COPY

United States Army
Fort Monmouth, New Jersey

Underground Storage Tank Closure and Site Investigation Report

Building 2707
Charles Wood-West

NJDEP UST Registration No. 81515-40

January 1999

UNDERGROUND STORAGE TANK
CLOSURE AND SITE INVESTIGATION REPORT

BUILDING 2707

CHARLES WOOD-WEST
NJDEP UST REGISTRATION NO. 81515-40

JANUARY 1999

PREPARED FOR:

UNITED STATES ARMY, FORT MONMOUTH, NEW JERSEY
DIRECTORATE OF PUBLIC WORKS
BUILDING 167
FORT MONMOUTH, NJ 07703

PREPARED BY:

VERSAR
1900 FROST ROAD
SUITE 110
BRISTOL, PA 19007

PROJECT NO. 2491-308

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EXECUTIVE SUMMARY

UST Closure

On August 10, 1998, a fiberglass underground storage tank (UST) was closed by removal in accordance with the New Jersey Department of Environmental Protection (NJDEP) underground storage tank procedures at the Charles Wood-West area of the U.S. Army Fort Monmouth, Fort Monmouth, New Jersey. The UST, NJDEP Registration No. 81515-40 (Fort Monmouth ID No. 2707), was located east of Building 2707. UST No. 81515-40 was a 6,000-gallon No. 2 fuel oil UST.

Site Assessment

The site assessment was performed by U.S. Army personnel in accordance with the NJDEP *Technical Requirements for Site Remediation* (N.J.A.C. 7:26E) and the NJDEP *Field Sampling Procedures Manual*. The sampling and laboratory analysis conducted during the site assessment were performed in accordance with Section 7:26E-2.1 of the *Technical Requirements for Site Remediation*. Soils surrounding the tank were screened visually and with air monitoring equipment for evidence of contamination. Following removal, the UST was inspected for corrosion holes. No holes were noted in the UST. Soil screening was also performed along the piping run associated with the UST closure. Contamination was noted along the piping length and appeared to be from a former above ground tank. Approximately 5 cubic yards of potentially contaminated soil were removed from the excavated area and stored at the Fort Monmouth petroleum contaminated soil staging area. Soil samples, which were collected after the removal of the potentially contaminated soil, contained TPHC concentrations ranging from non-detect to 357.42 mg/kg. Groundwater was not encountered.

Site Restoration

Following receipt of all post-excavation soil sampling results, the excavation was backfilled to grade with crushed stone, sand, and native backfill and restored to its original condition.

Conclusions and Recommendations

Based on the post-excavation soil sampling results, soils with TPHC concentrations exceeding the NJDEP soil cleanup criteria for total organic contaminants of 10,000 mg/kg, do not exist in the former location of the UST or associated piping.

No further action is proposed in regard to the closure and site assessment of UST No. 81515-40 at Building 2707.

1.0 UNDERGROUND STORAGE TANK DECOMMISSIONING ACTIVITIES

1.1 OVERVIEW

One underground storage tank (UST), New Jersey Department of Environmental Protection (NJDEP) Registration No. 81515-40, was closed at Building 2707 at the Charles Wood-West area of U.S. Army Fort Monmouth, Fort Monmouth, New Jersey on August 10, 1998. Refer to site location map on Figure 1. This report presents the results of the Department of Public Works= (DPW) implementation of the UST Decommissioning/Closure Plan approved by the NJDEP. The UST was a fiberglass 6000-gallon tank containing No. 2 fuel oil.

Decommissioning activities for UST No. 81515-40 complied with all applicable Federal, State and Local laws and ordinances in effect at the date of decommissioning. These laws included but were not limited to N.J.A.C. 7:14B-1 et seq., N.J.A.C. 5:23-1 et seq., and Occupational Safety and Health Administration (OSHA) 1910.146 & 1910.120. All permits including but not limited to the NJDEP-approved Decommissioning/Closure Plan were posted onsite for inspection. The decommissioning activities were conducted by DPW personnel who are registered and certified by the NJDEP for performing UST closure activities. Closure of UST No. 81515-40 proceeded under the approval of the NJDEP Bureau of Federal Case Management (NJDEP-BFCM). The Standard Reporting Form and signed Site Assessment Summary form for UST No. 81515-40 are included in Appendices A and B, respectively.

Based on inspecting the UST, field screening of subsurface soils and groundwater, and reviewing analytical results of soil samples, the DPW has concluded that no significant historical discharges are associated with the UST or associated piping.

This UST Closure and Site Investigation Report has been prepared by Versar, to assist the United States Army Directorate of Public Works (DPW) in complying with the NJDEP regulations. The applicable NJDEP regulations at the date of closure were the *Interim Closure Requirements for Underground Storage Tank Systems* (N.J.A.C. 7:14B-1 et seq. October 1990 and revisions dated November 1, 1991).

This report was prepared using information collected at the time of closure. Section 1 of this UST Closure and Site Investigation Report provides a summary of the UST decommissioning activities. Section 2 of this report describes the site investigation activities. Conclusions and recommendations, including the results of the soil sampling investigation, are presented in the final section of this report.

1.2 SITE DESCRIPTION

Building 2707 is located in the Charles Wood-West area of the Fort Monmouth Army Base. UST No. 81515-40 was located east of Building 2707 and three steel piping lines ran southeast from the excavation to Building 2707. A site map is provided on Figure 2.

1.2.1 Geological/Hydrogeological Setting

The following is a description of the geological/hydrogeological setting of the area surrounding Building 2707. Included is a description of the regional geology of the area surrounding Fort Monmouth as well as descriptions of the local geology and hydrogeology of the Charles Wood area.

Regional Geology

Monmouth County lies within the New Jersey Section of the Atlantic Coastal Plain physiographic province. The Main Post, Charles Wood, and the Evans areas are located in what may be referred to as the Outer Coastal Plain subprovince, or the Outer Lowlands.

In general, New Jersey Coastal Plain formations consist of a seaward-dipping wedge of unconsolidated deposits of clay, silt, and gravel. These formations typically strike northeast-southwest with a dip ranging from 10 to 60 feet per mile and were deposited on Precambrian and lower Paleozoic rocks (Zapecza, 1989). These sediments, predominantly derived from deltaic, shallow marine, and continental shelf environments, date from Cretaceous through the Quaternary Periods. The mineralogy ranges from quartz to glauconite.

The formations record several major transgressive/regressive cycles and contain units which are generally thicker to the southeast and reflect a deeper water environment. Over 20 regional geologic units are present within the sediments of the Coastal Plain. Regressive, upward coarsening deposits are usually aquifers (e.g., Englishtown and Kirkwood Formations, and the Cohansey Sand) while the transgressive deposits act as confining units (e.g., the Merchantville, Marshalltown, and Navesink Formations). The individual thicknesses for these units vary greatly (i.e., from several feet to several hundred feet). The Coastal Plain deposits thicken to the southeast from the Fall Line to greater than 6,500 feet in Cape May County (Brown and Zapecza, 1990).

Local Geology

Based on the regional geologic map (Jablonski, 1968), the Cretaceous age Red Bank and Tinton Sands outcrop at the Charles Wood area. The Red Bank sand conformably overlies the Navesink Formation and dips to the southeast at 35 feet per mile. The upper member (Shrewsbury) of the Red Bank sand is a yellowish-gray to reddish brown clayey, medium-to-coarse-grained sand that contains abundant rock fragments, minor mica and glauconite (Jablonski). The lower member (Sandy Hook) is a dark gray to black, medium-to-fine grained sand with abundant clay, mica, and glauconite.

The Tinton sand conformably overlies the Red Bank Sand and ranges from a clayey medium to very coarse grained feldspathic quartz and glauconite sand to a glauconitic coarse sand. The color varies from dark yellowish orange or light brown to moderate brown and from light olive to grayish olive. Glauconite may constitute 60 to 80 percent of the sand fraction in the upper part of the unit (Minard, 1969). The upper part of the Tinton is often highly oxidized and ironoxide encrusted (Minard).

Over the last 80 years, the natural topography of Fort Monmouth has been altered by excavation and filling activities by the military. Topographic elevations for the Charles Wood area range from 20 feet above mean seal level (MSL) to 71 feet above MSL.

Hydrogeology

The water table aquifer in the Charles Wood area is identified as part of the "composite confining units", or minor aquifers. The minor aquifers include the Navesink formation, Red Bank Sand, Tinton Sand, Hornerstown Sand, Vincentown Formation, Manasquan Formation, Shark River Formation, Piney Point Formation, and the basal clay of the Kirkwood Formation.

Six well records for monitor wells installed at locations within the Charles Wood area in February 1981 were used for reference. The wells were completed to total depths ranging from 20 to 25 feet below ground surface (bgs). Water was encountered at depths ranging from 5 to 12 feet bgs.

The lithologic descriptions for these borings described deposits that were primarily fine to coarse, glauconitic sands, with traces of gravel, silt, and clay. These sediments are part of the Hornerstown Marl, from the Tertiary Period (Paleocene Series, approximately 58 to 66 Ma). According to Jablonski, wells drilled in the Red Bank and Tinton Sands may produce from 2 to 25 gallons per minute (gpm). Some well owners have reported acidic water that requires treatment to remove iron.

Shallow groundwater is locally influenced within the Charles Wood area by the following factors:

- tidal influence (based on proximity to the Atlantic Ocean, rivers, and tributaries)
- topography
- nature of the fill material within the Charles Wood area
- presence of clay and silt lenses in the natural overburden deposits
- local groundwater recharge areas (i.e., streams, lakes)

Due to the fluvial nature of the overburden deposits (i.e., sand and clay lenses), shallow groundwater flow direction is best determined on a case-by-case basis. Building 2707 is located approximately 400 feet south of Wampum Brook, the nearest water body. Based on the Charles Wood area topography, the groundwater flow in the area of Building 2707 is anticipated to be to the north.

1.3 HEALTH AND SAFETY

Before, during, and after all decommissioning activities, hazards at the work site which may have posed a threat to the Health and Safety of all personnel who were involved with, or were affected by, the decommissioning of the UST system were minimized. All areas, which posed, or may have been suspected to pose a vapor hazard were monitored by a qualified individual utilizing an organic vapor analyzer (OVA). The individual ascertained if the area was properly vented to render the area safe, as defined by OSHA.

1.4 REMOVAL OF UNDERGROUND STORAGE TANK

1.4.1 General Procedures

- All underground obstructions (utilities, etc.) were identified by the contractor performing the closure prior to excavation activities.
- All activities were carried out with the greatest regard to safety and health and the safeguarding of the environment.
- All excavated soils were visually examined and screened with an OVA for evidence of contamination. Potentially contaminated soils were identified and logged during closure activities.
- Surface materials (i.e., asphalt, concrete, etc.) were excavated and staged separately from all soil and recycled in accordance with all applicable regulations and laws.
- A Sub-Surface Evaluator from the DPW was present during all site assessment activities.

1.4.2 Underground Storage Tank Excavation and Cleaning

Prior to UST decommissioning activities, surficial soil was removed to expose the UST and associated piping. All free product present in the piping was drained into the UST, and the UST was purged to remove vapors prior to cutting and removal of the piping. After removal of the associated piping, a manway was made in the UST to allow for proper cleaning. The UST was completely emptied of all liquids prior to removal from the ground. Approximately 25 gallons of liquid from the UST and its associated piping were transported by Casie Protank to Casie Ecology Oil Salvage, Inc. facility, a NJDEP-approved petroleum recycling and disposal company located in Vineland, New Jersey. Refer to Appendix C for the waste manifest.

