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DRAFT CONDENSED WORK PLAN FOR SOIL AND GROUNDWATER SAMPLING AT TANK FARM 2 NS NEWPORT RI (DRAFT ACTING AS FINAL)

5/1/2005

TETRA TECH EC

TETRA TECH EC, INC.

Defense Energy Support Center
Contract No. SPO600-04-D-5403

Draft
Condensed Work Plan
for Soil and Groundwater Sampling
Tank Farm 2

Defense Fuel Support Point – Melville
Portsmouth, Rhode Island

May 2005

Prepared by:

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Revision	Date	Prepared By	Approved By
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ACRONYMS

AOC	areas of concern
bgs	below ground surface
COC	Chain of Custody
DESC	Defense Energy Support Center
DFSP	Defense Fuel Support Point
DRO	diesel range organics
GPS	Global Positioning System
mg/kg	milligrams per kilogram
MS/MSD	matrix spike/matrix spike duplicate
NAPL	non-aqueous phase liquid
PCB	polychlorinated biphenyl
ppm	parts per million
QA/QC	quality assurance/quality control
RIDEM	Rhode Island Department of Environmental Management
SAPA	Stereoscopic Aerial Photography Analysis
SVOC	semivolatile organic compound
TPH	total petroleum hydrocarbons
TtEC	Tetra Tech EC, Inc.
EPA	U.S. Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

1.0 INTRODUCTION

This Condensed Work Plan for Soil and Groundwater Sampling (hereinafter referred to as the Condensed Work Plan) has been prepared on behalf of Defense Energy Support Center (DESC) for Tank Farm 2 at the former Defense Fuel Support Point (DFSP) Melville. The objective of this Work Plan is to present a sampling approach for Tank Farm 2 in order to adequately assess the existing conditions on-site. The approach will be similar to that employed at Tank Farm 3 where sampling and remediation were conducted concurrently during the test pitting program. DESC feels this approach is the most expedient way to address the Rhode Island Department of Environmental Management's (RIDEM) concerns regarding the subject property.

In September 2003, Tetra Tech EC, Inc. (TtEC) [formerly Tetra Tech FW, Inc. (TtFW)] submitted a Draft Work Plan for Site Closure to RIDEM for review and comment. The purpose of the Work Plan was to provide an overview of known site conditions and to assess areas of potential concern with regards to petroleum releases on the property. Issues raised by RIDEM in their comments on the Draft Work Plan for Site Closure will be addressed during this investigative work. This Condensed Work Plan has been prepared to address areas where additional information is required to prove/disprove historical anecdotal evidence from interviews, site operations manuals, and previous environmental assessments. The field investigation described in this document is intended to identify groundwater and soil areas that exceed the current RIDEM Remediation Regulations applicable to the Site based on current usage. A historical aerial analysis of the former tank farms has been conducted and used to identify areas likely to have been impacted by releases to the environment as indicated by staining, material storage, and site activity. Soil sampling will generally be conducted by test pit method, and remediation of areas identified to exceed the Industrial/Commercial Criteria will be concurrent with the sampling effort.

2.0 SOIL SAMPLING PROGRAM

2.1 Stereoscopic Aerial Photography Analysis (SAPA)

In order to accurately identify areas of potential petroleum based contamination on the Site, historical aerial photographs were collected and analyzed stereoscopically by a specialty contractor. The full report is provided as Appendix A. The analysis was conducted on aerial photographs dating from 1942 through 1995. Objects and areas determined to be potential sources of releases were compiled from each of these photographs, georeferenced, and overlaid on a 1995 aerial photograph. The photographs provide locations of past surface soil staining, stockpile areas, and materials storage areas. Forty-one of these areas were identified as areas of concern (AOCs). All AOCs are described in Table 2-1 and shown on Figures 2-1 and 2-2 and have been georeferenced to be field located with sub meter accuracy Global Positioning System (GPS) units. The AOC's were field delineated and evaluated during a site survey in December 2004 at which time several areas noted as ground scars in the aerial photographs were determined to be construction related and would not be investigated during this field event. These areas included AOCs 008, 011, 021, 025, 032, 038, 039, 040, and 041. The field soil-sampling program for the remaining areas are described in Section 2.3. In addition to the AOCs identified during the aerial photography survey are shown on Figure 2-1, areas previously agreed upon by DESC and RIDEM related to structures and drainage features on the Site will also be investigated as outlined in the following sections.

2.2 Previously Identified Areas of Concern

The approach that will be used to investigate and remediate Tank Farm 2 will be the same approach used at Tank Farm 3. Additional AOCs identified in the *Draft Work Plan for Site Closure, Tank Farm 2, September 2003,* prepared by TtEC (formerly Foster Wheeler Environmental) and associated RIDEM comments will also be addressed. These additional areas include:

- Surface soils located directly beneath the vent pipes for each underground storage tank (UST);
- Outdoor electrical transformer;
- Soil surrounding USTs; and
- Drainage features (swales) leading downgradient to offsite areas.

Review of historical site data indicated soil from the GZ-209 well installation exceeded the total petroleum hydrocarbons (TPH) Industrial/Commercial Direct Contact Leachability Criteria of 2,500 parts per million (ppm) with a concentration of 5,600 mg/kg at a depth of 15-17 feet below ground surface (bgs). This area of soil represents the only exceedance of the RIDEM Method 1 Industrial/ Commercial Direct Exposure and GB Leachability Criteria found on the site. Three soil borings will be advanced equally radially offset from GZ-209 by 20 feet. Continuos soil samples will be collected to the depth of the water table anticipated being 20 feet below ground surface. Soil samples will be screened for headspace using a flame ionizing detector and the jar headspace method. The samples with the greatest headspace result from each boring will be sent off site for analysis of by EPA method 8015 for gasoline (GRO) and diesel range organics (DRO).

2.2.1 Surface Soils Located Directly Beneath the Vent Pipes for Each UST

In order to assess releases to surface soils beneath each of the UST vent pipes, one grab sample will be taken at a depth of 1 foot below grade or where visual or olfactory evidence of a release is observed for analysis by Petroflag™. Petroflag™ screening and sample analysis will be conducted as outlined in Section 2.3.

