



**US Army Corps
of Engineers®**

New England District

2004 SEMI-ANNUAL REPORT

LONG TERM MONITORING AREA OF CONTAMINATION (AOC) 57 DEVENS, MASSACHUSETTS SPRING 2004 SAMPLING EVENT

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**2004 SEMI-ANNUAL REPORT
LONG TERM MONITORING
AREA OF CONTAMINATION (AOC) 57
DEVENS, MASSACHUSETTS
SPRING 2004 SAMPLING EVENT**

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DEVENS, MASSACHUSETTS
SPRING 2004 SAMPLING EVENT

1. SUMMARY OF RESULTS

The New England District Corps of Engineers (NAE) conducted the Spring 2004 semi-annual groundwater sampling event at Area of Contamination (AOC) 57 at Devens, Massachusetts on May 19, 2004. Sampling of the four sumps was conducted on June 2, 2004. This data report presents the summary of results, tabulated analytical results on Tables 1 and 2, data quality evaluation report (Appendix A), chemical quality assurance report (Appendix B), and groundwater field analysis forms (Appendix C). Information on obtaining an electronic copy of the raw analytical laboratory data is included as Appendix D.

Groundwater was sampled at eight monitoring well locations using the U.S. EPA's Low Flow Method and three surface water locations. Monitoring wells sampled were 57M-03-01X, 57M-03-02X, 57M-03-03X, 57M-03-04X, 57M-03-05X, 57M-03-06X, 57M-95-03X, and 57M-96-11X. Prior to sampling the monitoring wells, water levels were measured in the set of exterior piezometers and monitoring wells used in this program. Monitoring well purge water and decontamination fluids were non-hazardous and were disposed onsite. Surface water samples and the four sumps, numbers 1 through 4 were sampled using a pond sampler with a clean jar attached to the end and were decanted into the appropriate sample container. A new jar was used for each location. Sheens were observed on the sump water surface but were determined to be organic in nature. A bailer was used to check for thin layers of floating product that may have been present. None were detected in any of the four sumps or in the vicinity of the surface water locations.

Analyses performed on the groundwater, sump, and surface water samples were: Volatile Organic Compounds (VOC) and Extractable Petroleum Hydrocarbons (EPH) according to the MADEP method, PCBs, and arsenic, lead and cadmium. VOC, EPH, PCB and metal samples, including the appropriate QC (duplicate, matrix spike/matrix spike duplicate) samples, were analyzed by the primary laboratory, AMRO Environmental Laboratories Corporation of Merrimack, New Hampshire. The QA sample was analyzed by the QA laboratory, Severn Trent Laboratories of Colchester, Vermont. No QA or QC samples were collected for the sump samples. Analytical results were compared against the action levels for the site as established in the Record of Decision. Exceedances are tabulated on the following page.

Arsenic was detected above the cleanup goal of 50 ug/L in samples from Area 3 well 57M-96-11X and Area 2 Sump 1 at concentrations of 210 ug/L and 55 ug/L, respectively. Numerous other volatiles and metals were also detected but were below their respective cleanup goals. See Table 1 showing groundwater and surface water results and Table 2 for sump sample results.

MAY 2004			
WELL/ LOCATION	PARAMETERS	Concentration-ug/L [Cleanup Goal -ug/L]	Remarks
Area 3 57M-96-11X	• Arsenic	• 210 [50]	Decrease from November 2003
57M-DUP	• Arsenic	• 240 [50]	Duplicate of 57M-96-11X
SUMP 1	• Arsenic	• 55 [50]	First time sampled

Arsenic was detected above the cleanup goal of 50 ug/L in samples from Area 3 well 57M-96-11X and Area 2 Sump 1 at concentrations of 210 ug/L and 55 ug/L, respectively. Numerous other volatiles and metals were also detected but were below their respective cleanup goals. See Table 1 showing groundwater and surface water results and Table 2 for sump sample results.

General water quality chemistry parameters (temperature, pH, specific conductivity, dissolved oxygen (DO), oxidation reduction potential (ORP), and turbidity) were also measured at the wells and are found in Appendix C. DO and ORP results can also be found on Table 1. No trends were evident but all water quality parameters stabilized relatively quickly. Water level data was collected and will be analyzed the annual report.

A data validation was performed and minimal qualifications were made to the VOC, metals, and PCB data. See Appendix A for the data quality report.

NAE ecological staff monitored the habitat restoration sites. On June 16, 2004, the Area 2 seeded upland was observed to be well covered with grass/herbs, exceeding the cover criterion. The Area 2 wetland was observed to have a lowered water level, and a small ponded area at edge. Vegetation exceeded the 75% indigenous wetland cover criterion. Phragmites were treated with herbicide and subsequently was seen as 100% effective. Continued actions here include:

- Monitoring exotics/invasives;
- Scarifying/reseeding a small area of erosion between a rock-lined drain chute and wetland in the spring;
- Removing stakes and the silt screen before winter;
- Selective removal/herbicide action by a MA licensed applicator.

On June 23, 2004, the upland at Area 3 showed mild erosion, consisting of several dry rivulets and fine material deposited at the wetland edge. Thirteen of the red oaks that were planted on the upland slope had leafed out. Some plantings had reseeded at the upland edge of the mitigated area. There was limited intrusion into the wetland at Area 3. The wetland mitigation was seen as successful by having more than 75 % of the cover native wetland plants, which satisfies the performance standard. No exotics visible. Future actions include:

- Removing the silt screen anytime as it's no longer needed;
- Monitoring for exotics;
- Controlling the mild erosion with a spring hydro seeding.

The 2004 annual report will contain a review and discussion of the results of the May 2004 and the November 2004 sampling events, as well as the habitat restoration monitoring results. Analytical results will be compared to analytical results from the previous years and trends will be analyzed.

APPENDIX A

DATA EVALUATION REPORT

**Data Evaluation Report
For
AOC 57, DEVENS, MA
Long Term Monitoring
Groundwater and Surface Water Samples
Collected May 19, 2004
And
Sump Water Samples
Collected June 2, 2004**

Introduction

Eight groundwater samples from monitoring well 57M-03-01X, 57M-03-02X, 57M-03-04X, 57M-03-03X, 57M-03-05X, 57M-03-06X, 57M-95-03X and 57M-96-11X, and three surface water samples 57-AREA3-SW1, 57-AREA2-SW2 and 57-AREA2-SW3 at AOC 57, were collected on May 19, 2004. In addition, samples from four sumps: SUMP 1, SUMP 2, SUMP3, and SUMP 4 were collected on June 2, 2004. The samples were analyzed at AMRO Environmental Laboratories Corporation in Merrimack NH for Volatile Organic Compounds (VOCs), polychlorinated biphenyls (PCBs), total metals and Extractable Petroleum Hydrocarbons (EPH) in accordance with the methods stated in Table 1. All results were compared to the MCP Method 1 GW-1 Groundwater Standards. The arsenic values exceeded the MCP GW-1 standards for sample 57M-96-11X and its duplicate, and the sample from Sump 1. The data is reported in Analytical Results Tables 4-2a and 4-2b.

The results were evaluated for acceptability in accordance with the laboratory's defined acceptance limits, standard EPA SW846 guidance, guidelines provided in the "Interim Chemical Data Quality Management (CDQM) Policy for USACE Hazardous, Toxic and Radioactive Waste (HTRW) Projects", dated 23 November 1998, and/or EM 200-1-10 (DRAFT/Final), "Guidance for Evaluating Performance Based Chemical Data Packages".

Sample Shipment and Receipt

All sample coolers were packed with ice at the site and some of the coolers were picked up by an AMRO sample courier and delivered to the laboratory the day of sampling; others were shipped via FedEx overnight delivery to AMRO laboratory by Corps personnel on May 19, 2004 and June 2, 2004. Samples were received by the laboratory on May 19, 2004, May 20, 2004 and June 3, 2004. All samples were appropriately preserved by the procedures shown in Table 1. There were no sample shipment or receipt anomalies associated with these samples.

Holding Times

Samples were prepared and analyzed in accordance with the methods and holding time requirements cited in Table 1.

Volatile Organic Compound (VOC) Analysis

Eight groundwater samples, three surface water samples, and four sump samples were analyzed for VOCs using SW846 method 8260B. In addition, the laboratory analyzed one groundwater field duplicate (57M-DUP, a duplicate of sample 57M-96-11X), one equipment blank (57M-EB, dated 5/19/04), and two trip blanks (dated 5/19/04 and 6/2/04).

Laboratory Method Blank (MB), Trip Blank (TB), and Equipment Blank (EB) Results: All target compounds were undetected at levels above the laboratory's practical quantitation limit (PQL) in the MB, TB, and EB. Methylene chloride was detected in the EB and the 6/2/04 TB, at estimated concentrations below the PQL, therefore, no data qualification was applied. All results were acceptable.

Field Duplicate Sample Results: The results for groundwater sample 57M-96-11X and its duplicate sample 57-DUP showed less than 20% relative percent difference (RPD) for the project specific analytes detected above the PQL. Therefore, the duplicate results were acceptable.

Surrogate Results: All VOC sample surrogate recoveries were within the laboratory's stated acceptance limits.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results: One set of groundwater MS/MSD samples was analyzed for AOC 57. All MS/MSD recoveries and RPDs were within the laboratory's acceptance limits for VOC analysis except for the recoveries for five compounds. 1,4-dioxane and tertiary butanol exhibited high recoveries outside the laboratory's control limits in both the MS and MSD. No data qualification was made since these two compounds were not reported as target compounds for the project. Dichlorodifluoromethane, chloromethane and bromoform all exhibited low matrix spike recoveries. As a result, reporting limit values and positive detected values for dichlorodifluoromethane, chloromethane and bromoform were qualified as estimated (J) for all groundwater samples in the Analytical Results Table. The maximum RPD of 20% was exceeded for precision between the MS and MSD for acetone. As a result, reporting limit values and detected values for acetone were also qualified estimated (J) in the Analytical Results Table for all groundwater samples.

