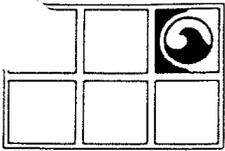


01.02-07/30/93-00115



**GROUNDWATER
TECHNOLOGY
GOVERNMENT SERVICES**

Groundwater Technology Government Services, Inc.
1244 B Executive Boulevard, Suite 106, Chesapeake, VA 23320
Tel: (804) 436-7881 Fax: (804) 436-2312

**FIVE SOIL BORING PLUS ONE ADDITIONAL
SOIL BORING SITE CHECK REPORT
UNDERGROUND STORAGE TANK 271-3
ST. JULIANS CREEK ANNEX
NORFOLK NAVAL SHIPYARD
PORTSMOUTH, VIRGINIA
JOB No. 830011088.43**

July 30, 1993

Prepared for:
Commander
Atlantic Division
Naval Facilities Engineering Command
Norfolk, Virginia 23511-6299

**GROUNDWATER TECHNOLOGY
GOVERNMENT SERVICES, INC.**
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TABLE OF CONTENTS

| | PAGE |
|--|------|
| 1.0 INTRODUCTION | 1 |
| 1.1 Definition of Terms | 1 |
| 2.0 BACKGROUND | 2 |
| 2.1 Site Description | 2 |
| 2.2 Land Use | 2 |
| 2.3 Regional Geology | 2 |
| 2.4 Regional Hydrogeology | 5 |
| 3.0 INVESTIGATIVE METHODS | 7 |
| 3.1 Soil Boring Installation and Soil Sampling | 7 |
| 4.0 INVESTIGATIVE RESULTS | 8 |
| 4.1 Site Geology | 8 |
| 4.2 Site Hydrogeology | 8 |
| 4.3 Presence of Hydrocarbons | 8 |
| 4.3.1 Adsorbed-Phase Hydrocarbons | 8 |
| 4.3.2 Liquid- and Dissolved-Phase Hydrocarbons | 11 |
| 4.4 Drill Cutting Disposal | 11 |
| 4.5 Technical Summary | 11 |
| 5.0 REFERENCES | 12 |

LIST OF FIGURES

| | PAGE |
|---|------|
| Figure 1: Site Location Map | 3 |
| Figure 2: Site Map | 4 |
| Figure 3: Adsorbed-Phase Hydrocarbon Concentration Map (0-2 Feet Below Grade) | 9 |

LIST OF TABLES

| | |
|--|----|
| Table 1: Summary of Soil Sample Analytical Results, May 13, 1993 | 10 |
|--|----|

LIST OF APPENDICES

| | |
|---|--|
| Appendix A: Geologic Boring Logs | |
| Appendix B: Soil Sample Analytical Laboratory Report with Chain-of-Custody Record | |
| Appendix C: Drum Disposal Documentation | |

1.0 INTRODUCTION

Groundwater Technology Government Services, Inc. (GSI) was contracted by the Atlantic Division (LANTDIV) Naval Facilities Engineering Command (NAVFACENGCOM) of the Department of the Navy to conduct a site check to identify and/or verify suspected hydrocarbon-impacted subsurface soils. The site check was performed at former underground storage tank (UST) 271-3 located at the St. Julians Creek Annex, Norfolk Naval Shipyard, Portsmouth, Virginia.

This site check is based on the NAVFAC requirements and the Virginia Department of Environmental Quality (DEQ) site, risk, and remediation guidelines and includes the drilling of six soil borings and collection of fourteen soil samples for laboratory analyses. Subsequent sections of this report will describe site background information; site conditions in terms of physiography, geology and hydrogeology; and results of the field investigations including the evaluation of any petroleum hydrocarbons in the subsurface soils and groundwater. No previously compiled environmental assessment information pertaining to this site has been provided to GSI.

1.1 Definition of Terms

This section defines the four phases which petroleum hydrocarbons may exist in the subsurface. Liquid-phase hydrocarbons are liquids that may exist in the subsurface as an immobile residual liquid in the unsaturated zone and capillary fringe or free mobile liquids that migrate near the top of the capillary fringe. Dissolved-phase hydrocarbons are hydrocarbons which have dissolved in the groundwater. The tendency for hydrocarbons to transfer to the dissolved phase are a result of the degree of mixing and contact and the solubility of the released substance. Dissolved-phase hydrocarbons can be present in infiltrating water in the unsaturated zone, the capillary fringe and in the groundwater of the saturated zone. Vapor-phase hydrocarbons are hydrocarbons that have transferred into the gaseous phase. Vapor-phase hydrocarbons can be present in the pore spaces of the unsaturated zone or as small bubbles in the saturated zone. Adsorbed-phase hydrocarbons are liquid- or dissolved-phase hydrocarbons that cover the surfaces of sediment in the saturated and unsaturated zones.

2.0 BACKGROUND

2.1 Site Description

The site is located on the south boundary of the Norfolk Naval Shipyard in Portsmouth, Virginia (Figure 1). One partially buried 55-gallon steel UST was excavated and removed from the site. The UST was open on top and while in service was routinely filled with a mixture of diesel fuel and motor oil which was set afire while fire-fighting personnel practiced extinguishing the fire. During the fire-fighting training exercises, the hydrocarbons in the UST were spilled around the tank. This information was obtained on May 10, 1993 via verbal communication from the point of contact (POC) at the site. No previously compiled environmental assessment information pertaining to this site nor the exact location of the UST has been provided to GSI. The UST excavation was open at the time GSI performed the site check, and excavated soils were stockpiled around the excavation (Figure 2).

2.2 Land Use

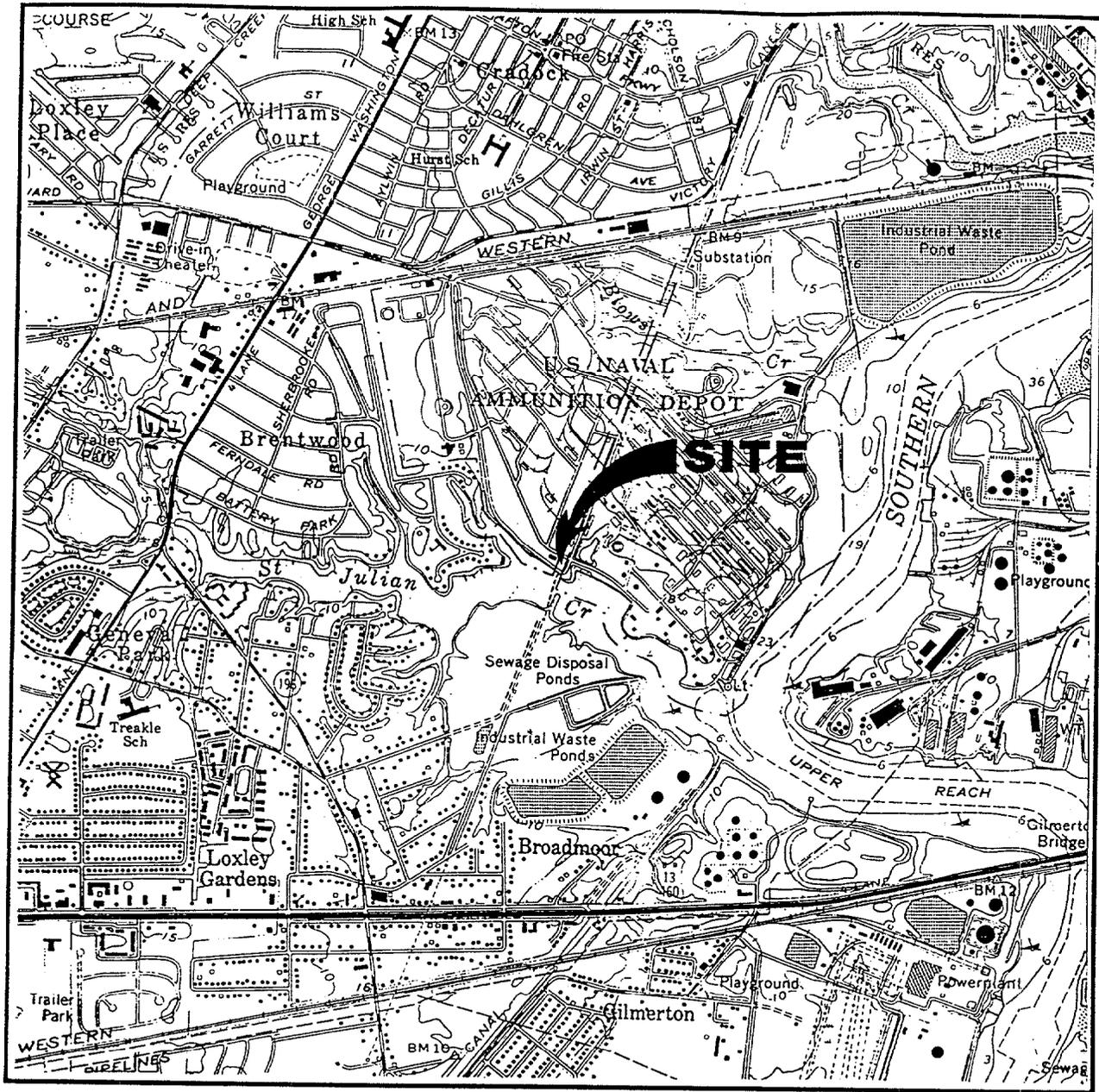
Underground storage tank 271-3 was located at the fire station for the Annex. The site is situated in an area dominated by relatively flat topography. The site is bordered by St. Julians Creek to the south and east. The area to the north and west of the site is woodlands.

2.3 Regional Geology

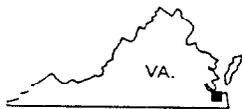
The Portsmouth area is located on the seaward edge of the Atlantic Coastal Plain Province. The coastal plain is characterized by low elevations and slight relief. Overall, the topography has a north-south trend that is closely related to its fluvial and marine depositional history (Meng, Harsh and Krull, 1984). The area is characterized by short, intertidal streams that empty into the Chesapeake Bay and the Atlantic Ocean (Siudyla, May and Hawthorn, 1981).

The coastal plain consists of a layered sequence of unconsolidated sand, gravel, silt, and clay deposits of Lower Cretaceous to Holocene age. These deposits, which overlie bedrock of Pre-Cretaceous age, thicken and dip eastward with thicknesses ranging from 2,000 feet in the west to 4,000 feet in the east.

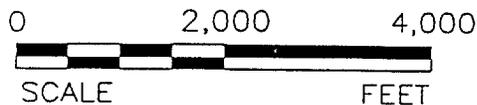
The geologic units in the Portsmouth area are divided into four groups: the Potomac Group of Cretaceous age; the Pamunkey Group of Paleocene and Eocene age; the Chesapeake Group of Oligocene, Miocene, and Pliocene age; and the Columbia Group of Pleistocene and Holocene age.



SOURCE: U.S.G.S. TOPOGRAPHIC QUADRANGLE
 NORFOLK SOUTH, VA.
 7.5 MINUTE SERIES
 36076-G3-TF-024
 1986



SCALE 1:24,000



**GROUNDWATER
 TECHNOLOGY**

1244-B EXECUTIVE BLVD.
 ESSEX, VA. 23320
 (504) 436-7881

DESIGNED:

BH

DETAILED:

PJC

CHECKED:

SITE LOCATION

CLIENT:

LANTDIV NAVFACENCOM

LOCATION:

UST 271-3, BUILDING 271
 ST. JULIAN'S CREEK ANNEX, PORTSMOUTH, VA.

DRAWING DATE:

5/6/93

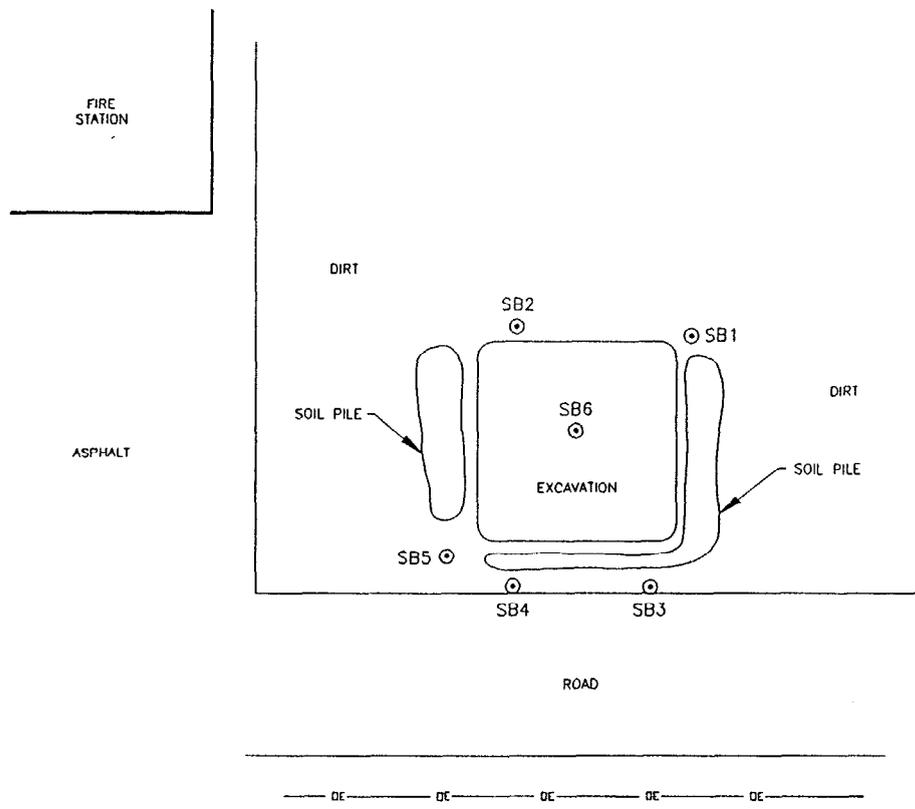
FIGURE:

1

LEGEND

⊙ SOIL BORING LOCATION

—⊠— OVERHEAD ELECTRIC



NOT TO SCALE

SOURCE: GEOLOGIST SKETCH

| | | | |
|---|---------------|---|----------|
| | | 1244-B EXECUTIVE BLVD. CHESAPEAKE, VA. 23320 (804) 436-7881 | |
| REV. NO.: | DRAWING DATE: | ACAD FILE: | |
| 1 | 5/11/93 | 2713-SIT | |
| SITE MAP | | | |
| CLIENT: | | PM: | |
| LANTDIV NAVFACENGCOM | | SJS | |
| LOCATION: | | PE/RC: | |
| UST 271-3, BUILDING 271 ST. JULIANS CREEK ANNEX, PORTSMOUTH, VA. | | KOB | |
| DESIGNED: | DETAILED: | PROJECT NO.: | FIGURE: |
| BH | PJC | 830011088.4301 | 2 |

The Cretaceous sediments of the Potomac Group overlie the crystalline basement rocks. These sediments are primarily light yellowish brown, gray and yellowish orange, plastic, silt clay.

Overlying the Potomac Group are the sediments of the Pamunkey Group, which include the glauconitic clay, silts, and sands of the Aquia Formation and Nanjemoy Formation. The Aquia is marked by contrasting members; one is fossiliferous, poorly-sorted clayey and silty sand, and the other is well-sorted, micaceous, and quartzose. The Nanjemoy is characterized by glauconitic, olive gray to olive black, clayey and silty fine sand, and is thin bedded to massive. The sediments of the Pamunkey Group were mostly deposited in transgressive marine environments (Ward and Strickland, 1985).

The Chesapeake Group beneath the area has been divided into the Choptank, the Eastover, the Yorktown, and the Bacons Castle Formation. The formations of the Chesapeake Group are fossiliferous, relatively thin, unconformity-bounded marine units and usually consist of a thin, basal gravelly sand and an overlying fining-upward sequence of sand, silt and clay.

The Windsor Formation of the Columbia Group overlies the Bacons Castle Formation. Above this are several other formations in the Columbia Group - the Charles City Formation, the Chuckatuck, the Shirley, the Tabb (all of Pleistocene age) and the Kennon Formation, which is Holocene in age. These formations consist of repetitive sequences of fining upward units. These formations are restricted to terraces parallel to the principal rivers and were deposited in a fluvial-estuarine environment or under a combination of bay or lagoon, barrier and nearshore marine conditions.

2.4 Regional Hydrogeology

In the eastern part of the Virginia coastal plain, groundwater is obtained from the unconfined Columbia aquifer. The depth to groundwater typically ranges from three to twelve feet below the surface. Groundwater yield from this aquifer ranges between 5 to 250 gallons per minute (gpm) depending upon the well size, pump size and screened interval. Water from this aquifer is generally suitable for domestic purposes such as irrigation.

