UST 94019 ATEC

Technical Report Underground Storage Tank Closure UST Nos. 0035 - 0037 Building Nos. 2452, 2458, 2461 respectively Fort Devens, Massachusetts

ATEC File: 37.07.91.00451 Contract No. DAK31-91-D-00015

Prepared for:

United States Army
 Directorate of Contracting
 Building 227
 Fort Devens, Massachusetts

Attn: Mr. James Dijack, Contracting Officer

January 14, 1994

January 14, 1994

Mr. Steven Dijack, Contracting Officer United States Army Directorate of Contracting Building 227 Fort Devens, Massachusetts 01433-5340

RE: Technical Report Underground Storage Tank Closure UST Nos. 0035 - 0037 Fort Devens, Massachusetts ATEC File: 37.07.91.00451

Mr. Dijack:

Attached is a Technical Report by ATEC Associates, Inc. (ATEC), detailing the closure of three underground storage tanks (USTs) referenced as UST Nos. 0035 - 0037, located at Fort Devens, Massachusetts (the site). The Technical Report covers work conducted under Contract No. DAKF31-91-D-00015 as part of Removal of Underground Storage Tanks in the New England Area, US Army Project No. EQ-19027-9P.

ATEC appreciates the opportunity to be of service in this matter. If you have any questions or comments, please do not hesitate to contact our office.

Sincerely,

ATEC Associates, Inc.

ames M. Regan

Project Engineer 🗸

Ronald Lawson Assistant Vice President

James B. O'Brien Division Manager

UNDERGROUND STORAGE TANK INDEX (Volume 8)

UST No. SIZE (gal) PRODUCT

LOCATION

0035	1,000	No. 2 Fuel Oil	Building 2452, FortDevens,MA
0036	1,000	No. 2 Fuel Oil	Building 2458, Fort Devens, MA
0037	1,000	No. 2 Fuel Oil	Building 2461, Fort Devens, MA

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TECHNICAL REPORT UST Nos. 0035 - 0037

United States Army Fort Devens, Massachusetts ATEC Project No. 37.07.91.00451

1.0 INTRODUCTION

This Technical Report details the removal of three underground storage tanks (USTs) referenced as UST Nos. 0035 - 0037 at Building 2452, Building 2458 and Building 2461, respectively, located at Fort Devens, Massachusetts. The Technical report covers work conducted under Contract No. DAKF31-91-D-00015 as part of "Removal of Underground Storage Tanks in the New England Area", US Army Project No. EQ-19027-9P.

The basic Project Work Scope of Contract No. DAKF31-91-D-00015 included:

- Excavation and removal of USTs at various buildings located at Fort Devens, Massachusetts and at several Army Reserve centers located throughout New England.
- Remedial excavation and disposal of contaminated soil, if required.
- Hydrogeological services to include installation of monitoring wells, sampling and analysis of soil/groundwater, and determination of groundwater flow direction, if required.
- Backfilling and surface restoration of excavations.
- Preparation of a Technical Report, to include assimilation of information gathered, major findings and conclusions.

2.0 UST No. 0035

2.1 POST REMOVAL REPORT

2.1.1 Introduction

This Post-Removal Report details the results of the closure of one 1,000-gallon, single wall, steel, Underground Storage Tank (UST) referenced as UST No. 0035, located at property known as Building 2452, Fort Devens, Massachusetts (the site). The purpose of the closure was to excavate the UST and evaluate the potential for the presence of oil and hazardous material at the site. The closure of this UST was conducted on January 15, 1992.

The basic Project Work Scope included:

- Procurement/administration of all federal, state and local permits, manifests, regulations, etc., associated with UST system closure.
- Excavating, venting, cleaning, transporting, and disposing of one 1,000-gallon waste oil UST by appropriately licensed contractors/facilities.
- Disposal of residual UST materials at a licensed facility.
- Field screening and analysis of soil from the excavation by Photoionization Detector (PID) and field analyzed with a portable Non-Dispersive Infrared (NDIR) Analyzer, to identify a potential release of oil and hazardous materials from the UST, if any.
- Laboratory Analysis of soil sampled from the UST excavation by a USEPA certified laboratory for Total Petroleum Hydrocarbons.
- Preparation of a Post-Removal Report, to include assimilation of information gathered, major findings and conclusions.

2.1.2 Subsurface Storage Tank Excavation and Removal

Prior to removal, UST No. 0035 was estimated to contain 39 gallons of No. 2 fuel oil and residual materials. Approximately 14 gallons of fuel oil were removed on January 7, 1992, and transported to a licensed treatment storage disposal facility (T.S.D.F.) (Beede Waste Oil Corporation from Plastow, New Hampshire).

On January 15, 1992, one 1,000-gallon, subsurface, No. 2 fuel oil, steel storage tank was excavated and removed from the site. The UST was located adjacent to the west side of the Building 2452 (see Figure 2.1, UST Location Plan). Site topography is relatively level.

Soils in the excavation consisted primarily of medium brown, fine sand with some fine to coarse gravel, cobbles, and boulders. The tank was covered by approximately 1.5 feet of soil. The bottom of the excavation was approximately 5.5 feet below grade. Groundwater was not encountered. Excavated soils required to free the tank were visibly contaminated. Soil within an overfill spill containment area appeared more contaminated than other excavated soils and were segregated. Based on visual observation of the limits of the excavation, soils in the vicinity of the southeast corner of the excavation appeared to be the most heavily contaminated. During removal operations, a petroleum odor from the excavation was evident.

Once the top of the tank was exposed, the associated piping was drained and tank connections were removed. Tank openings were capped and the tank was removed from the excavation. Upon excavation and removal, the tank was observed to be in good condition with no holes, perforations, or severe corrosion.

Following venting of the tank, an access way was cut in the end of the tank to allow entry for cleaning. The tank was then entered and vacuumed/wiped clean of any residual materials. Approximately 25 gallons of No. 2 fuel oil and residual materials were



removed and drummed on January 15, 1992. Drummed material was transported to Beede Waste Oil on February 27, 1992. See Section 2.10 for copies of the applicable Hazardous Waste Manifests.

The scrap tank was removed from the site on January 15, 1992 and transported to the Contractor's yard, located on Lake George Street, Fort Devens for temporary storage. The tank was disposed at Tombarello & Sons from Lawrence, Massachusetts, a licensed Massachusetts tank yard, on January 28, 1992. A copy of the disposal receipt is included in Section 2.11, Permits and Certifications.

2.1.3 Sampling and Analysis Plan

Ten soil samples were obtained from the excavation for field screening with a Photoionization Detector (PID) and field analyzed with a Non-Dispersive Infrared (NDIR) Analyzer. The PID field screening for Total Organic Vapors (TOVs) was conducted with an HNu photoionizer utilizing the jar headspace screening procedure outlined in the Hazardous Materials Containment Plan. The NDIR field screening for Total Petroleum Hydrocarbons (TPH) was conducted with a Horiba OCMA 220, utilizing the procedures outlined in the Hazardous Materials Containment Plan.

Eight samples (SS-1 to SS-8) were obtained from the excavation walls at depths of approximately 2.5 to 3.5 feet below grade. Two of the samples (SS-9 and SS-10) were obtained from the bottom of the excavation at a depth of approximately 5.5 feet below grade. One composite soil sample (Stock-1) was obtained from stockpiled soils for PID and NDIR field screening. One soil sample (Spill-1) was obtained for PID and NDIR field screening from the segregated soil stockpile associated with the overfill spill containment area.

Two soil samples (LSS-1 and LSS-2) were obtained from the excavation for laboratory analysis. Soil Sample LSS-1 was obtained from the southeast wall of the excavation.



Soil sample LSS-2 was obtained from the bottom of the excavation. One composite, soil sample (LSS-3) was obtained from stockpiled soils required to free the tank. These samples were analyzed for TPH.

Sampling locations are depicted on the Sampling Schematic attached as Figure 2.2. The applicable chain of custody forms are included in Section 2.9.

2.1.4 Analytical Results

The results from analysis with the PID and the NDIR analyzer of the ten soil samples obtained from the excavation, the one composite sample obtained from stockpiled soil, and the one soil sample obtained from the stockpiled soils excavated from the overfill spill containment area are as follows:

SAMPLE NUMBER	PID (ppm TOV)	NDIR (ppm TPH)
SS-1	49.0	4,121.4
SS-2	18.6	1,159.4
SS-3	18.4	118.1
SS-4	8.6	194.8
SS-5	2.8	55.7
SS-6	2.0	44.0
SS-7	0.4	32.6
SS-8	128.0	39.6
SS-9	102.0	132.2
SS-10	6.8	186.7
Stock-1	43.0	339.9
Spill Contain - 1	64.0	6,985.2

TABLE 2.1 - PID AND NDIR RESULTS

Laboratory analytical results of the two soil samples obtained from the excavation revealed TPH concentrations of 20,700 ppm for LSS-1, and 21,700 ppm for LSS-2. Laboratory analysis of soil sample LSS-3 obtained from the stockpiled soils revealed a TPH concentration of 348 ppm. A copy of the laboratory analytical report is included in Section 2.8.

2.1.5 Conclusions and Recommendations

As noted in ATEC's Post Removal Report dated February 14, 1992, ATEC's conclusions are as follows:

Upon excavation and removal, the tank was observed to be in good condition with no holes, perforations, or severe corrosion.

All excavated soils required to free the tank were visibly contaminated. Soil within the overfill spill containment appeared more heavily contaminated than other excavated soils and were segregated. Based on visual observation of the limits of the excavation, soils in the vicinity of the southeast corner of the excavation appeared to be the most heavily contaminated. Groundwater was not encountered within the excavation.

Field screening and field analysis revealed elevated levels of Total Organic Vapors (TOVs) and TPH in soil samples collected at the limits of the closure excavation. PID readings revealed TOV concentrations ranging from 0.4 ppm to 128 ppm. NDIR results reveal TPH concentrations ranging from 32.6 ppm to 4,121.4 ppm. One composite soil sample obtained from the spill containment revealed 6,985.2 ppm TPH by NDIR analysis.

Two soil samples were obtained from the excavation for laboratory analysis for TPH. Analytical results for LSS-1 obtained from the southeast wall of the excavation revealed a TPH concentration of 20,700 ppm. Analytical results for LSS-2 obtained from the bottom of the excavation revealed 21,700 ppm TPH. One composite, soil sample (LSS-3) was obtained from stockpiled soils for laboratory analysis. Analytical results for LSS-3 revealed TPH concentration of 348 ppm.

The following were recommended and implemented by ATEC subsequent to the submittal of the Post Removal Report:

Remedial excavation was conducted until laboratory analysis of soil samples showed a TPH concentration of less than 100 ppm. Field screening of soil was conducted during excavation utilizing a Photoionization Detector until background levels of less than 1 ppm are attained prior to obtaining samples for laboratory analysis.

Soil borings were advanced and groundwater monitoring wells were installed to determine the vertical and horizontal extent of contamination. Continuous split spoon sampling and analysis was conducted utilizing field analysis techniques, i.e. PID and NDIR analysis, and laboratory analysis to document soil contamination levels.

Additional excavated soils and stockpiled soils were laboratory analyzed for TPH, VOCs, Semivolatile Organic Compounds, Polychlorinated Biphenyls (PCBs), 13 Toxicity Characteristic Leachate Procedure (TCLP) Metals, flashpoint, sulfide reactivity, cyanide reactivity, and corrosivity for disposal classification.

Soils excavated during the tank removals and remediation were disposed at a licensed TSDF.

2.2 SITE REMEDIATION AND CONTAMINATED SOIL DISPOSAL

2.2.1 Site Remediation

Following initial PID screening, additional excavation to remove contaminated soil and reach background levels by PID (<1 ppm) was conducted per order of the Contracting Officer's Representative and David Salvadore of the Massachusetts Department of Environmental Protection (DEP). A total of 134.2 tons of contaminated soil were removed during the original excavation and from excavation floor and sidewalls during remedial excavation on August 20, 1992 (see Remedial Excavation Plan, Figure 2.3).

Six soil samples (RSS-1A through RSS-6A) were obtained from the limits of the remedial excavation for PID field screening. RSS-1A through RSS-4A were obtained from the sidewalls at a depth of approximately 3 to 4 feet below grade. RSS-5A and RSS-6A were obtained from the bottom of the excavation at a depth of 6 feet. These soil samples were screened, and TOV concentrations ranged from 10 ppm to 58 ppm.

An additional one foot of soil was removed from the excavation sidewall and the bottom of the excavation. Following the additional excavation, four soil samples (RSS-1B through RSS-4B) were obtained from the excavation sidewalls at a depth of approximately 3 to 4 feet below grade. Groundwater was encountered at the bottom of the excavation approximately 7 feet below grade. Therefore, soil samples were not obtained from the bottom of the excavation. Soil samples were screened and TOV concentrations ranged from 0.0 ppm to 8.0 ppm. (See Table 2.2).

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SAMPLE NUMBER	PID (ppm TOV)	LOCATION
RSS-1A	30.0	N. sidewall (3-4' B.G.)
RSS-2A	30.0	E. sidewall (3-4' B.G.)
RSS-3A	10.0	S. sidewall (3-4' B.G.)
RSS-4A	20.0	W. sidewall (3-4' B.G.)
RSS-5A	50.0	Bottom (7' B.G.)
RSS-6A	58.0	Bottom (7' B.G.)
RSS-1B	0.0	N. sidewall (5' B.G.)
RSS-2B	8.0	E. sidewall (5' B.G.)
RSS-3B	0.2	S. sidewall (5' B.G.)
RSS-4B	1.0	W. sidewall (5' B.G.)

TABLE 2.2 - PID SCREENING RESULTS

<u>KEY</u>:

RSS = Remediation Soil Sample B.G. = Below Grade

Four soil samples (LRS-1, LRS-2, LRS-3, and LRS-4) and one groundwater sample (LWS-1) were obtained for laboratory analysis for TPH (USEPA Method 418.1). One soil sample (LRS-2) was also laboratory analyzed for VOCs (USEPA Method 8240) and 13 Metals by TCLP (USEPA Method 6010). LRS-1 through LRS-4 were obtained from the sidewalls at a depth of 3 to 4 feet below grade. The following table contains levels of TPH revealed by laboratory analysis:

SAMPLE NUMBER	TPH (ppm)	VOCs (ppm)	13 TCLP METALS (PPM)	LOCATION
LRS-1	17	NA	NA	N.sidewall (5' B.G.)
LRS-2	31	ND	0.35 (Zn)	E. sidewall (5' B.G.)
LRS-3	ND	NA	NA	S. sidewall (5' B.G.)
LRS-4	ND	NA	NA	W. sidewall (5' B.G.)
LWS-1	2	NA	NA	Bottom (7' B.G.)

TABLE - 2.3 Laboratory Analytical Results

LRS = Laboratory Remediation Sample (soil) LWS = Laboratory Remediation Sample (water) ND = Not Detected above the Method Reporting Limit NA = Not Applicable B.G.=Below Grade

Copies of the laboratory analytical report is included in Section 2.8.

2.2.2 Soil Stratigraphy

The soil stratigraphy for the excavation consisted of an initial four feet of sand and gravel mixed with cobbles. The remaining three feet of the excavation consisted primarily of sand. (see Figure 2.5 - Soil Stratigraphy).

2.2.3 Contaminated Soil Disposal

Prior to disposal, contaminated soil was laboratory analyzed for disposal classification purposes. One composite soil sample (LSP-35) was obtained from stockpiled soil associated with the removal of the UST No. 0035 and the additional excavation conducted at the site. LSP-35 was laboratory analyzed for TPH, VOCs, Semivolatile Organics, 13 Metals by TCLP, PCBs, Reactive Cyanide, Reactive Sulfide, flashpoint, and corrosivity for characterization and disposal purposes. Laboratory analytical results



revealed, 7.6 S.U. Corrosivity, 0.13 ppm Zinc, 0.04 ppm Copper and 0.2 ppm Lead. Other analytical results were below the Method Reporting Limits (MRL).

Approximately 134.2 tons of No. 2 fuel oil contaminated soil was removed and stockpiled during UST removal and follow-up remediation. Contaminated soil was disposed for recycle at Trimount Bituminous Products Company, Shrewsbury, Massachusetts.

2.3 HYDROGEOLOGICAL SERVICES

2.3.1 General Explanation of Procedures

At the time of removal of UST No. 0035, laboratory analysis of one soil sample obtained from the southeast wall of the excavation revealed a TPH concentration of 20,700 ppm. Laboratory analysis of a second soil sample obtained from the bottom of the excavation revealed a TPH concentration of 21,700 ppm. Based on the analytical results, three groundwater monitoring wells were installed in the vicinity of UST No. 0035 to assess soil and groundwater conditions.

Prior to advancing soil borings at the site, "Dig-Safe" was contacted. Dig-Safe contacts various utilities to mark their service connections on public ground surfaces. Site plans depicting underground utilities (i.e. water, gas, and sewer) were obtained and reviewed. Geosearch, Inc. of Leominister, Massachusetts, was subcontracted by ATEC to install the monitoring wells at the site. Monitoring well borings were advanced on August 26, 1992, utilizing hollow-stem auger drilling and diamond bit coring techniques, as necessary. Split spoon samplers were utilized to collect subsurface soil samples and determine soil types at five foot intervals.

2.5.2 Soil Borings for Monitoring Wells

Monitoring well MW-1 was installed approximately 46 feet west of Building 2452 and approximately 20 feet south of the backfilled tank excavation (see Figure 2.6 - Site Plan). MW-1 is located hydrogeologically crossgradient from the former UST No. 0035. MW-1 was advanced to a depth of 9.8 feet to assess the release of No.2 fuel oil from the removed UST. Soil types encountered from grade level to a depth of approximately 2 feet, below grade, consisted primarily of medium-dense, light-brown, coarse silt to fine sand containing trace coarse gravel. Soil types encountered from a depth of approximately 2 feet below grade to 9.8 feet below grade consisted primarily of dense to medium-stiff, gray to gray-brown, clayey silt with trace coarse gravel. Concentrations of TOVs were detected by field screening with a PID (1.0 ppm at 0'-2 and 2.2 ppm at 5'). Petroleum odors were not evident in soil samples. Groundwater was encountered at approximately 5 feet below grade.

Monitoring well MW-2 was installed approximately 25 feet west of Building 2452 and approximately 20 feet north of the backfilled tank excavation (Figure 30.3.1 - Site Plan). MW-2 is located hydrogeologically upgradient from the former UST No. 0035. MW-2 was advanced to a depth of 10.3 feet below grade to assess the release of No. 2 fuel oil from the removed UST. Soil types encountered from grade level to a depth of approximately 2 feet, below grade, consisted primarily of loose to medium-dense, light-brown coarse silt, and fine sand containing trace coarse gravel. Soil types encountered from a depth of approximately 2 feet below grade to 5.3 feet below grade consisted primarily of soft, light brown, clayey silt with trace medium to coarse gravel. A concentration of TOVs of 2.2 ppm was detected in a soil sample obtained from 0 feet to 4 feet below grade. TOVs were not detected in soil obtained from 4 feet to 5.3 feet below grade. Petroleum odors were not evident in soil samples. Groundwater was encountered at a depth of approximately 5 feet below grade. Coring was conducted

from a depth of 5.3 feet to 10.5 feet below grade. Bedrock consisted primarily of a fractured gray phyllite. A large fracture which was filled with silt and gravel was encountered at a depth of approximately 6 feet to 8 feet below grade.

Monitoring well MW-3 was installed approximately 9 feet south of Building 2452 and approximately 30 feet southeast of the backfilled tank excavation (see Figure 30.6 - Site Plan). MW-3 is located hydrogeologically downgradient from the former UST No. 0035. MW-3 was advanced to a depth of 13 feet to assess the release of No.2 fuel oil from the removed UST. Soil types encountered from grade level to a depth of approximately 5.5 feet below grade consisted primarily of medium-dense, light-brown, coarse silt to fine sand containing trace fine to coarse gravel. Soil types encountered from a depth of approximately 5.5 feet to 9.5 feet below grade consisted of primarily of stiff, dark grey, clayey silt, with trace coarse gravel. Concentrations of Total Organic Vapors (TOVs) were detected by field screening with a PID (1.4 ppm at 0'-2'; 4.1 ppm at 4'-6'; and 0.4 at 9'-9.5'). Petroleum odors were not evident in soil samples. Groundwater was encountered at a depth of approximately 9.5 feet below grade. Auger refusal was encountered at a depth of 13 feet. Bedrock consisted of a fine-grained gray igneous rock.

2.3.3 Results of Soil Screenings and Chemical Analyses

Split spoon soil samples were screened for TPH utilizing a NDIR analyzer (EPA Method 418.1). Subsurface soil samples were placed directly into pre-labeled, pre-cleaned containers and immediately placed on ice for shipment to the laboratory. TPH samples were placed in 500-ml amber glass jars.

Three subsurface soil samples were collected during the installation of monitoring well one (MW-1) and labelled MW-1.1, MW-1.2 and MW-1.3. Results of NDIR screening

revealed TPH concentrations of 35.1 ppm, 50.3 and 11.9 ppm in soil samples MW-1.1. MW-1.2 and MW-1.3, respectively.

Two subsurface soil samples were collected during the installation of monitoring well two (MW-2) and labelled MW-2.1 and MW-2.2. Results of NDIR screening revealed TPH concentrations of 10.8 ppm and "not detected" in soil samples MW-2.1 and MW-2.2, respectively.

Three subsurface soil samples were collected during the installation of monitoring well three (MW-3) and labelled MW-3.1. MW-3.2 and MW-3.3. Results of NDIR screening revealed TPH concentrations of 15.5 ppm, 22.8 ppm and 22.3 ppm in soil samples MW-3.1, MW-3.2, and MW-3.3, respectively.

NDIR analytical results of subsurface soil samples collected during the site investigation are given in Table 2.4 - Summary of Subsurface Soil Analyses.

SAMPLE IDENTIFICATION	SAMPLE DEPTH	TPH (ppm)
MW-1.1	. 0' - 2' below grade	35.1 ppm
MW-1.2	4' - 6' below grade	50.3 ppm
MW-1.3	9' - 9'6" below grade	11.9 ppm
MW-2.1	0' - 2' below grade	10.8 ppm
MW-2.2	4' - 6' below grade	ND
MW-3.1	0' - 2' below grade	15.5 ppm
MW-3.2	4' - 6' below grade	22.8 ppm
MW-3.3	9' - 9'6" below grade	22.3 ppm

 TABLE 2.4 - SUMMARY OF SUBSURFACE SOIL ANALYSIS

2.3.4 Details of Monitoring Well Construction

Monitoring wells were typically constructed of a length of bottom-plugged, two inch diameter Polyvinyl Chloride (PVC) well screen (0.010 inch slot) followed by a length of two inch diameter PVC solid riser to grade level. No. 2 washed, silica sand was packed to approximately one foot above the screen followed by a one to two foot thick bentonite grout packing. The remainder of the boring was backfilled with washed sand and concrete surface seal to grade. Monitoring wells were fitted with a 4 four inch diameter, flush mount iron road box.

2.3.5 Standard Type Survey and Determination of Groundwater Gradient

An instrument survey was conducted by ATEC personnel to determine the relative locations and elevations of the groundwater monitoring wells and significant surficial features. An arbitrary datum was established by assigning an elevation of 100.00 feet to a fire hydrant spindle located between Building 2432 and Building 2433. All reported groundwater elevations are referenced to the fire hydrant spindle. The monitoring wells were gauged utilizing an electronic water level meter prior to sampling to determine the groundwater elevations at each well.

Groundwater elevations were then calculated utilizing the survey and gauging data from MW-1, located west of former UST No. 0035, MW-2 located north of former UST No. 0035 and MW-3 located south of former UST No. 0035 (refer to Figure 2.6 - Groundwater Contours). Based on the gauging data, groundwater in the area flows generally to the east across the site at a lateral hydraulic gradient of 0.006 ft./ft. Groundwater at the site occurs at depths of 7.10 feet, 7.33 feet, 7.85 feet below grade for MW-1, MW-2 and MW-3, respectively.





A summary of groundwater elevations measured at the three monitoring wells installed at the site are included in Table 2.5.

Monitoring Wells	Date	Rim Elevation (ft)	Depth to Groundwater	Groundwater Elevation (ft)
MW-1	11-01-92	101.26	7.10	94.16
MW-2	11-01-92	101.60	7.33	94.27
MW-3	11-01-92	101.64	7.85	93.7

 TABLE 2.5 - SUMMARY OF GROUNDWATER ELEVATIONS

2.3.6 Results of Groundwater Chemical Analyses

Groundwater monitoring wells MW-1, MW-2 and MW-3 were sampled on November 1, 1992. The groundwater samples were analyzed for TPH (USEPA Method 418.1). Prior to sampling, approximately three well volumes of groundwater were purged from the well. Groundwater samples were placed directly into pre-labelled, pre-cleaned 500-ml amber glass jars and placed on ice for immediate shipment to the laboratory. The samples were analyzed by Environmental Science Services (ESS) of Providence, Rhode Island. Chain of custody forms were completed and included in the shipment.

Laboratory analytical results did not reveal detectable concentrations of TPH in the groundwater samples collected from MW-1, MW-2 or MW-3 (see Section 2.8, Laboratory Analytical Results).

A summary of the groundwater analytical results are included in Table 2.6.

TABLE 2.6. - SUMMARY OF GROUNDWATER ANALYSES

SAMPLE NUMBER	TPH (ppm)
MW-1	N.D.
MW-2	N.D.
MW-3	N.D

N.D. - Not Detected above the 1 ppm reporting limit.

2.3.7 Summary of Findings

On August 26, 1992 three groundwater monitoring wells were installed to assess soil and groundwater conditions in the vicinity of UST No. 0035. Soil samples collected during drilling were screened in the field for TOVs utilizing a PID. PID field screening results revealed relatively low TOV concentrations. Subsequent NDIR screening of the same soil samples revealed TPH concentrations ranging from 11.9 ppm to 50.3 ppm in MW-1, 0.0 ppm to 10.8 ppm in MW-2 and 15.5 ppm to 22.8 ppm in MW-3. Results of laboratory analyses did not reveal detectable TPH concentrations in the groundwater samples collected from MW-1, MW-2 or MW-3.

2.3.8 Recommendations

Based on the analytical results, i.e. low soil TPH concentrations and the absence of detectable TPH concentrations in the groundwater, ATEC does not recommend any further investigative or remedial action at this time. However, to ensure that the environmental integrity of the site is maintained, ATEC recommends periodic sampling of the groundwater analyses for TPH.

2.3.9 Boring Logs

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The attached boring logs were recorded during drilling and monitoring well installation activities of MW-1, MW-2, and MW-3.

.



GROUND WATER MONITORING WELL BORING/INSTALLATION LOG

LOG OF BORING/WELL: Mw/

FOREMAN: Matt Bovenzi, Geosearch INSPECTOR: Mark Bald; ATEC DATE: 8/26/92

.

