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001.002	PROJECT LOCATION: Devens/Ayer			DATE: 8/10/10	WELL ID: SHM-10-22
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):	

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump		PUMP EQUIPMENT MODEL & SERIAL #s:	
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY				GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88				1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 10-12	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 11	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 10-12' 11	PURGING INITIATED AT: 13:20	PURGING ENDED AT: 13:50	GALLONS: LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
13:26	400	11'	22.1	7.53	6.09	16.19	306	83.9	clear	none
13:31	400	11'	8.78	7.42	5.94	14.99	307	104.1	clear	none
13:37	400	11'	6.27	7.43	5.92	14.70	306	115.8	clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES: [signature]		SAMPLING INITIATED AT: 13:43	SAMPLING ENDED AT: 13:50
PUMP OR TUBING DEPTH IN WELL (feet): 11	SAMPLE PUMP FLOW RATE (mL per minute): 400	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:		
FIELD DECONTAMINATION: Y N	FIELD FILTERED: Y N Filtration Equipment Type:	FILTER SIZE: ___ µm	DUPLICATE: Y N	

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION: Devens/Ayer			DATE: 8/10/10	WELL ID: SHM-10-22
PROJECT NUMBER: AC001.002	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):		PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): PON	PURGE PUMP TYPE: Geopump		PUMP EQUIPMENT MODEL & SERIAL #s:	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY				GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88				1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 20-22	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 21	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 21 ~~20-22~~	PURGING INITIATED AT: 14:00	PURGING ENDED AT: 14:45	GALLONS: LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
14:13	350	21'	301	0.53	6.17	13.90	439	86.2	little cloudy	none
14:17	350	21'	86.2	0.56	5.19	13.43	440	74.2	clear	none
14:23	350	21'	45	0.63	6.19	13.42	440	75.5	clear.	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 14:38	SAMPLING ENDED AT: 14:45
PUMP OR TUBING DEPTH IN WELL (feet): 21	SAMPLE PUMP FLOW RATE (mL per minute): 350	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y / N	FIELD-FILTERED: Y / N; Filtration Equipment Type:	FILTER SIZE: ____ µm	DUPLICATE: Y / N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-22-021-F
-U

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: ACCOL.002	PROJECT LOCATION: Devens/Ayer		DATE: 8/10/10	WELL ID: SOV-10-22
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY | GALLONS: | LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 | 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED: GALLONS: LITERS:
30-32	31	30-32 31	14:55	16:31	

WATER LEVEL STABLIZATION DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
15:04	475	31'	191	0.67	6.20	13.12	764	75.5	little cloudy	none
15:08	475	31'	81.2	0.64	6.21	13.27	767	71.7	clear	none
15:13	475	31'	54.0	0.72	6.22	13.22	766	68.1	clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES: JK	SAMPLING INITIATED AT: 15:16	SAMPLING ENDED AT: 15:31
PUMP OR TUBING DEPTH IN WELL (feet): 31	SAMPLE PUMP FLOW RATE (mL per minute): 475	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s	

FIELD DECONTAMINATION: (Y) N | FIELD-FILTERED: (Y) N | FILTER SIZE: ___ µm | Filtration Equipment Type: | DUPLICATE: Y (N)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb?: Y / N   PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

GP-10-22-031-F
-U

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling-DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION: Devens/ Ayer	DATE: 8/10/10	WELL ID: SHM-10-22
PROJECT NUMBER: ACOO1.002	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump
PUMP EQUIPMENT MODEL & SERIAL #s:	GALLONS:	LITERS:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
40-42	41	41~~40~~-42'	15:47	16:10	GALLONS: LITERS:

WATER LEVEL STABILIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
15:49	325	41'	181	0.80	6.37	13.46	431	-28.5	little cloudy	none
15:52	325	41'	97.6	0.94	6.37	13.35	435	-31.1	clear	none
15:57	325	41'	85.4	0.99	6.38	13.30	434	-32.9	clear	none

* EPA stabilization parameters from EPA/540/S-95/504, April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
SovCon	GR	16:00	16:10

PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:
FIELD DECONTAMINATION: Y / N (Y circled)	FIELD-FILTERED: Y / N (Y circled) FILTER SIZE: ___ µm; Filtration Equipment Type:	DUPLICATE: Y / N (N circled)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-22-041-F
-U

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: | PROJECT LOCATION: Devens/Ayer | DATE: 8/10/10 | WELL ID: SHM-10-22

PROJECT NUMBER: AC001.002 | WELL DIAMETER (inches): | DEPTH TO WATER (feet): | DEPTH TO BOTTOM (feet): | PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4" | TUBING MATERIAL CODE (see below): Poly | PURGE PUMP TYPE: Geopump | PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY | GALLONS: | LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 | 1 GALLON = 3.785 LITERS | TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet): 50-52 | INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 51 | FINAL PUMP OR TUBING DEPTH IN WELL (feet): 51 50-52' | PURGING INITIATED AT: 16:18 | PURGING ENDED AT: 17:00 | GALLONS: | LITERS:

WATER LEVEL STABLIZATION | DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
16:19	425	51'	<1,000	0.71	6.49	14.18	583	-8.4	cloudy	none
16:30	425	51'	706	0.78	6.52	13.64	585	-20.0	cloudy	none
16:35	425	51'	145	0.83	6.52	13.72	587	-20.1	little cloudy	none
16:40	425	51'	83.5	0.88	6.55	13.57	585	-20.9	clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon | SAMPLER(S) SIGNATURES: | SAMPLING INITIATED AT: 16:45 | SAMPLING ENDED AT: 17:00

PUMP OR TUBING DEPTH IN WELL (feet): 51 | SAMPLE PUMP FLOW RATE (mL per minute): 425 | FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION: Y N | FIELD-FILTERED: Y N | FILTER SIZE: ___ μm | Filtration Equipment Type: | DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe | General Condition: Good / Needs Repair | Well Caps: Good / Broken / None | Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N | Is Well Plumb?: Y / N | PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N | Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-22-051-F
-U

Sovereign Consulting Inc.
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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME:	PROJECT LOCATION: Devens/ AyeR		DATE: 8/10/10	WELL ID: SHM-10-22
PROJECT NUMBER: ACOO1	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED: GALLONS: LITERS:

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT
60 - 61.5	61	~~60~~ ~~62~~ 61.5' 61	17:10	17:55

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
17:30	350	61'	123	1.08	6.79	13.60	748	-48.3	little cloudy	none
17:35	350	61'	118	0.96	6.77	13.37	749	-50.3	little cloudy	none
17:41	350	61'	29.9	1.02	6.77	13.28	750	-51.1	Clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 17:45	SAMPLING ENDED AT: 17:55
PUMP OR TUBING DEPTH IN WELL (feet): 61	SAMPLE PUMP FLOW RATE (mL per minute): 350	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	

FIELD DECONTAMINATION: (Y) N — FIELD FILTERED: (Y) N — Filtration Equipment Type: — FILTER SIZE: ___ µm — DUPLICATE: Y (N)

MATERIAL CODES: AG = Amber Glass CG = Clear Glass PE = Polyethylene PP = Polypropylene S = Silicone T = Teflon O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb?: Y / N   PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-22-061' -F
-U

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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION: Devens/Ayer	DATE: 8/10/10	WELL ID: SHM-10-25
PROJECT NUMBER: ACOO1.002	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
24-26	25	25 ~~24-26'~~	9:05	9:44	GALLONS: LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
9:09	325	25'	645	3.66	6.93	13.80	524	97.2	cloudy	none
9:16	325	25'	<1,000	3.42	5.99	13.55	511	73.9	cloudy	none
9:24	325	25'	<1,000	3.38	6.02	13.10	510	69.1	Cloudy	none
9:29	325	25'	889	3.57	6.09	13.07	506	69.3	cloudy	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 9:32	SAMPLING ENDED AT: 9:44
PUMP OR TUBING DEPTH IN WELL (feet): 25	SAMPLE PUMP FLOW RATE (mL per minute): 325	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	

FIELD DECONTAMINATION: Y N — FIELD FILTERED: Y N — Filtration Equipment Type: — FILTER SIZE: ___ µm — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

GP-10-25-025-F
-U

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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
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413-540-0650

PROJECT NAME	PROJECT LOCATION: Vertical Profiling - DPT Devens/ Ayer		DATE: 8/10/10	WELL ID: SHM-10-25
PROJECT NUMBER: ACC01.002	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump		PUMP EQUIPMENT MODEL & SERIAL #s:
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY				GALLONS / LITERS
WELL CAPACITY (Gallons Per Foot): 0.75"=0.02; 1"=0.04; 1.25"=0.06; 2"=0.16; 3"=0.37; 4"=0.65; 5"=1.02; 6"=1.47; 12"=5.88				1 GALLON = 3.785 LITERS
WELL SCREEN INTERVAL DEPTH (feet): 34-36	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 35	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 34-36.35	PURGING INITIATED AT: 9:47	PURGING ENDED AT: 10:30
TOTAL VOLUME PURGED: GALLONS: LITERS:				

WATER LEVEL STABLIZATION DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
9:53	425	35'	662	1.06	5.95	13.86	726	71.1	cloudy	none
10:05	425	35'	392	1.37	5.94	13.87	737	67.2	cloudy	none
10:12	425	35'	372	1.60	5.93	12.98	746	69.2	cloudy	none
10:17	425	35'	223	1.69	5.94	13.10	745	69.3	little cloudy	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Sovcon	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 10:19	SAMPLING ENDED AT: 10:30
PUMP OR TUBING DEPTH IN WELL (feet): 35	SAMPLE PUMP FLOW RATE (mL per minute): 425	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD FILTERED: Y N FILTER SIZE: ___ µm Filtration Equipment Type:	DUPLICATE: Y N Metals	

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb?: Y / N   PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-25-035-F
-U
& DUP-081010-F
-U

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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
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PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
ACOOL.002	Devens/Ayer	8/10/10	SHM-10-25

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
1/4"	Poly	Geopump	

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	GALLONS: / LITERS:
44-46	45	44-46' 45	10:40	11:11	

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
10:45	400	45'	871	1.17	6.46	13.16	618	-56.7	cloudy	none
10:50	400	45'	283	1.12	6.53	12.84	624	-70.4	little cloudy	none
10:55	400	45'	175	1.17	6.54	12.80	623	-73.8	little cloudy	none
11:00	400	45'	137	1.13	6.56	12.86	622	-74.4	little cloudy	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
Jaycar	[signature]	11:06	11:11

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
45	400	

FIELD DECONTAMINATION (Y) N — FIELD-FILTERED: (Y) N — FILTER SIZE: ____ µm — Filtration Equipment Type: — DUPLICATE (Y) N — Metals

MATERIAL CODES: AG = Amber Glass CG = Clear Glass, PE = Polyethylene, PP = Polypropylene, S = Silicone, T = Teflon, O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-25-045-F   -U   & DUP2-081010-F   -U

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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling-Photosonic

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001-002	PROJECT LOCATION: Fort Devens		DATE: 8/11/10	WELL ID: SHM-10-15
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet): 25.3	DEPTH TO BOTTOM (feet): 40	PID READING (ppmv): —

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder / Stainless	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS: —

WELL CAPACITY (Gallons Per Foot): 0.75 = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet): 38-40	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 39	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 39	PURGING INITIATED AT: 0835	PURGING ENDED AT: 0910	TOTAL VOLUME PURGED: GALLONS: LITERS: —

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0835	300	CPM 4: 10.0 - 5.0	25.30	—	N	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
0840	300	952 ⟷ 25.35		0.63	6.19	19.09	560	-78	Cloudy	None
0845	300	6,628	25.40	0.39	5.90	18.19	550	-9.3	Silty	None
0850	300	9,427	25.45	0.31	5.89	18.63	551	-10.3	Silty	None
0855	300	6,476	25.35	0.29	5.86	18.39	546	-7.6	Silty	None
0900	300	8,609	25.45	0.25	5.81	18.47	544	-5.3	Silty	None
905	300	7,540	25.52	0.25	5.81	17.99	543	-6.4	Silty	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jonathan Chaffee	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 0910	SAMPLING ENDED AT: 0925
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	

FIELD DECONTAMINATION: Y / N — FIELD-FILTERED: Y N — FILTER SIZE: .45 um — Filtration Equipment Type: — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - Prolosonic

Sovereign Consulting Inc.
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Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001.002	PROJECT LOCATION: Fort Devens		DATE: 8/11/2010		WELL ID: SHM-10-15
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet): 31.6	DEPTH TO BOTTOM (feet): 50	PID READING (ppmv): —	

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder / Stainless	PUMP EQUIPMENT MODEL & SERIAL #s:	
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS: —	LITERS: —
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88			1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 48 - 50	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 49	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 49	PURGING INITIATED AT: 1015	PURGING ENDED AT: 1140 / GALLONS: ≈2.0 / LITERS: —

WATER LEVEL STABLIZATION DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
1015	250	CPM4: 10.0 - 5.0	31.6	—	N	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1020	250	30.6	114	0.73	6.27	19.45	585	-56.3	CLOUDY	NONE
1025	250	30.245	39.9	0.26	6.09	19.66	585	-26.7	SLIGHTLY CLOUDY	NONE
1030	250	30.48	23.6	0.22	6.09	19.24	587	-21.3	CLEAR	NONE
1035	250	30.61	39.9	0.27	5.96	19.27	594	-6.0	CLEAR	NONE
1040	250	30.70	41.3	0.45	6.00	20.68	589	-40.5	Clear	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jonathan Chafee	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1045	SAMPLING ENDED AT: 1145
PUMP OR TUBING DEPTH IN WELL (feet): 49	SAMPLE PUMP FLOW RATE (mL per minute): 250	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION (Y) N	FIELD-FILTERED Y N / Filtration Equipment Type:	FILTER SIZE: 0.45 µm	DUPLICATE: Y (N)

MATERIAL CODES: AG = Amber Glass CG = Clear Glass PE = Polyethylene PP = Polypropylene S = Silicone T = Teflon O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - Potassium

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
ACCOL002	Fort Devens	8/11/2010	SHM-10-15

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
		51.2	60	—

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
1/4	PE	Bladder / Stainless	

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
58-60	59	59	1340	1405	GALLONS: ~1.5; LITERS: —

