

N62661.AR.002865
NS NEWPORT
5090.3a

SUMMARY OF ENVIRONMENTAL INVESTIGATIONS FOR TANK FARMS 1, 2 AND 3 NS
NEWPORT RI
3/1/2009
TETRA TECH EC

**DEFENSE ENERGY SUPPORT CENTER
CONTRACT NO. SP0600-04-D-5403**

**TANK FARMS 1, 2 AND 3
SUMMARY OF ENVIRONMENTAL INVESTIGATIONS CONDUCTED BY DESC
DEFENSE FUEL SUPPORT POINT – MELVILLE
PORTSMOUTH, RHODE ISLAND**

March 2009

Prepared by

Tetra Tech EC, Inc.
133 Federal Street
Boston, Massachusetts 02110

<u>Revision</u>	<u>Date</u>	<u>Prepared By</u>	<u>Approved By</u>	<u>Pages Affected</u>
1	3/17/09	R. Claydon	D. Stokes	All

1.0	INTRODUCTION	1
2.0	BACKGROUND INFORMATION	1
2.1	NAVSTA NEWPORT.....	1
2.1.1	<i>Generalized Geology and Hydrogeology</i>	1
2.1.2	<i>Generalized Tank Farm Construction</i>	1
2.2	DFSC – MELVILLE.....	2
2.2.1	<i>Tank Farm 1</i>	2
2.2.2	<i>Tank Farm 2</i>	3
2.2.3	<i>Tank Farm 3</i>	3
2.2.4	<i>Fuel Loading Area</i>	4
2.3	TANK FARMS 4 AND 5.....	5
2.3.1	<i>Tank Farm 4</i>	5
2.3.2	<i>Tank Farm 5</i>	5
3.0	REGULATORY SETTING	6
3.1	NAVSTA NEWPORT.....	6
3.2	TANK FARMS 1 THROUGH FIVE.....	6
4.0	SUMMARY OF ENVIRONMENTAL INVESTIGATIONS	7
4.1	TANK FARM 1	7
4.2	TANK FARM 2	7
4.3	TANK FARM 3	8
5.0	REMAINING WORK TO BE PERFORMED BY DESC	9
5.1	TANK FARM 1	9
5.2	TANK FARM 2	10
5.3	TANK FARM 3	10
6.0	REFERENCES	10

List of Figures

- Figure 1-2 NAVSTA Site Plan
- Figure 1-1 NAVSTA Newport Sites and Study Areas
- Figure 2-3 Generalized Tank Construction
- Figure 2-1 Tank Farms 1, 2 and 3 Site Location Map
- Figure 2-1 FLA Site Location Map
- Figure 2-2 FLA Site Plan
- Figure 2-2 Tank Farm 1 Site Plan
- Figure 3-1 Tank Farm 2 Groundwater Monitoring Wells
- Figure 5-4 Tank Farm 3 Areas of Potential Environmental Concern

1.0 INTRODUCTION

Tetra Tech EC, Inc., (TtEC) on behalf of the Defense Energy Support Center (DESC) has prepared this document to summarize environmental investigations and findings to date at Tank Farm 1, 2 and 3 at the Defense Fuel Support Point (DFSP) – Melville located at the Naval Station (NAVSTA) Newport in Rhode Island.

2.0 BACKGROUND INFORMATION

2.1 NAVSTA Newport

NAVSTA Newport has been used by the United States (US) Navy since the Civil War era (NAVSTA Newport, 2004). The area encompasses approximately 1,100 acres in the towns of Portsmouth, Middleton and Newport, Rhode Island on the west shore of Aquidneck Island, and also the northern portion of Gould Island in Jamestown, Rhode Island (Figure 1-2 NAVSTA Newport Site Locus). The NAVSTA Newport includes multiple areas where environmental media were affected by historic operations, including Tank Farms 1 through 5 (Figure 1-1 NAVSTA Newport Sites and Study Areas).

2.1.1 Generalized Geology and Hydrogeology

The geology in the NAVSTA Newport area is generally typified by highly fractured shale bedrock, overlain by varying thicknesses of glacial till. The bedrock is Pennsylvanian in age and exhibits relatively horizontal bedding in the area of the site. Thickness of the overburden glacial material ranges from 2 to 20 feet in thickness. Bedrock outcrops are observed at some areas of NAVSTA Newport.

The groundwater in the NAVSTA Newport area predominately lies in the Pennsylvanian bedrock. It is recognized that rainwater and surface water infiltrate the overburden material; however a saturated zone is not present within this material. The saturated zone within the bedrock material ranges from 1 to 14 feet beneath grade. Groundwater fluctuates approximately 4 feet at the site during the year.

2.1.2 Generalized Tank Farm Construction

Tank Farms 1 through 5 were constructed in the early 1940s and were in operation by the Navy between World War II and 1970. The USTs were constructed in blasted bedrock sockets that were approximately 120 feet in diameter and 35 feet deep (Figure 2-3 Generalized Tank Construction). Bedrock spoil material was usually placed around the constructed tank after construction, and additional fill material imported to cover each tank. Except at Tank Farm 1, the completed tanks are not visible at grade and the upper portion lies approximately 5 feet below grade. Only the valve house, pump house, and vents are visible at grade.

Underground petroleum distribution lines connect the USTs to the FLA. These fuel distribution lines are located between 4 and 10 feet below grade in concrete lined utility trenches. Buried conduit laterals extend from the distribution lines to the sump pump chamber adjacent to each

tank. These chambers are accessed from concrete vaults at the ground surface and extend approximately 13 feet below the tank floor. The sump pump chambers are used to house the pumps associated with the tanks' petroleum transfer system. Underground petroleum distribution lines connect the USTs to the Fuel Loading Area (FLA).