ROJECT NAME: US Army Multisite ROJECT NUMBER: 37.07.151 ROJECT LOCATION: UST 35, Bldg 2452 Ft Devens ORING LOCATION: See Site Schematic Studich on back FOREMAN: Multi INSPECTOR: Mun DATE: 9/26/92

SOIL/ROCK DESCRIPTION	DEPTH FEET	SAMP. NO.	S.P.T.	Above Surface Elevation
hed danse, I.g ht brown,	0-2	:551,1	18.10	Length of Riser Pipe O Above Surface Elevation
silt and fine send w/			5.17	Surface Elevation
Frace Course grand PID= 1.0				Type/Thickness of 1' concrete Surface Seal
med stiff, dark gray clayer silt w/ trace	4-6	5512	-10,4 4,82	ID/Type of Protect. Flus mount Casing CI buffalo box
course gravel. PID= 2.2	√5'			Depth Bottom 2' of Casing
medium stiff, gray-brown		1610		ID/OD/Type of Riser ご
grand. PID= 0.0 PTM	9- 99"	927.5	3.50	Diameter of Borehole g'
Juger Refusal				Type of Backfill But out e/concrete Around Riser Pipe
				Depth/Type of Bottom 1'-2.5' Seal Benton tu
				Depth Top of 3.5 Pervious Pipe
				ID/OD/Type of 2" Prc Pervious Pipe . 01 51. T
				Type of Backfill washed Around Pervious Pipe Silica
				Depth Bottom of Pervious Pipe 8.5
· .				Type of Backfill Below Pervious Pipe



GROUND WATER MONITORING WELL BORING/INSTALLATION LOG

LOG OF BORING/WELL: MWZ

ROJECT NAME: US Army Multisite ROJECT NUMBER: 37 07.451 ROJECT LOCATION: UST 35, B/dg 2452 IFt Devens DATE: 8/26/92 ORING LOCATION: See Site Schematic





GROUND WATER MONITORING WELL BORING/INSTALLATION LOG

LOG OF BORING/WELL: $M \omega 3$

ROJECT NAME: US Army Multis, 4. ROJECT NUMBER: 37.07.451 ROJECT LOCATION: UST35, Bldg 2452 Ft Deven ORING LOCATION: See Site Schematic

FOREMAN: Matt Bovenzi, Geose and INSPECTOR: Mark Bald, ATEC DATE: 8/26/92

SOIL/ROCK DESCRIPTION	DEPTH	SAMP.	S.P.T.		Length of Protect. Casing Above Surface Elevation
very loose to loose, med	0-2'	56.31	4.4		Length of Riser Pipe ∂ Above Surface Elevation
silt willittle four graved		55 70	5.7		Surface Elevation
PIDE 1.4ppm				-	Type/Thickness of 5' Concrite Surface Seal
Sund and silt w/f-cgeard	9-5,5	5532	12,14		ID/Type of Protect. flushmound CI Casing buffulo box
Stiff drk grey, clayey silt W/train course grand. PiD=41.	5.5-6'	553.2	23		Depth Bottom Z ' of Casing
ueist med brown alwer at H	∇ 9'	553.3	50		ID/OD/Type of Riser 7" PVC Pipe
w/trace to m growned. Split Spoon refus J@ 9.5 s bedrock.	7-7.5				Diameter of Borehole $\zeta \mathcal{A} \mathcal{B}''$
Bedroil - grey, fine grained -	9.5 ⁻ / ₋ 13	lore	core		Type of Backfill Bendonite/ Around Riser Pipe Concrete
fractures; bedding dip <10°.					Depth/Type of Bottom 5-1 Benton 4. Seal
,					Depth Top of 2,5 / Pervious Pipe
					ID/OD/Type of 2" PV C Pervious Pipe ,0(910T
-					Type of Backfill washed Around Pervious Pipe 3,1,~~
					Depth Bottom of Pervious Pipe 17.5
					Type of Backfill Bedrock Below Pervious Pipe

2.4 BACKFILL

The excavation was lined with polyethylene plastic sheeting and backfilled with 102.7 cubic yards of uncontaminated fill material on July 29, 1992. Backfill material consisted of clean granular fill. The granular fill contained particles which were less than three inches in diameter and was free of roots and debris, as per Section 4, Paragraph 5 of the contract. Backfill material was compacted to subgrade level according to contract specifications and with the approval of the Contracting Officer's Representative.

2.5 SURFACE RESTORATION

Following backfill of the excavation, approximately 396 square feet of loam was spread at the site. Seeding was conducted to complete surface restoration on October 21, 1992.

2.6 PHOTOGRAPHIC DOCUMENTATION

The following photographs are of the removed UST and the excavation:

- A-1: One side of removed tank.
- A-2: Opposite side of removed tank.
- A-3: Excavation as viewed from north, facing south.
- A-4: Excavation as viewed from south, facing north.




2.7 OCMA 220 DATA SHEETS

The following information was organized from the data collected from the Non-Dispersive Infrared Analyzer.

SS-1 to SS-10, STOCK-1 and SPILL-1: Soil Samples obtained from original excavation and soil stockpiles.

MW1.1-1.3, MW 2.1-2.2, MW 3.1-3.3: Soil samples obtained from split spoon samples during installation of monitoring wells.

Operator Name: Publiseiran

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Date: 16 Jan 72	
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EBI Project Number: 37.07.951 TZ= 435

<u>Calibration</u>

Ŧ	Firs	t Reading	Sec	ond Reading	Third Reading		
	Initial	Final	Initial	Final	Initial	Final	
Zero Calibration ·	1.4	10.0	1-0.5	10.0	10.0	10.01	
Span Calibration	L		1	1	1	1	
Zero Calibration	l		1	!	1	1	
		•				Span Check: 28-0	

Testin	q
A second s	

	Wei	ght	First A	pproach	Second.	Approach		Readings		
Sample ID#	Gross	Tare	F-113	Sample	F-113	Sample	First	Second	Third	
STOPIC 2	183.0	75.0				he	4.8	12.9	1	370. 41
SPILL 2	180.1	173.9	I	1	1	1.5	140-3	140.1	I	×
I	181.5	172.8	1]	· ·	1.	1354	133.1	133.2	1412
2	178.9	172.B			1	ļ,	7.4	17.3	1	
	180.2	173.8			}	1	10.7	0.7	1	
<u> </u>	180.2	174.1	1				11,0	17.7		1408
<u> </u>	183.9	170.2			1	1	105	10,5		1507
6	179.9	73.6			1	1.1.0	10.5	10.5		144.0
L	180.3	75.2		1	1	1	10.4	10,3	1	1.3.2.1.
<u>. 8</u>	182.2	175.6		1	1	1	10.4	1.6	1	1 29. 11
9	185.2	75.4			1	5	11.2	11.3	1	1132.2
10.	183.6	75.5			1		11:4	11.0		1.46.7
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TPH SOIL ANALYSES BY NON-DISPERSIVE INFRARED ANALYZER - MODIFIED EPA STANDARD TEST METHOD 418.1

PROJECT NAME, NUMBER, TANK: U.S. ARMY - FORT DEVENS 37.07.91.451 UST 35

DATE: <u>Sep 22, 1992</u> OPERATOR: <u>Derek M, Witt</u>

CALIBRATION DATA

TYPE	FIRST REA	ADING	SECOND R	EADING	THIRD REA	ADING	SPAN
CALIBRATION		FINAL	INITIAL	FINAL		FINAL	CHECK
ZERO:	1.2	0.0	0.8	0.0	-0.1	0.0	
SPAN:	38.7	40.0		40.0	40.1	40.0	
ZERO:	0.5	0.0	-0.3	0.0	0.1	0.0	

ANALYTICAL DATA

SAMPLE	WEIGH	T (g)	1st DILUTIO	<u>ON RATIO (ml)</u>	2nd DILUTIC	<u>ON RATIO (ml)</u>	INSTRUME	NT RESULTS	(ppm)	_ CONCENTRATION
NUMBER	GROSS	TARE	F-113	SAMPLE	F-113	SAMPLE	1st	<u>2nd</u>	3rd	mg/1
	<u></u>	<u></u>								
MW-1.1	86,4	79.4	17.5	3.0			1.3	1.2		35.1
	85.0	79.7	17.5	3.0			1,5	1.3		50.3
MW-1.3	87.5	78.9	17.5	3.0			0.8	0.5		11.9
	86.1	78.5	17.5	3.0			0.3	0.4		10.8
MW-2.2	83.1	77.3	17.5	3,0			0.1	0.0		0.0
MW-3.1	83.2	76.6	17.5	3.0			0.4	0.5		15.5
MW-3.2	86.1	78,9	17.5	3.0			0.9	0.8		22,8
MW-3.3	85.4	76.2	17.5	3.0			0.8	1.0		22,3

2.8 LABORATORY ANALYTICAL RESULTS

The following laboratory analytical reports are associated with the removal, remedial excavation and stockpiled soil. These reports were organized and provided by Environmental Science Services, Inc. Results are included for:

- LSS-1, LSS-2, and LSS-3: Soil samples obtained from original excavation.
 Laboratory analyzed for TPH (Method 418.1).
- LRS-1, LRS-2, LRS-3, LRS-4: Soil samples obtained from post-remedial excavation. Laboratory analyzed for TPH (Method 418.1). LRS-2 was also analyzed for VOCs (Method 8240), and 13 Metals by TCLP (Method 6010).
- LWS-1: Water sample obtained from groundwater in remediated excavation. Laboratory analyzed for TPH (Method 418.1).
- LSP-35: Soil sample obtained from stockpiled soil for disposal classification.
 Lab analyzed for VOCs (Method 8240), Semivolatile Organics (Method 8270),
 TPH (Method 418.1), 13 Metals by TCLP (Method 6010), Polychlorinated
 Biphenyls (PCBs) (Method 8080), Reactive Sulfide (Method 7.3.4.1), Reactive
 Cyanide (Method 7.3.3.2), Flashpoint (Method 1010) and Corrosivity (pH)
 (Method 9045) for characterization and disposal purposes.
- MW-1, MW-2, MW-3, MW-4: Groundwater samples obtained from monitoring wells MW- 1 through MW-3 respectively. Laboratory analyzed for TPH (Method 418.1).

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JAN-24-1992 14:01 ERVIRONMENTE SCIENCE SUC



In Response To The Future

CITFICATE OF ANALYSIS

Date: 1/24/92 Job: 141 Account: 95659 Received: 1/16/92

ATEC ENVIRONMENTAL CC. 62 Accord Park Drive Norwell, MA 02061

Project: DEVENS-TANK 35

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1: Mr. Mark Baldi

mple. aber	Method Number	Paraneter	Result	Unit	Sample Description
14101	EPA-160.3 EPA-418.1	Total Solids TPH/JR (Dry Wt.)	82 20700	¥ mg/kg	LSS-1
14102	EPA-160.3 EPA-418.1	Total Solids TPH/:R (Dry Wt.)	84 21700	% mg∕kg	LSS-2
14103	EPA-160.3 EPA-418.1	Tota: Solids TPH/:R (Dry Wt.)	89 348	% mg∕kg	LSS-3

Kipson Di Laboratory Manager

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nvironmental Science Services

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532 Atwells Avenue. Providence, Rho io Island 02909 (401) 421-0398 Fax. (401) 471-5731



ERTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants		
Client Project ID: UST 35 Bldg.2452	ESS Project ID:	922056
Client Sample ID: LRS-1	ESS Sample ID:	922056-01
Date Sample Received: 8/7/92	Date Reported:	8/17/92

Parameter	Results	Units	MRL	Method
Percent Solids	85	% w/w	1	160.3
Total Petroleum Hydrocarbon-IR	17	mg/Kg	12	418.1

TPHIR reported on a dry weight basis

MRL = Method Reporting Limit

Approved by: David Dickinson Laboratory Director

Date: 179452

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/www

ERTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants		
Client Project ID: UST 35 Bldg. 2452	ESS Project ID:	922056
Client Sample ID: LRS-2	ESS Sample ID:	922056-02
Date Sample Received: 8/7/92	Date Reported:	8/17/92

Parameter	Results	Units	MRL	Method
Percent Solids	82	% w/w	. 1	160.3
Total Petroleum Hydrocarbon-IR	31	mg/Kg	12	418.1
Volatile Organics	ND	ug/Kg	Attached	8260
Toxicity Characteristic Leaching	Procedure			1311
Zinc	0.34	mg/L	Attached	6010

TPHIR reported on dry weight basis

ND = Not Detected above the Method Reporting Limit(MRL)

Approved by: (David Dickinson Laboratory Director

Date: 17/4 52



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ERTIFICATE OF ANALYSIS TCL VOLATILE ORGANICS Method 8260

Client: ATEC Environmental Co	onsultants		
Client Project ID: UST 35, B	ldg. 2452	ESS Project ID:	922056
Client Sample ID: LRS-2		ESS Sample ID:	922056-02
Date Sample Received: 8/7/92		Date Reported:	8/17/92
Parameter	Result (ug/Kg)	······	MRL
Methylene Chloride	ND		5
1,1-Dichloroethane	ND		5
Chloroform	ND		5
Carbon Tetrachloride	ND		5
1,2-Dichloropropane	ND		5
Dibromochloromethane	ND		5

1,2 Dichiciopiopane	ND	2
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Tetrachloroethene	ND	5
Chlorobenzene	ND	5
1,2-Dichloroethane	ND	5
1,1,1-Trichloroethane	ND	5
Bromodichloromethane	ND	5
Trans-1,3-Dichloropropene	ND	5
Bromoform	ND	5
1,1,2,2-Tetrachloroethane	ND	5
Benzene	ND	5
Toluene	ND	5
Ethyl Benzene	ND	5
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl Chloride	ND	10
Chloroethane	ND	10
1,1-Dichloroethene	ND	5
1,2-Dichloroethene (Total)	ND	5
Trichloroethene	ND	5
Acetone	ND	10
Carbon Disulfide	ND	5
2-Butanone	ND	10
Cis-1,3-Dichloropropene	ND	5
4-Methyl-2-Pentanone	ND	10
2-Hexanone	ND .	10
Styrene	ND	5
Xylenes (Total)	ND	. 10

ND = Not Detected above Method Reporting Limit (MRL)

David Dickinson Laboratory Director

Approved by:

Date: / 1/44542

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ERTIFICATE OF ANALYSIS

TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

METALS EPA METHOD 1311

Client: ATEC Environmental Consultants Client Project ID: UST# 35 Bldg. 2452 Client Sample ID: LRS-2, UST 35 ESS Sample ID: 922056-02

Date Sampled: 8/5/92 Date TCLP Performed: 8/10/92 Date Leachate Extracted: 8/11/92 Date Extract Analyzed: 8/11/92

	Act	ual	Adjusted*		
Target Analyte	Sample Result (mg/L)	Method Reporting Limit	Sample Result (mg/L)	Nethod Reporting Limit	
Antimony	ND	0.2	ND	0.3	
Arsenic	ND -	0.2	ND	0.2	
Cadmium •	ND	0.02	ND	0.02	
Chromium	. ND	. 0.05	ND	-0.07	
Lead	ND	0.1	ND	0.1	
Mercury	ND	0.005	ND	0,005	
Selenium	ND	0.3	ND	0.3	
Silver	ND	0.05	ND	0.06	
Copper	ND ·	0.02	ND	0.02	
Nickel	ND	0.04	ND	0.04	
Zinc	0.32	0.02	0.34	0.03	
Beryllium	ND	0.02	ND	0.03	
Thallium	ND	. 0.3	ND	0.4	

* Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

ND = Not Detected above Method Reporting Limit (MRL)

Approved

Date: Revised

Environmental Science Services

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TOTAL P.02

RTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants		
Client Project ID: UST 35 Bldg.2452	ESS Project ID:	922056
Client Sample ID: LRS-3	ESS Sample ID:	922056-03
Date Sample Received: 8/7/92	Date Reported:	8/17/92

Parameter	Results	Units	MRL	Method
Percent Solids	92	% w∕w	1	160.3
Total Petroleum Hydrocarbon-IR	ND	mg/Kg	11	418.1

TPHIR reported on a dry weight basis

ND = Not Detected above the Method Reporting Limit(MRL)

Approved by: David Dickinson Laboratory Director

Date:



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RTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants		
Client Project ID: UST 35 Bldg.2452	ESS Project ID:	922056
Client Sample ID: LRS-4	ESS Sample ID:	922056-04
Date Sample Received: 8/7/92	Date Reported:	8/17/92

Parameter	Results	Units	MRL	Method
Percent Solids	87	% w/w	1	160.3
Total Petroleum Hydrocarbon-IR	ND	mg/Kg	11	418.1

TPHIR reported on a dry weight basis

ND = Not Detected above the Method Reporting Limit(MRL)

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Approved by: David Dickinson Laboratory Director LEAV

Date:___ 17444

vironmental Science Services

RTIFICATE OF ANALYSIS

Total Petroleum Hydrocarbon-IR	2	mg/L	1	418.1
Parameter	Results	Units	MRL	Method
Date Sample Received: 8/7/92		Date Re	ported:	8/17/92
Client Sample ID: LWS-1		ESS Sam	ple ID:	922056-05
Client Project ID: UST 35 Bldg.2	452	ESS Pro	ject ID:	922056
Client: ATEC Environmental Consu	ltants			

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MRL = Method Reporting Limit

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Approved by: Bavid Dickinson Laboratory Director

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Date: 17/10/ 52

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CERTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants	
Client Project ID: Ft. Devens-Stockpiled Soils	ESS Project ID: 921528
Client Sample ID: LSP-35	ESS Sample ID: 921528-08
Date Sample Received: 6/11/92	Date Reported: 7/1/92

Parameter	F	Results	Units	MRL	Method
pH (Corrosivity)		7.6	S.U.	N/A	9045
Flashpoint	No	Flash	°F	200	1010
Polychlorinated Biphenyls		ND	mg/Kg	Attached	8080
Reactive Cyanide		ND	mg/Kg	2	7.3.3.2
Reactive Sulfide		ND	mg/Kg	2	7.3.4.1
Semivolatile Organics		ND	ug/Kg	Attached	8270
Volatile Organics		ND	ug/Kg	Attached	8240
Toxicity Characteristic Leaching	Pro	ocedure			1311
Lead Copper Zinc		0.2 0.04 0.13	mg/L mg/L mg/L	Attached Attached Attached	6010 6010 6010

N/A = Not Applicable

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: David Dickinson Laboratory Director

Jul 492 Date:

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CERTIFICATE OF ANALYSIS

POLYCHLORINATED BIPHENYLS Method 8080

Client: ATEC Environmental C	lonsultants		
Client Project ID: Ft. Deven	ESS Project ID: 921528		
Client Sample ID: LSP-35		ESS Sample ID: 921528-08	
Date Sample Received: 6/11/92		Date Reported: 6/30/92	
Parameter	Result (mg/Kg)	MRL	
Arochlor 1016	ND	0.1	
Arochlor 1221	ND	0.1	
Arochlor 1232	ND	0.1	
Arochlor 1242	ND	0.1	
Arochlor 1248 ND		0.1	
Arochlor 1254 ND 0.		0.2	
Arochlor 1260	ND	0.2	

ND = Not Detected above Method Reporting Limit (MRL)

Surrogate Recovery	Data	<pre>% Recovery</pre>	QC	Li	mit
Dibutylchlorendate		101%	50		150%

Approved by: David Dickinson Laboratory Director

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191 Post Road West, Westport, Connecticut 06880 (203) 221-2753 Fax. (203) 454-4970

192 Date:

061

CERTIFICATE OF ANALYSIS

ACID EXTRACTABLES EPA 8270

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-35

ESS Sample ID: 921528-08

Date Sample Received: 6/9/92

Date Reported: 7/1/92

Parameter	Result (ug/Kg)	MRL
2-Chlorophenol	ND	330
2-Nitrophenol	ND	330
Phenol	ND	330
2,4-Dimethylphenol	ND	330
2,4-Dichlorophenol	ND	330
2,4-Dinitrophenol	ND	1,650
Pentachlorophenol	ND	1,650
4-Nitrophenol	ND	1,650
2,4,6-Trichlorophenol	ND .	330
2,4,5-Trichlorophenol	ND	1,650
2-Methylphenol	ND	330
4-Methylphenol	ND	330
4-Chloro-3-Methylphenol	ND	330
4,6-Dinitro-2-Methylphenol	ND	1,650

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: David Dickinson Laboratory Director

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Date:

662

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ERTIFICATE OF ANALYSIS

BASE NEUTRAL EXTRACTABLES EPA 8270

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-35

Date Sample Received: 6/9/92

ESS Sample ID: 921528-08

Date Reported: 7/1/92

Parameter	Result (ug/Kg)	MRL
Acenaphthylene	ND	330
1,2,4-Trichlorobenzene	ND	330
Hexachlorobenzene	ND	330
Bis(2-chloroethyl)ether	ND	330
2-Chloronaphthalene	ND	330
1,2-Dichlorobenzene	ND	330
1,3-Dichlorobenzene	ND	330
1,4-Dichlorobenzene	ND	330
3,3-Dichlorobenzidine	ND	660
2,4-Dinitrotoluene	ND	330
2,6-Dinitrotoluene	ND	330
Fluoranthene	ND	330
4-Chlorophenyl phenyl ether	ND	330
Bis(2-chloroisopropyl) ether	ND	330
Bis(2-chloroethoxy) methane	ND	330
Hexachlorobutadiene	. ND	330
Hexachlorocyclopentadiene	ND	330
Isophorone	ND	330
Naphthalene	ND	330
Nitrobenzene	ND	330
N-nitrosodiphenylamine	ND	330
N-nitrosodi-n-propylamine	ND	330
Bis(2-ethylhexyl)phthalate	ND	330
Di-n-butylphthalate	ND	330 -
Di-n-octylphthalate	ND	330 .
Diethyl phthalate	ND	330
Dimethyl phthalate	ND	330
Benzo(a)anthracene	ND	330

ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

David Dickinson Laboratory Director

2 Jul 492 Date:

nvironmental Science Services

532 Atwells Avenue, Providence, Rhode Island 02909 (401) 421-0398 Fax. (401) 421-5731



CERTIFICATE OF ANALYSIS

BASE NEUTRAL EXTRACTABLES cont. EPA 8270

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-35

Date Sample Received: 6/9/92

Date Reported: 7/1/92

ESS Sample ID: 921528-08

Parameter	Result (ug/Kg)	MRL
Benzo(a)pyrene	ND	330
Benzo(b)fluoranthene	ND	330
Benzo(k)fluoranthene	ND	330
Chrysene	ND	. 330
Acenaphthene	ND	330
Anthracene	ND	330
Benzo(ghi)perylene	ND	330
Fluorene	ND	330
Phenanthrene	ND	330
Dibenzo(a,h)anthracene	ND	330
Indeno(1,2,3-cd)pyrene	ND	330
Pyrene	ND	330
Hexachloroethane	ND	330
4-Bromophenyl-phenylether	ND .	330
Benzyl Alcohol	ND	330
Benzoic Acid	ND	1,650
Bis(2-Chloroethoxy)methane	ND	330
4-Chloroaniline	ND	330
2-Methylnaphthalene	ND	330
2-Nitroaniline	ND	1,650
3-Nitroaniline	ND	330
Dibenzofuran	ND	330
4-Nitroaniline	ND	1,650
Butylbenzylphthalate	ND	330

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: David Dickinson Laboratory Director

Environmental Science Services

Date: ______

532 Atwells Avenue, Providence, Rhode Island 02909 (401) 421-0398 Fax. (401) 421-5731



ERTIFICATE OF ANALYSIS

TCL VOLATILE ORGANICS Method 8240

Client: ATEC Environmental Consultants

Client Project I	D: Ft.	Devens-Stockpiled	Soils	ESS	Project	ID:	921528
Client Sample ID	: LSP-	35		ESS	Sample	ID:	921528-0

Date Sample Received: 6/29/92

80 Date Reported: 7/1/92

Parameter	Result (ug/Kg)	MRL
Methylene Chloride	ND	1,000
1,1-Dichloroethane	ND	1,000
Chloroform	ND	1,000
Carbon Tetrachloride	ND	1,000
1,2-Dichloropropane	ND	1,000
Dibromochloromethane	ND	1,000
1,1,2-Trichloroethane	ND	1,000
Tetrachloroethene	ND	1,000
Chlorobenzene	ND	1,000
1,2-Dichloroethane	ND	1,000
1,1,1-Trichloroethane	ND	1,000
Bromodichloromethane	ND	1,000
Trans-1,3-Dichloropropene	ND	1,000
Bromoform	ND	1,000
1,1,2,2-Tetrachloroethane	ND	1,000
Benzene	ND	1,000
Toluene	ND	1,000
Ethyl Benzene	ND	1,000
Chloromethane	ND	1,000
Bromomethane	ND	1,000
Vinyl Chloride	ND	1,000
Chloroethane	ND	1,000
1,1-Dichloroethene	ND	1,000
1,2-Dichloroethene (Total)	ND	1,000
Trichloroethene	ND	1,000
Acetone	ND	1,000
Carbon Disulfide	ND	1,000
2-Butanone	ND	1,000
Cis-1,3-Dichloropropene	ND	1,000
4-Methyl-2-Pentanone	ND	1,000
2-Hexanone	ND	1,000
Styrene	ND	1,000
Xylenes (Total)	ND	1,000

ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

David Dickinson Laboratory Director

Jul 192 Date:

Invironmental Science Services

532 Atwells Avenue, Providence, Rhode Island 02909 (401) 421-0398 Fax. (401) 421-5731

CERTIFICATE OF ANALYSIS

TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

METALS

EPA METHOD 1311

Client: ATEC Environmental Consultants

Client Project ID: Stockpiled Soils

Client Sample ID: LSP-35

ESS Sample ID: 921528-08

Date Sampled: 6/9/92 Date TCLP Performed: 6/22/92 Date Leachate Extracted: 6/23/92 Date Extract Analyzed: 6/24/92

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Target Analyte	Sample Result (mg/L)	Method Reporting Limit	Sample Result (mg/L)	Method Reporting Limit
Antimony	ND	0.1	ND	0.2
Arsenic	ND	0.2	ND	0.2
Cadmium	ND	0.02	ND	0.02
Chromium	ND	0.05	ND	0.05
Lead	0.2	0.1	0.2	0.1
Mercury	ND	0.005	ND	0.005
Selenium	ND	0.3	ND	0.3
Silver	ND	0.05	ND	0.09
Copper	0.03	0.02	0.04	0.03
Nickel	ND	0.04	ND	0.04
Zinc	0.13	0.02	0.13	0.02
Beryllium	ND	0.02	ND	0.04
Thallium	ND	0.05	ND	0.09

* Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: David Dicki Laboratory Director

Date: 2 Jul 192

066

Environmental Science Services

532 Atwells Avenue, Providence, Rhode Island 02909 (401) 421-0398 Fax. (401) 421-5731

mg/L

1

ERTIFICATE OF ANALYSIS

MW-3

TOTAL PETROLEUM HYDROCARBON-IR Method 418.1

Client: ATEC En	vironmental Consu	ltants		
Client Project I	D: UST #35, Bldg	2452	ESS Project ID:	922994
Date Samples Rec	eived: 11/3/92		Date Reported:	11/4/92
Client ID	Lab ID	Results	Units	MRL
 MW-1	922994-01	ND	mg/L	1
MW-2	922994-02	ND	mg/L	1

ND

ND = Not Detected above Method Reporting Limit (MRL)

922994-03

Approved by

4 N/0192 Date:

x.(401)(421-5731)

2.9 CHAIN OF CUSTODY FORMS

The following chain of custody forms were completed for the soil samples which were laboratory analyzed.

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CHAIN OF CUSTODY RECORD

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2.10 HAZARDOUS WASTE MANIFEST

UST No. 0035 was estimated to contain thirty nine gallons of No. 2 fuel oil and sludges. Approximately fourteen gallons of fuel oil was removed on January 7, 1992, and transported to a licensed T.S.D.F. (Beede Waste Oil Corporation). Approximately twenty five gallons of fuel oil and sludges were removed and drummed on January 15, 1992. Drummed material was transported to a licensed Transportation, Storage, Disposal Facility (T.S.D.F.).

The following Hazardous Waste Manifest was generated from tank contents and residual tank materials. The manifest dated January 7, 1992, is associated with vacuuming product from several USTs which included UST No. 0035. Therefore, the total quantity (1,400 gallons) is greater than the 14 gallons which was removed from UST 0035. The manifest dated February 27, 1992 is associated with the drummed material from several USTs. Therefore, the total quantity (395 gallons) is greater than the 25 gallons which was removed from UST No. 0035.