The UST was cleaned prior to removal from the excavation in accordance with the NJDEP regulations. After the UST was removed from the excavation, it was staged on polyethylene sheeting and examined for holes. No holes or punctures were observed during the inspection by the Sub-Surface Evaluator. Soils surrounding the UST were screened visually and with an OVA for evidence of contamination. No evidence of contamination was observed. Soil screening was also performed along the piping run associated with the UST closure. Contamination was noted along the piping length and appeared to be from a former above ground tank. Approximately 5 cubic yards of potentially contaminated soil were removed from the excavated area and stored at the Fort Monmouth petroleum contaminated soil staging area. Soil samples, which were collected after the removal of the potentially contaminated soil, contained TPHC concentrations ranging from non-detect to 357.42 mg/kg. Groundwater was not encountered.

1.5 UNDERGROUND STORAGE TANK TRANSPORTATION AND DISPOSAL

The tank was transported to Mazza and Sons, Inc., Metal Recyclers. See Appendix D for a copy of the UST disposal certificate and Appendix F for photographs of the UST. The transportation of the UST was in compliance with all applicable regulations and laws.

The UST was labeled prior to transport with the following information:

- Site of origin
- Contact person
- NJDEP UST Facility ID number
- Former contents

1.6 MANAGEMENT OF EXCAVATED SOILS

Based on OVA air monitoring and TPHC analysis results from the post-excavation soil samples, approximately 5 cubic yards of potentially contaminated soil were removed from the UST excavation.

2.0 SITE INVESTIGATION ACTIVITIES

2.1 OVERVIEW

The Site Investigation was managed and carried out by U.S. Army DPW personnel. All analyses were performed and reported by U.S. Army Fort Monmouth Environmental Laboratory, a NJDEP-certified testing laboratory. All sampling was performed under the direct supervision of a NJDEP Certified Sub-Surface Evaluator according to the methods described in the NJDEP *Field Sampling Procedures Manual* (1992). Sampling frequency and parameters analyzed complied with the NJDEP-BUST document *Interim Closure Requirements for Underground Storage Tank Systems* (October 1990 and revisions dated November 1, 1991) which was the applicable regulation at the date of the closure. All records of the Site Investigation activities are maintained by the Fort Monmouth DPW Environmental Office.

The following Parties participated in Closure and Site Investigation Activities:

- Subsurface Evaluator: Charles Appleby
  Employer: U.S. Army, Fort Monmouth
  Phone Number: (730) 532-6224
  NJDEP Certification No.: 2056

- Analytical Laboratory: U.S. Army Fort Monmouth Environmental Laboratory
  Contact Person: Daniel K. Wright
  Phone Number: (908) 532-4359
  NJDEP Company Certification No.: 13461

- Hazardous Waste Hauler: Casie Protank Environmental Services
  Contact Person: Bob Corsiglia
  Phone Number: (609) 696-4401
  NJDEP Company Certification No.: 16931

2.2 FIELD SCREENING/MONITORING

Field screening was performed by a NJDEP Certified Sub-Surface Evaluator using an OVA and visual observations to identify potentially contaminated material. Approximately 5 cubic yards of potentially petroleum contaminated soil were removed from the excavated area and transported to the Fort Monmouth petroleum contaminated soil holding area. Soils were removed from the excavation until no evidence of contamination remained. Groundwater was not encountered.

2.3 SOIL SAMPLING

On August 10, 1998, following the removal of the UST, post-excavation soil samples A, B, C, D, E, F, G, H, and DUP C were collected from a total of eight (8) locations of the UST excavation. Sidewall samples A, B, C, D, E, F, G, H, and DUP C were collected at a depth of 11.5 feet bgs. All samples were analyzed for total petroleum hydrocarbons (TPHC) and total solids.

On August 31, 1998, piping samples A, B, C, D, E, F, G, and DUP F were collected from a total of seven (7) locations along the piping run. Samples A, B, C, E, F, G, and DUP F were collected at a depth of 3.0 feet bgs. Sample D was collected at a depth of 2.0 feet bgs. All samples were analyzed for total petroleum hydrocarbons (TPHC) and total solids.

On September 22, 1998, due to the detected concentration of TPHC at sample location G, approximately 3 cubic yards of potentially contaminated soils were removed. Following the removal of this soil, post-excavation soil sample G2 was collected along the former piping run at a depth of 5.0 feet bgs. All samples were analyzed for total petroleum hydrocarbons (TPHC) and total solids.

DPW personnel in accordance with the NJDEP Technical Requirements and the NJDEP Field Sampling Procedures Manual performed the site assessment. A summary of sampling activities including parameters analyzed is provided in Table 1. The post-excavation soil samples were collected using NJDEP *Field Sampling Procedures Manual* (1992) standard sampling procedures. Following soil sampling activities, the samples were chilled and delivered to U.S. Army Fort Monmouth Environmental Laboratory located in Fort Monmouth, New Jersey, for analysis.

3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1 SOIL SAMPLING RESULTS

To evaluate soil conditions following removal of the UST, post-excavation soil samples were collected from a total of sixteen (16) locations. All samples were analyzed for TPHC and total solids. The post-excavation sampling results were compared to the NJDEP residential direct contact total organic contaminants soil cleanup criteria of 10,000 mg/kg (N.J.A.C. 7:26D and revisions dated February 3, 1994). A summary of the analytical results and comparison to the NJDEP soil cleanup criteria is provided in Table 2 and the soil sampling locations are shown on Figure 4. The analytical data package is provided in Appendix E.

All post-excavation soil samples collected from the UST excavation and from below piping associated with the UST contained concentrations of TPHC below the NJDEP soil cleanup criteria. Samples contained levels of TPHC ranging in concentration from non-detect to 357.42 mg/kg.

3.2 CONCLUSIONS AND RECOMMENDATIONS

The analytical results for all post-excavation soil samples collected from the UST closure excavation at Building 2707 were below the NJDEP soil cleanup criteria for total organic contaminants.

Based on the post-excavation sampling results, soils with TPHC concentrations exceeding the NJDEP soil cleanup criteria for total organic contaminants of 10,000 mg/kg, do not exist in the former location of the UST or associated piping.

No further action is proposed in regard to the closure and site assessment of UST No. 81515-40 at Building 2707.

TABLES

TABLE 1

SUMMARY OF POST-EXCAVATION SAMPLING ACTIVITIES
BUILDING 2707, CHARLES WOOD-WEST AREA
FORT MONMOUTH, NEW JERSEY

Sample ID	Date of Collection	Date Analysis Started	Matrix	Sample Type	Analytical Parameters*	Analysis Method
A	8/10/98	8/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025
B	8/10/98	8/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025
C	8/10/98	8/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025
D	8/10/98	8/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025
E	8/10/98	8/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025
F	8/10/98	8/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025
G	8/10/98	8/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025
H	8/10/98	8/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025
DUPC	8/10/98	8/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025

Note:
* TPHC Total Petroleum Hydrocarbons

TABLE 1

SUMMARY OF POST-EXCAVATION SAMPLING ACTIVITIES
BUILDING 2707, CHARLES WOOD-WEST AREA
FORT MONMOUTH, NEW JERSEY

Sample ID	Date of Collection	Date Analysis Started	Matrix	Sample Type	Analytical Parameters*	Analysis Method
A	8/31/98	8/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025
B	8/31/98	8/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025
C	8/31/98	8/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025
D	8/31/98	8/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025
E	8/31/98	8/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025
F	8/31/98	8/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025
**G	8/31/98	8/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025
DUPF	8/31/98	8/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025

Note:
* TPHC Total Petroleum Hydrocarbons
** Sample Further Remediated and Resampled

TABLE 1

SUMMARY OF POST-EXCAVATION SAMPLING ACTIVITIES
BUILDING 2707, CHARLES WOOD-WEST AREA
FORT MONMOUTH, NEW JERSEY

Sample ID	Date of Collection	Date Analysis Started	Matrix	Sample Type	Analytical Parameters*	Analysis Method
G2	9/22/98	9/23/98	Soil	Post-Excavation	TPHC	OQA-QAM-025

Note:
* TPHC Total Petroleum Hydrocarbons

TABLE 2

POST-EXCAVATION SOIL SAMPLING RESULTS
BUILDING 2707, CHARLES WOOD-WEST AREA
FORT MONMOUTH, NEW JERSEY

Sample ID/ Depth	Sample Laboratory ID	Sample Date	Analysis Date	Analytical Method Used	Method Detection Limit (mg/kg)	Compound of Concern	Result (mg/kg) *	NJDEP Soil Cleanup Criteria ** (mg/kg)	Exceeds Cleanup Criteria
A/11.5=	3795.01	8/10/98	8/11/98	Total Solid	--	--	92.53	--	--
				TPHC	165	yes	ND	10,000	No
B/11.5=	3795.02	8/10/98	8/11/98	Total Solid	--	--	95.00	--	--
				TPHC	161	yes	ND	10,000	No
C/11.5=	3795.03	8/10/98	8/11/98	Total Solid	--	--	90.04	--	--
				TPHC	174	yes	ND	10,000	No
D/11.5=	3795.04	8/10/98	8/11/98	Total Solid	--	--	91.44	--	--
				TPHC	166	yes	ND	10,000	No
E/11.5=	3795.05	8/10/98	8/11/98	Total Solid	--	--	87.82	--	--
				TPHC	177	yes	ND	10,000	No
F/11.5=	3795.06	8/10/98	8/11/98	Total Solid	--	--	86.25	--	--
				TPHC	182	yes	ND	10,000	No
G/11.5=	3795.07	8/10/98	8/11/98	Total Solid	--	--	90.72	--	--
				TPHC	168	yes	ND	10,000	No
H/11.5=	3795.08	8/10/98	8/11/98	Total Solid	--	--	90.72	--	--
				TPHC	168	yes	ND	10,000	No
DUPC/11.5=	3795.09	8/10/98	8/11/98	Total Solid	--	--	90.72	--	--
				TPHC	168	yes	ND	10,000	No

Note:
* Total Solid results are expressed as a percentage.
** NJDEP Residential Direct Contact soil cleanup criteria for total organics
-- Not detected above stated sample quantitation limit
TPHC Total Petroleum Hydrocarbons

TABLE 2

POST-EXCAVATION SOIL SAMPLING RESULTS
BUILDING 2707, CHARLES WOOD-WEST AREA
FORT MONMOUTH, NEW JERSEY

Sample ID/ Depth	Sample Laboratory ID	Sample Date	Analysis Date	Analytical Method Used	Method Detection Limit (mg/kg)	Compound of Concern	Result (mg/kg) *	NJDEP Soil Cleanup Criteria ** (mg/kg)	Exceeds Cleanup Criteria
A/3.0=	3848.01	8/31/98	9/1/98	Total Solid	--	--	95.42	--	--
				TPHC	164	yes	ND	10,000	No
B/3.0=	3848.02	8/31/98	9/1/98	Total Solid	--	--	94.53	--	--
				TPHC	165	yes	ND	10,000	No
C/3.0=	3848.03	8/31/98	9/1/98	Total Solid	--	--	96.79	--	--
				TPHC	154	yes	ND	10,000	No
D/2.0=	3848.04	8/31/98	9/1/98	Total Solid	--	--	96.32	--	--
				TPHC	158	yes	ND	10,000	No
E/3.0=	3848.05	8/31/98	9/1/98	Total Solid	--	--	92.82	--	--
				TPHC	169	yes	ND	10,000	No
F/3.0=	3848.06	8/31/98	9/1/98	Total Solid	--	--	97.27	--	--
				TPHC	161	yes	357.42	10,000	No
***G/3.0=	3848.07	8/31/98	9/1/98	Total Solid	--	--	95.61	--	--
				TPHC	159	yes	14626.39	10,000	YES
DUPF/3.0=	3848.08	8/31/98	9/1/98	Total Solid	--	--	94.19	--	--
				TPHC	166	yes	193.88	10,000	No

Note:

*	Total Solid results are expressed as a percentage.
**	NJDEP Residential Direct Contact soil cleanup criteria for total organics
***	Sample further remediated and resampled
--	Not detected above stated sample quantitation limit
TPHC	Total Petroleum Hydrocarbons