The Yorktown aquifer (confined) is situated directly below the Columbia aquifer. The Yorktown aquifer consists of greenish-grey sands, commonly shelly, interbedded with silt, clay, shell beds and gravel. Yield from the Yorktown aquifer ranges from 5 to 500 gpm depending upon the well size, pump size and screened interval. The regional groundwater flow direction is towards the south.

Businesses and residences in the Norfolk Naval Shipyard area are provided with potable water from the city of Portsmouth. The city of Portsmouth obtains water from a series of reservoirs located in Suffolk, Virginia.

3.0 INVESTIGATIVE METHODS

3.1 Soil Boring Installation and Soil Sampling

To investigate for the presence/absence of adsorbed-phase hydrocarbons in the soils beneath the site, six soil borings (SB-1 through SB-6) were drilled to the top of the static water table on May 13, 1993. Soil boring was performed by driving a 1.75-inch diameter by 2-foot long steel split-spoon barrel into the soil with a truck mounted hollow-stem auger drilling rig. Due to the shallow depth of groundwater at the site, core samples were obtained by driving the split-spoon barrels into the soil with the drill rig's hydraulic mechanism normally used for lifting augers. This is a modification of ASTM D-1586 sampling methodology. This was repeated until groundwater was encountered. The sample barrel was cleaned with distilled water andalconox between the collection of each sample. After sampling, the soil boreholes were backfilled with cement.

Before and between drilling each borehole, all split spoons and drill rods were steam cleaned. All split-spoon sampling devices were cleaned with analconox wash followed by a distilled water rinse after each sampling event. During drilling, a geologist logged drill cuttings for soil classification. Collected split-spoon samples occurred at each of the following depths: 0.0 to 2 feet and 2 to 4 feet below grade surface. A portion of each core sample was placed into the appropriate laboratory container, sealed labelled and stored on ice. The remainder of each core sample was placed into a labelled air-tight container which was permitted to warm to ambient temperature where any hydrocarbons, if present would volatilize. After the equilibration period, each sample was scanned with a photo-ionization detector (PID) by inserting the sampling probe into the head space of the containers and a reading was recorded. The PID is a field monitoring instrument used to measure volatile organic constituents in parts per million (ppm). All the PID readings were recorded on the drill logs. Upon completion of each boring, the PID readings from each split-spoon sample were compared, and the sample with the highest PID reading collected from above the saturated zone was selected for laboratory analysis. One additional soil sample was collected as a duplicate and analyzed. The corresponding sample was stored on ice in the appropriate laboratory container and was submitted to Groundwater Technology Environmental Laboratories, Inc. (GTEL) for analysis. The samples were analyzed for the presence of total petroleum hydrocarbons (TPH) by gas chromatograph flame-ionization detector (GC-FID) by U.S. Environmental Protection Agency (EPA) by Method 3550/8015.

Geologic well logs detailing the lithology penetrated by each soil boring and the results of the PID surveys are presented in Appendix A. The laboratory analytical report, including the chain-of-custody documentation for the soil samples collected, is presented in Appendix B.

4.0 INVESTIGATIVE RESULTS

4.1 Site Geology

The stratigraphy directly beneath the site, as determined by well logs (Appendix A) compiled during drilling of the soil borings, is characterized by silt and fine-grained sand.

4.2 Site Hydrogeology

During the drilling of the soil borings, saturated soils were encountered at approximately 3.5 to 4 feet below grade. In the soil boring (SB-6) located within the UST excavation, water was encountered at 1.5 feet below grade; however, this location is approximately 2-feet lower in elevation than the ground surface surrounding the excavation.

4.3 Presence of Hydrocarbons

4.3.1 Adsorbed-Phase Hydrocarbons

On May 13, 1993, six soil borings were drilled and soil samples were collected from each borehole and scanned with a PID. The results of PID monitoring of split-spoon samples collected during drilling activities are presented in Table 1.

Analytical results indicate that gasoline, mineral spirits, kerosine, and motor oil concentrations were less than the laboratory's reported method detection limits in all of the soil samples collected.

Concentrations of diesel in all of the soil samples collected from the soil borings were less than the laboratory's reported method detection with the exception of the soil samples collected at 0 to 2 feet below grade in soil borings SB-1 and SB-5. The diesel concentrations in the soil samples collected from soil borings SB-1 and SB-5 were 290 parts per million (ppm) and 140 ppm, respectively (Figure 3).

Two soil samples were collected from the stockpiled excavated soil surrounding the excavation and analyzed by EPA Method 3550/8015. The soil samples collected from the soil pile at 0 to 2 and 2 to 4 feet below the surface contained 810 ppm and 970 ppm of diesel, respectively. Gasoline, kerosine, mineral spirits and minor oil concentrations were less than the laboratory's reported method detection limits in the soil samples collected from the soil pile.

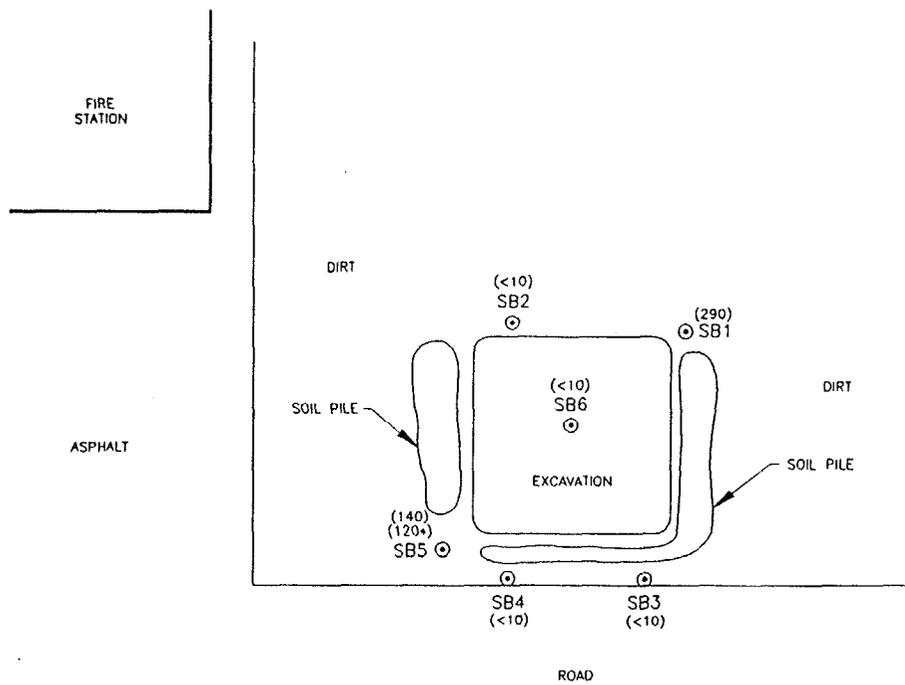
LEGEND

⊙ SOIL BORING LOCATION

— DE — OVERHEAD ELECTRIC

(290) TPH--AS--DIESEL
CONCENTRATION BY
EPA 3550/8015 IN ppm

* DUPLICATE ANALYSES



NOT TO SCALE

SOURCE: GEOLOGIST SKETCH

| | | | |
|--|---------------|---|----------|
| | | 1244-B EXECUTIVE BLVD. CHESAPEAKE, VA. 23320 (804) 436-7881 | |
| REV. NO.: | DRAWING DATE: | ACAD FILE: | |
| 1 | 5/11/93 | 2713-SIT | |
| ADSORBED-PHASE HYDROCARBON CONCENTRATIONS 10-2 FEET BELOW GRADE | | | |
| CLIENT: | | PM: | |
| LANTDIV NAVFACENCOM | | | |
| LOCATION: | | PE/RG: | |
| UST 271-3, BUILDING 271 ST. JULIANS CREEK ANNEX, PORTSMOUTH, VA. | | | |
| DESIGNED: | DETAILED: | PROJECT NO.: | FIGURE: |
| BH | PJC | 830011088.4301 | 3 |

Table 1
Summary of Soil Sample Analytical Results
By EPA Method 3550/8015
May 13, 1993

| Sample Location | Sample ID | Depth (ft) | Analyte | | | | | PID (ppm) |
|-----------------|-----------|------------|----------------|-----------------------|----------------|--------------|-----------------|-----------|
| | | | Gasoline (ppm) | Mineral Spirits (ppm) | Kerosine (ppm) | Diesel (ppm) | Motor Oil (ppm) | |
| SB-1 | SB-1, 0-2 | 0-2 | <10 | <10 | <10 | 290 | <100 | 4 |
| | SB-1, 2-4 | 2-4 | <10 | <10 | <10 | <10 | <100 | 3 |
| SB-2 | SB-2, 0-2 | 0-2 | <10 | <10 | <10 | <10 | <100 | 4 |
| | SB-2, 2-4 | 2-4 | <10 | <10 | <10 | <10 | <100 | 4 |
| SB-3 | SB-3, 0-2 | 0-2 | <10 | <10 | <10 | <10 | <100 | 3 |
| | SB-3, 2-4 | 2-4 | <10 | <10 | <10 | <10 | <100 | 3 |
| SB-4 | SB-4, 0-2 | 0-2 | <10 | <10 | <10 | <10 | <100 | 2 |
| | SB-4, 2-4 | 2-4 | <10 | <10 | <10 | <10 | <100 | 3 |
| SB-5 | SB-5, 0-2 | 0-2 | <10 | <10 | <10 | 140 | <100 | 20 |
| | SB-5, 2-4 | 2-4 | <10 | <10 | <10 | <10 | <10 | 5 |
| SB-6 | SB-6, 0-2 | 0-2 | <10 | <10 | <10 | <10 | <100 | 6 |
| SB-5 | DUP-5 | 0-2 | <10 | <10 | <10 | 120 | <100 | N/A |
| Soil Pile | SP, 0-2 | 0-2 | <200 | <200 | <200 | 810 | <2000 | N/A |
| Soil Pile | SP, 2-4 | 2-4 | <200 | <200 | <200 | 970 | <2000 | N/A |

PID = Photo-ionization detector reading (based on a similar response using calibration gas)
 ppm = parts per million (mg/kg)
 N/A = data not taken
 < = Below laboratory's reported method detection limit

4.3.2 Liquid- and Dissolved-Phase Hydrocarbons

Groundwater samples were not collected during this investigation.

4.4 Drill Cutting Disposal

During the drilling of each of the monitoring wells, drill cuttings from the borehole were collected and placed in one 55-gallon barrel. The POC has agreed to take responsibility for the handling and disposal of this material. A thorough search of the area adjacent to the work area was undertaken; however, the drum could not be located. It has been concluded that the drum was removed by unauthorized personnel, and the drum and its contents were, therefore, unrecoverable. Groundwater Technology Government Services, Inc. was informed of this by the POC at the base and as of the date of this publication and to the best of GSI's knowledge, the location or final disposition of the drum is unknown. A copy of the memorandum from the POC to GSI regarding the drum removal is presented in Appendix C.

4.5 Technical Summary

Groundwater Technology Government Services, Inc. (GSI) has completed a five soil boring plus one additional soil boring site check at UST 271-3 located at the St. Julians Creek Annex, Norfolk Naval Shipyard, Portsmouth, Virginia. The site check was designed to comply with NAVFACENGCOM contractual requirements.

Soils in the area are characterized as silt and fine-grained sand. Based on drilling activities, the depth to groundwater is approximately 4-feet below grade. Soil samples were collected during the drilling of the soil borings and analyzed for TPH by Method 3550/8015. Analytical results indicate that adsorbed-phase hydrocarbon concentrations were less than the laboratory's reported method detection limit in the soil samples collected at 2 to 4 feet below grade. Soil samples collected at 0 to 2 feet below grade in soil borings SB-1 and SB-5 contained 290 ppm and 140 ppm of diesel, respectively. Two soil samples collected from the excavated soil pile contained 810 ppm and 970 ppm of diesel.

5.0 REFERENCES

- Meng III, A.A., Harsh, J.F., and Kull T.K. 1984. Virginia Groundwater Resources. U.S.G.S. Water-Supply Paper 2275, United States Government Printing Office.
- Siudyla, E.A., May, A.E., and Hawthorne, D.W., 1981. Groundwater Resources of the Four Cities area, Virginia: Virginia State Water Control Board Planning Bulletin 331, p. 168.
- Ward, L.W., and Strickland, G.L., 1985, Outline of Tertiary stratigraphy and depositional history of the U.S. Atlantic Coastal Plain, In: Poag, C.W., ed., Geologic Evolution of the United States Atlantic Margin. New York, Nostrand Reinhold, Co. pp. 87-128.

APPENDIX A
Geologic Boring Logs

UNIFIED SOIL CLASSIFICATION SYSTEM

CLASSIFICATION CHART

| MAJOR DIVISIONS | | SYMBOLS | TYPICAL NAMES | GTGS FILL PATTERN |
|---|---|---------|--|-------------------|
| COARSE GRAINED SOILS OVER 50% > No. 200 SIEVE SIZE | <u>GRAVELS</u> MORE THAN 1/2 OF COARSE FRACTION > NO. 4 SIEVE SIZE | GW | Well graded gravels or gravel-sand mixtures, little or no fines | 26 |
| | | GP | Poorly graded gravels or gravel-sand mixtures, little or no fines | 25 |
| | | GM | Silty gravels, gravel-sand mixtures | 26=11 |
| | | GC | Clayey gravels, gravel-sand-clay mixtures | 26=14 |
| | <u>SANDS</u> MORE THAN 1/2 OF COARSE FRACTION < NO. 4 SIEVE SIZE | SW | Well graded sands or gravelly sands, little or no fines | 8 |
| | | SP | Poorly graded sands or gravelly sands, little or no fines | 6 |
| | | SM | Silty sands, sand-silt mixtures | 9 |
| | | SC | Clayey sands, sand-clay mixtures | 10 |
| FINE GRAINED SOILS OVER 50% < No. 200 SIEVE SIZE | <u>SILTS & CLAYS</u> <u>LL < 50</u> | ML | Inorganic silty sands and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity | 11 |
| | | CL | Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays | 14 |
| | | OL | Organic silts and organic silty clays of low plasticity | 18 |
| | <u>SILTS & CLAYS</u> <u>LL > 50</u> | MH | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts | 12 |
| | | CH | Inorganic clays of high plasticity, fat clays | 15 |
| | | OH | Organic clays of medium to high plasticity, organic silty clays, organic silts | 35 |
| HIGHLY ORGANIC SOILS | | Pt | Peat and other highly organic soils | 20 |

GRAIN SIZE CHART

| CLASSIFICATION | RANGE OF GRAIN SIZES | |
|----------------------------------|--|--|
| | U.S. Standard Sieve Size | Grain Size in Millimeters |
| BOULDERS | Above 12" | Above 305 |
| COBBLES | 12" to 3" | 305 to 76.2 |
| GRAVEL COARSE FINE | 3" to No. 4 3" to 3/4" 3/4" to No. 4 | 76.2 to 4.75 76.2 to 19.1 10.1 to 4.75 |
| SAND COARSE MEDIUM FINE | No. 4 to No. 200 No. 4 to No. 10 No. 10 to No. 40 No. 40 to No. 200 | 4.75 to 0.074 4.76 to 2.00 2.00 to 0.420 0.420 to 0.074 |
| SILT & CLAY | Below No. 200 | Below No. 0.074 |

WELL CONSTRUCTION MATERIALS

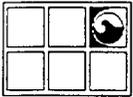
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--------------------------|--------------|--|---------------|--|------------------|--|------------------|--|------------|--|----------------|--|-----------------|--|----------------|--|------------|--|---------------|---|--|------------|--|------------------|--|--------------------------|--|----------------------|--|------------------------|--|---------------|
| <table style="width: 100%;"> <tr> <td></td> <td>Asphalt (68)</td> </tr> <tr> <td></td> <td>Concrete (55)</td> </tr> <tr> <td></td> <td>Neat Cement (54)</td> </tr> <tr> <td></td> <td>Base Course (30)</td> </tr> <tr> <td></td> <td>Sluff (64)</td> </tr> <tr> <td></td> <td>Bentonite (21)</td> </tr> <tr> <td></td> <td>Filter Pack (7)</td> </tr> <tr> <td></td> <td>Pea Gravel (2)</td> </tr> <tr> <td></td> <td>Liner (33)</td> </tr> <tr> <td></td> <td>Geocloth (36)</td> </tr> </table> | | Asphalt (68) | | Concrete (55) | | Neat Cement (54) | | Base Course (30) | | Sluff (64) | | Bentonite (21) | | Filter Pack (7) | | Pea Gravel (2) | | Liner (33) | | Geocloth (36) | <p style="text-align: center;">SCREENS</p> <table style="width: 100%;"> <tr> <td></td> <td>Solid (1s)</td> </tr> <tr> <td></td> <td>Slotted PVC (3w)</td> </tr> <tr> <td></td> <td>Slot. PVC High Flow (8w)</td> </tr> <tr> <td></td> <td>Wire Wound PVC (16w)</td> </tr> <tr> <td></td> <td>Wire Wound Steel (15w)</td> </tr> <tr> <td></td> <td>Saw Cut (12w)</td> </tr> </table> | | Solid (1s) | | Slotted PVC (3w) | | Slot. PVC High Flow (8w) | | Wire Wound PVC (16w) | | Wire Wound Steel (15w) | | Saw Cut (12w) |
| | Asphalt (68) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Concrete (55) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Neat Cement (54) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Base Course (30) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Sluff (64) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Bentonite (21) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Filter Pack (7) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Pea Gravel (2) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Liner (33) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Geocloth (36) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Solid (1s) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Slotted PVC (3w) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Slot. PVC High Flow (8w) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Wire Wound PVC (16w) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Wire Wound Steel (15w) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Saw Cut (12w) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