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
1340	300	CPM4 / 10.0 - 5.0	51.2	—	N	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1345	300	51.2	782	3.15	7.52	23.50	325	186.2	Cloudy	None
1350	300	51.8	531	4.82	8.02	22.80	307	164.3	CLOUDY	None
1355	300	52.5	261	5.23	8.26	22.54	310	177.9	Clear	None
1400	300	53.15	207	5.11	8.30	21.89	313	181.1	Cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
Jonathan Chaffee	[signature]	1410	1425

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
59	300	

FIELD DECONTAMINATION: Y / N (Y circled) — FIELD-FILTERED: Y N — FILTER SIZE: .45 µm — Filtration Equipment Type: — DUPLICATE: Y / N (N circled)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION			DATE	WELL ID
AC001.002	Devens/Ayer			8/11/10	SHM-10-26
PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)	

PURGING DATA

TUBING DIAMETER (inches): 1/4" | TUBING MATERIAL CODE (see below): Poly | PURGE PUMP TYPE: Geopump | PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY | GALLONS: | LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75 = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 | 1 GALLON = 3.785 LITERS | TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
10-12	11	11 10-12'	8:17	8:45	GALLONS: LITERS:

WATER LEVEL STABLIZATION | DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
8:24	4:25	11'	58.6	6.73	5.59	14.11	124	137.8	clear	none
8:27	425	11'	6.95	6.79	5.58	14.05	123	139.0	clear	none
8:31	425	11'	9.11	6.78	5.59	14.08	123	139.4	Clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon | SAMPLER(S) SIGNATURES: [signature] | SAMPLING INITIATED AT: 8:34 | SAMPLING ENDED AT: 8:45

PUMP OR TUBING DEPTH IN WELL (feet): 11 | SAMPLE PUMP FLOW RATE (mL per minute): 425 | FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION Y / N | FIELD-FILTERED: Y N | Filtration Equipment Type: | FILTER SIZE: ____ µm | DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe | General Condition: Good / Needs Repair | Well Caps: Good / Broken / None | Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N | Is Well Plumb?: Y / N | PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N | Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-26-D -F -U

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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling-DPT

Sovereign Consulting Inc.
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Holyoke, MA 01040
413-540-0650

PROJECT NAME:
PROJECT LOCATION: Devens/Ayer
DATE: 8/11/10
WELL ID: SHM-10-26
PROJECT NUMBER: AC001.002
WELL DIAMETER (inches):
DEPTH TO WATER (feet):
DEPTH TO BOTTOM (feet):
PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"
TUBING MATERIAL CODE (see below): Poly
PURGE PUMP TYPE: Geopump
PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY

GALLONS: LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75 = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

1 GALLON = 3.785 LITERS

TOTAL VOLUME PURGED: GALLONS: LITERS:

WELL SCREEN INTERVAL DEPTH (feet): 20-22
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 21
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 21 ~~20-20'~~
PURGING INITIATED AT: 8:50
PURGING ENDED AT: 9:28

WATER LEVEL STABILIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
9:00	450	21'	119	3.05	6.02	12.50	283	95.1	little cloudy	none
9:04	450	21'	52.3	2.86	6.04	12.48	281	85.7	Clear	none
9:07	450	21'	33.7	3.01	6.05	12.50	275	84.4	Clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon
SAMPLER(S) SIGNATURES: QK
SAMPLING INITIATED AT: 9:12
SAMPLING ENDED AT: 9:28

PUMP OR TUBING DEPTH IN WELL (feet): 21
SAMPLE PUMP FLOW RATE (mL per minute): 450
FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION: Y N
FIELD-FILTERED: Y N
Filtration Equipment Type:
FILTER SIZE: ___ μm
DUPLICATE: Y N Metals

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-D-26-0 -F -U & DUP-081110-F -U

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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

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413-540-0650

PROJECT NAME	PROJECT LOCATION: Devens/Ayer	DATE: 8/11/10	WELL ID: SHM-10-26
PROJECT NUMBER: AC001.002	WELL DIAMETER (inches): / DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED:
30-32	31	30-32' 31	9:40	10:04	GALLONS: LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (ml)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
9:45	475	31'	365	2.70	6.04	12.43	672	82.7	little cloudy	none
9:49	475	31'	167	2.68	6.03	11.95	663	82.4	little cloudy	none
9:52	475	31'	84.8	2.67	6.04	11.74	652	84.5	clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES: GK	SAMPLING INITIATED AT: 9:56	SAMPLING ENDED AT: 10:04
PUMP OR TUBING DEPTH IN WELL (feet): 31	SAMPLE PUMP FLOW RATE (mL per minute): 475	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	

FIELD DECONTAMINATION Y / N — FIELD-FILTERED Y / N — Filtration Equipment Type: — FILTER SIZE: ___ µm — DUPLICATE Y / N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-26-31-F
-U

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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME:	PROJECT LOCATION: Vertical Profiling - DPT Devens/Ayer	DATE: 8/11/10	WELL ID: SHM-10-26
PROJECT NUMBER: ACOO1.002	WELL DIAMETER: (inches) / DEPTH TO WATER: (feet)	DEPTH TO BOTTOM: (feet)	PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED: GALLONS: LITERS:

WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:
40-42	41	41 ~~40-42~~	10:10	10:50

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME	FLOW RATE (mL/min)	DEPTH TO WATER (feet)	TURBIDITY (NTU)	DISSOLVED OXYGEN (mg/L)	pH	TEMP (°C)	SPECIFIC CONDUCTIVITY (µS/cm)	ORP (mV)	COLOR (describe)	ODOR (describe)
(3-5 minutes)*	[100-500 mL/min]*	(+/- 0.3')*	(+/- 10%)*	(+/- 10%)*	(+/- 0.1)*	(+/- 3%)*	(+/- 3%)*	(+/- 10mV)*	-	-
10:17	350	41'	512	0.67	6.03	12.27	637	75.0	cloudy	none
10:22	350	41'	745	0.62	6.02	12.44	640	70.1	cloudy	none
10:26	350	41'	764	0.79	6.04	12.21	637	64.8	cloudy	none
10:33	350	41'	207	0.72	6.05	12.11	631	61.5	little cloudy	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES: OR	SAMPLING INITIATED AT: 10:40	SAMPLING ENDED AT: 10:50
PUMP OR TUBING DEPTH IN WELL (feet): 41	SAMPLE PUMP FLOW RATE (mL per minute): 350	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: (Y) N — FILTER SIZE: ____ µm — Filtration Equipment Type:	DUPLICATE: Y (N)	

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s); cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-26-041-F
-U

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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
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413-540-0650

PROJECT NAME:	PROJECT LOCATION: Devens / Ayer		DATE: 8/11/10	WELL ID: SHM-10-26
PROJECT NUMBER: AC001.002	WELL DIAMETER: (inches)	DEPTH TO WATER: (feet)	DEPTH TO BOTTOM: (feet)	PID READING: (ppmv)

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE: (see below) Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS: / LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED:
50-52	51	51 50-52'	10:55	11:22	GALLONS: LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
11:00	375	51'	167	0.92	6.25	13.14	484	37.9	little cloudy	none
11:07	375	51'	86.0	0.98	6.27	12.84	485	36.9	clear	none
11:12	375	51'	76.1	1.02	6.27	12.65	485	36.3	clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
SovCon	QR	11:15	11:22

PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:
51	375	

FIELD DECONTAMINATION: Y N — FIELD-FILTERED: Y N — FILTER SIZE: ___ µm — Filtration Equipment Type: — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-26-051-F
-U

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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

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PROJECT NAME:	PROJECT LOCATION: Devens/Ayer		DATE: 8/11/10		WELL ID: SHM-10-26
PROJECT NUMBER: ACC01	WELL DIAMETER: (inches)	DEPTH TO WATER: (feet)	DEPTH TO BOTTOM: (feet)	PID READING: (ppmv)	

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE: (see below) Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:		
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS:		LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88			1 GALLON = 3.785 LITERS		TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 60-62	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 61	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 60-62' 61	PURGING INITIATED AT: 11:25	PURGING ENDED AT: 12:15	GALLONS: LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
11:44	325	61'	610	1.00	6.43	13.18	766	1.8	cloudy	none
11:50	325	61'	<1,000	1.20	6.42	12.73	769	4.7	cloudy	none
11:54	325	61'	<1,000	1.25	6.43	12.87	773	-9.9	cloudy	none
12:03	325	61'	376	1.49	6.45	12.74	791	-6.8	little cloudy	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES: CK	SAMPLING INITIATED AT: 12:06	SAMPLING ENDED AT: 12:15
PUMP OR TUBING DEPTH IN WELL (feet): 61	SAMPLE PUMP FLOW RATE (mL per minute): 325	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N Filtration Equipment Type:	FILTER SIZE: ____ μm	DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s); cross out if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb?: Y / N   PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-26-061-F
-U

Sovereign Consulting Inc.
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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME:	PROJECT LOCATION: Devens/Ayer		DATE: 8/11/10	WELL ID: SHM-10-26
PROJECT NUMBER: ACOO1	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88			1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 70-72	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 71	FINAL PUMP OR TUBING DEPTH IN WELL (feet): ~~70-72~~ 71	PURGING INITIATED AT: 12:27	PURGING ENDED AT: 1:28	GALLONS: LITERS:

WATER LEVEL STABLIZATION DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1:36	400	71'	<1,000	0.90	6.59	14.00	860	-12.6	cloudy	none
1:42	400	71'	<1,000	1.01	6.59	14.08	861	-26.9	cloudy	none
1:47	400	71'	<1,000	0.95	6.58	13.96	860	-36.1	cloudy	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES: JR	SAMPLING INITIATED AT: 1:15	SAMPLING ENDED AT: 1:28
PUMP OR TUBING DEPTH IN WELL (feet): 71	SAMPLE PUMP FLOW RATE (mL per minute): 400	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N Filtration Equipment Type:	FILTER SIZE: ____ µm	DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item or write N/A if not applicable)

Type: Flush Mount / Stand Pipe   General Condition: Good / Needs Repair   Well Caps: Good / Broken / None   Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N   Is Well Plumb?: Y / N   PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N   Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

GP-10-26-071-F
-U

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MONITORING WELL SAMPLING LOG

Low Flow Sampling
Vertical Profiling - DPT

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME:	PROJECT LOCATION: Devens/Ayer	DATE: 8/11/10	WELL ID: SHM-10-27
PROJECT NUMBER: AC001.002	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED
24-26	25	24-26 25	15:23	15:46	GALLONS: / LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
15:25	400	25'	52.0	1.82	7.30	15.33	329	18.2	Clear	none
15:30	400	25'	19.6	1.34	6.54	14.84	333	42.1	clear	none
15:34	400	25'	21.6	1.33	6.46	14.80	332	47.7	Clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
Sov Con	[signature]	15:38	15:46

PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:
25	400	

FIELD DECONTAMINATION: (Y) N — FIELD-FILTERED: (Y) N — Filtration Equipment Type: — FILTER SIZE: ___ µm — DUPLICATE: (Y) N Metals

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-27-025-F & DUP2-081110-F
-U -U

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MONITORING WELL SAMPLING LOG

Low Flow Sampling

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Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME:	PROJECT LOCATION: Devens/Ayer	DATE: 8/11/10	WELL ID: SHM-10-27
PROJECT NUMBER: AC001	WELL DIAMETER: (inches)	DEPTH TO WATER: (feet)	DEPTH TO BOTTOM: (feet) / PID READING (ppmv)

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE: (see below) Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED
34-36	35	~~35~~ 34-36'	15:56	16:27	GALLONS: LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
16:03	350	35'	304	0.84	5.85	14.07	1,020	70.3	cloudy	none
16:08	350	35'	165	1.00	5.86	13.75	1026	71.8	little cloudy	none
16:20	350	35'	101.1	1.07	5.87	13.44	1,022	76.8	clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 16:22	SAMPLING ENDED AT: 16:27
PUMP OR TUBING DEPTH IN WELL (feet): 35	SAMPLE PUMP FLOW RATE (mL per minute): 350	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	

FIELD DECONTAMINATION: Y N — FIELD-FILTERED: Y N — FILTER SIZE: ____ μm — Filtration Equipment Type: — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate items; cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-27-035 - F
- U

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MONITORING WELL SAMPLING LOG

Low Flow Sampling

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Sovereign Consulting Inc.
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PROJECT NAME:	PROJECT LOCATION: Devens/Ayer	DATE: 8/11/10	WELL ID: SHM-10-27
PROJECT NUMBER: ACO01.002	WELL DIAMETER: (inches)	DEPTH TO WATER: (feet)	DEPTH TO BOTTOM: (feet) · PID READING: (ppmv)

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE: (see below) Poly	PURGE PUMP TYPE: Geopump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY

GALLONS: LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED:
44-46	45	45 ~~44-46~~'	16:32	16:40	GALLONS: LITERS:

WATER LEVEL STABLIZATION DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
16:37	425	45'	<1,000	0.57	6.49	14.30	648	-67.6	cloudy	none
16:43	425	45'	309	0.70	6.54	14.13	649	-76.7	cloudy	none
16:48	425	45'	339	0.71	6.58	18.50	647	-93.6	cloudy	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES: OR	SAMPLING INITIATED AT: 16:52	SAMPLING ENDED AT: 16:40
PUMP OR TUBING DEPTH IN WELL (feet): 45	SAMPLE PUMP FLOW RATE (mL per minute): 425	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	

FIELD DECONTAMINATION: Y N · FIELD-FILTERED: Y N · Filtration Equipment Type: · FILTER SIZE: ____ μm · DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate items / cross out that apply)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-270 -F -U

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MONITORING WELL SAMPLING LOG

Low Flow Sampling

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Sovereign Consulting Inc.
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413-540-0650

PROJECT NAME: ACOO1.002	PROJECT LOCATION: Devens/Ayer			DATE: 8/11/10	WELL ID: SHM-10-27
PROJECT NUMBER:	WELL DIAMETER: (inches)	DEPTH TO WATER: (feet)	DEPTH TO BOTTOM: (feet)		PID READING: (ppmv)

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): Poly	PURGE PUMP TYPE: Geopump		PUMP EQUIPMENT MODEL & SERIAL #s:	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY				GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88				1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 54-56	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 55	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 54-56'	PURGING INITIATED AT: 17:05	PURGING ENDED AT: 17:36	GALLONS: LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.33)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
17:10	400	55'	<1,000	0.77	6.66	13.65	632	-108.4	cloudy	none
17:15	400	55'	488	0.94	6.66	13.40	637	-109.5	little cloudy	none
17:20	400	55'	294	0.95	6.65	18.28	644	-108.8	little cloudy	none.