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Generator's Phone (508-796-3002 A	FZD-DEQEM Attr	n: Mark Bo	ser		/		t	
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GENERATOR'S CERTIFICATION: I hereby ceclare that th	a contents of this consignment	are fully and accurate	ty described above by	r <u> </u>				
proper shipping name and ara classified packed, marke according to applicable international and national gover	d, and labeled, and are in all resp rement regulations.	ects in proper condit	ion for transport by fa	ğuwa'y				
if I am a large quantity generator. I certify that I have a t	mooram in place to reduce the vo	dume and toxicity of	waste generated to th	e degree	I have determin	ed to b	e economicall	y practicable
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. Transporter 2 Acknowledgement of Recei	ot of Materials			erec.	~	~~~		Date
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Facility Owner or Operator: Certification of rec Printed/Typed Name red OMD Nu. 2050-0039 Expires 9-30-91		Signature					Month	Lioy Year

2.11 WEIGHT RECEIPTS AND BILLS OF LADING

The following weight receipts and Bills of Lading document the soil disposal associated with UST No. 0035

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IAIN OFFICE: IVERS 750-4200	OUNT BITUMINOUS PRODUC 5 CHERRY I DRIVE P.O. BOX - 69 DANVERS, MA 01923-5089 SHREWSBURY DIVISION 651 LAKE STREET AT RTE. 20 SHREWSBURY, MA 01545 OFFICE 881-1430 PLANT 754-47	ETS CO. T → 비 M E	ARRIVED JOB	CHECKED BY	C.O.D. CHarge C CARRIER #R 73979
stomer # ATE001 TEC ASSOC. 2 ACCORD PARK DRIVE DRWELL, MA 02061 17-878-6200	Job # BLDGFD US ARMY BLDG R45V TA FORT DEVENS, MA 014 PO# 37.04.72183	NK 35 33	, ≇ ≇7 6	NIX NAME OIL SOIL	TRUCK# 9
Time Tar 9:34:39 3100	e Net 0 75920	Gross 106920	Total 37.96		
Cost/Ton Percent Ta	x Load Cost Amount Tax	Dest Charge	Total Cost		
	37.96 9:34:39 am	Aug 20, 1992)	f	RECEIVED BY	THIS COMPANY WILL NOT BE RE- SPONSIBLE FOR DAMAGE CAUSED BY THUCKS DELIVERING MATERIAL BEYOND STREET PAVEMENT.
TRIM TAIN OFFICE: IVERS 750-4200	OUNT BITUMINOLIS PRODU 5 CHERRY (DRIVE P.O. BOX-2089 DANVERS, MA 01923-5085 SHREWSBURY DIVISIOI 651 LAKE STREET AT RTE. SHREWSBURY, MA 01545 OFFICE 881-1430 PLANT 754-4	UCTS CO. T I M 20 E	ARRIVED JOE	Cash Cash CHECKED I	C.O.D. Charge C
tomer # ATEO01 EC ASSOC. ACCORD PARK DRIVE RWELL, MA 02061 7-878-6200	Job # BLDGFD US ARMY BLDG FORT DEVENS, MA 014 PU5 37.04.72183	NIX 133	1 1 176	MIX NAME OIL SOIL	TRUCK# 9
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MATERIAL DESCRIPTION (TOTAL PROJECTED QUANTITY): CONTANGNATED DEF MS: + biother paint I shorten: boots CONTANGNATED SOL JZ.S. w (ant) Val (ary di) val (ary di) I shorten: boots TYPES OF CONTAMENATION: 	CONTACT/TEL 11 508-796-3002 4	TRANSPORTATION ACCIDENTI _Y YN
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Central - Req. BOSTON, MA 02101 AND THE ORIGINATING REGIONAL OFFICE	JUL 2 1 1992 DEP DeP Central - Req. THE ORIGINATI	Architel Information CY RESPONSE BRANCH STREET, SW FLOOR DN, MA DZIOL AND NO REGIONAL OFFICE

01-13-94 12:00PM FROM BARDON TRIMOUNT TO 918716781 P009/014

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AUG-14-92 THU 8:03	P. 01
OFLADING 1: 1/2/ DATE:	LADING WSC-89-001
TENERATOR NAME/ADDRESS: U.S. ARMY <u>AFZD-FM, Box 19</u> <u>FORT DEVENS, MA 01433</u> CONTACT/TEL 1: <u>508-796-3002</u>	STREET BUILDING 2452 UST #35 TOWN FORT DEVENS STATE MA DIA33 TRUNSPORTATION ACCIDENTI _Y XN
MATERIAL DESCRIPTION (TOTAL PROJECTED QUANTITY): CONTAMINATED SOL: <u>37.5</u> 25 00 rd (was) rol (c) yds)	NTAMINATED DESRIS: + shiorbest pids & sboorbest boorss vol (es yds) specily dri other (specify)
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TRUCK/TRACTOR REGISTRATION 1857 MM TRALER REGISTRATION 100 60 MM LEFT SITE AT 100 5 DATE 0-20-91 GENERATOR OR SECTION FACT FOR REPRESENTATIVES SIGNATURE:	QUANTITY SHIPPED: re (Land) vol (ca ýái) TOTAL PROJECTED SEPPED TO DATE TELS LOAD (enimad) <u>31.01</u> REJUDITING TO BE SHIPPED
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AUG-14-92 THU 8:03	P. 01
LOFLADING 1:	LADING WSC-89-001
GENERATOR NAME/ADDRESS: U.S. ARMY <u>AFZD-FM</u> , <u>Rox 19</u> <u>FORT DEVENS, MA 01433</u> CONTACTITE 1: <u>508-796-3002</u> ",	STITE OF CENERATION: STREET BUILDING 2452 UST #35 TOWN FORT DEVENS STATE MA DIABB TRANSPORTATION ACCIDENT? Y YN
MATERIAL DESCRIPTION (TOTAL PROJECTED QUANTITY): CONTAMINATED SOL: 37.5 25 CON vol (= yds)	ITALUNAIED DEBRIS: + abiorizes pués
TYPE OF CONTAMENATION:	Voluties _Y XN TPH: XY N
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GENERATOR'S SIGNATURE AND TO DEP AUTHORIZATION: DEP SIGNATURE (ANTHORIZATION: DEP SIGNATURE (on sections region);	DATE 7.20,92
(ני וקרשיישואי) DER SICNATURE (לברשיישות הקולה):	DATE:
TRUCKATRACTOR REGISTRATION MA AK 167 TRAILER REGISTRATION <u>CZ32</u> MM LEFT SITE AT <u>LACED</u> DATE <u>S-207</u> GENERATOR ON RECEIVING EACH ITY REPRESENTATIVES SIGNATURE: TRANSPORTER'S SIGNATURE TRANSPORTER'S SIGNATURE RECEIVING FACELITY REFRESENTATIVES SIGNATURE SUBJECTIVING FACELITY REFRESENTATIVES SIGNATURE DEPARTMENT OF ENVI DEPARTMENT OF ENVI BWSCEMERGENC ONE WINTER S	QUANTITY SHIPPED: $M(und)$ vol (re yea) TOTAL PROJECTED SEEPED TO DATE THIS LOAD (retimated) 374.20° REMAINTRO TO BE SHIPPED ALL THE R 7400G DATE $8/20/72^{\circ}$ ARR TIME $12:13^{\circ}$ MANNE CONSTRUCTION YRESPONSE BRANCH TREET, SU FLOOR M, MA GEIDS AND

2.12 PERMITS AND CERTIFICATIONS

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The following permit was obtained from the Fort Devens Fire Department for the closure of a UST. Following the permit there is a disposal receipt for the steel UST.

The Commonwealth of Massachusetts DEPARTMENT OF PUBLIC SAFETY DIVISION OF FIRE PREVENTION · 15 Ellinsell FOR REMOVAL AND TRANSPORTATIO TO APPROVED TANK YARD DIG BAFE NUMBER In accordance with the provisions of Chapter 148 Bill as provided in 220205 Name: <u>Atec Environmental Associates Inc.</u> Full name of person, firm or Corporation To transport underground steel storage tank(s) Section 38A this permit is granted to SHI Bill, man to Approved tank yards.] 49 State clearly type of inert gas used in steel storage tank steel tank: Dr method Name and address of contractor FD10#1491 disposing tank <u>ATEC</u> Acco Location to which tank will Accord Park Dr. Norvell N/A 62 Fee paid \$ be transported vard# This permit will expire 31 JAN 1992 ignature of official granting (Head of Fire Dept.) Dent 9 1
NAME AND ADDRESS OF OF APPROVED TANK YARD (AVXRSTON 3T. (AVXRSTON	RECEIPT OF DISPOSAL OF U	NDERGROUND STUDEN STOR	AGE TANK	
A value period by 0. day 1 have personally examined the Underground Portge Canding Also C. Delivered to this "approved tank yard of Fire Department FDDM _ 2 9 / 9 to transport this tark to this yard. Regulation 502 CDR 3.00 Provisions for Approving Underground Steel Storage Tark dismantling yards. A valid permit was issued by LOCAL Head of Fire Department FDDM _ 2 9 / 9 to transport this tark to this yard. Name and official title of approved tank yard owner or owners authorized representative: Janue Manage Market State	NAME AND ADDRESS OF APPROVED TANK YARD APPROVED TANK YARD NO.'_ Tank Yard Ledger 502 CMR	JOHN C. TOMBARELLO & SON 207 ALARSTON ST. LAVYRENCE, MASS. 01841 1 4901 3.03(4) Number:9	$\frac{200117}{2}$	
FORM F.P. 291 (rev. 9/88) (OVER) MASSACHUSETTS STATE FIRE MARSHAL'S OFFICE DIMENSIONS Tank Removed From Width Length	I certify under penalty of law delivered to this "approved tar ar Regulation 502 CMR 3.00 Provis: A valid permit was issued by I this tank to this yard. Name and official title of appr SIGNATURE This signed receipt of disposal	I have personally examined nk yard" by finm, corporation nd accepted same in conforma- ions for Approving Undergrou LOCAL Head of Fire Departm roved tank yard owner or own CPW TITLE 1 must be returned to the 10	the underground steel storage tank on or partnership <u>ATPC Environmentul ASS</u> ance with Massachusetts Fire Prevention und Steel Storage Tank dismantling yards. ment FDID# <u>1</u> <u>7</u> <u>9</u> <u>19</u> to transport ners authorized representative: <u>1-28-92</u> DATE SIGNED ocal head of the fire department	<u>.00</u> .
DIMENSIONS Width Length Tank 1 $-\frac{18}{x} J \underline{0.8}^{"}$ Tank 2 $ x$ Tank 4 $ x$ (feet) (feet) Tank 5 $ x$ Tank 5 $ x$ Tank 5 $ x$ Tank 5 $ x$	FDID# <u>7 9 7 9</u> pursuant f	(OVER)	MUST HAVE A RECEIPT OF DISPOSAL). MASSACHUSEITS STATE FIRE MARSHAL'S OF	FICE
DIMENSIONS Width Length Tank 1 $-\frac{48}{x} J \underline{0'8''}$ Tank 2 $ x$ Tank 3 $ x$ Tank 4 $ x$ (feet) (feet) Tank 5 $ x$ Tank 5 $ x$ (Tank 5 $ x$ (Tank 5 $ x$ (feet) (feet) Tank 7 Tank 7	and a second and a s	²² - 4 ₂ ,4 ₂ ,4 ² ,1 - 1 4 - 8 -1 64 , 4 4, 14, 1 - 1 ₄	an ingen a Anton a git ga paga a su an	
Width I LengthLength $Ft.$ Devens Sudg.# 2452 - tonk#35Tank 1 $-48'' \times 10'8''$ (no. street)Tank 2 $ \times$ (city or town)Tank 3 $ \times$ Fire Department Permit # $DONE-USFed$ (if applicable)Tank 5 $ \times$ (feet)(if applicable)	DIMENSIONS	Tank Re	emoved From	-
Tank 2 X (city or town) Tank 3 X Fire Department	Width Length Tank 1 <u>- 48^{°'} x J0'8</u> ″	(no.	Dereno Bldg. # 2452 - tonk#35 street) AULI	,
Tank 3 X Tank 4 X Tank 5 X (feet) (feet) Tank 5 X	Tank 2 X	(city or	r town)	
Tank 4 X Tank 5 X (feet) (feet)	Tank 3 X	Fina Da	nantment	
Tank 5 X (feet) (feet)	Tank 4 X	Permit	(if applicable)	
	Tank 5 X (feet) (feet)			

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UST-CLOSURE O/C CHECK LIST		<u> </u>			
				· · · · · · · · · · · · · · · · · · ·	
DEFINABLE FEATURE	DATE	TIME	MEASUREMENTS		NOTES
Calibrate PID & LEL/02 meters	1/15/92	8.00			Site Topography: Jane
-				*****	-
Drain & flush piping & pumps	1/15/92	11:00		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
Excavate to top of tank	1/15/97	11.20			Depth to tank: 1,5
	· · ·				
Vent tank note LEL/O2 levels & times	1115197		LEL	02	
	·····,······	T1: 2:15	0	70.9	
		T2: 3:00	0	70.7	
		T3: 3: 15	0	70.7	
		T4: 3:00	0	70.7	
		T5:			
		T6:			
		T7:			
· · · · · · · · · · · · · · · · · · ·	,	T8:			
		T9:			
		T10:			
		T11:			
		T12:			
Pump & clean tank:	1/7/92		<u>14</u> gal liquid		Tank Dimensions: 4×10.5'
Note quantities liquid (gal) & sludge (lbs)	1/15/92	11:30	25 die sludge		1- L good - no holes, rust
			Į	•	
Remove all tank connections, and cap openings	1/15/92	11:45		•	
Excepto coils to fine track			<u></u>		
	1/13/92	72:45			
Segregate stained soils: Note PID readings	1/15/97	17:45	PID (ppm)	NDIR (ppm)	
(if>10 ppm NDIR also)			43		stach-1
All soil reg to free tank visible			64		spill-1
contane Soil it soil contained	-				/
werst 2 segregat (spill-D					

ST-CLUDUKE U/C CHECK LIST]
1				
DEFINABLE FEATURE	DATE	TIME	MEASUREMENTS	NOTES
Remove tank, piping, pumps, and hardware.	1/15/92	12:50	Photographic Descriptions:	Soil Description: med. brown Fine and
Photograph excavation; note descriptions.			Photo 1: Jon 4	u/some fine - coarse around, colling
Sketch Schematic			Photo 2: Lang	boulders.
			Photo 3: excant	
			Photo 4: excary	
			Photo 5:	Depth to Groundwater/Conditions: N/H
			Photo 6:	
Place tank at safe distance from excavation	1/15/92	12:50	·	Depth of Excavation: 5,5
				noticeable a for from examption
Secure tanks transport off-site	1/15/97	2:30		wast contain at SE corner
Obtain 10 soil samples from	1/15/92	1100	PID (ppm) NDIR (ppm) .	Sample locations: 7.5-3.5 deep
excavation walls/bottom: Note PID/NDIR		L	SS1: 49	Swall
readings and sample locations.			SS2: 19,6	5 ull
			SS3: 18.4	W wall
		Į	SS4: 9.6	los wall
			SS5: 7.8	N wall
		ļ	SS6: 7,D	N wall
		Į	SS7: 0,4	E wit
L		L	SS8: 178	Ewall
		ļ	SS9: /07	6. Hom
		Į	SS10: 6.8	6. + to me
		<u> </u>		
1		<u> </u>		
			· · · · · · · · · · · · · · · · · · ·	
Obtain 2 soil samples & 1 water samples	1/15/92	1:25		Sample Locations:
for laboratory analysis. Note sample locations.		ļ		LSS1: ~ 558
	·	<u> </u>		LSS2: C 55 7
L				LWS1:
				1553: composite stadpike

f		ļ		
DEFINABLE FEATURE	DATE	TIME	MEASUREMENTS	NOTES
				tons of backfill
Backfill excavation (if clean):				Backfill description:
Note amount & type of backfill				
Close open excavation (if applicable)				
Restore surface and rope off				
Remove rubbish/debris				
Transport hazardous material off-site:				Amount Classification
Note amount/classification				· ·
Make copies of manifests, permits,				
and disposal receipts.				

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2.13 UST CLOSURE CHECKLIST

The following closure checklist was completed by ATEC for quality control purposes.

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2.14 INSTALLATION

The installation of a replacement UST 0035 was not performed. UST No. 0036

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3.0 UST No. 0036

3.1 POST REMOVAL REPORT

3.1.1 Introduction

This Post-Removal Report details the results of the closure of one 1,000-gallon, single wall, steel, Underground Storage Tank (UST) referenced as UST No. 0036, located at property known as Building 2458, Fort Devens, Massachusetts (the site). The purpose of the closure was to excavate the UST, evaluate the potential for the presence of oil and hazardous material at the site. The closure of this UST was conducted on January 17, 1992.

The basic Project Work Scope included:

- Procurement/administration of all federal, state and local permits, manifests, regulations, etc., associated with UST system closure.
- Excavating, venting, cleaning, transporting, and disposing of one 1,000-gallon waste oil UST by appropriately licensed contractors/facilities.
- Disposal of residual UST materials at a licensed facility.
- Field screening and analysis of soil from the excavation by Photoionization Detector (PID) and field analyzed with a portable Non-Dispersive Infrared (NDIR) Analyzer, to identify a potential release of oil and hazardous materials from the UST, if any.
- Laboratory Analysis of soil sampled from the UST excavation by a USEPA certified laboratory for Total Petroleum Hydrocarbons.
- Preparation of a Post-Removal Report, to include assimilation of information gathered, major findings and conclusions.

3.1.2 Subsurface Storage Tank Excavation and Removal

Prior to removal, UST No. 0036 was estimated to contain 54 gallons of No. 2 fuel oil and residual materials. Approximately 14 gallons of fuel oil were removed on January 7, 1992, and transported to a licensed treatment storage disposal facility (TSDF - Beede Waste Oil Corporation from Plastow, New Hampshire). See Section 3.10 for the applicable Hazardous Waste Manifests.

On January 17, 1992, one 1,000-gallon, subsurface, No. 2 fuel oil, storage tank was excavated and removed from the site. The UST was located adjacent to the south side of Building 2458. Site topography is relatively level.

Soils in the excavation consisted primarily of medium-brown, fine sand with some fine to coarse gravel. The tank was covered by approximately 1 foot of soil. The bottom of the excavation was approximately 5 feet below grade. Groundwater was encountered within the excavation at a depth of approximately 5 feet below grade level. A sheen was observed on the groundwater surface. Excavated soils required to free the tank were visibly contaminated. Within the excavation, soil located at the east and southeast portion of the excavation appeared the most heavily contaminated and exhibited a petroleum odor.

Once the top of the tank was exposed, the associated piping was drained and tank connections were removed. Tank openings were capped and the tank was removed from the excavation. Upon excavation and removal, the tank was observed to be in good condition with no holes, perforations, or severe corrosion. However, the return line was noted to be cracked.

Following venting of the tank, an access way was cut in the end of the tank to allow entry for cleaning. The tank was then entered and vacuumed/wiped clean of any residual materials. Approximately 40 gallons of No. 2 fuel oil and residual materials were



removed and drummed on January 17, 1992. Drummed material was transported to Beede Waste Oil Corporation, Plaistow, New Hampshire, on February 27, 1992 (see Section 3.10 for the applicable Hazardous Waste Manifests).

The scrap tank was removed from the site on January 17, 1992 and transported to the Contractor's yard, located on Lake George Street, Fort Devens for temporary storage. The tank was disposed of at Tombarello & Sons, Lawrence, Massachusetts, a licensed Massachusetts tank yard, on January 28, 1992. A copy of the disposal receipt is included in Section 3.11, Permits and Certifications.

3.1.3 Sampling and Analysis Plan

Ten soil samples were obtained from the excavation for field screening with a Photoionization Detector (PID) and field analyzed with a Non-Dispersive Infrared (NDIR) Analyzer. The PID field screening for Total Organic Vapors (TOVs) was conducted with an HNu photoionizer utilizing the jar headspace screening procedure outlined in the Hazardous Materials Containment Plan. The NDIR field screening for Total Petroleum Hydrocarbons (TPH) was conducted with a Horiba OCMA 220, utilizing the procedures outlined in the Hazardous Materials Containment Plan.

Eight of the samples (SS-1 to SS-8) were obtained from the excavation walls at a depth of approximately 2 to 3 feet below grade. Two of the samples (SS-9 and SS-10) were obtained from the bottom of the excavation at a depth of approximately 5 feet below grade. There was not enough groundwater within the excavation to obtain a sample for laboratory analysis.

Two composite soil samples (Stock-1 and Stock-2) were obtained from stockpiled soils for PID and NDIR field screening.



Two soil samples (LSS-1 and LSS-2) were obtained from the excavation for laboratory analysis. Soil Sample LSS-1 was obtained from the south wall of the excavation. Soil sample LSS-2 was obtained from the bottom of the excavation. One composite, soil sample (LSS-3) was obtained from stockpiled soils required to free the tank. These samples were analyzed for TPH utilizing USEPA Method 418.1. Sampling locations are depicted on the Sampling Schematic as Figure 3.2. The applicable chain of custodies are included in Section 3.9, Chain of Custody Forms.

3.1.4 Analytical results

The results from analysis with the PID and the NDIR analyzer of the ten soil samples obtained from the excavation, and the two composite samples obtained from stockpiled soil are as follows:

SAMPLE NUMBER	PID (ppm TOV)	NDIR (ppm TPH)
SS-1	94.0	9,692.4
SS-2	78.0	10,894.3
SS-3	106.0	9,570.0
SS-4	15.0	116.4
SS-5	4.4	22.4
SS-6	10.4	19.7
SS-7	8.8	30.8
SS-8	95.0	5,644.5
SS-9	220.0	9,578.2
SS-10	25.0	205.0
Stock-1	48.0	6,105.0
Stock-2	45.0	4,040.8

TABLE 3.1 - PID AND NDIR RESULTS

Laboratory analytical results of the two soil samples obtained from the excavation revealed a TPH concentration of 19,500 ppm for LSS-1, and 22,900 ppm for LSS-2. Laboratory analysis of the one soil sample obtained from the stockpiled soils revealed a TPH concentration of 11,800 ppm for LSS-3. (See Section 3.8, Laboratory Analytical Results).

3.1.5 Conclusions and Recommendations

As noted in ATEC's Post Removal Report dated February 3, 1993, ATEC's conclusions are as follows:

Upon excavation and removal, the tank was observed to be in good condition with no holes, perforations, or severe corrosion. However, the return line was noted to be broken.

Groundwater was encountered within the excavation at a depth of approximately five feet below grade. A sheen was noted, however, there was not enough groundwater to obtain a sample for laboratory analysis.

Excavated soils required to free the tank were visibly contaminated. Within the excavation, soil located at the east and southeast portion of the excavation were observed to be heavily contaminated. A petroleum odor from the excavation was evident.

Ten soil samples were obtained from the excavation for field screening and field analysis utilizing a PID and NDIR Analysis respectively. PID readings revealed TOV concentrations ranging from 4.4 ppm to 220 ppm. NDIR results revealed TPH concentrations ranging from 19.7 ppm to 10,894.3 ppm.

Two soil samples were obtained from the excavation for laboratory analysis for TPH. Analytical results for LSS-1 obtained from the south wall of the excavation revealed a TPH concentration of 19,500 ppm. Analytical results for LSS-2 obtained from the bottom of the excavation revealed a TPH concentration of 22,900 ppm.

One composite, soil sample (LSS-3) was obtained from stockpiled soils for laboratory analysis. Analytical results for LSS-3 revealed a TPH concentration of 11,800 ppm.

The following were recommended and implemented by ATEC subsequent to the submittal of the Post Removal Report.

Remedial excavation was conducted until laboratory analysis of soil samples showed a TPH concentration of <100 ppm. Field screening of soil was conducted during excavation utilizing a Photoinization Detector until TOV levels of <1 ppm were obtained prior to obtaining samples for laboratory analysis.

Soil borings were advanced and groundwater monitoring wells were installed to determine the vertical and horizontal extent of contamination. Continuous split spoon sampling and analysis was conducted utilizing field analysis techniques, i.e Photoionization Detector and Non-Dispersive Infrared Analysis, and laboratory analysis to document soil contamination levels.

Additionally excavated soils and stockpiled soils were laboratory analyzed for Total Petroleum Hydrocarbons, Volatile Organic Compounds, PCBs, 13 TCLP Metals, flashpoint and sulfide reactivity, cyanide reactivity, and corrosivity for disposal classification.

Soils excavated during the tank removals and remediation were disposed at a licensed TSDF.

3.2 SITE REMEDIATION AND CONTAMINATED SOIL DISPOSAL

3.2.1 Site Remediation

Following initial PID screening, additional excavation to remove contaminated soil and reach background levels (<1 ppm TOVs) by PID was conducted per order of the Contracting Officer's Representative and David Salvadore of the Massachusetts Department of Environmental Protection (DEP). Approximately <u>59.95</u> tons of contaminated soil was removed from the bottom of the excavation and all sidewalls during remedial excavation on July 30 and 31, 1992 (see Remedial Excavation Plan, Figure 3.3).

Approximately 1 foot of soil was removed from the sidewalls and bottom of the excavation. Eight soil samples (RSS-1A through RSS-8A) were obtained from the post-remedial excavation for PID field screening. Six samples (RSS-1A through RSS-4A, RSS-7A, RSS-8A) were obtained from the side walls at a depth of approximately 4 feet below grade. Two samples (RSS-5A and RSS-6A) were obtained from the bottom of the excavation at a depth of approximately 6 feet below grade. These soil samples were PID screened and TOV concentrations ranged from 66 ppm to 116 ppm.

An additional 1 foot of soil was removed from the excavation sidewall and at the bottom of the excavation. Following the removal of the additional one foot of soil, soil samples (RSS -1B through RSS-6B) were obtained from the excavation. RSS-1B through RSS-4B were obtained from sidewalls at a depth of approximately 4 feet below grade. RSS-5B and RSS-6B were obtained from the bottom of the excavation at a depth of approximately seven feet below grade. Soil samples from the north wall were not obtained due to access restrictions. Groundwater was encountered at a depth of approximately 7 feet within the central portion of the excavation. Soil samples were screened and TOV concentrations ranged from 6.4 ppm to 120 ppm. A remedial Excavation Plan is attached as Figure 3.3. Further excavation was not conducted per



order of the Contracting Officer's Representative. Remedial excavation PID screening results are listed in Table 3.2 as follows:

SAMPLE NUMBER	PID (ppm TOV)	LOCATION
RSS-1A	72.0	W. sidewall (4' B.G.)
RSS-2A	66.0	S. sidewall (4' B.G.)
RSS-3A	90.0	S. sidewall (4' B.G.)
RSS-4A	67.0	E. sidewall (4' B.G.)
RSS-5A	105.0	Bottom (6' B.G.)
RSS-6A	116.0	Bottom (6' B.G.)
RSS-7A	120.0	N. sidewall (4' B.G.)
RSS-8A	94.0	E. sidewall (4' B.G.)
RSS-1B	13.2	W. sidewall (5' B.G.)
RSS-2B	32.0	S. sidewall (5' B.G.)
RSS-3B	6.4	S. sidewall (5' B.G.)
RSS-4B	9.2	E. sidewall (5' B.G.)
RSS-5B	42.0	Bottom (7' B.G.)
RSS-6B	62.0	Bottom (7' B.G.)

TABLE 3.2 - PID SCREENING RESULTS

<u>KEY</u>:

RSS = Remediation Soil Sample B.G. = Below Grade

Four soil samples (LRS-1, LRS-3, LRS-4, and LRS-5) were obtained for laboratory analysis for TPH. Two soil samples (LRS-1, and LRS-5) were obtained for laboratory analysis for Volatile Organic Compounds (VOCs), and 13 Metals by toxicity characteristic leaching procedure (TCLP).

One groundwater sample (LWS-1) was obtained from the bottom of the excavation for laboratory analysis for TPH, VOCs and 13 Metals by TCLP. The following table documents levels revealed by laboratory analysis:

SAMPLE NUMBER	TPH (ppm)	VOCs (ppm)	13 TCLP METALS (PPM)	LOCATION
LRS-1	41	ND	0.19 (Zn)	W.sidewall (4' B.G.)
LRS-3	25,200	425 Toluene 1370 Ethylbenzene 1850 Total Xylenes	0.19 (Zn)	N. sidewall (4' B.G.)
LRS-4	13	NA	NA	E. sidewall (4` B.G.)
LRS-5	ND	NA	NA	S. sidewall (4' B.G.)
LWS-1	471	95 Benzene 50 Toluene 84 Ethylbenzene 400 Total Xylenes	NA	Bottom (8' B.G.)

TABLE 3.3 - LABORATORY ANALYSIS

LRS = Laboratory Remediation Sample (soil)

LWS = Laboratory Remediation Sample (water)

ND = Not Detected above the Method Reporting Limit

NA = Not Applicable

B.G.=Below Grade

E. Benzene= Ethyl Benzene

T. Xylenes= Total Xylenes

Laboratory Analytical Results may be referenced in Section 3.8

3.2.2 Soil Stratigraphy

The soil stratigraphy for the excavation consisted of an initial 4 inches of dark brown topsoil. The following 3 feet of excavation was a mixture of medium brown, unsorted, silt and fine to medium grain sand. The next foot of the excavation consisted of dark brown, loamy silt and sand. The remaining 3 feet of the excavation consisted of grey



sand. A layer of stained soil was present as a result of within the bottom 3 feet of the excavation. (See Figure 3.4 - Soil Stratigraphy).

3.2.3 Contaminated Soil Disposal

One composite soil sample (LSP-36) was obtained from stockpiled soil associated with the removal of the UST No. 0036 and the additional excavation conducted at the site. LSP-36 was laboratory analyzed for Volatile Organic Compounds (VOCs), Semivolatile Organic Compounds, 13 Metals by Toxicity Characteristic Leachate Procedure (TCLP), Polychlorinated Biphenyls (PCBs), sulfide/cyanide reactivity, flashpoint, and corrosivity for characterization and disposal purposes. Laboratory analytical results revealed 7.8 S.U. Corrosivity, 2,000 ppb Isophorone, 2.5 ppm Lead, 0.08 ppm Copper, 0.04 ppm Nickel, 0.44 ppm Zinc. All other analytical results were below the Method Reporting Limits.

Approximately 82 tons contaminated soil was removed and stockpiled during the original UST excavation and the remediation of the UST 0036 excavation. Contaminated soil was disposed for recycling at Trimount Bituminous Products Company, Shrewsbury, Massachusetts.

3.3 HYDROGEOLOGICAL INVESTIGATION

3.3.1 General Explanation of Procedures

Due to apparent release of No. 2 fuel oil from UST No. 036, three groundwater monitoring wells were drilled and installed in the vicinity of UST No. 0036 to assess soil and groundwater conditions.

Prior to advancing soil borings at the site, "Dig-Safe" was contacted. Dig-Safe contacts various utilities to mark their service connections on public ground surfaces. The Fort Devens Plumbing Department was contacted and site plans were reviewed that depicted

underground utilities (i.e. water, gas, and sewer). Ron DeFilippo, Contracting Officer Representative (COR) met with Craig D. Trombly, Project Manager with ATEC to determine monitoring well locations to assess the potential release of No. 2 fuel oil from the 1,000-gallon UST (UST No. 0036). Geosearch, Inc. of Leominister, Massachusetts, was subcontracted by ATEC to install the monitoring wells at the site. Monitoring well borings were advanced on August 24, 1992, utilizing hollow stem auger drilling techniques. Split spoon samplers were utilized to collect subsurface soil samples and determine soil types at 5 foot intervals.