One set of sump water MS/MSD samples was also analyzed. Dichlorodifluoromethane exhibited low spike recoveries in both the MS and MSD samples. The reporting limit was qualified as estimated (J) for this compound in all four sump samples due to the low recoveries.

Laboratory Control Sample Results (LCS): Since no matrix spike samples were analyzed for the surface water samples, the LCS data was evaluated. Eight laboratory control spike recoveries were low in the LCS associated with the three surface water samples. The reporting limits for the affected compounds, Dichlorodifluoromethane, chloromethane, acetone, carbon disulfide, bromodichloromethane, dibromochloromethane, bromoform and 1,2-dibromo-3-chloropropane were qualified as estimated (J) due to the low recoveries.

Total Metals Analysis

Eight groundwater samples, three surface water samples and four sump samples were analyzed for arsenic, cadmium, and lead using USEPA methods 206.2, 213.2 and 239.2, respectively. The arsenic concentration for the Sump 2 sample was determined by the Method of Standard Addition. The laboratory also analyzed one groundwater field duplicate (57M-DUP, a duplicate of sample 57M-96-11X), and one equipment blank (57M-EB, dated 5/19/04).

Laboratory Preparation Blank and Equipment Blank Results: Target analytes were undetected at levels above the laboratory's PQL in the laboratory method blank samples, except for arsenic that was reported in the EB at 8.5 ug/L. As a result, arsenic values in the groundwater samples that were less than or equal to five times the concentration found in the EB were qualified as estimated (J) in the Analytical Results Table. Nondetect reporting limit values for arsenic remained unqualified. Since the EB was associated with the groundwater samples only, all other samples were unaffected.

Field Duplicate Sample Results: The results for groundwater sample 57M-96-11X and its duplicate sample 57M-DUP showed less than 20% RPD for the project specific analytes detected above the PQL. Therefore, the duplicate results were acceptable.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results: One set of groundwater MS/MSD samples was analyzed. The MS/MSD recoveries and RPDs were within the laboratory's acceptance limits for all the metals analyses. All results for the MS/MSD were acceptable.

Laboratory Control Sample Results (LCS): Since no matrix spike samples were analyzed for the surface and sump water samples, the LCS data was evaluated. The LCS recoveries for arsenic, cadmium and lead were within the laboratory's acceptable limits.

Polychlorinated Biphenyls (PCBs) Analysis

Eight groundwater samples, three surface water samples and four sump samples were analyzed for PCBs using SW-846 methods 3510/8082. In addition, the laboratory analyzed one groundwater field duplicate (57M-DUP, a duplicate of sample 57M-96-11X), and one equipment blank (57M-EB, dated 5/19/04).

Laboratory Method Blank (MB), and Equipment Blank (EB) Results: All target PCB aroclors were undetected at levels above the laboratory's PQL in the MBs and EB. All blank results were therefore acceptable.

Field Duplicate Sample Results: The results for groundwater sample 57M-96-11X and its duplicate sample 57-DUP showed comparable results in that no PCB aroclors were detected in either sample. The duplicate results were therefore acceptable.

Surrogate Results: All surrogate recoveries were within the laboratory's stated acceptance limits with the exception of DCB in sample 57-AREA3-SW-1 and TCMX in sample 57M-96-11X. Since the TCMX recovery was high and no aroclors were detected in sample 57M-96-11X, the results

were not qualified. The DCB recovery was marginally low, and since the aroclors were not detected in sample 57-AREA3-SW-1, the reporting limits were qualified as estimated (J).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results: One set of groundwater MS/MSD samples was analyzed for AOC 57. All MS/MSD recoveries and RPDs were within the laboratory's acceptance limits for PCB analysis.

Laboratory Control Sample Results (LCS): Since no matrix spike samples were analyzed for the surface and sump water samples, the LCS data was evaluated. All LCS/LCSD recoveries and RPDs were within the laboratory's acceptance limits for PCB analysis.

Extractable Petroleum Hydrocarbons (EPH)

Eight groundwater samples, three surface water samples and four sump samples were analyzed for EPH by the MADEP method for EPH analysis. In addition, the laboratory analyzed one groundwater field duplicate (57M-DUP, a duplicate of sample 57M-96-11X), and one equipment blank (57M-EB, dated 5/19/04).

Laboratory Method Blank (MB), and Equipment Blank (EB) Results: All target EPH analytes and hydrocarbon ranges were undetected at levels above the laboratory's PQL in the MB and EB. All results were acceptable.

Field Duplicate Sample Results: The results for groundwater sample 57M-96-11X and its duplicate sample 57-DUP showed comparable results in that no EPH target analytes or hydrocarbon ranges were detected in either sample. The duplicate analysis results were therefore acceptable.

Surrogate Results: All EPH sample surrogate recoveries were within the laboratory's stated acceptance limits with the following exceptions. A couple of surrogate recoveries were high in the blank and blank spike samples analyzed with the sump water samples. This did not result in data qualification since no EPH values were detected. There were low surrogate spike recoveries for 2-Bromonaphthalene in most of the groundwater samples, and in all of the surface water and sump water samples. In addition, the spike recoveries for this surrogate were low in many of the laboratory control samples. Naphthalene and substituted naphthalene compounds that should remain in the aromatic fraction of the extract tend to go into the aliphatic fraction of the extract. This most accounted for the low recovery of 2-Bromonaphthalene. The laboratory documented the loss of naphthalene itself and 2-methylnaphthalene from the aromatic fraction into the aliphatic fraction, which further supported the reason for the poor surrogate recovery. These low recoveries did not affect the sample results for the EPH target range of C₁₁-C₂₂ Aromatics for the project, since they do not behave like the naphthalene compounds. The EPH data for the project was therefore not qualified due to the poor surrogate recoveries.

Matrix Spike/Matrix Duplicate (MS/MD) Results: One set of groundwater MS/MD samples was analyzed for AOC 57. All MS recoveries of EPH target analytes were within the laboratory's acceptance limits. The sample result and matrix duplicate sample result were in agreement.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Results: Since no matrix spike samples were analyzed for the surface and sump water samples, the LCS data was evaluated. The RPD from the recovery of naphthalene in the LCS/LCSD sample was out of acceptable QC limits. This did not affect the EPH sample results for the reasons stated in the surrogate results section. All EPH results were reported without qualification.

Conclusions

Laboratory reports were reviewed for adherence to acceptable laboratory practices. Based on the data evaluation elements reviewed (including holding times, blank sample results, surrogate recoveries, MS/MSD recoveries and LCS recoveries), all data may be reported without qualification with the following exceptions:

- The reporting limit values and positive detects for the VOCs dichlorodifluoromethane, chloromethane and bromoform in the groundwater samples were qualified as estimated (J) due to low matrix spike compound recoveries. Also, the maximum RPD of 20% was exceeded for precision between the MS and MSD for acetone. As a result, reporting limit values for acetone were qualified as estimated (J) in the Analytical Results Table for the groundwater samples.
- The reporting limit for dichlorodifluoromethane was qualified as estimated in the four sump samples due to low matrix spike recoveries. The reporting limits for dichlorodifluoromethane, chloromethane, acetone, carbon disulfide, bromodichloromethane, dibromochloromethane, bromoform and 1,2-dibromo-3-chloropropane were qualified as estimated due to low LCS spike recoveries.
- Arsenic was reported for the metals EB sample above the RL. As a result the arsenic values in the groundwater samples that were less than or equal to five times the concentration found in the EB sample were qualified as estimated (J) in the Analytical Results Table.
- The reporting limits for the PCB aroclors for sample 57AREA3-SW-1 were qualified as estimated due to the low surrogate recovery in that sample. The remainder of the data was acceptable and reported without qualification.

Table 1
Sample Preparation and Analysis Methods, Containers, Holding Times, and Preservatives

Parameter	Preparation Method ¹	Analysis Method ¹	Sample Container ²	Preservative	Holding Time
VOC	5030B	8260B	3 X 40 mL vials with Teflon septa screw caps	HCl to pH less than 2 (No Headspace) 4 +/- 2°C	14 days to analysis
Metals - Arsenic Cadmium Lead	200 series	206.2/213.2/239.2 or 6010B	1-Liter HDPE	HNO ₃ to pH less than 2	180 days to analysis
PCBs	3510	8082	1-Liter Glass Amber	Ice 4 +/- 2°C	7 days to extraction 40 days to analysis
EPH	MADEP	MADEP	1-Liter Glass Amber	HCl to pH less than 2	14 days to extraction 40 days to analysis

- 1 "Methods for Chemical Analysis of Water and Wastes", Cincinnati, OH, March 1979, EPA 600/4-79-020.
 "Test Methods for Evaluating Solid Waste, Physical and Chemical Methods", U.S. EPA SW-846, 3rd Edition.
- 2 Additional sample containers/volume is required for matrix quality control samples.