TABLE 2

POST-EXCAVATION SOIL SAMPLING RESULTS
BUILDING 2707, CHARLES WOOD-WEST AREA
FORT MONMOUTH, NEW JERSEY

Sample ID/ Depth	Sample Laboratory ID	Sample Date	Analysis Date	Analytical Method Used	Method Detection Limit (mg/kg)	Compound of Concern	Result (mg/kg) *	NJDEP Soil Cleanup Criteria ** (mg/kg)	Exceeds Cleanup Criteria
G2/5.0=	3903.01	9/22/98	9/23/98	Total Solid	--	--	86.87	--	--
				TPHC	177	yes	ND	10,000	No

Note:
* Total Solid results are expressed as a percentage.
** NJDEP Residential Direct Contact soil cleanup criteria for total organics
-- Not detected above stated sample quantitation limit
TPHC Total Petroleum Hydrocarbons

FIGURES

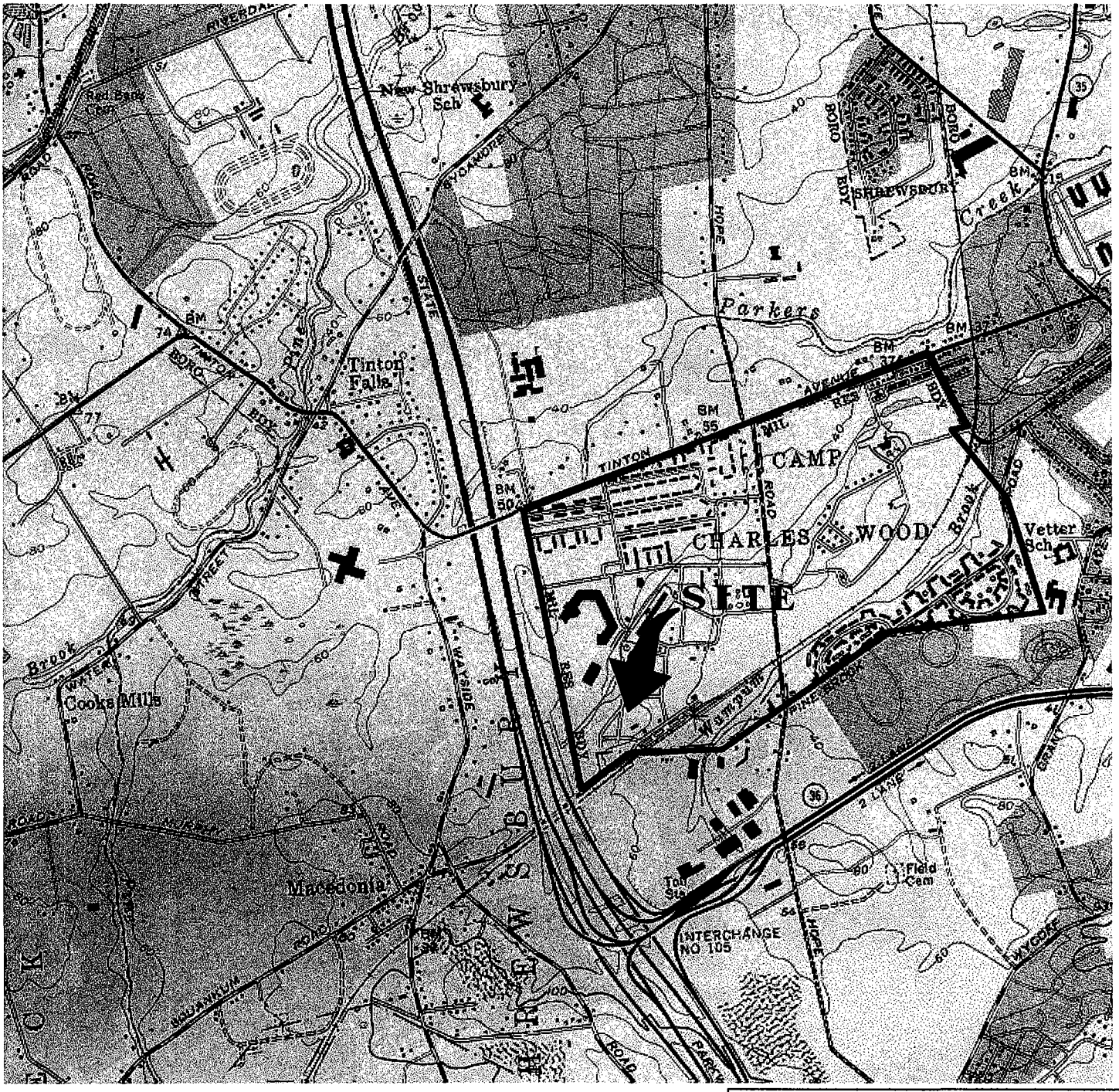


FIGURE 1

LOCATION MAP
Building 2707
Charles Wood
Fort Monmouth Army Base
Monmouth County, NJ

VERSAR
Engineers, Managers, Scientists, & Planners
Bristol, PA

LONG BRANCH, N. J.
40073-C8-TF-024

1954
PHOTOREVISED 1981
DMA 6164 I SE-SERIES V822

NEW JERSEY
QUADRANGLE LOCATION

Mapped, edited and published by the Geological Survey

Scale: 1" = 2000'

Date: AUG 1998

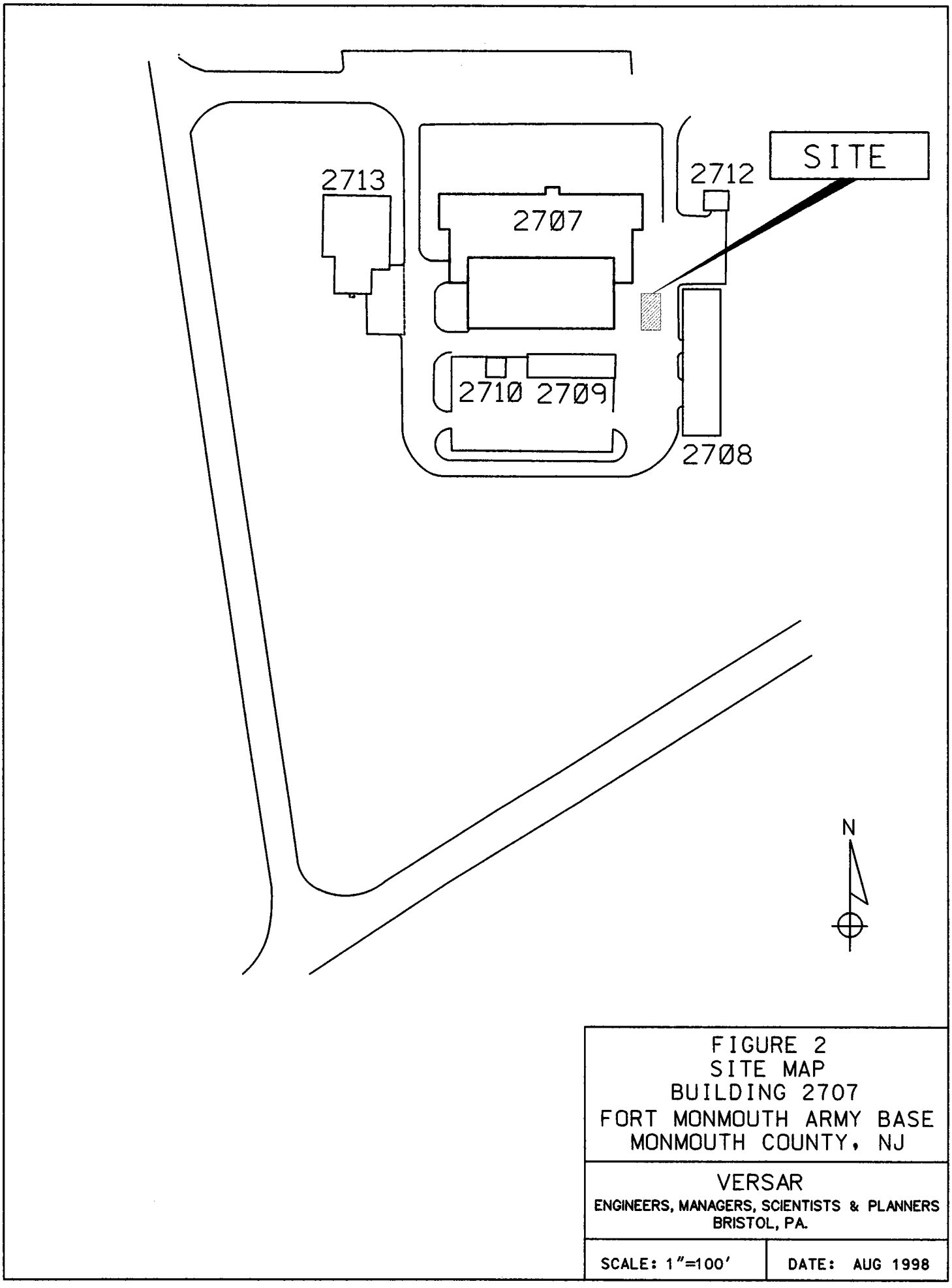


FIGURE 2
SITE MAP
BUILDING 2707
FORT MONMOUTH ARMY BASE
MONMOUTH COUNTY, NJ

VERSAR
ENGINEERS, MANAGERS, SCIENTISTS & PLANNERS
BRISTOL, PA.

SCALE: 1"=100'