SAMPLE TYPES

SS - Split Spoon
 CC - Continuous Core
 CG - Cuttings Grab

SYMBOLS

∇ Initial Water Level
 ▼ Static Water Level



GROUNDWATER
TECHNOLOGY
GOVERNMENT SERVICES

Drilling Log

Soil Boring **SB-1**

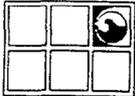
Project UST 271-3 Owner LANTDIV NAVFACENGCOM
 Location St. Julian Creek Annex, VA Project No. 83001088.43 Date drilled 5/13/93
 Surface Elev. _____ Total Hole Depth 4 ft. Diameter 2 in.
 Top of Casing _____ Water Level Initial 4 ft. Static _____
 Screen: Dia _____ Length _____ Type/Size _____
 Casing: Dia _____ Length _____ Type _____
 Filter Pack Material _____ Rig/Core Type AD-2/Spit Spoon
 Drilling Company Bedford Env. Drilling Method Hydraulic Driven Permit # _____
 Driller Steve Boblett Log By Neil Frasca
 Checked By Taylor Sword License No. CPG APIG #8334

See Site Map
For Boring Location

COMMENTS:

Soil borings SB-1 through SB-6 were installed around former UST 271-3 at the St. Julian Creek Annex, Portsmouth, Virginia.

| Depth (ft.) | PID (ppm) | Sample ID Blow Count/ % Recovery | Graphic Log | USCS Class. | Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50% |
|-------------|-----------|--|-------------|-------------|---|
| -2 | | | | | |
| 0 | 4 | 12,10,4,4 /60 | | | Brown-grey color, damp, fine-grained SAND and SILT, trace fine-grained gravel, trace coarse-grained gravel. |
| 2 | | SB-10-2 | | SM | Grey color, moist, fine-grained SAND and SILT. |
| 3 | 3 | 12,10,8,6 /75 | | | |
| 4 | | SB-12-4 | | | Encountered water End of boring. |
| 6 | | | | | |
| 8 | | | | | |
| 10 | | | | | |



GROUNDWATER
TECHNOLOGY
GOVERNMENT SERVICES

Drilling Log

Soil Boring **SB-2**

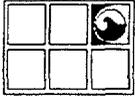
Project UST 271-3 Owner LANTDIV NAVFACENGCOM
 Location St. Julian Creek Annex, VA Project No. 830011088.43 Date drilled 5/13/93
 Surface Elev. _____ Total Hole Depth 4 ft. Diameter 2 in.
 Top of Casing _____ Water Level Initial 3.5 ft. Static _____
 Screen: Dia _____ Length _____ Type/Size _____
 Casing: Dia _____ Length _____ Type _____
 Filter Pack Material _____ Rig/Core Type AD-2/Spit Spoon
 Drilling Company Bedford Env. Drilling Method Hydraulic Driven Permit # _____
 Driller Steve Boblett Log By Neil Frasca
 Checked By Taylor Sword License No. CPG AFIG #8334

See Site Map
For Boring Location

COMMENTS:

Soil borings SB-1 through SB-6 were installed around former UST 271-3 at the St. Julian Creek Annex, Portsmouth, Virginia.

| Depth (ft.) | PID (ppm) | Sample ID Blow Count/ % Recovery | Graphic Log | USCS Class. | Description |
|-------------|-----------|--|-------------|-------------|--|
| | | | | | (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50% |
| -2 | | | | | |
| 0 | 4 | 6,7,6,5 /80 | | SM | Brown-light grey color, damp, fine-grained SAND and SILT. |
| 2 | 4 | 6,5,3,1 /80 | | SM | Light grey color, moist, fine-grained SAND and SILT. |
| 4 | | SB-2,2-4 | | | Encountered water |
| 4 | | | | | End of boring. |
| 6 | | | | | |
| 8 | | | | | |
| 10 | | | | | |



GROUNDWATER
TECHNOLOGY
GOVERNMENT SERVICES

Drilling Log

Soil Boring **SB-3**

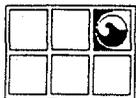
Project UST 271-3 Owner LANTDIV NAVFACENGCOM
 Location St. Julian Creek Annex, VA Project No. 830011088.43 Date drilled 5/13/93
 Surface Elev. _____ Total Hole Depth 4 ft. Diameter 2 in.
 Top of Casing _____ Water Level Initial _____ Static _____
 Screen: Dia _____ Length _____ Type/Size _____
 Casing: Dia _____ Length _____ Type _____
 Filter Pack Material _____ Rig/Core Type AD-2/Spit Spoon
 Drilling Company Bedford Env. Drilling Method Hydraulic Driven Permit # _____
 Driller Steve Boblett Log By Neil Frasca
 Checked By Taylor Sword License No. CPG APIG #8334

See Site Map
For Boring Location

COMMENTS:

Soil borings SB-1 through SB-6 were installed around former UST 271-3 at the St. Julian Creek Annex, Portsmouth, Virginia.

| Depth (ft.) | PID (ppm) | Sample ID Blow Count/ % Recovery | Graphic Log | USCS Class. | Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50% |
|-------------|-----------|--|-------------|-------------|---|
| | | | | | -2 |
| 0 | 3 | 10,6,5,6 /50 | | | Brown-grey color, dry, fine-grained SAND and SILT. |
| 2 | 3 | 6,3,4,6 /70 | | SM | Grey color, moist, fine-grained SAND and SILT. |
| 4 | | SS-3,2-4 | | | End of boring. |
| 6 | | | | | |
| 8 | | | | | |
| 10 | | | | | |



GROUNDWATER
TECHNOLOGY
GOVERNMENT SERVICES

Drilling Log

Soil Boring **SB-4**

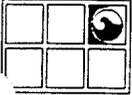
Project UST 271-3 Owner LANTDIV NAVFACENCOM
 Location St. Julian Creek Annex, VA Project No. 830011088.43 Date drilled 5/13/93
 Surface Elev. _____ Total Hole Depth 4 ft. Diameter 2 in.
 Top of Casing _____ Water Level Initial _____ Static _____
 Screen: Dia _____ Length _____ Type/Size _____
 Casing: Dia _____ Length _____ Type _____
 Filter Pack Material _____ Rig/Core Type AD-2/Spit Spoon
 Drilling Company Bedford Env. Drilling Method Hydraulic Driven Permit # _____
 Driller Steve Boblett Log By Neil Frasca
 Checked By Taylor Sword License No. CPG APIG #8334

See Site Map
For Boring Location

COMMENTS:

Soil borings SB-1 through SB-6 were installed around former UST 271-3 at the St. Julian Creek Annex, Portsmouth, Virginia.

| Depth (ft.) | PID (ppm) | Sample ID Blow Count/ % Recovery | Graphic Log | USCS Class. | Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50% |
|-------------|-----------|--|-------------|-------------|---|
| | | | | | -2 |
| 0 | 2 | 4,3,2,3 /70 SB-4,0-2 | | | Brown color, dry, fine-grained SAND and SILT. |
| 2 | 3 | 4,2,1,4 /70 SB-4,2-4 | | SM | Grey color, moist, fine-grained SAND and SILT. |
| 4 | | | | | End of boring. |
| 6 | | | | | |
| 8 | | | | | |
| 10 | | | | | |



GROUNDWATER
TECHNOLOGY
GOVERNMENT SERVICES

Drilling Log

Soil Boring **SB-5**

Project UST 271-3 Owner LANTDIV NAVFACENGCOM
 Location St. Julian Creek Annex, VA Project No. 830011088.43 Date drilled 5/13/93
 Surface Elev. _____ Total Hole Depth 4 ft. Diameter 2 in.
 Top of Casing _____ Water Level Initial 4 ft. Static _____
 Screen: Dia _____ Length _____ Type/Size _____
 Casing: Dia _____ Length _____ Type _____
 Filter Pack Material _____ Rig/Core Type AD-2/Spit Spoon
 Drilling Company Bedford Env. Drilling Method Hydraulic Driven Permit # _____
 Driller Steve Boblett Log By Neil Frasca
 Checked By Taylor Sword License No. CPG APIG #8334

See Site Map
For Boring Location

COMMENTS:

Soil borings SB-1 through SB-6 were installed around former UST 271-3 at the St. Julian Creek Annex, Portsmouth, Virginia.

| Depth (ft.) | PID (ppm) | Sample ID Blow Count/ % Recovery | Graphic Log | USCS Class. | Description |
|-------------|-----------|--|-------------|-------------|--|
| | | | | | (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50% |
| -2 | | | | | |
| 0 | 20 | 9,9,9,7 /60 | | SM | Brown color, dry, fine-grained SAND and SILT. |
| 2 | | SB-5,0-2 | | | |
| 5 | 5 | 0,10,8,10 /75 | | SM | Grey color, moist, fine-grained SAND and SILT. |
| 4 | | SB-5,2-4 | | | End of boring. |
| 6 | | | | | |
| 8 | | | | | |
| 10 | | | | | |



GROUNDWATER
TECHNOLOGY
GOVERNMENT SERVICES

Drilling Log

Soil Boring **SB-6**

Project UST 271-3 Owner LANTDIV NAVFACENCOM
 Location St. Julian Creek Annex, VA Project No. 83001088.43 Date drilled 5/13/93
 Surface Elev. _____ Total Hole Depth 2 ft. Diameter 2 in.
 Top of Casing _____ Water Level Initial 1.5 ft. Static _____
 Screen: Dia _____ Length _____ Type/Size _____
 Casing: Dia _____ Length _____ Type _____
 Filter Pack Material _____ Rig/Core Type AD-2/Spit Spoon
 Drilling Company Bedford Env. Drilling Method Hydraulic Driven Permit # _____
 Driller Steve Boblett Log By Neil Frasca
 Checked By Taylor Sword License No. CPG APIG #8334

See Site Map
For Boring Location

COMMENTS:

Soil borings SB-1 through SB-6 were installed around former UST 271-3 at the St. Julian Creek Annex, Portsmouth, Virginia.

| Depth (ft.) | PID (ppm) | Sample ID Blow Count/ % Recovery | Graphic Log | USCS Class. | Description |
|-------------|-----------|--|-------------|-------------|--|
| | | | | | (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50% |
| -2 | | | | | |
| 0 | 6 | 3,3,4,3 /40 | | SM | Grey color, wet, fine-grained SAND and SILT, trace fine-grained gravel 1.5 |
| 2 | | SB-6,0-2 | | | Encountered water End of boring. |
| 4 | | | | | |
| 6 | | | | | |
| 8 | | | | | |
| 10 | | | | | |

APPENDIX B

Soil Sample Analytical Laboratory Report with Chain-of-Custody Record



GTEL

ENVIRONMENTAL
LABORATORIES, INC.

4080 Pike Lane
Concord, CA 94520
(510) 685-7852
(800) 544-3422 Inside CA
(800) 423-7143 Outside CA
(510) 825-0720 FAX

Client Number: 830011088
Project ID: St. Julians Creek Annex, VA
Work Order Number: C3-05-0272
Date Reissued: 06-02-93

June 2, 1993

Taylor Sword
Government Services Incorporated
1244-B Executive Blvd., Suite 106
Chesapeake, VA 23320

Enclosed please find the analytical results for samples received by GTEL Environmental Laboratories, Inc. on 05/15/93, under chain of custody record 54926.

A formal Quality Assurance/Quality Control (QA/QC) program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria, unless otherwise stated in the footnotes.

GTEL is certified by the California State Department of Health Services, Laboratory certificate numbers 194 and 1075, to perform analyses for drinking water, wastewater, and hazardous waste materials according to EPA protocols.

If you have any questions concerning this analysis or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,
GTEL Environmental Laboratories, Inc.

Eileen F. Bullen
Laboratory Director

Client Number: 830011088
 Project ID: St. Julians Creek Annex, VA
 Work Order Number: C3-05-0272
 Date Reissued: 06-02-93

Table 1
ANALYTICAL RESULTS
 Hydrocarbons in Soil
 Method: GC-FID^a

| GTEL Sample Number | | 01 | 02 | 03 | 04 |
|-----------------------------------|------------------------|----------------------|-----------|-----------|-----------|
| Client Identification | | SB-1 0-2' | SB-2 0-2' | SB-3 0-2' | SB-4 0-2' |
| Date Sampled | | 05/13/93 | 05/13/93 | 05/13/93 | 05/13/93 |
| Date Extracted | | 05/24/93 | 05/24/93 | 05/24/93 | 05/24/93 |
| Date Analyzed | | 05/25/93 | 05/26/93 | 05/25/93 | 05/26/93 |
| Analyte | Detection Limit, mg/Kg | Concentration, mg/Kg | | | |
| TPH as gasoline | 10 | <10 | <10 | <10 | <10 |
| TPH as mineral spirits | 10 | <10 | <10 | <10 | <10 |
| TPH as kerosene | 10 | <10 | <10 | <10 | <10 |
| TPH as diesel fuel | 10 | 290 | <10 | <10 | <10 |
| TPH as motor oil | 100 | <100 | <100 | <100 | <100 |
| Detection Limit Multiplier | | 1 | 1 | 1 | 1 |
| Percent solids | | 93.7 | 93.2 | 83.8 | 90.0 |
| O-Terphenyl surrogate; % recovery | | 112 | 118 | 111 | 113 |

a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, USEPA, November, 1986. Results reported on a wet weight basis. O-Terphenyl surrogate acceptability limits are 50-150%.

Client Number: 830011088
 Project ID: St. Julians Creek Annex, VA
 Work Order Number: C3-05-0272
 Date Reissued: 06-02-93

Table 1 (continued)
ANALYTICAL RESULTS
Hydrocarbons in Soil
Method: GC-FID^a

| GTEL Sample Number | | 05 | 06 | 07 | 08* |
|-----------------------------------|------------------------|----------------------|-----------|------------------|------------------------|
| Client Identification | | SB-5 0-2' | SB-6 0-2' | SB-DUP 5 0-2' | SOIL PILE GRAB 0-2' |
| Date Sampled | | 05/13/93 | 05/13/93 | 05/13/93 | 05/13/93 |
| Date Extracted | | 05/24/93 | 05/24/93 | 05/24/93 | 05/24/93 |
| Date Analyzed | | 05/26/93 | 05/26/93 | 05/26/93 | 05/26/93 |
| Analyte | Detection Limit, mg/Kg | Concentration, mg/Kg | | | |
| TPH as gasoline | 10 | <10 | <10 | <10 | <200 |
| TPH as mineral spirits | 10 | <10 | <10 | <10 | <200 |
| TPH as kerosene | 10 | <10 | <10 | <10 | <200 |
| TPH as diesel fuel | 10 | 140 | <10 | 120 | 810 |
| TPH as motor oil | 100 | <100 | <100 | <100 | <2000 |
| Detection Limit Multiplier | | 1 | 1 | 1 | 20 |
| Percent solids | | 85.5 | 88.8 | 83.4 | 90.4 |
| O-Terphenyl surrogate, % recovery | | 104 | 103 | 110 | 110 |

a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, USEPA, November, 1986. Results reported on a wet weight basis. O-Terphenyl surrogate acceptability limits are 50-150%.

* Detection limit raised due to high levels of target compounds.