3.3.2 Soil Borings for Monitoring Wells

Monitoring well MW-1 was installed approximately 9 feet west of Building 2458 and approximately 36.5 feet northwest of the backfilled tank excavation (See Figure 3.6, Site Plan). MW-1 is located hydrogeologically upgradient from the former UST No. 0036. MW-1 was advanced to a depth of 13 feet to assess the release of No. 2 fuel oil from the removed UST. Soil types encountered from grade level to a depth of approximately 6 feet below grade consisted primarily of very loose to medium dense sand and silt. Soil encountered from a depth of approximately 11 to 13 feet below grade consisted primarily of PID screenings revealed TOV concentrations of 2.0 ppm, 1.0 ppm, and 1.0 ppm in soil samples collected at grade level to 2 feet below grade, 4 to 6 feet below grade, and 11 to 13 feet below grade, respectively. Drill cutting soils, revealing a TOV concentration of 390 ppm, were stockpiled on plastic. See Section 3.3.9 - Boring Logs for further information.

Monitoring well MW-2 was installed approximately 8 feet west of Building 2458 and approximately 34 feet south of the backfilled tank excavation (see attached Site Plan). MW-2 is located hydrogeologically downgradient of the former UST No. 0036. MW-2 was advanced to a depth of 14 feet to assess the release of No. 2 fuel oil from the removed UST. Soil types encountered from grade level to a depth of approximately 6 feet below grade consisted primarily of very loose, moist, dark brown silt. Soil types

encountered from a depth of approximately 9 to 11 feet below grade consisted primarily of very loose to medium dense, tan/grey, fine and medium wet sand. Soil types encountered from a depth of 14 to 16 feet below grade consisted primarily of very loose to very dense, wet, fine to coarse grey/brown sand and silt. Results of PID screenings revealed TOV concentrations of 2.0 ppm, 11.0 ppm, 5.0 ppm, and 0.8 ppm in soil samples collected at grade level to 2 feet below grade, 4 to 6 feet below grade, 9 to 11 feet below grade, and 14 to 16 feet below grade, respectively. Drill cutting soils, revealing a TOV concentration of 400 ppm, were stockpiled on plastic. Petroleum odors were noted in soils obtained from a depth of 9 to 11 feet below grade. See Section 3.3.9 - Boring Logs for further information.

Monitoring well MW-3 was installed approximately 10 feet west of Building 2458 and approximately 60 feet east of the backfilled tank excavation (see attached Site Plan). MW-3 is located hydrogeologically upgradient of the former UST No. 0036. MW-3 was advanced to a depth of 14 feet, 6 inches to assess the potential release of No. 2 fuel oil from the removed UST. Soil types encountered from grade level to a depth of approximately 2 feet below grade consisted primarily of medium dense, black, fine sand and gravel. Soil encountered from a depth of approximately 4 to 6 feet below grade consisted primarily of medium dense, grey coarse sand. Results of PID screenings revealed TOV concentrations of 0.8 ppm, 70.0 ppm, and 190 ppm in soil samples collected at grade level to 2 feet below grade, 4 to 6 feet below grade. Groundwater was encountered during drilling at approximately 11.5 feet below grade. Auger refusal was encountered at a depth of approximately 14.5 feet, below grade. See Section 3.3.9 - Boring Logs for further information.

3.3.3 Results of Soil Screenings and Chemical Analyses

Split spoon soil samples were obtained at approximate 5 foot intervals during the

installation of monitoring wells at the site. Split spoon soil samples were screened for TPH utilizing a NDIR analyzer. Subsurface soil samples were placed directly into prelabeled, precleaned containers and immediately placed on ice for shipment to the laboratory. TPH samples were placed in 500-ml amber glass jars.

Three subsurface soil samples were selected during the installation of monitoring well one (MW-1) and labelled MW-1.1, MW-1.2, and MW-1.3. Results of NDIR screening revealed TPH concentrations of 8.5 ppm, 78.1 ppm, and 14.6 ppm in soil samples MW-1.1, MW-1.2, and MW-1.3, respectively.

Four subsurface soil samples were selected during the installation of monitoring well two (MW-2) and labelled MW-2.1, MW-2.2, MW-2.3, and MW-2.4. Results of NDIR screening revealed TPH concentrations of 51.3 ppm, 22.4 ppm, 21.3 ppm, and 19.7 ppm in soil samples MW-2.1, MW-2.2, MW-2.3, and MW-2.4, respectively. Analytical results of subsurface soil samples collected during the site investigation are depicted in Table 3.4 - Summary of Subsurface Soil Analyses.

SAMPLE NUMBER	SAMPLE DEPTH	TPH (ppm)
MW-1.1	0'-2'	8.5
MW-1.2	4'-6'	78.1
MW-1.3	9'-11'	14.6
MW-2.1	0`-2`	51.3
MW-2.2	4'-6'	22.4
MW-2.3	9'-11'	21.3
MW-2.4	14'-16'	19.7
MW-3.1	0'-2'	32.2
MW-3.2	4'-6'	61.5
MW-3.3	9'-11'	16.8

TABLE 3.4 - SUMMARY OF SUBSURFACE SOIL ANALYSES

Three subsurface soil samples were selected during the installation of monitoring well three (MW-3) and labelled MW-3.1, MW-3.2, and MW-3.3. Results of NDIR screening revealed TPH concentrations of 32.2 ppm, 61.5 ppm, and 16.8 ppm in soil samples MW-3.1, MW-3.2, and MW-3.3, respectively.

3.3.4 Details of Monitoring Well Construction

Monitoring wells were typically constructed of a length of bottom-plugged, two inch diameter Polyvinyl Chloride (PVC) well screen (0.010 inch slot) followed by a length of two inch diameter PVC solid riser to grade level. No. 2 washed sand was packed to approximately one foot above the screen followed by a one to two foot thick bentonite grout packing. The remainder of the boring was backfilled with washed silica sand and concrete surface seal to grade. Monitoring wells were fitted with a 4 inch diameter flush mount cast iron roadbox.

3.3.5 Standard Type Survey and Determination of Groundwater Gradient

An instrument survey was conducted by ATEC personnel to determine the relative locations and elevations of the groundwater monitoring wells and significant surficial features. The survey was based on an assumed arbitrary datum. The monitoring wells were gauged utilizing an electronic water level meter prior to sampling to determine the groundwater elevations at each well.

Groundwater elevations were then calculated utilizing the survey and gauging data. Based on the gauging data, it appears that groundwater in the area flows generally to the south across the site at a lateral hydraulic gradient of 0.022 ft/ft. Groundwater at the site occurs at depths of 7.13 feet, 7.66 feet, and 7.08 feet below grade for MW-1, MW-2, and MW-3, respectively.



Table 3.5 - summarizes groundwater elevations measured at the three monitoring wells installed at the site.

Monitoring Wells	Date	Rim Elevation (ft)	Depth to Groundwater	Groundwater Elevation (ft)
MW-1	11-01-92	101.73	7.13	94.60
MW-2	11-01-92	101.65	7.66	93.99
MW-3	11-01-92	101.80	7.08	94.72

TABLE 3.5 - SUMMARY OF GROUNDWATER ELEVATIONS

3.3.6 Results of Groundwater Chemical Analysis

Each of the three groundwater monitoring wells were sampled on November 1, 1992. The groundwater samples were analyzed for TPH (USEPA Method 418.1). Prior to sampling, approximately three well volumes of groundwater were purged from the well. Groundwater samples were placed directly into pre-labelled, pre-cleaned 500-ml amber glass jars and placed on ice for immediate shipment to the laboratory. The samples were analyzed by Environmental Science Services (ESS) of Providence, Rhode Island. Chain-of-custody forms were completed and included in the shipment.

Laboratory analytical results did not reveal detectable concentrations of TPH in the groundwater samples collected from MW-1, MW-2, and MW-3.

Analytical results of groundwater samples collected during the site investigation are depicted in Table 3.6 - Summary of Groundwater Analyses.

SAMPLE NUMBER	ТРН (ррні)
MW-1	N.D.
MW-2	N.D.
MW-3	N.D

TABLE 3.6 - SUMMARY OF GROUNDWATER ANALYSES

ND- Not Detected

3.3.7 Summary of Findings

On August 24, 1992, three groundwater monitoring wells were installed to assess soil and groundwater conditions in the vicinity of UST No. 0036. Soil samples collected during drilling were screened in the field for TOVs utilizing a PID. The soil sample (MW-3.3) exhibiting the highest TOV concentration of 190.0 ppm was obtained during the installation of MW-3 at a depth of 9 to 11 feet below grade.

NDIR screening of the subsurface soil samples collected during the installation of MW-1, MW-2, and MW-3 revealed TPH concentrations ranging between 8.5 ppm and 78.1 ppm. The soil sample (MW-1.2) exhibiting the highest TPH concentration of 78.1 ppm was obtained during the installation of MW-1 at a depth of 4 to 6 feet below grade.

Results of laboratory analyses did not reveal detectable TPH concentrations in groundwater samples collected from MW-1, MW-2, and MW-3. There are no regulatory levels for TPH in groundwater in the state of Massachusetts.

3.3.8 Recommendations

Based upon TPH concentrations soil samples, ATEC recommends the implementation of a quarterly groundwater monitoring program. Groundwater samples should be collected from MW-1, MW-2, and MW-3 on a quarterly basis and laboratory analyzed for TPH and Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX).

3.3.9 Boring Logs

The attached boring logs were recorded during drilling and monitoring well installation activities of MW-1, MW-2, and MW-3, located at Building 2458, Fort Devens, Massachusetts (the site). Groundwater monitoring wells were installed on August 24, 1992 to assess for potential petroleum hydrocarbon contamination associated with one 1,000-gallon No. 2 fuel UST removed from the site.



GROUND WATER MONITORING WELL BORING/INSTALLATION LOG

LOG OF BORING/WELL: MW.1

ROJECT NAME: FT. DEVENS ROJECT NUMBER: 37.07.451 ROJECT LOCATION: DRING LOCATION: <u>See Site Schematic</u> LIST[#] 36 BLDG. 2+5B

.

FOREMAN: INSPECTOR: C. TROMBLY DATE: 8-24-92

SOIL/ROCK DESCRIPTION	DEPTH	SAMP.	S.P.T.	Length of Protect. Casing $60''$ Above Surface Elevation
			16.10	Length of Riser Pipe Flowsh Above Surface Elevation
MESIUM DENSE			10.3	Surface Elevation Flush
PID 2.0	0'-z'	.5.5, 1.1		Type/Thickness of 1.0' CONCLETE Surface Seal
× ×			21.6	ID/Type of Protect. 3. 4 Casing
× ×				・Depth Bottom ノゟ ゚ of Casing
MEDILMDENSE TO X Very. Loole	1.1.1	5.5.		ID/OD/Type of Riser $2^{\#} P_{VL}$ Pipe
SANGT SILLY FIDT.U	4-6	1,2	Ç.7	Diameter of Borehole g''
X X X			9.8	Type of Backfill
MEDILA dense . PID-1.0				Around Riser Pipe
X. SAIUS / SILT	11-13	5.5. 1.3		· Depth/Type of Bottom 20
				Seal
				・Depth Top of 3.0 Pervious Pipe <i>,01 5と0て</i>
	:			· ID/OD/Type of 2" AVC
				Pervious Pipe
				• Type of Backfill <i>PUASHED STATE</i> Around Pervious Pipe
				・Depth Bottom of ノ ろ , ク Pervious Pipe
				• Type of Backfill



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GROUND WATER MONITORING WELL BORING/INSTALLATION LOG





GROUND WATER MONITORING WELL BORING/INSTALLATION LOG

LOG OF BORING/WELL: MW 3

OJECT NAME:

OJECT NUMBER: OJECT LOCATION: UST 36 - BLDG. 2458

 $\left(\right)$

RING LOCATION: See Site Schematic

FOREMAN: INSPECTOR: C. TROMBLY DATE: 8-24-92

SOIL/ROCK DESCRIPTION	DEPTH	SAMP.	S.P.T.			Length of Protect. Casing $4''$ Above Surface Elevation
FINESAND + GRAVEL		110.		╡╏┌┐╽		Length of Riser Pipe Above Surface Elevation FLASK
BLALK IN LOLOIC					- ←	Surface Elevation
PID = 0.8	6-2'	155 3.1	6-12		-	Type/Thickness of 1,0 con ist
FINE SHAND) SILT OLDR = RUST - GREY						ID/Type of Protect. 3,o " PIA, Casing
LOOSE PID = 70.0	4'-6'	55 3.2	10.8 45			Depth Bottom ノー & ′′ of Casing
COARCE SAND Colol Strey						ID/OD/Type of Riser <i>ヹ゛Pv</i> L Pipe
MEDIUM DENSE PID= 190.0	9'-11'	155 3.3	7-7 9-8			Diameter of Borehole g
+20 TABLE 11.5 '					~ ~ ~	Type of Backfill Around Riser Pipe
AUGER REFUSAL	14-6					Depth/Type of Bottom 2 D - BENTAL 1E Seal
						- Depth Top of <i>나</i> . ∂ Pervious Pipe
						- ID/OD/Type of 2 [゜] <i>P</i> vC Pervious Pipe
					-	- Type of Backfill ONSHED SILAGE Around Pervious Pipe
					-	- Depth Bottom of <i>ノ দ, 0</i> Pervious Pipe
						- Type of Backfill レタイッシモ Below Pervious Pipe

3.4 BACKFILL

The excavation was lined with polyethylene plastic sheeting and backfilled with 47 cubic yards of uncontaminated fill material on July 29, 1992. Backfill material consisted of clean granular fill. The granular fill contained particles which were less than three inches in diameter and was free of roots and debris, as per Section 4, Paragraph 5 of the contract. Backfill material was compacted to subgrade level according to contract specifications and with the approval of the Contracting Officer's Representative.

3.5 SURFACE RESTORATION

Following backfill of the excavation, approximately 140 square feet of loam was spread at the site. Seeding was conducted to complete surface restoration on October 21, 1992.

3.6 PHOTOGRAPHIC DOCUMENTATION

The following photographs are of the removed UST, the excavation and a post removal view of the excavation:

- A-1: One side of removed tank.
- A-2: Opposite side of removed tank.
- A-3: Excavation as viewed from north, facing south.
- A-4: Excavation as viewed from south, facing north.





3.7 OCMA 220 DATA SHEETS

The following information was organized from the data collected from the Non-Dispersive Infrared Analyzer.

- SS-1 to SS-10, Stock-1 and Stock-2: Soil samples obtained from original excavation and stockpiled soil on January 17,1992.
- RS-1 to RS-6, RS-7 and RS-8: Soil samples obtained from post-remedial excavation.
- MW 1.1 to MW 1.3; MW 2.1 to MW 2.3; MW 3.1 to MW 3.3: Soil samples obtained from split spoon samples during monitoring well installation.



TPH SOIL ANALYSES BY NON-DISPERSIVE INFRARED ANALYZER - MODIFIED EPA STANDARD TEST METHOD 418.1

PROJECT NAME, NUMBER, TANK: U.S. ARMY - FORT DEVENS 37.07.91.451 UST # 36

DATE: <u>Br 21, 1992</u> Operator: richard W. german

CALIBRATION DATA

TYPE	FIRST REA	4DING	SECOND READING		THIRD REA	ADING	SPAN
CALIBRATION	INITIAL	FINAL	DITI'IAL	FINAL	<u>DITI'IAL</u>	FINAL	CHECK
ZERO:	5.2	0.0	-1.3	0.0	1.3	0.0	28.0
SPAN:							
ZERO:			·			<u></u>	

ANALYTICAL DATA

SAMPLE	WEIGHT (g)		1st DILUTION RATIO (ml) 2nd DILUTION R			<u>N RATIO (ml)</u>	HISTRUME	IT RESULTS	CONCENTRATION	
NUMBER	GROSS	TARE	<u>F-113</u>	<u>SAMPLE</u>	<u>F-113</u>	SAMPLE	<u>1st</u>	<u>2nd</u>	<u>3ni</u>	mgʻl
-										
STOCK-1	30.8	76.1	17.5	1.0			55.1	51.8	51.7	6105.0
STOCK-2	78.3	72.6	17.5	1.0			40.3	41.5	41.5	4040.8
	79.3	74.3	17.5	1.0	20.0	0.5	77.5	38.9	39.4	9693.4
SS-2	77.7	74.2	17.5	1.0	20.0	0.5	66.2	30.8	31.0	10894.3
88-3	80.4	75.3	20.0	0.5	25.0	0.5	82.0	31.7	31.9	9570.0
88-4	82.2	76.0	20.0	0.5	17.5	1.0	0.0	1.1	1.3	116.4
	81.1	75.6	17.5	1,0	17.5	3,0	0.0	0.5	0.6	
88-6	81.8	76.6	17.5	1.0	17.5	3.0	0.0	0.4	0.5	19.7
\$8-7	88.5	77.1	17.5	1.Ŭ			0.3	0.3		30.8
<u>\$\$-8</u>	85.5	77.9	17.5	1.0	20,0	0.5	88.5	34.6	35.0	5664.5
88-9	81.1	73.8	20.0	0,5	25.0	0.5	<u>90.1</u>	45.5	45.7	9578.3
\$3-10	31.0	76 2	20.0	0.5			1.5	0.9	0.8	205.0
and the set of the set			20.0							#Enor#
						a, <u>an</u> , <u>an</u>				FC warry of
			••••						and search and	▲ • •• !
TPH SOIL ANALYSES BY NON-DISPERSIVE INFRARED ANALYZER - MODIFIED EPA STANDARD TEST METHOD 418.1

PROJECT NAME, NUMBER, TANK: U.S. ARMY - FORT DEVENS 37.07.91.451 UST 0036

DATE: <u>Aug 3, 1992</u> OPERATOR: <u>Charles Langenhagen</u>

CALIBRATION DATA

TYPE	FIRST REA	DING	SECOND RI	EADING	THIRD REA	ADING	SPAN
CALIBRATION	<u>INITIAL</u>	FINAL		FINAL	_INITIAL	FINAL	CHECK
ZERO:	1.8	0.0	0.5	0.0	-0.7	0.0	27.3
SPAN:	34.0	40,0	47.0	40.0	40.5	40.0	
ZERO:	6.2	0.0	5.8	0.0	-0.6	0.0	

ANALYTICAL DATA

SAMPLE	WEIGH	<u>T (g)</u>	1st DILUTIC	<u>ON RATIO (ml)</u>	2nd DILUTIC	<u>ON RATIO (ml)</u>	INSTRUME	<u>NT RESULTS (</u>	(ppm)	_ CONCENTRATION
NUMBER	GROSS	TARE	F-113	SAMPLE	<u> </u>	SAMPLE	<u>lst</u>	2nd	3rd	mg/1
RS-1	80.4	74.6	17.5	3.0			0.6	0.9		31.8
RS-2	85.9	80.1	17.5	3.0			0.8	0.9		31.8
RS-3	85.4	79.6	17.5	3.0			0.4	0.7		24.7
RS-4	85.0	79.9	17.5	3.0			0.4	0.7		28.1
RS-5	85.8	80.0	17.5	3.0			2.5	2.5		88.4
RS-6	85.7	79.7	17.5	3.0			14.0	16.1		550.1
RS-7	80.3	75.1	25.0	0.5			51.7	51.2		15064.6
RS-8	80.5	75.0	25.0	0.5			32.3	30.7		8540.2

TPH SOIL ANALYSES BY NON-DISPERSIVE INFRARED ANALYZER - MODIFIED EPA STANDARD TEST METHOD 418,1

PROJECT NAME, NUMBER, TANK: U.S. ARMY - FORT DEVENS 37.07.91.451 UST 0036

DATE: <u>Aug 25, 199</u> OPERATOR: <u>William McConnell</u>

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CALIBRATION DATA

TYPE	FIRST REA	ADING	SECOND RE	EADING	THIRD RE	ADING	SPAN
CALIBRATION	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	CHECK
ZERO:	1,2	0.0	-0.3	0.0	-3.0	0.0	26.0
SPAN:	33.7	40.0	45.3	40.0	40.8	40.0	
ZERO:	5,2	0.0	-4,8	0.0	-0.5	0.0	

ANALYTICAL DATA

SAMPLE	WEIGH	T (g)	1st DILUTIC	<u>)N RATIO (ml)</u>	2nd DILUTIC	ON RATIO (ml)	INSTRUME	NT RESULTS	(ppm)	CONCENTRATION
NUMBER	GROSS	TARE	F-113	SAMPLE_	F-113	SAMPLE	1st	2nd	3rd	mg/l
<u></u>										
MW1.1	80.2	75.4	17.5	3.0			0.3	0.2		
MW1.2	81.1	74.8	17.5	3.0			1.6	2,4		78,1
MW1.3	80.6	75	17.5	3.0			0.5	0,4		14.6
	81.1	75.1	17.5	3.0			1.5	1,5		51.3
MW2.2	80.8	75.3	17.5	3.0			1,2	0.6		22,4
MW2.3	82.7	75.0	17.5	3.0			0.7	0,8		21,3
MW2 4	80.3	75.1	17.5	3.0			0.9	0.5		19.7
MW3.1	80.3	75.2	17.5	3.0			1.3	0.8		32,2
MW3 2	80.2	75.2	17.5	3.0			1.0	1.5		61.5
MW3.3	82.5	75.2	17.5	3.0			0.5	0.6		16.8

TPH SOIL ANALYSES BY NON-DISPERSIVE INFRARED ANALYZER - MODIFIED EPA STANDARD TEST METHOD 418.1

PROJECT NAME, NUMBER, TANK: U.S. ARMY - FORT DEVENS 37.07.91.451 UST 0036

DATE: <u>Aug 3, 1992</u> OPERATOR: <u>Charles Langenhagen</u>

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CALIBRATION DATA_____

TYPE	FIRST REA	DING	SECOND READING		THIRD RE.	ADING	SPAN
CALIBRATION	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	CHECK
ZERO:	1.8	0.0	0.5	0.0	-0.7	0.0	27.3
SPAN:	34.0	40.0	47.0	40.0	40.5	40.0	
ZERO:	6.2	0.0	-5.8	0.0	-0.6	0.0	

ANALYTICAL DATA

SAMPLE	WEIGH	<u>Г (g)</u>	1st DILUTIO	N RATIO (ml)	2nd DILUTIC	<u>ON RATIO (ml)</u>	INSTRUMEN	IT RESULTS	(ppm)	_ CONCENTRATION
NUMBER	GROSS	TARE	F-113	SAMPLE	F-113	SAMPLE	1st	2nd	3rd	mg/l
LRS-2	80.4	75.2	25.0	0.5			42.0	43.3		12740.2

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3.8 LABORATORY ANALYTICAL RESULTS

The following laboratory analytical reports are associated with the removal, remedial excavation and stockpiled soil. These reports were organized and provided by Environmental Science Services, Inc. Results are included for:

- LSS-1, LSS-2, and LSS-3: Soil samples obtained from original excavation.
 Laboratory analyzed for TPH (Method 418.1).
- LRS-1, LRS-3, LRS-4, LRS-5: Soil samples were obtained from post-remedial excavation. Laboratory analyzed for TPH (Method 4181.). LRS-1 and LRS-3 were also analyzed for VOCs (Method 8240), and 13 Metals by TCLP (Method 6010).
- LWS-1: Groundwater sample obtained from Post-remedial excavation. Laboratory analyzed for TPH (Method 418.1), VOCs (Method 8240) and 13 Metals by TCLP(Method 6010).
- LSP-36: Soil sample obtained from stockpiled soil for disposal classification.
 Laboratory analyzed for Corrosivity (pH) (Method 9045), flashpoint (Method 1010), PCBs (Method 8080), Reactive Cyanide (Method 7.3.3.2), Reactive Sulfide (Method 7.3.4.1), VOCs (Method 8240), Semivolatile Organics (Method 8270), 13 TCLP (Method 6010).
- MW-1, MW-2 and MW-3: Groundwater sample obtained from monitoring wells installed at the site. Laboratory analyzed for TPH (Method 418.1).

IRTIFICATE OF ANALYS IS

Date: 1/30/92 Job: 190 Account: 95659 Received: 1/22/92

Project: DEVENS-TANK 36

ATEC ENVIRONMENTAL CC. 62 Accord Park Drive Norwell, MA 02061

n: Mr. Mark Baldi

mple mber	Method Number	Paran eter	Result	Unit	Sample Description
19001	EPA-160.3 EPA-418.1	Total Solids TPH/JR (Dry Wt.)	81 19500	∛ mg∕kg	LSS-1
19002	EPA-160.3 EPA-418.1	Total Solids TPH/JR (Dry Wt.)	85 22900	% mg∕kg	LSS-2
19003	EPA-160.3 EPA-418.1	Tota] Solids TPH/1R (Dry Wt.)	88 11800	% mg∕kg	LSS-3

Device Dickipson Laboratory Manager

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ironmental Science Services

532 Atwells Avenue, Providence, Rhoc a Island 02909 (401) 421-0398 Fax. (401) 421-5731

RTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants Client Project ID: UST 36 Bldg. 2458 ESS Project ID: 921996 Client Sample ID: LRS-1 ESS Sample ID: 921996-01 Date Sample Received: 8/3/92 Date Reported: 8/17/92

Parameter	Results	Units	MRL	Method
Percent Solids	84	% w/w	1	160.3
Total Petroleum Hydrocarbon-IR	41	mg/Kg	12	418.1
Volatile Organics	ND	ug/Kg	Attached	8260
Toxicity Characteristic Leaching F Zinc	Procedure 0.19	mg/L	Attached	1311 6010

TPHIR reported on dry weight basis

ND = Not Detected above the Method Reporting Limit(MRL)

Approved by: Dickinson

Laboratory Director

Date: 18 1/2 51



RTIFICATE OF ANALYSIS TCL VOLATILE ORGANICS Method 8260

Client: ATEC Environmental Consultants						
Client Project ID: UST 36 Bldg. 2458						
Client Sample ID: LRS-1						
Date Sample Received: 8/3/92						

ESS	Project	ID:	921996
ESS	Sample I	D:	921996-01
Date	e Reporte	ed:	8/17/92

Parameter	Result (ug/Kg)	MRL
Methylene Chloride	ND	5
1,1-Dichloroethane	ND	5
Chloroform	ND	5
Carbon Tetrachloride	ND	5
1,2-Dichloropropane	ND	5
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Tetrachloroethene	ND	5
Chlorobenzene	ND	5
1,2-Dichloroethane	ND	5
1,1,1-Trichloroethane	ND	5
Bromodichloromethane	ND	5
Trans-1,3-Dichloropropene	ND	5
Bromoform	ND	5
1,1,2,2-Tetrachloroethane	ND	5
Benzene	ND	5
Toluene	ND	5
Ethyl Benzene	ND	5
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl Chloride	ND	10
Chloroethane	ND	10
1,1-Dichloroethene	ND	5
1,2-Dichloroethene (Total)	ND	5
Trichloroethene	ND	5
Acetone	ND	10
Carbon Disulfide	ND	5
2-Butanone	ND	10
Cis-1,3-Dichloropropene	ND	5
4-Methyl-2-Pentanone	ND	10
2-Hexanone	ND	10
Styrene	ND	5
Xylenes (Total)	ND	10

ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

David Dickinson Laboratory Director

Date: 18 Aug 7 L

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RTIFICATE OF ANALYSIS

TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

METALS

EPA METHOD 1311

Client: ATEC Environmental Consultants

Client Project ID: UST# 36, Bldg. 2458

Client Sample ID: LRS-1

ESS Sample ID: 921996-01

Date Sampled: 7/31/92 Date TCLP Performed: 8/16/92

Date Leachate Extracted: 8/17/92

Date Extract Analyzed: 8/18/92

	Act	ual	Adjusted*		
Target Analyte	Sample Result (mg/L)	Method Reporting Limit	Sample Result (mg/L)	Method Reporting Limit	
Antimony	ND	0.2	ND	0.3	
Arsenic	ND	0.2	ND	0.2	
Cadmium	ND	0.02	ND	0.03	
Chromium	ND	0.05	ND	0.06	
Lead	ND	0.1	ND	0.1	
Mercury	ND	0.005	ND	0.005	
Selenium	ND	0.3	ND	0.3	
Silver	ND	0.05	ND	0.05	
Copper	ND	0.02	ND	0.02	
Nickel	ND	0.04	ND	0.04	
Zinc	0.19	0.02	0.19	0.02	
Beryllium	ND	0.02	ND	0.03	
Thallium	ND	0.3	ND	0.4	

* Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: David Dickinson

Laboratory Director

Date: 18 Parg 5 L



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RTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants		
Client Project ID: UST 36 Bldg. 2458	ESS Project ID:	921996
Client Sample ID: LRS-3	ESS Sample ID:	921996-02
Date Sample Received: 8/3/92	Date Reported:	8/17/92

Parameter	Results	Units	MRL	Method
Percent Solids	89	% w/w	1	160.3
Total Petroleum Hydrocarbon-IR	25,200	mg/Kg	112	418.1
Volatile Organics Toluene Ethyl Benzene Total Xylenes	425 1,370 1,850	ug/Kg ug/Kg ug/Kg	Attached Attached Attached	8260 8260 8260
Toxicity Characteristic Leaching Zinc	Procedure 0.19	mg/L	Attached	1311 6010

TPHIR reported on dry weight basis

MRL = Method Reporting Limit

Approved by: Dávid/Dickinson Laboratory Director

Date: 1394-52

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vironmental Science Services

532 Atwells Avenue, Providence, Rhode Island 02909 (401) 421-0398 Fax. (401) 421-5731

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	In	Response To The Future	
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RTIFICATE OF ANALYSIS TC	L VOLATILE ORGANIC Method 8260	S	
Client: ATEC Environmental	Consultants		
Client Project ID: UST 36 B	ldg. 2458	ESS Project ID:	921996
Client Sample ID: LRS-3		ESS Sample ID:	921996-02
Date Sample Received: 8/3/9	2	Date Reported:	8/17/92
Parameter	Result (ug/Kg)		MRL
Methylene Chloride	ND	•	25
1,1-Dichloroethane	ND		25
Chloroform	ND		25
Carbon Tetrachloride	ND		25
1,2-Dichloropropane	ND		25
Dibromochloromethane	ND		25
1,1,2-Trichloroethane	ND		25
Tetrachloroethene	ND		25
Chlorobenzene	ND		25
1,2-Dichloroethane	ND		25
1,1,1-Trichloroethane	ND		25
Bromodichloromethane	ND		25
Trans-1,3-Dichloropropene	ND		25
Bromotorm	ND		25
1,1,2,2-Tetrachloroethane	ND		25
Benzene	ND		25
Toluene	425		25
Ethyl Benzene	1,370		25
Chloromethane	ND		50
Bromomethane	ND		50
Vinyi Chioride	ND		50
Unioroethane	ND		50
1,1-Dichioroethene	ND		25
1,2-Dichloroethene (Total)	ND		25
Trichioroethene			25
Acetone Corbon Digulfide			5U 2E
Carpon Disuillae			20
Z-Bulanone Cia-1 3-Diabloronano			50 25
A-Methyl-2-Dentence			20
2-Hexapone			50
Styrene			25
Xvlenes (Total)	1 850		50
my remed (recur)	±,000		50

ND = Not Detected above Method Reporting Limit (MRL)

Approved by:_

David Dickinson Laboratory Director

Date: 18 Aug 52

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RTIFICATE OF ANALYSIS

TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

METALS

EPA METHOD 1311

Client: ATEC Environmental Consultants

Client Project ID: UST# 36, Bldg. 2458

Client Sample ID: LRS-3

ESS Sample ID: 921996-02

Date Sampled: 7/31/92

Date TCLP Performed: 8/16/92

Date Leachate Extracted: 8/17/92

Date Extract Analyzed: 8/18/92

	Act	ual	Adjı	Adjusted*	
Target Analyte	Sample Result (mg/L)	Method Reporting Limit	Sample Result (mg/L)	Method Reporting Limit	
Antimony	ND	0.2	ND	0.3	
Arsenic	ND	0.2	ND	0.2	
Cadmium	ND	0.02	ND	0.03	
Chromium	ND	0.05	ND	0.06	
Lead	ND	0.1	ND	0.1	
Mercury	ND	0.005	ND	0.005	
Selenium	ND	0.3	ND	0.3	
Silver	ND	0.05	ND	0.05	
Copper	ND	0.02	ND	0.02	
Nickel	ND	0.04	ND	0.04	
Zinc	0.19	0.02	0.19	0.02	
Beryllium	ŃD.	0.02	ND	0.03	
Thallium	ND	0.3	ND	0.4	

* Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: David Dickinson Laboratory Director

Date: 18 Aug 5 L



RTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants		
Client Project ID: UST 36 Bldg. 2458	ESS Project ID:	921996
Client Sample ID: LRS-4	ESS Sample ID:	921996-03
Date Sample Received: 8/3/92	Date Reported:	8/17/92

Parameter	Results	Units	MRL	Method
Percent Solids	87	% w/w	1	160.3
Total Petroleum Hydrocarbon-IR	13	mg/Kg	12	418.1

TPHIR reported on dry weight basis

MRL = Method Reporting Limit

Approved by: David Dickinson

Laboratory Director

Date: 18 Aug 52





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RTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants		
Client Project ID: UST 36 Bldg. 2458	ESS Project ID:	921996
Client Sample ID: LRS-5	ESS Sample ID:	921996-04
Date Sample Received: 8/3/92	Date Reported:	8/17/92

Parameter	Results	Units	MRL	Method
Percent Solids	87	& w/w	1	160.3
Total Petroleum Hydrocarbon-IR	ND	mg/Kg	12	418.1

TPHIR reported on dry weight basis

ND = Not Detected above the Method Reporting Limit(MRL)

Approved by: David Dickinson

Laboratory Director

Date: 18 Frag 5 L

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vironmental Science Services

RTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants		
Client Project ID: UST 36 Bldg. 2458	ESS Project ID:	921996
Client Sample ID: LWS-1	ESS Sample ID:	921996-05
Date Sample Received: 8/3/92	Date Reported:	8/17/92

Parameter	Results	Units	MRL	Method
Total Petroleum Hydrocarbon-IR	471	mg/L	10	418.1
Volatile Organics				
Benzene	95	uq/L	Attached	8260
Toluene	50	uq/L	Attached	8260
Ethyl Benzene	84	ug/L	Attached	8260
Total Xylenes	400	ug/L	Attached	8260
Toxicity Characteristic Leaching	Procedure			1311
Zinc	0.06	mg/L	Attached	6010

TPHIR reported on dry weight basis

MRL = Method Reporting Limit(MRL)

Approved by: David Dickipson Laboratory Director

Date: 18 4451

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TCL VOLATILE ORGANICS RTIFICATE OF ANALYSIS Method 8260

Client: ATEC Environmental Consultants

Client	Project ID:	UST 36 Bldg. 2458
Client	Sample ID:	LWS-1

Date Sample Received: 8/3/92

ESS Project ID:	921996
ESS Sample ID:	921996-05
Date Reported:	8/17/92

Parameter	Result (ug/L)	MRL
Methylene Chloride	ND	50.
1,1-Dichloroethane	ND	50
Chloroform	ND	50
Carbon Tetrachloride	ND	50
1,2-Dichloropropane	ND	50
Dibromochloromethane	ND	50
1,1,2-Trichloroethane	ND	50
Tetrachloroethene	ND	50
Chlorobenzene	ND	50
1,2-Dichloroethane	ND	50
1,1,1-Trichloroethane	ND	50
Bromodichloromethane	ND	50
Trans-1,3-Dichloropropene	ND	50
Bromoform	ND	50
1,1,2,2-Tetrachloroethane	ND	50
Benzene	95	50
Toluene	50	50
Ethyl Benzene	84	50
Chloromethane	ND	100
Bromomethane	ND	100
Vinyl Chloride	ND	100
Chloroethane	ND	100
1,1-Dichloroethene	ND	50
1,2-Dichloroethene (Total)	ND	50
Trichloroethene	ND	50
Acetone	ND	100
Carbon Disulfide	ND	50
2-Butanone	ND	100
Cis-1,3-Dichloropropene	ND	50
4-Methyl-2-Pentanone	ND	100
2-Hexanone	ND	100
Styrene	ND	50
Xylenes (Total)	400	100

ND = Not Detected above Method Reporting Limit (MRL)

David Dickinson Laboratory Director Approved by:_

Date: 18 An. 59 L



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RTIFICATE OF ANALYSIS

TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

METALS

EPA METHOD 1311

Client: ATEC Environmental Consultants Client Project ID: UST# 36, Bldg. 2458 Client Sample ID: LWS-1

ESS Sample ID: 921996-05

Date Sampled: 7/31/92 Date TCLP Performed: 8/6/92

Date Leachate Extracted: 8/7/92

Date Extract Analyzed: 8/10/92

	Act	Actual		Adjusted*	
Target Analyte	Sample Result (mg/L)	Method Reporting Limit	Sample Result (mg/L)	Method Reporting Limit	
Antimony	ND	0.2	ND	0.3	
Arsenic	ND	0.2	ND	0.2	
Cadmium	ND	0.02	ND	0.03	
Chromium	ND	0.05	ND	0.05	
Lead	ND	0.1	ND	0.1	
Mercury	ND	0.005	ND	0.005	
Selenium	ND	0.3	ND	0.3	
Silver	ND	0.05	ND	0.07	
Copper	ND	0.02	ND	0.02	
Nickel	ND	0.04	ND	0.04	
Zinc	0.06	0.02	0.06	0.02	
Beryllium	ND	0.02	ND	0.03	
Thallium	ND	0.3	ND	0.4	

* Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: Dávid

Dávid Dickińson Laboratory Director

Date: 18 19 19 5 2





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RTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants	
Client Project ID: Ft. Devens-Stockpiled Soils	ESS Project ID: 921528
Client Sample ID: LSP-36	ESS Sample ID: 921528-09
Date Sample Received: 6/11/92	Date Reported: 7/1/92

Parameter	Results	Units	MRL	Method
pH (Corrosivity)	7.8	s.v.	N/A	9045
Flashpoint	No Flash	°F	200	1010
Polychlorinated Biphenyls	ND	mg/Kg	Attached	8080
Reactive Cyanide	ND	mg/Kg	2	7.3.3.2
Reactive Sulfide	ND	mg/Kg	2	7.3.4.1
Semivolatile Organics Isophorone	2,000	ug/Kg	Attached	8270
Volatile Organics	ND	ug/Kg	Attached	8240
Toxicity Characteristic Leaching	Procedure			1311
Lead Copper Nickel Zinc	2.5 0.08 0.04 0.44	mg/L mg/L mg/L mg/L	Attached Attached Attached Attached	6010 6010 6010 6010

N/A = Not Applicable

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: David Dickinson Laboratory Director

L Jul 1952 Date:___

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532 Atwells Avenue, Providence, Rhode Island 02909 (401) 421-0398 Fax. (401) 421-5731

RTIFICATE OF ANALYSIS

POLYCHLORINATED BIPHENYLS Method 8080

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528 Client Sample ID: LSP-36 ESS Sample ID: 921528-09

Date Sample Received: 6/11/92

Date Reported: 6/30/92

Parameter	:	Result (mg/Kg)	MRL
Arochlor	1016	ND	0.1
Arochlor	1221	ND	0.1
Arochlor	1232	ND	0.1
Arochlor	1242	ND	0.1
Arochlor	1248	ND	0.1
Arochlor	1254	ND	0.2
Arochlor	1260	ND	0.2

ND = Not Detected above Method Reporting Limit (MRL)

Surrogate Recovery Data	<pre>% Recovery</pre>	QC Limit
Dibutylchlorendate	90%	50 - 150%

Approved by: David Dickinson Laboratory Director

vironmental Science Services

532 Atwells Avenue, Providence, Rhode Island 02969 (401) 421-0398 Fax, (401) 421-5731

<u>2 (</u>] Date:__

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RTIFICATE OF ANALYSIS

ACID EXTRACTABLES EPA 8270

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-36

ESS Sample ID: 921528-09

Date Sample Received: 6/9/92

Date Reported: 7/1/92

Parameter	Result (ug/Kg)	MRL	
2-Chlorophenol	ND	1,670	
2-Nitrophenol	ND	1,670	
Phenol	ND	1,670	
2,4-Dimethylphenol	ND	1,670	
2,4-Dichlorophenol	ND	1,670	
2,4-Dinitrophenol	ND	8,350	
Pentachlorophenol	ND	8,350	
4-Nitrophenol	ND	8,350	
2,4,6-Trichlorophenol	ND	1,670	
2,4,5-Trichlorophenol	ND	8,350	
2-Methylphenol	ND	1,670	
4-Methylphenol	ND	1,670	
4-Chloro-3-Methylphenol	ND	1,670	
4,6-Dinitro-2-Methylphenol	ND	8,350	

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: David Dickinson Laboratory Director

vironmental Science Services



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532 Atwells Avenue, Providence, Rhode Island 02909 (401) 421-0398 Fax. (401) 421-5731 191 Post Revel West, Westwart: Connection Dessol (103) 221-2753 Fix: (2003) 451-4070



RTIFICATE OF ANALYSIS

BASE NEUTRAL EXTRACTABLES EPA 8270

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-36

Parameter

Date Sample Received: 6/9/92

Result (ug/Kg)

MRL

ESS Sample ID: 921528-09

Date Reported: 7/1/92

Acenaphthylene	ND	1,670
1,2,4-Trichlorobenzene	ND	1,670
Hexachlorobenzene	ND	1,670
Bis(2-chloroethyl)ether	ND	1,670
2-Chloronaphthalene	ND	1,670
1,2-Dichlorobenzene	ND	1,670
1,3-Dichlorobenzene	ND	1,670
1,4-Dichlorobenzene	ND	1,670
3,3-Dichlorobenzidine	ND	3,340
2,4-Dinitrotoluene	ND	1,670
2,6-Dinitrotoluene	ND	1,670
Fluoranthene	ND	1,670
4-Chlorophenyl phenyl ether	ND	1,670
Bis(2-chloroisopropyl) ether	ND	1,670
Bis(2-chloroethoxy) methane	ND	1,670
Hexachlorobutadiene	ND	1,670
Hexachlorocyclopentadiene	ND	1,670
Isophorone	2,000	1,670
Naphthalene	ND	1,670
Nitrobenzene	ND	1,670
N-nitrosodiphenylamine	ND	1,670
N-nitrosodi-n-propylamine	ND	1,670
Bis(2-ethylhexyl)phthalate	ND	1,670
Di-n-butylphthalate	ND	1,670
Di-n-octylphthalate	ND	1,670
Diethyl phthalate	ND	1,670
Dimethyl phthalate	ND	1,670
Benzo(a)anthracene	ND	1,670

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: David Dickinson Laboratory Director

vironmental Science Services

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191 Post Road West, Wassions, Communition Desserved Discourse and Strategy and State 2075

Date:

070

ERTIFICATE OF ANALYSIS

BASE NEUTRAL EXTRACTABLES cont. EPA 8270

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-36

Date Sample Received: 6/9/92

Parameter 🚽

Result (ug/Kg)

MRL

ESS Sample ID: 921528-09

Date Reported: 7/1/92

Benzo(a)pyrene	ND	1,670
Benzo(b)fluoranthene	ND	1,670
Benzo(k)fluoranthene	ND	1,670
Chrysene	ND	1,670
Acenaphthene	ND	1,670
Anthracene	ND	1,670
Benzo(ghi)perylene	ND	1,670
Fluorene	ND	1,670
Phenanthrene	ND	1,670
Dibenzo(a,h)anthracene	ND	1,670
Indeno(1,2,3-cd)pyrene	ND	1,670
Pyrene	ND	1,670
Hexachloroethane	ND	1,670
4-Bromophenyl-phenylether	ND	1,670
Benzyl Alcohol	ND	1,670
Benzoic Acid	ND	8,350
Bis(2-Chloroethoxy)methane	ND	1,670
4-Chloroaniline	ND	1,670
2-Methylnaphthalene	ND	1,670
2-Nitroaniline	ND	8,350
3-Nitroaniline	ND	1,670
Dibenzofuran	ND	1,670
4-Nitroaniline	ND	8,350
${\tt Butylbenzylphthalate}$	ND	1,670

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: David Dickinson Laboratory Director

1692 Date:

071

vironmental Science Services

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RTIFICATE OF ANALYSIS

TCL VOLATILE ORGANICS Method 8240

Result (ug/Kg)

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils

Client Sample ID: LSP-36

Parameter

Date Sample Received: 6/29/92

ESS Project ID: 921528 ESS Sample ID: 921528-09

Date Reported: 7/1/92 MRL

Methylene Chloride	ND	1,000
1,1-Dichloroethane	ND	1,000
Chloroform	ND	1,000
Carbon Tetrachloride	ND	1,000
1,2-Dichloropropane	ND	1,000
Dibromochloromethane	ND	1,000
1,1,2-Trichloroethane	ND	1,000
Tetrachloroethene	ND	1,000
Chlorobenzene	ND	1,000
1,2-Dichloroethane	ND	1,000
1,1,1-Trichloroethane	ND	1,000
Bromodichloromethane	ND	1,000
Trans-1,3-Dichloropropene	ND	1,000
Bromoform	ND	1,000
1,1,2,2-Tetrachloroethane	ND	1,000
Benzene	ND	1,000
Toluene	ND	1,000
Ethyl Benzene	ND	1,000
Chloromethane	ND	1,000
Bromomethane	ND	1,000
Vinyl Chloride	ND	1,000
Chloroethane	ND	1,000
1,1-Dichloroethene	ND	1,000
1,2-Dichloroethene (Total)	ND	1,000
Trichloroethene	ND	1,000
Acetone	ND	1,000
Carbon Disulfide	ND	1,000
2-Butanone	ND	1,000
Cis-1,3-Dichloropropene	ND	1,000
4-Methyl-2-Pentanone	ND	1,000
2-Hexanone	ND	1,000
Styrene	ND	1,000
Xvlenes (Total)	ND	1,000

ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

David Dickinson Laboratory Director

Date:

vironmental Science Services

532 Atwells Avenue, Providence, Rhode Island 02909 (401) 421-0599 Fax. (401) 421-5731

RTIFICATE OF ANALYSIS

TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

METALS

EPA METHOD 1311

Client: ATEC Environmental Consultants

Client Project ID: Stockpiled Soils

Client Sample ID: LSP-36

ESS Sample ID: 921528-09

Date Sampled: 6/9/92 Date TCLP Performed: 6/22/92

Date Leachate Extracted: 6/23/92

Date Extract Analyzed: 6/24/92

Mart 1 - 14 - 14 - 14 - 14 - 14 - 14 - 14 -	Act	Actual		Adjusted*	
Target Analyte	Sample Result (mg/L)	Method Reporting Limit	Sample Result (mg/L)	Method Reporting Limit	
Antimony	ND	0.1	ND	0.2	
Arsenic	ND	0.2	ND	0.2	
Cadmium	ND	0.02	ND	0.02	
Chromium	ND	0.05	ND	0.05	
Lead	2.5	0.1	2.5	0.1	
Mercury	ND	0.005	ND	0.005	
Selenium	ND	0.3	ND	0.3	
Silver	ND	0.05	ND	0.09	
Copper	0.07	0.02	0.08	0.03	
Nickel	0.04	0.04	0.04	0.04	
Zinc	0.44	0.02	0.44	0.02	
Beryllium	ND	0.02	ND	0.04	
Thallium	ND	0.05	ND	0.09	

* Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: David Dickinson Laboratory Director

2 Jul 92 Date:

ironmental Science Services

532 Atwells Avenue, Providence, Rhode Island 02909 (2010) 4010309 (arch1042) 45720

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In Response To The Future

ERTIFICATE OF ANALYSIS

TOTAL PETROLEUM HYDROCARBON-IR Method 418.1

Client: ATEC Environmental Consultants														
Client Project II	: UST #36, Bldg	2458	ESS Project ID:	922995										
Date Samples Rece	eived: 11/3/92		Date Reported:	11/4/92										
Client ID	Lab ID	Results	Units	MRL										
MW-1	922995-01	ND	mg/L	1										
MW-2	922995-02	ND	mg/L	1										
MW-3	922995-03	ND	mg/L	1										

ND = Not Detected above Method Reporting Limit (MRL)

<u>____</u> Approved by:

Date: 41/0052

RTIFICATE OF ANALYSIS

VOA SOIL SURROGATE RECOVERY

Client: A	TEC Environmental Consultants	Client Project ID:	UST 36,	Bldg.	2458
Date Sample	e Analyzed: 8/14/92	ESS Project ID:	921996		
SAMPLE ID	1,2 DICHLOROETHANE-D4 (70-121%)*	TOLUENE-D8 (81-117%)*		B (74-1	FB 21%)*
VS0814B1	76%	88%		11	0%

* Acceptance criteria

Approved by: David Dickinson Laboratory Director

Date: 13 Aug 52

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'ironmental Science Services

TCL VOLATILE ORGANICS **RTIFICATE OF ANALYSIS** Method 8260

NA

Client: ATEC Environmental Consultants Client Project ID: UST# 36, Bldg. 2458 Client Sample ID: Method Blank

Date Sample Received:

ESS Project ID:	921996
ESS Sample ID:	VS0814B1
Date Reported:	8/17/92

Parameter	Result (ug/Kg)	MRL
Methylene Chloride	ND	5
1,1-Dichloroethane	ND	5
Chloroform	ND	5
Carbon Tetrachloride	ND	5
1,2-Dichloropropane	ND	5
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Tetrachloroethene	ND	5
Chlorobenzene	ND	5
1,2-Dichloroethane	ND	5
1,1,1-Trichloroethane	ND	5
Bromodichloromethane	ND	5
Trans-1,3-Dichloropropene	ND	5
Bromoform	ND	5
1,1,2,2-Tetrachloroethane	ND	5
Benzene	ND	5
Toluene	ND	5
Ethyl Benzene	ND	5
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl Chloride	ND	10
Chloroethane	ND	10
1,1-Dichloroethene	ND	5
1,2-Dichloroethene (Total)	ND	5
Trichloroethene	ND	5
Acetone	ND	10
Carbon Disulfide	ND	5
2-Butanone	ND	10
Cis-1,3-Dichloropropene	ND	5
4-Methyl-2-Pentanone	ND	10
2-Hexanone	ND	10
Styrene	ND	5
Xylenes (Total)	ND	10

ND = Not Detected above Method Reporting Limit (MRL)

NA = Not Applicable

Date: 1812 42

Approved by:

David Dickinson Laboratory Director

ironmental Science Services

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RTIFICATE OF ANALYSIS

VOA AQUEOUS SURROGATE RECOVERY

Client: ATEC	Environmental Consultants	Client Project ID: UST	36, Bldg. 2458
Date Sample	Analyzed: 8/14/92	ESS Project ID: 9219	96
SAMPLE ID	1,2 DICHLOROETHANE-D4	TOLUENE-D8	BFB
	(76-114%)*	(86-110%)*	(86-115%)*
VW0814B1	76%	88%	110%
921996-05	90	104	88

* Acceptance criteria

Approved by: David Dickinson Laboratory Director

Date: 18 Au. 52

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vironmental Science Services

TCL VOLATILE ORGANICS **RTIFICATE OF ANALYSIS** Method 8260

Client: ATEC Environmental Consultants Client Project ID: UST# 36, Bldg. 2458 Client Sample ID: Method Blank

Date Sample Received: NA

ESS Project ID:	921996
ESS Sample ID:	VW0814B1
Date Reported:	8/17/92

Parameter	Result (ug/L)	MRL
Methylene Chloride	ND	5
1,1-Dichloroethane	ND	5
Chloroform	ND	5
Carbon Tetrachloride	ND	5
1,2-Dichloropropane	ND	5
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Tetrachloroethene	ND	5
Chlorobenzene	ND	5
1,2-Dichloroethane	ND	5
1,1,1-Trichloroethane	ND	. 5
Bromodichloromethane	ND	5
Trans-1,3-Dichloropropene	ND	5
Bromoform	ND	5
1,1,2,2-Tetrachloroethane	ND	5
Benzene	ND	5
Toluene	ND	5
Ethyl Benzene	ND	5
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl Chloride	ND	10
Chloroethane	ND	10
1,1-Dichloroethene	ND	5
1,2-Dichloroethene (Total)	ND	5
Trichloroethene	ND	5
Acetone	ND	10
Carbon Disulfide	ND	5
2-Butanone	ND	10
Cis-1,3-Dichloropropene	ND	5
4-Methyl-2-Pentanone	ND	10
2-Hexanone	ND	10
Styrene	ND	5
Xylenes (Total)	ND	10

ND = Not Detected above Method Reporting Limit (MRL) NA = Not Applicable

Approved by: Bavid Dickinson Laboratory Director

Date: 17 Ang 12

'ironmental Science Services

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RTIFICATE OF ANALYSIS

MATRIX SPIKE ANALYSIS SUMMARY

TCLP METALS

EPA METHOD 1311

Client: ATEC Environmental Consultants Matrix: Solid

TCLP Batch ID: 200101

Concentration in: mg/L

Target Analyte 🧳	Result	Spike Added	Spiked Result	Percent Recovery
Antimony	ND	*	ND	90%
Arsenic	ND	2.00	2.45	122
Cadmium	ND	0.5	0.580	116
Chromium	ND	1.0	0.90	90
Lead	0.1	1.0	1.17	107
Mercury	ND	0.02	0.020	100
Selenium	ND	2.00	2.74	137
Silver	ND	1.0	1.20	120
Copper	ND ·	1.0	1.00	100
Nickel	ND	1.0	1.04	104
Zinc	0.06	1.0	1.09	103
Beryllium	ND	*	ND	90
Thallium	ND	*	ND	90

This matrix spike analysis summary applies to the following samples: 921996-01, -02

ND = Not Detected above Method Reporting Limit (MRL)

* Matrix spike recovery is based on the lowest spike recovery of the spiked analytes.

Approved by: 6kinson /David Di Laboratory Director

Date:_ 13 this

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vironmental Science Services

532 Atwells Avenue, Providence, Rhude Island 02000 (401) 421-0398 Fax: (401) 421-5731



RTIFICATE OF ANALYSIS

MATRIX SPIKE ANALYSIS SUMMARY

TCLP METALS

EPA METHOD 1311

Client: ATEC Environmental Consultants Matrix: Liquid

TCLP Batch ID: 202301

Concentration in: mg/L

Target Analyte	Result	Spike Added	Spiked Result	Percent Recovery
Antimony	ND	*	ND	76%
Arsenic	ND	2.00	2.26	113
Cadmium	ND	0.5	0.39	78
Chromium	ND	1.0	1.22	122
Lead	ND	1.0	1.12	112
Mercury	ND	0.02	0.020	100
Selenium	ND	2.00	2.13	107
Silver	ND	1.0	0.76	76
Copper	ND	1.0	1.14	114
Nickel	ND	1.0	1.07	107
Zinc	ND	1.0	1.09	109
Bervllium	ND	*	ND	76
Thallium	ND	*	ND	76

This matrix spike analysis summary applies to the following samples: 921996-05

ND = Not Detected above Method Reporting Limit (MRL)

* Matrix spike recovery is based on the lowest spike recovery of the spiked analytes.

Approved by: Dickinson _⊉avid Laboratory Director

<u>18 4</u> Date:____

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vironmental Science Services

3.9 CHAIN OF CUSTODY FORMS

The following chain of custody forms were completed for the soil samples which were laboratory analyzed.

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3.10 HAZARDOUS WASTE MANIFEST

UST No. 0036 was estimated to contain 54 gallons of No. 2 fuel oil and sludges. Approximately 14 gallons of fuel oil was removed on January 7, 1992, and transported to a licensed T.S.D.F. (Beede Waste Oil Corporation). Approximately 40 gallons of fuel oil and sludges were removed and drummed on January 17, 1992. Drummed material was transported to a licensed Transportation, Storage, Disposal, Facility (T.S.D.F.).

The following Hazardous Waste Manifest was generated from residual tank materials. The manifest dated January 7, 1992 is associated with vacuuming product from several USTs. Therefore, the total quantity (1,400 gallons) is greater than the 14 gallons which were removed from UST No. 0036. The manifest dated February 27, 1992 is associated with the drummed material from several USTs. Therefore, the total quantity (395 gallons) is greater than the 40 gallons which was removed from UST No. 0036.

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a SMD No. 2050-0039 Expres 9-30-91 8700-22 (Rev. 9 88) Previous withous are obsolete			****	u			
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3.11 WEIGHT RECEIPTS AND BILLS OF LADING

The following weight receipts and Bills of Lading document the soil disposal associated with UST No. 0036.