Table 4-2a
Groundwater and Surface Water Analytical Results
May 19, 2004
AOC 57
Devens Massachusetts
(SHEET 1 of 3)

PARAMETERS	Well No.	57M-03-01X	57M-03-02X	57M-03-03X	57M-DUP	57M-03-04X	57M-03-05X	57M-03-06X	57M-95-03X	57M-96-11X	57-AREA 2-SW2	57-AREA 2-SW3	57-AREA 3-SW1
	GW STANDARD (1)	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
VOLATILES (8260B)	ug/L												
Dichlorodifluoromethane	NS	5UJ	5UJ	5UJ	5UJ	5UJ	5UJ	5UJ	5UJ	5UJ	5UJ	5UJ	5UJ
Chloromethane	NS	2.7J	5UJ	5UJ	5UJ	5UJ	5UJ	5UJ	5UJ	5UJ	5UJ	5UJ	5UJ
Vinyl chloride	2	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
Chloroethane	NS	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
Trichlorofluoromethane	NS	2U	2U	2J	2U	2U	2U	3.7	2U	2U	2U	2U	2U
Diethyl ether	NS	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U
Acetone	3,000	10UJ	10UJ	10UJ	4 J	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ
1,1-Dichloroethene	7	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U
Carbon disulfide	NS	2U	2U	2U	2U	2U	2U	2U	2U	2U	2UJ	2UJ	2UJ
Methylene chloride	5	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U
Methyl tert-butyl ether	70	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
trans-1,2-Dichloroethene	100	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
1,1-Dichloroethane	70	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
2-Butanone	350	10U	10U	10U	7.4 J	10U	10U	10U	10U	7.3 J	10U	10U	10U
2,2-Dichloropropane	NS	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
cis-1,2-Dichloroethene	70	0.71J	7.1	2U	1.5 J	7.3	4.3	2U	2U	1.6 J	2U	2U	2U
Chloroform	NS	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
Tetrahydrofuran	NS	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
Bromochloromethane	NS	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
1,1,1-Trichloroethane	200	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
1,1-Dichloropropene	NS	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
Carbon tetrachloride	5	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
1,2-Dichloroethane	5	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
Benzene	5	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U
Trichloroethene	5	0.75J	4.3	2U	2U	2.2	2U	2U	2U	0.52 J	2U	2U	2U
1,2-Dichloropropane	5	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
Bromodichloromethane	5	2U	2U	2U	2U	2U	2U	2U	2U	2U	2UJ	2UJ	2UJ
Dibromomethane	NS	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
4-Methyl-2-pentanone	350	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
cis-1,3-Dichloropropene	1	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U

(1) - MCP Method 1 GW-1 Groundwater Standards

U - Below laboratory reporting limit

J - Estimated concentration below laboratory reporting limit but above the MDL

Source wells: 57M-95-03X

Sentry wells: 57M-96-11X

Groundwater and Surface Water Analytical Results

May 19, 2004

AOC 57

Devens Massachusetts

(SHEET 2 of 3)

PARAMETERS	Well No.	57M-03-01X	57M-03-02X	57M-03-03X	57M-DUP	57M-03-04X	57M-03-05X	57M-03-06X	57M-95-03X	57M-96-11X	57-AREA 2-SW2	57-AREA 2-SW3	57-AREA 3-SW1
	GW STANDARD (1)	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
VOLATILES (8260B) cont'd	ug/L												
Toluene	1,000	2U	1.2 J	2U	8.9	2U	16	2U	1.6 J	8.5	2U	0.88 J	2U
trans-1,3-Dichloropropene	1	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U
1,1,2-Trichloroethane	5	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
1,2-Dibromoethane	NS	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
2-Hexanone	NS	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U
1,3-Dichloropropane	NS	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
Tetrachloroethene	5	2U	2.3	2J	2U	3.4	2U	2U	0.82 J	2U	2U	2U	2U
Dibromochloromethane	5	2U	2U	2U	2U	2U	2U	2U	2U	2U	2UJ	2UJ	2UJ
Chlorobenzene	100	2U	2U	2U	2.9	2U	0.72 J	2U	2U	2.6	2U	2U	2U
1,1,1,2-Tetrachloroethane	5	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
Ethylbenzene	700	2U	2U	2U	3.6	2U	26	2U	7.5	3.4	2U	2U	2U
m,p-Xylene	10,000	2U	2U	2U	5.3	2U	2U	2U	21	4.7	2U	2U	2U
o-Xylene	10,000	2U	2U	2U	3.1	2U	0.56 J	2U	15	2.8	2U	2U	2U
Styrene	100	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
Bromoform	5	2UJ	2UJ	2UJ	2UJ	2UJ	2UJ	2UJ	2UJ	2UJ	2UJ	2UJ	2UJ
Isopropylbenzene	NS	2U	2U	2U	1.2 J	2U	0.76 J	2U	2.6	1 J	2U	2U	2U
1,1,2,2-Tetrachloroethane	2	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
1,2,3-Trichloropropane	NS	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
Bromobenzene	NS	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
n-Propylbenzene	NS	2U	2U	2U	2.3	2U	1.5 J	2U	4	2.2	2U	2U	2U
2-Chlorotoluene	NS	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
4-Chlorotoluene	NS	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
1,3,5-Trimethylbenzene	NS	2U	2U	2U	5.2	2U	2U	2U	14	4.5	2U	2U	2U
tert-Butylbenzene	NS	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
1,2,4-Trimethylbenzene	NS	2U	2U	2U	18	2U	7.4	2U	49	17	2U	2U	2U
sec-Butylbenzene	NS	2U	2U	2U	0.7 J	2U	1.1 J	2U	1.1 J	0.59 J	2U	2U	2U
4-Isopropyltoluene	NS	2U	2U	2U	0.64 J	2U	1 J	2U	1.1 J	0.61 J	2U	2U	2U
1,3-Dichlorobenzene	600	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
1,4-Dichlorobenzene	5	2U	2U	2U	4.2	2U	5U	2U	2.2	3.8	2U	2U	2U
n-Butylbenzene	NS	2U	2U	2U	2U	2U	1 J	2U	2U	2U	2U	2U	2U
1,2-Dichlorobenzene	600	2U	2U	2U	10	0.6 J	0.89 J	2U	3.3	9.9	2U	2U	2U
1,2-Dibromo-3-chloropropane	NS	5U	5U	5U	5U	5U	5U	5U	5U	5U	5UJ	5UJ	5UJ
1,2,4-Trichlorobenzene	70	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
Hexachlorobutadiene	0.6	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
Naphthalene	20	5U	5U	5U	5.3	5U	2.6 J	5U	5.5	5.3	5U	5U	5U
1,2,3-Trichlorobenzene	NS	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U

(1) - MCP Method 1 GW-1 Groundwater Standards

U - Below laboratory reporting limit

J - Estimated concentration below laboratory reporting limit but above the MDL

Source wells: 57M-95-03X

Sentry wells: 57M-96-11X

May 10, 2004
AOC 57
Devens Massachusetts
(SHEET 3 of 3)

PARAMETERS	Well No.	57M-03-01X	57M-03-02X	57M-03-03X	57M-DUP	57M-03-04X	57M-03-05X	57M-03-06X	57M-95-03X	57M-96-11X	57-AREA 2-SW2	57-AREA 2-SW3	57-AREA 3-SW1
	GW												
	STANDARD (1)	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
PCBs (8082)	ug/L												
Aroclor 1016	0.5	0.24 U	0.24 U	0.22 U	0.23 U	0.22 U	0.22U	0.22U	0.21 U	0.22U	0.21 U	0.21 U	0.22UJ
Aroclor 1221	0.5	0.24 U	0.24 U	0.22 U	0.23 U	0.22 U	0.22U	0.22U	0.21 U	0.22U	0.21 U	0.21 U	0.22UJ
Aroclor 1232	0.5	0.24 U	0.24 U	0.22 U	0.23 U	0.22 U	0.22U	0.22U	0.21 U	0.22U	0.21 U	0.21 U	0.22UJ
Aroclor 1242	0.5	0.24 U	0.24 U	0.22 U	0.23 U	0.22 U	0.22U	0.22U	0.21 U	0.22U	0.21 U	0.21 U	0.22UJ
Aroclor 1248	0.5	0.24 U	0.24 U	0.22 U	0.23 U	0.22 U	0.22U	0.22U	0.21 U	0.22U	0.21 U	0.21 U	0.22UJ
Aroclor 1254	0.5	0.24 U	0.24 U	0.22 U	0.23 U	0.22 U	0.22U	0.22U	0.21 U	0.22U	0.21 U	0.21 U	0.22UJ
Aroclor 1260	0.5	0.24 U	0.24 U	0.22 U	0.23 U	0.22 U	0.22U	0.22U	0.21 U	0.22U	0.21 U	0.21 U	0.22UJ

Metals (206.2, 213.2, 239.2)		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Arsenic	50	5U	6.4 J	5U	240	30 J	21 J	5U	44	210	4.4 J	8.1	3.1 J
Cadmium	5	0.3 J	0.65 J	0.55 J	0.5 J	0.31 J	0.47 J	0.5 J	0.6 J	0.32 J	0.42 J	0.51 J	0.59 J
Lead	15	5U	0.88 J	5U	5U	5U	5U	5U	5U	5U	5U	5U	5U

EPH (MADEP-EPH)		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
C ₁₁ -C ₂₂ Aromatics	200	120U	120U	100U	110U	100U	110U	110U	110U	120U	110U	110U	110U

(1) - MCP Method 1 GW-1 Groundwater Standards

U - Below laboratory reporting limit

J - Estimated concentration below laboratory reporting limit but above the MDL

25 Exceeds MCP GW-1 Groundwater Standard

Table 4-2b
Sump Water Analytical Results
June 2, 2004
AOC 57
Devens Massachusetts
(SHEET 1 of 3)