Client Number: 830011088
 Project ID: St. Julians Creek Annex, VA
 Work Order Number: C3-05-0272
 Date Reissued: 06-02-93

Table 1 (continued)
ANALYTICAL RESULTS
 Hydrocarbons in Soil
 Method: GC-FID^a

| GTEL Sample Number | | 09 | 10 | 11 | 12 |
|-----------------------------------|------------------------|----------------------|-----------|-----------|-----------|
| Client Identification | | SB-1 2-4' | SB-2 2-4' | SB-3 2-4' | SB-4 2-4' |
| Date Sampled | | 05/13/93 | 05/13/93 | 05/13/93 | 05/13/93 |
| Date Extracted | | 05/24/93 | 05/24/93 | 05/24/93 | 05/24/93 |
| Date Analyzed | | 05/25/93 | 05/25/93 | 05/25/93 | 05/25/93 |
| Analyte | Detection Limit, mg/Kg | Concentration, mg/Kg | | | |
| TPH as gasoline | 10 | <10 | <10 | <10 | <10 |
| TPH as mineral spirits | 10 | <10 | <10 | <10 | <10 |
| TPH as kerosene | 10 | <10 | <10 | <10 | <10 |
| TPH as diesel fuel | 10 | <10 | <10 | <10 | <10 |
| TPH as motor oil | 100 | <100 | <100 | <100 | <100 |
| Detection Limit Multiplier | | 1 | 1 | 1 | 1 |
| Percent solids | | 83.5 | 82.5 | 83.0 | 88.6 |
| O-Terphenyl surrogate, % recovery | | 115 | 105 | 112 | 119 |

a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, USEPA, November, 1986. Results reported on a wet weight basis. O-Terphenyl surrogate acceptability limits are 50-150%.

Client Number: 830011088
 Project ID: St. Julians Creek Annex, VA
 Work Order Number: C3-05-0272
 Date Reissued: 06-02-93

Table 1 (continued)
ANALYTICAL RESULTS
 Hydrocarbons in Soil
 Method: GC-FID^a

| GTEL Sample Number | | 13 | 14* | K052593 | |
|-----------------------------------|------------------------|----------------------|---------------------|--------------|--|
| Client Identification | | SB-5 2-4' | SOIL PILE GRAB 2-4' | METHOD BLANK | |
| Date Sampled | | 05/13/93 | 05/13/93 | -- | |
| Date Extracted | | 05/24/93 | 05/24/93 | 05/24/93 | |
| Date Analyzed | | 05/25/93 | 05/26/93 | 05/25/93 | |
| Analyte | Detection Limit, mg/Kg | Concentration, mg/Kg | | | |
| TPH as gasoline | 10 | <10 | <200 | <10 | |
| TPH as mineral spirits | 10 | <10 | <200 | <10 | |
| TPH as kerosene | 10 | <10 | <200 | <10 | |
| TPH as diesel fuel | 10 | <10 | 970 | <10 | |
| TPH as motor oil | 100 | <100 | <2000 | <100 | |
| Detection Limit Multiplier | | 1 | 20 | 1 | |
| Percent solids | | 84.4 | 90.3 | NA | |
| O-Terphenyl surrogate, % recovery | | 92.8 | 107 | 108 | |

a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, USEPA, November, 1986. Results reported on a wet weight basis. O-Terphenyl surrogate acceptability limits are 50-150%.

* Detection limit raised due to high levels of target compounds.

APPENDIX C
Drum Disposal Documentation

MEMORANDUM REPORT/SPECIFICATION
NNSY 5260/1 (REV. 11-77)

| | | | |
|------------|-------------------------------------|---------------------|-----------|
| FROM: CODE | 106,31A (LANCASTER) | SER. | |
| TO: (1) | BILL Hughes, Groundwater Technology | DIVISION-SUB-NUMBER | |
| (2) | Phone 436 7881 | DATE | 17 Aug 93 |
| (3) | FAX 436 2312 | J.O. NO. | SWO K.O. |

COPY TO:

SHIP/SUBJECT
Soil drum, Building 271, St. Julien's Creek Annex
REFERENCE

REMARKS (OR SPECIFICATIONS)
1. I have visited the above mentioned site and the soil drum has been removed. It is no longer available for disposal.

| ISSUE | DISTRI CODE/SHOP | | | | |
|-------|------------------|--|--|--|--|
| | | | | | |
| TE | | | | | |
| | | | | | |

| | | | |
|----------------|---------|-------------|-----------|
| PREPARED BY | DATE | REVIEWED BY | DATE |
| J.B. LANCASTER | 8/17/93 | | |
| CHECKED BY | DATE | APPROVED BY | PAGE OF |
| | | | |

- Upon completion of field work at each site, the contractor shall submit five copies of a draft report. Two copies are to be sent to LANTDIV and three copies should be sent to the activity. After receiving government comments, the A&E shall incorporate those comments into the Final Report for each site. Three copies of the Final Report should be sent to LANTDIV and five copies should be sent to the activity.

Unit Price C: Five Boring Site Check:

- Complete a one day visit to the site of the suspected release to gather background information needed and to secure a security clearance to drill.
- Advance five soil borings to a depth of 20 feet.
- Obtain one split spoon sample (per ASTM D-1586) at each of the following depths: 0.0 - 1.5', 3.5 - 5.0', 8.5 - 10.0', 13.5 - 15.0', and 18.5 - 20.0'.
- Scan the soil samples with an appropriate photoionization device (PID), flame ionization device (FID), or portable gas chromatography device.
- Submit the sample showing the highest contamination with a PID, etc., from each boring for analysis identified under option H. If no contamination is suspected in a boring, then submit the sample closest to and above the water table for analyses. For purposes of quality control, one trip blank will be taken per delivery order, one field blank will be taken per delivery order, one duplicate test will be completed for every five soil samples taken, and one duplicate test will be completed for every five water samples taken. All samples will be analyzed on a five day turnaround basis.
- Upon completion of field work at each site, the contractor shall submit five copies of a draft report that includes the information requested in enclosure (2). Two copies are to be sent to LANTDIV and three copies should be sent to the activity. After receiving government comments, the A&E shall incorporate those comments into the Final Report for each site. Three copies of the Final Report should be sent to LANTDIV and five copies should be sent to the activity.

Unit Price D: One Additional Boring:

- Install one additional boring. This will allow us to add one additional boring to any option. Please note the cost estimate for this option should include time to incorporate the information from this boring into the report. Assume a depth of 20 feet for this boring.

15 Pages

To: John Lancaster

From Dave Daly

9/MAR 83

Unit Price E: Three Well Site Check:

- Complete a one day visit to the site of the suspected release to gather background information needed (outlined in enclosure (2)) and to secure security clearance to drill.
- Advance three soil borings to a depth of 20 feet.
- Obtain one split spoon sample (per ASTM D-1586) at each of the following depths: 0.0 - 1.5', 3.5 - 5.0', 8.5 - 10.0', 13.5 - 15.0', and 18.5 - 20.0'.
- Scan the soil samples with an appropriate photoionization device (PID), flame ionization device (FID), or portable gas chromatography device.
- Submit the sample showing the highest contamination with a PID, etc., from each boring for analysis identified under option H. If no contamination is suspected in a boring, the submit the sample closest to and above the water table for analyses. For purposes of quality control, one trip blank will be taken per delivery order, one field blank will be taken per delivery order, one duplicate test will be completed for every five soil samples taken, and one duplicate test will be completed for every five water samples taken. All samples will be analyzed on a five day turnaround basis.
- Install a permanent monitoring well in each boring with the well screen set to intersect the water table. The monitoring wells shall be constructed in accordance with enclosure (2), LUST Monitoring Well Construction and Field Operations Specifications.
- Develop well by removing three well volumes of water from each well. Dispose of development water on the ground next to well.
- After allowing the wells to stabilize for a suitable period, check each well for free product.
- Obtain a groundwater sample from each well and analyze for the constituents identified under option H.
- Survey well elevations (vertical ties only), tape measure the horizontal distances between wells, determine groundwater levels in each well, and determine direction of groundwater flow.
- Upon completion of field work at each site, the contractor shall submit five copies of a draft report that includes the information requested in enclosure (2). Two copies are to be sent to LANTDIV and three copies should be sent to the activity. After receiving government comments, the A&E shall incorporate those comments into the Final Report for each site. Three copies of the Final Report should be sent to LANTDIV and five copies should be sent to the activity.

Unit Price E: Five Well Site Check:

- Complete a one day visit to the site of the suspected release to gather background information needed (outlined in enclosure (1)) and to secure security clearance to drill.
- Advance five soil borings to a depth of 20 feet.

- Obtain one split spoon sample (per ASTM D-1586) at each of the following depths: 0.0 - 1.5', 3.5 - 5.0', 8.5 - 10.0', 13.5 - 15.0', and 18.5 - 20.0'.
- Scan the soil samples with an appropriate photoionization device (PID), flame ionization device (FID), or portable gas chromatography device.
- Submit the sample showing the highest contamination with a PID, ~~etc., from each boring for analysis identified under option H.~~ If no contamination is suspected in a boring, submit the sample closest to and above the water table for analyses. For purposes of quality control, one trip blank will be taken per delivery order, one field blank will be taken per delivery order, one duplicate test will be completed for every five soil samples taken, and one duplicate test will be completed for every five water samples taken. All samples will be analyzed on a five day turnaround basis.
- If called for in the option, the contractor shall install a permanent monitoring well in each boring with the well screen set to intersect the water table. The monitoring wells shall be constructed in accordance with Enclosure (3), LUST Monitoring Well Construction and Field Operations Specifications.
- Develop well by removing three well volumes of water from each well. Dispose of development water on the ground next to well.
- After allowing the wells to stabilize for a suitable period, check each well for free product.
- Obtain a groundwater sample from each well and analyze for the ~~constituents identified under unit price H.~~
- Survey well elevations (vertical ties only), tape measure the horizontal distances between wells, determine groundwater levels in each well, and determine direction of groundwater flow.
- Upon completion of field work at each site, the contractor shall submit five copies of a draft report that includes the information requested in enclosure 2). Two copies are to be sent to LANTDIV and three copies should be sent to the activity. After receiving government comments, the A&E shall incorporate those comments into the Final Report for each site. Three copies of the Final Report should be sent to LANTDIV and five copies should be sent to the activity.

Unit Price G: One Additional Monitoring Well:

- " Advance one additional boring and convert it to a permanent monitoring well. This will allow us to add one additional boring to any option. Please note the cost estimate for this option should include time to incorporate the information from this well into the report. Assume a depth of 20 feet for this well.

Unit Price #: Sample Analyses Options:

- The cost of the following analyses will be prenegotiated on a per sample basis so that these analyses can be added to any unit price listed above:
1. TPH 418.1 (soil)
 2. TPH 418.1 (water)
 3. TPH 8015 Modified (soil)
 4. TPH 8015 Modified (water)
 5. EPA 8020 (soil)
 6. EPA 602 (water)
 7. EPA 610 (PAH, water)
 8. EPA 8100 (PAH, soil)
 9. EPA 624 (Purgables, water)
 10. EPA 625 (Base-neutrals and Acid extractables, Pesticides, water)
 11. EPA 8240 (Volatile Organics, soil)
 12. EPA 8250 (Semi-volatile organics, soil)
 13. Full TCLP
 14. Total Lead (EPA 239.2)
 15. TCLP Lead only

It is the responsibility of the contractor to dispose of all soil generated during drilling and/or sampling activities. Likewise, it is the responsibility of the contractor to dispose of all water generated during the development and sampling of groundwater wells. All disposal will be in accordance with applicable federal, state, and local regulations.

30 September 1992

SCOPE OF WORK

1. OBJECTIVE

This scope sets up a menu of items which will allow the government to choose the appropriate level of effort for achieving the primary objective for different circumstances. The work completed under this scope must meet the requirements of the EPA's 40 CFR 280.5 of the UST regulations.

2. WORK EFFORT OPTIONS

The following unit prices will make up the menu:

Unit Price A: Develop Workplan and Health and Safety Plan:

Prior to conducting any field work, the contractor shall prepare a Workplan (WP) and a Health and Safety Plan (HASP). The Workplan shall describe the methods used to advance soil borings, install monitoring wells, obtain samples, determine groundwater flow direction, and conduct field work as a whole, and shall also describe the rationale by which the presence of a release shall be either confirmed or denied. The HASP shall outline the safety precautions that will be taken while conducting fieldwork. The HASP shall include but is not limited to a description of the contractor's medical monitoring program, education and training program, site work control plan, personnel protection criteria, and contingency plans. The Safety and Health Guidelines for NACIP Confirmation Studies is included as enclosure (1) to provide guidance on developing a proper HASP.

These plans will be developed only once and shall serve as standard operating procedures for work completed under any of the unit prices listed below.

Unit Prices B: Three Boring Site Check:

- Complete a one day visit to the site of the suspected release to gather background information needed (outlined in enclosure (2)) and to secure security clearance to drill.
- Advance three soil borings to a depth of 20 feet.
- Obtain one split spoon sample (per ASTM D-1586) at each of the following depths: 0.0 - 1.5', 3.5 - 5.0', 8.5 - 10.0', 13.5 - 15.0', and 18.5 - 20.0'.
- Scan the soil samples with an appropriate photoionization device (PID), flame ionization device (FID), or portable gas chromatography device.
- Submit the soil sample showing the highest contamination with a PID, etc., from each boring for analysis identified under option H. If no contamination is suspected in a boring, submit the sample closest to and above the water table for analyses. For purposes of quality control, one trip blank will be taken per delivery order, one field blank will be taken per delivery order, one duplicate test will be completed for every five soil samples taken, and one duplicate test will be completed for every five water samples taken. All samples will be analyzed on a five day turnaround basis.

SAFETY AND HEALTH GUIDELINES FOR PACIP CONFIRMATION STUDIES

1. INTRODUCTION

A confirmation study represents the first time a site suspected of containing hazardous wastes is extensively sampled. During this phase, safety and health precautions are paramount since the nature of the hazards present is not known.

These guidelines describe the steps involved in confirmation, the responsibilities and roles of participants, and specific safety and health requirements of those involved in on-site investigation.

A. Confirmation Study Steps: Verification and Characterization

1. Verification

The verification step involves sampling and analysis to confirm or deny the presence of suspected contaminants at sites being studied.

Sampling may be conducted in all media including ground water, soil, sediment, surface water, and air, as well as biological samplings consisting of plant or animal tissue. In some cases, sampling of drums or other hazardous waste containment vessels may be necessary. Hazards encountered may be physical in nature or can result from exposure to toxic substances.

2. Characterization

a. The sites for which contamination has been verified in the first step require further investigation to determine the levels and distribution of contamination, both vertical and horizontal. This step will result in a quantitative assessment of the extent of contamination, sources, and contaminant migration potential.

b. The hazards encountered during characterization are similar to those encountered during the verification step. However, the investigators will have more information on contaminants present which will allow for more specific safety and health planning.

B. Participant Roles and Responsibilities

Advanced planning and preparation are the crucial elements for ensuring protection of field workers during confirmation studies; this requires coordination of safety and health planning among all those involved in the on-site investigation. The Engineering Field Division (EPD), contractor, and activity all have an important role in assuring that on-site investigations are accomplished with the highest level of worker safety and health in mind.

REPRODUCED AT GOVERNMENT EXPENSE

1. ~~Contractor~~ Field Division (EFD)

The EFD shall provide for adequate training of its personnel who administer, evaluate and monitor the hazardous waste site investigations to ensure contractor compliance with requirements presented in Part II herein. The EFD shall review the contractors safety and health plan to ensure that the Navy guidelines contained herein are addressed. The EFD review of the ~~Contractors~~ safety and health plan shall include the EFD Certified Industrial Hygienist or the servicing NAVMEDCOM Certified Industrial Hygienist (CIH), if one is not present at the EFD, and the EFD Safety Engineer/Manager prior to permitting the contractor to begin the on-site investigation.

2. Activity

a. The activity shall provide to the contractor, all information available to the activity regarding known hazards associated with each site being studied. The activity Point of Contact (POC) shall assist the contractor in preparation of the contingency plan by providing information on ~~Contractors~~ emergency medical assistance available on and off the activity. The POC shall notify local medical facilities of the hazards to be faced by workers on-site and select facilities most capable of responding to an emergency on-site. The POC shall apprise activity security of the procedures that will be followed in the event of an emergency, and shall assure that emergency transportation is available and has access to the work area.

b. All safety and health plans shall be made available for review by the activity safety and health manager and the servicing NAVMEDCOM Industrial Hygienist prior to the contractor beginning on-site investigation. A team review and preplanning meeting including the above safety and health professionals, other key activity personnel, and EFD personnel may be conducted at the request of the EFD Engineer-in-Charge if determined to be necessary.