DATE: AUG 1998

2707 2429 FIG2

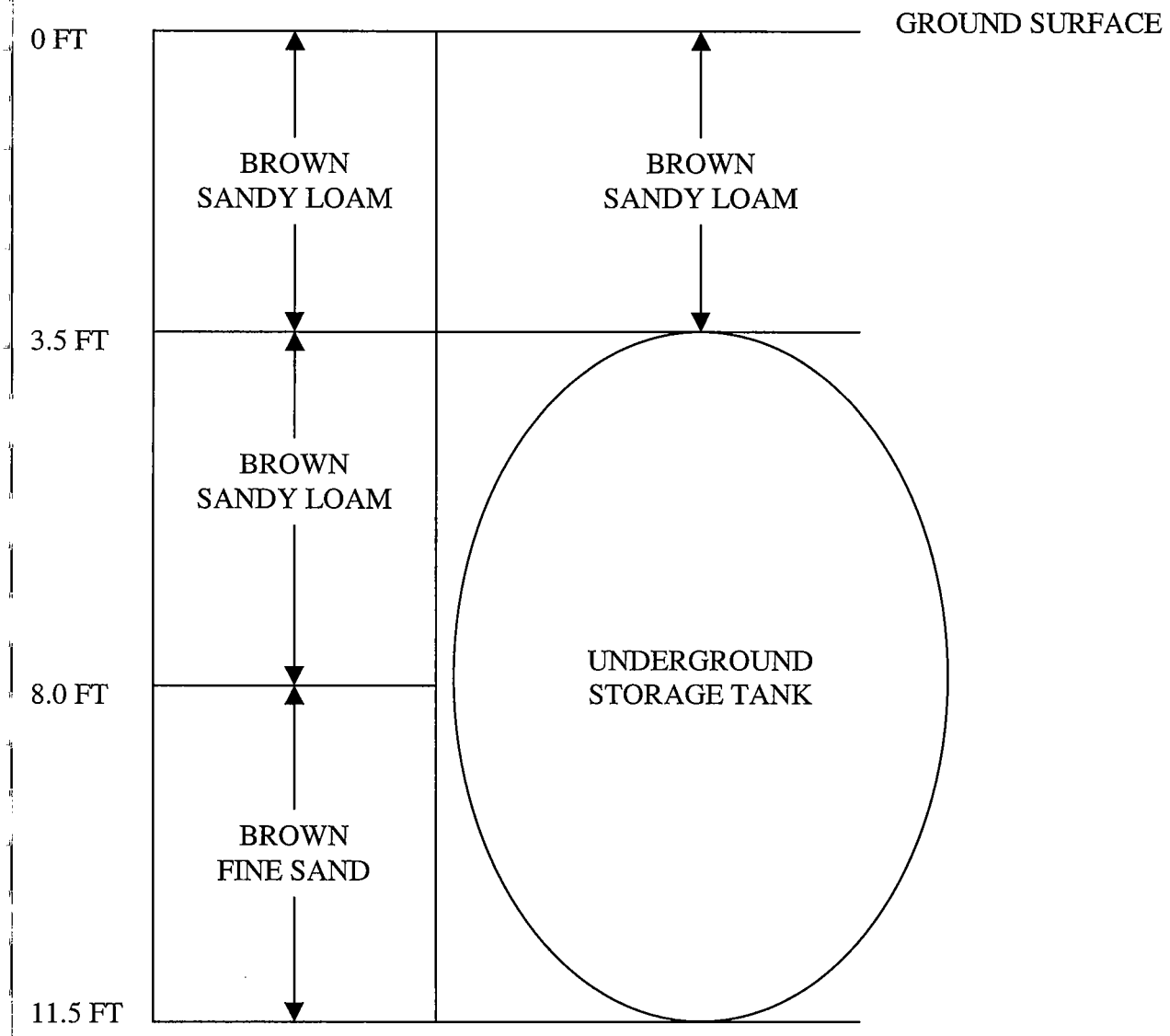
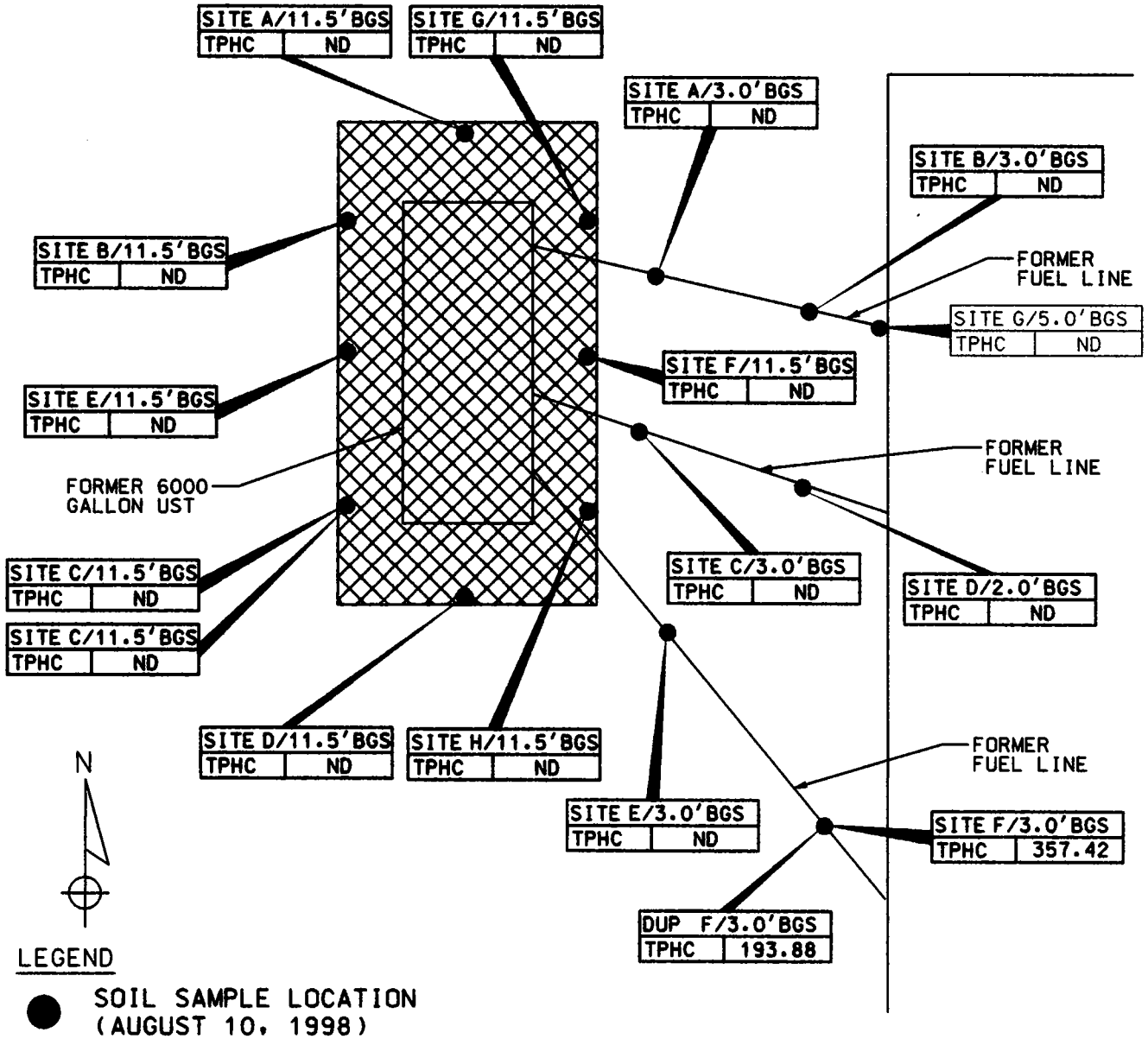


FIGURE 3
CROSS SECTIONAL VIEW
BUILDING 2707
FORT MONMOUTH ARMY BASE
MONMOUTH COUNTY, NJ

VERSAR
Engineers, Managers, Scientists & Planners
Bristol, Pennsylvania

SCALE: NTS	DATE: AUG 1998



LEGEND

- SOIL SAMPLE LOCATION (AUGUST 10, 1998)
- SOIL SAMPLE LOCATION (AUGUST 31, 1998)
- SOIL SAMPLE LOCATION (SEPTEMBER 22, 1998)
- LIMIT OF EXCAVATION (AUGUST 10, 1998)

NOTES:

1. ALL RESULTS IN MG/KG.
2. SEE TABLE 2 FOR NJDEP SOIL CLEANUP CRITERIA
3. BGS = BELOW GROUND SURFACE

FIGURE 4
SOIL SAMPLING LOCATION MAP
BUILDING 2707
FORT MONMOUTH ARMY BASE
MONMOUTH COUNTY, NJ

VERSAR
ENGINEERS, MANAGERS, SCIENTISTS & PLANNERS
BRISTOL, PA.

SCALE: 1"=10' | DATE: AUG 1998

2707 2429 FIG4

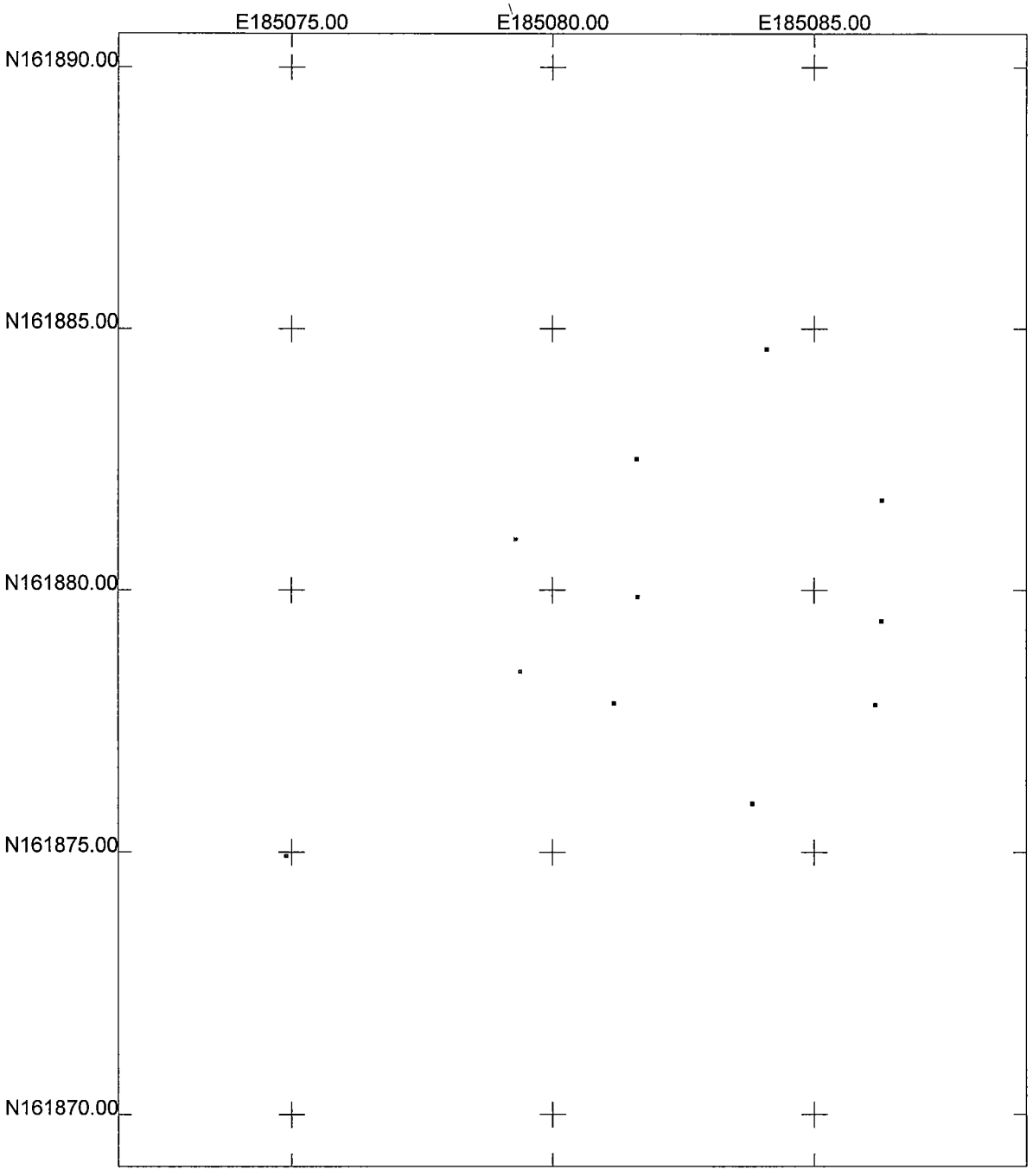


Figure 4 GPS Sample Location Map (UST)

US State Plane 1983
New Jersey (NY East) 2900
NAD 1983 (Conus)

N

Scale 1:125
0 4.000
Meters

r012116a2707.cor
1/28/1999
Pathfinder Office
Trimble

Figure 4 GPS Sample Location Point Data

US State Plane 1983 NJ (NY East) 2900 NAD 1983 (CONUS)

(In Meters)

Sample Points (UST)

Location/Desc.	Y Coord. (Northing)	X Coord. (Easting)
2707 A	161884.63	185084.083
2707 B	161882.527	185081.599
2707 C	161877.863	185081.16
2707 D	161875.949	185083.806
2707 E	161879.888	185081.616
2707 F	161879.43	185086.27
2707 G	161881.739	185086.276
2707 H	161877.837	185086.15

Reference Points

Location/Desc.	Y Coord. (Northing)	X Coord. (Easting)
2707 CORN	161874.945	185074.878
2707 CORN	161878.47	185079.365
2707 CORN	161880.988	185079.284