PARAMETERS	Well No.	SUMP 1	SUMP 2	SUMP 3	SUMP 4
	GW STANDARD (1)	µg/L	µg/L	µg/L	µg/L
VOLATILES (8260B)	ug/L				
Dichlorodifluoromethane	NS	5UJ	5UJ	5UJ	5UJ
Chloromethane	NS	5U	5U	5U	5U
Vinyl chloride	2	2U	2U	2U	2U
Chloroethane	NS	5U	5U	5U	5U
Bromomethane	10	2U	2U	2U	2U
Trichlorofluoromethane	NS	2U	2U	2U	2U
Diethyl ether	NS	5U	5U	5U	5U
Acetone	3,000	10U	10U	10U	10U
1,1-Dichloroethene	7	1U	1U	1U	1U
Carbon disulfide	NS	2U	2U	2U	2U
Methylene chloride	5	5U	5U	5U	5U
Methyl tert-butyl ether	70	2U	2U	2U	2U
trans-1,2-Dichloroethene	100	2U	2U	2U	2U
1,1-Dichloroethane	70	2U	2U	2U	2U
2-Butanone	350	10U	10U	10U	10U
2,2-Dichloropropane	NS	2U	2U	2U	2U
cis-1,2-Dichloroethene	70	0.84 J	0.86 J	2U	2U
Chloroform	NS	2U	2U	2U	2U
Tetrahydrofuran	NS	10U	10U	10U	10U
Bromochloromethane	NS	2U	2U	2U	2U
1,1,1-Trichloroethane	200	2U	2U	2U	2U
1,1-Dichloropropene	NS	2U	2U	2U	2U
Carbon tetrachloride	5	2U	2U	2U	2U
1,2-Dichloroethane	5	2U	2U	2U	2U
Benzene	5	1U	1U	1U	1U
Trichloroethene	5	2U	2U	2U	2U
1,2-Dichloropropane	5	2U	2U	2U	2U
Bromodichloromethane	5	2U	2U	2U	2U
Dibromomethane	NS	2U	2U	2U	2U
4-Methyl-2-pentanone	350	10U	10U	10U	10U
cis-1,3-Dichloropropene	1	1U	1U	1U	1U

(1) - MCP Method 1 GW-1 Groundwater Standards

U - Below laboratory reporting limit

J - Estimated concentration below laboratory reporting limit but above the MDL

Table 4-2b
Sump Water Analytical Results
June 2, 2004
AOC 57
Devens Massachusetts
(SHEET 2 of 3)

PARAMETERS	Well No.	SUMP 1	SUMP 2	SUMP 3	SUMP 4
	GW STANDARD (1)	µg/L	µg/L	µg/L	µg/L
VOLATILES (8260B) cont'd	ug/L				
Toluene	1,000	2U	2U	2U	2U
trans-1,3-Dichloropropene	1	1U	1U	1U	1U
1,1,2-Trichloroethane	5	2U	2U	2U	2U
1,2-Dibromoethane	NS	2U	2U	2U	2U
2-Hexanone	NS	10U	10U	10U	10U
1,3-Dichloropropane	NS	2U	2U	2U	2U
Tetrachloroethene	5	0.57 J	0.58 J	2U	0.98 J
Dibromochloromethane	5	2U	2U	2U	2U
Chlorobenzene	100	2U	2U	2U	2U
1,1,1,2-Tetrachloroethane	5	2U	2U	2U	2U
Ethylbenzene	700	2U	2U	2U	2U
m,p-Xylene	10,000	2U	2U	2U	2U
o-Xylene	10,000	2U	2U	2U	2U
Styrene	100	2U	2U	2U	2U
Bromoform	5	2U	2U	2U	2U
Isopropylbenzene	NS	2U	2U	2U	2U
1,1,2,2-Tetrachloroethane	2	2U	2U	2U	2U
1,2,3-Trichloropropane	NS	2U	2U	2U	2U
Bromobenzene	NS	2U	2U	2U	2U
n-Propylbenzene	NS	2U	2U	2U	2U
2-Chlorotoluene	NS	2U	2U	2U	2U
4-Chlorotoluene	NS	2U	2U	2U	2U
1,3,5-Trimethylbenzene	NS	2U	2U	2U	2U
tert-Butylbenzene	NS	2U	2U	2U	2U
1,2,4-Trimethylbenzene	NS	2U	2U	2U	2U
sec-Butylbenzene	NS	2U	2U	2U	2U
4-Isopropyltoluene	NS	2U	2U	2U	2U
1,3-Dichlorobenzene	600	2U	2U	2U	2U
1,4-Dichlorobenzene	5	0.62 J	0.53 J	2U	2U
n-Butylbenzene	NS	2U	2U	2U	2U
1,2-Dichlorobenzene	600	2U	2U	2U	2U
1,2-Dibromo-3-chloropropane	NS	5U	5U	5U	5U
1,2,4-Trichlorobenzene	70	2U	2U	2U	2U
Hexachlorobutadiene	0.6	2U	2U	2U	2U
Naphthalene	20	5U	5U	5U	5U
1,2,3-Trichlorobenzene	NS	2U	2U	2U	2U

(1) - MCP Method 1 GW-1 Groundwater Standards

U - Below laboratory reporting limit

Camp Water Analytical Results
 June 2, 2004
 AOC 57
 Devens Massachusetts
 (SHEET 3 of 3)

PARAMETERS	Well No.	SUMP 1	SUMP 2	SUMP 3	SUMP 4
	GW STANDARD (1)	µg/L	µg/L	µg/L	µg/L
PCBs (8082)	ug/L				
Aroclor 1016	0.5	0.23 U	0.23 U	0.22U	0.23 U
Aroclor 1221	0.5	0.23 U	0.23 U	0.22U	0.23 U
Aroclor 1232	0.5	0.23 U	0.23 U	0.22U	0.23 U
Aroclor 1242	0.5	0.23 U	0.23 U	0.22U	0.23 U
Aroclor 1248	0.5	0.23 U	0.23 U	0.22U	0.23 U
Aroclor 1254	0.5	0.23 U	0.23 U	0.22U	0.23 U
Aroclor 1260	0.5	0.23 U	0.34	0.22U	0.23 U

Metals (206.2, 213.2, 239.2)		µg/L	µg/L	µg/L	µg/L
Arsenic	50	55	28	22	21
Cadmium	5	0.37 J	0.47 J	2U	0.28 J
Lead	15	1.3 J	1.1 J	1.2 J	0.8 J

EPH (MADEP-EPH)		µg/L	µg/L	µg/L	µg/L
C ₁₁ -C ₂₂ Aromatics	200	120U	120U	110U	120U

(1) - MCP Method 1 GW-1 Groundwater Standards

U - Below laboratory reporting limit

J - Estimated concentration below laboratory reporting limit but above the MDL

25	Exceeds MCP GW-1 Groundwater Standard
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APPENDIX B

CHEMICAL QUALITY ASSURANCE REPORT

**LONG TERM GROUNDWATER MONITORING AT AOC 57
DEVENS, MASSACHUSETTS
MAY 2004 SAMPLING ROUND**

CHEMICAL QUALITY ASSURANCE REPORT

PREPARED BY
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CONCORD, MASSACHUSETTS

SEPTEMBER 10, 2004

**LONG TERM GROUNDWATER MONITORING AT AOC 57
DEVENS, MASSACHUSETTS
MAY 2004 SAMPLING ROUND**

CHEMICAL QUALITY ASSURANCE REPORT

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**LONG TERM GROUNDWATER MONITORING AT AOC 57
DEVENS, MASSACHUSETTS
MAY 2004 SAMPLING ROUND**

CHEMICAL QUALITY ASSURANCE REPORT

Executive Summary

One groundwater QA sample from AOC 57 Long Term Monitoring, Devens, Massachusetts project was analyzed by the QA laboratory, resulting in a total of 77 target analyte determinations. In 20 of these determinations, one or both laboratories detected analytes.

AMRO Environmental Laboratories, Merrimack, NH, performed all primary laboratory analyses. Severn Trent Laboratories, Colchester, VT, performed QA laboratory analyses (Reference 6a and 6b). See Table 2 for analyses performed by the QA lab. See Attachment D-1 for Primary and QA laboratory comparison data.

Results from the analysis of the QA sample were compared with results from analysis of the corresponding primary sample. Agreement was expressed in terms of relative percent difference (RPD). For all analyses, values were considered to be in agreement if the RPD was less than 75. In a situation where one lab reported a detected value and the other reported a non-detect less than the reporting limit (RL), agreement was evaluated based on consistency of the quantity of the detected value with respect to the RL for that analyte from the other lab. If the detected value from one lab was higher than the other lab's RL, and the RPD was greater than 75, the comparison was considered a data discrepancy.

The primary and QA samples agreed overall in 76 (99%) of the comparisons. Primary and QA samples agreed quantitatively in 19 out of 20 (95%) of the comparisons. Refer to Table 1 for a QA split sample data comparison summary. Quantitative agreement represents only those determinations where an analyte was detected by at least one laboratory. There was one data discrepancy between the primary laboratory and the QA laboratory sample results. The RPD between the cadmium results for the primary and QA laboratories was 78%. Both cadmium concentrations were estimated values below the reporting limit, but above the contract required detection limit (CRDL). The concentrations below the reporting limit were estimated due to the higher degree of variation at the lower range of the calibration curve. This accounted for the RPD value exceeding 75%. The estimated results were valid. The data is usable for its intended purposes. DQOs for the project have been satisfied.

Analytical results were compared to the MCP GW-1 standards. The arsenic results reported by both laboratories exceeded the MCP GW-1 standard of 50 µg/L. The primary laboratory reported an arsenic concentration of 213 µg/L and the QA laboratory reported 210 µg/L of arsenic.

Table ES-1
Quality Assurance Split Sample
Data Comparison Summary
 Project: AOC 57 LTM Devens, Massachusetts

Test Parameter	Overall Agreement (1)		Quantitative Agreement (2)	
	Number	Percent	Number	Percent
VOC	66/66	100	17/17	100
EPH	1/1	100	NA	NA
PCB	7/7	100	NA	NA
Metals	2/3	67	2/3	67
Total	76/77	99	19/20	95

NOTES:

(1) Represents the number and percentage agreement of all determinations including analytes not detected by either laboratory.