3. Contractor

The prime contractor for the on-site investigation has primary responsibility of protecting the safety and health of all personnel on the work site and ensuring that contractor actions do not endanger surrounding personnel and/or property and that ~~contamination encountered at the site does~~ not contaminate other areas. All contractor personnel are responsible for strict adherence to applicable OSHA (29 CFR 1910, and 1926) state occupational safety and health regulations, and federal and state environmental regulations. The contractor shall designate and provide a safety and health contact on-site to ensure that all work is accomplished in compliance with pertinent standards and regulations promulgated by the groups above and to ensure conformance with the safety and health plans submitted for review to the Navy prior to initiating the on-site investigation.

II. SPECIFIC CONTRACTOR REQUIREMENTS

The contractor is required to submit a written safety and health plan for the Confirmation Study to the Navy for approval prior to conducting the on-site investigation. The safety and health plan shall include a description of the

PC PRODUCED AT GOVERNMENT EXPENSE

contractor's medical surveillance and training programs and site work control plans for each site investigated. The safety and health plan shall address all of the requirements of this section.

A. Medical Program

To safeguard the health of field personnel, the contractor shall have a medical program in place. The program shall address routine health care and baseline information on all employees who will work at confirmation sites, and emergency treatment procedures for use in on-site field operations.

1. Routine Health Care and Monitoring

a. Health Monitoring - As part of the contractor's medical monitoring program, each employee involved in hazardous waste site investigation shall have a pre-exposure physical examination. The medical program shall provide for annual follow-up examinations. Medical records of all employees shall be maintained by the contractor.

The physical examination will establish how employee's general health status, baseline physiological condition, blood chemistry, pulmonary, renal, and liver functions. The data on record for each employee shall indicate the employee's capability to work on-site using all levels of personnel protective equipment.

b. Pre-survey Physical - Each employee working at a site suspected of containing toxic or hazardous wastes, listed in 40 CFR 302 shall be examined for the suspected substance(s) preceding and following the on-site investigation.

2. Emergency Treatment (See Section II.G.5)

B. Education and Training Program

1. All employees involved in confirmation site investigations shall be trained in the area of safety and health. Training shall be provided to new employees and periodically to experienced employees.

2. The contractor shall designate a safety and health contact to oversee all work performed at the confirmation sites. The safety and health contact shall have an educational background and experience level in engineering or the sciences and must have received adequate formal safety and health training specific to the hazards of the work. Certification, by examination, as a Certified Safety Professional (CSP) or as a Certified Industrial Hygienist (CIH), although not required, is an example of recognized special education, experienced proven professional ability. The following types of safety and health training shall be completed by contractor personnel, as appropriate to their function during on-site investigations.

DUPLICATED AT GOVERNMENT EXPENSE

a. General Safety Procedures

- Site Entry
- (1) Safety practices and procedures for hazardous waste
 - (2) First Aid and Cardiopulmonary Resuscitation (CPR)
 - (3) Hazard Recognition and Evaluation
 - (4) Work Zone Determination and Procedures
 - (5) Decontamination Procedures
 - (6) Preparation and use of Site Safety Plans

b. Safety Equipment Use and Maintenance

- (1) Field Monitoring Equipment
- (2) Emergency Equipment
- (3) Personal Protective Equipment
 - (a) Protective clothing--types, uses, limitations and levels of protection
 - (b) Respiratory equipment--masks, respirators, Self Contained Breathing Apparatus (SCBA)

c. Site Investigation Safety Decision Making

- (1) Planning Site Safety Procedures
- (2) Contingency Planning for Emergencies

d. Site Work Control Plan

A specific site work control plan must be prepared for work to be performed at each site being investigated during the confirmation study. Each site work control plan must address all the areas outlined in this section and ~~must~~ be kept current and technically correct.

1. Site Entry Procedures - preplanning for on-site activity
 - a. Routes of entry and exit
 - b. Communication between workers on and off site
2. Survey and Reconnaissance

a. Before beginning on-site work, the contractor shall collect and analyze data to identify potential safety and health hazards inherent to the required tasks; equipment, nature of operations and suspected contaminants. The contractor will determine and implement the necessary

Contractor measures for these hazards, including safety and health requirements for personnel working on-site. Potential hazards shall include mechanical, electrical, toxic, and other hazards that may cause serious injury, illness, or significant environmental or property damage.

b. The contractor will revise the necessary hazard control measures as field work generates additional data.

3. Levels of Protection

a. Based upon information gathered during initial reconnaissance, the appropriate level of protection required by workers on-site shall be described. The various levels of protection are designed to protect against external and internal body exposure to hazardous materials when working at the site undergoing confirmation study.

b. Levels of protection shall be prescribed ranging from Level A for the highest level of protection needed to Level D, the minimum protection that must be provided. Levels of protection are described in Part 5 of the USEPA Interim Standard Operating Safety Guides, revised September 1982, or the latest edition as published.

c. Where information is incomplete on types, concentrations and potential for worker contact with chemicals, a level of protection shall be designated based on professional judgment of the contractor's safety and health contact.

4. Work Zones and Site Control

To minimize the transfer of hazardous substances from the site, due to site activities, contamination control procedures shall be outlined in the site work control plan.

a. Work Zones--Delineation of zones where prescribed operations occur is required. Work area shall be designated with boundaries, size of zones, distance between zones and access points into each zone. Numbers of personnel and equipment in each zone shall be listed in the plan for each operation.

b. Site Control--The site shall be controlled to reduce potential for contaminant transport from the site by personnel or equipment.

The contractor shall present procedures in the plan to:

- (1) Exclude unnecessary personnel from the general area;
- (2) minimize the amount of people and equipment on-site;
- (3) Manage work zones to control access of people and equipment.

(4) Implement proper decontamination procedures for equipment and protective clothing.

OFFICE OF ENVIRONMENTAL PROTECTION

5. Decontamination

Contamination of personnel and equipment may occur while working on site. To prevent transfer of harmful materials into clean areas decontamination procedures shall be established before entering the site.

a. Initial Decontamination Plans--Establish wash and rinse procedures for all personnel and materials leaving the contaminated area.

b. Equipment Decontamination - A plan shall be developed for decontamination of all equipment to be removed from the site.

c. Waste Disposal - Plans shall be developed for proper packaging of contaminated clothing, equipment and rinse water generated during site investigation for disposal on-site or off-site at the discretion of the EIC.

d. Contamination Reduction Corridor (CRC)--A CRC shall be established to reduce access into and away from the contaminated area.

e. Medical Emergencies--A plan for decontamination shall also be prepared for medical emergency situations and should be addressed in the contingency plan section.

6. Contingency Planning

A plan shall be developed to address a course of action in the case of an emergency situation.

a. Key personnel--All key personnel and alternates responsible for site safety and health and on-site operations shall be identified.

b. Site emergency procedures shall be established, stated in the plan and conveyed to all personnel during site specific training.

Procedures shall include:

- (1) escape routes
- (2) signals for evacuating work parties
- (3) emergency communication
- (4) fire, explosion and hazardous material release response
- (5) first aid and evacuation of injured persons

DDUCED AT GOVERNMENT EXPENSE

c. Medical facilities and vehicles for emergency transportation shall be located and arrangements made for emergency medical care in the event of injury due to chemical exposure of personnel. This information shall be provided in the plan.

d. Training of personnel for non-routine site activities to address unlikely events that may occur on-site shall be established.

e. Procedures for operation during adverse weather conditions which may affect operations at the site shall be established in the plan.

7. Recordkeeping

Records shall be maintained of all safety and health related matters that occur during the course of the study. This will include field analytical data collected using field instrumentation (i.e., HNU, OVA), employee health monitoring data, safety and health planning documentation and contingency plan communications and contacts. The records will be provided to the EIC upon completion of the contract.

11-17-93 AT 03:13 PM

UST MONITORING WELL CONSTRUCTION
AND
FIELD OPERATIONS

REQUIREMENTS

Well permits required by state agencies are the responsibility of the contractor. The Contractor shall submit applications for well permits to the Navy activity immediately after the notice to proceed is issued. All monitoring wells will be installed in accordance with the following Navy UST monitoring well specifications.

DRILLING

During the drilling program, boreholes will be advanced using conventional hollow stem auger drilling methods. If it is the opinion of the contractor that air or mud rotary drill methods are necessary, approval must be obtained from the EIC. Presentation of justification for a boring method change shall be presented prior to drilling.

The wells will be constructed of flush joint threaded PVC well screen and riser casing depending on conditions encountered during borehole completion.

Well construction details are shown in Figures A-1 and A-2. A drill mounted on an All-Terrain-Vehicle (ATV) may be required for access to remote areas. Each rig will use necessary tools, supplies and equipment supplied by the contractor to drill each site. Drill crews should consist of an experienced driller and a driller assistant for work on each rig. A geologist, experienced in hazardous waste site investigations, shall be on site to monitor the drillers efforts and for air monitoring/safety control. Additional contractor personnel may be needed to transport water to the rigs, clean tools, assist in the installation of the security and marker pipes, construct the concrete aprons/collars and develop the wells. A potable water source on base will be designated by the Government.

Standard penetration tests will be performed in accordance with ASTM D-1586. Standard penetration tests will be performed at the following depths: 0.0-foot to 1.5-foot; 1.5-foot to 3.0-foot; 3.0-foot to 4.5-foot; and 5-foot centers thereafter. A boring log of the soil type, stratification, consistency and groundwater level will be prepared. Groundwater sampling using a Hydropunch penetrometer and the corresponding laboratory analysis to help define the lateral and horizontal extent of the contamination will be a prepriced option which the Contracting Officer may exercise. The Hydropunch sample shall be obtained from either the upper or lower portion of the aquifer as needed. The use of augering to provide a pilot hole shall not be used. The Hydropunch operation shall not produce soil debris or excess groundwater. The location of Hydropunch penetrometers shall be detailed in the preliminary well location plan:

SAMPLING

Two soil samples will be obtained from each boring/well in accordance with ASTM Method D-1586 for split barrel sampling. The first sample will be obtained from 2 to 5 feet below ground surface. The second soil sample will be from the water table to 5 feet above the water table. Each soil sample will be screened in the field using an HNu photoionizer, organic vapor detector or similar type direct readout instrument to identify the presence of petroleum product within the soils. This field screening will provide a preliminary indication of the vertical and horizontal extent of petroleum contamination in order to select the optimum locations of other monitoring wells during the drilling program. Based on the field screening, monitoring wells will be installed at the locations where the most significant accumulation of fuel is encountered.

Enclosure (2)

DEVELOPMENT

After completion of the soil sampling and drilling to the specified depth, 2-inch or 4-inch (as required by the EIC) I.D. flush-threaded Schedule 40 PVC (Schedule 80 in traffic areas) monitoring wells with slotted screens and well casings will be installed in the borehole. A 5 to 15-foot section of 0.01 inch slotted PVC well screen should be used in each well. A sand pack will be placed around the slotted well screen extending to 2 feet above the top of the screen. A bentonite seal (minimum thickness - 1 ft.) will be placed on top of the sand pack. Finally, a ground mixture of two parts sand and one part cement, thoroughly mixed with the specified amount of potable water, will be placed in the borehole and rodded to insure a proper seal.

All wells will be developed following their installation to remove fine ground materials that may have entered the well during construction. This will be accomplished by either bailing or continuous low yield pumping. Equipment used for well installation, that may have come in contact with potentially contaminated material will be decontaminated with a high pressure steam clean wash followed by a potable supply water rinse. The drill equipment and tools shall be cleaned prior to drilling each well using a portable decontamination system/operation supplied by the contractor.

All decontamination wash water and groundwater generated from well development and pump tests shall be containerized in DOT approved barrels. Soil drill cuttings removed from boreholes shall be containerized in DOT approved barrels. All barrels shall be properly identified with permanent markings. It is expected that sampling Required for this effort will suffice in determining if the materials are hazardous. All containerized groundwater and soil shall be disposed of outside of the activity by the contractor using methods that are acceptable to local, State, and Federal agencies.

Supplies and equipment will be transported to the lay-down area designated by the Government. Any office space, trailers, etc., required for drilling, subsequent sampling and shipping shall be arranged and provided by the contractor.

WELL HEAD COMPLETION

A 4-inch diameter security pipe with a hinged locking cap will be installed on the well casing top having an embedment depth of 2.5 feet into the grout.

There are two acceptable methods of completing the wellheads.

In traffic areas (and non-traffic areas where required), a "flush" manhole type cover shall be built into a concrete pad as shown in figure A-1. If the well is installed through a paved or concrete surface, the annular space between the casing and the bore hole shall be grouted to a depth of at least 2.5 feet and finished with a concrete collar. If the well was not installed through a concrete or paved medium and still finished as a high traffic area well, a concrete apron measuring 5-foot by 5-foot by 0.5 foot will be constructed around each well. This apron/collar will be constructed of 3,000 psi ready-mixed concrete. The concrete will be crowned to meet the finished grade of surrounding pavement as required. The concrete pads can be constructed within five days after all of the wells have been installed.

In non-traffic areas the acceptable method of finishing a wellhead is shown in Figure A-2. Each well will be marked with three Schedule 40 steel pipes, 3-inch I.D., imbedded in a minimum of 2.5-foot of 3,000 psi concrete. The concrete used to secure the three pipes will be poured at the same time and be an integral part of the 5-foot by 5-foot by 0.5-foot concrete apron described above. The security pipes will extend a minimum 2.5 feet and maximum 4.0 feet above the ground surface. The steel marker pipes will be filled with concrete and painted day-glo yellow or an equivalent.

In all finishing methods, the well covers will be properly labeled by metal stamping on the exterior of the security pipe locking cap and by labeling vertically on the exterior of the security pipe or manhole cover as appropriate. The labeling shall consist of the letters UGW (UST Groundwater) to describe the medium and the reason for the well, and a number specific to each well.

A sign reading "NOT FOR POTABLE USE OR DISPOSAL" shall be firmly attached to each well.

If the contractor or project team may supplement these requirements, but may not modify or delete them, in total or in part, without prior approval of the Contracting Officer.

03 Nov 92

OUTLINE OF A&E SERVICES

Title: SITE CHARACTERIZATION STUDY, BUILDING 271, ST. JULIENS CREEK ANNEX

Task: PHASE A: Perform field investigation, soil and groundwater sampling, and laboratory analysis. Prepare a report discussing results and recommendations.

PHASE B: At the Government's option, prepare a Corrective Action Plan (CAP), per Virginia Regulation VR 680-13-02, paragraph 6.7.

PHASE C: At the Government's option, perform remediation design in accordance with an approved CAP.

Scope: PHASE A: The A/E shall perform an assessment of the ground/underground area around Building 271, St. Julien's Creek Annex. The final report will be submitted to the Commonwealth of Virginia State Water Control Board (SWCB) by the Norfolk Naval Shipyard (NNSY) for review and acceptance.

The site to be investigated is adjacent to a fire station (Building 271) and St. Juliens Creek. The ground surface is predominately grassy, with areas of gravel used for fire fighting training. The soil is suspected to have been contaminated with diesel fuel, gasoline, and waste oil used in the training operations. Carbon dioxide and water have been used in the past for training; there was also the possible use of Aqueous Film Forming Foam (AFFF).

The results of this site assessment shall provide the information required by Virginia Regulation VR 680-13-02, paragraph 6.4.A, and the complete Site Characterization Report Checklist provided as attachment (1). The report shall include site assessment, risk assessment and remediation assessment.

Proper quality assurance/quality control (QA/QC) procedures shall be used in all sample collection and delivery in accordance with established Environmental Protection Agency methods or methods approved by the SWCB. A written verification that the laboratory used for analysis is certified by the Commonwealth of Virginia shall be submitted prior to any analysis work.

Sampling, testing and analysis shall include:

1. Providing five groundwater monitoring wells. Provide continuous soil sampling to water table and at 5 foot intervals thereafter, the wells shall extend at least 7 feet below the water table. The anticipated well depth is 15 feet below land surface. The Government will mark utilities in the vicinity of work prior to the start of drilling.