Table 2-1
SAPA Areas of Concern (AOCs)

AOC	Ref. Date	Photo Description/Field Conditions *
TF2-001	1951	Open burning is evident at Tank 21. Not shown in 1953/Minor stressed vegetation.
TF2-002	1951	Large linear ground scar at Tank 19. Remains in 1953/Stressed soils within polygon.
TF2-003	1954	Open burning/stained ground at Tank 19/Grassy, open area.
TF2-004	1954	Open burning/ground staining at Tank 19/Grassy, open area.
TF2-005	1954	Open burning/ground staining at Tank 19/Grassy, open area; roadway partially within polygon.
TF2-006	1954	Significant ground staining at Tank 22/Grassy, open area.
TF2-007	1954	Significant ground staining at Tank 22/Low vegetation and grass, open area.
TF2-008	1954	Significant ground staining at Tank 22/Loose rock and shale, no surface soils. Will not excavate.
TF2-009	1954	Significant ground staining at Tank 27/Low vegetation, no staining or stressed vegetation.
TF2-010	1954	Significant ground staining at Tank 27/Stressed, stained soils in SE area, approx. 20 square feet, otherwise partially grassy and open, partially wooded
TF2-011	1962	Medium-toned material or liquid east of Tank 19/Area around water lines and hydrant; surface material used to cover water lines to protect them from freezing. Will not excavate this area.
TF2-012	1962	Ground staining at Tank 22/Open area with minor stressed vegetation.
TF2-013	1962	Ground staining at Tank 28/No stressed vegetation or ground staining.
TF2-014	1962	Ground staining at Tank 28/Open vegetated area, no stress or staining.
TF2-015	1962	Ground staining at Tank 29/Open area, area surrounds T29 blockhouse.
TF2-016	1962	Staining and dark toned material at Tank 27/No staining or mounded material observed.
TF2-017	1962	Two pits are southwest of Tank 26/Stressed vegetation, 2 small craters, various small depressions.
TF2-018	1964	Access road leads to two circular ground scars east of Tank 26/Stressed vegetation, extend pits ends outside area boundary.
TF2-019	1964	Access road leads to two circular ground scars east of Tank 26/Depression in middle of area, will extend test pit ends to outside area boundary.
TF2-020	1970	Ground scar is visible in wooded area at the west central portion of Tank Farm 2/Will excavate in area 20, not in area 39.
TF2-021	1972	Ground staining evident near Tank 19/Stressed vegetation due to poor soil at rock outcrop. Will not excavate.
TF2-022	1972	Open storage of thousands of stacked cylindrical containers visible within the circular access road west of Tanks 27 and 28. Containers remain in place throughout the 1970s. All are removed by 1988/AOC defined by 1 foot by 1 foot concrete berm. Area not flagged.
TF2-023	1975	Two scarred or cleared areas are visible in the wooded area west of Tank 25/Debris at western edge of AOC.
TF2-024	1975	Two scarred or cleared areas are visible in the wooded area west of Tank 25/Area previously cleared, heavy new growth today.

AOC	Ref. Date	Photo Description/Field Conditions *
TF2-025	1975	Ground scar and/or liquid are located east of Tank 19/Area is exposed bedrock. Appeared as liquid in aerial photographs. Will not excavate.
TF2-026	1979	Low ground area containing probable liquid located north of stored containers. Visible in 1980 also/Heavy scrub vegetation present.
TF2-027	1979	Hose leads from structure to a discharge point at Tank 23/Hose observed in aerial photos lead from T23 vault. Distressed vegetation in polygon.
TF2-028	1979	Large stained areas west of hose and discharge point/Open area, low vegetation.
TF2-029	1979	Large stained areas west of hose and discharge point/Stressed vegetation within area of interest.
TF2-030	1981	Hose or pipe leads from a structure or pit at Tank 20/Depression on western side of T23 blower.
TF2-031	1981	Hose or pipe leads from a structure or pit at Tank 20/Minor stressed vegetation, new 4-inch hose on ground .
TF2-032	1986	Fill area in northwest portion of tank farm. Debris in area in 1995/Steep embankment due to debris dumping, fill made up of piles, tires, concrete. Will not excavate.
TF2-033	1986	Mound of dark toned material west of container storage area/Will excavate through center of mound.
TF2-034	1986	Area of staining or liquid adjacent to container storage area/construction/ demolition debris including drum with stained soil.
TF2-035	1988	Light-toned mounded material is visible in the former container storage area. ***Area 1/Will excavate through center of mounded material.***
TF2-036	1988	Light-toned mounded material is visible in the former container storage area. ***Area 2/Will excavate through center of mounded material.***
TF2-037	1988	Two large pits (one containing a cylindrical object) are in the north central portion of TF2. ***Pit 1/Area on top of fill. Stressed vegetation present.***
TF2-038	1988	Two large pits (one containing a cylindrical object) are in the north central portion of TF2. ***Pit 2/Object within pit is water valve. Will not excavate.***
TF2-039	1988	Three pits (one polygon) and a ground scarred area are within and adjacent to wooded area on the western side of TF2. ***Pit 1/*** The three pits are water valves, scarred area observed in photos due to installation of these valves. ***Will not excavate.***
TF2-040	1988	Three pits (one polygon) and a ground scarred area are within and adjacent to wooded area on the western side of TF2. ***Pit 2/See TF2-039. Will not excavate.***
TF2-041	1988	Three pits (one polygon) and a ground scarred area are within and adjacent to wooded area on the western side of TF2. ***Pit 3/See TF2-039. Will not excavate.***
TF2-042	1988	Three pits and a ground scarred area are within and adjacent to wooded area on the western side of TF2. ***Ground scarred area/AOC follows drainage west, construction debris and water valve present.***
TF2-043	1992	A large ***linear ground scar*** is on the west side of T26/Line from transformer building 219, vegetated area.

* Test pitting, screening, and analysis of these AOCs to be performed as described in Section 2.3.

FA w/ PROB DB
FA
TF2-032
TF2-004
TF2-005
ST
T21
OBN (SEPT '51)
TF2-001
TF2-038
TF2-037
PIT
PIT w/ OB
ST
HOSE / PIPE & PIT ('81)
TF2-031
TF2-008
ST
ST
TF2-015
T29
TF2-002
GS
T19
T22
ST
TF2-012
TF2-006
TF2-007
OBN
TF2-003
ST
TF2-021
TF2-025
GS
GS / LQ
TF2-042
TF2-011
MT M / LQ
TF2-034
PROB LQ (ALSO '80)
TF2-026
ST / LQ
CT
TF2-033
DK M
TF2-035
TF2-028
TF2-029
ST
GS ('70)
T28
LT MM
DB
DEFENSE HWY
T23
TF2-020
TF2-036
PITS
TF2-039
TF2-040
TF2-041
TF2-027
HOSE
CT
TF2-013
ST
TF2-014
CT
TF2-022
CT
ST & DK M
TF2-016
TANK FARM 2
T27
TF2-009
ST
T20
TF2-010
TF2-030
HOSE / PIPE & PIT ('81)
T24
GS ('64)
TF2-018
TF2-019
TF2-023
GS / CA
T26
TF2-024
T25
GS ('92)
TF2-043
2 PITS
TF2-017