Crushed rock ring drains are located around each of the USTs (Figure 2-3 Generalized Tank Construction) and function as a groundwater drainage system to prevent excessive hydrostatic uplift pressure on the bottom of the tanks. Ring drains are reportedly about 10-inches in diameter and located approximately 7 feet above the bottom of the tanks. The ring drains connect to a common 12-inch drainage pipe, which discharges via gravity. Groundwater and storm water collected from Tank Farms 1 and 2 and the FLA are directed to Tanks 9 and 10, which are partial USTs located at Tank Farm 1. These partial USTs act as gross oil/water separators (OWS) prior to discharge to OWS # 3 in the FLA. This OWS and Tanks 9 and 10 reportedly discharge to Narragansett Bay through Outfall #008 as defined in the site's Rhode Island Pollutant Discharge Elimination System (RIPDES) permit. At Tank Farm 3, the original OWS received bottom sediment and water flows from Tanks 69 and 70 via an underground, gravity drained pipe. Bottom sediment and water outflows from Tanks 32 through 36 were processed through to the sand filter pit. In 1976, modifications were made to the system. A new pipe was installed from a junction west of the OWS and south of the sand filter pit. This pipe fed the OWS by gravity. From this time on, all subsurface water discharged off-site first went through the separator. Discharge is monitored under the RIPDES permit for Outfall # 005

2.2 DFSC – Melville

In 1974, the DESC was licensed by the Navy to use Tank Farms 1, 2 and 3 (Figure 2-1 Tank Farms 1, 2 and 3 Site Location Map) and the Fuel Loading Area (FLA) (Figure 2-1 FLA Site Location Map) as the DFSP – Melville. The DESC was licensed to store and distribute petroleum fuel storage, and operated between 1974 and 1998. DFSP – Melville was administratively closed by the DESC in 1998, and efforts to convey the tank farms and FLA back to the Navy are ongoing. Comprehensive environmental investigations have been conducted at Tank Farms 1, 2 and 3 and the FLA to characterize and remediate petroleum contamination that occurred as a result of DESC's operations. Investigation and remediation are being conducted under Rhode Island's Underground Storage Tank (UST) Regulations. DESC's intent is to return the property to the Navy as an industrial/commercial property. Any environmental issues not related to DESC use of the property as a petroleum facility will be the responsibility of the Navy.

2.2.1 Tank Farm 1

Tank Farm 1 is located in the Melville section of Portsmouth, Rhode Island (Figure 2-1 Tank Farms 1, 2 and 3 Site Location Map). The approximate 50-acre site is bordered by railroad tracks and the former FLA to the west, Melville Pond to the north, the Melville Public Fishing and Camping Area to the north and east, a Navy Fire Department building and an electrical substation to the southeast, and vacant Navy land to the south. Other nearby features include the East Passage Yachting Center located approximately 200 feet to the west, the Ted Hood Marine

Complex located approximately 600 feet to the southwest, and a boat basin and Narragansett Bay located approximately 600 feet to the west and 800 feet to the northwest.

Tank Farm 1 consists of two 2.56 million gallon concrete partial USTs (Tanks 9 and 10); two 2.35 million gallon aboveground storage tanks (ASTs) (Tanks 11 and 12); and six 1.12 million gallon steel USTs (Tanks 13-18) (Figure 2-2 Tank Farm 1 Site Plan). Tanks 9 and 10 are rectangular in shape with dimensions of 145 feet by 127 feet and 22 feet deep. Tanks 11 and 12 are surrounded by earthen dikes and area cylindrical in shape with dimensions of 112 feet in diameter and 32 feet high. Tanks 13 through 18 are buried approximately 5 feet below grade and are 100 feet in diameter and 20 feet tall. The tanks and underground distribution lines have been cleaned, inspected and reballasted with water. Holes were observed in the six steel tanks (Tanks 13 through 18), with Tanks 13 and 18 having the most numerous holes and severe infiltration of groundwater. Tanks 9, 10, and 12 and associated piping and vaults were not cleaned due to their use as either storage of water collected from the ring drains and lower fuel loading area or storage of JP-5.

2.2.2 Tank Farm 2

Tank Farm 2 is located in the Melville section of Portsmouth, Rhode Island (Figure 2-1 Tank Farms 1, 2 and 3 Site Location Map). The approximate 70-acre site is bordered by undeveloped woodlands to the west, Tank Farm 1 and the Naval Fire Department to the northwest, Melville Campground and Recreational Area to the north and east, Melville Naval Family Housing to the southeast, and the Newport Naval Cable Television property to the south. Beyond the woodlands to the west is the Ted Hood Marine complex and Narragansett Bay. Surrounding the cable television property to the south is farmland.

Tank Farm 2 has eleven 2.5 million-gallon concrete USTs (Tanks 19-29) (Figure 3-1 Tank Farm 2 Groundwater Monitoring Wells). The tanks are cylindrical in shape and located approximately 5 feet below grade. The tanks were used to store No. 5 fuel oil from the 1940s to 1975, distillate fuel (transition from No. 5 fuel oil to No. 2 fuel oil) from 1975 to 1985, and marine diesel fuel from 1985 to the mid-1990s. Tank 22 was taken out of service and cleaned in the mid-1970s and then used as a slop tank. The other tanks were taken out of service in the mid-1990s. Tank Farm 2 is inactive as the tanks were cleaned, certified gas-free, reballasted with water, and administratively closed in 1998. All accessible appurtenances associated with each tank (i.e., pumps, interior pipelines, and vaults) were also cleaned, and the fuel distribution pipelines associated with each tank and the transfer pipe loop were permanently decommissioned. The ring drain system was not cleaned or decommissioned.

2.2.3 Tank Farm 3

Tank Farm 3 is located in the southwestern portion of Portsmouth, Rhode Island (Figure 2-1 Tank Farms 1, 2 and 3 Site Location Map). The 40-acre site is adjoined by the Navy's Defense Highway to the northwest, Raytheon's Submarine Signal Division plant to the northeast, Bayview Estates (residential condominiums) to the southeast, and undeveloped woodlands to the southwest. Other nearby features include: Tank Farm 4 (located 700 feet south of the site); a

playground and recreational camp site (located 300 feet southwest of the site); Narragansett Bay (located 100 feet northwest of the site); and the Lawton Valley Reservoir (located 2,000 feet southeast of the site). The Lawton Valley Reservoir is a drinking water supply for the City of Newport and the Towns of Middleton and Portsmouth, and is located hydraulically upgradient of the site to the southeast. Lawton Brook flows northwesternly across the site and discharges into Narragansett Bay.

The site consists of five 1.18 million gallon concrete underground storage tanks (Tanks 32 to 36) and two 2.1 million gallon steel underground storage tanks (Tanks 69 and 70) (Figure 5-4 Tank Farm 3 Areas of Potential Environmental Concern). All tanks are cylindrical in shape and are located approximately 5 feet below grade. Tanks 32 to 36 were formerly used to store marine diesel fuel and were changed over to storing jet propulsion (JP)-5 jet fuel between 1978 and 1986, and then to JP-8 in 1994. Tanks 69 and 70 were formerly used to store JP-5 jet fuel and were changed over to storing JP-4 jet fuel in 1980 and 1993, respectively, and then back to JP-5 in 1994. Tank closure activities were conducted in 1996 and 2000. Tanks were cleaned and inspected by a Marine Chemist, and all were certified as suitable for closure in accordance with RIDEM UST closure criteria. All accessible appurtenances associated with each tank (i.e., pumps, interior pipelines, and vaults) were cleaned along with the tanks. The fuel distribution pipelines associated with each tank and the transfer pipe loop were permanently decommissioned.