(2) Represents the number and percentage agreement of only those determinations where an analyte was detected by at least one laboratory.

Table ES-2
QA Analyses Performed

Sample Description	Matrix	Sample Date	Analysis
57M-96-11X-QA	WATER	05/19/04	VOC, EPH, PCB, METALS

**LONG TERM GROUNDWATER MONITORING AT AOC 57
DEVENS, MASSACHUSETTS
MAY 2004 SAMPLING ROUND**

CHEMICAL QUALITY ASSURANCE REPORT

QA Findings

1. QA sample shipping and chain-of-custody deficiencies.

The QA laboratory, Severn Trent Laboratories, received one groundwater sample, 57M-96-11X-QA, on 5/20/04. Proper sample handling protocols were followed. There was no sample handling or custody documentation deficiency.

Copies of chain-of-custody document and sample receipt checklists are appended to this report for reference.

2. Data comparison for volatile organic compounds (VOC).

There were 66 VOC determinations. In 17 of these determinations, one or both laboratories detected target analytes. There was overall agreement in all 66 (100%) cases and quantitative agreement in 17 out of 17 (100%) of the cases. There was no data discrepancy between the primary and QA laboratory sample results. The reporting limit for the detected VOCs was higher than the estimated detections of VOCs in each case when only one laboratory detected a VOC compound. All RPDs were less than 30% for the cases when both laboratories detected VOCs.

a. Batch QC Evaluation for the Primary Laboratory.

QC for the primary laboratory was evaluated and reported in the data evaluation report.

b. Batch QC Evaluation for the QA Laboratory.

Holding times: QA samples for VOC analysis were analyzed within prescribed holding times.

Method blanks: The method blank sample showed no detection of VOCs above the laboratory's practical quantitation limit (PQL). Hexachlorobutadiene and naphthalene contamination was detected in the method blank sample associated with sample, but at estimated concentrations below the PQL. Therefore, no data qualification was applied to the well sample data.

Trip blank: The trip blank sample showed no detection of VOCs.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD): Results of the analysis of laboratory control samples were within laboratory control limits for recovery of all VOCs. All RPD values were within QC limits.

Matrix Spike/Matrix Spike Duplicate (MS/MSDs): MS/MSDs were not required for the QA lab.

Surrogate Spike Recoveries: Surrogate spike recoveries from the sample, the associated method blank sample, trip blank sample LCS and LCSD were within laboratory acceptance limits.

3. Data comparison for extractable petroleum hydrocarbons (EPH).

The C₁₁-C₂₂ aromatic hydrocarbon range was the only EPH contaminant of concern for the site. Neither laboratory detected C₁₁-C₂₂ aromatic hydrocarbons. Therefore, there was overall agreement for the one comparison (100%).

- a. Batch QC Evaluation for the Primary Laboratory.

QC for the primary laboratory was evaluated and reported in the data evaluation report.

- b. Batch QC Evaluation for the QA Laboratory.

Holding times: The QA sample for EPH analysis was analyzed within the prescribed holding time.

Method blanks: Method blank results showed no detection of project target analytes above the laboratory's reporting limit.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD): All hydrocarbon ranges and EPH analytes were recovered within laboratory acceptance limits. All LCS/LCSD RPDs were acceptable.

Matrix Spike/Matrix Spike Duplicate (MS/MSDs): Matrix spikes were not required for the QA laboratory.

Surrogate Spike Recoveries: Surrogate spike recoveries for the QA sample, the associated method blank sample, the LCS and LCSD were within laboratory acceptance limits.

4. Data comparison for polychlorinated biphenyls (PCB).

There were seven determinations for PCB aroclors. In all determinations, neither laboratory detected PCBs. There was overall agreement in all seven (100%) cases.

- a. Batch QC Evaluation for the Primary Laboratory.

QC for the primary laboratory was evaluated and reported in the data evaluation report.

- b. Batch QC Evaluation for the QA Laboratory.

Holding times: The QA sample for PCB analysis was analyzed within the prescribed holding time.

Method blanks: Method blank results showed no PCB detected above the laboratory's reporting limit.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD): PCB aroclor 1260 was recovered within laboratory acceptance limits for the LCS and LCSD. The RPD was within QC limits.

Matrix Spike/Matrix Spike Duplicate (MS/MSDs): Matrix spikes were not required for the QA laboratory.

Surrogate Spike Recoveries: Surrogate spike recoveries for the QA sample, the associated method blank and LCSs were within laboratory acceptance limits.

5. Data comparison for metals.

There was one determination each for arsenic, cadmium and lead. Both laboratories detected arsenic and cadmium in sample 57M-96-11X. There was overall agreement in two of the three (67%) cases and quantitative agreement in two out of the three cases (67%). There was one data discrepancy for cadmium. Both laboratories detected cadmium at an estimated concentration above the instrument detection limit but below the CRDL. The results were marginally outside the acceptable RPD of 75% at 78%. The concentrations below the reporting limit were estimated by the laboratory due to the higher degree of variation at the lower end of the calibration curve. This accounted for the data discrepancy. The reported results, qualified as estimated, were acceptable.

a. Batch QC Evaluation for the Primary Laboratory.

QC for the primary laboratory was evaluated and reported in the data evaluation report.

b. Batch QC Evaluation for the QA Laboratory.

Holding times: All samples were analyzed within prescribed holding times.

Method blanks: Method blank results showed no contamination above the laboratory's detection limit.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD): The LCS and LCSD results were within laboratory acceptance limits.

Matrix Spike/Matrix Spike Duplicate (MS/MSDs): Matrix spikes were not required for the QA laboratory.

6. References.

- a. Data reports for AOC 57 Long Term Monitoring, Devens, Massachusetts, May 2004, submitted by Severn Trent Laboratories, Inc., dated June 3, 2004.
- b. Data reports for AOC 57 Long Term Monitoring, Devens, Massachusetts, May 2004, submitted by AMRO Environmental Laboratories Corporation, dated July 2, 2004.
- c. EM 200-1-6, Chemical Quality Assurance for Hazardous, Toxic and Radioactive Waste (HTRW) Projects, dated 10 October 1997.

ATTACHMENT D-1
DATA COMPARISON TABLES

Groundwater Analytical Results - May 19, 2004

AOC 57

Devens Massachusetts

(SHEET 1 of 3)

PARAMETERS	Well No.	57M-96-11X-QA	57M-96-11X
(Analytical Method)	GW	µg/L	µg/L
	STANDARD (1)		
VOLATILES (8260B)	ug/L		
Dichlorodifluoromethane	NS	5.0 U	5UJ
Chloromethane	NS	5.0 U	5UJ
Vinyl chloride	2	5.0 U	2U
Chloroethane	NS	5.0 U	5U
Bromomethane	10	5.0 U	2U
Trichlorofluoromethane	NS	5.0 U	2U
Acetone	3,000	12	5U
1,1-Dichloroethene	7	5.0 U	10UJ
Carbon disulfide	NS	5.0 U	1U
Methylene chloride	5	5.0 U	5U
Methyl tert-butyl ether	70	5.0 U	2U
trans-1,2-Dichloroethene	100	5.0 U	2U
1,1-Dichloroethane	70	5.0 U	2U
2-Butanone	350	7.1	7.3 J
2,2-Dichloropropane	NS	5.0 U	2U
cis-1,2-Dichloroethene	70	1.6 J	1.6 J
Chloroform	NS	5.0 U	2U
Tetrahydrofuran	NS	50 U	10U
Bromochloromethane	NS	5.0 U	2U
1,1,1-Trichloroethane	200	5.0 U	2U
1,1-Dichloropropene	NS	5.0 U	2U
Carbon tetrachloride	5	5.0 U	2U
1,2-Dichloroethane	5	5.0 U	2U
Benzene	5	5.0 U	1U
Trichloroethene	5	5.0 U	0.52 J
1,2-Dichloropropane	5	5.0 U	2U
Bromodichloromethane	5	5.0 U	2U
Dibromomethane	NS	5.0 U	2U
4-Methyl-2-pentanone	350	5.0 U	10U
cis-1,3-Dichloropropene	1	5.0 U	1U

(1) - MCP Method 1 GW-1 Groundwater Standards

U - Below laboratory reporting limit

J - Estimated concentration below laboratory reporting limit but above the MDL

Groundwater Analytical Results - May 19, 2004
AOC 57
Devens Massachusetts
(SHEET 2 of 3)