1942 Drainage
1942 Polygon Features
1951 Polygon Features
1954 Drainage
1954 Polygon Features
1962 Drainage
1962 Polygon Features
1972 Drainage
1972 Hoses
1972 Polygon Features
1975 Drainage
1975 Hoses
1975 Polygon Features
1979 Drainage
1979 Hoses
1979 Polygon Features
1986 Drainage
1986 Polygon Features
1988 Drainage
1988 Hoses
1988 Polygon Features
1995 Polygon Features
Tank Farm Boundaries
Tanks and Geographic Features

0 100 200 400 600 800 Feet

Figure 2-1

Tank Farm 2

Stereoscopic Aerial Photography Analysis (SAPA)

INVESTIGATION PLAN

DESC
Melville, Rhode Island

TETRA TECH FW, INC

Date: November 17, 2004

Notes:
Aerial photographic basemap dated April 3, 1995
Datum: NAD 83, Rhode Island State Plane 3800, Feet

p:/DESCNE/Melville/GIS/TF1_TF2_FLA/Final/Figure2-1.mxd

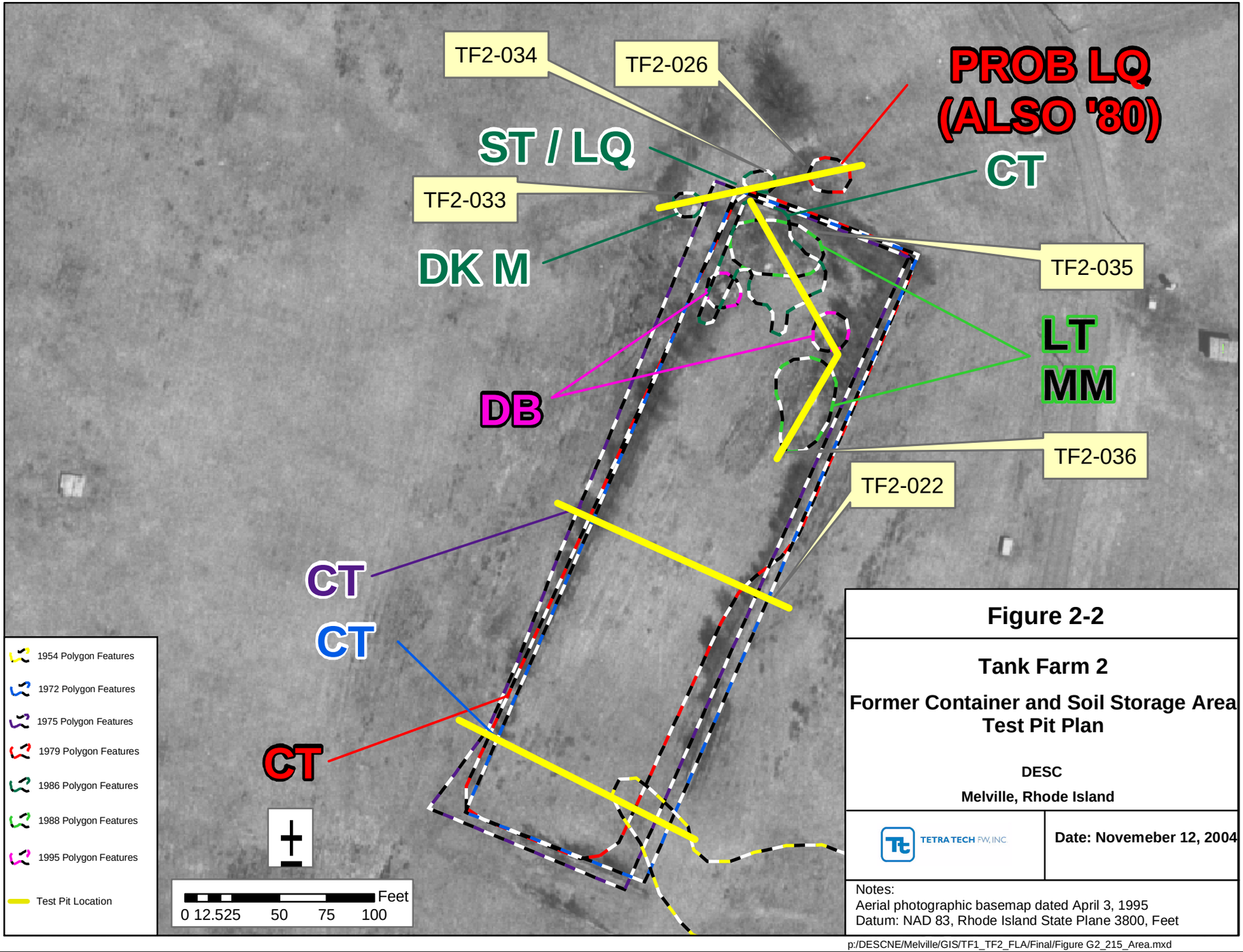


Figure 2-2

Tank Farm 2

Former Container and Soil Storage Area Test Pit Plan

DESC

Melville, Rhode Island

TETRA TECH FW, INC

Date: Novemeber 12, 2004

Notes:
Aerial photographic basemap dated April 3, 1995
Datum: NAD 83, Rhode Island State Plane 3800, Feet