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 17:30	SAMPLING ENDED AT: 17:36
PUMP OR TUBING DEPTH IN WELL (feet): 55	SAMPLE PUMP FLOW RATE (mL per minute): 400	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N Filtration Equipment Type:	FILTER SIZE: ____ µm	DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s) (cross out if not applicable))

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-27-055-F -U

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MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - DPT

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Holyoke, MA 01040
413-540-0650

PROJECT NAME:	PROJECT LOCATION: Devens/Ayer	DATE: 8/11/10	WELL ID: SHM-10-27
PROJECT NUMBER: AC001.002	WELL DIAMETER (inches):	DEPTH TO WATER (feet):	DEPTH TO BOTTOM (feet):	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4" | TUBING MATERIAL CODE (see below): Poly | PURGE PUMP TYPE: Geopump | PUMP EQUIPMENT MODEL & SERIAL #s:

GALLONS: | LITERS:

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 | 1 GALLON = 3.785 LITERS | TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet): 64-66 | INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 65 | FINAL PUMP OR TUBING DEPTH IN WELL (feet): 65 ~~64-66~~ | PURGING INITIATED AT: 17:45 | PURGING ENDED AT: 18:10 | GALLONS: | LITERS:

WATER LEVEL STABLIZATION | DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME	FLOW RATE (mL/min)	DEPTH TO WATER (feet)	TURBIDITY (NTU)	DISSOLVED OXYGEN (mg/L)	pH	TEMP (°C)	SPECIFIC CONDUCTIVITY (µS/cm)	ORP (mV)	COLOR (describe)	ODOR (describe)
(3-5 minutes)*	(100-500 mL/min)*	(+/- 0.3')*	(+/- 10%)*	(+/- 10%)*	(+/- 0.1)*	(+/- 3%)*	(+/- 3%)*	(+/- 10mV)*	-	-
17:44	450	65'	<1,000	0.97	6.64	13.61	763	-87.5	cloudy	none
17:48	450	65'	<1,000	0.99	6.65	13.47	764	-91.5	cloudy	none
17:55	450	65'	<1,000	1.10	6.66	13.37	766	-93.3	cloudy	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon | SAMPLER(S) SIGNATURES: OK | SAMPLING INITIATED AT: 18:00 | SAMPLING ENDED AT: 18:10

PUMP OR TUBING DEPTH IN WELL (feet): 65 | SAMPLE PUMP FLOW RATE (mL per minute): 450 | FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION: Y N | FIELD-FILTERED: Y N | FILTER SIZE: ____ µm | Filtration Equipment Type: | DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS: GP-10-27-065-F
-U

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MONITORING WELL SAMPLING LOG

Low-Flow Sampling

Vertical Profiling - Photosonic

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PROJECT NAME: AC001.002	PROJECT LOCATION: Fort Devens		DATE: 8/16/10		WELL ID: SHM-10-14
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet): 27.8	DEPTH TO BOTTOM (feet): 40	PID READING (ppmv): —	

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder / Stainless	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS: —

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
38 - 40	39	39	0920	0950	GALLONS: ~3 LITERS: —

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0922			27.8	—	N	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
0925	400	26.75	40.3	1.11	5.58	16.67	511	89.2	Cloudy	None
0930	400	25.35	18.6	0.58	5.46	16.27	511	864	Clear	None
0935	400	23.70	47.2	0.47	5.44	16.04	512	67.9	Clear	None
0940	400	23.40	57.9	0.42	5.48	16.01	512	59.1	Cloudy	None
0945	400	23.00	49.9	0.36	5.54	15.86	510	50.8	Cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jonathan Chaffee	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 0950	SAMPLING ENDED AT: 1010
PUMP OR TUBING DEPTH IN WELL (feet): 39	SAMPLE PUMP FLOW RATE (mL per minute): 400	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N — FILTER SIZE: ____ µm — Filtration Equipment Type:		DUPLICATE: MS/MSD Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s); cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - Bioluminescence

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: ACOOLOO2	PROJECT LOCATION: Fort Devens	DATE: 8/16/2010	WELL ID: SHM-10-14
PROJECT NUMBER:	WELL DIAMETER (inches): —	DEPTH TO WATER (feet): 39.3'	DEPTH TO BOTTOM (feet): 50 / PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder/Stainless	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS: —

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
48-50	49	49	10:50	1120	GALLONS: ~2.5 LITERS: —

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
10:50	350	CPM4: / 10.0-5.0	38.3	—	N	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1055	350	32.9	10.58	0.66	5.97	16.38	475	29.7	Clear	None
1100	350	28.7	13.5	0.38	5.87	16.24	477	20.0	Clear	None
1105	350	26.3	18.4	0.35	5.86	16.23	478	17.3	Clear	None
1110	350	24.5	22.4	0.39	5.87	16.08	479	14.7	Clear	None
1115	350	23.6	22.5	0.41	5.86	15.99	479	14.9	Clear	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jonathan Chaffee	SAMPLER(S) SIGNATURES: J. Chaffee	SAMPLING INITIATED AT: 1120	SAMPLING ENDED AT: 1145
PUMP OR TUBING DEPTH IN WELL (feet): 49	SAMPLE PUMP FLOW RATE (mL per minute): 350	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	

FIELD DECONTAMINATION: Y N — FIELD-FILTERED: Y N — FILTER SIZE: 0.45 µm — Filtration Equipment Type: — DUPLICATE: Y N

**MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s); cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well!? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - Mckesson

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001.002	PROJECT LOCATION:		DATE: 8/16/10	WELL ID: SHM-10-14
PROJECT NUMBER:	WELL DIAMETER (inches): —	DEPTH TO WATER (feet): 56.0	DEPTH TO BOTTOM (feet): 60	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder / Stainless	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS: —

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
58-60	59	59	1230	1300	GALLONS: ~2 LITERS: —

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
1230	200	CPM4: 10.0-5.0	55.55	—	N	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1235	200	55.45	890	0.32	6.07	17.24	553	7.9	Silty	None
1240	200	55.35	3623	0.28	5.88	16.80	551	4.3	Silty	None
1245	200	55.20	704	0.13	5.85	16.53	550	4.9	SILTY	NONE
1250	200	55.15	1573	0.16	5.86	16.47	550	3.0	Silty	None
1255	200	55.05	1129	0.17	5.86	16.31	553	-0.9	Silty	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jonathan Chaffee	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 1300	SAMPLING ENDED AT: 1325
PUMP OR TUBING DEPTH IN WELL (feet): 59	SAMPLE PUMP FLOW RATE (ml per minute): 200	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y / N (Y circled)	FIELD FILTERED: Y / N (Y circled) Filtration Equipment Type:	FILTER SIZE: 0.45 µm	DUPLICATE: Y / N (N circled)

MATERIAL CODES: AG = Amber Glass CG = Clear Glass PE = Polyethylene PP = Polypropylene S = Silicone T = Teflon O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - Photosonic

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME		PROJECT LOCATION: Fort Devens			DATE: 8/16/10		WELL ID: SHM-10-14
PROJECT NUMBER: AC001002		WELL DIAMETER (inches):	DEPTH TO WATER (feet): 63.6	DEPTH TO BOTTOM (feet): 70		PID READING (ppmv): —	

PURGING DATA

TUBING DIAMETER (inches):	TUBING MATERIAL CODE (see below):	PURGE PUMP TYPE:	PUMP EQUIPMENT MODEL & SERIAL #s:
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY		GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75 = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88		1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
68-70	69	69	1405	1435	GALLONS: ~2; LITERS: —

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
1405	200	CPM4: 10.0-5.0	61.55	—	N	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1410	200	61.2	2350	0.25	6.17	18.94	426	-6.9	Silty	None
1415	200	58.2	662	0.22	5.93	18.64	430	-4.4	Cloudy	None
1420	200	54.0	220	0.17	5.83	18.60	435	-4.2	Cloudy	None
1425	200	50.7	178	0.18	5.84	17.88	442	-6.7	Cloudy	None
1430	200	48.5	111	0.18	5.82	17.71	444	-8.7		None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jonathan Chutter	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1435	SAMPLING ENDED AT: 1455
PUMP OR TUBING DEPTH IN WELL (feet): 69	SAMPLE PUMP FLOW RATE (mL per minute): 200	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N Filtration Equipment Type:	FILTER SIZE: 0.45 µm	DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s); cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
Arcol 00 2	Fort Devens	8/17/2010	41M-10-14

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
		18.7	80	—

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
1/4	PE	Bladder / Stainless	

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS: —

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
78-80	79	79	0715	0745	GALLONS: ~2; LITERS: —

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0715	200	CPM = 10.0/5.0	18.7	—	N	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
0720	200	19.18	37.4	1.33	6.67	15.29	403	82.5	CLOUDY	NONE
0725	200	19.90	47.8	0.48	5.94	14.86	402	75.5	Cloudy	None
0730	200	20.95	36.4	0.49	6.06	14.66	397	55.0	Cloudy	None
0735	200	21.82	36.1	0.33	6.15	14.67	396	41.8	~~CLOUDY~~ CLEAR	NONE
0740	200	22.92	38.9	0.31	6.18	14.71	395	34.2	CLEAR	NONE

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
Jonathan Clarke	[signature]	0745	0815

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
79	200	

FIELD DECONTAMINATION: (Y) N — FIELD FILTERED: (Y) N — FILTER SIZE: .45 µm — Filtration Equipment Type — DUPLICATE: MS/MSD (Y) N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - Robosonic

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: Acool co2	PROJECT LOCATION: Fort Devens	DATE: 8/17/2010	WELL ID: SHM 10-16
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet): 8.78	DEPTH TO BOTTOM (feet): 25
PID READING (ppmv): —			

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder / Stainless	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS: —

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
23-25	24	24	1545	1615	GALLONS: LITERS: —

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
1545	400	CHRY: 10.0 / 5.0	8.78	—	N	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1550	400	8.70	88.0	3.37	7.43	13.84	104	85.1	Cloudy	None
1555	400	8.71	204	3.23	6.82	13.28	104	82.2	Cloudy	None
1600	400	8.70	1199	3.18	6.34	12.94	107	96.1	Silty	None
1605	400	8.70	965	3.17	6.29	12.74	107	98.8	Silty	None
1610	400	8.75	1235	3.06	6.27	12.58	107	101.1	Silty	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jonathan Chaffee	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 1615	SAMPLING ENDED AT: 1635
PUMP OR TUBING DEPTH IN WELL (feet): 24	SAMPLE PUMP FLOW RATE (mL per minute): 400	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N — Filtration Equipment Type:	FILTER SIZE: .45 µm	DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s); cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Everdence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - Rotasonic

Sovereign Consulting Inc.
1 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
AC001.00.2	Fort Devens	8/18/2010	SHM-10-16

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
		31.3	35	—

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
1/4	PE	Bladder / Stainless	

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED:
33-35	34	34	0735	0755	GALLONS: ~1.5 LITERS: —

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0735	200	CPM 4: 10.0/5.0	31.53	—	N	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
0740	200	31.65	4496	9.96	7.94	15.09	306	111.0	Silty	None
0745	200	31.93	2220	11.14	7.96	14.26	327	98.5	Silty	None
0750	200	32.45	852	11.67	8.03	14.08	336	91.4	Silty	None
0755	200	32.80	609	12.11	8.25	13.91	350	78.3	Silty	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
Jonathan Chalke		0755	0910

PUMP OR TUBING DEPTH IN WELL (feet): 34 — SAMPLE PUMP FLOW RATE (mL per minute): 200 — FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION: Y / N (Y circled) — FIELD FILTERED: Y / N (Y circled) — FILTER SIZE: .45 µm — Filtration Equipment Type: — DUPLICATE: MS/MSD Y / N (Y circled)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s); cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

Vertical Profiling - Potassium

PROJECT NAME: AE001-008	PROJECT LOCATION: Fort Devens	DATE: 8/17/2010	WELL ID: SHM-10-16
PROJECT NUMBER:	WELL DIAMETER (inches): —	DEPTH TO WATER (feet): 38.85	DEPTH TO BOTTOM (feet): 55	PID READING (ppmv): —

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder / Stainless	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS: —

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
53-55	54	54	1055	1115	GALLONS: LITERS: —

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE 325 (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
1055	~~39.45~~ (N)	CPM 4: 10.0/5.0	39.45	—	N	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1100	325	40.10	836	11.90	7.76	17.83	401	44.3	Cloudy	None
1105	325	40.80	302	11.92	7.62	17.17	400	35.2	Cloudy	None
1110	325	41.8	186	12.76	7.49	16.99	398	33.3	Cloudy	None
1115	325	42.7	101.4	12.62	7.43	16.85	398	27.4	Cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
Jonathan Chaffee	[signature]	1120	1145

PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:
54	325	

FIELD DECONTAMINATION: (Y) N — FIELD-FILTERED: Y N — FILTER SIZE: 0.45 μm — Filtration Equipment Type: — DUPLICATE: (Y) N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

Vertical Profiling - Hydrasleeve

PROJECT NAME: ACOO1 002	PROJECT LOCATION: Fort Devens		DATE: 8/17/2010	WELL ID: SHM-10-18
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet): 56.10	DEPTH TO BOTTOM (feet):	PID READING (ppmv): —

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder / Stainless	PUMP EQUIPMENT MODEL & SERIAL #s:	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY			GALLONS: —	LITERS: —
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88			1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 63-65	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 64	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 64	PURGING INITIATED AT: 1310 / PURGING ENDED AT: 1340	GALLONS: ~2 / LITERS: —

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
1310	250	CPM4: 10.0 / 5.0	52.70	—	N	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.33)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1315	250	52.7	169	2.04	6.66	16.01	407	-69.1	Cloudy	None
1320	250	84.6	48.4	2.67	6.61	14.94	491	-73.2	Clear	None
1325	250	43.2	21.7	2.89	6.58	14.46	491	-76.3	Clear	None
~~1350~~	~~250~~									
~~1340~~	~~250~~									
1330	250	38.9	17.8	2.26	6.58	14.03	491	-78.2	CLEAR	NONE
1335	250	34.5	21.5	2.45	6.57	14.73	492	-78.5	Clear	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jonathan Chafee	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1340	SAMPLING ENDED AT: 1400
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N — Filtration Equipment Type:	FILTER SIZE: .45 µm	DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Vertical Profiling - Pidasonic

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: ACCOL 002	PROJECT LOCATION: Fort Devens		DATE: 8/18/10		WELL ID: SHM-10-16
PROJECT NUMBER:	WELL DIAMETER (inches): —	DEPTH TO WATER (feet): 60.6	DEPTH TO BOTTOM (feet): 75	PID READING (ppmv): —	