2.2.4 Fuel Loading Area

The FLA, in the Melville section of Portsmouth, Rhode Island, encompasses approximately 8 acres (Figure 2-2 FLA Site Location Map). The FLA is bordered by the East Passage Yachting Center (and harbor) to the north, Tank Farm 1 to the east, unoccupied land (owned by the Navy) the Ted Hood Marine Complex to the south, and Narragansett Bay to the west. Narragansett Bay borders the site to the north (at the adjacent boat basin/harbor) and is also located 500 feet west of the area. Tank Farm 2 is approximately 1,000 feet southeast of the FLA. Three buildings were constructed in the 1940s, (mess hall, drill and recreation hall, and office building). There was also an athletic field in this property. The mess hall was razed in the 1960s, the drill and recreation hall in the 1970s, and the office building in 1994 (Figure 2-2 FLA Site Plan).

The FLA historically handled the transfer and loading of wide range petroleum products, including lubricating oil, JP-4, JP-5 and JP-8 jet fuels, aviation gasoline, diesel fuel marine (DFM), aviation gasoline and heating oil. Currently, there are no petroleum products stored at the FLA and storage tanks, fuel loading racks and piping have been emptied and decommissioned.

There were three oil/water separators and a UST installed in the FLA. Oil/water separator 1 was installed in the late 1970s and used to receive groundwater flow from drainage lines beneath the USTs in Tank Farm 1. There has been no flow through this unit since the gate valve was closed. Oil/water separator 2, also installed in the late 1970s, receives groundwater flow from the under-drainage lines beneath the USTs in Tank Farm 2. A 5,000-gallon UST was used to store floating product that built up in oil/water separator 2. Oil/water separator 3, installed in the spring of 1995, receives storm water run-off flows from Tank Farms 1 and 2.

2.3 Tank Farms 4 and 5

Tank Farms 4 and 5 were owned and operated by the Navy.

2.3.1 Tank Farm 4

Tank Farm 4 is approximately 80 acres and is located in Portsmouth. The area is bordered by Narragansett Bay to the east, Defense Highway to the west, and wooded, undeveloped areas to the north and south (NAVSTA, 2004). A brook flows off the tank farm into Narragansett Bay. Twelve USTs (Tanks 37 through 48) were used for storage of fuel. Each UST had a capacity of 2.52 million gallons (60,000 barrels). The tanks were made of pre-stressed reinforced concrete. The tank roof and walls were approximately 12-inches thick and the floor was approximately 24-inches thick.

All USTs were cleaned and ballasted between 1994 and 1997. The tanks were demolished between 1997 and 1998 as part of UST closure activities conducted by the Navy under RIDEM's UST regulations. The demolition objective was to collapse and separate the tank roof from the tank walls while maintaining structural integrity of the tank floor and side walls. Ballasted water was removed and a 15-foot layer of sand was placed into the bottom of each tank. Sand was used to absorb the shock from the collapsing tank roof and to avoid for formation of void spaces. Following demolition, each UST site was backfilled with certified clean fill material.

2.3.2 Tank Farm 5

Tank Farm 5 is approximately 80 acres and is located approximately 1.5 miles south of Tank Farm 4 in Middleton. The area is bordered by Narragansett Bay to the east, Defense Highway to the west, a wooded area a cemetery to the south, and Green Lane to the northeast. Eleven UST (Tanks 49 through 59) were used for storage of fuel. From 1975 through 1984, Tanks 53 and 56 were used for waste oil storage as part of an oil recovery program. All other tanks were exclusively used for storage of virgin fuel oils. Each UST had a capacity of 2.52 million gallons (60,000 barrels). The tanks were made of pre-stressed reinforced concrete. The tank roof and walls were approximately 12-inches thick and the floor was approximately 24-inches thick.

All tanks were demolished between 1998 and 1999 as part of UST closure activities conducted by the Navy under RIDEM's UST regulations. The demolition objective was to collapse and separate the tank roof from the tank walls while maintaining structural integrity of the tank floor and side walls. Ballasted water was removed and a 15-foot layer of sand was placed into the bottom of each tank. Sand was used to absorb the shock from the collapsing tank roof and to avoid for formation of void spaces. Following demolition, each UST site was backfilled with certified clean fill material.

3.0 REGULATORY SETTING

3.1 NAVSTA Newport

After Initial Assessment Study (IAS)¹ a subsequent Confirmation Study (CS)², NAVSTA Newport was listed on the National Priorities List (NPL) in 1989. In 1992, the Navy, RIDEM, and the United States Environmental Protection Agency (USEPA) established a Federal Interagency Facilities Agreement (FFA)³. The Navy is the lead agency for the site investigation and cleanup, with formal oversight provided by the USEPA and RIDEM (NAVSTA, 2004).

3.2 Tank Farms 1 through Five

The DESC was licensed by the Navy to use Tank Farms 1, 2 and 3 and the FLA to store and distribute petroleum fuel storage, and operated between 1974 and 1998. Conditions of the lease stipulate that DESC meets all local, State, and Federal requirements for cleanup and closure of petroleum-related releases prior to conveyance of the property back to the Navy. For this reason, DESC seeks to meet the RIDEM UST requirements regarding the closure of Tank Farms 1, 2 and 3. Following DESC's efforts, the NAVSTA Newport Installation Restoration (IR) Program, which is mandated by CERCLA, will conduct investigations for possible sludge pits and for areas of contamination other than petroleum (NAVSTA, 2004). The remedial action selection process will evaluate risk from future recreations uses of the tanks farms (e.g., golf course) in establishing cleanup goals. The protectiveness of the selected remedy will be evaluated in the ongoing five year review process already conducted for NAVSTA Newport (NAVSTA, 1999 and 2004).

Investigation and remediation activities at Tank Farm 4 and Tank Farm 5 (soil only at Tanks 53 and 56) are being addressed by the Navy under RIDEM's UST regulations. Similarly to Tank Farms 1, 2 and 3, the remedial action selection process will evaluate risk from future recreations uses of the tanks farms (e.g., golf course) in establishing cleanup goals. The protectiveness of the selected remedy will be evaluated in the ongoing five year review process already conducted for NAVSTA Newport (NAVSTA, 1999 and 2004).