p:/DESCNE/Melville/GIS/TF1_TF2_FLA/Final/Figure G2_215_Area.mxd

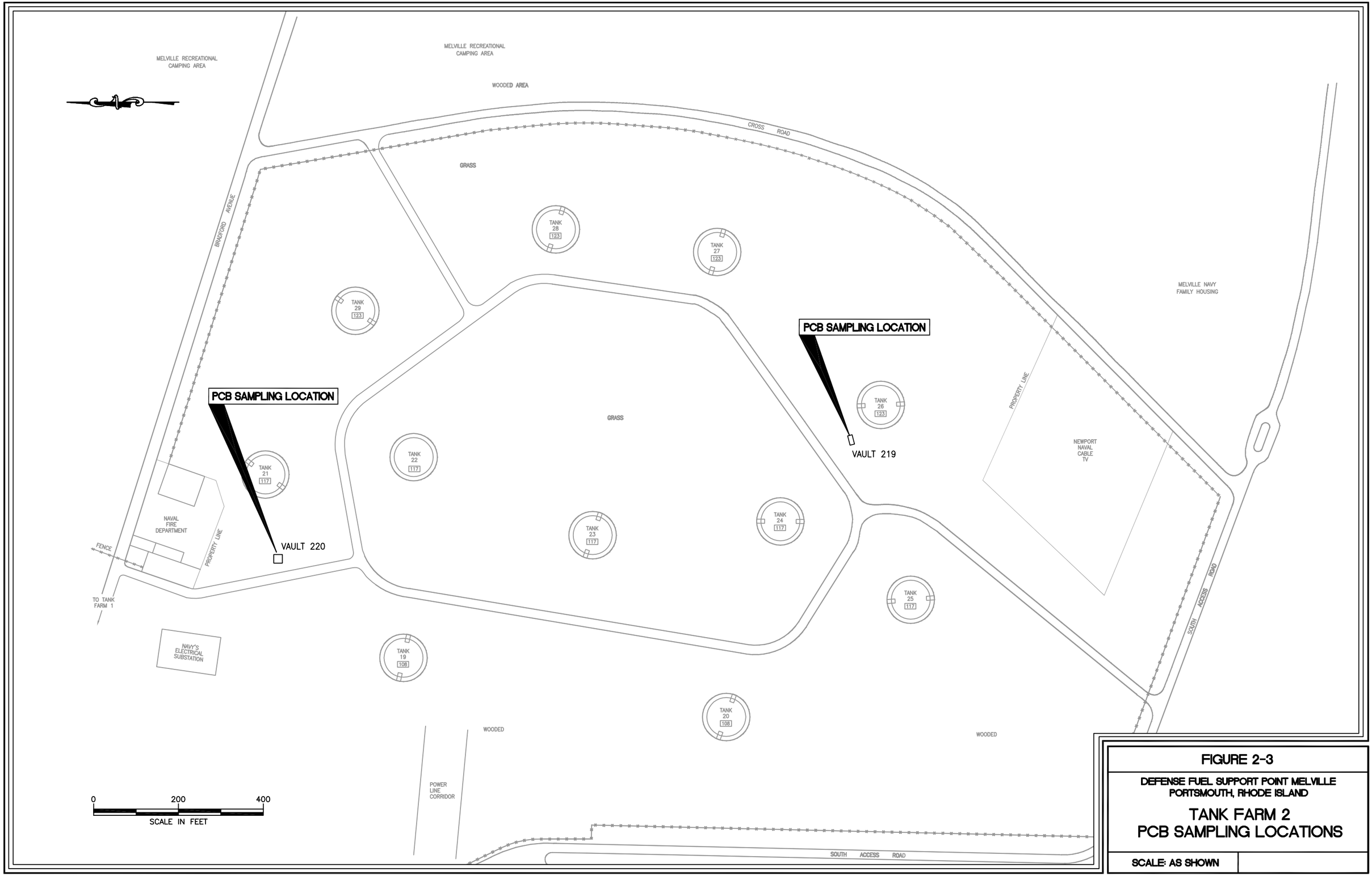


FIGURE 2-3

DEFENSE FUEL SUPPORT POINT MELVILLE
PORTSMOUTH, RHODE ISLAND

TANK FARM 2
PCB SAMPLING LOCATIONS

SCALE: AS SHOWN

CAD FILE: 10440000_A001.DWG

2.2.2 PCB Sampling

Two areas have been previously discussed with RIDEM concerning potential polychlorinated biphenyl (PCB) contamination. These areas are transformer vaults 219 and 220 (see Figure 2-3 for locations). One discrete soil sample will be collected from the center of each side of the vaults. Samples will be taken from 0 to 6 inches below existing grade at each location if it appears undisturbed or from 0 to 2 feet if the area has been disturbed unless staining or other evidence of a release is detected at a different depth. Samples will then be analyzed in the project laboratory for PCBs and by request of the Navy, chlorinated benzenes. Concrete sampling will not be conducted as DESC is not responsible for the future demolition of these structures; only soils samples will be collected. In addition, the area will be inspected for other areas of staining or potential release and sampled accordingly.

2.2.3 Soil Surrounding Bulk Storage USTs

Soils surrounding the bulk storage USTs will be assessed by excavating one test pit on the downgradient side of each of the tanks directly adjacent to the exterior of each tank wall. The USTs are located 5 feet below one ground surface. Test pits will be a minimum of 10 feet in depth and 10 feet in length tangential to the tank wall. One base and four sidewall samples will be collected from each pit for Petroflag™ screening and laboratory analysis, if necessary, as outlined in Section 2.3.

2.2.4 Drainage Features (Swales)

One surface soil sample will be collected for Petroflag™ analysis at the outlet of each drainage swale location identified during the field reconnaissance. Petroflag™ screening and sample analysis will be conducted as outlined in Section 2.3.

2.3 Test Pit Approach

A focused approach will be applied to the test pits to be evaluated at each AOC identified by the aerial photography analysis and previously identified AOCs. The high level of accuracy associated with the GIS system used to locate the AOCs precludes the need to randomly test pit these areas. The following protocol will be used for all test pit locations with the exception of AOCs outlined in Figure 2-2. Due to their close proximity, AOCs 022, 026, and 033 through 036 will be test pitted according to Figure 2-2.

The test pit(s) will extend 5 feet beyond the boundaries depicted for each area in Figure 2-1 to transect the AOC. A single test pit will be placed to traverse the long axis of each AOC beginning at the point of likeliest contamination (i.e., end of hose). The pit will terminate where field conditions dictate. Test pitting for areas associated with surficial staining or other surface features will extend to 2 feet below grade and will be bucket width (approximately 3 feet). Areas defined as pits or excavations on the SAPA will be excavated to a minimum of 5 feet below grade or to bedrock, whichever is shallower. It should be noted that many of the areas to be investigated are likely to encounter shallow bedrock or rock outcroppings. If the path of a test trench intercepts an outcropping, the excavation will continue on line once the outcropping is passed. Per RIDEMs request, a magnetometer will be used to screen AOCs and additional test pitting may be directed by results of the magnetometer surveys.

Due to the large rectangular shape of AOC TF3-036, a grid approach will be implemented with multiple pits excavated throughout the AOC. The sampling will consist of test pits spaced evenly within the marked AOC as indicated in Figure 2-2.