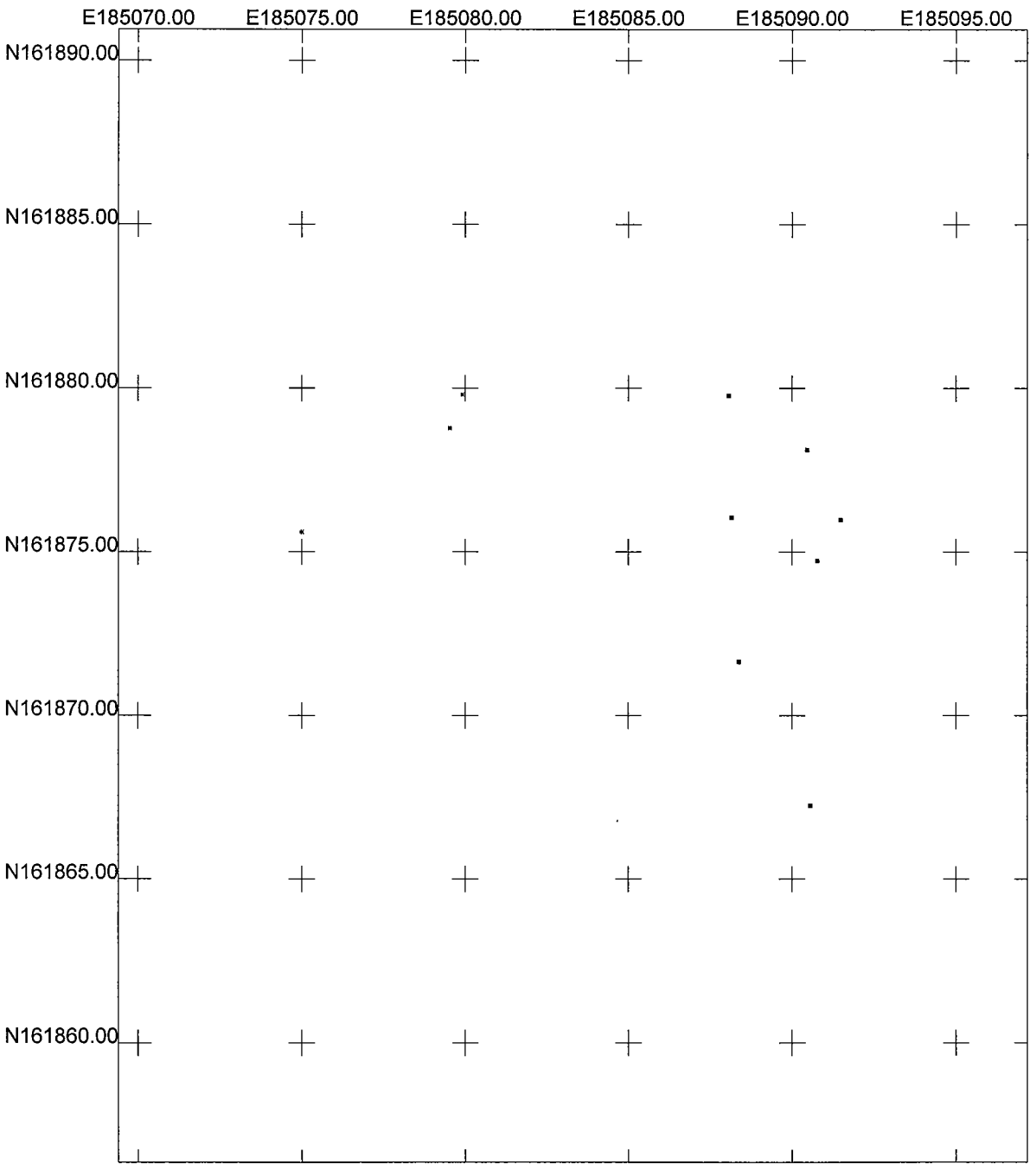


Figure 4 GPS Sample Location Map (Piping)

US State Plane 1983
New Jersey (NY East) 2900
NAD 1983 (Conus)

N

Scale 1:200
0 6.000
Meters

r012117a2707.cor
1/28/1999
Pathfinder Office
Trimble

Figure 4 GPS Sample Location Point Data

US State Plane 1983 NJ (NY East) 2900 NAD 1983 (CONUS)

(In Meters)

Sample Points

Location/Desc.	Y Coord. (Northing)	X Coord. (Easting)
PIPING A	161879.792	185088.043
PIPING B	161878.145	185090.432
PIPING G G2	161876.009	185091.446
PIPING C	161876.08	185088.13
PIPING D	161874.765	185090.74
PIPING E	161871.662	185088.363
PIPING F	161867.279	185090.527

Reference Points

Location/Desc.	Y Coord. (Northing)	X Coord. (Easting)
2707 CORN	161879.828	185079.893
2707 CORN	161878.797	185079.508
2707 CORN	161875.638	185074.962

APPENDIX A

NJDEP-STANDARD REPORTING FORM

File Copy marked &

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF RESPONSIBLE PARTY SITE REMEDIATION
BUREAU OF APPLICABILITY AND COMPLIANCE
Registration and Billing Unit
CN 028, Trenton, N.J. 08625-0028
1-609-984-3156

FOR STATE USE ON
Check In ☐ Yes ☐
STATUS Active ☐ Inactive ☐
COMCOD ☐☐☐

UNDERGROUND STORAGE TANK FACILITY QUESTIONNAIRE

FACILITY UST # 005515

B16 3707

Completion of this Registration Questionnaire will satisfy the registration requirements of the Underground Storage of Hazardous Substances Act, N.J.S.A. 58:10A-21, and the Registration and Billing Regulations N.J.A.C. 7:14B-2.

[Check appropriate box(es)]

A. ☐ Is this a registration of a proposed or newly installed underground storage tank? (This form must be filed at least 30 days prior to opera
B. ☐ Is this a registration of an existing underground storage tank not presently registered?
C. ☒ Is this a correction or amendment to an existing facility registration? UST # 005515
D. ☐ There have been no changes to the facility registration since last submittal. UST # _____ (Go to certification page for signatures)

If "C" is checked above, please check the appropriate type of change(s) below

☐ Facility Name and/or Address Change	☐ Type of Product(s) Stored	☐ Financial Responsibility Change
☐ Owner Name and/or Address Change	☐ Spills, Leaks, Releases	☐ Substantial Modification(s)
☐ Facility Operator and/or Address Change	☐ Tank(s) and/or Piping Changes	☐ Sale or Transfer (Complete Questions 4,5,6 &
☐ Owner Contact Person Change	☒ Closure (Complete Question #13)	☐ Other *(please specify)*

SECTION A - GENERAL FACILITY INFORMATION

1. Facility Name: Charles Wood Joint

2. Facility Location: Ft. Monmouth
NUMBER AND STREET

CITY OR MUNICIPALITY

COUNTY | STATE: NJ | ZIP CODE | BLOCK | LOT

3. Facility Operator
PERSON OR TITLE
Contact Tele. No. (Area Code) (Extension)

Operator Address (if different than #2)
NUMBER AND STREET

CITY OR MUNICIPALITY

STATE ZIP CODE

4. Tank Owner

5. Tank Owner Address
NUMBER AND STREET

CITY OR MUNICIPALITY

STATE ZIP CODE

Contact Person (Tank Owner): Charles Appleby
Contact Tele. No. (Area Code): 732 532 6004 (Extension)

7. EPA ID #

8. Total number of regulated underground storage tanks at facility ☐☐ Complete Section B for each tank

B/G. 2707 #4.

Tank Identification Number	TANK NO.	TANK NO.	TANK NO.	TANK NO.	TANK NO.
8. Type of Monitoring/Detection System	Tank Piping	Tank Piping	Tank Piping	Tank Piping	Tank Piping
K. None					
L. Other (please specify)					
9. Overfill Protection (tank only) (Mark one X for each tank)					
A. Yes					
B. No					
10. Spill Containment Around Fill Pipe (Mark one X for each tank)					
A. Yes					
B. No					
11. Tank Status (Mark one X for each tank)	Tank Piping	Tank Piping	Tank Piping	Tank Piping	Tank Piping
A. In-use					
B. Empty less than 12 months					
C. Empty 12 months or more					
D. Emergency spill tank (sump)					
E. Emergency backup generator tank					
F. Abandoned in Place					
G. Removed					
H. Other (please specify)					
12. If box 11B, C, or D above has been marked, indicate the estimated date last used (month/day/year)	Mo. Day Year	Mo. Day Year	Mo. Day Year	Mo. Day Year	Mo. Day Year
13. Closure Information - Tank ID No.	TANK NO. 004C	TANK NO.	TANK NO.	TANK NO.	TANK NO.
	Mo. Day Year	Mo. Day Year	Mo. Day Year	Mo. Day Year	Mo. Day Year
A. Date abandoned in place					
B. Date taken temporarily out of service					
C. Date removed	05/01/1998				
D. Date of Sale or Transfer					
E. TMS # (if applicable)					
F. ISRA # (if applicable)					

SECTION C - FINANCIAL RESPONSIBILITY

Does this facility have a Financial Responsibility Assurance Mechanism as required in 40 CFR 280? ☐ YES ☐ NO
Please list the appropriate financial information below:

Type _____ Carrier / Issuing Agency _____

___/___/___ Effective Date ___/___/___ Expiration Date _____ Policy Number $_____ Amount

SECTION D - MONITORING SYSTEMS

Does this facility have a release detection monitoring system which is in compliance with N.J.A.C. 7:14B-6? ☐ YES ☐ NO
If "No", please be aware that the facility must meet the appropriate deadline. (See "Dates to Know" on Page 4)

SECTION E - RECORDKEEPING/COMPLIANCE

Please answer all the questions in this section on a facility basis. Any one tank not in compliance requires a "NO" answer for the entire facility.

1. Does this facility have cathodic protection systems for all steel tanks and piping? ☐ YES ☐ NO
   If "Yes", are the systems properly operated and maintained pursuant to N.J.A.C. 7:14B-5? ☐ YES ☐ NO
2. Are the performance claims and documentation of monitoring systems maintained by the owner or operator pursuant to N.J.A.C. 7:14B-5? ☐ YES ☐ NO
3. Are the proper monitoring, testing, sampling, repair and inventory records kept on-site pursuant to N.J.A.C. 7:14B-5 and 6? ☐ YES ☐ NO
4. Is the proper Release Response Plan kept on-site pursuant to N.J.A.C. 7:14B-5? ☐ YES ☐ NO
5. Does the facility have spill and over fill protection systems pursuant to N.J.A.C. 7:14B-4? ☐ YES ☐ NO
6. Have all Fill Ports been permanently marked as per API #1637 pursuant to N.J.A.C. 7:14B-5?

APPENDIX B

SITE ASSESSMENT SUMMARY

(12/97) **New Jersey Department of Environmental Protection**

Site Remediation Program

UST Site/Remedial Investigation Report Certification Form

A. Facility Name : U.S. Army Fort Monmouth New Jersey

Facility Street Address : Directorate of Public Works Building 173

Municipality: Tinton Falls County : Monmouth

Block: Lot(s): Telephone Number : 732-532-6224

B. Owner (RP)'s Name:

Street Address: City :

State: Zip: Telephone Number :

C. (Check as appropriate)

___ Site Investigation Report (SIR) $500 Fee

___ Remedial Investigation Report (RIR) $1000 Fee

_X_ NA – Federal Agreement

D. (Complete all that apply)

- Assigned Case Manager : Ian Curtis, Federal Case Manager
- UST Registration Number : 81515-40 (7 digits)
- Incident Report Number ___•___•___•_____•___ (10 or 12 digits)
  ___•___•___•_____•___
- Tank Closure Number : Federal Case Manager

E. Certification by the Subsurface Evaluator:

The attached report conforms to the specific reporting requirements of N.J.A.C. 7:26E ..... Yes No

Name: Charles Appleby Signature: UST Cert. No.: 2056

Firm: U.S. Army Fort Monmouth Firm's UST Cert. Number: NA-U.S. Army

Firm Address: Directorate of Public Works Building 173 City: Fort Monmouth

State: NJ Zip: 07703 Telephone Number : 732-532-6224

(NOTE: Certification numbers required only if work was conducted on USTs regulated per N.J.S.A. 58:10A-21 et seq.)

F. Certification by the Responsible Party(ies) of the Facility:

The following certification shall be signed [according to the requirements of N.J.A.C. 7:14B-1.7(b)]as follows:

1. For a Corporation by a person authorized by a resolution of the board of directors to sign the document. A copy of the resolution, certified as a true copy by the secretary of the corporation, shall be submitted along with the certification; or
2. For a partnership or sole proprietorship, by a general partner or the proprietor, respectively; or
3. For a municipality, State, federal or other public agency by either a principal executive officer or ranking elected Official.