Waste oil had been stored in Tanks 53 and 56 located at Tank Farm 5 and as such, groundwater remediation is being addressed under CERCLA. A Record of Decision (ROD) for an Interim Remedial Action was signed by the Navy and the USEPA in 1992 (USEPA, 1992). The selected remedy was groundwater extraction and treatment to contain contaminated groundwater and prevent its migration and potential discharge to surface water bodies. Treatment consisted of coagulation/filtration and ultraviolet oxidation to treat organic and inorganic contaminants. Treated water was discharged via a local wastewater treatment facility. The system operated from 1994 through 1998 and is currently under evaluation for a final remedy decision. Several

¹ In 1983, the IAS identified 18 sites where contamination was suspected to pose a threat to human health and the environment.

² In 1986, six of the 18 sites identified in the IAS were investigated further, and a Phase I RI/FS was completed in 1992. These six sites included the McAllister Point Landfill, Melville North Landfill, Old Fire Fighting Training Area, Tank Farm 4, and Tank Farm 5.

³ CERCLA requires Federal agencies to develop a plan for cooperating and coordinating efforts between multiple agencies in the cleanup of Federal facilities. A FFA is the contract that formalizes this process.

rounds of post-remediation groundwater monitoring have been conducted. In the second five year review (NAVSTA, 2004) recommended a ROD revision for No Further Action pending results of the May 2004 groundwater sampling round.

4.0 SUMMARY OF ENVIRONMENTAL INVESTIGATIONS

4.1 Tank Farm 1

In addition to tank farm closure activities, comprehensive investigations and remediation have been conducted at Tank Farm 1 since 1983. Investigations have included soil, groundwater, surface water, and soil gas sampling as well as aquifer pumping tests and passive free-product removal. Over 50 monitoring wells have been installed across the site, and groundwater monitoring was conducted on a regular basis from 1993 through 1999. Free-phase product was detected intermittently downgradient of Tanks 16 and 17 at thicknesses of less than 1 foot. Aquifer pumping tests were conducted to evaluate free product recovery. These tests indicated the bedrock aquifer had irregular fracturing and relatively low transmissivity. Both factors have contributed to the apparent immobility of the free-phase product. It was determined that product was not recoverable via pumping. Passive product recovery canisters were installed in five wells (GT-101, GT-121, GT-122, GZ 107, and GZ-108) in May 1996 and utilized until no product was present. During the last comprehensive groundwater gauging and sampling event (1999), no free-phase product was measured. During this event, 19 wells were sampled and analyzed for TPH, VOCs and SVOCs. Results indicated TPH detections in all groundwater samples with the highest TPH concentrations were detected in wells GZ-107 (16,000 ppb) and GT-112 (7,300 ppb). Low concentrations of VOCs and SVOCs were detected in wells.

Additional site investigation and possible remediation has been proposed at Tank Farm 1 (TtEC, 2006b) as a continued effort to convey Tank Farm 1 back to the Navy. A Stereoscopic Aerial Photography Analysis (SAPA) was conducted to analyze historical aerial photographs stereoscopically. The photographs provide locations of past surface soil staining, stockpile areas, and materials storage areas. Forty-five Areas of Concern (AOCs) were identified. The work proposed in the draft work plan includes the following tasks:

- Investigate AOCs;
- Surface soil sampling from drainage features;
- Groundwater gauging and sampling; and
- Ring drain sampling.

4.2 Tank Farm 2

In addition to tank farm closure activities, comprehensive environmental investigations have been conducted at Tank Farm 2 since 1983 (TtEC, 2003, 2005a and 2006a). Investigations have included soil, groundwater, and soil gas sampling. Over 25 monitoring wells have been installed across the site. Several groundwater monitoring events were conducted during the mid- to late-1990s. Free-phase product and detectable concentrations of TPH, VOCs and PAHs were observed. Site investigation and remediation activities were conducted in 2005 by TtEC (2006a).

No free-phase product was measured during groundwater monitoring activities. Sheen was observed in two wells (GZ-202 and GZ-208) in the initial volume of water collected; however, it was not present after the wells recharged. Twenty-two monitoring wells were sampled and results did not indicate any exceedance of dissolved petroleum related compounds. A SAPA was conducted to analyze historical aerial photographs stereoscopically for indications of surface soil staining, stockpile areas, and materials storage areas. Forty-three Areas of Concern (TF2-001 through TF2-043) were identified and investigated by TtEC. Fourteen additional locations were added to the investigation based on RIDEM's review. Areas of petroleum-impacted soil exceeding the ICDEC were remediated via excavation. Areas exceeding RDEC levels have been identified; however, the ICDEC limits are applicable based on current site usage. In addition, PCB concentrations in soil adjacent to Building 219 are above both the RDEC and the ICDEC; however remediation of PCB soil is beyond the scope of this investigation as it is not attributable to DESC's fueling operations. After the property is transferred, the Navy would be required to address these areas during closure and redevelopment of the tank farm.

The Draft Site Investigation and Remediation Report (TtEC, 2006a) concluded that areas identified above the ICDEC and attributable to DESC's use of the property have been remediated. Petroleum-impacted soil excavated during remedial actions were staged next to Tank 24, and RIDEM requested that a bioremediation pilot test be conducted. The goal of the test was to determine whether concentrations of TPH could be reduced to levels below both the ICDEC (2,500 ppm) and the RDEC (500 ppm) through passive biodegradation. The test was conducted from June 2006 through June 2008. Concentrations of TPH in excavated soil were generally below ICDEC; however, concentrations remained above the RDEC. It was determined that a separate disposal option was necessary. In December 2008, 2,966 tons of soil was transported off-site to the lined landfill operated by Waste Management-Taunton. Operations were temporarily ceased due to poor weather conditions, and commenced again in February 2009. An additional 770 tons of soil were transported off-site under a BOL to the lined landfill operated by Waste Management-Taunton. The results of the confirmatory samples collected from beneath the staging area are pending.

4.3 Tank Farm 3

In addition to tank farm closure activities, comprehensive environmental investigations have been conducted at Tank Farm 3 since 1983. Investigations have included soil, groundwater, surface water, and soil gas sampling as well as aquifer pumping tests and passive free-product removal. Over 40 monitoring wells have been installed across the site, and groundwater monitoring was conducted on a regular basis from the mid- to late-1990s. Free-phase product was detected at thicknesses of less than 1 foot in a localized area near Tanks 35 and 36. In the 1980s, a fuel spill occurred in this area. Aquifer pumping tests were conducted to evaluate free product recovery. These tests indicated the bedrock aquifer had irregular fracturing and relatively low transmissivity. Both factors have contributed to the apparent immobility of the free-phase product. It was determined that product was not recoverable via pumping. A passive product recovery canister was installed in GZ-310, and proposed in other wells in the vicinity.