FOR SIGNATURE - PLEASE FAX BACK

| | | |
|--|---------------------|----------------|
| Post-It™ brand fax transmittal memo 7671 | | # of pages = 5 |
| To CAREY MOORE | From TON BARSTOW | |
| Co. NNSY | Co. PWC | |
| Dept. CODE 106 | Phone # 444-3765 | |
| Fax # 396-7026 | Fax # 445-9204 | |

Title: SITE CHARACTERIZATION STUDY, BUILDING 321, ST. JULIENS CREEK ANNEX

2. Performing six soil borings. Provide continuous soil sampling to the water table. The anticipated boring depth is 7 feet below land surface. The Government will mark utilities in the vicinity of work prior to the start of drilling.
3. Collecting soil samples. All samples shall be field checked with an appropriate type of organic vapor analyzer to assist in the selection of samples that require laboratory analysis, and to reduce unnecessary laboratory analysis. Proper QA/QC procedures shall be used in all sample collection and delivery. Soils for each boring shall be field classified. Soil samples shall be placed in clean glass jars, labeled, preserved on ice, and stored in a protective cooler. Cuttings from the borings shall be placed in properly labeled drums and left on site for disposal by NNSY.
4. Testing soil samples for BTEX, TPH, and PCBs. Proper QA/QC procedures shall be used in all analyses.
5. Constructing each PVC well in accordance with State Water Control Board guidelines. In grassy areas, the wells shall have a protective casing with a locking well cover. In paved areas, the wells shall be completed flush with the surface with a locking well cover. Development of the wells shall continue until the effluent is as free of visible suspended solids as possible. A minimum of three well volumes shall be purged from the well prior to sampling. Following completion of the purge, a groundwater sample shall be retrieved and placed into a sample bottle. Proper QA/QC procedures shall be used in all sample collection and delivery.
6. Analyzing groundwater samples for BTEX, TPH, and PCBs. Proper QA/QC procedures shall be used in all analyses.
7. Performing one TCLP test on a soil sample from the fire fighting training site.

The report shall provide a comprehensive evaluation of all available data and include the following sections:

- a. Site information including past and present usage
- b. Sampling procedures
- c. Well construction logs
- d. Quality control procedures
- e. Analytical methods and parameters
- f. Sample analytical results

Title: SITE CHARACTERIZATION STUDY, BUILDING 321, ST. JULIENS CREEK ANNEX

- (1) Physical/chemical properties of the contaminant
 - (2) Nature, quantity and extent of the release
 - (3) Evidence if free product is found
 - (4) Geologic/hydrologic site characterization
 - (5) Current and projected land/water uses
 - (6) Water quality
 - (7) Subsurface soil condition
 - (8) Evidence if contaminated soils are in contact with the
- h. Risk Assessment
- (1) Evidence if wells of the area have been affected
 - (2) Use and approximate location of wells potentially affected by the release
 - (3) Identification of potential and impacted receptors
 - (4) Migration routes
 - (5) Surrounding population
 - (6) Potential for additional environmental damage
- i. Remediation Assessment
- (1) Potential for remediation and applicability of different remediation technologies to the site
 - (2) Free product investigation, methods for determining and results
 - (3) Recommendation of actions if required
- j. Conclusions

Site maps shall be provided showing monitoring well locations. Analytical data for compounds exceeding detection limits shall be provided in tabular form with a comparison of this data to relevant standards and criteria.

Title: SITE CHARACTERIZATION STUDY, BUILDING 321, ST. JULIENS CREEK ANNEX

Submit four copies of the final report. Text shall be double spaced; copies shall be double-sided to reduce bulk. All graphs, charts, illustrations and site plans shall be submitted on 8-1/2" x 11" size paper.

The work shall be completed in accordance with the following schedule:

| <u>TASK</u> | <u>DAY</u> |
|---------------------------------|------------|
| Delivery Order Award | 0 |
| Submit Laboratory Certification | 3 |
| Submit Final Report | 60 |

The required completion date is 60 days after award of contract change order.

Hazardous Conditions - Attention is directed to existence of potentially hazardous conditions in the area of work. All due care should be taken to prevent injury to personnel. Any necessary disturbance of any potentially hazardous materials, such as asbestos, or other questionable materials, should be brought to the attention of the contracting office before proceeding.

Submittals: A&E submittals for this project shall be at the final completion stage. All submittals shall be in accordance with the "Guide for Architect-Engineer Firms Performing Services for the Atlantic Division" with the exception that all submittals shall be directed to the MAILING ADDRESS. The Job Order Number is to be referenced in all correspondence. Submittals which are found to be incomplete or contain errors will be returned for corrections.

Quality Control Data: Your firm will be expected to perform a quality control review. Your final submittal shall include a 100% report highlighted to indicate that the review as performed and corrections made and a signature of the Project Engineer or Principal of the firm on the cover sheet indicating a quality review was performed.

Contact for job information: Contract Manager: Mr. Donald L. Ewell, P.E.
Code 210, Telephone: 444-4200

Engineer-In-Charge: Mr. Thomas E. Barstow, P.E.
Code 421, Telephone: 444-3765

Activity Contact: Mr. Ron Keyes
Telephone: 396-7248

MAILING ADDRESS: Navy Public Works Center
Engineering Department
Code 421, Bldg Z-140
Norfolk, Virginia 23511-6098

Title: SITE CHARACTERIZATION STUDY, BUILDING 321, ST. JULIENS CREEK ANNEX

References: Job Order No. 1532588, RCP 9167-92

We concur with the general description of work and special conditions described above.

CUSTOMER REPRESENTATIVE DATE

A/E REPRESENTATIVE DATE

EIC/AIC DATE

A/E CONTRACT MANAGER DATE

We intend to fund this project in an amount at least equal to the Government estimate of design fee plus applicable administrative costs.

CUSTOMER REPRESENTATIVE DATE

Prep of work at station S.D. will complete in 10 days. Keys

- FORCE TO OPEN GATE

- NNSY TO CUT OFF ANGLE @ GROUND

How do we get work Done?

USE an AWR To Shop 26, call shop to line prior to putting down. (see Mr. DeWitt for AWR 3 J.O.)

AREA OUTSIDE OF BLDG. USED FOR FIRE FIGHTING TRAINING 14 Oct 92

GRAVEL PIT
OUTLINE OF A&E SERVICES

Title: SITE CHARACTERIZATION STUDY, BUILDING 271, ST. JULIENS CREEK ANNEX

Task: PHASE A: Perform field investigation, soil and groundwater sampling, and laboratory analysis. Prepare a report discussing results and recommendations.

PHASE B: At the Government's option, prepare a Corrective Action Plan (CAP), per Virginia Regulation VR 680-13-02, paragraph 6.7.

PHASE C: AT GOV'T'S OPTION, PERFORM REMEDIATION DESIGN, Scope: PHASE A: The A/E shall perform an assessment of the ground/underground area around Building 271, St. Julien's Creek Annex. The final report will be submitted to the Commonwealth of Virginia State Water Control Board (SWCB) by the Norfolk Naval Shipyard (NNSY) for review and acceptance.

The results of this site assessment shall provide the information required by Virginia Regulation VR 680-13-02, paragraph 6.4.A, and the complete Site Characterization Report Checklist provided as attachment (1). The report shall include site assessment, risk assessment and remediation assessment.

Proper quality assurance/quality control (used in all sample collection and delivery established Environmental Protection Agency approved by the SWCB. A written verification for analysis is certified by the Commonwealth submitted prior to any analysis work.

Sampling, testing and analysis shall include

1. Providing ^{FIVE} four groundwater monitoring soil sampling to water table and at 5 foot wells shall extend at least 7 feet below anticipated well depth is 15 feet below 1. will mark utilities in the vicinity of well drilling.
2. Collecting soil samples. All samples an appropriate type of organic vapor analysis, selection of samples that require laboratory analysis, and to reduce unnecessary laboratory analysis. Proper QA/QC procedures shall be used in all sample collection and delivery. Soils for each boring shall be field classified. Soil samples shall be placed in clean glass jars with ~~rafton lined lids~~, labeled, preserved on ice, and stored in a protective cooler. Cuttings from the borings shall be placed in properly labeled drums and left on site for disposal by NNSY.

No. Host STATE completion Dates

USES GASOLINE, DIESEL, & WASTE OIL

POSSIBLE USE OF AFFF

ALSO, SIX SOIL BORINGS TO WATER TABLE

Monday Call Gold Barb
GET From Sawyer
AWR

Tomorrow 4 hours

5430
4574
Gold Barb

What is the approximate volume; this must be coordinated with Ralph, they can be moved to 163 n154 until the analysis results are known.

5 DRUMS

Post-It™ brand fax transmittal memo 7671 # of pages > 4

| | | | |
|-------|-----------|---------|-------------|
| To | ZON KEYES | From | TOM BARSTOW |
| Co. | NNSY | Co. | PWC |
| Dept. | CODE 106 | Phone # | 444-3765 |
| Fax # | 396-7026 | Fax # | 445-9204 |

PERFORM ONE
TELP TEST #

Title: SITE CHARACTERIZATION STUDY, BUILDING 321, ST. JULIENS CREEK ANNEX

3. Testing soil samples for BTEX and TPH, ~~AND PCB~~ ~~AND TOTALED~~, Proper QA/QC procedures shall be used in all analyses.

4. Each PVC well shall be constructed in accordance with State Water Control Board guidelines. The wells shall have a protective casing with a locking well cover. ~~In paved areas, the wells shall be completed flush with the surface with a locking well cover.~~ Development of the wells shall continue until the effluent is as free of visible suspended solids as possible. A minimum of three well volumes shall be purged from the well prior to sampling. Following completion of the purge, a groundwater sample shall be retrieved and placed into a sample bottle. Proper QA/QC procedures shall be used in all sample collection and delivery.

SAME

5. Analyzing groundwater samples for BTEX and TPH, ~~AND PCB~~ ~~AND TOTALED~~, Proper QA/QC procedures shall be used in all analyses.

The report shall provide a comprehensive evaluation of all available data and include the following sections:

- a. Site information including past and present usage
- b. Sampling procedures
- c. Well construction logs
- d. Quality control procedures
- e. Analytical methods and parameters
- f. Sample analytical results
- g. Site Assessment
 - (1) Physical/chemical properties of the contaminant
 - (2) Nature, quantity and extent of the release
 - (3) Evidence if free product is found
 - (4) Geologic/hydrologic site characterization
 - (5) Current and projected land/water uses
 - (6) Water quality
 - (7) Subsurface soil condition
 - (8) Evidence if contaminated soils are in contact with the ground water

Title: SITE CHARACTERIZATION STUDY, BUILDING 321, ST, JULIENS CREEK ANNEX

h. Risk Assessment

- (1) Evidence if wells of the area have been affected
- (2) Use and approximate location of wells potentially affected by the release
- (3) Identification of potential and impacted receptors
- (4) Migration routes
- (5) Surrounding population
- (6) Potential for additional environmental damage

i. Remediation Assessment

- (1) Potential for remediation and applicability of different remediation technologies to the site
- (2) Free product investigation, methods for determining and results
- (3) Recommendation of actions if required

j. Conclusions

Site maps shall be provided showing monitoring well locations. Analytical data for compounds exceeding detection limits shall be provided in tabular form with a comparison of this data to relevant standards and criteria.

Submit four copies of the final report. Text shall be double spaced; copies shall be double-sided to reduce bulk. All graphs, charts, illustrations and site plans shall be submitted on 8-1/2" x 11" size paper.

The work shall be completed in accordance with the following schedule:

| <u>TASK</u> | <u>DAY</u> |
|---------------------------------|------------------|
| Delivery Order Award | 0 |
| Submit Laboratory Certification | 3 |
| Submit Final Report | 28 60 |

The required completion date is ~~28~~ 60 days after award of contract change order.

Title: SITE CHARACTERIZATION STUDY, BUILDING 321, ST. JULIENS CREEK ANNEX

Hazardous Conditions - Attention is directed to existence of potentially hazardous conditions in the area of work. All due care should be taken to prevent injury to personnel. Any necessary disturbance of any potentially hazardous materials, such as asbestos, or other questionable materials, should be brought to the attention of the contracting office before proceeding.

Submittals: A&E submittals for this project shall be at the final completion stage. All submittals shall be in accordance with the "Guide for Architect-Engineer Firms Performing Services for the Atlantic Division" with the exception that all submittals shall be directed to the MAILING ADDRESS. The Job Order Number is to be referenced in all correspondence. Submittals which are found to be incomplete or contain errors will be returned for corrections.

Quality Control Data: Your firm will be expected to perform a quality control review. Your final submittal shall include a 100% report highlighted to indicate that the review as performed and corrections made and a signature of the Project Engineer or Principal of the firm on the cover sheet indicating a quality review was performed.

Contact for job information: Contract Manager: Mr. Donald L. Ewell, P.E.
Code 210, Telephone: 444-4200

Engineer-In-Charge: Mr. Thomas E. Barstow, P.E.
Code 421, Telephone: 444-3765

Activity Contact: Mr. Ron Keyes
Telephone: 396-7248

MAILING ADDRESS: Navy Public Works Center
Engineering Department
Code 421, Bldg Z-140
Norfolk, Virginia 23511-6098

References: Job Order No. 1532588, RCP 9167-92

D Coleman 10/27/92
~~_____~~ 10/21/92
R.H. Keyes
D.L. Ewell 10/27/92

NORFOLK NAVAL SHIPYARD ENVIRONMENTAL PROGRAMS DIVISION

Fax Cover Sheet



DATE: 11/2/92

TO: Tom Barston CODE:

PHONE: FAX #: 44⁵~~6~~-9204

MESSAGE: Attached Bldg 271 s.v.

Chem. analysis report

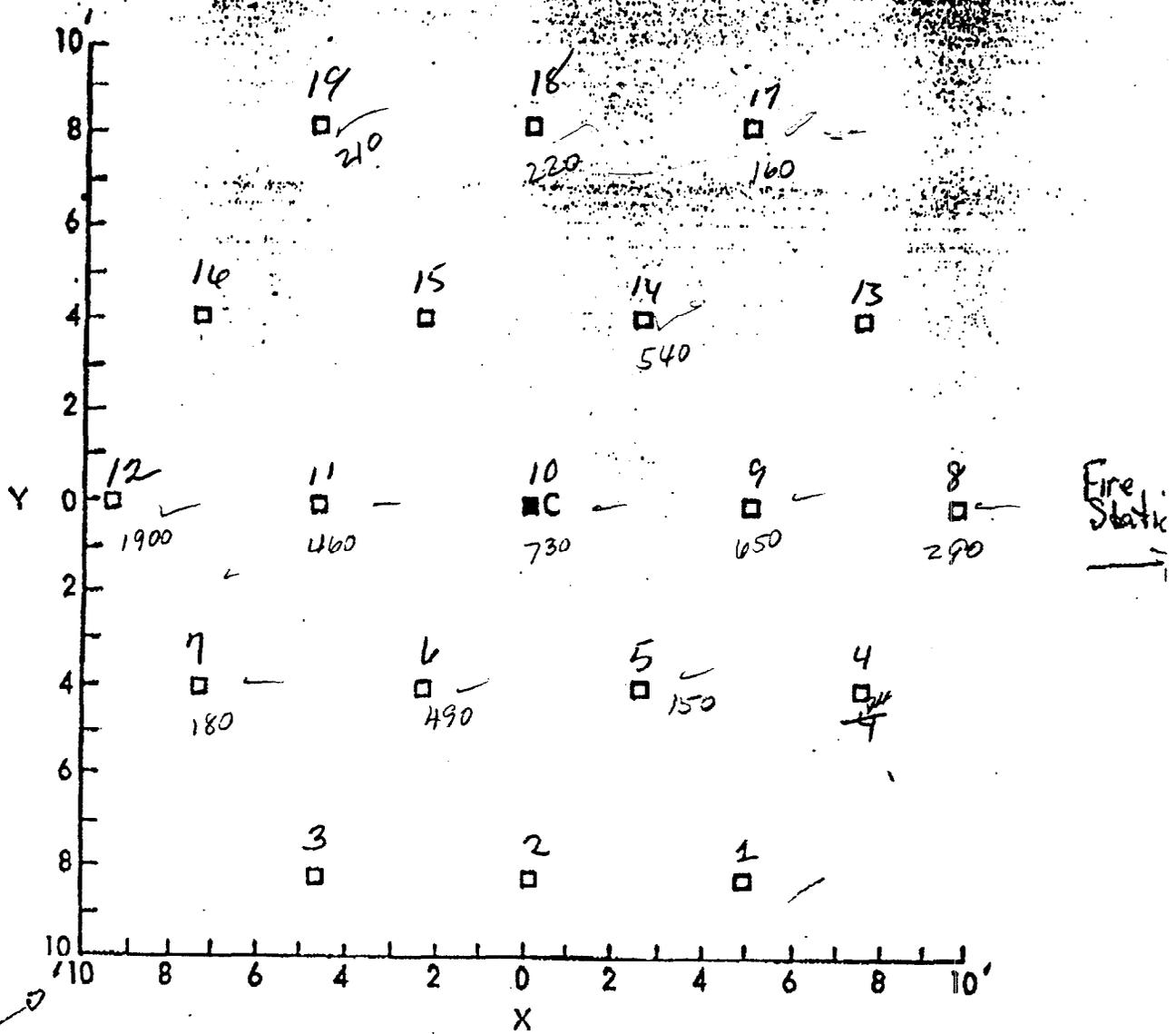
Pass to A/B.