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attached documents, and that based on my inquiry of those individuals responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate, or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."

Name (Print or Type): James Ott Title: Directorate of Public Works

Signature:

Company Name: U.S. Army Fort Monmouth Date: 3/25/99

APPENDIX C

WASTE MANIFEST

CASIE / PROTANK
ENVIRONMENTAL SERVICES

Please type or print in block letters. (Form designed for use on elite (12-pitch) typewriter.)

NON-HAZARDOUS MANIFEST

1. Generator's US EPA ID No. NJ2210020978 Document No. 5172[illegible]
2. Page 1 of

3. Generator's Name and Mailing Address
US Army Communications Electronics
C/O Joseph Fallon, Bldg. 173
Charles Wood Area: 732-532-[illegible] ATTN: SELFM-PW-EV
Fort Monmouth NJ 07703

4. Generator's Phone (~~609~~) ~~696-4401~~

A. Non-hazardous Manifest Document Number: NHZ020 15724

B. State Generator's ID: SAME

5. Transporter 1 Company Name: Casie Ecology Oil Salvage, Inc.
6. US EPA ID Number: NJD045995693

C. State Trans. ID: 169311

7. Transporter 2 Company Name
8. US EPA ID Number

D. Transporter's Phone (609) 696-4401

E. State Trans. ID: X0591716

9. Designated Facility Name and Site Address
Casie Ecology Oil Salvage, Inc. T/A
3209 N. Mill Rd / Casie Protank
Vineland NJ 08360
10. US EPA ID Number: NJD045995693

F. Transporter's Phone ( )

G. State Facility's ID: 0614D1HP05

H. Facility's Phone (~~609~~) ~~696-4401~~

	11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	15. Waste No.
a.	Combustible liquid, n.o.s.(Fuel Oil) NA1993, III	001	TT	00900	G	D072
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
a. (L,T) 94% oil/sed 6% wtr
b.
c.
d.

K. Handling Codes for Wastes Listed Above
a. Filter T04 S02
b.
c.
d.

15. Special Handling Instructions and Additional Information
Bldg 3207 - UST
a. ERG# 128
b. 24 hr emergency response #609-696-4401 K. Ambrosia

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

I hereby certify that the above-named material is not hazardous waste as defined by 40 CFR Part 261, 264 and 279 or any applicable state law.

GENERATOR

Printed/Typed Name	Signature	Month	Day	Year
Charles Appleby SELFM-PW-EV		10	4	1918

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Dan Scolari	Dan Scol	10	4	1918

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of non-hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
PATRICK ECCARIUS		10	4	1918

5-TSD MAIL TO GENERATOR COPY

SIGNATURE AND INFORMATION *MUST* BE LEGIBLE ON ALL COPIES

In case of an emergency or spill immediately call CASIE (800) 424-9584

APPENDIX D

UST DISPOSAL CERTIFICATE

Piping, METAL DEBRIS
B.2707

MAZZA & SONS, INC.

Metal Recyclers
3230 Shafto Rd.
Tinton Falls, NJ
(908) 922-9292

NO. 295

DATE. 12 Aug 98

Customer's Name Tecom-Vinnell

Address

	Weight	Price		Weight	Price
Cast Iron			Lt. Copper		
Steel			Brass		
Lt. Iron	37 25		Alum Clean		
Copper #1			Lead		
Copper #2			Stainless		
			Battery		
				8 37 25	
				TOTAL AMOUNT:	

15260 LB
12280
2980

AUG 12 1998

2018

Weigher Customer

THIS CHECK IS DELIVERED FOR PAYMENT ON THE FOLLOWING ACCOUNTS.

DATE		AMOUNT	
TOTAL OF INVOICES			
LESS ___ % DISCOUNT			
LESS FREIGHT			
LESS			
TOTAL DEDUCTIONS			
AMOUNT OF CHECK			

MAZZA & SONS, INC.
RECYCLING DIVISION
P.O. BOX 246
OAKHURST, NJ 07755

2018

55-7233/2212

DATE 8/12/98

PAY TO THE ORDER OF Tecom Vinnell Services $37.25

Thirty Seven & 25/100 DOLLARS

Sovereign Bank

⑈002018⑈ ⑆221272332⑆000 109109928⑈

MONMOUTH COUNTY
RECLAMATION CENTER
TINTON FALLS, NJ
MAILING ADDRESS: 6000 ASBURY AVE.
NEPTUNE, NJ 07753

CUSTOMER COPY

FACILITY I.D. NO. 1336P1SP01

RECEIPT DOCUMENT NUMBER

01783947

BILL TO
MARP508937
MARPAL COMPANY
PO BOX 188
LINCROFT NJ 07738

TRUCK
MARP508937
MARPAL COMPANY
PO BOX 188
LINCROFT 78104 NJ 07738
Escrow Level: 2400.00

DATE	ENTRY TIME	OPER.	EXIT TIME	OPER.	GROSS WEIGHT	TARE WEIGHT	NET WEIGHT
10/08/98	07:45	VJF	08:01	KRW	(42360 LB)	(36540 LB)	5820 LB)
00874427	Scale 02		Scale 04		Scale 02 (21.18 T)	Scale 04 (18.27 T)	2.91 T)

VEHICLE NUMBER	VEHICLE TYPE	PLATE NUMBER	TRANSACTION TYPE
2065AU	Rolloff Open 20	XX89HD	T US (2500 A464) Normal

QUANTITY	WC	DESCRIPTION/ORIGIN	UNITS	UNIT PRICE	AMOUNT
2.9100	13	Bulky Waste ~ (MRF) MONMOUTH COUNTY EATONTOWN BOROUGH	Tons 100.00%	88.15	256.52

I hereby certify that the information provided on this form is true to the best of my knowledge.

Previous payments: 81806.22 ***

DRIVER NAME PRINT D Jarques SIGNATURE

DOCUMENT TOTAL $256.52

APPENDIX E

SOIL ANALYTICAL DATA PACKAGE

US ARMY FT. MONMOUTH ENVIRONMENTAL LABORATORY
NJDEPE # 13461

REPORT OF ANALYSIS

Client: U.S. Army
DPW, SELFM-PW-EV
Bldg. 173
Ft. Monmouth, NJ 07703

Project: Total Petroleum Hydrocarbons
98-0001
Bldg. 2707
Fuel Oil Tank

Project # 3795
Date Rec. 08/10/98
Date Compl. 08/11/98
Released by:

9/15/98
Daniel K. Wright Date:
Laboratory Director

Table of Contents

Method Summary

NJDEP Method OQA-QAM-025-10/97

Gas Chromatographic Determination of Total Petroleum Hydrocarbons in Soil

Fifteen grams (15g)(wet weight) of a soil sample is added to a 125 mL acid cleaned, solvent rinsed, capped Erlenmeyer flask. 15g anhydrous sodium sulfate is added to dry sample. Surrogate standard spiking solution is then added to the flask.

Twenty five milliliters(25mL) Methylene Chloride is added to the flask and it is secured on a gyrotory shaker table. The agitation rate is set to 400rpm and the sample is shaken for 30 minutes. The flask is the removed from the table and the particulate matter is allowed to settle. The extract is transferred to a Teflon capped vial. A second 25mL of Methylene Chloride is added to the flask and shaken for an additional 30 minutes. The flask is again removed and allowed to settle. The extracts are combined in the vial then transferred to a 1mL autosampler vial.

The extract is then injected directly into a GC-FID for analysis. The sample is analyzed for petroleum hydrocarbons covering a range of C8-C42 including pristane and phytane. Total Petroleum Hydrocarbon concentration is determined by integrating between 5 minutes and 22 minutes. The baseline is established by starting the integration after the end of the solvent peak and stopping after the last peak.

The final concentration of Total Petroleum Hydrocarbons is calculated using percent solid, sample weight and concentration.

PHC Conformance/Non-conformance Summary Report

	No	Yes
1.Method Detection Limits provided.	__	✓
2. Method Blank Contamination - If yes, list the sample and the corresponding concentrations in each blank	✓	__
3. Matrix Spike Results Summary Meet Criteria. (If not met, list the sample and corresponding recovery which falls outside the acceptable range).	__	✓
4. Duplicate Results Summary Meet Criteria. (If not met, list the sample and corresponding recovery which falls outside the acceptable range).	__	✓
5. IR Spectra submitted for standards, blanks, & samples	__ NA	__
6. Chromatograms submitted for standards, blanks, and samples if GC fingerprinting was conducted.	__	✓
7. Analysis holding time met. (If not met, list number of days exceeded for each sample)	__	✓

Additional Comments:_____

Laboratory Authentication Statement

I certify under penalty of law, where applicable, that this laboratory meets the Laboratory Performance Standards and Quality Control requirements specified in N.J.A.C. 7:18 and 40 CFR Part 136 for Water and Wastewater Analyses and SW 846 for Solid Waste Analysis. I have personally examined the information contained in this report, and to the best of my knowledge, I believe that the submitted information is true, accurate, complete, and meets the above referenced standards where applicable. I am aware that there are significant penalties for purposefully submitting falsified information, including the possibility of a fine and imprisonment.

Daniel K. Wright
Laboratory Manager

Fort Monmouth Environmental Testing Laboratory

Bldg. 173, SELFM-PW-EV, Fort Monmouth, NJ 07703
Tel (732)532-4359 Fax (732)532-3484 EMail:appleby@doim6.monmouth.army.mil
NJDEP Certification #13461

Chain of Custody Record

Customer: Charles Appleby
Phone #: X26224
( )DERA (X)OMA UST Assessment

Project No: 98-0001
Location: 2707 (6,000 GAL. FUEL O.C TANK)
UST# 815/5-40

Samplers Name / Company : Gary DiMartinis TVS

Lab Sample I.D.	Sample Location	Date	Time	Sample Type	# bottles	TPHC	% SOLIDS	VOA+15	VOA ID Number	OVA	Remarks / Preservation Method
3795.01	2707-A	8-10-98	1148	Soil	1	X	X				SIDEWALL @ 11.5' *
02	B		1145								
03	C		1120								
04	D		1117								
05	E		1123								
06	F		1131								
07	G		1153								
08	H		1126								
09	Dup	↓	—	↓	↓	↓	↓				FIELD DUPLICATE ✓

Comments:
* = Samples Kept <4 Celsius

Note: OVA(#A51903) Calibrated With 95 ppm Methane & Zero Air @ 1112 on 8/10/98 by Gary DiMartinis

Relinquished by (signature):	Date/Time:	Received by (signature):	Relinquished by (signature):	Date/Time:	Received by (signature):
[signature]	8/10/98 1420	[signature]			
Relinquished by (signature):	Date/Time:	Received by (signature):	Relinquished by (signature):	Date/Time:	Received by (signature):
		[signature]			

Report Type: (_)Full, (✓)Reduced, (_)Standard, (_)Screen / non-certified
Turnaround time: (✓)Standard 4 wks, (_)Rush ____ Days, (_)ASAP Verbal ____ Hrs.