During the 2004 groundwater monitoring event, no measurable free product was recorded (TtEC, 2005b). In addition to gauging, a visual inspection of the first volume of water removed from each well was made. Sheen was observed on the water removed from the following eight monitoring wells: GZ-304, GZ-310, GZ-318, GZ-323, GZ-324, GZ-325, GZ-326, and GZ-335 (TtEC, 2005b). All but two monitoring wells, GZ-306 (dry) and GZ-309 (destroyed), were sampled and analyzed for VOCs, SVOCs and TPH DRO. TPH-DRO was detected samples collected from 22 wells at concentrations ranging from 0.14 to 140 mg/L. Benzene was detected in well GZ-317 (1.2 ug/L) at a concentration below the GA Groundwater Objective (5 ug/L). Naphthalene was detected in well GZ-304 at a concentration (63 ug/L) below the GA Groundwater Objective (100 ug/L). These results indicate that dissolved-phase petroleum hydrocarbons in groundwater at Tank Farm 3 are not present at significant concentrations and do not exceed GA Groundwater Objectives. A comprehensive gauging round was conducted in October 2007. One well (GZ-318) had measurable product (0.68 ft). This well is located in the 1980s spill area and free-phase product has been detected in the past. Four wells had sheen present (GZ-304, GZ-310, GZ-324, and GZ-325).

In 2004, a SAPA was conducted to analyze historical aerial photographs stereoscopically for indications of surface soil staining, stockpile areas, and materials storage areas. Thirty-one AOCs were identified. Twelve additional locations (TF_022 through TF_033) were added to the investigation based on RIDEM's review. These areas were investigated in 2004, and some remediation (i.e., soil removal) was conducted (TtEC, 2005b). Areas that are associated with DESC's operation of the site were remediated to at least ICDECs. Two areas (sand filter pit TF-001 and TF-003) have concentrations of petroleum constituents above ICDEC; however, the sources of contamination are not attributable to DESC's fueling operations. After the property is transferred, the Navy would be required to address these areas during closure and redevelopment of the tank farm.

Efforts to convey the Tank Farm 3 back to the Navy are ongoing. TtEC, on behalf of the DESC, has been consulting with RIDEM to identify DESC work remaining at Tank Farm 3. Planned work to date includes the following:

- Groundwater gauging and sampling;
- Sediment sampling at Outfall # 005; and
- Inspection of Structure 227 and surrounding area.

5.0 REMAINING WORK TO BE PERFORMED BY DESC

5.1 Tank Farm 1

Additional site investigation and possible remediation was proposed at Tank Farm 1 in the Draft Work Plan for Site Closure (TtEC, 2006b). The work proposed in the draft work plan includes the following tasks:

- Investigate AOCs identified in SAPA report;

- Surface soil sampling from drainage features;
- Groundwater gauging and sampling; and
- Ring drain sampling.

In early 2009, DESC had portions of Tank Farm 1 cleared as vegetation had grown significantly since site work was last conducted in 1999. Areas that were not cleared due to flooding or other reasons are as follows: TF1-008, TF1-037, ethyl blending plant (large trees left in place) and TF1-015 (trees along top of dike).

5.2 Tank Farm 2

Areas that are associated with DESC's operation of Tank Farm 2 have been remediated to at least ICDECs or RDECs. Efforts to convey the Tank Farm 3 back to the Navy are ongoing. Remaining work at Tank Farm 2 consists of two reporting tasks. One task is to document the biopile test results and soil disposal information in an addendum to the SI/RAR for Tank Farm 2. The second task is to finalize the Response to RIDEM Comments letter upon resolution of comments received from the Navy and DESC. This draft document was distributed on March 3, 2009.

5.3 Tank Farm 3

Except for AOC-1 and AOC-4, areas that are associated with DESC's operation of the site have been remediated to at least ICDECs or RDECs. ICDEC for TPH could not be achieved at AOC-1 (sand pit filter) or AOC-4 (staining adjacent to former sludge pits) due to the instability of the excavation. As these areas were inaccessible due to existing infrastructure, DESC did not implement further remedial activities, and is actively working to transfer the property back to the Navy. The remaining task is to finalize the Response to RIDEM Comments letter upon resolution of comments received from the Navy and DESC. This draft document was distributed on March 11, 2009.

6.0 REFERENCES

NAVSTA Newport, 1999. Five Year Review for Naval Station Newport, Newport Rhode Island Comprehensive Long-Term Environmental Action. December 30, 1999.

NAVSTA Newport, 2004. Five Year Review for Naval Station Newport, Newport Rhode Island Comprehensive Long-Term Environmental Action. December 10, 2004.

TtEC, 2003. Draft Work Plan for Site Closure Tank Farm 2, Defense Fuel Support Point – Melville, Portsmouth, Rhode Island, September 2003.