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder / Stainless	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75 = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
73 - 75	74	74	0700	0725	GALLONS: ~2.0 / LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0705	250	CPM4: 10.0/5.0	61.15	—	N	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (μS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
0705	250	61.15	363	2.52	6.89	12.41	740	-94.6	Cloudy	None
0710	250	62.10	174	1.52	6.79	11.44	761	-117.6	CLOUDY	NONE
0715	250	63.2	171	1.07	6.85	11.30	745	-129.5	Cloudy	None
0720	250	63.85	122	0.79	6.91	11.33	729	-136.7	Cloudy	None
0725	250	64.80	122	0.66	6.94	11.26	720	-140.3	Cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jonathan Chartier	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 0725	SAMPLING ENDED AT: 0800
PUMP OR TUBING DEPTH IN WELL (feet): 74	SAMPLE PUMP FLOW RATE (mL per minute): 250	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD FILTERED: Y N — Filtration Equipment Type:	FILTER SIZE: 0.45 μm	DUPLICATE: MS/MSD Y

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001.002	PROJECT LOCATION: Fort Devens	DATE: 8/18/2010	WELL ID: SHM-10-16
PROJECT NUMBER:	WELL DIAMETER (inches): —	DEPTH TO WATER (feet): 46.15	DEPTH TO BOTTOM (feet): 85 / PID READING (ppmv): —

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder / Stainless	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS: —

WELL CAPACITY (Gallons Per Foot): 0.75 = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
83 - 85	84	84	0910	0940	GALLONS: ~1.5 LITERS: —

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0912	150	CPM4: 10.0/5.0	48.15	—	N	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
0915	150	44.95	189	1.76	6.85	15.62	792	-85.5	Cloudy	None
0920	150	41.70	70.9	2.26	6.90	15.22	829	-96.4	Clear	None
0925	150	38.90	38.2	1.67	6.92	15.19	835	-110.6	Clear	None
0930	150	19.93	36.15	1.11	6.94	14.91	~~-103.6~~	-113.9	Clear	None
0935	150	34.7	16.6	0.90	6.95	14.92	837	-104.8	Clear	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jonathan Chaffee	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 0940	SAMPLING ENDED AT: 1010
PUMP OR TUBING DEPTH IN WELL (feet): 84	SAMPLE PUMP FLOW RATE (mL per minute): 150	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	

FIELD DECONTAMINATION: Y / N — FIELD-FILTERED: Y N — FILTER SIZE: 0.45 μm — Filtration Equipment Type: — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (Circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: Acool 002	PROJECT LOCATION: Fort Devens			DATE: 8/19/2010	WELL ID: SHM-10-16
PROJECT NUMBER:	WELL DIAMETER (inches):	DEPTH TO WATER (feet): 86.85	DEPTH TO BOTTOM (feet): 95	PID READING (ppmv): —	

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder / Stainless	PUMP EQUIPMENT MODEL & SERIAL #s:
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY		GALLONS: —	LITERS: —
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88		1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 85-95	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 94	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 94	PURGING INITIATED AT: 1210 / PURGING ENDED AT: 1235 / GALLONS: ~2 / LITERS: —

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
1210	250	CPM & : 15.0/15.0	86.85	—	N	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1215	250	86.15	621	6.11	7.15	22.17	417	3.1	Clear	None
1220	250	86.56	188	4.27	7.00	14.21	401	-21.8	Cloudy	None
1225	250	87.66	168	4.84	6.97	17.68	381	-28.9	Clear	None
1230	250	86.4	180	5.06	6.92	17.45	382	-21.4	Clear	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jonathan Chaffee	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 1235	SAMPLING ENDED AT: 1320
PUMP OR TUBING DEPTH IN WELL (feet): 94	SAMPLE PUMP FLOW RATE (mL per minute): 250	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: (Y) N Filtration Equipment Type:	FILTER SIZE: 0.45 µm	DUPLICATE: Y (N)

MATERIAL CODES AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL ~~SAMPLING~~ Development LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME:	PROJECT LOCATION: Devens, MA	DATE: 8/24/2020	WELL ID: SHM-10-11
PROJECT NUMBER: AC001.032	WELL DIAMETER (inches): 2	DEPTH TO WATER (feet): 40.11	DEPTH TO BOTTOM (feet): 62.13	PID READING (ppmv): —

PURGING DATA

TUBING DIAMETER (inches): 1/2	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Waterra Pump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: 3.5 LITERS: —

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet): 50-60	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 59	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 59	PURGING INITIATED AT: 0830	PURGING ENDED AT: 0920	TOTAL VOLUME PURGED: GALLONS: ~10.5 LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
—	—	—	—	—	—	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
0850	—	—	12.5	2.01	5.37	12.15	433	6.5	Clear	None
0900	—	—	20.7	0.85	5.41	12.17	433	5.6	Clear	None
0910	—	—	31.4	1.75	5.43	12.08	431	4.9	Clear	None
0915	—	—	28.8	0.79	5.44	12.16	431	3.8	Clear	None
0920	—	—	36.1	0.73	5.47	12.13	433	2.3	Clear	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jonathan Charles	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: —	SAMPLING ENDED AT: —
PUMP OR TUBING DEPTH IN WELL (feet): —	SAMPLE PUMP FLOW RATE (mL per minute): —	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	

FIELD DECONTAMINATION: Y N — FIELD-FILTERED: Y N — FILTER SIZE: ___ µm — Filtration Equipment Type: NA — DUPLICATE: Y N NA

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: Well Development - No samples collected
Purging completed after 3 well volumes and turbidity less than 50 NTU

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

~~SAMPLING~~ Development MONITORING WELL LOG

Low Flow Sampling

Sovereign Consulting Inc.
1 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME:	PROJECT LOCATION: Fort Devens, MA	DATE: 8/24/2010	WELL ID: SHM-10-12
PROJECT NUMBER: ACOOI. 002	WELL DIAMETER (inches): 2	DEPTH TO WATER (feet): 34.01	DEPTH TO BOTTOM (feet): 57.24
PID READING (ppmv): —			

PURGING DATA

TUBING DIAMETER (inches): 1/2	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Waterra Pump	PUMP EQUIPMENT MODEL & SERIAL #s:
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY		GALLONS: 3.7	LITERS: —

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
45 - 55	54	54	0935	1055	GALLONS: ~26 LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
—	—	—	—	—	—	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1000	—	—	637	3.00	5.61	11.76	583	95	Cloudy/Silty	None
1010	—	—	600	3.90	5.65	12.23	569	0.6	Cloudy/Silty	None
1015	—	—	211	2.92	5.65	11.89	570	3.0	Cloudy	None
1020	—	—	167	3.99	5.65	11.84	567	3.5	Cloudy	none
1025	—	—	147	2.42	5.66	11.94	572	-47.4	Cloudy	None
1035	—	—	131	3.19	5.65	11.96	569	-44.9	Cloudy	none
1040	—	—	79.9	3.32	5.65	12.07	572	-49.3	cloudy	none
1045	—	—	62.4	3.70	5.65	12.01	574	-46.6	cloudy	none
1050	—	—	57.4	3.51	5.64	12.07	573	-46.6	clear	none
1055	—	—	47.7	3.66	5.65	12.01	575	-44.7	clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jordan Chafee	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: —	SAMPLING ENDED AT: —
PUMP OR TUBING DEPTH IN WELL (feet): —	SAMPLE PUMP FLOW RATE (mL per minute): —	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N (Y circled)	FIELD-FILTERED: Y N — FILTER SIZE: ___ µm — Filtration Equipment Type: NA	DUPLICATE: Y N NA	

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: Well Development - No samples collected
Rigging complete following turbidity readings less than 50 NTU

Sovereign Consulting Inc.
3 South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL ~~SAMPLING~~ Development LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NUMBER:	PROJECT LOCATION:	DATE:	WELL ID:
1ACUNI.OOS	Devens, MA	8/24/10	SHM-10-13

WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
2	26.31	70.82	

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
1/2	PE	Waterra	

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: 7 — LITERS: —

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED: GALLONS / LITERS
60-70	69	69	1130	1245	GALLONS: ~~77~~ 21 20 / LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
—	—	—	—	—	—	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1155	—	—	150	7.83	6.62	13.01	1000	-131.4	Clear	None
1205	—	—	93.6	0.58	6.14	13.19	955	-154.0	Clear	None
1210	—	—	62.0	0.46	6.00	13.12	905	-157.0	Clear	None
1215	—	—	55.8	0.32	6.08	12.85	845	-159.2	Clear	None
1225	—	—	24.9	0.24	5.92	12.81	859	-147.8	Clear	none

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
Jonathan Chaffee	[signature]	—	—

PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:
—	—	

FIELD DECONTAMINATION: (Y) N — FIELD FILTERED: Y N — FILTER SIZE: ___ µm — Filtration Equipment Type: NA — DUPLICATE: Y N NA

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: Purging complete after 3 well volumes and turbidity detected less than 50 NTU

Well Development - No Samples Collected

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL ~~SAMPLING~~ Development LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 4307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION: Fort Devens, MA	DATE: 8/24/2010	WELL ID: SHM-10-15
PROJECT NUMBER: AC001-002	WELL DIAMETER (inches): 2	DEPTH TO WATER (feet): 24.82	DEPTH TO BOTTOM (feet): 56.80	PID READING (ppmv): —

PURGING DATA

TUBING DIAMETER (inches): 1/2	TUBING MATERIAL CODE (see below):	PURGE PUMP TYPE: Watern	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: 5.1 — LITERS: —

WELL CAPACITY (Gallons Per Foot): 0.75 = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
45-55	54	54	1300	1435	GALLONS: ~38; LITERS: —

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
—	—	—	—	—	—	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1335	—	—	415	1.40	5.70	12.34	505	-79.7	Cloudy	None
1345	—	—	816	3.25	5.76	12.18	504	-78.7	Cloudy	None
1355	—	—	425	0.77	5.68	12.14	507	-124.4	Cloudy	None
1405	—	—	256	0.87	5.67	12.30	508	-124.8	Cloudy	None
1410	—	—	269	1.06	5.69	12.02	510	-130.2	Cloudy	None
1420	—	—	237	1.77	5.70	12.01	513	-112.0	Cloudy	None
1425	—	—	190	2.04	5.70	12.07	517	-96.3	Cloudy	None
1430	—	—	209	1.01	5.69	12.13	519	-99.9	Cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
Jonathan Chiller	[signature]	—	—

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
—	—	

FIELD DECONTAMINATION: Y N (Y circled) — FIELD-FILTERED: Y N — FILTER SIZE: ___ µm — Filtration Equipment Type: NA — DUPLICATE: Y N NA

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:
Purging completed following three successive stable readings of pH, Temperature, and specific conductivity. Turbidity readings of less than 50 NTU unable to be reached

Well Development - No Samples Collected

Sovereign Consulting Inc.
905B South Main Street Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL ~~SAMPLING~~ Development LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME:	PROJECT LOCATION: Devens, MA			DATE: 8/25/10	WELL ID: SHM-10-14
PROJECT NUMBER: ACC01.002	WELL DIAMETER (inches): 2	DEPTH TO WATER (feet): 21.81	DEPTH TO BOTTOM (feet): 82.35		PID READING (ppmv): —

PURGING DATA

TUBING DIAMETER (inches): 1/2	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Waterra Pump	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: 9.6 — LITERS: —

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet): 60 - 80	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 79	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 79	PURGING INITIATED AT: 0810	PURGING ENDED AT: 1010	TOTAL VOLUME PURGED: GALLONS: ~50 LITERS: —

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
—	—	—	—	—	—	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
0845	—	—	384	4.69	5.84	12.35	641	-80.2	Clear	None
0855	—	—	322	2.20	5.78	12.19	632	-84.2	Cloudy	None
0905	—	—	239	1.63	5.77	12.17	637	-88.0	Cloud	None
0915	—	—	194	1.57	5.75	12.12	637	-85.7	Clear	None
0925	—	—	142	1.69	5.75	12.23	636	-82.3	Clear	None
0935	—	—	219	1.49	5.75	12.15	636	-84.3	Clear	None
0945	—	—	178	1.32	5.76	12.20	635	-111.0	Clear	None
0955	—	—	177	1.57	5.72	12.19	636	-114.1	Clear	None
1005	—	—	163	1.37	5.73	12.24	637	-111.8	Clear	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jonathan Chaffee	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: —	SAMPLING ENDED AT: —
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute): —	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N — NA	FIELD-FILTERED: Y N — Filtration Equipment Type:	FILTER SIZE: ___ µm — NA	DUPLICATE: Y N NA

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: Purging completed after 3 stable readings of temp., pH, conductivity and turbidity.

Well Development - No Samples Collected

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL ~~SAMPLING~~ Development LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME:
PROJECT LOCATION: Devens MA
DATE: 8/25/10
WELL ID: SHM-10-16
PROJECT NUMBER: ACOOI 002
WELL DIAMETER (inches): 2
DEPTH TO WATER (feet): 8.90
DEPTH TO BOTTOM (feet): 85.0
PID READING (ppmv): —

PURGING DATA

TUBING DIAMETER (inches): 1/2
TUBING MATERIAL CODE (see below): PE
PURGE PUMP TYPE: Watera
PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
GALLONS: 12.5
LITERS: —

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
1 GALLON = 3.785 LITERS
TOTAL VOLUME PURGED: GALLONS: ~85 LITERS: —

WELL SCREEN INTERVAL DEPTH (feet): 75-85
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 84
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 84
PURGING INITIATED AT: 1025
PURGING ENDED AT: 1225

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
—	—	—	—	—	—	—

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1115	—	—	811	0.77	6.05	10.83	672	-193.3	Cloudy	None
1125	—	—	1368	0.84	6.06	10.78	677	-149.4	Cloudy	None
1135	—	—	1324	0.40	6.07	10.80	680	-152.3	Cloudy	None
1145	—	—	671	0.33	6.05	10.73	676	-190.1	Cloudy	None
1155	—	—	200	0.95	6.03	10.77	676	-160.3	Cloudy	None
1200	—	—	116	0.44	6.06	10.81	678	-169.9	Cloudy	None
1205	—	—	99.6	0.34	6.03	10.77	680	-170.0	Cloudy	None
1210	—	—	93.7	0.35	6.03	10.82	681	-161.3	Cloudy	None
1215	—	—	77.6	0.41	6.03	10.32	680	-151.5	Cloudy	None
1220	—	—	64.9	0.31	6.08	10.72	684	-157.1	Cloudy	None
1225	—	—	44.8	0.47	6.07	10.70	688	-149.2	Cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jonathan Chaffee
SAMPLER(S) SIGNATURES:
SAMPLING INITIATED AT: —
SAMPLING ENDED AT:

PUMP OR TUBING DEPTH IN WELL (feet): —
SAMPLE PUMP FLOW RATE (mL per minute): —
FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION: (Y) N
FIELD FILTERED: Y N
FILTER SIZE: ___ µm
Filtration Equipment Type: NA
DUPLICATE: Y N NA

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe
General Condition: Good / Needs Repair
Well Caps: Good / Broken / None
Lock: Good / Broken / None
Evidence of Rain Water Between Steel & PVC? Y / N
Is Well Plumb?: Y / N
PVC Riser: Good / Damaged / None
Evendence of Ponding Around Well? Y / N
Concrete Collar: Good / Cracked / Leaking / None

REMARKS: Purging complete after turbidity detected less than 50 NTU.