FROM: Ron Keys CODE: 106.31A

PHONE: 396-7661 FAX #: (804) 396-7028

NUMBER OF PAGES INCLUDING COVER SHEET:

RIVER SITE



The outer boundary of the contaminated area is assumed to be 10 feet from the center (C) of the spill site.

Location of sampling points in a 19-point grid.

20 SAMPLES TOTAL

Sample depth sufficient to achieve the needed volume

- Background sample

feet
50
away from edge of contamination area

Fire Static

FOR OFFICIAL USE ONLY
REPORTS MAY BE DUPLICATED,
BUT ONLY IN THEIR ENTIRETY.

REPORT NUMBER

92NN12971

OCT. 5 1992

LABORATORY DIVISION
NORFOLK NAVAL SHIPYARD
PORTSMOUTH, VA. 23709-5000

Customer's Ref. No.: 106-2253-0553

Submitted by: KEYES

Shop/Code : C106.3

Phone : 7019

Program Code : SDWA

Job Order Number: 991003SDWA

Sample Received: 920915

Sample Source: SOIL

ENVIRONMENTAL LABORATORY REPORT

DESCRIPTION: SOIL, FIRE STATION ST "J" EAST SIDE

| TESTS | UNITS | Results | | | | Specification Limits | |
|----------------------|-------|---------------|---------------|---------------|---------------|----------------------|---------|
| | | 001 SOIL#1 | 002 SOIL#2 | 003 SOIL#3 | 004 SOIL#4 | (Lower) | (Upper) |
| OIL&GREASE on SOLIDS | ppm | 96 | 11 | 54 | 26 | | |

FOR OFFICIAL USE ONLY
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BUT ONLY IN THEIR ENTIRETY.

REPORT NUMBER

92NN12971

OCT. 5 1992

LABORATORY DIVISION
NORFOLK NAVAL SHIPYARD
PORTSMOUTH, VA. 23709-5000

Customer's Ref. No.: 106-2253-0553

Program Code : SDWA

Submitted by: KEYES

Job Order Number: 991003SDWA

Op/Code : C106.3

Sample Received: 920915

Phone : 7019

Sample Source: SOIL

ENVIRONMENTAL LABORATORY REPORT

DESCRIPTION: SOIL, FIRE STATION ST "J" EAST SIDE

| TESTS | UNITS | Results | | | | Specification Limits | |
|----------------------|-------|---------|--------|--------|--------|----------------------|---------|
| | | 005 | 006 | 007 | 008 | (Lower) | (Upper) |
| | | SOIL#5 | SOIL#6 | SOIL#7 | SOIL#8 | | |
| OIL&GREASE on SOLIDS | ppm | 150 | 490 | 180 | 290 | | |

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OCT. 5 1992

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NORFOLK NAVAL SHIPYARD
PORTSMOUTH, VA. 23709-5000

Customer's Ref. No.: 106-2253-0553

Submitted by: KEYES

Shop/Code : C106.3

Phone : 7019

Program Code : SDWA

Job Order Number: 991003SDWA

Sample Received: 920915

Sample Source: SOIL

ENVIRONMENTAL LABORATORY REPORT

DESCRIPTION: SOIL, FIRE STATION ST "J" EAST SIDE

| TESTS | UNITS | Results | | | | Specification Limits | |
|----------------------|-------|---------------|----------------|----------------|----------------|----------------------|---------|
| | | 009 SOIL#9 | 010 SOIL#10 | 011 SOIL#11 | 012 SOIL#12 | (Lower) | (Upper) |
| OIL&GREASE on SOLIDS | ppm | 650 | 730 | 460 | 1900 | | |

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REPORT NUMBER

92NN12971

OCT. 5 1992

LABORATORY DIVISION
 NORFOLK NAVAL SHIPYARD
 PORTSMOUTH, VA. 23709-5000

Customer's Ref. No.: 106-2253-0553

Program Code : SDWA

Submitted by: KEYES

Job Order Number: 991003SDWA

Prop/Code : C106.3

Sample Received: 920915

Phone : 7019

Sample Source: SOIL

ENVIRONMENTAL LABORATORY REPORT

DESCRIPTION: SOIL, FIRE STATION ST "J" EAST SIDE

| TESTS | UNITS | Results | | | | Specification Limits | |
|----------------------|-------|---------|---------|---------|---------|----------------------|---------|
| | | 013 | 014 | 015 | 016 | (Lower) | (Upper) |
| | | SOIL#13 | SOIL#14 | SOIL#15 | SOIL#16 | | |
| OIL&GREASE on SOLIDS | ppm | < 10 | 540 | 23 | 90 | | |

FOR OFFICIAL USE ONLY
REPORTS MAY BE DUPLICATED,
BUT ONLY IN THEIR ENTIRETY.

REPORT NUMBER

92NN12971

OCT. 5 1992

LABORATORY DIVISION
NORFOLK NAVAL SHIPYARD
PORTSMOUTH, VA. 23709-5000

Customer's Ref. No.: 106-2253-0553
Submitted by: KEYES
Shop/Code : C106.3
Phone : 7019

Program Code : SDWA
Job Order Number: 991003SDWA
Sample Received: 920915
Sample Source: SOIL

ENVIRONMENTAL LABORATORY REPORT

DESCRIPTION: SOIL, FIRE STATION ST "J" EAST SIDE

| TESTS | UNITS | Results | | | | Specification Limits | |
|----------------------|-------|---------|---------|---------|---------|----------------------|---------|
| | | 017 | 018 | 019 | 020 | (Lower) | (Upper) |
| | | SOIL#17 | SOIL#18 | SOIL#19 | SOIL#20 | | |
| OIL&GREASE on SOLIDS | ppm | 160 | 220 | 210 | 680 | | |

REMARKS:

* Reviewer (signature) *MOM Davies* Date: *10.5.92* | Released (signature) *RRS* Date: *10.5.92* | Code: 134.12
| Phone 6-3029

* The person designated to sign for an action verifies, based on personal observation, certified records, or direct report from watchstanders, and certifies by his signature that the action has been performed in accordance with the specified requirements.

Distribution:

ENVIRONMENTAL CHEMISTRY LABORATORY ANALYSIS REQUEST FORM

I ADMINISTRATIVE INFORMATION

Priority: 1 (2) 3 (Circle one)

Requested completion date 9-28-92

Lab Rpt # 12971

Investigator Keyes

Code 10631 Phone 7661 Date 9-14-92

106 - 2253-0553(1-20)

Program Manager BULLOCK

Code 106323 Phone 7019

J.O.# 991003 SDWA

Priority approved by _____

This is a RESAMPLE of reference # _____

Program Code SDWA

Additional sample information and intended data use: _____

II ANALYSIS REQUEST

| | | | | | | |
|-----------------|-------------|-----------------|--------------------|--------------------|-------------|-------------------|
| ORGANICS | RCRA | NITROGEN | IC | GRAPHITE AA | pH | BOILING PT |
| TOC | FLASH PT | AMMONIA | NITRATE | ARSENIC | COND | COLOR |
| TOX | | NITRATE | NITRITE | SILVER | SP. GRAV. | AGGRESSIVITY |
| TX | CORROSIVITY | NITRITE | CHLORIDE | LEAD | COO | |
| ORGANIC | PH | PHOSPHATE | FLUORIDE | | TSS | BACTERIOLOGY |
| SCREEN | 1020 | ORTHO | | COLD VAPOR | TDS | CHT |
| HAZARID | | TOTAL | METALS | MERCURY | | SURFACE |
| TPH | REACTIVITY | PHOSPHOROUS | | | RESIDUES | POTABLE |
| | CYANIDE | TOTAL | TEST GROUPS | | 105°C | |
| | SULFIDE | | TOXIC | ICP METALS | FIXED 550°C | T. COLI |
| PCB | | CYANIDE | HRSD | ARSENIC | VOL 550°C | F. COLI |
| SHIPE | TCLP | AMENABLE | RF | CADMIUM | TOTAL SLOS | F. STREP |
| SOLID | METALS | TOTAL | IPDES | CHROME | | RESID. CL |
| OIL | ORGANICS | PHENOL | CRANEY | COPPER | ACIDITY | IPC |
| WATER | | SULFATE | | IRON | ALKALINITY | |
| | | SULFITE | FLAME AA | LEAD | IBAS | |
| | | SULFIDE | CHROME 6 | SILVER | OILGREASE | |
| | | | | ZINC | | |

SPECIAL ANALYSIS AND INSTRUCTIONS: _____

III FIELD INFORMATION

Inner ID _____
 Sample source SOIL
 Location FIRE STATION ST "J" EAST SIDE
 Grab Thief _____ Comp A _____ Other coop _____
 PIN # (RCRA only) _____ pH _____ Temp _____ °F
 Sample description: SOIL

Multiple Sample Record Total number of samples

| | |
|---------------------|----------------------------------|
| 001 <u>SOIL #1</u> | 013 <u>SOIL #13</u> |
| 002 <u>SOIL #2</u> | 014 <u>SOIL #14</u> |
| 003 <u>SOIL #3</u> | 015 <u>SOIL #15</u> |
| 004 <u>SOIL #4</u> | 016 <u>SOIL #16</u> |
| 005 <u>SOIL #5</u> | 017 <u>SOIL #17</u> |
| 006 <u>SOIL #6</u> | 018 <u>SOIL #18</u> |
| 007 <u>SOIL #7</u> | 019 <u>SOIL #19</u> |
| 008 <u>SOIL #8</u> | 020 <u>SOIL #20 (Back Group)</u> |
| 009 <u>SOIL #9</u> | 021 _____ |
| 010 <u>SOIL #10</u> | 022 _____ |
| 011 <u>SOIL #11</u> | 023 _____ |
| 012 <u>SOIL #12</u> | 024 _____ |

Check here _____ if sample IDs are continued on back.

V LABORATORY INFORMATION

Sample description: _____
 Phase 1 _____ Phase 2 _____ Phase 3 _____
 Phase sample number P1 _____ P2 _____ P3 _____
 Sample Preservation: Sat. _____ Corrected _____ by _____

IV CHAIN OF CUSTODY Collected by J. Havel

Date 9-14-92 Time 1450 Code 106 Phone 3632

Relinquished by J. Havel Received by 106 STORAGE

Date 9-14-92 Time 1540 Code 106 Phone 3632

Relinquished by J. Havel Received by momcDaris

Date 9/15/92 Time 9/15/92 Code 106 Phone 6-3029

Relinquished by _____ Received by _____

Date _____ Time _____ Code _____ Phone _____

Relinquished by _____ Received by _____

Time _____ Code _____ Phone _____

ENVIRONMENTAL PROGRAMS DIVISION

SAMPLING AND MONITORING REQUEST FORM

106.323A

| | |
|--------|---------|
| Name: | R Keyes |
| Code: | 106.31A |
| Phone: | 7661 |
| Fax: | 7026 |
| Date: | 9/11/92 |

| | |
|-----------------|---------|
| Date Received: | 9/4/92 |
| Date Completed: | 9-14-92 |

106-2258-0553

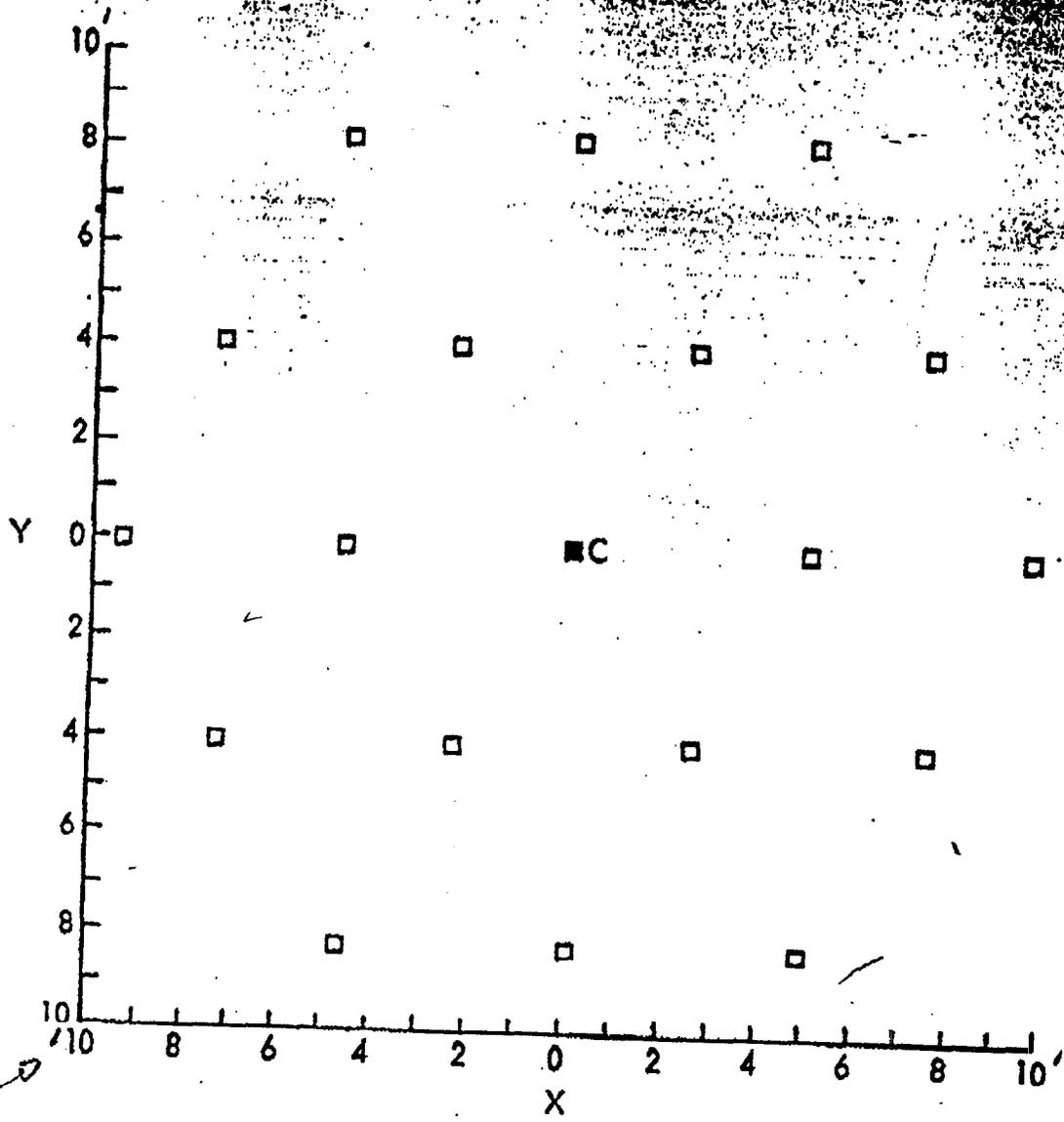
THE FOLLOWING TYPES OF DATA IS PROVIDED TO REQUEST AND SCHEDULE SAMPLING/MONITORING:

| | | |
|--|---|--------------|
| Description of project: Evaluate fuel spill at Fire station (Saint "J") East Side Sample for TPH and use the attached sampling scheme. TAKE 19 samples and analyze each also TAKE A Background sample Fire chief (King) will pump water out of hole 1 day Priority 2 (no overtime) before samples are taken. Coordinate work WITH the him. | | |
| Type of material: | Soil | |
| Specific analysis required: | TPH | |
| Point of contact: | R Keyes | 106.31A |
| | NAME | CODE |
| | | 396-7661 |
| | | PHONE NUMBER |
| Work generated by Planning/Engineering documents Yes ___ No ___ (If yes, attach a copy) | PIN No. | |
| Program Code: 106.31A SDWA | Location: (BE VERY SPECIFIC) Bldg W-22, 3 rd Floor | I.D. No. |
| PRIORITY ASSIGNED: 106.323 <u>4</u> Lab <u>2</u> | | |
| ANALYSIS TO BE PERFORMED BY: <u>(Complete sampling by</u> Code 134 <u>Contract</u> <u>COB 9/10/92)</u> To be completed by 106.929 only | | |

JOB ORDER NUMBER (All programs must have a JOB ORDER NUMBER)
J.O.# 9444-03-WATR J.O.# FOR 134.12 9444-03-WATR
E VERIFIED 9/11/92

~~overhead~~ overhead for us & lab

R Keyes 106.31A 9/11/92 396- 7661
PROGRAM MANAGER'S SIGNATURE CODE DATE PHONE



The outer boundary of the contaminated area is assumed to be 10 feet from the center (C) of the spill site.

Location of sampling points in a 19-point grid.