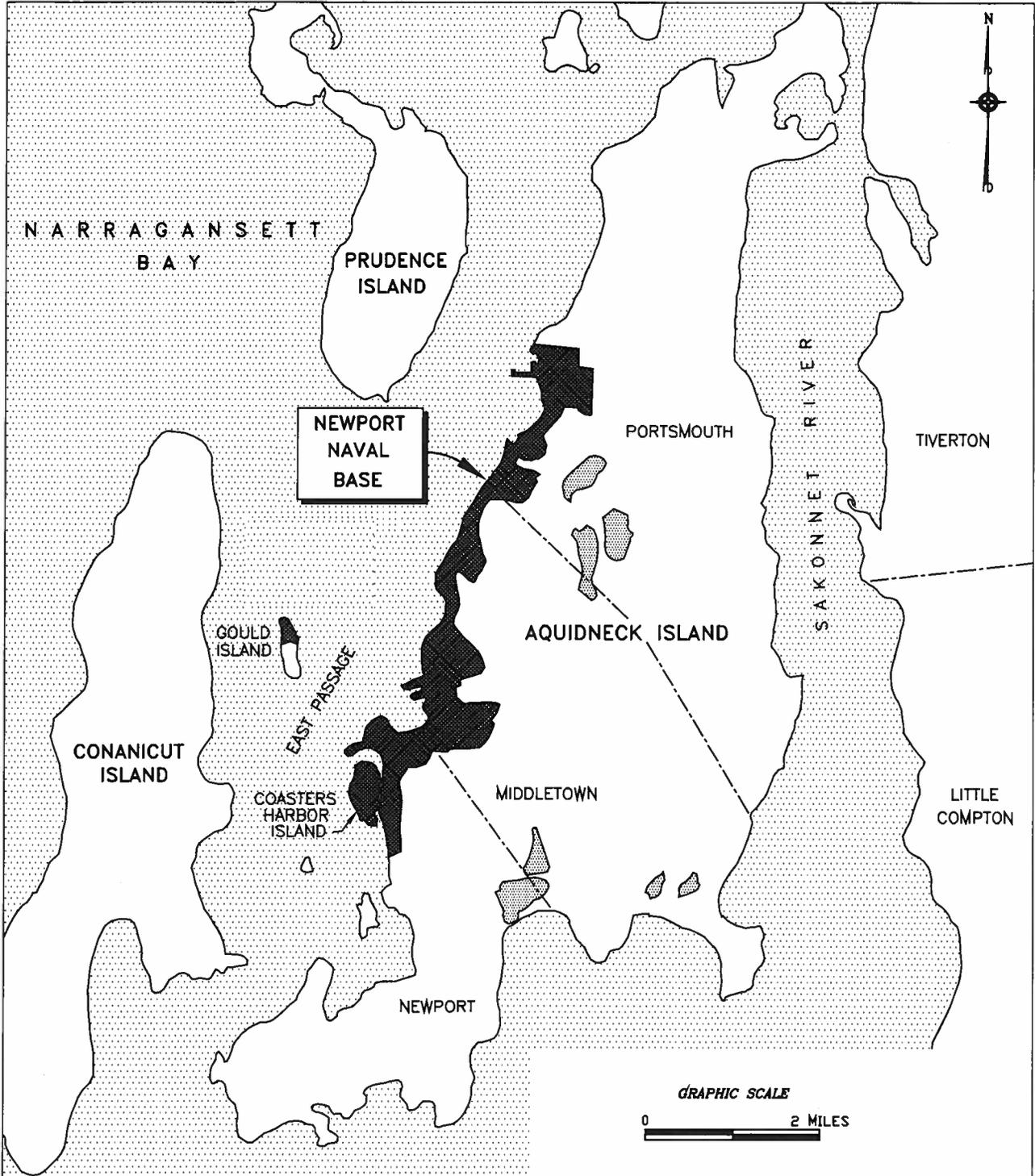
TtEC, 2005a. Draft Condensed Work Plan for Soil and Groundwater Sampling Tank Farm 2, Defense Fuel Support Point – Melville, Portsmouth, Rhode Island, May 2005.

TtEC, 2005b. Draft Site Investigation and Remedial Action Report for Tank Farm 3 Defense Fuel Support Point – Melville Portsmouth, Rhode Island. May 2005.

TtEC, 2006a. Draft Site Investigation and Remedial Action Report for Tank Farm 2 Defense Fuel Support Point – Melville, Portsmouth, Rhode Island. July 2006.

TtEC, 2006b. Draft Work Plan for Site Closure Tank Farm 1 Defense Fuel Support Point – Melville, Portsmouth, Rhode Island. October 2006.

USEPA, 1992. Record of Decision of an Interim Remedial Action at Tank Farm 53 and 56, Groundwater Operable Unit Naval Education and Training Center, Newport, Rhode Island. September 29, 1992. EPA/ROD/R01-92/072.



SITE LOCUS

FIGURE 1-2

NAVSTA NEWPORT – FIVE-YEAR REVIEW
NEWPORT, RHODE ISLAND

DRAWN BY:	D.W. MACDOUGALL	REV.:	0
CHECKED BY:	P. CALL	DATE:	NOVEMBER 24, 2004
SCALE:	AS NOTED	ACAD NAME:	DWG\5152\3584\FIG_1-2.DWG



TETRA TECH NUS, INC.