PARAMETERS	Well No.	57M-96-11X-QA	57M-96-11X
(Analytical Method)	GW	µg/L	µg/L
STANDARD (1)			
VOLATILES (8260B) cont'd	ug/L		
Toluene	1,000	8.3	8.5
trans-1,3-Dichloropropene	1	5.0 U	1U
1,1,2-Trichloroethane	5	5.0 U	2U
1,2-Dibromoethane	NS	5.0 U	2U
2-Hexanone	NS	5.0 U	10U
1,3-Dichloropropane	NS	5.0 U	2U
Tetrachloroethene	5	5.0 U	2U
Dibromochloromethane	5	5.0 U	2U
Chlorobenzene	100	2.8 J	2.6
1,1,1,2-Tetrachloroethane	5	5.0 U	2U
Ethylbenzene	700	3.5 J	3.4
m,p-Xylene	10,000	5.2	4.7
o-Xylene	10,000	3.2 J	2.8
Styrene	100	5.0 U	2U
Bromoform	5	5.0 U	2UJ
Isopropylbenzene	NS	1.2 J	1 J
1,1,2,2-Tetrachloroethane	2	5.0 U	2U
1,2,3-Trichloropropane	NS	5.0 U	2U
Bromobenzene	NS	5.0 U	2U
n-Propylbenzene	NS	2.0 J	2.2
2-Chlorotoluene	NS	5.0 U	2U
4-Chlorotoluene	NS	5.0 U	2U
1,3,5-Trimethylbenzene	NS	5.9	4.5
tert-Butylbenzene	NS	5.0 U	2U
1,2,4-Trimethylbenzene	NS	18	17
sec-Butylbenzene	NS	5.0 U	0.59 J
4-Isopropyltoluene	NS	5.0 U	0.61 J
1,3-Dichlorobenzene	600	5.0 U	2U
1,4-Dichlorobenzene	5	3.2 J	3.8
n-Butylbenzene	NS	5.0 U	2U
1,2-Dichlorobenzene	600	9.7	9.9
1,2-Dibromo-3-chloropropane	NS	5.0 U	5U
1,2,4-Trichlorobenzene	70	5.0 U	2U
Hexachlorobutadiene			
Naphthalene	20	4.9 JB	5.3
1,2,3-Trichlorobenzene	NS	5.0 U	2U

(1) - MCP Method 1 GW-1 Groundwater Standards

U - Below laboratory reporting limit

J - Estimated concentration below laboratory reporting limit but above the MDL

B - Compound is detected in the sample and the associated method blank sample

Groundwater Analytical Results - May 19, 2004

AOC 57

Devens Massachusetts

(SHEET 3 of 3)

PARAMETERS (Analytical Method)	Well No.	57M-96-11X-QA	57M-96-11X
	GW STANDARD (1)	µg/L	µg/L
PCBs (8082)	ug/L		
Aroclor 1016	0.5	0.57 U	0.22 U
Aroclor 1221	0.5	0.57 U	0.22 U
Aroclor 1232	0.5	0.57 U	0.22 U
Aroclor 1242	0.5	0.57 U	0.22 U
Aroclor 1248	0.5	0.57 U	0.22 U
Aroclor 1254	0.5	0.57 U	0.22 U
Aroclor 1260	0.5	0.57 U	0.22 U
Metals (206.2, 213.2, 239.2) - Primary Lab			
Select Metals (SW846 6010B) - QA Lab			
Arsenic	50	213	210
Cadmium	5	0.73 B	0.32 J
Lead	15	4.5	5 U
EPH (MADEP-EPH)			
C ₁₁ -C ₂₂ Aromatics	200	180U	120 U

(1) - MCP Method 1 GW-1 Groundwater Standards

U - Below laboratory reporting limit

J - Estimated concentration below laboratory reporting limit but above the MDL

B - Compound is detected in the sample and the associated method blank sample

Exceeds MCP GW-1 Groundwater Standard

ATTACHMENT D-2
CUSTODY DOCUMENTATION

Project No.: _____		Project Name: <u>DEVENS - AOC 57</u>			Project Manager: <u>Paul Young</u>		Samplers (Signature): <u>Tack Keenan</u> <u>Patrick Blumeris</u>		AMRO Project No.: <u>0405140</u>								
		Project State: <u>MA</u>															
Sample ID	Date/Time Sampled	Matrix A= Air S= Soil GW= Ground W. WW= Waste W. DW= Drinking W. O= Oil Other= Specify	Total # of Cont. & Size 10mL 10A Plastic 1L Amber	Comp	Grab	Analysis Required										Remarks	
						VOCs	metals As, Pb, Cd	EPH	PCB								
57M-03-03X	/0940	GW	3 1 4		X	3	1	2	2								
57M-03-01X	/0930	GW	3 1 4		X	3	1	2	2								
57M-03-01X-MS	/0930	GW	3 1 4		X	3	1	2	2								
57M-03-01X-MSD	/0930	GW	3 1 4		X	3	1	2	2								
57M-03-06X	/1045	GW	3 1 4		X	3	1	2	2								
57M-03-04X	/1210	GW	3 1 4		X	3	1	2	2								
57M-03-02X	/1220	GW	3 1 4		X	3	1	2	2								
57-Area 2-SW2	/1155	SW	3 1 4		X	3	1	2	2								
57-Area 2-SW3	/1205	SW	3 1 4		X	3	1	2	2								
57M-03-05X	/1330	GW	3 1 4		X	3	1	2	2								
Preservative: CI-HCl, MeOH, N-HNO3, S-H2SO4, Na-NaOH, O- Other						CL	N	CL	-								
Container Type: P- Plastic, G- Glass, V- Vial, T- Teflon, O- Other						G	P	G	G								
Send Results To: <u>DAVID LUBIANEZ</u>		FAX No.: <u>978-319-8663</u>		Seal Intact?		P.O. No:		GW-1* _____ GW-2 _____ GW-3 _____									
U.S. ARMY CORPS OF ENGINEERS				Yes No N/A				MCP Level Needed: _____									
<u>696 VIRGINIA ROAD</u>				Results Needed By:				*= May require additional cost									
<u>CONCORD, MA 01742</u>																	
Relinquished By		Date/ Time		Received By		PRIORITY TURNAROUND TIME AUTHORIZATION Before submitting samples for expedited TAT, you must have requested in advance and received a coded AUTHORIZATION NUMBER . Samples arriving after 12:00 noon will be tracked and billed as received on the following day. AUTHORIZATION No. _____ BY: _____											
<u>Kathleen Miller</u>		<u>5-19-04/1620</u>		<u>J. Buonomano</u>													
<u>J. Buonomano</u>		<u>5/19/04 1725</u>		<u>C. Coarley</u>													
Please print clearly, legibly and completely. Samples can not be logged in and the turnaround time clock will not start until any ambiguities are resolved.				NOTES: Preservatives, Special reporting limits, Known Contamination, etc;						AMRO policy requires notification in writing to the laboratory in cases where the samples were collected from highly contaminated sites.							
				<u>SW = Surface Water</u>													
White: Lab Copy		Yellow: Accompanies Report		Pink: Client Copy		SHEET <u>1</u> OF <u>2</u>											

Project No.: _____		Project Name: <u>DEVENS - AOC 57</u>		Project Manager: <u>Paul Young</u>		Samplers (Signature): <u>Jack Keenan</u> <u>Patrick Blumeris</u>		AMRO Project No.: <u>0405140</u>										
Project State:																		
Sample ID	Date/Time Sampled	Matrix A= Air S= Soil GW= Ground W. WW= Waste W. DW= Drinking W. O= Oil Other= Specify	Total # of Cont. & Size <u>40mL Plastic</u> <u>1L Amber</u>	Comp	Grab	Analysis Required												Remarks
						VOCs	Metals As, Pb, Cd	EPH	PCB									
57m-96-11X	1/1530	GW			X	3	1	2	2								km Shipped 5-19-04	
57m-95-03X	1/1515	GW	3 1 4		X	3	1	2	2								evening after	
57-Arc103-SW1	1/1440	SW	3 1 4		X	3	1	2	2								Amro pick-up @ 1603	
57M DWP	1	GW			X	3	1	2	2								km Shipped 5-19-04	
57M EB	1/1615	W			X	3	1	2	2								km	
TRIP BLANK		W			X	2	km										km	
km						CL		N	CL	-							43/5 Sample Coolers 1 cooler w/ extra, unused bottles.	
						G	P	G	G									
Preservative: <u>CL-HCl, MeOH, N-HNO3, S-H2SO4, Na-NaOH, O- Other</u>																		
Container Type: <u>P- Plastic, G-Glass, V-Vial, T- Teflon, O-Other</u>																		
Send Results To: <u>DAVID LUBIANEZ</u>		FAX No.: <u>978-318-8663</u>		Seal Intact?		P.O. No:		GW-1* _____		GW-2 _____		GW-3 _____						
<u>U.S. ARMY CORPS OF ENGINEERS</u>				Yes No N/A														
<u>696 VIRGINIA ROAD</u>																		
<u>CONCORD, MA 01742</u>				Results Needed By:														
Relinquished By		Date/ Time		Received By														
<u>Katherine Miller</u>		<u>5-19-04/1620</u>		<u>J Buonomo</u>														
<u>J Buonomo</u>		<u>5/19/04/1725</u>		<u>C Clearley</u>														
Please print clearly, legibly and completely. Samples can not be logged in and the turnaround time clock will not start until any ambiguities are resolved.				NOTES: Preservatives, Special reporting limits, Known Contamination, etc;						AMRO policy requires notification in writing to the laboratory in cases where the samples were collected from highly contaminated sites.								
White: Lab Copy		Yellow: Accompanies Report		Pink: Client Copy		SHEET <u>2</u>		OF <u>2</u>										