2.3.1 Test Pit Sampling

Petroflag™ testing will be conducted once every 50 linear feet of test pit floor. Samples will be collected using disposable sampling equipment to eliminate rinsate generation. If the test pit is less than 50 feet in length, one centrally located base sample will be taken. Petroflag™ samples will not be composited. Sidewall samples will be placed away from the floor sample and from each other in order to cover the most exposed area. Sidewall samples will be taken at mid depth of the test pit, one per sidewall. All of the Petroflag™ samples will be preferentially collected from areas of staining and/or where olfactory evidence of petroleum is encountered. Areas with Petroflag™ sample results of less than 100 ppm will require no further action and the trench may be backfield with the excavated material. Samples that exceed 100 ppm by Petroflag™ will be sent for off-site analysis by U.S. Environmental Protection Agency (EPA) Method 8015 for diesel range organics (DRO). If the laboratory results for TPH exceed 100 ppm, the samples will be analyzed for volatile organic compounds (VOCs) by EPA Method 8260 and semivolatile organic compounds (SVOCs) by EPA Method 8270 to be compared to RIDEM Residential and RIDEM Industrial/Commercial soil criteria. Laboratory TPH screening by Method 8015 may be substituted for Petroflag™ sampling where visual or olfactory evidence of contamination is present. In the event of laboratory screening the 100 ppm criteria for no further action will still apply. Areas which exceed RIDEM Residential soil standards will be excavated. Petroflag™ screening will be used to direct the excavation. Confirmatory samples will be collected from mid depth of each of the excavated sidewalls and from the center of the base of the excavation for confirmatory TPH, VOC and SVOC analysis. Based on the results of these supplemental investigations and the comparisons to these Criteria, DESC will identify and evaluate appropriate response actions. These options may include the removal of additional soil.

2.3.2 Excavated Soils

All soils will be staged adjacent to the test pit area on the ground surface. If analytical results are above the residential standard, additional soil from the area will be excavated to the labeled soil stockpile and covered until the area is remediated. Soils will then be characterized for off-site disposal. If the confirmatory analysis indicates soils are below the Industrial/Commercial standard, stockpiled soils from the area will be returned to the excavation as fill.

DESC is aware that the Navy may wish to redevelop this Site for residential use in the future; therefore, an attempt will be made to remediate impacted soils to residential levels in order to facilitate the Navy reaching closure. It should be noted that DESC's responsibility to the Navy is only to remediate fuel related contamination to Industrial/Commercial standards.

3.0 GROUNDWATER

3.1 Groundwater Sampling

In order to adequately assess current groundwater conditions at the site, a resampling of all site groundwater wells is recommended. All monitoring wells and recovery wells will be sampled using for VOCs, SVOCs, and TPH by EPA Methods 8260B, 8270C, and 8015 DRO (diesel range organics), respectively. Groundwater well purging and sampling will be conducted using dedicated bailers. Results of groundwater sampling will be compared to the RIDEM GA and GB Groundwater Objectives, however, DESC believes the GB criteria applicable to the site. Please see Figure 3-1 for the site groundwater monitoring well locations.

Prior to any sampling activity, water level measurements will be made of all groundwater wells currently located within Tank Farm 2. Water level measurements will be made using an electronic oil-water interface probe that signals contact with non-aqueous phase liquid (NAPL) and will be measured to the nearest .01 foot and recorded in the field logbook. The procedure will include measurement of LNAPL and DNAPL at the top and bottom of the groundwater column in the well prior to any bailing using the interface probe. If the probe indicates that LNAPL or DNAPL are present, the measured NAPL will be sampled accordingly and the well will not be sampled for dissolved phase contaminants. If no product is measured with the interface probe then a bailer will be lowered to intercept the groundwater surface and be retrieved and emptied into a 5-gallon bucket and observed for sheen and noted. The next bailer will be lowered to the bottom of the well and retrieved and inspected for the presence of DNAPL prior to purging the remaining well volumes of water required for sampling. Each well will be monitored