Well Development No Samples Collected

Sovereign Consulting Inc
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc
4 Open Square Way, Suite 307
Holyoke, MA 01040
413 540-0650

PROJECT NAME: Fort Devens SHL	PROJECT LOCATION: Ayer MA	DATE: 8/30/10	WELL ID: SHM-10-11
PROJECT NUMBER: AC001	WELL DIAMETER (inches): 2"	DEPTH TO WATER (feet): 40.14	DEPTH TO BOTTOM (feet): 62.13 · PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder	PUMP EQUIPMENT MODEL & SERIAL #: Cont-2195 Pump-11295 QED

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet): 52-62	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 57	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 57	PURGING INITIATED AT: 1020	PURGING ENDED AT: 1120	TOTAL VOLUME PURGED: GALLONS: 3.6 L · LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0-10	~~300~~ 150 (EF)	R-10 D-5 PSI/C-40 PSI/T-200	40.16	40.16	Y	≈ 1600

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1035	300 150	40.16	25.1	1.45	6.10	13.55	~~422~~ 421	-22.5	Clear	None
1040	300 150	40.16	20.1	6.12	6.19	13.28	423	-30.6	Clear	None
1045	300 150	40.16	18.5	5.91	6.18	13.34	423	-31.2	Clear	None
1048	300 150	40.16	14.8	6.88	6.17	13.48	422	-32.1	Clear	None
1051	300 150	40.16	10.52	1.81	5.91	13.45	423	-19.4	Clear	None
1054	300 150	40.16	9.21	1.89	6.04	13.33	422	-28.5	Clear	None
1057	300 150	40.16	6.28	1.48	6.04	13.50	421	-28.7	Clear	None
1100	300 150	40.16	6.20	3.46	6.08	13.44	421	-32.2	Clear	None
1103	300 150	40.16	5.19	2.43	6.09	13.36	420	-33.9	Clear	None
1107	300 150	40.16	4.67	2.39	6.09	13.57	420	-33.3	Clear	None
1110 ~~1108~~	300 150	40.16	3.94	2.93	6.12	13.40	420	-36.5	Clear	None
1113	300 150	40.16	3.71	1.56	6.12	13.36	420	-35.6	Clear	None
1116	300 150	40.16	4.47	1.68	6.12	13.27	419	-34.6	Clear	None
1119	300 150	40.16	4.05	1.68	6.12	13.19	419	-32.0	Clear	None

*A stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Erin Foley / Sov. Con	SAMPLER(S) SIGNATURES: Erin Foley	SAMPLING INITIATED AT: 1120	SAMPLING ENDED AT: 1230
PUMP OR TUBING DEPTH IN WELL (feet): ~~57.0~~ (EF) 57'	SAMPLE PUMP FLOW RATE (mL per minute): 150	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s: YSI 556 MPS # 10F10C02	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: (Y) N · FILTER SIZE: ___ µm · Filtration Equipment Type:		DUPLICATE: Y (N) MS/MSD

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Lamotte 2020 Turb SN-ME12915

Sovereign Consulting Inc
9050 South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: Fort Devens SHL	PROJECT LOCATION: Ayer, MA			DATE: 6/30/10	WELL ID: SHM-10-12
PROJECT NUMBER: AC001	WELL DIAMETER (inches): 2	DEPTH TO WATER (feet): 34.05	DEPTH TO BOTTOM (feet): 57.24		PID HEADING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder	PUMP EQUIPMENT MODEL & SERIAL #s: Cont-1209 Pump-1121

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: 36 — LITERS: 136

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	GALLONS / LITERS
~~47~~ 47-57	52	52	1342	1453	

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0-10	150	D-10 R-10 PSI/C-40 PSI/T-170	34.05	34.05	Y	1500
10-20	150	" " " "	34.05	34.05	Y	1500

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.33)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1405	150	34.05	62.7	0.39	5.97	14.64	472	-27.8	Clear	None
1408	150	34.05	54.5	0.50	5.94	14.80	469	-27.9	Clear	None
1411	150	34.05	53.4	1.42	5.95	14.69	469	-28.6	Clear	None
1414	150	34.05	52.0	0.57	5.99	14.99	465	-33.2	Clear	None
1417	150	34.05	51.4	0.57	5.98	14.97	465	-34.6	Clear	None
1423	150	34.05	31.0	0.49	5.98	14.16	461	-32.6	Clear	None
1426	150	34.05	26.4	0.38	5.99	14.25	460	-33.8	Clear	None
1429	150	34.05	24.2	0.40	5.99	14.44	459	-33.2	Clear	None
1435	150	34.05	17.6	4.08	6.01	14.15	460	-34.4	Clear	None
1438	150	34.05	14.3	3.81	6.02	14.23	460	-34.1	Clear	None
1441	150	34.05	11.3	3.71	5.98	14.52	460	-29.7	Clear	None
1444	150	34.05	9.13	3.68	6.04	14.33	460	-35.5	Clear	None
1447	150	34.05	8.02	3.51	6.03	14.48	460	-35.3	Clear	None
1450	150	34.05	8.77	3.51	6.03	14.55	460	-35.0	Clear	None
1453	150	34.05	8.43	3.55	6.04	14.41	460	-34.9	Clear	None

*EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Carolyn Harold	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 1500	SAMPLING ENDED AT: 1555
PUMP OR TUBING DEPTH IN WELL (feet): 52	SAMPLE PUMP FLOW RATE (mL per minute): 150	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s: YSI 556 MPS #10F10C02	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N — Filtration Equipment Type:	FILTER SIZE: ___ µm	DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Lamotte 2020 Turb # 5 SN-ME6915

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001
PROJECT LOCATION: Ayer, MA
DATE: 9/1/10
WELL ID: SHM-10-13
PROJECT NUMBER: Fort Devens SHL
WELL DIAMETER (inches): 2"
DEPTH TO WATER (feet): 26.4
DEPTH TO BOTTOM (feet): 70.82
PID READING (ppmv): —

PURGING DATA

TUBING DIAMETER (inches): 1/4"
TUBING MATERIAL CODE (see below): PE
PURGE PUMP TYPE: Bladder
PUMP EQUIPMENT MODEL & SERIAL #s: Cont = 1209 Pump 11295 QED

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
GALLONS: LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
1 GALLON = 3.785 LITERS
TOTAL VOLUME PURGED: GALLONS 3.5 gal LITERS

WELL SCREEN INTERVAL DEPTH (feet): 61-71 ft
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 66 ft
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 66 ft
PURGING INITIATED AT: 1005
PURGING ENDED AT: 1105

WATER LEVEL STABLIZATION
DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0-10	NA	Trying different settings	26.40	26.40	Y	1000
10-20	200	D-10 R-20 TPSI-150 CPSI-50	26.40	26.40	Y	2000

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1025	200	26.4	25.4	0.51	6.11	14.24	754	-58.8	Clear	None
1028	200	26.4	25.7	1.64	6.12	14.05	759	-60.0	Clear	None
1031	200	26.4	22.2	2.50	6.10	14.11	759	-58.0	Clear	None
1038	200	26.4	22.2	2.20	6.14	13.95	771	-60.2	Clear	None
1041	200	26.4	25.4	2.94	6.18	13.82	774	-63.5	Clear	None
1044	200	26.4	17.7	3.03	6.19	13.77	773	-64.8	Clear	None
1047	200	26.4	19.6	3.04	6.20	13.61	777	-66.3	Clear	None
1050	200	26.4	18.1	2.88	6.21	13.61	779	-67.5	Clear	None
1053	200	26.4	18.0	2.73	6.21	13.60	781	-68.0	Clear	None
1056	200	26.4	18.0	2.71	6.22	13.58	782	-68.5	Clear	None
1105	200	26.4	18.8	2.76	6.22	13.57	782	-68.6	Clear	None

*A stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Erin Foley
SAMPLER(S) SIGNATURES: Erin Foley
SAMPLING INITIATED AT: 1115
SAMPLING ENDED AT: 1150
PUMP OR TUBING DEPTH IN WELL (feet): 66 ft
SAMPLE PUMP FLOW RATE (mL per minute): 200 mL/min
FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s: YSI 556 MPS 07J100085 + 10F100002 micro Purge Controller SN# 1209
FIELD DECONTAMINATION (Y) N
FIELD-FILTERED (Y) N FILTER SIZE ___ µm
Filtration Equipment Type:
DUPLICATE Y (N)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

MS/MSD on well (Turbidity meter LaMotte 2020e SN-ME12915)

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: Ft Devens SHL	PROJECT LOCATION: Ayer Ma	DATE: 9/1/10	WELL ID: SHM-10-15
PROJECT NUMBER: ACOC1	WELL DIAMETER (inches): 2	DEPTH TO WATER (feet): 24.70	DEPTH TO BOTTOM (feet): 56.80	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder	PUMP EQUIPMENT MODEL & SERIAL #s: Cont-1209 Pump 1421 QED
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY		GALLONS: 5.12	LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02, 1" = 0.04, 1.25" = 0.06, 2" = 0.16, 3" = 0.37, 4" = 0.65, 5" = 1.02, 6" = 1.47, 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
47-57	52	52	1340	1455	GALLONS: LITERS: 9

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0-20	N/A	Started pump - had to restart and start	again			1500
1400 20-30	150	D-10 R-20 TPSI=175 CPSI=50	24.70	24.70	Y	1500

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1417	150	24.70	16.8	0.36	6.22	16.95	507	-56.0	Clear	none
1422	150	24.70	8.11	0.89	6.22	16.63	506	-58.9	Clear	none
1427	150	24.70	16.9	0.73	6.23	16.55	504	-60.1	Clear	none
1432	150	24.70	13.8	0.44	6.22	16.25	504	-57.3	Clear	none
1437	150	24.70	18.9	0.47	6.21	15.74	503	-54.5	Clear	none
1442	150	24.70	15.9	0.40	6.21	15.60	503	-53.4	Clear	none
1447	150	24.70	15.5	0.33	6.21	15.95	502	-53.3	Clear	none
1452	150	24.7	16.3	0.25	6.21	16.02	503	-52.7	Clear	none

*EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Carolyn Hassolt	SAMPLER(S) SIGNATURES: Carolyn Hassolt	SAMPLING INITIATED AT: 1455	SAMPLING ENDED AT: 1545
PUMP OR TUBING DEPTH IN WELL (feet): 52	SAMPLE PUMP FLOW RATE (mL per minute): 150	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s: YSI 556 09500085 / 10F100C02 Lamotte 2020E ME12915	
FIELD DECONTAMINATION: (Y) N	FIELD FILTERED: (Y) N Filtration Equipment Type:	FILTER SIZE: 0.45 µm	DUPLICATE: (Y) N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / (Stand Pipe) — General Condition: (Good) / Needs Repair — Well Caps: (Good) / Broken / None — Lock: Good / Broken / (None)

Evidence of Rain Water Between Steel & PVC? Y / (N) — Is Well Plumb? (Y) / N — PVC Riser: (Good) / Damaged / None

Evidence of Ponding Around Well? Y / (N) — Concrete Collar: (Good) / Cracked / Leaking / None

REMARKS:

DUP-090110-F/U

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001-002
PROJECT NUMBER:
PROJECT LOCATION: Devens, MA
WELL DIAMETER (inches): 2"
DEPTH TO WATER (feet): 20.59 / 28.54 / 20.85
DEPTH TO BOTTOM (feet): 62.35
DATE: 9/2/10
PID READING (ppmv):
WELL ID: SHM-10-14

PURGING DATA

TUBING DIAMETER (inches):
TUBING MATERIAL CODE (see below): PE
PURGE PUMP TYPE: Bladder
PUMP EQUIPMENT MODEL & SERIAL #s: Cont-1209 Pump 11421 QED

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
GALLONS: 1.8 gallons
LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet): 62-52
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 72
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 72
PURGING INITIATED AT: 957
PURGING ENDED AT:
TOTAL VOLUME PURGED: GALLONS: LITERS: 14

WATER LEVEL STABLIZATION
DEPTH TO WATER WITH PUMP (feet): 20.87

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
957 0-20	NA	Adjusting pump + water level				4000
20-30	225	D-20, R-20, TPSI-150, CPSI-50	20.87	20.87	Yes	1500

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.33')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1030	225	20.87	186	0.36	5.14	14.65	669	-17.5	Cloudy	none
1035	225	20.87	267	0.27	5.56	14.44	666	-40.2	Cloudy	none
1040	225	20.87	221	0.28	5.86	14.51	666	-56.4	Cloudy	none
1045	225	20.87	269	0.23	6.04	14.45	665	-66.8	Cloudy	none
1050	225	20.87	295	0.19	6.18	14.27	669	-76.8	Cloudy	none
1055	225	20.87	227	0.15	6.25	14.35	670	-82.7	Cloudy	none
1100	225	20.87	207	0.20	6.29	14.37	671	-83.1	Cloudy	none
1105	225	20.87	168	0.20	6.28	14.56	663	-84.0	Cloudy	none
1110	225	20.87	113	0.19	6.30	14.56	648	-83.8	Cloudy	none
1115	225	20.87	72.4	0.20	6.31	14.40	646	-83.6	Cloudy	none
1120	225	20.87	59.5	0.18	6.33	14.39	647	-85.9	Clear	none
1125	225	20.87	55.5	0.17	6.35	14.42	649	-87.9	Clear	none
1130	225	20.87	43.3	0.17	6.35	14.44	649	-87.9	Clear	none
1135	225	20.87	34.4	0.18	6.35	14.46	648	-88.1	Clear	none
1140	225	20.87	35.9	0.18	6.34	14.56	644	-87.6	Clear	none
1145	225	20.87	34.7	0.18	6.35	14.44	645	-87.4	Clear	none