Remarks: Dedicated Sampling Tools Used

print legibly

USTcoc6/30/98

Report of Analysis
U.S. Army, Fort Monmouth Environmental Laboratory
NJDEP Certification # 13461

Client :	U.S. Army	**Lab. ID # :**	3795
	DPW. SELFM-PW-EV	**Date Rec'd:**	10-Aug-98
	Bldg. 173	**Analysis Start:**	11-Aug-98
	Ft. Monmouth, NJ 07703	**Analysis Complete:**	11-Aug-98
Analysis:	OQA-QAM-025	**UST Reg. #:**	
Matrix:	Soil	**Closure #:**	
Analyst:	D.DEINHARDT	**DICAR #:**	
Ext. Meth:	Shake	**Location #:**	B. 2707

Sample	Field ID	Dilution Factor	Weight (g)	% Solid	MDL (mg/kg)	TPHC Result (mg/kg)
3795.01	2707-A	**1.00**	15.40	92.53	165	**ND**
3795.02	2707-B	**1.00**	15.35	95.00	161	**ND**
3795.03	2707-C	**1.00**	15.01	90.04	174	**ND**
3795.04	2707-D	**1.00**	15.45	91.44	166	**ND**
3795.05	2707-E	**1.00**	15.12	87.82	177	**ND**
3795.06	2707-F	**1.00**	14.99	86.25	182	**ND**
3795.07	2707-G	**1.00**	15.45	90.72	168	**ND**
3795.08	2707-H	**1.00**	15.45	90.72	168	**ND**
3795.09	2707-DUP	**1.00**	15.45	90.72	168	**ND**
METHOD BLANK	TBLK 147	**1.00**	15.00	100.00	157	**ND**

ND = Not Detected

MDL = Method Detection Limit

Daniel K. Wright
Laboratory Director

LABORATORY DELIVERABLES CHECKLIST AND NON-CONFORMANCE SUMMARY

THIS FORM MUST BE COMPLETED BY THE LABORATORY OR ENVIRONMENTAL CONSULTANT AND ACCOMPANY ALL DATA SUBMISSIONS

The following Laboratory Deliverables checklist and Non-Conformance Summary shall be included in the data submission. All deviations from the accepted methodology and procedures, of performance values outside acceptable ranges shall be summarized in the Non-Conformance Summary. The Technical Requirements for Site Remediation, effective June 7, 1993, provides further details. The document shall be bound and paginated, contain a table of contents, and all pages shall be legible. Incomplete packages will be returned or held without review until the data package is completed.

It is recommended that the analytical results summary sheets listing all targeted and non-targeted compounds with the method detection limits, practical quantitation limits, and the laboratory and/or sample numbers be included in one section of the data package and in the main body of the report.

1. Cover page, Title Page listing Lab Certification #, facility name and address, & date of report submitted ✓
2. Table of Contents submitted ✓
3. Summary Sheets listing analytical results for all targeted and non-targeted compounds submitted ✓
4. Document paginated and legible ✓
5. Chain of Custody submitted ✓
6. Samples submitted to lab within 48 hours of sample collection ✓
7. Methodology Summary submitted ✓
8. Laboratory Chronicle and Holding Time Check submitted ✓
9. Results submitted on a dry weight basis ✓
10. Method Detection Limits submitted ✓
11. Lab certified by NJDEP for parameters of appropriate category of parameters or a member of the USEPA CLP ✓

Laboratory Manager or Environmental Consultant's Signature _____

Date 9/13/94

Laboratory Certification #13461

*Refer to NJAC 7:26E - Appendix A, Section IV - Reduced Data Deliverables - Non-USEPA/CLP Methods for further guidance.

US ARMY FT. MONMOUTH ENVIRONMENTAL LABORATORY
NJDEPE # 13461

REPORT OF ANALYSIS

Client: U.S. Army
DPW, SELFM-PW-EV
Bldg. 173
Ft. Monmouth, NJ 07703

Project: Total Petroleum Hydrocarbons
98-0001
Bldg. 2707
Oil Lines

Project # 3848
Date Rec. 09/01/98
Date Compl. 09/03/98
Released by:

9/15/98

Daniel K. Wright Date:
Laboratory Director

Table of Contents

Method Summary

NJDEP Method OQA-QAM-025-10/97

Gas Chromatographic Determination of Total Petroleum Hydrocarbons in Soil

Fifteen grams (15g)(wet weight) of a soil sample is added to a 125 mL acid cleaned, solvent rinsed, capped Erlenmeyer flask. 15g anhydrous sodium sulfate is added to dry sample. Surrogate standard spiking solution is then added to the flask.

Twenty five milliliters(25mL) Methylene Chloride is added to the flask and it is secured on a gyrotory shaker table. The agitation rate is set to 400rpm and the sample is shaken for 30 minutes. The flask is the removed from the table and the particulate matter is allowed to settle. The extract is transferred to a Teflon capped vial. A second 25mL of Methylene Chloride is added to the flask and shaken for an additional 30 minutes. The flask is again removed and allowed to settle. The extracts are combined in the vial then transferred to a 1mL autosampler vial.

The extract is then injected directly into a GC-FID for analysis. The sample is analyzed for petroleum hydrocarbons covering a range of C8-C42 including pristane and phytane. Total Petroleum Hydrocarbon concentration is determined by integrating between 5 minutes and 22 minutes. The baseline is established by starting the integration after the end of the solvent peak and stopping after the last peak.

The final concentration of Total Petroleum Hydrocarbons is calculated using percent solid, sample weight and concentration.

PHC Conformance/Non-conformance Summary Report

		Indicate Yes, No, N/A
1.	Method Detection Limits provided.	Yes
2.	Method Blank Contamination – If yes, list the sample and the corresponding concentrations in each blank.	NO
3.	Matrix Spike Results Summary Meet Criteria (If not met, list the sample and corresponding recovery which falls outside the acceptable range).	Yes
4.	Duplicate Results Summary Meet Criteria (If not met, list the sample and corresponding recovery which falls outside the acceptable range).	Yes
5.	IR Spectra submitted for standards, blanks and samples.	NA
6.	Chromatograms submitted for standards, blanks and samples if GC fingerprinting was conducted.	Yes
7.	Analysis holding time met. (If not met, list number of days exceeded for each sample).	Yes

Additional comments: _____

Laboratory Manager

9/15/94
Date

Fort Monmouth Environmental Testing Laboratory

Bldg. 173, SELFM-PW-EV, Fort Monmouth, NJ 07703
Tel (732)532-4359 Fax (732)532-3484 EMail:appleby@doim6.monmouth.army.mil
NJDEP Certification #13461

Chain of Custody Record

Customer: Charles Appleby
Phone #: X26224
( )DERA (X)OMA UST Assessment

Project No: 98-0001
Location: B 2707-OIL LINES
UST# 81515-40

Samplers Name / Company : Gary DiMartinis TVS

Lab Sample I.D.	Sample Location	Date	Time	Sample Type	# bottles	TPHC	% SOLIDS	VOA+15	VOA ID Number	OVA	Remarks / Preservation Method
38158.01	2707-A	8/31/98	1430	SOIL	1	X	X			ND	Piping Run @ 3.0' *
02	B	↓	1433	↓	↓	↓	↓			ND	↓
03	C		1427							ND	
04	D		1424							1	Piping Run @ 2.0'
05	E		1418							ND	Piping Run @ 3.0'
06	F		1436							10	↓
07	G		1453							20	
08	DUP	↓	—	↓	↓	↓	↓			—	FIELD DUPLICATE ↓

Note: OVA(#A51903) Calibrated With 95 ppm Methane & Zero Air @ 1410 on 8/31/98 by Gary DiMartinis

Relinquished by (signature):	Date/Time:	Received by (signature):	Relinquished by (signature):	Date/Time:	Received by (signature):
[signature]	9-1-98 1045	[signature]			
Relinquished by (signature):	Date/Time:	Received by (signature):	Relinquished by (signature):	Date/Time:	Received by (signature):

Report Type: (_)Full, (X)Reduced, (_)Standard, (_)Screen / non-certified
Turnaround time: (_)Standard 4 wks, (X)Rush 2 Days, (_)ASAP Verbal ___ Hrs.

Remarks: Dedicated Sampling Tools Used

print legibly

USTcoc6/30/98

Report of Analysis
U.S. Army, Fort Monmouth Environmental Laboratory
NJDEP Certification # 13461

Client :	U.S. Army	**Lab. ID # :**	3848
	DPW. SELFM-PW-EV	**Date Rec'd:**	01-Sep-98
	Bldg. 173	**Analysis Start:**	01-Sep-98
	Ft. Monmouth, NJ 07703	**Analysis Complete:**	03-Sep-98
Analysis:	OQA-QAM-025	**UST Reg. #:**	
Matrix:	Soil	**Closure #:**	
Analyst:	D.DEINHARDT	**DICAR #:**	
Inst. ID.	GC TPHC INST. #1	**Injection Volume**	1 ul
Column Type	RTX 5	**Column ID**	0.32 um
Ext. Meth:	Shake	**Location #:**	B. 2707- Oil Lines

Sample	Field ID	Dilution Factor	Weight (g)	% Solid	MDL (mg/kg)	TPHC Result (mg/kg)
3848.01	2707-A	**1.00**	15.01	95.42	164	**ND**
3848.02	2707-B	**1.00**	15.03	94.53	165	**ND**
3848.03	2707-C	**1.00**	15.72	96.79	154	**ND**
3848.04	2707-D	**1.00**	15.42	96.32	158	**ND**
3848.05	2707-E	**1.00**	14.98	92.82	169	**ND**
3848.06	2707-F	**1.00**	14.99	97.27	161	**357.42**
3848.07	2707-G	**5.00**	15.47	95.61	159	**14626.39**
3848.08	2707-DUP	**1.00**	15.07	94.19	166	**193.88**
METHOD BLANK	TBLK 156	**1.00**	15.00	100.00	157	**ND**

ND = Not Detected

MDL = Method Detection Limit

Daniel K. Wright
Laboratory Director

Response Factor Report GC/MS Ins

Method : C:\HPCHEM\1\METHODS\TPH45.M (Chemstation Integrator)
Title : TPHC Calibration 06/05/97 21 peaks
Last Update : Fri Aug 14 11:29:53 1998

Calibration Files
100 =T06448.D 50 =T06449.D 20 =T06450.D
10 =T06451.D 5 =T06452.D

	Compound	100	50	20	10	5	Avg		%RSD
1)	tC C8	2.351	2.506	2.300	2.319	2.623	2.420	E4	5.77
2)	tC C10	2.628	2.757	2.650	2.668	3.049	2.750	E4	6.33
3)	TC C12	2.993	3.114	2.951	2.972	3.352	3.076	E4	5.41
4)	tC C14	3.185	3.325	3.175	3.243	3.571	3.300	E4	4.94
5)	tC C16	3.292	3.451	3.327	3.430	3.765	3.453	E4	5.41
6)	tC C18	3.714	3.854	3.720	3.900	4.458	3.929	E4	7.81
7)	tC C20	3.633	3.807	3.685	3.810	4.170	3.821	E4	5.49
8)	tC C22	3.684	3.868	3.740	3.882	4.264	3.887	E4	5.83
9)	tC C24	3.646	3.872	3.704	3.821	4.149	3.839	E4	5.10
10)	tC C26	3.630	3.872	3.672	3.774	4.100	3.810	E4	4.92
11)	tC C28	3.639	3.896	3.663	3.764	4.060	3.805	E4	4.61
12)	tC C30	3.721	3.997	3.721	3.844	4.124	3.881	E4	4.55
13)	tC C32	3.676	3.957	3.666	3.781	4.020	3.820	E4	4.24
14)	tC C34	3.712	4.009	3.717	3.817	4.139	3.879	E4	4.86
15)	tC C36	3.526	3.821	3.519	3.633	3.941	3.688	E4	5.06
16)	tC C38	3.439	3.733	3.425	3.539	3.832	3.594	E4	5.04
17)	tC C40	3.214	3.482	3.166	3.239	3.427	3.306	E4	4.23
18)	tC c42	3.172	3.390	2.972	2.917	2.904	3.071	E4	6.78
19)	TC Pristane	3.488	3.828	3.583	3.672	4.042	3.723	E4	5.85
20)	TC Phytane	3.637	3.830	3.710	3.836	4.232	3.849	E4	5.98
21)	sC o-terphenyl	3.684	3.868	3.740	3.882	4.264	3.887	E4	5.83
22)	tC TPHC - total	3.795	4.051	3.997	4.375	5.075	4.259	E4	11.78

(#) = Out of Range MEAN RSD = 5.71%

TPH45.M Wed Aug 19 14:08:02 1998

LABORATORY DELIVERABLES CHECKLIST AND NON-CONFORMANCE SUMMARY

THIS FORM MUST BE COMPLETED BY THE LABORATORY OR ENVIRONMENTAL CONSULTANT AND ACCOMPANY ALL DATA SUBMISSIONS

The following Laboratory Deliverables checklist and Non-Conformance Summary shall be included in the data submission. All deviations from the accepted methodology and procedures, of performance values outside acceptable ranges shall be summarized in the Non-Conformance Summary. The Technical Requirements for Site Remediation, effective June 7, 1993, provides further details. The document shall be bound and paginated, contain a table of contents, and all pages shall be legible. Incomplete packages will be returned or held without review until the data package is completed.