	TRINOUNT		ODUCTS CO. A	I English	Cash 🗆	C.O.D.
金融的 おんちょう	DA	P.O. BOX 2089" NVERS, MA 01923-	5089	ARRIVED		BY
VIN OFFICE	SH 00 651 L	REWSBURY DIVIS	TE. 20	E LEFT JOB	CHECK #	
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P014/014 01-13-94 12:00PM FROM BARDON TRIMOUNT TO 918716781 · · · · - 1 $t:\mathbb{Z}$ BILL OF LADING POLICY # WSC-39-001 DEP CASE I ADING IT DATE: STIE OF GENERATION: IK #Z FO. RATOR NAME/ADDRESS: -7-2519 むちて ゴシろ STREET : 4 : TOWN STATE 17 TRANSPORTATION ACCIDENT? Y 508-796-3002 NCTITEL # η, ÷. ERIAL DESCRIPTION (TOTAL PROJECTED QUANTITY): 2 TAMINATED SOIL: 37.5 25 CONTAMINATED DEBRIS: I white parts amod inchords \$ other (specify) vol (az yds) speedy da vej (en Aqr) vi (was) ANALYSES ATTACHEDI OF CONTAMINATION: Velatilart Y X N TPH: XY asoline X 12 oil __ 14 oil _ 16 oil __ other (specify) N NSPORTER NAME/ADDRESS: DESTINATION FACILITY NAME/ADDRESS: ROUU RIMAN \mathbf{x} 503 Recycling TYPE OF FACILITY: Landfill Incinentat DATES ERATOR'S SIGNATURE: D PRIOR TO DEP VE ITEMS MUST BE COMPLETE 7190277 DATE IORIZATION: DEF. SIGNATURE (originating region); DATE (If applicable) .DEB SIGNATURE (destination region): 9 QUANTITY SHIPPED: ve (lans) val (લ પ્રેવંડ) CYARACTOR REGISTRATION TOTAL PROJECTED ILER REGISTRATION SHIPPED TO DATE 30192 ISTEAT FT DOUCHS DATE 19:50 THIS LOAD (estimated) ERATOR OR RECEIVING FACIL ERESENTATIVES NATURE BAR REMAINING TO BE SHIPPED -7236% INSPORTER'S SIGNATURE 6/97 ARR TIME 10:57 71 EIVING FACILITY REPRESENTATIVE'S SIGNATURE GENERATOR IS RESPONSIBLE FOR RETURNING COMPLETED FORM WITHIN'S DAYS TO: VED · · · · · · t DEPARTMENT OF ENVIRONMENTAL PROTECTION BWSC/ENERGENCY RESPONSE BRANCH 1592 · ONE WINTER STREET, SUFLOOR BOSTON, MA 02108 Ρ. AND - Ren 🏞 THE ORIGINATING REGIONAL OFFICE . FICATION OR MISREPRESENTATION OF ANY OF THE INFORMATION ON THIS BILL OF LADING IS A VIOLATION OF - C. 21C AND 310 CMR 30.006 AND 30.007 AND IS SUBJECT TO APPROPRIATE STATUTORY OR REGULATORY

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01-13-94 12:00PM FROM BARDON TRIMOUNT TO 918716781 P011/014 • • • • • . . BILL OF LADING POLICY # WSC-89-001 17 DATE: LUDING I: DEP CISEI S Wieich SITE OF GENERATION: ERATOR NAME/ADDRESS: IK #2 60 STREET_ 2458 UST# 36 RMY TOWN 7,80 STATE TRANSPORTATION ACCIDENTS 508 -786 HACTAEL #: 1 5 ann - 1 2 ann - 1 . . . 꽃많 TERIAL DESCRIPTION (TOTAL PROJECTED QUANTITY): 25 CONTAMINATED DEBRIS: # abiorbest puds ____ TAMINATED SOL: 37.5 I absorbent booms **WK (10713)** vel (es ydz) vel (cs yds) ज़्ल्स्लीy की ____ wher (specify) E OF CONTAMINATION: ANALYSES ATTACHED? 's violine 🗶 12 oil ___ 14 ail ___ 16 ail ___ other (receiv). Voluiler Y XN TPH XY _א_ ANSPORTER NAME/ADDRESS: DESTINATION FACILITY NAME/ADDRESS: UMINOUS RODIZ RIMOI 1111 1525 ЪĆ 22 TAC TYPE OF FACILITY: لانتلحسا **Kacyclin**z In the sales 7.20.9 HERATOR'S SIGNATURES DATE JOVE ITEMS MUST BE COMPLET PRIOR TŪ THORIZATION: DET, SIGNATURE (ong DATE (I spolicable) DEB SIGNATURE (destination region DATE A80963 UCK/IRACTOR REGISTRATION _____ QUANTITY SHIPPED: **** (**tota) ****** vol (ص yْطَع) VAILER REGISTRATION TOTAL PROJECTED ET SITE AT <u>۱</u>۵۰45 SERTED TO DATE à---DATE : 18-21 EVERATOR DE RECEIVING FA TETS LOAD (criminalized) FPRESENTATI REMAINING TO BE SEPPET IGNATURE' et PR 72364 92 KANSPORTER'S SIGNATURE 130192 ARR TIME 10:45 SCEIVING FACILITY REPRESEVIATIVE'S SIGNATURE GENERATOR IS RESPONSIBLE FOR RETURNING COMPLETED FORM WITHIN'S DAYS TO: EIVED DEPARTMENT OF ENVIRONMENTAL PROTECTION ! **† 195**. BW3C/EHERGENCY RESTONSE BRANCH ONE WINTER STREET, 5th FLOOR ÆΡ BOSTON, MA 02108 al-Reci -**THO** THE ORIGINATING REGIONAL OFFICE 1.3 SIFICATION OR MISREPRESENTATION OF ANY OF THE INFORMATION ON THIS BILL OF LADING IS A VIOLATION OF L. C. JIC AND 310 CMR 30.006 AND 30.007 AND IS SUBJECT TO APPROPRIATE STATUTORY OR REGULATORY **ALTIES**, ٢.

BILL OF LADING POLICY # WSC-89-001 75¥ ADING #: DATE: 🖓 🖉 DEP, CASE I SITE OF GENERATION: UNTOR NAME/ADDRESS: IK #2 F.O, - 1.4 2458 UST # 36 STREET 4 TOWN ા પ્રિટેટ STATE_ 1 Y VN TRANSPORTATION ACCIDENT? 508-78 ACT/IEL I: - ⁻ - i. FIAL DESCRIPTION (TOTAL PROJECTED QUANTITY): 37.5 25 CONTAMINATED DEBRIS: # abiorbent pads ... 'AMINATED SOLL' absorbent booms wi (was) vol (ai yds) vol (cz yds) specedy dri _ other (specify) OF CONTAMINATION: ANALYSES ATTACHED? 150 line 🗶 12 oil ____ 14 oil ____ 16 oil ____ other (specify) Voluiler: Y XN TPH: KY N **SPORTER NAME/ADDRESS:** DESTINATION FACILITY NAME/ADDRESS: RIMOUN JMINAUS ROUC 112031 563 TYPE OF FACILITY: 🖊 Recycling Landfill Incinerator FRATOR'S SIGNATURE: DATES IVE ITEMS MUST BE COMPL IORIZATION: 'DEF, SIGNATURE (originating meior DATE (if applicable) DEP. SIGNATURE (destination region DATE: CK/TRACTOR REGISTRATION vol (ca yas) QUANTITY SHIPPED: ¥t (1001) TOTAL PROJECTED JLER REGISTRATION TSITEAT TT Devens SHEPPED TO DATE DATE Z 130 THIS LOAD (estimated) ERATOR OR RECEIVING FACILITY REPRESENTATIVES NATURE: Abob Lu REMAINING TO BE SHIPPED TK 723.98 Tid 97 /30 UNSPORTER'S SIGNATURE DATE 2121 DATE ARR TIME TEIVING FACILITY REPRESENTATIVES SIGNATUR GENERATOR IS RESPONSIBLE FOR RETURNING COMPLETED FORM WITHIN 5 DAYS TO: VEC DEPARTMENT OF ENVIRONMENTAL PROTECTION 1956 BWSC/EMERGENCY RESPONSE BRANCH ONE WINTER STREET, 5th FLOOR BOSTON, MA 02105 -Red = AND THE ORIGINATING REGIONAL OFFICE IFICATION OR MISREPRESENTATION OF ANY OF THE INFORMATION ON THIS BILL OF LADING IS A VIOLATION OF L. C. 21C AND 310 CMR 30.006 AND 30.007 AND IS SUBJECT TO APPROPRIATE STATUTORY OR REGULATORY LTIES.

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BILL OF LADING POLICY # WSC-89-001 DATE: DE? CASE I: LDING # SITE OF GENERATION: IK #2 60 LATOR NAME/ADDRESS: UST # 36 STREET OMV TOWN STATE TRANSPORTATION ACCIDENT7 508 ACT/TEL I: RIAL DESCRIPTION (TOTAL PROJECTED QUANTITY): CONTAMINATED DEBRIS: # absorbent pads _____ # absorbent booms 25 37~5 AMINATED SOIL: vol (cz ydz) vol (cu yds) speedy dri ____ other (specify) ____ wt (1001) (⁴ ' ANALYSES ATTACHED? OF CONTAMINATION: soline 🗶 12 oil ____ 14 oil ____ 16 oil ____ other (specify). Volauiles: YXN TPH: XY N SPORTER NAME/ADDRESS: DESTINATION FACILITY NAME/ADDRESS: 21MMUr NUCTS 1903 TYPE OF FACILITY: Recycling Lundfill Incincrator DATE: VATOR'S SIGNATURE: TE TIEMS MUST BE COMPLET DRIZATION: DEF. SIGNATURE (originating m "DA" if applicable) . DEP. SIGNATURE (destination region · DATE: A809(3 Yol (2 ydu) K/TRACTOR REGISTRATION QUANTITY SHIPPED: ¥t (tons) TOTAL PROJECTED ER REGISTRATION - 30-92 SHIPPED TO DATE SITE AT. DATE OR THIS LOAD (crumred) RATOR OR RECEIVING FACILITY REPRESENTATIVES REMAINING TO BE SHIPPE ATURE: 77 8 E **ĎATE** SPORTER'S SIGNATURE 1:00 ARR TIME IVING FACILITY REPRESENTATIVES SIGNATURE GENERATOR IS RESPONSIBLE FOR RETURNING COMPLETED FORM WITHIN 5 DAYS TO: ED and the second DEPARTMENT OF ENVIRONMENTAL PROTECTION 93L BWSC/EMERGENCY RESPONSE BRANCH ONE WINTER STREET, 5th FLOOR BOSTON, MA 02103 ied ş AND THE ORIGINATING REGIONAL OFFICE ICATION OR MISREPRESENTATION OF ANY OF THE INFORMATION ON THIS BILL OF LADING IS A VIOLATION OF C. 21C AND 310 CMR 30.006 AND 30.007 AND IS SUBJECT TO APPROPRIATE STATUTORY OR REGULATORY ITES. 10

3.12 PERMITS AND CERTIFICATIONS

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The following permit was obtained from the Fort Devens Fire Department for the proper closure of a UST. Following the permit there is a disposal receipt for the steel UST.



NAME AND ADDRESS JOHN C. TOMBARELLO & SONS OF APPROVED TANK YARD <u>14901</u> APPROVED TANK YARD NO. <u>14901</u> Tank Yard Ledger 502 CMR 3.03(4) Number: <u>9200120</u> I certify under penalty of law I have personally examined the underground steel storage tank tank for the formation of the storage tank tank the formation of the tank tank tank the formation of the tank tank tank tank tank tank tank tank	
OF APPROVED TANK YARD APPROVED TANK YARD APPROVED TANK YARD NO. 1 4 9 0 1 Tank Yard Ledger 502 CMR 3.03(4) Number: 9 2 0 0 1 2 0 I certify under penalty of law I have personally examined the underground steel storage tank tank the third tank with the first state of the underground steel storage tank	
APPROVED TANK YARD NO. 14901 APPROVED TANK YARD NO. 14901 Tank Yard Ledger 502 CMR 3.03(4) Number: 9200/2000 J20 I certify under penalty of law I have personally examined the underground steel storage tank ASSOC.	
Tank Yard Ledger 502 CMR 3.03(4) Number: 9 2 0 0 1 2 0 I certify under penalty of law I have personally examined the underground steel storage tank additional to this alternation of the storage tank FAITAL ASSOC.	
I certify under penalty of law I have personally examined the underground steel storage tank delivered to this answerd took work by fine comparison of the underground steel storage tank	
delivery whet penalty of the rest penalty change of the state of the s	
derivered to uns approved tank yard by rim, corporation or partnership KIA- LIVV AQUATENT	
and accepted same in conformance with Massachusetts Fire Prevention Regulation 502 CMR 3.00 Provisions for Approving Underground Steel Storage Tank dismantling yards.	
A valid permit was issued by LOCAL Head of Fire Department FDID! 17919 to transport	
Name and official title of approved tank yard owner or owners authorized representative:	
Jamie Maranto CPW 1-28.92	
V SIGNATURE TITLE DATE SIGNED	
This signed receipt of disposal must be returned to the local head of the fire department $\frac{1}{7}$ $\frac{9}{9}$ $\frac{9}{9}$ $\frac{9}{100}$ $\frac{1}{100}$ $\frac{1}$	
FORM F.P. 291 (rev. 9/88) (OVER) MASSACHUSETTS STATE FIRE MARSHAL'S OFFICE	1
an an an an an ann an ann an an an an an	
Tank Removed From	
DIMENSIONS Tankt 36	
Width Length $Ft - DOV(n) - Sugar - Course - Co$	
(no. street)	
1 48 x 10.8 AVER	
(city or town)	
	. •
Z X	
3 X Fire Department <u>None-Listed</u>	
X X X X X 4 X Fire Department X 4 X Permit # (if applicable)	
x 3 X Fire Department None-Listed x 4 X Permit # (if applicable)	
2 X Fire Department None-Listed 3 X Permit # (if applicable) x 5 X (if applicable)	

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3.13 UST CLOSURE CHECKLIST

The following closure checklist was produced by ATEC for quality control purposes.

UST CLOSURE O/C-CHECK LIST	- Tente	36 Bld	2458		
1000 gal No. 2 fuel		1	T		
DEFINABLE FEATURE	DATE	TIME	MEASUREMENT	ſ <u>\$</u>	NOTES
		1	1		site tonerarby: level
Calibrate PID & LELO2 meters	1/17/92	9:00	1		
È		1	1		······································
Drain & flush piping & pumps	1/17/52	8:45		······································	
Excavate to top of tank	1/17/97	9:00			Depth to tank: 1.0'
			:	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	:
Vent tank note LEL/O2 levels & times	1/17/72	1	LEL	02	
		T1:10:30	0	20.9	
		T2: 10:45	0	20.9	· · · · · · · · · · · · · · · · · · ·
· · · · · · · · · · · · · · · · · · ·		T3: ,,: 00	0	70.9	
territ in the		T4://:/5	0	20.9	
		T5: 11:30	0	70.9	
		T6: 12:45	U	20.9	
		17:		,	
· · ·		T8:			
		T9:		······································	
		T10:	-		
		T11:			
		T12:		1	
				×.	
ump & clean tank:	V7/92		<u>+ 1</u> gal liquid	+40 gal	Tout Dimensions/conditions.
Note quantities liquid (gal) & sludge (lbs)	1/17/92		lbs. sludge		4× 10.5% No boks, part or
· · · · · · · · · · · · · · · · · · ·					rust. Refurn line broken
Remove all tank connections, and cap openings	1/17/92	2:45			Ersend of excar grossly
				·····	contamination strong
Excavate soils to free tank	1/17/92	3:00			odor from excar.
egregate stained soils: Note PID readings	1/17/72	3:00	PID (ppm)	NDIR (ppm)	
if >10 ppm NDIR also)			48		stock-1
All soil require to free					51024-2
turch contaminated visibly					
/					
			· · · · · · · · · · · · · · · · · · ·		

UST CLOSURE O/C CHECK LIST				
DEFINABLE FEATURE	DATE	TIME	MEASUREMENTS	NOTES
Remove tank, piping, pumps, and hardware.	1/17/92	3:15	Photographic Descriptions:	Soil Descriptionimed brown
Photograph excavation; note descriptions.			Photo 1: T-4	fine and some fine -
			Photo 2: Tan 4	course grovel
· · · · ·		1	Photo 3: excar E face W	
]	Photo 4: examini fare E	
			Photo 5:	
			Photo 6:	Death to Grand H. O/ (and it in
				(4) Q SO' a F end ex cair
lace tank at safe distance from excavation	1/17/92	3:15		Visible Sheen not enough to
· · · · · · · · · · · · · · · · · · ·				Smigle
ecure tanks transport off-site	1/17/92	34.45		Depti of Examplion' 5.0'
btain 10 soil samples from	1/12/52	3'10	PID (ppm) NDIR (ppm)	Sample locations: 7-3
xcavation walls/bottom: Note PID/NDIR	<u></u>		SSI: 94	E_{12}
adings and sample locations.			SS2: 74	Euroll
	•		1553: 10/4	
······			SS4: 15	
		······	SS5: 44	
*	2		SS6: 177 H	
******	····		SS7: 09	N wal
			SS8. QF	X wall
		·····	SS9: 73 C	
			SS10 7 5	hatter
······				
			· · · · · · · · · · · · · · · · · · ·	· ·
***************************************				······
			{	
btain 2 soil samples & 1 water samples	1/17/92	3:45		Sample Locations:
r laboratory analysis. Note sample locations.				LSS1:
				LSS2: ~ 559
				LWS1:
			1	1553: composite stocksile

SOL SINOUKE O/C CHECK LIST				
DEFINABLE EFATURE	- DATE	TTAKE	MEACUIDEMENTS	NOTES
			MEASUREMENTS	tors of back511
Backfill excavation (if clean):				Backfill description:
Note amount & type of backfill				
		1		
Close open excavation (if applicable)				
				:
Restore surface and rope off				
Demote millight data				
Transport hazardous material off-site:				Amount Classification
Note amount/classification			-	Alloud
······································			·	
			•	

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3.14 INSTALLATION

The installation of a replacement UST 0036 was not performed.

4.0 UST No. 0037

4.1 POST REMOVAL REPORT

4.1.1 Introduction

This Post-Removal Report details the results of the closure of one 1,000-gallon, single wall, steel, Underground Storage Tank (UST) referenced as UST No. 0037, located at property known as Building 2461, Fort Devens, Massachusetts (the site). The purpose of the closure was to excavate the UST and evaluate the potential for the presence of oil and hazardous material at the site. The closure of this UST was conducted on January 16, 1992.

The basic Project Work Scope included:

- Procurement/administration of all federal, state and local permits, manifests, regulations, etc., associated with UST system closure.
- Excavating, venting, cleaning, transporting, and disposing of one 1,000gallon UST by appropriately licensed contractors/facilities.
- Disposal of residual UST materials at a licensed facility.
- Field screening and analysis of soil in the excavations by Photoionization Detector (PID) and field analyzed with a portable Non-Dispersive Infrared (NDIR) Analyzer, to identify evidence of a release of oil and hazardous materials from the UST, if any.
- Laboratory Analysis of soil and groundwater sampled from the UST excavation by a USEPA certified laboratory for Total Petroleum Hydrocarbons.
- Preparation of a Post-Removal Report, to include assimilation of information gathered, major findings, and conclusions.

4.1.2 Subsurface Storage Tank Excavation and Removal

Prior to removal, UST No. 0037 was estimated to contain 955 gallons of No. 2 fuel oil and residual materials. Approximately 935 gallons of fuel oil was removed on January 7, 1992, and transported to a licensed T.S.D.F. (Beede Waste Oil Corporation). See Section 4.10 for the applicable Hazardous Waste Manifests.

On January 16, 1992, one 1,000-gallon, subsurface, No. 2 fuel oil, storage tank was excavated and removed from the site. The UST was located adjacent to the east side of Building 2461. Site topography is relatively level.

Soils in the excavation consisted primarily of medium brown, fine sand with some fine to coarse gravel, cobbles, and boulders. The tank was covered by approximately 6 inches of soil. The bottom of the excavation was approximately 4.5 feet below grade. Groundwater was not encountered within the excavation. Excavated soils required to free the tank were visibly contaminated. Soil removed from above the tank were visibly stained. Within the excavation, soil located at the south end of the excavation appeared contaminated based on visual observation.

Once the top of the tank was exposed, the associated piping was drained and tank connections were removed. Tank openings were capped and the tank was removed from the excavation. Upon excavation and removal, the tank was observed to be in good condition with no holes, perforations, or severe corrosion. However, the fill pipe was observed to be cracked at the connection with the tank.

Following venting of the tank, an access way was cut in the end of the tank to allow entry for cleaning. The tank was then entered and vacuumed/wiped clean of any residual materials. Approximately 20 gallons of fuel oil and residual materials were removed and drummed on January 15, 1992. Drummed material was transported to Beede Waste Oil from Plaistow, New Hampshire, on February 27, 1992. See Section



4.10 for copies of the appropriate Hazardous Waste Manifests.

The scrap tank was removed from the site on January 16, 1992 and transported to the Contractor's yard, located on Lake George Street, Fort Devens for temporary storage. The tank was disposed of at Tombarello & Sons from Lawrence, Massachusetts, a licensed Massachusetts tank yard, on January 28, 1992. A copy of the disposal receipt is included in Section 32.12, Permits and Certifications.

4.1.3 Sampling and Analysis Plan

Ten soil samples were obtained from the excavation for field screening with a Photoionization Detector (PID) and field analyzed with a Non-Dispersive Infrared (NDIR) Analyzer. The PID field screening for Total Organic Vapors (TOVs) was conducted with an HNu photoionizer utilizing the jar headspace screening procedure outlined in the Hazardous Materials Containment Plan. The NDIR field screening for Total Petroleum Hydrocarbons (TPH) was conducted with a Horiba OCMA 220, utilizing the procedures outlined in the Hazardous Materials Containment Plan.

Eight of the samples (SS-1 to SS-8) were obtained from the excavation walls at a depth of approximately 2 to 3 feet below grade. Two of the samples (SS-9 and SS-10) were obtained from the bottom of the excavation at a depth of approximately 4.5 feet below grade. Two composite soil sample (Stock-1 and Stock-2) were obtained from stockpiled soils for PID and NDIR field screening.

Two soil samples (LSS-1 and LSS-2) were obtained from the excavation for laboratory analysis. Soil Sample LSS-1 was obtained from the south wall of the excavation at a depth of 7 feet below grade. Soil sample LSS-2 was obtained from the bottom of the excavation at a depth of 4.5 feet below grade. One composite, soil sample (LSS-3) was obtained from stockpiled soils required to free the tank. These samples were analyzed for TPH.



Sampling locations are depicted on the Sampling Schematic attached as Figure 4.2. The applicable chain of custody forms are included in section 4.9.

4.1.4 Analytical Results

The results from analysis with the PID and the NDIR analyzer of the ten soil samples obtained from the excavation, and the two composite samples obtained from stockpiled soil are as follows:

SAMPLE NUMBER	PID (ppm TOV)	NDIR (ppm TPH)
SS-1	260.0	7,732.3
SS-2	300.0	13,468.3
SS-3	290.0	11,135.7
SS-4	168.0	117.1
SS-5	172.0	68.3
SS-6	200.0	43.2
SS-7	156.0	46.4
SS-8	320.0	10,280.9
SS-9	240.0	3,799.8
SS-10	158.0	230.6
Stock-1	220.0	895.9
Stock-2	166.0	111.0

TABLE 4.1 - PID AND NDIR RESULTS

Laboratory analytical results of the two soil samples obtained from the excavation revealed a TPH concentration of 2,680 ppm for LSS-1, and 23,300 ppm for LSS-2. Laboratory analysis of one soil sample (LSS-3) obtained from the stockpiled soils revealed a TPH concentration of 19,040 ppm.

A copy of the laboratory results has been included in Section 2.9, Laboratory Analytical Results.

4.1.5 Conclusions and Recommendations

As noted in ATEC's Post Removal report dated February 14, 1992, ATEC's conclusions are as follows:

Upon excavation and removal, the tank was observed to be in good condition without holes, perforations, or severe corrosion. However, the fill pipe was observed to be broken at the connection with the tank.

Excavated soils required to free the tank were visibly contaminated. Soil removed from above the tank were visibly stained. Within the excavation, soil located at the south end of the excavation were observed to be visibly contaminated. Groundwater was not encountered within the excavation.

Ten soil samples were obtained from the excavation for field screening and field analysis utilizing a PID and NDIR analysis respectively. PID readings revealed TOV concentrations ranging from 156 ppm to 320 ppm. NDIR results revealed TPH concentrations ranging from 43.2 ppm to 13,468.3 ppm TPH.

Two soil samples were obtained from the excavation for laboratory analysis for TPH. Analytical results for LSS-1 obtained from the south wall of the excavation revealed a TPH concentration of 2,680 ppm. Analytical results for LSS-2 obtained from the bottom of the excavation revealed a TPH concentration of 23,300 ppm.

One composite, soil sample (LSS-3) was obtained from stockpiled soils for laboratory analysis. Analytical results for LSS-3 revealed a TPH concentration of 19,040 ppm.

Based on these findings ATEC recommended the following:

Remedial excavation of the south, east, and southeast walls and the bottom of the excavation was conducted until laboratory analysis of soil samples showed a TPH concentration of <100 ppm. Field screening of soil should be conducted during excavation utilizing a Photoionization Detector until background levels of <1 ppm are attained prior to obtaining samples for laboratory analysis.

Additional excavated soils and stockpiled soils should be laboratory analyzed for Total Petroleum Hydrocarbons, Volatile Organic Compounds, PCBs, 13 TCLP Metals, flashpoint, sulfide reactivity, cyanide reactivity, and corrosivity for disposal classification. The remediated soils should be disposed at a licensed T.S.D.F.

Based on the data collected during the UST removal, the following was recommended by ATEC but was not performed at the request of the US Army:

Advance soil borings and install groundwater monitoring wells to determine the vertical and horizontal extent of contamination. Continuous split spoon sampling and analysis will be conducted utilizing field analysis techniques, i.e. Photoionization Detector and Non-Dispersive Infrared Analysis, and laboratory analysis to document soil contamination levels as specified in the Hazardous Waste Containment Plan.

4.2 SITE REMEDIATION AND CONTAMINATED SOIL DISPOSAL

4.2.1 Site Remediation

Following initial PID screening, additional excavation to remove contaminated soil and reach background levels by PID (<1 ppm) was conducted per order of the Contracting Officer's Representative and David Salvadore of the Massachusetts Department of Environmental Protection (DEP). A total of approximately 102 tons of



contaminated soil were removed from the bottom of the excavation and sidewalls during remedial excavation on July 31, 1992 (See Remedial Excavation Plan, Figure 4.3).

Five soil samples (RSS-1A through RSS-5A) were obtained from the remedial excavation for PID field screening. RSS-1A through RSS-4A were obtained from the sidewalls at a depth of approximately 7 feet below grade. RSS-5A was obtained from the bottom of the excavation at a depth of approximately 11 feet. PID results revealed TOV concentrations ranging from 0.5 ppm TOVs to 50.0 ppm TOVs.

Additional excavation from the sidewalls and at the bottom of the excavation was conducted. Following the removal of the additional soil, five soil samples (RSS-1B through RSS-5B) were obtained from the excavation sidewalls at a depth of approximately 7 feet below grade and at the bottom of the excavation at a depth of approximately 12 feet below grade. Soil samples were screened and TOV concentrations ranged from 2.5 ppm to 65.0 ppm. (See Table 4.2).

Additional excavation from the sidewalls and at the bottom of the excavation was conducted. Following the removal of the additional soil, six soil samples (RSS-1C through RSS-5C, RSS-6C) were obtained from the excavation sidewalls at a depth of approximately 7 feet below grade and at the bottom of the excavation at a depth of approximately 13.5 feet below grade. Soil samples were screened and TOV concentrations ranged from 0.2 ppm to 30.0 ppm. (See Table 4.2).

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TABLE 4.2 PID SCREENING RESULTS

SAMPLE NUMBER	PID (ppm TOV)	LOCATION
RSS-1A	0.5	N. sidewall (7' B.G.)
RSS-2A	13.0	E. sidewall (7' B.G.)
RSS-3A	3.0	S. sidewall (7' B.G.)
RSS-4A	30.0	W. sidewall (7' B.G.)
RSS-5A	50.0	Bottom (11' B.G.)
RSS-1B	2.5	N. sidewall (7' B.G.)
RSS-2B	48.0	E. sidewall (7' B.G.)
RSS-3B	50.0	S. sidewall (7' B.G.)
RSS-4B	30.0	W. sidewall (7' B.G.)
RSS-5B	65.0	Bottom (12.0' B.G.)
RSS-1C	0.2	N. sidewall (7' B.G.)
RSS-2C	0.2	E. sidewall (7' B.G.)
RSS-3C	5.5	S. sidewall (7' B.G.)
RSS-4C	30.0	W. sidewall (7' B.G.)
RSS-5C	4.5	Bottom (13.5' B.G.)
RSS-6C	0.5	Bottom (13.5' B.G.)