55 Jonspin Road
Wilmington, MA 01887
(978)658-7899

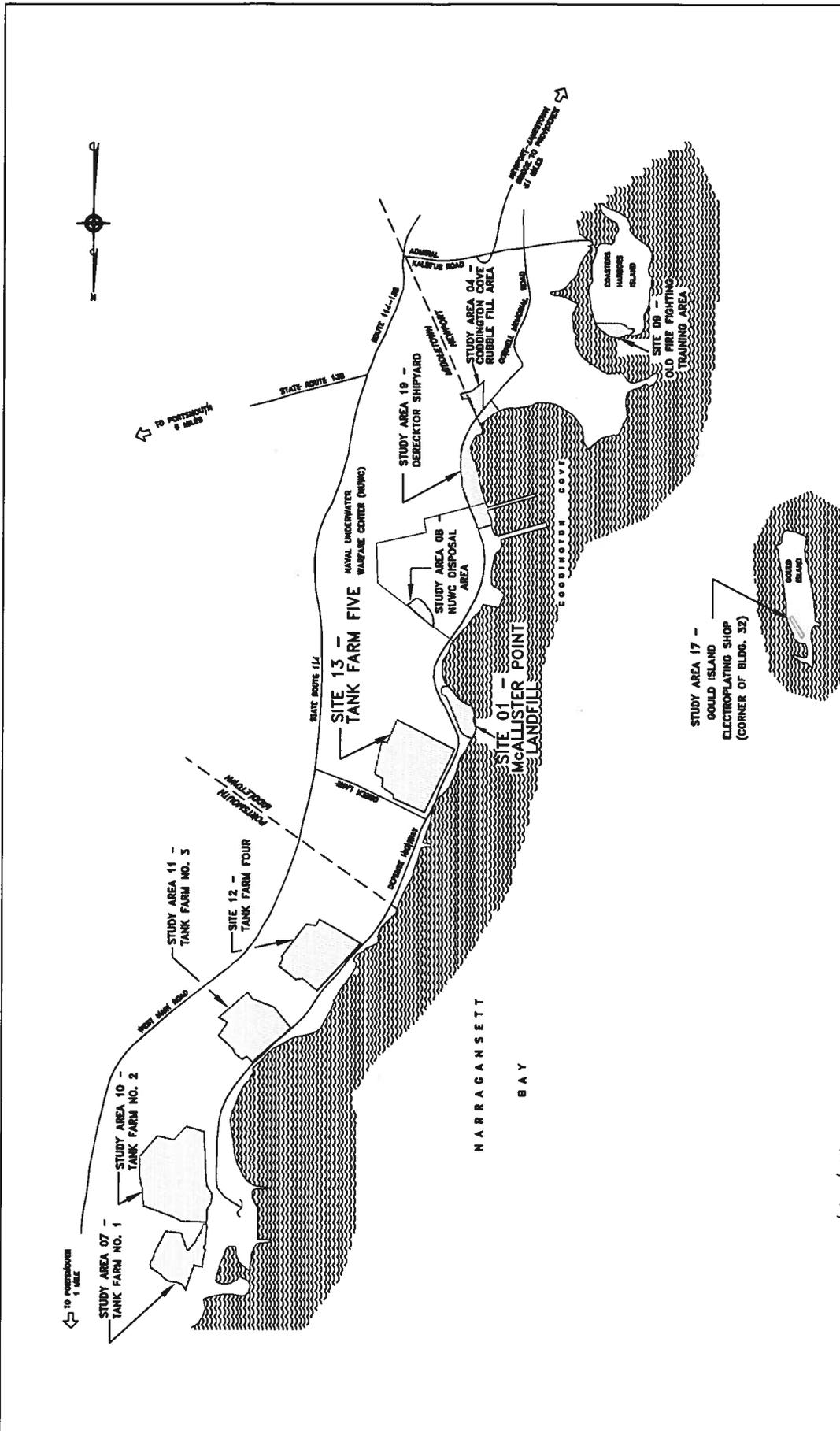


FIGURE 1-1

NAVSTA NEWPORT SITES AND STUDY AREAS	
NAVSTA NEWPORT - FIVE-YEAR REVIEW	
NEWPORT, RHODE ISLAND	
DRAWN BY:	D.W. MACDOUGALL
CHECKED BY:	P. CALL
SCALE:	AS NOTED
REV:1	0
DATE:	NOVEMBER 24, 2004
FILE NO.:	DWG\5152\3584\FIG_1-1.DWG

TETRA TECH NUS, INC.

55 Jonspin Road
Wilmington, MA 01887
(978)658-7899

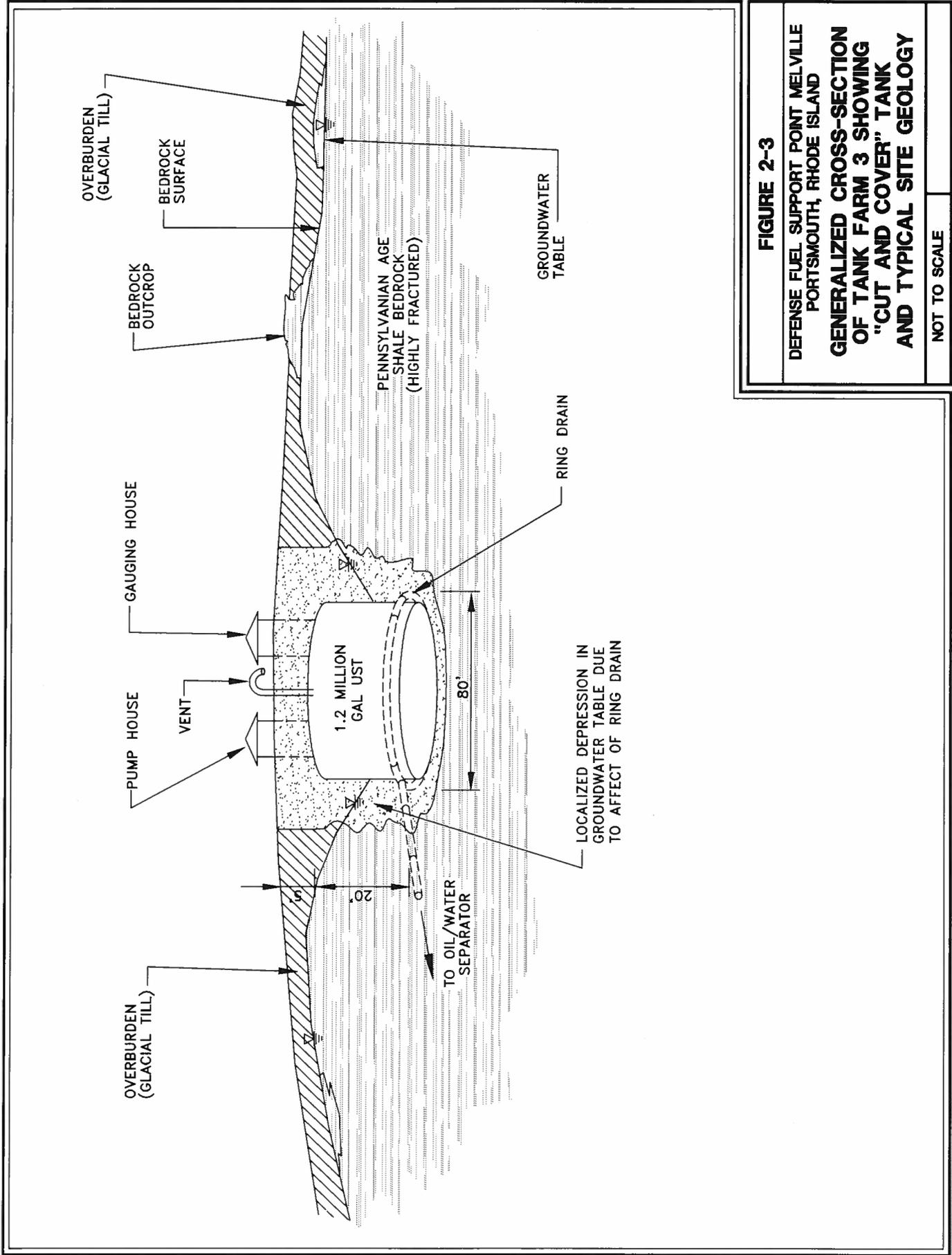


FIGURE 2-3

**DEFENSE FUEL SUPPORT POINT MELVILLE
 PORTSMOUTH, RHODE ISLAND
 GENERALIZED CROSS-SECTION
 OF TANK FARM 3 SHOWING
 "CUT AND COVER" TANK
 AND TYPICAL SITE GEOLOGY**