It is recommended that the analytical results summary sheets listing all targeted and non-targeted compounds with the method detection limits, practical quantitation limits, and the laboratory and/or sample numbers be included in one section of the data package and in the main body of the report.

1.	Cover page, Title Page listing Lab Certification #, facility name and address, & date of report submitted	✓
2.	Table of Contents submitted	✓
3.	Summary Sheets listing analytical results for all targeted and non-targeted compounds submitted	✓
4.	Document paginated and legible	✓
5.	Chain of Custody submitted	✓
6.	Samples submitted to lab within 48 hours of sample collection	✓
7.	Methodology Summary submitted	✓
8.	Laboratory Chronicle and Holding Time Check submitted	✓
9.	Results submitted on a dry weight basis	✓
10.	Method Detection Limits submitted	✓
11.	Lab certified by NJDEP for parameters of appropriate category of parameters or a member of the USEPA CLP	✓

Laboratory Manager or Environmental Consultant's Signature _____

Date 9/15/94

Laboratory Certification #13461

*Refer to NJAC 7:26E - Appendix A, Section IV - Reduced Data Deliverables - Non-USEPA/CLP Methods for further guidance.

FORT MONMOUTH ENVIRONMENTAL TESTING LABORATORY

DIRECTORATE OF PUBLIC WORKS

PHONE: (732)532-6224 FAX: (732)532-3484
WET-CHEM - METALS - ORGANICS - FIELD SAMPLING
NJDEP LABORATORY CERTIFICATION # 13461

ANALYTICAL DATA REPORT
Fort Monmouth Environmental Laboratory
ENVIROMENTAL DIVISION
Fort Monmouth, New Jersey
PROJECT: #98-0001/BLDG. 2707

BLDG. 2707/6000 FUEL OIL TANK

Field Location No. & Location	Laboratory Sample ID#	Matrix	Date and Time Of Collection	Date Received
2707-G2	3903.01	Soil	22-Sept-98 14:48	09/22/98

ANALYSIS:
FORT MONMOUTH ENVIROMENTAL LAB
TPHC, %SOLIDS

10/6/98
Daniel Wright/ Date
Laboratory Director

ENCLOSURE:
CHAIN OF CUSTODY
RESULTS

Table of Contents

Method Summary

NJDEP Method OQA-QAM-025-10/97

Gas Chromatographic Determination of Total Petroleum Hydrocarbons in Soil

Fifteen grams (15g)(wet weight) of a soil sample is added to a 125 mL acid cleaned, solvent rinsed, capped Erlenmeyer flask. 15g anhydrous sodium sulfate is added to dry sample. Surrogate standard spiking solution is then added to the flask.

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The final concentration of Total Petroleum Hydrocarbons is calculated using percent solid, sample weight and concentration.

PHC Conformance/Non-conformance Summary Report

		Indicate Yes, No, N/A
1.	Method Detection Limits provided.	Yes
2.	Method Blank Contamination – If yes, list the sample and the corresponding concentrations in each blank.	NO
3.	Matrix Spike Results Summary Meet Criteria (If not met, list the sample and corresponding recovery which falls outside the acceptable range).	yes
4.	Duplicate Results Summary Meet Criteria (If not met, list the sample and corresponding recovery which falls outside the acceptable range).	Yes
5.	IR Spectra submitted for standards, blanks and samples.	NA
6.	Chromatograms submitted for standards, blanks and samples if GC fingerprinting was conducted.	Yes
7.	Analysis holding time met. (If not met, list number of days exceeded for each sample).	yes

Additional comments: _____

Laboratory Manager

10/6/06
Date

Fort Monmouth Environmental Testing Laboratory

Bldg. 173, SELFM-PW-EV, Fort Monmouth, NJ 07703
Tel (732)532-4359 Fax (732)532-3484 EMail:appleby@doim6.monmouth.army.mil
NJDEP Certification #13461

Chain of Custody Record

Customer: Charles Appleby
Phone #: X26224
( )DERA (X)OMA UST Assessment

Project No: 98-0001
Location: B. 2707 - 6,000 Fuel Oil Tank
UST# ~~78-01~~ 40 81515-40

Samplers Name / Company : Gary DiMartinis TVS

Lab Sample I.D.	Sample Location	Date	Time	Sample Type	# bottles	TPHC	% SOLIDS	VOA+15	VOA ID Number	OVA	Remarks / Preservation Method
34403.01	2707-G2	9-22-98	1448	SOIL	1	X	X			NO	Piping Run @ 5.0' *
NOTE: SAME LOCATION AS 8-31-98 SAMPLE G @ 3.0'											

Comments:
* = Samples Kept <4 Celsius

Note: OVA(#A51903) Calibrated With 95 ppm Methane & Zero Air @ 1438 on 9-22-98 by Gary DiMartinis

Relinquished by (signature):	Date/Time:	Received by (signature):	Relinquished by (signature):	Date/Time:	Received by (signature):
[signature]	9-22-98 1558	[signature]			
Relinquished by (signature):	Date/Time:	Received by (signature):	Relinquished by (signature):	Date/Time:	Received by (signature):
		[signature]			

Report Type: (_)Full, (X)Reduced, (_)Standard, (_)Screen / non-certified
Turnaround time: (_)Standard 4 wks, (X)Rush 3 Days, (_)ASAP Verbal ___ Hrs.

Remarks: Dedicated Sampling Tools Used

print legibly

USTcoc6/30/98

Report of Analysis
U.S. Army, Fort Monmouth Environmental Laboratory
NJDEP Certification # 13461

Client :	U.S. Army	**Lab. ID # :**	3903
	DPW. SELFM-PW-EV	**Date Rec'd:**	22-Sep-98
	Bldg. 173	**Analysis Start:**	23-Sep-98
	Ft. Monmouth, NJ 07703	**Analysis Complete:**	23-Sep-98
Analysis:	OQA-QAM-025	**UST Reg. #:**	
Matrix:	Soil	**Closure #:**	
Analyst:	D.DEINHARDT	**DICAR #:**	
Inst. ID.	GC TPHC INST. #1	**Injection Volume**	1 ul
Column Type	RTX 5	**Column ID**	0.32 um
Ext. Meth:	Shake	**Location #:**	B. 2707

Sample	Field ID	Dilution Factor	Weight (g)	% Solid	MDL (mg/kg)	TPHC Result (mg/kg)
3903.01	2707-G2	**1.00**	15.29	86.87	177	**ND**
METHOD BLANK	TBLK 168	**1.00**	15.00	100.00	157	**ND**

ND = Not Detected

MDL = Method Detection Limit

Daniel K. Wright
Laboratory Director

LABORATORY DELIVERABLES CHECKLIST AND NON-CONFORMANCE SUMMARY

THIS FORM MUST BE COMPLETED BY THE LABORATORY OR ENVIRONMENTAL CONSULTANT AND ACCOMPANY ALL DATA SUBMISSIONS

The following Laboratory Deliverables checklist and Non-Conformance Summary shall be included in the data submission. All deviations from the accepted methodology and procedures, of performance values outside acceptable ranges shall be summarized in the Non-Conformance Summary. The Technical Requirements for Site Remediation, effective June 7, 1993, provides further details. The document shall be bound and paginated, contain a table of contents, and all pages shall be legible. Incomplete packages will be returned or held without review until the data package is completed.

It is recommended that the analytical results summary sheets listing all targeted and non-targeted compounds with the method detection limits, practical quantitation limits, and the laboratory and/or sample numbers be included in one section of the data package and in the main body of the report.

1. Cover page, Title Page listing Lab Certification #, facility name and address, & date of report submitted ✓
2. Table of Contents submitted ✓
3. Summary Sheets listing analytical results for all targeted and non-targeted compounds submitted ✓
4. Document paginated and legible ✓
5. Chain of Custody submitted ✓
6. Samples submitted to lab within 48 hours of sample collection ✓
7. Methodology Summary submitted ✓
8. Laboratory Chronicle and Holding Time Check submitted ✓
9. Results submitted on a dry weight basis ✓
10. Method Detection Limits submitted ✓
11. Lab certified by NJDEP for parameters of appropriate category of parameters or a member of the USEPA CLP ✓

Laboratory Manager or Environmental Consultant's Signature _____

Date 10/6/96

Laboratory Certification #13461

*Refer to NJAC 7:26E - Appendix A, Section IV - Reduced Data Deliverables - Non-USEPA/CLP Methods for further guidance.

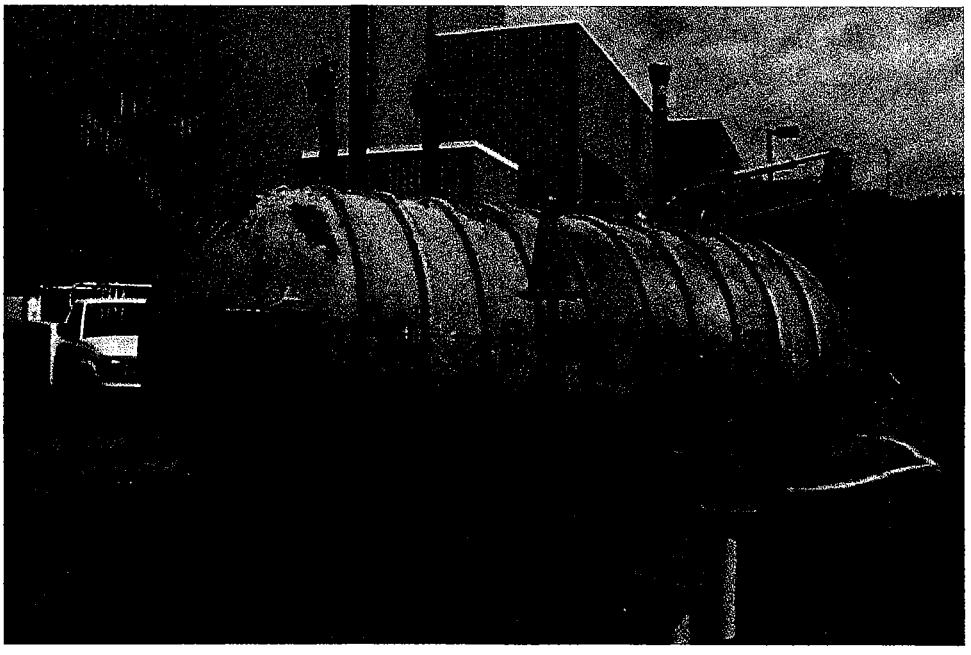
Laboratory Authentication Statement

I certify under penalty of law, where applicable, that this laboratory meets the Laboratory Performance Standards and Quality Control requirements specified in N.J.A.C. 7:18 and 40 CFR Part 136 for Water and Wastewater Analyses and SW-846 for Solid Waste Analysis. I have personally examined the information contained in this report and to the best of my knowledge, I believe that the submitted information is true, accurate, complete and meets the above referenced standards where applicable. I am aware that there are significant penalties for purposefully submitting falsified information, including the possibility of a fine and imprisonment.

Daniel K. Wright
Laboratory Manager

APPENDIX F

PHOTOGRAPHS



AUGUST 10, 1998

PHOTOGRAPHIC LOG

UST NO. 81515-40

Building 2707
Charles Wood-West
Fort Monmouth

VERSAR
Engineers, Managers, Scientists & Planners
Bristol, PA