RSS = Remediation Soil Sample B.G.= Below Grade

Six soil samples (LRS-1 to LRS-6) were then obtained for laboratory analysis for TPH. Two soil samples (LRS-4 and LRS-5) were obtained for laboratory analysis for VOCs, TPH, and 13 Metals by Toxicity Characteristic Leachate Procedure (TCLP). Results of laboratory analysis are depicted in Table 4.3 as follows:

SAMPLE NUMBER	TPH (ppm)	VOCs (ppm)	13 TCLP METALS (PPM)	LOCATION
LRS-1	ND	NA	NA	N.sidewall (7' B.G.)
LRS-2	ND	NA	NA	E. sidewall (7' B.G.)
LRS-3	ND	NA	NA	S. sidewall (7' B.G.)
LRS-4	246	11 T. Xylenes	0.05 (Ni) 0.27 (Zn)	W. sidewall (7' B.G.)
LRS-5	17	ND	0.33 (Zn)	Bottom (13.5' B.G.)
LRS-6	ND	NA	NA	Bottom (13.5' B.G.)

TABLE 4.3 - LABORATORY ANALYSIS

LRS = Laboratory Remediation Sample ND = Not Detected above the Method Reporting Limit NA = Not Applicable T. Xylenes= Total Xylenes

Laboratory Analytical Results have been provided in section 4.8.

4.2.2 Soil Stratigraphy

The soil stratigraphy for the excavation consisted of a variety of soils depending upon the depth of excavation. Soil consisted of dark fine and coarse pebbles and gravel mixed with cobbles from grade level to a depth of approximately 0.5 feet. From 0.5' to 2.5' below grade soil consisted primarily of lighter colored fine and coarse pebbles and gravel mixed with cobbles. From 2.5' to 3' soil consisted of sand. From 3' to 10' soil consists of coarse pebbles and gravel mixed with cobbles. From 10' to bottom (13.5' below grade) soil consists of clay with cobbles. (See Figure 4.4 - Soil Stratigraphy).

4.2.3 Contaminated Soil Disposal

One composite soil sample (LSP-37) was obtained from stockpiled soil generated during the removal of the UST No. 0037 and the additional excavation conducted at the site. LSP-37 was laboratory analyzed for Volatile Organic Compounds (VOCs), Semivolatile Organic Compounds, 13 Metals by Toxicity Characteristic Leachate Procedure (TCLP), Polychlorinated Biphenyls (PCBs), Reactive Sulfide, Reactive Cyanide, flashpoint, and corrosivity for characterization and disposal purposes. Laboratory analytical results revealed 7.6 S.U. Corrosivity; 8,500 ppb Benzo(a) antracene, 18,800 ppb Benzo(b)fluoranthene, 22,800 ppb Benzo(a)fluoranthene, 0.4 ppm Lead, 0.09 ppm Copper, 0.05 ppm Nickel, 0.33 ppm Zinc, 3.4 ppm PCBs. All other analytical results were below the Method Reporting Limits.

Approximately 102 tons of contaminated soil was removed and stockpiled during removal and remediation of the excavation, as estimated through field drawings. Contaminated soil was disposed for recycling at Trimount Bituminous Products Company, Shrewsbury, Massachusetts.

4.3 BACKFILL

The excavation was lined with polyethylene plastic sheeting and backfilled with 88 cubic yards of uncontaminated fill material on July 29, 1992. Backfill material consisted of clean granular fill. The granular fill contained particles which were less than three inches in diameter and was free of roots and debris, as per Section 4, Paragraph 5 of the contract. Backfill material was compacted to subgrade level according to contract specifications and with the approval of the Contracting Officer's Representative.



4.4 SURFACE RESTORATION

Following backfill of the excavation, 175 square feet of loam was spread. Seeding was conducted to complete surface restoration of October 21, 1992.

4.5 HYDROGEOLOGICAL SERVICES

Hydrogeological services to include installation of monitoring wells were not requested for UST No. 0037.

4.6 PHOTOGRAPHIC DOCUMENTATION

The following photographs are of the removed UST, the excavation and a post remedial view of the excavation.

A-1: One side of removed tank.

- A-2: Opposite side of removed tank.
- A-3: Excavation as viewed from north, facing south.
- A-4: Excavation as viewed from south, facing north.
- A-5: Post-Remedial excavation as viewed from north, facing south.
- A-6: Post-Remedial Excavation as viewed from south, facing north.






4.7 OCMA 220 DATA SHEETS

The following information was organized from the data collected from the Non-Dispersive Infrared Analyzer.

SS-1 to SS-10, STOCK-1 and STOCK-2: Soil samples obtained from original excavation and stockpiled soil.



TPH SOIL ANALYSES BY NON-DISPERSIVE INFRARED ANALYZER - MODIFIED EPA STANDARD TEST METHOD 418.1

PROJECT NAME, NUMBER, TANK: U.S. ARMY - FORT DEVENS 37.07.91.451 UST #37

DATE: <u>Jer 22, 1992</u> OPERATOR: <u>RICHARL</u>, <u>W. GERMAN</u>

CALBRATIONDATA

TYPE	FIRST READING SEC		SECOND READING		DING THIRD READING		THIRD READING			SPAN
CALIBRATION	DITTIAL	FINAL	INITIAL	FINAL	DITTIAL	FINAL		CHECK		
ZERO:	7.0	0.0	-2.9	0.0	0.0	0.0		26.4		
span:	35.5	40.0	46,0	40.0	41.9	40_0				
ZERO:	7.0	0.0		0.0	-0.8	0.0				

ANALYTICAL DATA

SAMPLE	VEIGH	I (g)	1a DILUTK	2N BATIO (m.11	2nd DILUTIO	<u>I RATIQ (m.1)</u>	INSTRUME	T RESULTS	(PPBL	CONCENTRATION
NUMBER	GROSS	TARE	F-113	<u>SAMPLE</u>	F-113	8AMPLE	1st	<u>214</u>	<u>3r1</u>	mg()
STOCK-1	82.0	75.0	17.5	1.0			11.6	11.3	<u> </u>	895.9
8TOCK-2	82.6	76.1	17.5	1.0			1.3	1.3		111.0
<u> </u>	84.0	74.7	17.5	1.0	25,0	0.5	98,3	46 9	47_0	
88-3	81.6	74.5	20,0	1.0	25.0	<u>0.5</u>		63.0	62.5	13468.3
<u> </u>		76.6	20,0	0.5	25,0	0.5	95.7	83.7		11135.7
884	82.0	75.7	20.0	0.5	المحمدين. مدين محمدين (1999 - 1999 - 1999 - 1999 -		0.6	0.6		117.1
		74.8	20,0	0,5			0.3	0.3		68 3
88-6		75.6	20.0	0.5		· • • • • • • • • • • • • • • • • • • •	0.2	0.2		43 2
<u> </u>	79.3	74.0	20.0	0,5	الجيسي		0.2	0.2		46 4
88.£		75.5	20.0	0.5				44_3		10,380.9
	79.6	74.0	20.0	15			17.3	17 3		3799.8
<u>\$8-10</u>		759	20.0	25	الموريين موري موري موري موري موري		1.0	1.2		230.6
		والارد والمرد القرب المرد الجرد بالمالة رقار		-		والمرور المراجع والمراجع والمراجع والمرور				· · · · · · · · · · · · · · · · · · ·
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4.8 LABORATORY ANALYTICAL RESULTS

The following laboratory analytical reports are associated with the removal, remedial excavation and stockpiled soil. These reports were organized and provided by Environmental Science Services, Inc. Results are included for:

- LSS-1, LSS-2, and LSS-3: Soil samples obtained from original excavation. Laboratory analyzed for TPH (Method 418.1).
- LRS-1, LRS-2, LRS-3, LRS-4, LRS-5, LRS-6: Soil samples obtained from the post-remedial excavation. Laboratory analyzed for TPH (Method 418.1). LRS-4 and LRS-5 also analyzed for VOCs (Method 8240), and 13 Metals by TCLP (Method 6010).
- LSP-37: Soil sample obtained from stockpiled soil for disposal classification.
 Laboratory analyzed for Corrosivity (pH Method 9045), Flashpoint (Method 1010), Polychlorinated Biphenyls (Method 8080), Reactive Sulfide (Method 7.3.4.1), Reactive Cyanide (Method 7.3.3.2), VOCs (Method 8240), Semivolatile Organics (Method 8270), 13 Metals by TCLP.

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		كر	Mrm	 		-	
	_		•	In Response To T	he Future		

LIFICATE OF ANALYSIS

Date: 1/24/92 Job: 147 Account: 95659 Received: 1/17/92

ATEC ENVIRONMENTAL CC. 62 Accord Park Drive Norwell, MA 02061

Project: DEVENS-TANK 37

Mr. Mark Baldi

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)le)ér	Method Number	Paraneter	Result	Unit	Sample Description
1701	EPA-160.3 EPA-418.1	Total Solids TPH/IR (Dry Wt.)	85 2680	% mg/kg	LSS-1
1702	EPA-160.3 EPA-418.1	Tota] Solids TPH/JR (Dry Wt.)	86 23300	% mg/kg	LSS-2
1703	EPA-160.3 EPA-418.1	Total Solids TPH/1R (Dry Wt.)	85 19040	€ ng∕kg	LSS-3

Devid Dickipson Laboratory Manager

% w/w

mg/Kg

₹TIFICATE OF ANALYSIS

Parameter	Results	Units	MRL	Method
Date Sample Received: 8/5/92		Date Rep	oorted:	8/18/92
Client Sample ID: LRS-1, UST 37		ESS Samp	le ID:	922026-01
Client Project ID: UST 37 Bldg. UST 39 Bldg.	2461, 2520	ESS Proj	ect ID:	922026
Client: ATEC Environmental Consul	ltants			

92

ND

Total Petroleum Hydrocarbon-IR

Percent Solids

TPHIR reported on dry weight basis

ND = Not Detected above the Method Reporting Limit(MRL)

Approved by: UDávid on

Laboratory Director

Date: 13 14 5 2

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160.3

418.1



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RTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants		
Client Project ID: UST 37 Bldg. 2461, UST 39 Bldg. 2520	ESS Project ID:	922026
Client Sample ID: LRS-2, UST 37	ESS Sample ID:	922026-02
Date Sample Received: 8/5/92	Date Reported:	8/18/92

Parameter	Results	Units	MRL	Method
Percent Solids	90	% w/w	1	160.3
Total Petroleum Hydrocarbon-IR	ND	mg/Kg	11	418.1

TPHIR reported on dry weight basis

ND = Not Detected above the Method Reporting Limit(MRL)

Approved by: Bavid Dickinson Laboratory Director

Date: 19 Ang5L





RTIFICATE OF ANALYSIS

Parameter	Reculte	Unite	MRT.	Method
Date Sample Received: 8/5/92		Date Re	ported:	8/18/92
Client Sample ID: LRS-3, UST 37		ESS Sam	ple ID:	922026-03
Client Project ID: UST 37 Bldg. UST 39 Bldg.	2461, 2520	ESS Pro	ject ID:	922026
Client: ATEC Environmental Cons	ultants			

Parameter	Results	Units	MRL	Method
Percent Solids	90	% w/w	1	160.3
Total Petroleum Hydrocarbon-IR	· ND	mg/Kg	11	418.1

TPHIR reported on dry weight basis

ND = Not Detected above the Method Reporting Limit(MRL)

Approved by: David Dictinson Laboratory Director

Date: 18 91-12



TIFICATE OF ANALYSIS

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Client: ATEC Environmental Consultants		
Client Project ID: UST 37 Bldg. 2461, UST 39 Bldg. 2520	ESS Project ID:	922026
Client Sample ID: LRS-4	ESS Sample ID:	922026-04
Date Sample Received: 8/5/92	Date Reported:	8/18/92

Parameter	Results	Units	MRL	Method
Percent Solids	91	& w/w	1	160.3
Total Petroleum Hydrocarbon-IR	246	mg/Kg	11	418.1
Volatile Organics Total Xylenes	11	ug/Kg	Attached	8260
Toxicity Characteristic Leaching Nickel Zinc	Procedure 0.05 0.27	mg/L mg/L	Attached Attached	1311 6010 6010

TPHIR reported on dry weight basis

MRL = Method Reporting Limit

Approved by:

David Dickinson Laboratory Director

Date: Bargaz



RTIFICATE OF ANALYSIS

TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

METALS

EPA METHOD 1311

Client: ATEC Environmental Consultants	Date Sampled: 8/3/92
Client Project ID: UST 37 Bldg. 2461, UST 39 Bldg. 2520	Date TCLP Performed: 8/6/92
Client Sample ID: LRS-4, UST 37	Date Leachate Extracted: 8/7/92
ESS Sample ID: 922026-04	Date Extract Analyzed: 8/10/92

	Act	ual	Adjusted*	
Target Analyte	Sample Result (mg/L)	Method Reporting Limit	Sample Result (mg/L)	Method Reporting Limit
Antimony	ND	0.2	ND	0.3
Arsenic	ND	0.2	ND	0.2
Cadmium	ND	0.02	ND	0.03
Chromium	ND	0.05	ND	0.05
Lead	ND	0.1	ND	0.1
Mercury	ND	0.005	ND	0.005
Selenium	ND	0.3	ND	0.3
Silver	ND	0.05	ND	0.07
Copper	ND	0.02	ND	0.02
Nickel	0.05	0.04	0.05	0.04
Zinc	0.27	0.02	0.27	0.02
Beryllium	ND	0.02	ND	0.03
Thallium	ND	0.3	ND	0.4

* Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: / Bavid Dickinson

Date: 18 Box 5-

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RTIFICATE OF ANALYSIS	L VOLATILE ORGANICS Method 8260	5	
Client: ATEC Environmental	Consultants		
Client Project ID: UST 37 B UST 39 B	ldg. 2461, ldg. 2520'	ESS Project ID:	922026
Client Sample ID: LRS-4		ESS Sample ID:	922026-04
Date Sample Received: 8/5/9	2	Date Reported:	8/18/92
Parameter	Result (ug/Kg)	· ···	MRL
Methylene Chloride	ND		5
1,1-Dichloroethane	ND		5
Chloroform	ND		5
Carbon Tetrachloride	ND		5
1,2-Dichloropropane	ND		5
Dibromochloromethane	ND		5
1,1,2-Trichloroethane	ND		5
Tetrachloroethene	ND		5
Chlorobenzene	ND		5
1,2-Dichloroethane	ND		5
1,1,1-Trichloroethane	ND		5
Bromodichloromethane	ND		5
Trans-1,3-Dichloropropene	ND		5
Bromoform	ND		5
1,1,2,2-Tetrachloroethane	ND		5
Benzene	ND		5
Toluene	ND		5
Ethyl Benzene	ND		5
Chloromethane	ND		10
Bromomethane	ND		10
Vinyl Chloride	ND		10
Chloroethane	ND		10
1,1-Dichloroethene	ND		5
1,2-Dichloroethene (Total)	ND		5
Trichloroethene	ND		5
Acetone	ND		10
Carbon Disulfide	ND		5
2-Butanone	ND		10
Cis-1,3-Dichloropropene	ND		5
4-Methyl-2-Pentanone	ND		10
2-Hexanone	ND		10
Styrene	ND		5
Xylenes (Total)	11		10

ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

David Dickinson Laboratory Director

Date: 18 12-52

RTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants Client Project ID: UST 37 Bldg. 2461, UST 39 Bldg. 2520 Client Sample ID: LRS-5 Date Sample Received: 8/5/92 Client Sample Received: 8/5/92 Date Reported: 8/18/92

Parameter	Results	Units	MRL	Method
Percent Solids	88	% w/w	1	160.3
Total Petroleum Hydrocarbon-IR	17	mg/Kg	11	418.1
Volatile Organics	ND	ug/Kg	Attached	8260
Toxicity Characteristic Leaching B Zinc	Procedure 0.33	mg/L	Attached	1311 6010

TPHIR reported on dry weight basis

ND = Not Detected above the Method Reporting Limit(MRL)

Approved by: Đá ∕vĭď ckins Laboratory Director

Date: 18 Phr. 4 L



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RTIFICATE OF ANALYSIS

TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

METALS

EPA METHOD 1311

Client: ATEC Environmental Consultants Client Project ID: UST 37 Bldg. 2461, UST 39 Bldg. 2520

Client Sample ID: LRS-5, UST 37

ESS Sample ID: 922026-05

Date TCLP Performed: 8/6/92

Date Sampled: 8/3/92

Date Leachate Extracted: 8/7/92

Date Extract Analyzed: 8/10/92

	Act	ual	Adjusted*	
Target Analyte	Sample Result (mg/L)	Method Reporting Limit	Sample Result (mg/L)	Method Reporting Limit
Antimony	ND	0.2	ND	0.3
Arsenic	ND	0.2	ND	0.2
Cadmium	ND	0.02	ND	0.03
Chromium	ND	0.05	ND	0.05
Lead	ND	0.1	ND	0.1
Mercury	ND	0.005	ND	0.005
Selenium	ND	0.3	ND	0.3
Silver	ND	0.05	ND	0.07
Copper	ND	0.02	ND	0.02
Nickel	ND	0.04	ND	0.04
Zinc	0.33	0.02	0.33	0.02
Beryllium	ND	0.02	ND	0.03
Thallium	ND	0.3	ND	0.4

* Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: · Bavid Bickinson Laboratory Director

Date: 18/14-1L



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RTIFICATE OF ANALYSIS	DLATILE ORGANICS Method 8260	5	
Client: ATEC Environmental Con	sultants		
Client Project ID: UST 37 Bldg UST 39 Bldg	. 2461, . 2520'	ESS Project ID:	922026
Client Sample ID: LRS-5		ESS Sample ID:	922026-05
Date Sample Received: 8/5/92		Date Reported:	8/18/92
Parameter	Result (ug/Kg)		MRL
Methylene Chloride	ND		5
1,1-Dichloroethane	ND		5
Chloroform	ND		5
Carbon Tetrachloride	ND		5
1,2-Dichloropropane	ND		5
Dibromochloromethane	ND		5
1,1,2-Trichloroethane	ND		5
Tetrachloroethene	ND		5
Chlorobenzene	ND		5
1,2-Dichloroethane	ND		5
1,1,1-Trichloroethane	ND		5
Bromodichloromethane	ND		5
Trans-1,3-Dichloropropene	ND		5
Bromoform	ND		5
1,1,2,2-Tetrachloroethane	ND		5
Benzene	ND		5
Toluene	ND		5
Ethyl Benzene	ND		5
Chloromethane	ND		10
Bromomethane	ND		10
Vinyl Chloride	ND		10
Chloroethane	ND		10
1,1-Dichloroethene	ND		5
1,2-Dichloroethene (Total)	ND		5
Trichloroethene	ND		5
Acetone	ND		10
Carbon Disulfide	ND		5
2-Butanone	ND		10
Cis-1,3-Dichloropropene	ND		5
4-Methyl-2-Pentanone	ND		10
2-Hexanone	ND		10
Styrene	ND		5
Xylenes (Total)	ND		10

ND = Not Detected above Method Reporting Limit (MRL)

Laboratory Director

David Dickinson

Approved by:

Date: 17/1252

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RTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants		
Client Project ID: UST 37 Bldg. 2461, UST 39 Bldg. 2520	ESS Project ID:	922026
Client Sample ID: LRS-6 UST 37	ESS Sample ID:	922026-06
Date Sample Received: 8/5/92	Date Reported:	8/18/92

Parameter	Results	Units	MRL	Method
Percent Solids	90	€ w/w	1	160.3
Total Petroleum Hydrocarbon-IR	ND	mg/Kg	11	418.1

TPHIR reported on dry weight basis

ND = Not Detected above the Method Reporting Limit(MRL)

Approved by: David Dickinson Laboratory Director

Date: 18 Aug 5 c



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ERTIFICATE OF ANALYSIS

Client: ATEC Environmental Consultants	
Client Project ID: Ft. Devens-Stockpiled Soils	ESS Project ID: 921528
Client Sample ID: LSP-37	ESS Sample ID: 921528-10
Date Sample Received: 6/11/92	Date Reported: 7/1/92

Parameter	Results	Units	MRL	Method
pH (Corrosivity)	7.6	s.u.	N/A	9045
Flashpoint	No Flash	°F	200	1010
Polychlorinated Biphenyls Arochlor 1254	3.4	mg/Kg	Attached	8080
Reactive Cyanide	ND	mg/Kg	2	7.3.3.2
Reactive Sulfide	ND	mg/Kg	2	7.3.4.1
Semivolatile Organics Benzo(a)anthracene Benzo(b)fluoranthene Benzo(k)fluoranthene	8,500 18,800 22,800	ug/Kg ug/Kg ug/Kg	Attached Attached Attached	8270 8270 8270
Volatile Organics	ND	ug/Kg	Attached	8240
Toxicity Characteristic Leaching	Procedure			1311
Lead Copper Nickel Zinc	0.4 0.09 0.05 0.33	mg/L mg/L mg/L mg/L	Attached Attached Attached Attached	6010 6010 6010 6010

N/A = Not Applicable

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: David Dickinson Laboratory Director

24.1492 Date:_

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 535 Ab., B. Arendello Waterer, Black Filmel, 1965, 401 (1975).
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 55 Directory (1976).

RTIFICATE OF ANALYSIS

POLYCHLORINATED BIPHENYLS Method 8080

Client: ATEC Environmental Consultants Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528 Client Sample ID: LSP-37 ESS Sample ID: 921528-10 Date Sample Received: 6/11/92 Date Reported: 6/30/92

Parameter		Result (mg/Kg)	MRL
Arochlor	1016	ND	0.1
Arochlor	1221	ND	0.1
Arochlor	1232	ND	0.1
Arochlor	1242	ND	0.1
Arochlor	1248	ND	0.1
Arochlor	1254	3.4	0.2
Arochlor	1260	ND	0.2

ND = Not Detected above Method Reporting Limit (MRL)

Surrogate Recovery Data	% Recovery	QC Limit
Dibutylchlorendate	95%	50 - 150%

Approved by: David Dickinson Laboratory Director

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ACID EXTRACTABLES EPA 8270

Client: ATEC Environmental Consultants	
Client Project ID: Ft. Devens-Stockpiled Soils	ESS Project ID: 921528
Client Sample ID: LSP-37	ESS Sample ID: 921528-10
Date Sample Received: 6/9/92	Date Reported: 7/1/92

Parameter	Result (ug/Kg)	MRL
2-Chlorophenol	ND	1,670
2-Nitrophenol	ND	1,670
Phenol	ND	1,670
2,4-Dimethylphenol	ND	1,670
2,4-Dichlorophenol	ND	1,670
2,4-Dinitrophenol	ND	8,350
Pentachlorophenol	ND	8,350
4-Nitrophenol	ND	8,350
2,4,6-Trichlorophenol	ND	1,670
2,4,5-Trichlorophenol	ND	8,350
2-Methylphenol	ND	1,670
4-Methylphenol	ND	1,670
4-Chloro-3-Methylphenol	ND	1,670
4,6-Dinitro-2-Methylphenol	ND	8,350

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: David Dickinson Laboratory Director

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Julige Date:



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 191 Bookho, PACE Astronom, Construction of Construction of Construction (2010).

ERTIFICATE OF ANALYSIS

BASE NEUTRAL EXTRACTABLES EPA 8270

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-37

Date Sample Received: 6/9/92

ESS Sample ID: 921528-10

Date Reported: 7/1/92

Parameter

Result (ug/Kg)

MRL

Acenaphthylene	ND	1,670
1,2,4-Trichlorobenzene	ND	1,670
Hexachlorobenzene	ND	1,670
Bis(2-chloroethyl)ether	ND	1,670
2-Chloronaphthalene	ND	1,670
1,2-Dichlorobenzene	ND	1,670
1,3-Dichlorobenzene	ND	1,670
1,4-Dichlorobenzene	ND	1,670
3,3-Dichlorobenzidine	ND	3,340
2,4-Dinitrotoluene	ND	1,670
2,6-Dinitrotoluene	ND	1,670
Fluoranthene	ND	1,670
4-Chlorophenyl phenyl ether	ND	1,670
Bis(2-chloroisopropyl) ether	ND	1,670
Bis(2-chloroethoxy) methane	ND	1,670
Hexachlorobutadiene	ND	1,670
Hexachlorocyclopentadiene	ND	1,670
Isophorone	ND	1,670
Napĥthalene	ND	1,670
Nitrobenzene	ND	1,670
N-nitrosodiphenylamine	ND	1,670
N-nitrosodi-n-propylamine	ND	1,670
Bis(2-ethylhexyl)phthalate	ND	1,670
Di-n-butylphthalate	ND	1,670
Di-n-octylphthalate	ND	1,670
Diethyl phthalate	ND	1,670
Dimethyl phthalate	ND	1,670
Benzo(a)anthracene	8,500	1,670

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: David Dickinson Laboratory Director

Date:

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RTIFICATE OF ANALYSIS

BASE NEUTRAL EXTRACTABLES cont. EPA 8270

Client: ATEC Environmental Consultants

Client Project ID: Ft. Devens-Stockpiled Soils ESS Project ID: 921528

Client Sample ID: LSP-37

ESS Sample ID: 921528-10

Date Sample Received: 6/9/92

Date Reported: 7/1/92

Parameter	Result (ug/Kg)	MRL
Benzo(a)pyrene	ND	1,670
Benzo(b)fluoranthene	18,800	1,670
Benzo(k)fluoranthene	22,800	1,670
Chrysene	ND	1,670
Acenaphthene	ND	1,670
Anthracene	ND	1,670
Benzo(ghi)perylene	ND	1,670
Fluorene	ND	1,670
Phenanthrene	ND	1,670
Dibenzo(a,h)anthracene	ND	1,670
Indeno(1,2,3-cd)pyrene	ND	1,670
Pyrene	ND	1,670
Hexachloroethane	ND	1,670
4-Bromophenyl-phenylether	ND	1,670
Benzyl Alcohol	ND	1,670
Benzoic Acid	ND	8,350
Bis(2-Chloroethoxy)methane	ND	1,670
4-Chloroaniline	ND	1,670
2-Methylnaphthalene	ND	1,670
2-Nitroaniline	ND	8,350
3-Nitroaniline	ND	1,670
Dibenzofuran	ND	1,670
4-Nitroaniline	ND	8,350
Butylbenzylphthalate	ND	1,670

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: David Dickinson Laboratory Director

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S Julique Date:

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ERTIFICATE OF ANALYSIS

TCL VOLATILE ORGANICS Method 8240

Client: ATEC Environmental Consultants

Client	Project	ID:	Ft.	Devens-Stockpiled	Soils	ESS	Project	ID:	921528
Client	Sample 3	ID:	LSP-	37		ESS	Sample	ID:	921528-3

Date Sample Received: 6/29/92

10 Date Reported: 7/1/92

Parameter	Result (ug/Kg)	MRL
Methylene Chloride	ND	1,000
1,1-Dichloroethane	ND	1,000
Chloroform	ND	1,000
Carbon Tetrachloride	ND	1,000
1,2-Dichloropropane	ND	1,000
Dibromochloromethane	ND	1,000
1,1,2-Trichloroethane	ND	1,000
Tetrachloroethene	ND	1,000
Chlorobenzene	ND	1,000
1,2-Dichloroethane	ND	1,000
1,1,1-Trichloroethane	ND	1,000
Bromodichloromethane	ND	1,000
Trans-1,3-Dichloropropene	ND	1,000
Bromoform	ND	1,000
1,1,2,2-Tetrachloroethane	ND	1,000
Benzene	ND	1,000
Toluene	ND	1,000
Ethyl Benzene	ND	1,000
Chloromethane	ND	1,000
Bromomethane	ND	1,000
Vinyl Chloride	ND ·	1,000
Chloroethane	ND	1,000
1,1-Dichloroethene	ND	1,000
1,2-Dichloroethene (Total)	ND	1,000
Trichloroethene	ND	1,000
Acetone	ND	1,000
Carbon Disulfide	ND	1,000
2-Butanone	ND	1,000
Cis-1,3-Dichloropropene	ND	1,000
4-Methyl-2-Pentanone	ND	1,000
2-Hexanone	ND	1,000
Styrene	ND	1,000
Xvlenes (Total)	ND	1,000

ND = Not Detected above Method Reporting Limit (MRL)

Approved by:

David Dickinson Laboratory Director

2 Jul 192 Date:__ 070

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RTIFICATE OF ANALYSIS

TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

METALS

EPA METHOD 1311

Client: ATEC Environmental Consultants

Client Project ID: Stockpiled Soils

Client Sample ID: LSP-37

ESS Sample ID: 921528-10

Date Sampled: 6/9/92 Date TCLP Performed: 6/22/92 Date Leachate Extracted: 6/23/92

Date Extract Analyzed: 6/24/92

And the Rest Concerning Source Sources of the Source Sources of the Source Sou	Act	ual	Adjı	isted*
Target Analyte	Sample Result (mg/L)	Method Reporting Limit	Sample Result (mg/L)	Method Reporting Limit
Antimony	ND	0.1	ND	0.2
Arsenic	ND	0.2	ND	0.2
Cadmium	ND	0.02	ND	0.02
Chromium	ND	0.05	ND	0.05
Lead	0.4	0.1	0.4	0.1
Mercury	ND	0.005	ND	0.005
Selenium	ND	0.3	ND	0.3
Silver	ND	0.05	ND	0.09
Copper	0.08	0.02	0.09	0.03
Nickel	0.05	0.04	0.05	0.04
Zinc	0.33	0.02	0.33	0.02
Beryllium	ND	0.02	ND	0.04
Thallium	ND	0.05	ND	0.09

* Actual sample result adjusted for matrix bias. Refer to matrix spike analysis summary form.