Project No.: _____		Project Name: <u>DEVENS - AOC 57</u>		Project Manager: <u>Paul Young</u>		Samplers (Signature): <u>Patrick Blumeris</u> <u>Jack Keenan</u>		AMRO Project No.: <u>0405140</u>										
Project State: <u>MA</u>																		
Sample ID	Date/Time Sampled	Matrix A= Air S= Soil GW= Ground W. WW= Waste W. DW= Drinking W. O= Oil Other= Specify	Total # of Cont. & Size <u>40mils VOA</u> <u>Plastic</u> <u>1L Amber</u>	Comp	Grab	Analysis Required										Remarks		
	<u>Amay 2004</u>					<u>VOCs</u>	<u>metals</u>	<u>As, Pb, Cd</u>	<u>EPH</u>	<u>PCB</u>								
<u>57m-96-11X</u>	<u>1/1530</u>	<u>GW</u>	<u>3</u> <u>4</u>		<u>X</u>	<u>3</u>	<u>1</u>	<u>2</u>	<u>2</u>									
<u>57m-DUP</u>	<u>1/1530</u>	<u>GW</u>	<u>3</u> <u>4</u>		<u>X</u>	<u>3</u>	<u>1</u>	<u>2</u>	<u>2</u>									<u>Dup taken @</u>
<u>57m-EB</u>	<u>1/1615</u>	<u>W</u>	<u>3</u> <u>4</u>		<u>X</u>	<u>3</u>	<u>1</u>	<u>2</u>	<u>2</u>									<u>57m-96-11X</u>
<u>TRIP BLANK</u>	<u>1/-</u>	<u>W</u>	<u>2</u>		<u>X</u>	<u>2</u>	<u>-</u>	<u>-</u>	<u>-</u>									
<u>Paul Young</u>																		
Preservative: <u>Cl-HCl, MeOH, N-HNO3, S-H2SO4, Na-NaOH, O- Other</u>																		
Container Type: <u>P- Plastic, G-Glass, V-Vial, T- Teflon, O-Other</u>																		
Send Results To: <u>David Lubianez</u>		FAX No.: <u>978-318-8663</u>		Seal Intact? <u>Yes</u> <u>No</u> <u>N/A</u>		P.O. No: _____		GW-1* _____		GW-2 _____		GW-3 _____						
<u>U.S. Army Corps of Engineers</u>																		
<u>696 Virginia Rd</u>																		
<u>Concord, MA 01742</u>																		
Relinquished By <u>Paul Young</u>		Date/ Time <u>5-19-04/1900</u>		Received By <u>FEDEX AIRBILL # 837687612431</u>		PRIORITY TURNAROUND TIME AUTHORIZATION Before submitting samples for expedited TAT, you must have requested in advance and received a coded AUTHORIZATION NUMBER . Samples arriving after 12:00 noon will be tracked and billed as received on the following day. AUTHORIZATION No. _____ BY: _____												
<u>FED EX</u>		<u>0925</u>		<u>Q. Coarley</u>														
		<u>5-20-04</u>																
Please print clearly, legibly and completely. Samples can not be logged in and the turnaround time clock will not start until any ambiguities are resolved.				NOTES: Preservatives, Special reporting limits, Known Contamination, etc; <u>VOA'S UNDER CHARGE OF CUSTODY # 43698 + 43689 were picked up, shipped via Fed Exp along with this chain of custody. CAMMIE FROM AMRO NOTIFIED on 5/19/04</u>						AMRO policy requires notification in writing to the laboratory in cases where the samples were collected from highly contaminated sites.								
White: Lab Copy		Yellow: Accompanies Report		Pink: Client Copy		SHEET		OF										

SAMPLE RECEIPT CHECKLIST

Client: USACE
Project Name: Decontamination
Ship via: (circle one) Fed Ex., NPS, AMRO Courier,
and Del., Other Courier, Other:

AMRO ID: 0405140
Date Rec.: 5-19-04 / 5/20/04
Date Due: 5-26-04

Items to be Checked Upon Receipt

Army Samples received in individual plastic bags?

Custody Seals present?

Custody Seals Intact?

Air Bill included in folder if received?

Is COC included with samples?

Is COC signed and dated by client?

Laboratory receipt temperature.

Samples rec. with ice ice packs neither

TEMP = 20 + 50

Were samples received the same day they were sampled?

Is client temperature $4^{\circ}\text{C} \pm 2^{\circ}\text{C}$?

If no obtain authorization from the client for the analyses.

Client authorization from: Date: Obtained by:

Is the COC filled out correctly and completely?

Does the info on the COC match the samples?

Were samples rec. within holding time?

Were all samples properly labeled?

Were all samples properly preserved?

Were proper sample containers used?

Were all samples received intact? (none broken or leaking)

Were VOA vials rec. with no air bubbles?

Were the sample volumes sufficient for requested analysis?

Were all samples received?

VPH and VOA Soils only:

Sampling Method VPH (circle one): M=Methanol, E=EnCore (air-tight container)

Sampling Method VOA (circle one): M=Methanol, SB=Sodium Bisulfate, E=EnCore, B=Bulk

If M or SB:

Does preservative cover the soil?

If NO then client must be faxed.

Does preservation level come close to the fill line on the vial?

If NO then client must be faxed.

Were vials provided by AMRO?

If NO then weights MUST be obtained from client

Was dry weight aliquot provided?

If NO then fax client and inform the VOA lab ASAP.

Subcontracted Samples:

What samples sent:

Where sent:

Date:

Analysis:

TAT:

Information entered into:

Internal Tracking Log?

Dry Weight Log?

Client Log?

Composite Log?

Filtration Log?

Received By: EC

Date: 5/19/04 / 5/20/04 Logged in By: 36

Prepared By: 36

Date: 5/20/04

Checked By: M6

Date: 5/20/04

Date: 5-21-04

111 Herrick Street
Merrimack, NH 03054
(603) 424-2022

Please Circle if:

ample= Soil

sample= Waste

AMRO ID: 0405140

Sample ID	Analysis	Volume Sample	Preserv. Listed	Initial pH	Acceptable? Y or N	List Preserv. Added by AMRO	Solution ID # of Preserv.	Volume Preservative Added	Final adjusted pH
01A	VOC	3x40ml V	HCl	-	Y				
02A		9x40ml V		-					
3A → 13A		3x40ml V		-					
14A	↓	2x40ml V	↓	-	↓				
01B	Metals	1x500ml P	HNO ₃	<2	Y				
02B		3x500ml P		<2					
3B → 13B	↓	1x500ml P	↓	<2	↓				
01E	EPH	2x1LGA	HCl	<2	Y				
02E		6x1LGA		<2					
3E → 13E	↓	2x1LGA	↓	<2	↓				
01D	PCB	2x1LGA	N/A	5	Y				
02D		1x1LGA		6					
03D		2x1LGA		5					
4D → 10D				6					
D, 12D				7					
13D	↓	↓	↓	5	↓				

Checked By: KM/cc

Date: 5/20/04

pH adjusted By:

Date:

Report to: Company: <u>U.S. ARMY CORPS OF ENGINEERS</u> Address: <u>646 VIRGINIA ROAD</u> <u>CONCORD, MA 01742</u> Contact: <u>DAVID LUBIANER</u> Phone: <u>978-318-8311</u> Fax: <u>978-318-8663</u> Contract/ Quote: _____				Invoice to: Company: <u>SAME</u> Address: _____ Contact: _____ Phone: _____ Fax: _____				ANALYSIS REQUESTED <div style="border: 1px solid black; padding: 5px; transform: rotate(-90deg); transform-origin: center;"> VOCs METALS - As, Pb, Cd GPH PCB </div>										Lab Use Only Due Date: _____ Temp. of coolers when received (C°): <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> </table> Custody Seal N / Y Intact N / Y Screened For Radioactivity <input type="checkbox"/>					1	2	3	4	5																																																								
1	2	3	4	5																																																																															
Sampler's Name _____				Sampler's Signature <u>JACK KEENAN</u>																																																																															
Proj. No. _____		Project Name <u>DEVENS - AOC 57</u>						No/Type of Containers ² _____																																																																											
Matrix ¹	Date	Time	C	O	M	P	G	Identifying Marks of Sample(s)	VOA	A/G 1 Lt.	250 ml	P/O													Lab/Sample ID (Lab Use Only)																																																										
1W	5/19/04	1530					X	57M-96-11X-QA	X	X	X	-	3	1	2	2																																																																			
W	5/19/04	-					X	TRIP BLANK	X	-	-	-	2	-	-	-														Bubble in 1 VOA vial.																																																					
Relinquished by: (Signature) <u>Paul Young</u>								Date <u>5/19/04</u>		Time <u>1900</u>		Received by: (Signature) <u>FED. EXP. AIRBILL #846551970310</u>								Date <u>5/20/04</u>		Time <u>0915</u>		Remarks <u>1 COOLER SHIPPED</u> Client's delivery of samples constitutes acceptance of Severn Trent Laboratories terms and conditions contained in the Price Schedule.																																																											
Relinquished by: (Signature) _____								Date _____		Time _____		Received by: (Signature) <u>Chris Paulsen</u>								Date _____		Time _____																																																													
Relinquished by: (Signature) _____								Date _____		Time _____		Received by: (Signature) _____								Date _____		Time _____																																																													
<table style="width:100%; font-size: small;"> <tr> <td>¹Matrix</td> <td>WW - Wastewater</td> <td>W - Water</td> <td>S - Soil</td> <td>L - Liquid</td> <td>A - Air bag</td> <td>C - Charcoal Tube</td> <td>SL - Sludge</td> <td>O - Oil</td> <td colspan="19"></td> </tr> <tr> <td>²Container</td> <td>VOA - 40 ml vial</td> <td>A/G - Amber / Or Glass 1 Liter</td> <td>250 ml - Glass wide mouth</td> <td>P/O - Plastic or other</td> <td colspan="23"></td> </tr> </table>																												¹ Matrix	WW - Wastewater	W - Water	S - Soil	L - Liquid	A - Air bag	C - Charcoal Tube	SL - Sludge	O - Oil																				² Container	VOA - 40 ml vial	A/G - Amber / Or Glass 1 Liter	250 ml - Glass wide mouth	P/O - Plastic or other																							
¹ Matrix	WW - Wastewater	W - Water	S - Soil	L - Liquid	A - Air bag	C - Charcoal Tube	SL - Sludge	O - Oil																																																																											
² Container	VOA - 40 ml vial	A/G - Amber / Or Glass 1 Liter	250 ml - Glass wide mouth	P/O - Plastic or other																																																																															

Date: 5-20-04 Sample Cust.: efp Client Code: Deform SDG: 100284 ETR: 100284

Additional Preservation By: _____ Date: _____ Preservative Lot #: _____

**STL Burlington
COOLER RECEIPT CHECKLIST**

Date Received: 5/20/04

Sample Custodian: ejf

Time Received: 0915

ETR/SDG: 100284/100284

RADIATION SCREEN: <0.05 MR/HR

If no, stop work and alert the Supervisor and the PM.