*A stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Carolyn Hardt
SAMPLER(S) SIGNATURES:
SAMPLING INITIATED AT: 1147
SAMPLING ENDED AT: 1223

PUMP OR TUBING DEPTH IN WELL (feet): 72'
SAMPLE PUMP FLOW RATE (mL per minute): 225
FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION Y N
FIELD FILTERED Y N
FILTER SIZE ___ μm
Filtration Equipment Type:
DUPLICATE Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe
General Condition: Good / Needs Repair
Well Caps: Good / Broken / None
Lock: Good / Broken / None
Evidence of Rain Water Between Steel & PVC? Y / N
Is Well Plumb? Y / N
PVC Riser: Good / Damaged / None
Evidence of Ponding Around Well? Y / N
Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

MSMSD from well

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508 339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION		DATE	WELL ID
Fort Devens SHL	Devens, MA		9/2/10	SHM-10-16
PROJECT NUMBER: ACOO1.002	WELL DIAMETER (inches): 2"	DEPTH TO WATER (feet): 8.64	DEPTH TO BOTTOM (feet): 87'	PID READING (ppmv): —

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
1/4"	PE	Bladder Pump	Pump S/N 1142

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: 12.5 gallons — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED GALLONS / LITERS
77-87'	82'	82'	1358		

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet): 8.65

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
~~2-7~~	50	Refill 20 Discharge 10	8.65	8.65	~~Yes~~ Yes	
7-~~9~~10	275	20/10	8.65	8.65	Yes	
10-20	275	20/10 TBI-275 CBI-180	8.65	8.65	Yes	3000

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1420	275	8.65	105.5	0.19	6.98	11.78	811	-217.7	~~Clear~~ Cloudy	None
1423	275	8.65	78.3	0.17	6.97	11.75	803	-222.9	~~Clear~~ little cloudy	None
1426	275	8.65	83.0	0.19	6.99	11.68	803	-227.3	~~Clear~~ little cloudy	None
1429	275	8.65	86.6	0.15	6.99	11.63	794	-231.4	little cloudy	None
1431	275	8.65	75.0	0.16	6.99	11.62	791	-233.5	little cloudy	None
1434	275	8.65	75.0	0.16	6.99	11.47	788	-234.8	little cloudy	None
1437	275	8.65	73.0	0.16	6.98	11.40	784	-234.8	little cloudy	None
1440	275	8.65	78.5	0.17	6.98	11.40	784	-233.8	little cloudy	None

*A stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
Erin Foley	Erin Foley	1445	1515

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (ml per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
82'	275	

FIELD DECONTAMINATION: (Y) N — FIELD FILTERED: (Y) N — FILTER SIZE: ___ um — Filtration Equipment Type — DUPLICATE: (Y) N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: Devens AC	PROJECT LOCATION:	DATE: 9/7/10	WELL ID: SHM-10-04
PROJECT NUMBER: A2001	WELL DIAMETER (inches): 1.25	DEPTH TO WATER (feet): 7.10	DEPTH TO BOTTOM (feet): 65'
PID READING (ppmv): —			

PURGING DATA

TUBING DIAMETER (inches): 3/4"	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: PERISTALTIC	PUMP EQUIPMENT MODEL & SERIAL #s: GEOPUMP

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: 3.5 LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
55-65'	60'	60'	1340	1426	GALLONS: 6.5 LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
15 min	320	~250 Rrpm	7.10	7.20		7Liters

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1400	320	7.20	14.4	0.60	5.96	13.42	704	23.4	Clear	None
1405	320	7.20	11.6	0.42	5.97	12.42	688	27.9	Clear	None
1408	320	7.20	4.96	0.43	5.99	12.00	671	~~44~~ 33.4	Clear	None
1411	320	7.20	7.05	0.30	5.98	12.21	666	40.2	Clear	None
1414	320	7.20	4.53	0.24	6.01	12.07	666	42.4	Clear	None
1417	320	7.20	5.48	0.19	6.00	11.93	661	43.9	Clear	None
1420	320	7.20	3.96	0.21	6.00	12.08	658	43.4	Clear	None
1423	320	7.20	4.01	0.23	6.00	12.08	657	43.3	Clear	None
1426	320	7.20	4.28	0.23	5.99	12.10	656	43.7	Clear	None

*EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Erin Foley	SAMPLER(S) SIGNATURES: Erin Foley	SAMPLING INITIATED AT: 1430	SAMPLING ENDED AT: 1450
PUMP OR TUBING DEPTH IN WELL (feet): 60'	SAMPLE PUMP FLOW RATE (mL per minute): 320	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	

FIELD DECONTAMINATION: Y N — FIELD-FILTERED: Y N — FILTER SIZE: ___ µm — Filtration Equipment Type: — DUPLICATE: Y ∅

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street Suite 202
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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	A001 Devens ACE	PROJECT LOCATION	Municipal Wastewater Treatment Plant, Ayer	DATE	9/17/10	WELL ID	SHM-10-3
PROJECT NUMBER	A001	WELL DIAMETER (inches)	1.5"	DEPTH TO WATER (feet)	27.06	DEPTH TO BOTTOM (feet)	69.30
PID READING (ppmv)	—						

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
3/4"	PE	Geopump	GEOPUMP #6423

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY

GALLONS: 2.5 Gallons LITERS:

WELL CAPACITY (Gallons Per Foot) 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
62-69.3	65'	65'	0954	~~1015~~ 1044	GALLONS: LITERS: 9Liters

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0955 15min	125	Cool w/ pump settings / Hand Surging	27.06	27.06	Yes	2 Liters

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.33')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1016	125	27.06	30.8	1.83	6.26	13.72	3311	187.8	Clear	None
1022	125	27.06	16.1	1.89	6.20	12.78	3334	179.4	Clear	None
1025	125	27.06	14.5	1.78	6.21	12.66	3318	169.5	Clear	None
1028	125	27.06	10.65	2.14	6.20	12.60	3323	164.7	Clear	None
1031	125	27.06	13.5	1.78	6.31	12.25	3341	152.8	Clear	None
1034	125	27.06	14.4	1.78	6.31	12.16	3345	150.2	Clear	None
1037	125	27.06	13.4	1.72	6.31	11.93	3341	148.1	Clear	None

*A stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
Erin Foley	Erin Foley	1045	1138

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
65'	125 mL/min	

FIELD DECONTAMINATION (Y) N — FIELD-FILTERED (Y) N — FILTER SIZE: ___ μm — Filtration Equipment Type: — DUPLICATE: (Y) N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC?: Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well?: Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

DUP-091710-FIU

Sovereign Consulting Inc.
905 South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001.002	PROJECT LOCATION: Devens		DATE: 9/7/10		WELL ID: SHM-10-02
PROJECT NUMBER:	WELL DIAMETER (inches): 1.5"	DEPTH TO WATER (feet): 18.21	DEPTH TO BOTTOM (feet): 63.90	PID READING (ppmv):	

PURGING DATA

TUBING DIAMETER (inches): 3/4"	TUBING MATERIAL CODE (see below): Poly PE	PURGE PUMP TYPE: Peri	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
55-65	18.21 59'	to 59'	1:20	1429	GALLONS: LITERS: 30

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0-10						6L
10-20	400	0-350 rpm, Speed Control 75%	18.21			4L

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)	
1:45	400	18.21	0.56	0.65	6.07	12.66	886	-90.7	clear	none	
1:50	400	18.21	3.37	0.40	5.95	12.53	882	-243.7	clear	none	
1:55	400	18.21	0.59	1.44	5.94	12.54	880	-230.9	clear	none	15L
2:00	400	18.21	0.26	1.57	5.90	12.30	883	-263.3	clear	none	
2:05	400	18.21	1.09	1.54	5.91	12.41	882	-265.1	clear	none	
2:10	400	18.21	0.82	1.37	5.93	12.48	880	-252.9	clear	none	
2:15	400	18.21	0.82	1.21	5.94	12.44	881	-252.8	clear	none	
2:20	400	18.21	0.73	0.92	5.95	12.41	880	-259.4	clear	none	
2:25	400	18.21	~~0.84~~ 0.31	0.84	5.94	12.45	880	-258.9	clear	none	
2:26	400	18.21	0.64	0.47	5.94	12.45	881	-258.3	clear	none	30L

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon CMH + JAR	SAMPLER(S) SIGNATURES: CMH, JAR [signature]	SAMPLING INITIATED AT: 1430	SAMPLING ENDED AT: 1450
PUMP OR TUBING DEPTH IN WELL (feet): 59'	SAMPLE PUMP FLOW RATE (mL per minute): 400	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N — Filtration Equipment Type:	FILTER SIZE: ___ µm	DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

MS/MSD

Sovereign Consulting Inc.
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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001.002	PROJECT LOCATION: Devens	DATE: 9/7/10	WELL ID: SHM-10-08
PROJECT NUMBER:	WELL DIAMETER (inches): 1.5	DEPTH TO WATER (feet): 9.53	DEPTH TO BOTTOM (feet): 57.51
PID READING (ppmv):			

PURGING DATA

TUBING DIAMETER (inches): 3/4"	TUBING MATERIAL CODE (see below): Poly PE	PURGE PUMP TYPE: Peri	PUMP EQUIPMENT MODEL & SERIAL #s:
WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY		GALLONS:	LITERS:
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88		1 GALLON = 3.785 LITERS	TOTAL VOLUME PURGED:
WELL SCREEN INTERVAL DEPTH (feet): 47'-57'	INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 52.51'	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 52.51'	PURGING INITIATED AT: 9:47
PURGING ENDED AT: 11:52	GALLONS:	LITERS: 41	
WATER LEVEL STABLIZATION	DEPTH TO WATER WITH PUMP (feet): 9.55		

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0-10						6 L
10-20	375	0-350 RPM, Speed Control .50%	9.55	9.55	Y	5 L

11

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1014	375	9.55	12.4	4.48	6.19	12.92	1075	-120.1	clear	none
1019	375	9.55	3989	3.16	6.11	11.52	1067	-144.2	Cloudy	none
1024	375	9.55	171	2.26	6.12	11.64	1065	-174.6	Cloudy	none
1029	375	9.55	31.9	2.81	6.11	11.49	1066	-173.7	Clear	none
Pump Turned off to clean flow thru cell										
1040										
10:55	375	9.55	3.60	2.98	6.15	12.01	1078	-259.6	clear	none
11:00	375	9.55	2.38	4.74	6.14	11.88	1078	-290.8	clear	none
11:05	375	9.55	1.29	4.49	6.16	11.88	1078	-250.4	Clear	none
11:10	375	9.55	0.64	4.12	6.16	11.91	1079	-140.9	Clear	none
11:15	375	9.55	0.26	5.13	6.18	12.13	1079	-171.7	clear	none
11:20	375	9.55	2.44	6.35	6.17	12.16	1078	-183.5	Clear	none
11:25	375	9.55	1.66	2.57	6.14	12.13	1081	-127.6	clear	none
11:30	375	9.55	0.84	1.66	6.14	12.04	1040	-123.9	Clear	none
11:35	375	9.55	1.45	0.92	6.19	12.07	1079	-185.6	Clear	none
11:40	375	9.55	1.32	8.53	6.22	12.05	1080	-205.8	clear	none
11:45	375	9.55	1.37	3.61	6.19	12.10	1079	-233.0	Clear	none

14L (beside 1029 row); 24L (beside 11:15 row); 41L (beside 11:45 row)

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: SovCon Carolyn Hartt	SAMPLER(S) SIGNATURES: CAH, JAR Carolyn Hartt	SAMPLING INITIATED AT: 11:53	SAMPLING ENDED AT: 12:11
PUMP OR TUBING DEPTH IN WELL (feet): 51'	SAMPLE PUMP FLOW RATE (mL per minute): 375	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm	DUPLICATE: Y (N)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / (Stand Pipe) General Condition: (Good) / Needs Repair Well Caps: (Good) / Broken / None Lock: Good / Broken / (None)

Evidence of Rain Water Between Steel & PVC? Y / (N) Is Well Plumb?: Y / (N) PVC Riser: (Good) / Damaged / None

Evendence of Ponding Around Welll? Y / (N) Concrete Collar: Good / Cracked / Leaking / (None)

REMARKS:

Sovereign Consulting Inc.
5050 South Main Street, Suite 202
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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: ACOOL-002	PROJECT LOCATION: Fort Devens		DATE: 9/8/10	WELL ID: SHM-10-05A
PROJECT NUMBER:	WELL DIAMETER (inches): 1.5	DEPTH TO WATER (feet): 26.11	DEPTH TO BOTTOM (feet): 60'	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches):	TUBING MATERIAL CODE (see below): Poly (PE)	PURGE PUMP TYPE:	PUMP EQUIPMENT MODEL & SERIAL #s:

WELL VOLUME PURGE: 1 WELL VOLUME (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED:
50-60 55(M)	55'	55	10:10	10:59	GALLONS: LITERS: 4

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet): 26.14

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0-10						1L
10-20	100	0-600 RPM, 100% speed Control	26.14	26.14	Yes	1L

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
10:30	100	26.14	14.6	5.70	5.01	19.04	201	11.7	Clear	none
10:33	100	26.14	14.3	4.47	5.01	18.94	202	2.1	Clear	none
10:36	100	26.14	11.8	4.11	5.06	19.49	199	-11.9	Clear	none
10:39	100	26.14	18.2	3.82	5.15	19.65	196	-14.3	Clear	none
10:42	100	26.14	12.6	3.58	5.20	19.65	202	-20.0	Clear	none
10:45	100	26.14	9.60	3.35	5.22	19.87	203	-15.9	Clear	none
10:48	100	26.14	13.2	3.30	5.26	20.10	202	-26.4	Clear	none
10:51	100	26.14	9.64	3.20	5.27	20.17	202	-26.3	Clear	none
10:54	100	26.14	8.75	3.10	5.26	20.30	198	-23.2	Clear	none
10:57	100	26.14	8.92	3.20	5.27	20.20	200	-24.0	Clear	none
11:00 CH										

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
Carolyn Hoodt, Julie Ricksman	[signatures]	11:00	12:03

PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:
55'	100	

FIELD DECONTAMINATION: (Y) N — FIELD-FILTERED: (Y) N — Filtration Equipment Type: — FILTER SIZE: ___ µm — DUPLICATE: Y (N)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: (Flush Mount) / Stand Pipe — General Condition: (Good) / Needs Repair — Well Caps: (Good) / Broken / None — Lock: Good / Broken / (None)