NOT TO SCALE

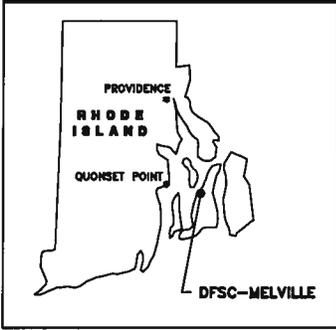
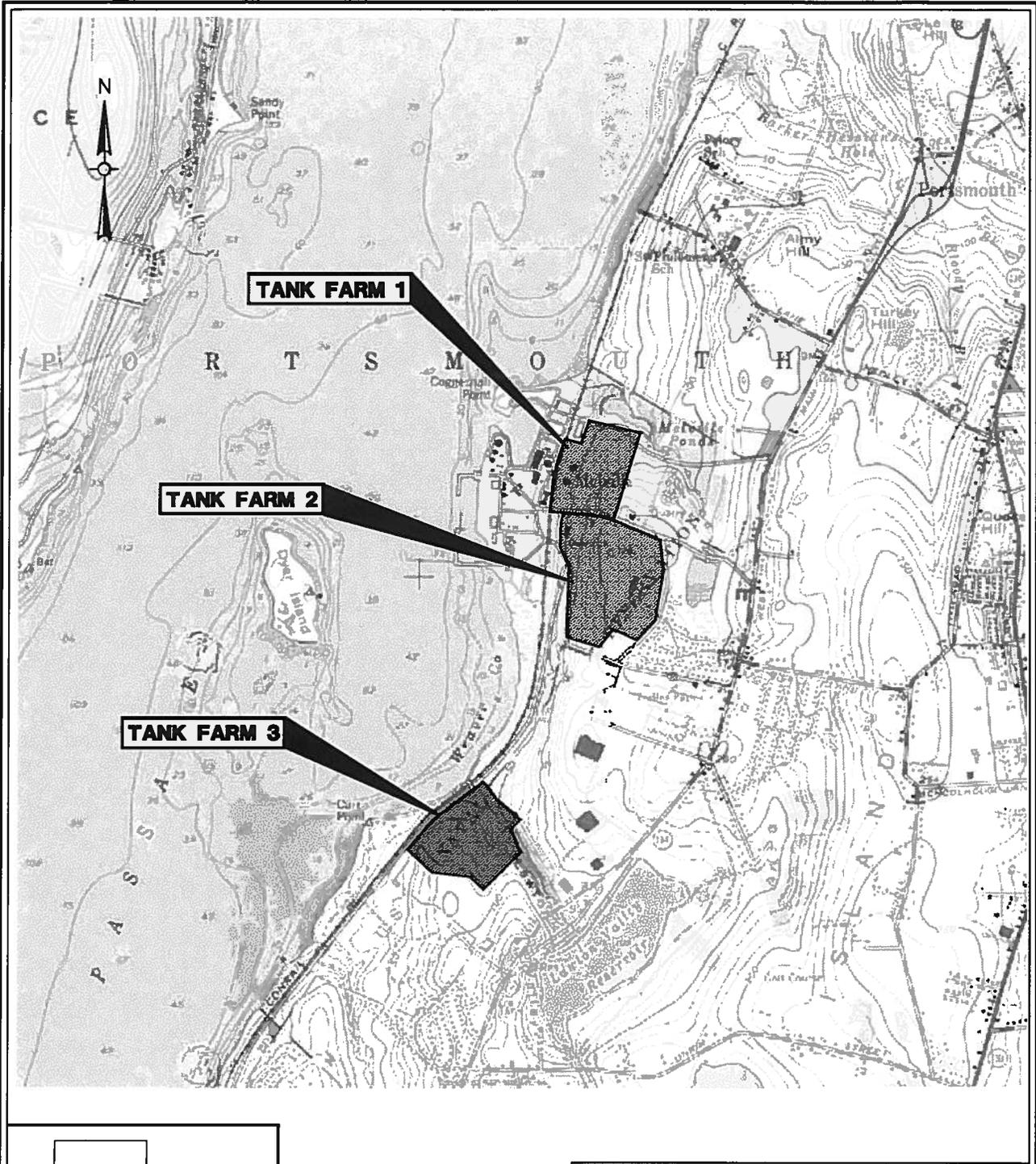


FIGURE 2-1
DEFENSE FUEL SUPPORT POINT MELVILLE
PORTSMOUTH, RHODE ISLAND
SITE LOCATION MAP

SCALE: AS SHOWN

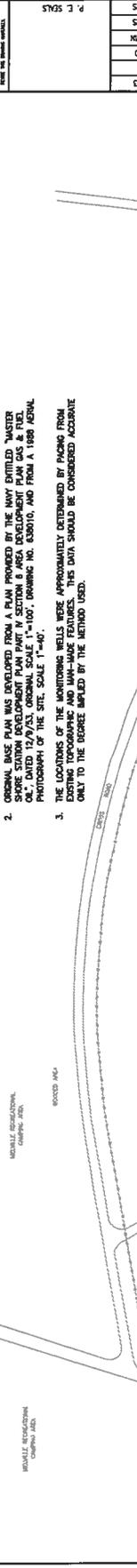
NO.	DATE	DESCRIPTION

NOTES:

1. BASE PLAN WAS DERIVED AND MONITORED BY TETRA TECH, INC. IN MAY 1989 FROM DRAWING ENTITLED "SPILL-TANK, LEAK 2, SITE PLAN", PROJECT NO. 31288.15, DRAWING NO. 2, CAD FILE: 31288-15.DWG, DATED MARCH 1989, BY GZA ENVIRONMENTAL, INC.
2. ORIGINAL BASE PLAN WAS DEVELOPED FROM A PLAN PROVIDED BY THE NAVY ENTITLED "MASTER SHORE STATION DEVELOPMENT PLAN PART II, SECTION 8 AREA DEVELOPMENT PLAN GAS & FUEL OIL", DATED 12/9/83, ORIGINAL SCALE 1"=100', DRAWING NO. 030010, 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.

ABBREVIATIONS

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



LEGEND:

MONITORING WELLS INSTALLED BY GZA WELLS, INC. BETWEEN 10/28/98 AND 12/10/98, OWNED BY GZA PERFORMANCE.
 MONITORING WELLS INSTALLED BY GZA WELLS, INC. BETWEEN 8/22/97 AND 10/7/97, OWNED BY GZA PERFORMANCE.
 UNDERGROUND STORAGE TANK
 INDICATED BOTTOM ELEVATION OF UNDERGROUND STORAGE TANK

TANK FARM 2
 PORTSMOUTH, RHODE ISLAND
 DEFENSE FUEL SUPPORT POINT NEVILLE

GROUNDWATER MONITORING WELL LOCATIONS

TETRA TECH P.W., INC.
 800 PLEASANT STREET
 PORTLAND, MAINE 04106
 TEL: (617) 437-8200
 FAX: (617) 437-8498/8499

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

P. C. STAS

PROJECT NO. 2033.044
 CLIENT: GZA WELLS, INC.
 DRAWING NO. 2033.044.M02.DWG
FOUR
 3-1
 SHEET 1 OF 1