☒ YES

☐ NO

CUSTODY SEALS PRESENT:

☒ YES

☐ NO

If yes, were the custody seals signed?

☒ YES

☐ NO

If yes, are custody seal numbers present?

☐ YES

☒ NO

List custody seal numbers: _____

TEMPERATURE CHECK: 4 (°C)

Acceptance Criteria (0-6°C) except air samples, which should be shipped at ambient temperature and/or biota/tissue samples, which may be frozen on receipt. The thermal preservation of samples that are hand delivered immediately following collection is considered acceptable if there is evidence that the chilling process has begun.

Thermal Preservation Type:

☒ ICE

☐ ICE PACK

☐ NONE

CONDITION OF SAMPLE CONTAINERS:

☒ INTACT

☐ BROKEN

If broken, list the client ID for each broken container:

Were any samples received with a short hold time* remaining?

* <7 Days

WET CHEMISTRY

☐ YES

☒ NO

METALS

☐ YES

☒ NO

ORGANIC EXTRACTABLES

☒ YES

☐ NO

VOLATILE (received unpreserved)

☐ YES

☒ NO

If yes, expedite sample log in procedure and alert the appropriate Department Manager.

Project No.:		Project Name: DEVELS - AOC S7	Project Manager: Paul Young		Samplers (Signature): Paul Young <i>[Signature]</i>	AMRO Project No.: 0406018														
		Project State: MA																		
Sample ID	Date/Time Sampled	Matrix A= Air S= Soil GW= Ground W. WW= Waste W. DW= Drinking W. O= Oil Other- Specify	Total # of Cont. & Size 40ml Poly Amber			Comp	Grab	Analysis Required										Remarks		
								VOC	METALS As, Pb, Cd	EPH	PCB									
Sump 1	6/2/04 1350	SW	3	1	4	X		3	1	2	2									
Sump 2	6/2/04 1405	SW	3	1	4	X		3	1	2	2									
Sump 3	6/2/04 1420	SW	3	1	4	X		3	1	2	2									
Sump 4	6/2/04 1435	SW	3	1	4	X		3	1	2	2									
TRIP BLANK	6/2/04 -	W	1	-	-	X		1	-	-	-							AIR BUBBLE		
<div style="text-align: center;">Paul Young</div>																				
Preservative: Cl-HCl, MeOH, N-HNO3, S-H2SO4, Na-NaOH, O- Other								CL	N	CL	-									
Container Type: P- Plastic, G-Glass, V-Vial, T-Teflon, O-Other								G	P	G	G									
Send Results To: DAVID LUBIANER U.S. ARMY CORPS OF ENGINEERS 696 VIRGINIA ROAD CONCORD, MA 01742		FAX NO.: 978-318-8663		Seal Intact? Yes No N/A		P.O. NO.:		GW-1* _____ GW-2 _____ GW-3 _____												
				Results Needed By:				*= May require additional cost												
Relinquished By <div style="font-size: large;"><i>Paul Young</i></div> FED EX		Date/ Time 6/2/04 1700 0925 6-3-04		Received By FEDERAL EXPRESS AIRBILL # 837687612420: <i>C Cravley</i>		PRIORITY TURNAROUND TIME AUTHORIZATION Before submitting samples for expedited TAT, you must have requested in advance and received a coded AUTHORIZATION NUMBER. Samples arriving after 12:00 noon will be tracked and billed as received on the following day.														
						AUTHORIZATION No. _____ BY: _____														
Please print clearly, legibly and completely. Samples can not be logged in and the turnaround time clock will not start until any ambiguities are resolved.				NOTES: Preservatives, Special reporting limits, Known Contamination, etc; SW = SURFACE WATER 2 COOLERS SHIPPED				AMRO policy requires notification in writing to the laboratory in cases where the samples were collected from highly contaminated sites.												
White: Lab Copy		Yellow: Accompanies Report		Pink: Client Copy		SHEET /		OF /												

AMRO ID: 04010018
Date Rec.: 10-3-04
Date Due: 6-10-04

Date: 6-3-04

qc/qcmemos/forms/sampleres Rev 12 06/00

111 Herrick Street
Merrimack, NH 03054
(603) 424-2022

Please Circle if:

Sample= Soil

Sample= Waste

AMRO ID: 0406018

[illegible]

Checked By: SC

Date: 6-3-04 pH adjusted By:

Date:

APPENDIX C

GROUNDWATER FIELD ANALYSIS FORMS

PUMP – Grundfos Rediflow II

PUMP – Grundfos Rediflow II

SAMPLED BY: PR SIGNATURE: P. Blum
RECORDED BY: PR SIGNATURE: P. Blum

SAMPLE METHOD: EPA LOW STRESS METHOD

PCBs: 2 x 1 L amber, ice

EPH: 2 x 1 L glass amber, HCl
pH<2

NOTES: +/- 3% +/- 3% +/- 0.1 unit +/- 10 mV +/- 10% +/- 10%

SAMPLE TAKEN AT: 0940 hrs

YSI #: 99K0055 AB

TURBIDITY #: 39576

PUMP – Grundfos Rediflow II

DEPTH SAMPLED: 9'
DATE: 5/19/04 TIME: 1111 Sample time = 1210 hrs.
SAMPLED BY: PB SIGNATURE: P.B. [Signature]
RECORDED BY: PB SIGNATURE: P.B. [Signature]

SAMPLE METHOD: EPA LOW STRESS METHOD

METALS (As, Pb, Cd): 1 x 500ml
poly; HNO₃ pH<2

EPH: 2 x 1 L glass amber, HCl
pH<2

[illegible]

SAMPLE TAKEN AT: 1210

±1-10%

PUMP – Grundfos Rediflow II

RECORDED BY: PR SIGNATURE: R. Blum.

SAMPLE METHOD: EPA LOW STRESS METHOD

EPH: 2 x 1 L glass amber, HCl
pH<2

NOTES: +/- 3% +/- 3% +/- 0.1 unit +/- 10 mV +/-10% +/-10%
SAMPLE TAKEN AT: 1330 hrs

PUMP – Grundfos Rediflow II

SAMPLED BY: PB SIGNATURE: P. Bhunia
RECORDED BY: PB SIGNATURE: P. Bhunia

SAMPLE METHOD: EPA LOW STRESS METHOD

METALS (As, Pb, Cd): 1 x 500ml
poly; HNO₃ pH<2

EPH: 2 x 1 L glass amber, HCl
pH<2

[illegible]

SAMPLE TAKEN AT: 1045 hrs

$\pm 10\%$

PUMP – Grundfos Rediflow II

TOP OF PVC ELEV = TOP OF METAL AFTER THE CAP IS OPENED.
THIS IS 1.4 FT ABOVE GROUND LEVEL. P.B.

GWM well #: 57M-95-03X
 SCREENED INTERVAL DEPTH: (9'-19' From TPVC)
 H₂O LEVEL: PRE-PUMP INSERTION 10.72'
 POST-PUMP INSERTION 10.68'
 DEPTH SAMPLED: 16'
 DATE: 5/19/04 TIME: 4:20 SAMPLE TIME 1515
 SAMPLED BY: PB SIGNATURE: P.B. [Signature]
 RECORDED BY: PB SIGNATURE: P.B. [Signature]

US Army Corps of Engineers
Groundwater Sampling Log Sheet

Project Name: Devens Area of Concern 57

SAMPLE METHOD: EPA LOW STRESS METHOD

VOCs: 3 x 40 ml vial; HCl pH<2

PCBs: 2 x 1 L amber, ice

METALS (As, Pb, Cd): 1 x 500ml
poly; HNO₃ pH<2

EPH: 2 x 1 L glass amber, HCl
pH<2

[illegible]

NOTES: SEE 1530 NOTE ABOVE.
SAMPLE TAKEN AT: 1515 HRS

 $\pm 3\%$

+/- 3%

 ± 0.1 unit $\pm 10 \text{ mV}$

+/-10%

$\pm 10\%$

YSI #: 99K0055 AB

TURBIDITY #: 39576 PUMP - Grundfos Rediflow II

SAMPLED BY: JK SIGNATURE: [Signature]
RECORDED BY: JK SIGNATURE: [Signature]

Project Name: Devens Area of Concern 57

VOCs: 3 x 40 ml vial; HCl pH<2

PCBs: 2 x 1 L amber, ice

METALS (As, Pb, Cd): 1 x 500ml
poly; HNO₃ pH<2

EPH: 2 x 1 L glass amber, HCl
pH<2

[illegible]

$\pm 3\%$

+/- 3%

+/- 0.1 unit

$\pm 10 \text{ mV}$

+/-10%

+/-10%

SAMPLE TAKEN AT: 1530

Flushed out initial slug of suspended sediments resulting in initial water level drop.

YSI#: 02A05-27 AD

TURBIDITY #: 39575

PUMP – Grundfos Rediflow II

Pump had to be turned up, and eventually back-flushed, during sampling in order to maintain flow

APPENDIX D

ELECTRONIC LABORATORY DATA

Analytical results for the May 2004 Sampling Event are summarized in Tables 1 and 2, and compared to the Massachusetts Contingency Plan Reportable Concentration (RCGW-1) values. The data for the May 2004 sampling event are available in electronic format upon request to the US Army Corps of Engineers:

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