Evidence of Rain Water Between Steel & PVC? Y / (N) — Is Well Plumb?: (Y) N — PVC Riser: Good / Damaged / (None)

Evendence of Ponding Around Well? Y / (N) — Concrete Collar: (Good) / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
9050 South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
AC001-002	Ayer MA	09-08-10	SHM-10-01

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
	2.5"	4.78	71.72	—

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s:
3/4	PE	GeoPump	SN#101

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS 4.01 — LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED:
62-72'	67'	67'	~~0933~~ 9:38	1024	GALLONS 5 / LITERS

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
15min	320	≈155RPM	4.81	4.81	Yes	

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
955	320	4.81	0.50	0.50	6.41	13.17	298	28.4	Clear	None
958	320	4.81	0.85	0.41	5.76	12.97	298	53.3	Clear	None
1001	320	4.81	0.55	0.24	5.33	12.85	297	53.0	Clear	None
1004	320	4.81	0.47	0.22	6.17	12.78	298	23.0	Clear	None
1007	320	4.81	0.47	0.19	6.23	12.69	299	15.5	Clear	None
1010	320	4.81	0.20	0.17	6.27	12.69	299	15.1	Clear	None
1013	320	4.81	0.29	0.14	6.29	12.70	299	13.3	Clear	None
1016	320	4.81	0.22	0.13	6.29	12.71	299	11.8	Clear	None
1019	320	4.81	0.16	0.13	6.30	12.69	299	11.4	Clear	None
1021	320	4.81	0.15	0.12	6.31	12.68	299	11.3	Clear	None

*EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
Erin Foley	Erin Foley	1030	1105

PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:
67'	320	YSI 06E10C02 + 09J100085 Turbidity 26858

FIELD DECONTAMINATION: (Y) N — FIELD FILTERED: (Y) N — FILTER SIZE: ____ µm — Filtration Equipment Type: — DUPLICATE: Y (N) MS/MSD

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / (Stand Pipe) — General Condition: (Good) / Needs Repair — Well Caps: (Good) / Broken / None — Lock: Good / Broken / (None)

Evidence of Rain Water Between Steel & PVC? Y / (N) — Is Well Plumb?: Y / (N) — PVC Riser: (Good) / Damaged / None

Evendence of Ponding Around Well? Y / (N) — Concrete Collar: (Good) / Cracked / Leaking / None

REMARKS:

MS/MSD

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001-002	PROJECT LOCATION: Fort Devens	DATE: 9-8-10	WELL ID: SHM-10-06
PROJECT NUMBER:	WELL DIAMETER (inches): 1.5" / DEPTH TO WATER (feet): 20.86	DEPTH TO BOTTOM (feet): 80'	PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches): 3/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: PERI	PUMP EQUIPMENT MODEL & SERIAL #s

WELL VOLUME PURGE: 1 WELL VOLUME (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
70-80'	75	75	12:32	1329	GALLONS: LITERS: 21

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet): 20.55

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0-5						2L
5-15	425	0-600 RPM, 65% speed control	20.55	20.55	Yes	3L

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)	
12:48	425	20.55	6.32	6.66	6.01	11.34	781	-79.0	Clear	none	
12:53	425	20.55	4.97	5.11	6.02	11.36	786	-76.4	clear	none	
12:58	425	20.55	2.90	3.85	6.05	11.74	786	-73.8	Clear	none	
~~12:53~~											
1303	425	20.55	2.24	3.62	6.10	11.79	785	-73.3	clear	none	
1307	425	20.55	2.24	3.86	6.11	11.82	780	-71.0	Clear	none	
1312	425	20.55	3.35	3.34	6.11	11.82	786	-68.9	Clear	none	15L
1317	425	20.55	4.84	3.00	6.15	11.67	789	-67.5	Clear	none	
1322	425	20.55	3.94	3.01	6.17	11.67	791	-66.2	Clear	none	
1327	425	20.55	3.72	2.83	6.16	11.59	783	-64.3	Clear	none	6

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
Carolyn Hardt	Carolyn Hardt	1330	1355

PUMP OR TUBING DEPTH IN WELL (feet): 75	SAMPLE PUMP FLOW RATE (mL per minute): 425	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION: Y / N (Y circled) — FIELD-FILTERED: Y / N (Y circled) — FILTER SIZE: ____ µm — Filtration Equipment Type: — DUPLICATE: Y / N (Y circled)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s); cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Everdence of Ponding Around Welll? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc
4 Open Square Way Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
AC 001-002	Ayer, MA	9/8/10	SCM-10-10

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
	2"	11.40	67.4	

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
3/4"	PE	Geopump	SN 101

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
58-68'	63'	63	1145	1225	GALLONS: 4 Gal; LITERS:

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
15	300	175 rpm	11.41	11.41	Yes	1 gal

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1203	300	11.41	1.33	0.72	6.58	13.36	613	83.3	Clear	None
1206	300	11.41	1.17	0.46	6.57	13.21	615	73.8	Clear	None
1209	300	11.41	1.~~44~~41	0.38	6.57	13.29	615	70.0	clear	None
1212	300	11.41	1.39	0.25	6.56	13.17	615	66.8	Clear	None
1215	300	11.41	0.80	0.20	6.56	13.25	615	64.6	clear	None
1218	300	11.41	0.89	0.17	6.56	13.15	618	63.2	Clear	None
1221	300	11.41	0.71	0.16	6.55	13.13	617	63.3	Clear	None
~~1224~~	~~300~~	~~11.41~~						6		

*PA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
Erin Foley	Erin Foley	1230	1330

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
63'	300	YSI 10F100C02 + 09J100085 Turb 26858

FIELD DECONTAMINATION (Y) N — FIELD FILTERED (Y) N — FILTER SIZE ___ µm — Filtration Equipment Type: — DUPLICATE (Y) N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
Accolor	Fort Devens	9/9/10	SHM-10-06A

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
	1.5	35.67	89.90	

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s:
	PE	PCI	

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS — LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS — TOTAL VOLUME PURGED:

WELL SCREEN INTERVAL DEPTH (feet):	INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	GALLONS: / LITERS:
80-90	85	85	942		LITERS: 63

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet): 35.9

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0-10						—
10-15	475	0-600rpm, 100% speed control	35.9	35.9	Yes	3L

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)	
10:03	475	35.9	135	5.99	5.64	11.12	264	-43.0	cloudy	none	
10:08	475	35.9	100.7	4.15	5.37	10.93	269	-68.5	cloudy	none	
10:13	475	35.9	81.4	2.80	5.56	10.63	272	-154.9	cloudy	none	14L
10:18	475	35.9	77.1	2.52	5.59	10.80	282	-226.5	cloudy	none	
10:23	475	35.9	70.1	2.58	5.62	10.65	298	-244.3	cloudy	none	
10:28	475	35.9	66.4	2.39	5.66	10.79	315	-144.9	cloudy	none	
10:33	475	35.9	60.2	2.61	5.70	10.76	317	-138.9	cloudy	none	
10:36	475	35.9	48.7	2.60	5.82	10.84	341	-131.4	cloudy	none	
10:39	475	35.9	44.9	2.04	5.71	10.71	344	-116.6	cloudy	none	14L
10:42	475	35.9	41.7	2.00	5.91	10.71	350	-126.3	cloudy	none	
10:46	475	35.9	44.7	3.49	5.90	10.66	355	-122.0	cloudy	none	
10:51	475	35.9	41.3	3.42	5.73	10.70	353	-97.6	cloudy	none	
10:56	475	35.9	46.4	1.20	5.73	10.68	362	-122.2	cloudy	none	
11:01	475	35.9	43.2	0.96	5.74	10.77	376	-129.0	Cloudy	None	
11:06	475	35.9	37.6	0.86	5.77	10.79	397	-152.9	cloudy	none	4L
11:11	475	35.9	50.3	0.99	5.78	10.77	353	-144.4	cloudy	none	
11:16	475	35.9		0.84	5.98	10.70	363	-162.9	cloudy	none	
11:21	475	35.9	43.7	0.86	5.95	10.73	413	-159.0	cloudy	none	

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT:	SAMPLING ENDED AT:

PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION: Y N — FIELD-FILTERED: Y N — FILTER SIZE: ____ µm — Filtration Equipment Type: — DUPLICATE: Y N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS: Used Check valve w/ Pump and manual pumping

P1 of 2

Sovereign Consulting Inc
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001.002
PROJECT LOCATION: Fort Devens
DATE: 9/9/10
WELL ID: SHM-10-06A

PROJECT NUMBER:
WELL DIAMETER (inches): 1.5
DEPTH TO WATER (feet): 35.87
DEPTH TO BOTTOM (feet): 89.96
PID READING (ppmv):

PURGING DATA

TUBING DIAMETER (inches):
TUBING MATERIAL CODE (see below): PE
PURGE PUMP TYPE: Peri
PUMP EQUIPMENT MODEL & SERIAL #s: Geopump SN 6423
GALLONS: LITERS:

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY

WELL CAPACITY (Gallons Per Foot) 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet): 80-90'
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 85
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 85
PURGING INITIATED AT: 9:42
PURGING ENDED AT: 11:42
TOTAL VOLUME PURGED: GALLONS: LITERS: 6.3

WATER LEVEL STABLIZATION
DEPTH TO WATER WITH PUMP (feet): 35.9

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)	
11:26	475	35.9	49.2	0.63	5.76	10.81	374	-158.8	cloudy	none	1L
11:31	475	35.9	54.9	1.09	6.04	10.70	360	-159.3	cloudy	none	
11:36	475	35.9	43.5	0.28	5.75	10.73	383	-147.7	cloudy	none	
11:41	475	35.9	40.6	0.39	5.94	10.65	431	-157.3	cloudy	none	7L

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: CMH
SAMPLER(S) SIGNATURES: [signature]
SAMPLING INITIATED AT: 11:45
SAMPLING ENDED AT: 12:00

PUMP OR TUBING DEPTH IN WELL (feet): 85
SAMPLE PUMP FLOW RATE (mL per minute): 475
FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s:

FIELD DECONTAMINATION: Y / N (Y circled)
FIELD-FILTERED: Y / N (Y circled) — FILTER SIZE: ____ µm
Filtration Equipment Type:
DUPLICATE: Y / N (Y circled)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evendence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508 339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite #307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: AC001-002	PROJECT LOCATION: Devens, MA		DATE: 9/9/10	WELL ID: SHM-10-7
PROJECT NUMBER:	WELL DIAMETER (inches): 2"	DEPTH TO WATER (feet): 28.00	DEPTH TO BOTTOM (feet): 50.03	PID READING (ppmv): —

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Geopump Bladder	PUMP EQUIPMENT MODEL & SERIAL #s: QED 2254

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: 3.5 — LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
40-50'	45'	45'	0953	1055	GALLONS: 3.5 LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0-10	210	D-10 R-20 TPSI-90 CPSI-30	28.00	28.05		2,000 mL
10-20	210	" "	28.05	28.05	Yes	4,000 mL

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1018	210	28.05	37.0	1.66	6.42	12.30	647	-98.5	lift cloudy	None
1021	210	28.05	28.7	1.20	6.51	12.35	640	-105.5	lift cloudy	None
1024	210	28.05	22.0	1.13	6.50	12.34	640	-102.9	lift cloudy	None
1027	210	28.05	21.8	1.01	6.53	12.27	638	-103.9	lift cloudy	None
1030	210	28.05	19.6	0.97	6.53	12.37	637	-103.9	lift cloudy	None
1034	210	28.05	22.4	0.76	6.53	12.33	636	-104.4	lift cloudy	None
1038	210	28.05	19.4	0.63	6.54	12.39	635	-104.5	lift cloudy	None
1041	210	28.05	21.3	0.64	6.54	12.34	636	-104.9	lift cloudy	None
1044	210	28.05	15.8	0.47	6.54	12.38	635	-105.4	Clear	None
1047	210	28.05	17.1	0.43	6.54	12.40	635	-105.4	Clear	None
1050	210	28.05	15.4	0.43	6.54	12.39	635	-105.6	Clear	None

*PA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Erin Foley	SAMPLER(S) SIGNATURES: Erin Foley	SAMPLING INITIATED AT: 1100	SAMPLING ENDED AT: 1135
PUMP OR TUBING DEPTH IN WELL (feet): 45	SAMPLE PUMP FLOW RATE (mL per minute): 210	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s: YSI 08I0085 + 10F10C02 Turb ME12915	

FIELD DECONTAMINATION: Y N — FIELD FILTERED: Y N — FILTER SIZE: ____ µm — Filtration Equipment Type: — DUPLICATE: Y N ms/msD

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb?: Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

MS/MSD

Sovereign Consulting Inc.
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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 310
Holyoke, MA 01040
413-540-0650

PROJECT NAME: Accel 002	PROJECT LOCATION: Ayer, MA		DATE: 10/19/10	WELL ID: SHM-10-13
PROJECT NUMBER: Fort Devens	WELL DIAMETER (inches): 2"	DEPTH TO WATER (feet): 26.75	DEPTH TO BOTTOM (feet): 70.82	PID READING (ppmv): —

PURGING DATA

TUBING DIAMETER (inches): 1/4"	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder	PUMP EQUIPMENT MODEL & SERIAL #s: cont = 2196 Pump - 10383

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: LITERS:

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
61-70.77	66.5 ft		9:50	11:10	GALLONS: LITERS: 18

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP (feet): 26.75

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
10	225	D:10 R:20 TPSI=30 CPSI=50	26.75	26.75	yes	2L

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)	
10:10	225	26.75	32.4	1.64	6.27	12.31	755	-52.6	Clear	none	
10:15	225	26.75	24.3	0.69	6.25	12.30	757	-54.5	Clear	none	
10:20	225	26.75	23.6	0.38	6.24	12.40	764	-55.0	Clear	none	
10:25	225	26.75	21.9	0.34	6.26	12.47	764	-55.1	Clear	none	
10:30	225	26.75	20.5	0.24	6.25	12.40	768	-55.6	Clear	none	
10:35	225	26.75	17.5	0.20	6.25	12.47	769	-55.3	Clear	none	
10:40	200	26.75	17.4	0.20	6.26	12.47	776	-53.4	Clear	none	
10:45	200	26.75	16.3	0.18	6.24	12.46	775	-52.3	Clear	none	
10:50	200	26.75	17.9	0.14	6.25	12.45	784	-54.4	Clear	none	
10:55	200	26.75	14.9	0.14	6.28	12.44	765	-54.7	Clear	none	14L
11:00	200	26.75	12.6	0.13	6.27	12.47	757	-53.6	Clear	none	
11:05	200	26.75	12.6	0.14	6.29	12.49	786	-53.5	Clear	none	
11:10	200		12.0	0.12	6.27	12.48	743	-52.5	Clear	none	4L

*EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Carolyn Hardt	SAMPLER(S) SIGNATURES: Carolyn Hardt	SAMPLING INITIATED AT: 11:13	SAMPLING ENDED AT: 1202
PUMP OR TUBING DEPTH IN WELL (feet): 66	SAMPLE PUMP FLOW RATE (mL per minute):	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s: YSI 600XL-4M; La Motte 2020we 241-4110	
FIELD DECONTAMINATION: (Y) N	FIELD FILTERED: (Y) N — FILTER SIZE: 0.45 µm — Filtration Equipment Type: Inline	DUPLICATE: (Y) N	

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / (Stand Pipe) — General Condition: (Good) / Needs Repair — Well Caps: (Good) / Broken / None — Lock: (Good) / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / (N) — Is Well Plumb? (Y) N — PVC Riser: (Good) / Damaged / None

Evidence of Ponding Around Well? Y / (N) — Concrete Collar: (Good) / Cracked / Leaking / None

REMARKS:

DUP-101910-F/U

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite ...
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION			DATE	WELL ID
AC001-002	Devens, MA			10/19/10	SHM-10-14
PROJECT NUMBER	WELL DIAMETER (inches) 2"	DEPTH TO WATER (feet) 21.98	DEPTH TO BOTTOM (feet) 82.35	PID READING (ppmv) —	

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
	PE	Bladder	Cont(1053), Pump(1017?)