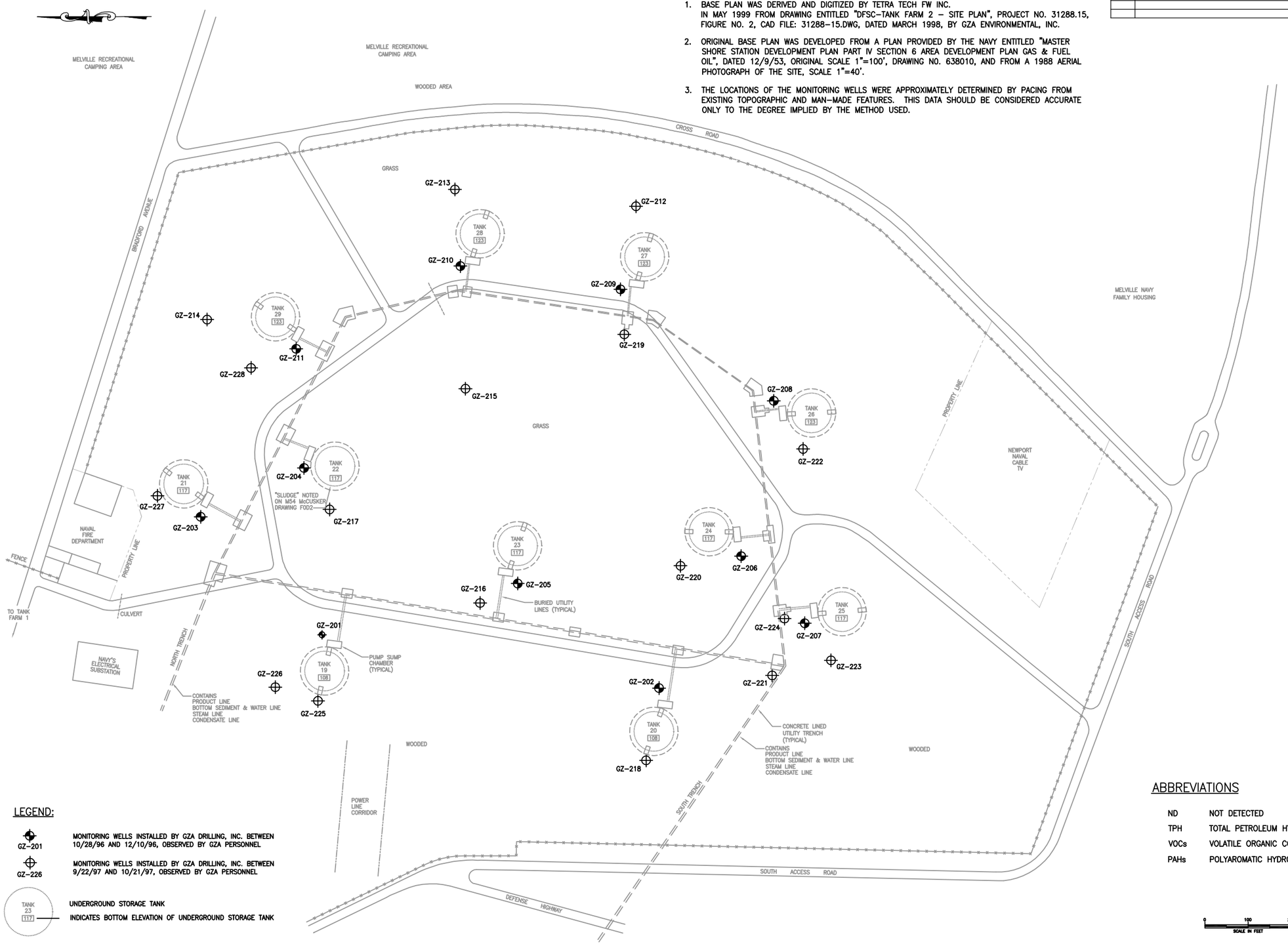
Non-Aqueous Phase Liquids

NAPL has been detected in several of the site monitoring wells during previous groundwater monitoring including wells GZ-201, GZ-202, GZ-208, and GZ-211. Due to the dense nature of the fill surrounding the wells, it is possible that the groundwater encountered may not represent true subsurface conditions and therefore, the NAPL levels may not be indicative of the current condition of the surrounding geology. Wells where NAPL is detected will be sampled and then purged of a minimum of five well volumes of groundwater and gauged weekly for product after they are allowed to recharge for a period of four weeks. The resulting data will provide a more accurate reading of NAPL at these locations so that a recommendation can be made. All monitoring wells in Tank Farm 2 will be sampled per RIDEM regulatory standards.

NOTES:

1. BASE PLAN WAS DERIVED AND DIGITIZED BY TETRA TECH FW INC. IN MAY 1999 FROM DRAWING ENTITLED "DFSC–TANK FARM 2 – SITE PLAN", PROJECT NO. 31288.15, FIGURE NO. 2, CAD FILE: 31288–15.DWG, DATED MARCH 1998, BY GZA ENVIRONMENTAL, INC.
2. ORIGINAL BASE PLAN WAS DEVELOPED FROM A PLAN PROVIDED BY THE NAVY ENTITLED "MASTER SHORE STATION DEVELOPMENT PLAN PART IV SECTION 6 AREA DEVELOPMENT PLAN GAS & FUEL OIL", DATED 12/9/53, ORIGINAL SCALE 1"=100', DRAWING NO. 638010, AND FROM A 1988 AERIAL PHOTOGRAPH OF THE SITE, SCALE 1"=40'.
3. THE LOCATIONS OF THE MONITORING WELLS WERE APPROXIMATELY DETERMINED BY PACING FROM EXISTING TOPOGRAPHIC AND MAN–MADE FEATURES. THIS DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.

REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPROVED



LEGEND:

- GZ-201 — MONITORING WELLS INSTALLED BY GZA DRILLING, INC. BETWEEN 10/28/96 AND 12/10/96, OBSERVED BY GZA PERSONNEL
- GZ-226 — MONITORING WELLS INSTALLED BY GZA DRILLING, INC. BETWEEN 9/22/97 AND 10/21/97, OBSERVED BY GZA PERSONNEL
- TANK 23 117 — UNDERGROUND STORAGE TANK; INDICATES BOTTOM ELEVATION OF UNDERGROUND STORAGE TANK

ABBREVIATIONS

ND	NOT DETECTED
TPH	TOTAL PETROLEUM HYDROCARBONS
VOCs	VOLATILE ORGANIC COMPOUNDS
PAHs	POLYAROMATIC HYDROCARBONS

0 100 200
SCALE IN FEET

P. E. SEALS

Date: AUGUST 2003
Scale: AS SHOWN
Designed by: M. WEED
Drawn by: C. POTVIN
Checked by: L. KAHRS
Approved by: L. KAHRS

. Remediation . Planning . Consulting . Engineering .
TETRA TECH FW, INC.
133 FEDERAL STREET
BOSTON, MASSACHUSETTS 02110
TEL: (617) 457-8200 FAX: (617) 457-8499

DEFENCE FUEL SUPPORT POINT MELVILLE
PORTSMOUTH, RHODE ISLAND

TANK FARM 2
GROUNDWATER MONITORING WELL LOCATIONS

PROJECT NO: 2033.1044
CADD FILE NO: 20331044_A002.DWG

DRAWING No
FIGURE 3-1
SHEET 1 OF 1

4.0 SAMPLE MANAGEMENT

The sample identification system to be used during this investigation will assign a unique sample identifier to each sample collected. Data management will be consistent with this sample identification system. The protocols for assigning field sample numbers are described below. Each sample collected will have its own identifier, which will apply for the duration of the project. The sample identifier will consist of an alpha-numeric code that will identify the site designation, sample type, sample number, and QC sample designation (if applicable). The QC sample identifier will also consist of an alpha-numeric code that will identify the QC sample designation, sampling date, and sample number (if applicable).

Note: All sample identifiers and their corresponding locations will be logged in the field notebook and may be identified on figures or drawings.

Site Identification:	MW	Monitoring Well (Groundwater Sampling)
	RW	Recovery Well (Groundwater Sampling)
	TF2-001 through 040	Tank Farm 2 Area of Concern
	TP	Test Pit
	T	Tank
	TV	Tank Vent
	DSW	Drainage Swale
	ET	Electrical Transformer
Sample Location:	NS	North Sidewall
	SS	South Sidewall
	ES	East Sidewall
	WS	West Sidewall
	BS	Base
QC sample designations:	TB	Trip Blank
	D	Duplicate Sample
	MS/MSD	Matrix Spike/Matrix Spike Duplicate
Sampling Depth:	5	5-ft sampling depth

Examples: AOC TF2_012 Test Pit 2 southern sidewall sample depth 2.5 feet below grade
Identifier: TF2-012-TP2-SS-2.5

Trip Blank Collected on August 28, 2004: TB082804

Matrix spike/matrix spike duplicate (MS/MSD): indicate on Chain of Custody (COC) form under remarks section

Field personnel will complete sample labels using indelible ink. Labels will include the project identification, sample identification, date and time of collection, sampler's initials, sample matrix, type of sample (grab or composite), analyses to be performed, and preservative used (if applicable).