ND = Not Detected above Method Reporting Limit (MRL)

Approved by: Dav Laboratory Director

wironmental Science Services

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Spaller Date:___

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4.9 CHAIN OF CUSTODY FORMS

The following chain of custody forms were completed for the soil samples which were laboratory analyzed.

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4.10 HAZARDOUS WASTE MANIFEST

UST No. 0037 was estimated to contain 955 gallons of No. 2 fuel oil and residual materials. Approximately 935 gallons of fuel oil was removed on January 7, 1992, and transported to a licensed T.S.D.F. (Beede Waste Oil Corporation). Approximately 20 gallons were transported and disposed at Beede Waste Oil Corporation on February 27, 1992.

The following Hazardous Waste Manifests were generated from residual tank materials during the vacuum process and cleaning process. The manifest dated January 7, 1992 is associated with vacuuming product from several USTs. Therefore, the total quantity (1,400 gallons), is greater than the 935 gallons which were removed from UST 0037. The manifest dated February 27, 1992 is associated with the drummed material from several USTs. Therefore, the total quantity, (395 gallons), is greater than the 20 gallons which was removed from UST 0037.

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COMMONWEALTH OF MASSACH DEPARTMENT OF ENVIRONMENTAL DIVISION OF HAZARDOUS W	USETT: PROTE(ASTE	S CTION				
One Winter Street Boston, Massachusetts 021	08					
e print or type. (Form designed for use on elite (12-pitch) typewriter,)						-
UNIFORM HAZARDOUS 1. Generator US EPAID No.	Manifest Sument No.	2. Page	1 Information	in the shade	d areas	
WASTE MANIFEST MIA17121/1016121-9/1519101	20101		/ is not requi	ed by Federa	si law.	E
3. Generator's Nanie and Mailing Address HQS Four Develop		MA	F35364	i 1		1
Fort Deven M 1.143-	5	B. State	Gen. ID	4.		
4. Generator's Phone 6681796-3003-342-1518-796-27	///		SAK	r/E		μ
Beede Waste Oil Corp. N H H D 018958140		WIHM	-19161713	2111		365
7. Transporter 2 Company Name 8. US EPA ID Number	1 1 1	D. Tran E. State	sporter's Phones Trans. 10	03_38:	2-5761	15
9. Designateo Facility Name and Site Address 10. US EPA ID Number		11-	1.1.1	<u> 4. 1</u>	<u> </u>	Í.
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	12. Cont	ainers	13.	14.	13/01	12
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15. Special Handling Instructions and Additional Information		L		0		
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16 GENERATOR'S CERTIFICATION, I hereby declare that the contents of this consignment are fully and accurately des	cribed above b					и И И
proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for according to applicable international and national government regulations.	transport by h	ighwiry				TA
If I am a large quantity generator, I certify that I have 's program in place to reduce the volume and toxicity of waster and that I have selected the practicable method of treatment, storage, or disposal currently available to me which m ment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and a	generated to th unimizes the p elect the best o	ve degree I h resent and h waste manag	ave determined to b uture threat to humi gement method that	e economically In health and ti Lis available to	r practicable he environ- me and that f	
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18. Transporter 2 Acknowledgement of Receipt of Materials Printed/Lived Name	· · · · · · · · · · · · · · · · · · ·				Date Date Year	}
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* 508-796-3002	AF7D_DFOFM Attn:	Mark Bose	γ-	B, State	^{Gen. 10} // /	4	
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							道之法道是
]	
		•			111]	
Icitional Descriptions for Materials Listed	Above Vinchide Physicial state and h	arad cods J		K, Hand	ing Codes for W	e stes	Above
				Ъ.	÷.	d.	
special Handling Instructions and Addition	al Information	4-RIde 63	31 1-6	10024	47 1-74	76 -	1-3573
Be Recycled \$2 Fuel	With SI=Sludge	7		1 .		,	
ENERATOR'S CERTIFICATION: I hereby reciare th	at the contents of this consignment are fu	illy and accurulely de	Scribed above b	7			
oper shipping name and are classified, packed, m cording to applicable international and national g	arked, and tabeled, and are in all respects lovernment regulations.	in proper condition fo	or transport by ta	ignway			
) am a large quantity generator, I certify that I hav is that I have selected the practicable method of I	e a program in place to reduce the volume treatment, storage, or disposal currently a	and toxicity of wasti vailable to me which	s generated to the minimizes the pr	he degree I h resent and fu	ele desensined to l nure threat to hum	be aconomicali an health and t	y practicable he environ-
enti OR, if Lam a small quantity generator, I have i in afford.	made a goor faith effort to minimize my w	vasie generation and	select the busin		(+0120) me1003 104		Date
Printed/Typed Namery / /	Si		ZULATI			Month	Day Year
JERLEN K HERKIN		· As	104-			0:2	12792
ransporter 1 Acknowledgement of Re	ceipt of Materials	×			<u></u>		Date
Printed/Typed Name	F	ອາອານເອ				Month	Day Year
ian Ginivan	15	un	- 4	a	<i>م</i>	00	27192
ransporter 2 Acknowledgement of Re	ceipt of Materials						Date
Printed/Typed Name	Si	ghature	1			Month	Day Year
Discrepancy Indication Space	<u>. </u>						┙┙┙
	l receipt of hezerdous materials cov	ered by this manif	est exception	i oted in Ite			
acility Owner or Operator. Certification of	•				· ·_ ·		Date
acility Owner or Operator. Certification of						Munth	lay Year
acility Owner or Operator. Certification of Printed/Typed Name	: :	gnature					
acility Owner or Operator. Certification of Printed/Typed Name a DMB Nu 2050-2038 Expres 9-30-91 8700-22 (Rev. 9-85) Previous Acidoon	: Su	Qnature					
acility Owner or Operator, Certification of Printed/Typed Name a DMD Nu 2050-3038 Expres 9-30-91 8700-22 (Rev. 9 RS) Previous -Killion:	: Sy	gnature					

4.11 WEIGHT RECEIPT AND BILLS OF LADING

The following weight receipts and Bills of Lading document the soil disposal assoiated with UST 0037.

MAIN OFFICE: NVERS 750-42 Istoner 3 ATE00 ITEC ASSOC.	TRIMOUNT B DAN 651 LA SHR OFFICE	TUMINO HERRY H RI P.O. BOX 2089 VERS, MA D1923- EWSBURY DIVIS KE STREET AT R EWSBURY, MA D1 881-1430 PLANT 7	DUCTS CO (E) (089 (10N (E) 20 545 54-4709	M E HIX t	RRIVED JC EFT JOB EFT JOB	BIE NAME	OHECKED	BY	CARRIEF	rge 277
12 BOCORD PARK 1 10 RVELL, MA 0200 117-878-6200	DRIVE 51	BLDG 4461 TI FORT DEVENS, MA PO¥ 37.04.72053	INK 37 01433	ъ.					- - -	
Time 10:02:34	Ja re 27400	Net 47340	Gross 74740	1	lotal 23.67			•		
Cost/Ton Pe	urcent Tax Loa Job Total	d Cost Amount T.	Tax Dest C	harge To Fob/Del	otal Cost				-	
		10:02:34 :	ann Aug 3, 1	992 F		REC	EIVED BY	THIS COM SPONSIBL BY TRUCK BEYOND S	PANY WILL N E FOR DAMA S DELIVERIN REET PAVI	IOT BE RE- IGE CAUSED IG MATERIAL EMENT.
UN OFFICE: /ERS 750-4200	TRIMOUNT BIT(5 CHE DANVE SHREW 651 LAKE SHREW OFFICE 881	IMINO) ROD RRY HI, RIVE O. BOX 2089 RS, MA 01923-508 SBURY DIVISIO STREET AT RTE. SBURY, MA 0154 -1430 PLANT 754	UCTS CO. 9 N 20 4709	T FMI H ARF E LEF	N AIVED JOB T JOB	CH ECK #	ash 🗆 HECKED B' I CRET	C.O.D. □ Y ¥	Charge Charge CARRIER 7	2591
DHET # ATFOOL 1 ESSOC. ACCOPD PAPY DET (ELL, MA 0206) -876-6200	Jot NG PUL FOR POR	¥ FLEMFE ARMY NG 7 DEMEKE, MA (0) 37.04.72053	÷</th <th>113 e</th> <th>¥75</th> <th>HIN NARF (L).</th> <th>L 5011</th> <th>T</th> <th>kuckt 9</th> <th></th>	113 e	¥75	HIN NARF (L).	L 5011	T	kuckt 9	
Time :L1:58	Tare 27500	Net 10060	orne: Boten	Tou: 28.3	21 35					•
Cost/Ton Perce	ent Tax - Load C	ost A∍ount Ta	, best ther	gs Total	Cost					
Loada 2	Joh Tolai 30.50	10:11:55 at	δ luite Aud 3. 1×17	Fob/De) F	Ę	RECEN	T S E E VED BY	HIS COMPAN PONSIBLE F IY TRUCKS D IEYOND STR	NY WILL NOT OR DAMAGE VELIVERING I EET RAVEME	BE RE- CAUSED MATERIAL NT.

AIN OFFICE IVERS 750-4200	TRIMOUNT BI 5 C DAN SHRE 651 LAI SHRE OFFICE	TUMIN PRO HERRY LOBI P.O. BOX 2089 VERS, MA 01923-5 WSBURY DIVIS KE STREET AT RT EWSBURY, MA 01 881-1430 PLANT 7	DUCTS CO 7E 089 ION FE. 20 545 54-4709	M ARRIVED J E LEFT JOB	Cash Cash CB	C.O.D. Charge A Strength Charg
					TICKET	∦ R 72809
tomer # ATEDO1 EC ASSOC. ACCORD PARK DRIVE RVELL, NA 02061 .7-878-6200	Jo U B P P	5 # BLDGFD S ARMY LDG TA ORT DEVENS, HA O# 37.04.72053	01433	<u>1912</u> ∎ ₩76	HIY MAME OIL SOIL	TRUCK# 9
Time 1:49:48 Cost/Ton Percen	Tare 27500 ht Tax Load	Ret 55020 Cost Amount	Gross 82520 Tax Dest Ch	Total 27.51 arge Total Cost		۲.
Loadi 6	Job Total 140.52	Ti 1:49:48 p	∎e & Date ■ Aug 4, 19	Fob/De1 92 F	RECEIVED BY	THIS COMPANY WILL NOT BE RE- SPONSIBLE FOR DAMAGE CAUSED BY TRUCKS DELIVERING MATERIAL BEYOND STREET PAVEMENT.

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RECEIVED BY ____

TO 918716781 P003/014 01-13-94 12:00PM FROM BARDON TRIMOUNT BILL OF LADING . POLICY # WSC-89-001 DATE יו שצר השב BILL OF LUDING IN SITE OF GENERATION: GENERATOR NAME/ADDRESS: 1K#2 F.O. 246 <u>UST #37</u> STREET **QMV** 6106.2461 WOT STATE /ĸ' Y ._\ TRANSPORTATION ACCEDENTI 508 CONTACTATEL & MATERIAL DESCRIPTION (TOTAL PROJECTED QUANTITY): CONTAMINATED SOL: 37.5 2.5 CONTAMINATED DEBRIS: I abiorhem pads ... I absorberst booms vol (ai ydi) vet (cayds) speaky det ____ **** (**12022) ••• ANALYSES ATTACHED? TYPE OF CONTAMINATION: _ raroline X 12 of ____ M Volauler: Y & H TPH: XY N TRANSPORTER NAME/ADDRESS: DESTINATION FACILITY NAME/ADDRESS: KITUMINOUS RIMOUNT RUNXZ UMINOUS RODUCTS 503 CONTACT/TEL I: _ In cinerator TYPE OF FACILITY: Recycling Landfill 📜) Į 120-92 GENERATOR'S SIGNATURE DATE: CABOYE MENS MUST BE COMPLET ÉD' PRIOR TO DE F UTHORIZATIC AUTHORIZATION: DEF. SIGNATURE (on in the ing region): 3 DATE ಳುಷ್ಟು (I' spolicable) DEP. SIGNATURE (dertination of DATES tion ! TRUCKARACTOR REGISTRATION MA 880963 1. S. र्भ (य रेग) QUANTITY SEEPPED: r (uns) TOTAL PROJECTED TRAILER REGISTRATION Sile SERVED TO DATE 8-3-9 LEFT SITE AT_ DATE 24.44 TITLS LOAD (cruinsum) · GEVERATOR OR RECEIPTING ELCH REPRESENTATIVES \mathbf{m} SIGNATURE . ८ REVUNING TO BE SHE Ticket 69 • ~92 . . TRAHSPORTER'S SIGNATURE ARR TIME _Z: 12 13190 1:02 RECEIVING FACILITY REPRESENT & TIVE'S SIGNATURE DATE Annte GENERATOR IS RESPONSIBLE FOR RETURNING COMPLETED FORM WITHIN'S DAYS TO: DEPARTMENT OF ENVIRONMENTAL FACTECTION RECEIVED. ٦. JUL 2 1 1997 DEP BWSCHENERGENCY RESPONSE BRANCH " ONE WINTER STREET, SO FLOOR ... BOSTON, MA 02104 ι. AND . Central Reg ? ١. THE WARD PROPERTY OF THE ORIGINATING REGIONAL OF CE THE PROPERTY OF THE OF 14 FALSIFICATION OR MISREPRESENTATION OF ANY OF THE INFORMATION ON THIS BILL OF LADING IS A VIOLATION OF M.G.L. C. 21C AND 310 CMR 30.006 AND 30.007 AND IS SUBJECT TO APPROPRIATE STATUTORY OR REGULATORY PENALTIES. . 2
01-13-94 12:00PM FROM BARDON TRIMOUNT TO 918716781 P005/014 BILL OF LADING POLICY # W5C-89-001 BELL OF LADING # DATES DE? CUSE I: SITE OF GENERATION: GENERATOR NAME/ADDRESS: IK # 2 F.O, STREET 246 UST #37 RMY BIAC. 2461 STATE Δ ĸ TRANSPORTATION A COLDENT? Y . 🛽 508-796 CONTACT/TEL #: MATERIAL DESCRIPTION (TOTAL PROJECTED QUANTITY): CONTAMINATED SOIL: 37.5 25 CONTAMINATED DEBRIS: I abiorben pade ___ s proces i pocurs M (ioni) भर्भ (चा yds) vel (cs ydi) specially dri _____ what (specify) TYPE OF CONTAMINATION: ANALYSES ATTACHED? garaline X 12 of __ 14 of __ 16 of __ other (mealy). Volution Y KN TPH: KY ___ N TRANSPORTER NAME/ADDRESS: DESTINATION FACILITY NAME/ADDRESS: UMINA RIMAINT MINOUS N903 CONTACT/TEL #: TYPE OF FACILITY: V. Recycling _ Lindiji ____ Isonemier 6.92 GENERATOR'S SIGNATURE DATE: (ABOVE ITEMS MUST BE COMPLE UTHORIZAT T PRIOR TO DE AUTHORIZATION: DEF. SIGNATURE (originating region): DAT (I spolicable) .DET. SIGNATURE (destination region) DATE A94/-TRUCK/TRACTOR REGISTRATION QUANTITY SHIPPED: × (was) 101 (cu you) TOTAL PROJECTED TRAILER REGISTRATION _ LEFT SITE AT 9:00 SEPTED TO DATE DATE 26.33 TES LOAD (caiminal) GENERATOR OR RECEIVING FACE SIGNATURE. NEXANING TO BE SHIPPED <u>M</u>e relate 725.7 90 TRANSPORTER'S SIGNATURE 10:11 13/72 ARR TIME RECEIVING FACILITY REFRESENTATIVE'S SIGNATURE DATE GENERATOR IS RESPONSIBLE FOR RETURNING COMPLETED FORM WITHIN'S DAYS TO. *RECEIVED* 1. 1 DEPARTMENT OF ENVIRONMENTAL PROTECTION JUL 2 1 1992 BWSCHEMERGENCY RESPONSE BRANCE ONE WINTER STREET, SU FLOOR DEP BOSTON, MA 02108 Central - Red 5 AND THE ORIGINATING REGIONAL OFFICE 63 FALSIFICATION OR MISREPRESENTATION OF ANY OF THE INFORMATION ON THIS BILL OF LADING IS A VIOLATION OF M.G.L. C. 21C AND 310 CMR 30.006 AND 30.007 AND IS SUBJECT TO APPROPRIATE STATUTORY OR REGULATORY PENALTIES. 1 -

TO 918716781 P006/014 FROM BARDON TRIMOUNT 01-13-94 12:00PM с. С BILL OF LADING POLICY # WSC-89-001 BELL OF LADING A DATE DEP CASE In STIE OF GENERATION CENERATOR NUME/ADDRESS; IK #2 F.O, STREET C 246 <u>UST #37</u> BUCK Zt 61 ٠. WOT STATE. TRANSPORTATION ACCIDENTS ¥ 508-796-3002 CONTACT/TEL R._ MATERIAL DESCRIPTION (TOTAL PROJECTED QUANTILY): CONTAMINATED DEBRIS: & abiorbest pade ... absorbeat beens WL (12025) voj (cz ydz) vol (= yds) specity in _____ other (specity) . . TYPE OF CONTAMINATION: ANALYSES ATTACHED? Volatilier: Y KN TPH: KY_ TRANSPORTER NAME/ADDRESS: DESTINATION FACILITY NAME/ADDRESS: UMINAN MINOU 503 21 4 CONTACT/TEL 1: TYPE OF FACILITY: H Renycling Landfill ____ Incinerator -97 GENERATOR'S SIGNATURE: DATE: (ABOYE MEN'S MUST BE COMPLET D PRIOR TO DE AUTHORIZATION: DEF. SKINATURE (originating region); DÁTE -11 (I applicable) DER SIGNATURE (destination re DATE: 880 - 963 MH TRUCK/TRACTOR REGISTRATION vol (cu ýdi) OUNNITY SHIPPED: r (ons) TRALER REGISTRATION _ ~7 A TOTAL PROJECTED SEPPED TO DATE LEFT SITE AT 9:10 DATE . \mathbf{R} 23.67 GENERATOR OR RECETYING FACE THIS LOAD (unimated) PLDDEL REHAINING TO BE SHIPPED SIGNATURE: and ACKA 72581 $\overline{2}$ TRANSPORTER'S SIGNATURE 92 ARR TIME (D'.CZ RECEIVING FACILITY REPRESENTATIVES SIGNATURE • • GENERATOR IS RESPONSIBLE FOR RETURNING COMPLETED FORM WITHIN'S DAYS TO. RECEIVED -والمعرية المتعادية والمعالية - **R**____ (DEPARTMENT OF ENVIRONMENTAL PROTECTION BWSCIENERGENCY RESPONSE BRUNCE JUL 24 1992 ONE WINTER STREET, SUN FLOOR DEP BOSTON, MA 02108 Čentral - Reg 🗧 AND THE ORIGINATING REGIONAL OFFICE 1 W 1. 1. Ł TALSIFICATION OR MISREPRESENTATION OF ANY OF THE INFORMATION ON THIS BILL OF LADING IS A VIOLATION OF M.G.L. C. 21C AND 310 CMR 30.006 AND 30.007 AND IS SUBJECT TO APPROPRIATE STATUTORY OR REGULATORY PENALTIES. . 1 4 ... • • . . .

4.12 PERMITS AND CERTIFICATIONS

The following permit was obtained from the Fort Devens Fire Department for the proper closure of a UST. Following the permit there is a disposal receipt for the steel UST.

			<u>د. د. کر کر در د. بر مر</u> در
<u><u></u> <u></u> 1</u>	The Common	wealth of Massachus	etts
DEPARTMENT	of Public S	AFETY DIVISION OF FI	at Prevention
	PEF	RMIT	1 <u>561120.11</u> 3-
FOR REMOVAL	AND TRANSPORTAT	KON TO APPROVED TANK YARE	DIG SAFE NUMBER
Section 38Å this permit i	s granted to	Dier 1481.8111 as provided	IN HOLDER 242
To transport un	f person, firm c derground steel	sociates, inc. or Corporation storage tank(s)	
State clearly type of inert gas used in	to Approv	ved tank yards 1.4440	
steel storage tank	steel tank:	Dry 10.9	· .
FDID# 17919 Fee paid \$N/A	Name and add disposing ta Location to be transport	dress of contractor onk <u>pre C Associates</u> which tank will ted	ZARecord Park Dr., Norvell
This permit will expire3	1124-1992	Approved tank yards Approved tank yards Geneticial of fire Dept. (Head of Fire Dept.)	ranting permit (TITLE)
त्रः 🔋	•	3	7

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ECEIPTROF DISPOSAL OF HINDERGR	OUND#STEELASTORAC	GETANK 2 M TOTAL CONTRACT OF THE					
IAME AND ADDRESS	TOMBARELLO & SQNS	<u></u>					
PPROVED TANK YARD 14 YZTACE MASS 01841							
PPROVED TANK YARD NO. 1 4	201						
'ank Yard Ledger 502 CMR 3.03(4) Number: <u>9</u>	200121					
: certify under penalty of law I have p elivered to this "accorded tank yard"	ersonally examined the firm, corroration	he underground steel storage tank or partnership ATEC ENVIRONMENTAL ASSOC.					
and accept	ed same in conformance	ce with Massachusetts Fire Prevention					
, valid permit was issued by LOCAL H	lead of Fire Departmer	nt FDIDI 17919 to transport					
ane and official title of approved tar	vk yard owner or owner	rs authorized representative:					
James Marinto	Ceu	1-28-92					
SIQATURE	TITLE	DATE SIGNED					
This signed receipt of disposal mist be DID 17912 pursuant to 502 CM	R 3:00. (EACH TANK M	al head of the fire department UST HAVE & RECEIPT OF DISPOSAL)					
ORH F.P. 291 (rev. 9/88)	(OVER)	MASSACHUSETTS STATE FIRE MARSHAL'S OFFICE					
		. *					
		· .	· .				
			••				
فالمراقب والارتباط المحال والمراجع المراجع المراجع	والأسراموني أسراها والعر	والمحاد والمحاد والمحالي المحام والمحالي والمحالة والمحالية والمحالية المحالية والمحالية والمحالية والمحالية وا					
	Tank Rem	oved From					
DIMENSIONS	-1. Do	201005 - Bldg. # 2461 tank#37					
Width Length		(100110					
A8" 10'8"	(10. 5						
ank 1 - JU X JU-2-							
ank 2 X	(city or	town)	· .				
	Fina Dana	artment have listed					
ank 3 X	rire vepa Permit #	11 UNICE NOTICE USIE					
Tank 4 X		(if applicable)					
Tank 5 X							
(feet) (feet)							

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4.13 UST CLOSURE CHECKLIST

The following closure checklist was produced by ATEC Associates Inc., for quality control purposes.

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AT-CLOSURE O/C CHECK LIST			UST 37 .	
1	ŧ		Building 2461	
DEFINABLE FEATURE	DATE	TIME	MEASUREMENTS	NOTES
Remove tank, piping, pumps, and hardware.	1/16/8	11:15	Photographic Descriptions:	Soil Description: Myd brown fins
Photograph excavation; note descriptions.			Photo 1: Timele	Sand wsome fine -
Sketch Schematio			Photo 2:	course grand, cobbler
			Photo 3: execut	
			Photo 4:	
			Photo 5:	Depth to Groundwater/Conditions: N/A-
	1		Photo 6:	
-			•	
Place tank at safe distance from excavation	1/14/22	11:15		Depth of Excavation: 4,5
				Send excar grossly
Secure tanks transport off-site	1/14/92	2:45		continuinated
Obtain 10 soil samples from	1/14/92	11:30	PID (ppm) . NDIR (ppm) .	Sample locations: 1.0 - 3.0'
excavation walls/bottom: Nota PID/NDIR			SS1: 740	5 wall
readings and sample locations.			SS2: 300	5. wall
[···]			SS3: Z+D	W wall
			SS4: 168	W wall
			SS5: 17-2	N wall
·			SS6: Zoo	N wall
			SS7: 156	E wall
			SS8: 720	E will
			SS9: 240	4. thom
			SS10: 158	bottom
			· · ·	1
			· ·	
			•	
			· · · · · ·	
Obtain 2 soil samples & 1 water samples	1/14/97	11:45		Sample Locations:
for laboratory analysis. Note sample locations.				LSS1: 252
[ļ		LSS2: - :59
		<u> </u>		LWS1:
				1553: composite 3tochine
•				1 5

UST-CLOSURE O/C CHECK LIST	_			· · · · · · · · · · · · · · · · · · ·	
			·		
DEFINABLE FEATURE	DATE		MEASUREMENTS		<u>NOTES</u>
alibrate PID & LPLAO2 meters	1/16/97	9:00			Site Topography: Jarrel
• • •					
Drain & flush piping & pumps	1/10/77	9:15	•		
Excervate to top of tank	1/14/72	10:15		·····	Depth to tank , 5"
	1	:	• 1		
Vent tink note LEL/02 levels & times	1/11/92		· · LEL	02 .	· · · · · · · · · · · · · · · · · · ·
		Tl: /; 30	<u> </u>	<u> </u>	
	<u></u>	T2: 1:45	0	20.9	
		13: 7:00	<u> </u>	20.9	
· · · · · · · · · · · · · · · · · · ·		14:		•	
	· {	1.5:			
		100	•		
		T2.		· · · · · · · · · · · · · · · · · · ·	
	- <u> </u>	TQ:	· ·		
		T10:		······································	
· · · · · · · · · · · · · · · · · · ·		T11:		· · · · · · · · · · · · · · · · · · ·	
		T12:		•	
······································		}			
ump & clean tank:	1/7/97	10:30	<u>93</u> gal liquid	······································	Tank Dimensions: 4x10,54
Note quantities liquid (gal) & sludge (lbs)	1/14/22		20 on Ale studge	4	Good condition no holes cust
		1	}	, <u>ann a faidh a fha an ann an ann an ann an ann an ann an</u>	filliping broken @ connection
Remove all tank connections, and cap openings	1/11/72	701.50		*	
				:	
Excerne soils to free tank	1/14/41	11:00			
·				· · · · · · · · · · · · · · · · · · ·	
Segregate stained soils: Note PID readings	1/16.62	11:00	PID (ppm)	NDIR (ppm)	
il>10 ppm NDIR also)			770		stock-1
All sil excan to canove tank			166		stack-2
contannie Seil an top					
tunk stined					
	· · · · · · · · · · · · · · · · · · ·				

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EFINABLE FEATURE	DATE	TIME	MEASUREMENTS	NOTES	
	•			tons of back	511
ackfill excavation (if cican):				Backfill description:	
Note amount & type of backfill					
Close open excavation (if applicable)			-	•	
~		ļ			
Restore surface and rope off	·				
Kenova nibbish/debris	· · · · · · · · · · · · · · · · · · ·			·····	
There exact has a material off sites			· · · · · · · · · · · · · · · · · · ·	A	Classification
Mata amount/classification			· [Ainount	Classification
Make copies of manifests, permits			-		
and disposal receipts.		}			······
			· · · · · · · · · · · · · · · · · · ·		
	· ·	{			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
			· · ·		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

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JOSURB O/C CHECK LIST				
DEFINABLE FEATURE	DATE	TIME	MEASUREMENTS	NOTES
				tons of backfill
Backfill excavation (if clean):				Backfill description:
Note amount & type of backfill				
Close open excavation (if applicable)			· ·	
Restore surface and rope off				
Remove rubbish/debris				
		· ·	· · · · · · · · · · · · · · · · · · ·	
Transport hazardous material off-site:				Amount Classification
Note amount/classification				
Make copies of manifests, permits,	[<i>.</i>		
and disposal receipts.	· .	· ·		
	· · · · ·			
			•	
	(•	1

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ATEC Promises

- To be totally responsive to our clients' wants and needs with a constant sense of urgency.
- To perform high quality services with technically superior personnel.
- To perform all assignments for a reasonable fee and within budget.
- To communicate with our clients frequently so there will be no surprises.
- To complete our assignments and deliver reports when promised.
- To review reports with our clients to be sure there are no misunderstandings.
- To deliver accurate invoices to our clients within seven (7) days after the completion of the assignment or as required by the clients.
- To follow up with the clients to be sure services completely satisfied their wants and needs.



ATEC Associates, Inc.

8665 Bash Street

Corporate Headquarters

please call 1-800-800-ATEC, a "hot line" to my office. We will do everything possible to satisfy your concerns. If you have received quality service, we would appreciate knowing that as well. Thank you for allowing us to work on your team.

Sincerely, Mann_

Gerald D. Mann President ATEC Associates, Inc.

Corporate Headquarters – Client Satisfaction Hot Line **1-800-800-ATEC** (1-800-800-2832)