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS / LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED
62-82	72	72	1012	1125	GALLONS: ~4 Gal LITERS:

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet) 21.203

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0-20 min	NA	R: 20, D: 10, TPSI: 95, CPSI: 50	21.03	21.03	Yes	4500

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.33')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1035	225	21.03	615	1.40	6.33	11.86	692	-31.9	cloudy	none
1040	225	21.03	608	1.08	6.26	11.82	688	-31.9	cloudy	none
1045	225	21.03	651	0.44	6.28	11.78	689	-38.4	cloudy	none
1050	225	21.02	81	0.40	6.33	11.87	689	-37.5	cloudy	none
1055	225	21.03	68.8	0.41	6.34	12.00	691	-35.5	cloudy	None
1100	225	21.03	60.0	0.39	6.34	11.97	692	-39.4	cloudy	None
1105	225	21.03	43.7	0.35	6.35	12.00	692	-39.3	cloudy	None
1110	225	21.03	37.9	0.36	6.34	12.00	692	-38.5	little cloudy	None
1115	225	21.03	38.2	0.35	6.35	12.01	691	-38.7	little cloudy	None
1120	225	21.03	34.5	0.36	6.35	11.99	693	-38.6	little cloudy	None

*PA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
Erin Foley / Sov Con	Erin Foley	1125	1202

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
72'	225 mL/min	YSI(10F07m01) Turb(7N0236 4110)

FIELD DECONTAMINATION: Y / N — FIELD FILTERED: Y / N — FILTER SIZE: ___ µm — Filtration Equipment Type — DUPLICATE: MS/MSD

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc
905B South Main Street, Suite 202
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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
Fort Devens SHL	Ayer MA	10-19-10	SHM-10-11

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
AC001	2"	40.87	63.13	

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #
	PE	Bladder	Cont (2196) Pump (10383)

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY | GALLONS | LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 | 1 GALLON = 3.785 LITERS | TOTAL VOLUME PURGED

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
52-62	57	57	1400		GALLONS 3.25 gal; LITERS

WATER LEVEL STABLIZATION DEPTH TO WATER WITH PUMP (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS R- D- PSI/C- PSI/T-	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0-10	400	R-10 D-5 psi/c-50 psi/T-95	40.88	40.88	yes	~1500

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1415	400	40.88	38.3	0.82	5.20	11.66	416	16.2	Clear	None
1420	400	40.88	13.9	0.41	6.40	11.60	418	-42.5	Clear	None
1425	400	40.88	10.29	0.44	6.28	11.60	417	-41.3	Clear	None
1430	400	40.88	8.24	0.42	6.29	11.50	416	-42.3	Clear	None
1435	400	40.88	6.08	0.46	6.22	11.54	415	-41.1	Clear	None
1438	400	40.88	4.97	0.47	6.24	11.57	414	-39.1	Clear	None
1441	400	40.88	4.89	0.46	6.28	11.51	414	-40.8	Clear	None
1444	400	40.88	4.28	0.41	6.28	11.57	414	-42.1	Clear	None

*PA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURE(S)	SAMPLING INITIATED AT	SAMPLING ENDED AT
Erin Rey	Erin Rey	1445	1455

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
57'	400ml/min	YSI (10F07md) Turb (2N23164 110)

FIELD DECONTAMINATION (Y) N FIELD FILTERED: Y N FILTER SIZE ____ µm Filtration Equipment Type: DUPLICATE: Y (N)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe General Condition: Good / Needs Repair Well Caps: Good / Broken / None Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N Is Well Plumb?: Y / N PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street Suite 202
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508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
1 Open Square Way Suite 330
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
Fort Devens	Ayer, MA	10/20/10	SHM-10-15

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
AC001	2"	24.98	56.80	

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
1/4"	PE	Bladder	

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS: — LITERS:

WELL CAPACITY (Gallons Per Foot) 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
47-57	52	52	0940	1050	GALLONS 9.5 LITERS

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet): 25.03

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0-10	200	D-10, R-20, T-100, C-50	~~25.03~~	25.25	~~Yes~~ No	~~09~~ 2,000
10-20	200	D-10, R-20, T-100, C-50	25.25	25.25	Yes	2,000

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.33')*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1000	200	25.25	87.9	0.89	6.17	12.19	516	-6.5	Cloudy	None
1005	200	25.25	86.7	1.28	6.18	12.18	511	-19.0	Cloudy	None
1010	200	25.25	67.7	0.85	6.19	12.01	511	-23.5	Cloudy	None
1015	200	25.25	68.2	0.58	6.18	12.04	511	-23.3	Cloudy	None
1020	200	25.25	70.5	0.48	6.14	11.81	512	-21.0	Cloudy	None
1025	200	25.25	66.2	0.49	6.12	11.79	510	-19.9	Cloudy	None
1030	200	25.25	48.1	0.45	6.08	11.88	511	-17.5	Cloudy	None
1035	200	25.25	50.1	0.22	6.03	11.96	509	-13.6	Cloudy	None
1040	200	25.25	60.3	0.38	5.98	12.02	511	-14.1	Cloudy	None
1045	200	25.25	55.1	0.30	5.95	12.00	510	-11.1	Cloudy	None
1050	200	25.25	59.5	0.36	5.94	11.95	510	-12.9	Cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
Simantha Vallati Sovereign	[signature]	1050	11:50

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
52	200	YSI 556 10E07MC1, LaMotte 2020 WE 2356-4110

FIELD DECONTAMINATION (Y) N — FIELD FILTERED (Y) N — FILTER SIZE ___ µm — Filtration Equipment Type: — DUPLICATE Y (N)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / (N) — Is Well Plumb? Y / (N) — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? (Y) / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

MS/MSD

Collected 5 gallons of H_2O for As Tests

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME	PROJECT LOCATION	DATE	WELL ID
Fort Devens	Ayer MA	10/20/10	SHM-10-16

PROJECT NUMBER	WELL DIAMETER (inches)	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	PID READING (ppmv)
AC001-	2"	8.22	87'	

PURGING DATA

TUBING DIAMETER (inches)	TUBING MATERIAL CODE (see below)	PURGE PUMP TYPE	PUMP EQUIPMENT MODEL & SERIAL #s
1/4	PE	Bladder	Cont-2196 Pump 10177

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS / LITERS

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED: GALLONS / LITERS
77-87	82'	82'	1340	1435	LITERS 10.5

WATER LEVEL STABLIZATION

DEPTH TO WATER WITH PUMP (feet):

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
0-10	250	D-10, R-20, T-80, C-60	8.22	8.22	Yes	2500 mL

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (uS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
1350	250	8.22	134	1.01	6.67	11.05	806	-104.0	cloudy	None
1355	250	8.22	84	0.75	6.66	10.92	804	-109.9	cloudy	None
1400	250	8.22	98	1.01	6.75	10.78	807	-115.9	cloudy	None
1405	250	8.22	93.1	0.80	6.80	10.78	806	-119.1	cloudy	None
1410	250	8.22	64.5	0.59	6.79	10.76	805	-121.5	cloudy	None
1415	250	8.22	60.6	0.47	6.81	10.76	801	-124.8	cloudy	None
1420	250	8.22	39.2	0.41	6.78	10.71	798	-127.9	cloudy	None
1425	250	8.22	34.0	0.35	6.81	10.69	797	-129.8	cloudy	None
1430	250	8.22	34.0	0.33	6.78	10.64	795	-129.7	cloudy	None
1435	250	8.22	34.6	0.34	6.77	10.63	793	-129.2	cloudy	None

* EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION	SAMPLER(S) SIGNATURES	SAMPLING INITIATED AT	SAMPLING ENDED AT
	Evan T. [signature]	1435	1500

PUMP OR TUBING DEPTH IN WELL (feet)	SAMPLE PUMP FLOW RATE (mL per minute)	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s
82	250	YSI 556 10F07100; LAMOTTE 2020e WE 2364110

FIELD DECONTAMINATION: Y / N (Y circled) — FIELD FILTERED: Y / N (Y circled) — FILTER SIZE: ___ µm — Filtration Equipment Type: Inline 0.45 — DUPLICATE: Y / N (N circled)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:

Sovereign Consulting Inc.
905B South Main Street, Suite 202
Mansfield, MA 02048
508-339-3200

MONITORING WELL SAMPLING LOG

Low Flow Sampling

Sovereign Consulting Inc.
4 Open Square Way, Suite 307
Holyoke, MA 01040
413-540-0650

PROJECT NAME: ACOD.CO 2	PROJECT LOCATION: Ayer, MA	DATE: 10/20/10	WELL ID: SHM-10-12
PROJECT NUMBER:	WELL DIAMETER (inches): 2	DEPTH TO WATER (feet): 34.73	DEPTH TO BOTTOM (feet): 57.24	PID READING (ppmv): —

PURGING DATA

TUBING DIAMETER (inches): 1/4	TUBING MATERIAL CODE (see below): PE	PURGE PUMP TYPE: Bladder	PUMP EQUIPMENT MODEL & SERIAL #s: Cont = 1053 Pump = 10383

WELL VOLUME PURGE: 1 WELL VOLUME= (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY — GALLONS / LITERS

WELL CAPACITY (Gallons Per Foot): 0.75 = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 — 1 GALLON = 3.785 LITERS

WELL SCREEN INTERVAL DEPTH (feet)	INITIAL PUMP OR TUBING DEPTH IN WELL (feet)	FINAL PUMP OR TUBING DEPTH IN WELL (feet)	PURGING INITIATED AT	PURGING ENDED AT	TOTAL VOLUME PURGED
47-57	52	52	9:40	1035	GALLONS: 5 LITERS: 20

WATER LEVEL STABLIZATION — DEPTH TO WATER WITH PUMP: (feet)

TIME INTERVAL (min)	FLOW RATE (mL/min)	PUMP SETTINGS	DEPTH TO WATER (feet) START	DEPTH TO WATER (feet) END	Water Level Stable (Yes or No)	VOLUME PURGED DURING INTERVAL (mL)
10	400	D-5 R-10 TPSI-80 CPSI-50	34.73	34.73	yes	4L

TIME (3-5 minutes)*	FLOW RATE (mL/min) (100-500 mL/min)*	DEPTH TO WATER (feet) (+/- 0.3)*	TURBIDITY (NTU) (+/- 10%)*	DISSOLVED OXYGEN (mg/L) (+/- 10%)*	pH (+/- 0.1)*	TEMP (°C) (+/- 3%)*	SPECIFIC CONDUCTIVITY (µS/cm) (+/- 3%)*	ORP (mV) (+/- 10mV)*	COLOR (describe)	ODOR (describe)
950	400	34.73	21.4	1.19	5.93	11.16	436	11.9	Clear	none
955	400	34.73	15.0	0.71	5.93	11.02	434	1.8	Clear	none
10:00	400	34.73	9.38	0.95	5.46	10.95	432	22.9	Clear	none
10:05	400	34.73	7.23	0.95	5.59	11.00	432	9.5	Clear	none
10:10	400	34.73	5.33	0.79	5.85	10.96	433	-5.8	Clear	none
10:15	400	34.73	3.53	0.48	5.92	10.91	433	-10.8	Clear	none
10:20	400	34.73	3.82	0.33	5.90	10.85	433	-10.6	Clear	none
10:25	400	34.73	2.47	0.35	5.92	10.90	433	-13.1	Clear	none
10:30	400	34.73	1.60	0.32	5.93	10.92	432	-14.5	Clear	none

*EPA stabilization parameters from EPA/540/S-95/504 April 1996

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Carolyn Hardt	SAMPLER(S) SIGNATURES: Carolyn Hardt	SAMPLING INITIATED AT: 10:35	SAMPLING ENDED AT: 1100
PUMP OR TUBING DEPTH IN WELL (feet): 52	SAMPLE PUMP FLOW RATE (mL per minute): 400	FIELD PARAMETER MONITORING EQUIPMENT MODEL & SERIAL #s: Lamotte 2020we 241-4110 YSI 556 10F07M01	
FIELD DECONTAMINATION: (Y) N	FIELD FILTERED: (Y) N — FILTER SIZE: 0.45 µm — Filtration Equipment Type: Inline		DUPLICATE: (Y) N

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

WELL CONDITION CHECKLIST (circle appropriate item(s), cross out if not applicable)

Type: Flush Mount / Stand Pipe — General Condition: Good / Needs Repair — Well Caps: Good / Broken / None — Lock: Good / Broken / None

Evidence of Rain Water Between Steel & PVC? Y / N — Is Well Plumb? Y / N — PVC Riser: Good / Damaged / None

Evidence of Ponding Around Well? Y / N — Concrete Collar: Good / Cracked / Leaking / None

REMARKS:
DUP-102010-F/U
Collected 10 gallons of H_2O for As Tests