4.1 Sample Packing and Shipping

Samples for off-site laboratory analysis will be shipped via Federal Express or by courier for overnight delivery in waterproof coolers using the procedures outlined below. The samples taken for this project shall be considered low-level or environmental samples for packaging and shipping purposes. The sample packing procedures are as follows:

- Fill out the pertinent information on the sample label, and ensure agreement with the COC.
- Place about 3 inches of cushioning material, such as vermiculite or bubblepack, in the bottom of the cooler.
- Wrap the sample containers in bubblepack. Place containers in the cooler in such a way that they will not touch during shipment.
- Put in additional packing material to partially cover sample containers (more than halfway).
- Place ice, sealed in plastic bags, around and on top of the containers. The temperature of the samples should be maintained at 4°C $\pm$2°C during shipment to the laboratory.
- Fill cooler with cushioning material.
- Close cooler and place signed custody seals on both ends of the cooler.

If a laboratory courier will pick up the cooler, the cooler may be closed and transferred to the courier. The courier will sign the COC as a record of receipt, returning one signed copy to the sampler. If samples are to be shipped via Federal Express or other delivery service, the following steps will be taken:

- Put COC record in a waterproof plastic bag and tape it to the inside lid of the cooler.
- Tape the drain shut.
- Secure the lid by wrapping the cooler completely with nylon strapping tape or duct tape at a minimum of two locations.
- Attach completed shipping label to top of the cooler and place signed custody seals on both ends of the cooler.

From the time of sample collection, samples for off-site analysis will be stored on ice. The laboratory will record the temperature of the samples upon arrival at the facility.

4.2 Sample Chain of Custody

To maintain and document sample possession, COC records will be kept. These procedures are necessary to ensure sample integrity from the collection time through data reporting. The COC protocol provides the ability to trace sample possession and handling. A sample is considered under custody if it is/was:

- In a person's possession;
- In a person's view after being in possession;
- In a person's possession and locked up; or
- In a designated secure area.

Personnel collecting samples are responsible for sample care and integrity until the samples are properly transferred or dispatched. The number of people handling a sample will be kept to a minimum.

The sampler(s) will initially complete the COC records which shall accompany the samples at all times. The following information shall be indicated on the COC record:

- Project identification;
- Signature of samplers;
- Sample identification, sample matrix, date and time of collection, grab or composite sample designation, number of containers corresponding to that sample identification, analyses required, remarks or sample location (if applicable), and preservation method(s);
- Signature of the individual relinquishing the samples; and
- Name of the individual(s) receiving the samples and air bill number, if applicable.

The COC preparer will then check the sample label and COC record for accuracy and completeness.

4.3 Sampling Waste Stream Disposal

Waste generated during site activities will be sampled in order to characterize the waste for disposal. Anticipated waste streams include decontamination rinsate, and soil potentially contaminated with TPH, VOCs, or SVOCs. Sampling equipment, latex gloves, glass jars, sampling scoops, and glassware will be combined and disposed with any contaminated soil, or if no contaminated soil is encountered, drummed. For liquid waste, a drum thief will be slowly lowered into the drum and the contents will be placed into the appropriate labeled sample bottle. The drum thief will ensure that the sample is taken over the entire depth of the drum. The sample will be analyzed to satisfy the requirements of the chosen disposal facility accepting the waste.

4.4 Sample QA/QC

For every 20 confirmatory samples collected, one field duplicate sample, one MS sample, and one MSD sample will be collected and analyzed for the appropriate criteria. Disposable sampling equipment will be utilized, therefore no rinsate samples will be analyzed.

Appropriate quality assurance/quality control (QA/QC) procedures will be implemented throughout the sampling and analyses programs. The sampling and analyses programs will be performed in accordance with the Navy Installation Restoration Quality Assurance Guide (February 1996), to ensure attainment of project objectives and to ensure the chemical data meets the Navy quality control requirements. All laboratory certifications are required to remain current throughout the duration of the project. All QA/QC samples will be indicated as such on the COC. TtEC will perform a QA/QC screening on laboratory data to ensure against bias and error.

Sample holding times are identified in Table 4-1 below.

Soil samples for VOCs will be collected in accordance with the following procedure for VOC samples with sodium bisulfate and methanol preservation/extraction.

Table 4-1
Soil Sample Containers, Preservatives, and Holding Times

Soil Analysis	Container	Preservative	Holding Time[1]
VOC EPA Method 8260	3 x 40 ml VOC vial + 1 2 oz. Jar (% moisture)	1 w/MeOH and 2 w/$NaHSO_4$	14 days
SVOC EPA Method 8270	8 oz (or larger) glass	Cool 4°C	7 days to extraction, 40 days to analysis
Metals	8 oz (or larger) glass	Cool 4°C	6 months
TPH EPA Method 8015	Min 4 oz. Jar glass 1 x 40 ml VOC vial	Cool 4°C MeOH	14 days

[1] Holding times are from time of sample collection.

4.5 VOC Sampling Procedure

1. Use a small electronic balance or manual scale to measure the weight of the small coring device (syringe sampler).
2. Obtain the soil sample by inserting the clean coring device into the soil. Wipe excess soil from the outside of the sampler.
3. Weigh the soil sample/syringe core sampler. A target weight of 5 $\pm$ 1 gram (i.e., between 4 and 6 grams) must be obtained. If necessary, additional samples shall be collected or a portion of the core soil shall be extruded from the device to obtain the target weight. Record the weight of the sample in the field logbook and on the COC form.
4. Open the sample containers, which has been pre-preserved by the subcontractor laboratory with sodium bisulfate (2 x 40 ml vials) and methanol (1 x 40 ml vial), and immediately but slowly extrude the soil core into the container. Avoid splashing preservative out of the bottle and do not immerse the coring device into the methanol. Also, do not leave sample containers open to the atmosphere before or after addition of soil as this will result in loss of preservative and invalidation of sample.
5. Remove any soil particles from the threads and/or top of the sample bottle container to ensure a proper seal and no loss of preservative.
6. After securing the lid, gently swirl the sample to mix the soil and preservative solution. Do not shake the bottle.
7. An additional aliquot of soil (approximately 15 grams) shall be collected from each sample location in a separate glass jar, not preserved, for percent moisture determination. A clean stainless steel spoon, spatula or trowel may be used to collect this soil sample.
8. Complete sample logs, labels, custody seals, and COC forms. Do not attach any additional labels or tape to the sample containers. Record sample information in the field notebook.
9. Place the analytical samples in a cooler for shipment and chill to 4°C $\pm$ 2°C.

Appendix A
SAPA Report

Defense Fuel Support –Portsmouth, RI
Tank Farm 1, Tank Farm 2,
and Fuel Loading Area (DRAFT)

April 03, 1995

Approx. Scale 1:4,300

1 inch equals 358 feet

Defense Fuel Support –Portsmouth, RI
Tank Farm 1, Tank Farm 2,
and Fuel Loading Area (DRAFT)

April 26, 1988

Approx. Scale 1:4,300

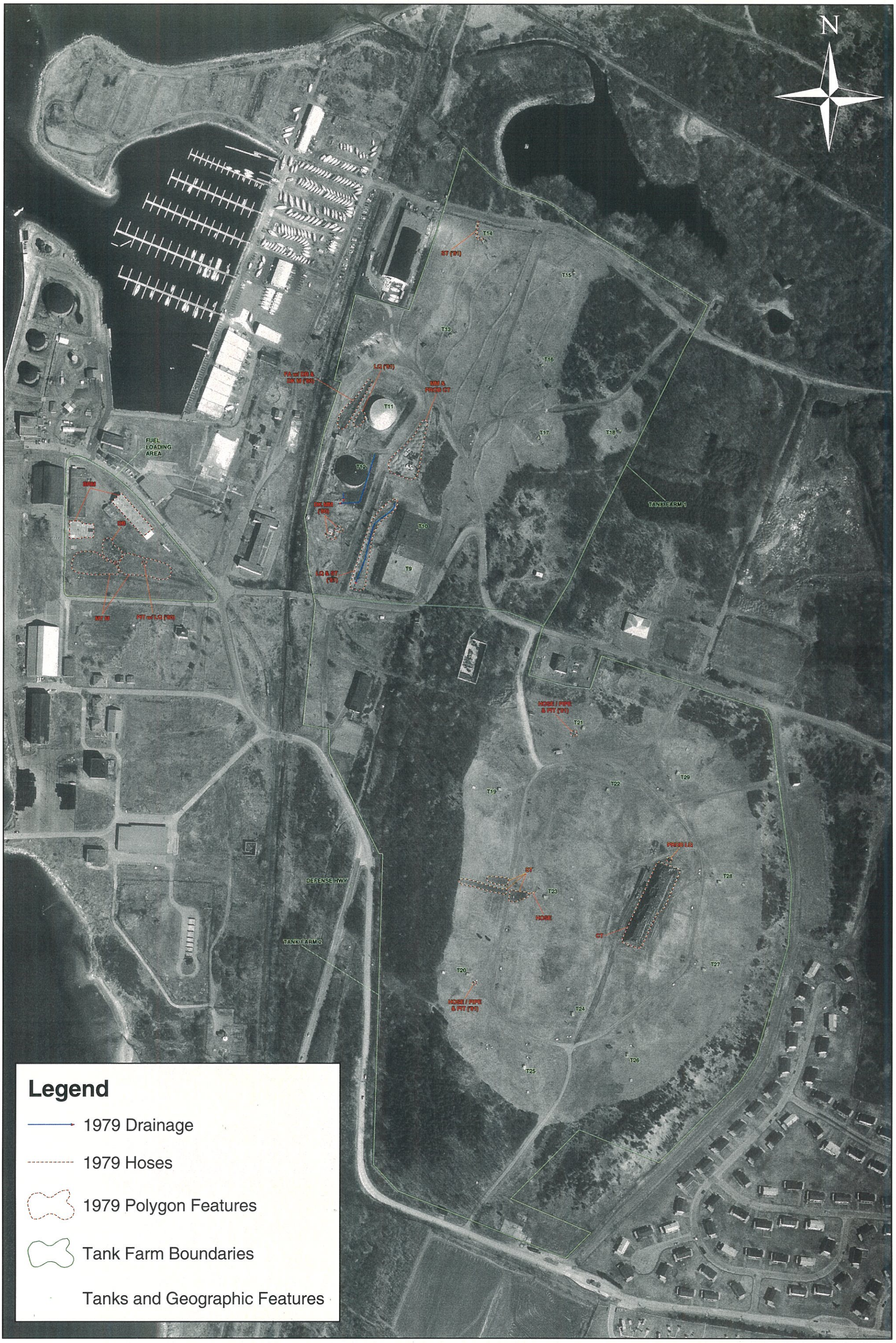
1 inch equals 358 feet

Defense Fuel Support –Portsmouth, RI
Tank Farm 1, Tank Farm 2,
and Fuel Loading Area (DRAFT)

March 03, 1986

Approx. Scale 1:4,300

1 inch equals 358 feet



Defense Fuel Support –Portsmouth, RI
Tank Farm 1, Tank Farm 2,
and Fuel Loading Area (DRAFT)

March 28, 1979

Approx. Scale 1:4,300

1 inch equals 358 feet

4-14-75

N

DK M & DG
T14
T15
T13
T16
EX w/ LQ
T11
T17
T18
HOSE
PIT w/ OB
FUEL LOADING AREA
T12
CS & ST
TT, TK, & HOSE
TANK FARM 1
T10
ST
CS w/ LQ
T9
T21
T29
T22
T19
GS
DEFENSE HWY
T23
T28
CT
TANK FARM 2
T20
T27
T24
GS / CA
T26
T25

Legend

- 1975 Drainage
- 1975 Hoses
- 1975 Polygon Features
- Tank Farm Boundaries
- Tanks and Geographic Features

Defense Fuel Support –Portsmouth, RI
Tank Farm 1, Tank Farm 2,
and Fuel Loading Area (DRAFT)

April 14, 1975

Approx. Scale 1:4,300

1 inch equals 358 feet

Defense Fuel Support –Portsmouth, RI
Tank Farm 1, Tank Farm 2,
and Fuel Loading Area (DRAFT)

April 29, 1972

Approx. Scale 1:4,300

1 inch equals 358 feet

Defense Fuel Support –Portsmouth, RI
Tank Farm 1, Tank Farm 2,
and Fuel Loading Area (DRAFT)

February 06, 1962

Approx. Scale 1:4,300

1 inch equals 358 feet

Defense Fuel Support –Portsmouth, RI
Tank Farm 1, Tank Farm 2,
and Fuel Loading Area (DRAFT)

April 22, 1954

Approx. Scale 1:4,300

1 inch equals 358 feet

Defense Fuel Support –Portsmouth, RI
Tank Farm 1, Tank Farm 2,
and Fuel Loading Area (DRAFT)

October 21, 1951

Approx. Scale 1:4,300

1 inch equals 358 feet

Defense Fuel Support –Portsmouth, RI
Tank Farm 1, Tank Farm 2,
and Fuel Loading Area (DRAFT)

September 23, 1942

Approx. Scale 1:4,300

1 inch equals 358 feet