20 SAMPLES TOTAL

Sample depth sufficient to achieve the needed volume

Background sample

50 feet away from edge of contamination area

Fire Station

- POLICE TO OPEN GATE

- NNSY TO CUT OFF ANGLE @ GROUND

AREA OUTSIDE OF BLDG.
USED FOR FIRE FIGHTING TRAINING
14 Oct 92

OUTLINE OF A&E SERVICES

GRAVEL PIT

Title: SITE CHARACTERIZATION STUDY, BUILDING 271, ST. JULIENS CREEK ANNEX

Task: PHASE A: Perform field investigation, soil and groundwater sampling, and laboratory analysis. Prepare a report discussing results and recommendations.

PHASE B: At the Government's option, prepare a Corrective Action Plan (CAP), per Virginia Regulation VR 680-13-02, paragraph 6.7.

PHASE C: AT GOVT'S OPTION, PERFORM REMEDIATION DESIGN,

Scope: PHASE A: The A/E shall perform an assessment of the ground/underground area around Building 271, St. Julien's Creek Annex. The final report will be submitted to the Commonwealth of Virginia State Water Control Board (SWCB) by the Norfolk Naval Shipyard (NNSY) for review and acceptance.

The results of this site assessment shall provide the information required by Virginia Regulation VR 680-13-02, paragraph 6.4.A, and the complete Site Characterization Report Checklist provided as attachment (1). The report shall include site assessment, risk assessment and remediation assessment.

Proper quality assurance/quality control (QA/QC) procedures shall be used in all sample collection and delivery in accordance with established Environmental Protection Agency methods or methods approved by the SWCB. A written verification that the laboratory used for analysis is certified by the Commonwealth of Virginia shall be submitted prior to any analysis work.

Sampling, testing and analysis shall include:

1. Providing ^{FIVE} ~~four~~ groundwater monitoring wells. Provide continuous soil sampling to water table and at 5 foot intervals thereafter, the wells shall extend at least 7 feet below the water table. The anticipated well depth is 15 feet below land surface. The Government will mark utilities in the vicinity of work prior to the start of drilling.

2. Collecting soil samples. All samples shall be field checked with an appropriate type of organic vapor analyzer to assist in the selection of samples that require laboratory analysis, and to reduce unnecessary laboratory analysis. Proper QA/QC procedures shall be used in all sample collection and delivery. Soils for each boring shall be field classified. Soil samples shall be placed in clean glass jars with ~~cap~~ lined lids, labeled, preserved on ice, and stored in a protective cooler. Cuttings from the borings shall be placed in properly labeled drums and left on site for disposal by NNSY.

USED GASOLINE,
DIESEL, & WASTE OIL

POSSIBLE USE
OF AFFF

ALSO, SIX SOIL
BORINGS TO
WATER TABLE

| | | | |
|--|-----------|----------------|-------------|
| Post-It™ brand fax transmittal memo 7671 | | # of pages > 4 | |
| To | ZON KEYES | From | TOM BARSTOW |
| Co. | NNSY | Co. | PWC |
| Dept. | CODE 106 | Phone # | 444-3765 |
| Fax # | 396-7026 | Fax # | 445-9204 |

Title: SITE CHARACTERIZATION STUDY, BUILDING 321, ST. JULIENS CREEK ANNEX

h. Risk Assessment

- (1) Evidence if wells of the area have been affected
- (2) Use and approximate location of wells potentially affected by the release
- (3) Identification of potential and impacted receptors
- (4) Migration routes
- (5) Surrounding population
- (6) Potential for additional environmental damage

i. Remediation Assessment

- (1) Potential for remediation and applicability of different remediation technologies to the site
- (2) Free product investigation, methods for determining and results
- (3) Recommendation of actions if required

j. Conclusions

Site maps shall be provided showing monitoring well locations. Analytical data for compounds exceeding detection limits shall be provided in tabular form with a comparison of this data to relevant standards and criteria.

Submit four copies of the final report. Text shall be double spaced; copies shall be double-sided to reduce bulk. All graphs, charts, illustrations and site plans shall be submitted on 8-1/2" x 11" size paper.

The work shall be completed in accordance with the following schedule:

| <u>TASK</u> | <u>DAY</u> |
|---------------------------------|------------------|
| Delivery Order Award | 0 |
| Submit Laboratory Certification | 3 |
| Submit Final Report | 28 60 |

The required completion date is ~~28~~ 60 days after award of contract change order.

§ 6.4. Site characterization.

A. Owners and operators must assemble information about the site and the nature of the release, including information gained while confirming the release or completing the initial abatement measures in §§ 6.1 and 6.2. This information must include, but is not necessarily limited to, the following:

1. Data on the material released and the estimated quantity of release;

2. Data from available sources and/or site investigations concerning the following:

a. Site assessment to include: data on the physical/chemical properties of the contaminant; nature and quantity and extent of the release; evidence that free product is found to need recovery; geologic/hydrologic site characterization; current and projected land/water uses; water quality; subsurface soil conditions; evidence that contaminated soils are in contact with the ground water; locations of subsurface conduits (e.g. sewers, utility lines, etc.); and climatological conditions. Samples collected for this site characterization shall be tested according to established EPA analytical methods or methods approved by the board;

b. Risk (exposure) assessment to include: evidence that wells of the area have been affected; use and approximate locations of wells potentially affected by the release; identification of potential and impacted receptors; migration routes; surrounding populations; potential for additional environmental damage;

c. Remediation assessment to include: potential for remediation and applicability of different remediation technologies to the site.

3. Results of the site check required under subdivision A.5 of § 6.3; and

4. Results of the free product investigations required under subdivision A.6 of § 6.3, to be used by owners and operators to determine whether free product must be recovered under § 6.5.

B. Within 45 days of release confirmation or another reasonable period of time determined by the board upon written request made and approved within 45 days after release confirmation, owners and operators must submit the information collected in compliance with subsection A of this section to the board in a manner that demonstrates its applicability and technical adequacy, or in a format and according to the schedule required by the board.

§ 6.5. Free product removal.

At sites where investigations under subdivision A.6 of § 6.3 indicate the presence of free product, owners and operators must remove free product to the maximum extent practicable as determined by the board while continuing, as necessary, ~~any actions initiated~~ under §§ 6.2 through 6.4, or preparing for actions required under §§ 6.6 through 6.7. In meeting the requirements of this section, owners and operators must:

5. Operational and post-operational monitoring schedules (to include data submittals);

6. Proposed disposition of any wastes and discharges (if applicable);

7. Actions taken to obtain any necessary federal, State and local permits to implement the plan; and

8. Proposed actions to notify persons directly affected by the release or the planned corrective action.

C. The board will approve the corrective action plan only after ensuring that implementation of the plan will adequately protect human health, safety, and the environment. In making this determination, the board will consider the following factors as appropriate:

1. The physical and chemical characteristics of the regulated substance, including its toxicity, persistence, and potential for migration;

2. The hydrogeologic characteristics of the facility and the surrounding area;

3. The proximity, quality, and current and future uses of nearby surface water and ground water;

4. The potential effects of residual contamination on nearby surface water and ground water;

5. The site, risk (exposure), and remediation assessments as required by subdivision A.2 of § 6.4; and

6. Any information assembled in compliance with this Part.

D. Upon approval of the corrective action plan or as directed by the board, owners and operators must implement the plan, including modifications to the plan made by the board. They must monitor, evaluate, and report the results of implementing the plan in accordance with a schedule and in a format established by the board.

E. Owners and operators may, in the interest of minimizing environmental contamination and promoting more effective cleanup, begin cleanup of soil and ground water before the corrective action plan is approved provided that they:

1. Notify the board of their intention to begin cleanup and obtain written approval to proceed with an agreed upon activity;

2. Comply with any conditions imposed by the board, including halting cleanup or mitigating adverse consequences from cleanup activities; and

3. Incorporate these self-initiated cleanup measures in the corrective action plan that is submitted to the board for approval.

§ 6.7. Corrective Action Plan (CAP) Permit.

A. Owners and operators shall file a complete application for and obtain a Corrective Action Plan (CAP) permit from the board for any corrective action plan required by § 6.6 of this regulation:

B. If the corrective action plan involves a point source discharge of pollutants to surface waters, the CAP permit application shall be processed in accordance with the procedures and the requirements set forth in the board's permit regulation (VR

**CORRECTIVE ACTION PLAN PERMIT APPLICATION
FOR REMEDIAL ACTION TREATMENT AT SITES
WITH GROUND WATER AND/OR SOILS CONTAMINATED
WITH PETROLEUM PRODUCTS**

General Information

1. Legal Name of Facility _____
2. Location of Facility (Address and Telephone Number)

3. City or County _____
4. a) Legal Name of Facility Owner or Operator, Address and Telephone Number

b) Nature of Business _____

c) Business SIC Code(s) _____
5. Site Cleanup/Contact (Name of Person, Company, Address, Telephone Number) _____

6. Type of Petroleum Product(s) or Regulated Substance Causing Contamination _____

7. Proposed facilities, or any facilities which have not previously been issued an effective VPDES or VPA permit must attach a completed Local Government Ordinance Form (LGOF) to this application. Form attached? Yes ___ No ___
If "No", then list permit number and name of permittee.

Note: If a surface water discharge is proposed in the Corrective Action Plan, EPA General Form 1 and a VPDES Application Form 2D must be completed and submitted with the Corrective Action Plan Permit application. Application Form 2C may be required in place of Form 2D, if the applicant currently has an existing, permitted industrial discharge which is capable of accepting effluent resulting

9. Permit Certification:

I hereby grant to duly authorized agents of the State Water Control Board, upon presentation of credentials, permission to enter the property for the purpose of determining the suitability of the Permit I have applied for. I certify under penalty of law that this document and all attachments, including the Initial Abatement Report, the Site Characterization Report, Corrective Action Plan, and the Corrective Action Plan Permit Application, were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate, and complete. I certify to the best of my knowledge the Corrective Action Plan has identified all contaminants at this site. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations.

Signature: _____ Date _____

Title _____

CORRECTIVE ACTION PLAN CHECKLIST

Site: _____ PC# _____ Region _____

The following checklist must be filled out by the Responsible Party (RP) and/or the RP's Consultant and included in the Corrective Action Plan. Indicate on the checklist the page and section number where each item is addressed in the attached plan. Also indicate on the checklist the section and page number where justification is given for items omitted from the attached plan. The contents of the report should reflect and be commensurate with the nature of the release, degree of contamination and complexity of the site investigation.

A copy of the Initial Abatement Measures Report and Site Characterization Report must be attached to or included in the Corrective Action Plan.

Items marked with an * are required as part of the CAP Permit Application.

1. CORRECTIVE ACTION PLAN

| Page | / | Section | |
|-------|---|---------|---|
| _____ | / | _____ | Cleanup measures conducted under Interim Authorization |
| _____ | / | _____ | *Block diagram, conceptual design, and narrative description of all proposed remediation systems (sketches, locations, design calculations, etc.) |
| _____ | / | _____ | *Maximum hours/day of operation |
| _____ | / | _____ | *Average hours/day of operation |
| _____ | / | _____ | *Days/week of operation |
| _____ | / | _____ | Numerical remediation endpoints for all applicable phases (eg. TPH, BTEX, lead and other appropriate pollutants) |
| _____ | / | _____ | Free product |
| _____ | / | _____ | Dissolved |
| _____ | / | _____ | Residual |
| _____ | / | _____ | Vapor |
| _____ | / | _____ | System effluent |
| _____ | / | _____ | Operational monitoring schedule |
| _____ | / | _____ | Parameters |
| _____ | / | _____ | Frequency |
| _____ | / | _____ | Locations |
| _____ | / | _____ | Methods (media, detection limits, units of measure) |
| _____ | / | _____ | Achievement of endpoints as evidenced by maintenance of values (numerical endpoints) over time |
| _____ | / | _____ | Parameters |
| _____ | / | _____ | Duration (period of time) |
| _____ | / | _____ | Locations |
| _____ | / | _____ | Methods (media, detection limits, units of measure) |
| _____ | / | _____ | Proposed system shutdown schedule |

SITE CHARACTERIZATION REPORT CHECKLIST

Site: _____ PC# _____ Region _____

The following checklist must be filled out by the Responsible Party (RP) and/or the RP's Consultant and included in the Site Characterization Report. Indicate on the checklist the page and section number where each item is addressed in the attached report. Also indicate on the checklist the section and page number where justification is given for items omitted from the attached report. The contents of the report should reflect and be commensurate with the nature of the release, degree of contamination and complexity of the site investigation.

A copy of the Initial Abatement Measures Report must be attached to or included in the Site Characterization Report.

Items marked with an * are required as part of the CAP Permit Application.

1. SITE ASSESSMENT

| Page | /Section | |
|---------|----------|--|
| ___/___ | | Nature and quantity of release |
| ___/___ | | *Physical and chemical properties of released product |
| ___/___ | | Free Product Removal Report |
| ___/___ | | Tank information (capacity, location, contents) |
| ___/___ | | Geologic/hydrogeologic site information |
| ___/___ | | Site geology |
| ___/___ | | Subsurface conditions (fractures, solution cavities, lenses, depth to ground water) |
| ___/___ | | Pumping/injection wells |
| ___/___ | | Drillers/geologic logs and construction details for all wells and boreholes |
| ___/___ | | Aquifer characteristics |
| ___/___ | | ___/___ Name |
| ___/___ | | ___/___ Thickness |
| ___/___ | | ___/___ Conductivity |
| ___/___ | | ___/___ Transmissivity |
| ___/___ | | ___/___ Hydraulic gradient |
| ___/___ | | ___/___ Flow velocity/direction |
| ___/___ | | ___/___ Hydrogeologic cross section |
| ___/___ | | Information as to water resources within 1000 ft of site (wells, springs, surface water) |
| ___/___ | | Information as to adjacent property owners and potentially affected ground and surface water users (names, addresses, telephone numbers) |
| ___/___ | | Information on historical releases at the site as well as historical releases from USTs located on adjacent property |
| ___/___ | | Construction information on potentially affected wells |
| ___/___ | | Current and projected groundwater/land use |
| ___/___ | | Description of vertical and lateral extent of contamination |
| ___/___ | | ___/___ Free product phase |
| ___/___ | | ___/___ Dissolved phase |
| ___/___ | | ___/___ Residual phase |

SCR Checklist
Page 2 of 4

___/___ Plume migration direction and rate
___/___ *Sampling/monitoring results

NOTE: All lab sheets and tables submitted in SCR must have sample media, analytical method used, detection limit method, unit of measure, sample depths, and sample locations. Sampling results from BTEX analysis must be reported individually and totaled.

Site maps/sketches (combine when appropriate and to scale when possible)

- ___/___ *Locus map on 7 1/2 min. quad. or county highway map
- ___/___ *Base map with property lines and physical features (buildings, roads, etc.)
- ___/___ *Location of source(s) of contamination at site
- ___/___ Sample locations (water, vapor, and/or soil)
 - ___/___ Excavation pits
 - ___/___ Surficial soils
 - ___/___ Surface waters
 - ___/___ Basements/conduits (and/or soil vapor surveys)
 - ___/___ Monitoring wells
 - ___/___ Domestic wells
 - ___/___ Public supply wells
 - ___/___ Springs
- ___/___ Boring locations
- ___/___ Observation well locations
- ___/___ Ground water flow direction map
- ___/___ Subsurface conduits (telephone, water, sewer, power, dispenser piping)
- ___/___ *Potentially affected wells/streams/springs
- ___/___ *Flood plain designation
- ___/___ Isoconcentration or plume delineation map for each affected aquifer and/or soil zone for all phases present (cross-sectional and map view)
 - ___/___ Free product
 - ___/___ Dissolved
 - ___/___ Residual
 - ___/___ Vapor

FOR OFFICE USE ONLY

COMMENTS:

DEFICIENCIES:

SCR Checklist
Page 4 of 4

3. REMEDIATION ASSESSMENT

- / Remediation feasibility
- / Projected remediation endpoints based on site, risk, and remediation assessments
 - / Free product
 - / Dissolved
 - / Residual
 - / Vapor
- / Description & evaluation of applicable technologies
 - / Design for each applicable technology
 - / Timeframe for implementation and duration for each applicable technology to achieve projected remediation endpoints
 - / Projected cost for each applicable technology to achieve projected remediation endpoints
 - / Achievable endpoints for each applicable technology
 - / Free product
 - / Dissolved
 - / Residual
 - / Vapor
 - / Estimated timeframe for achieving endpoints for each applicable technology
 - / Free product
 - / Dissolved
 - / Residual
 - / Vapor
 - / Immediate/future beneficial results for each applicable technology
- / Recommendation of most appropriate technologies with costs
- / Site Characterization Report submitted within 45 days of release confirmation or extension granted

FOR OFFICE USE ONLY

COMMENTS: _____

DEFICIENCIES: _____

REVIEWED BY: _____ DATE: _____

CAP SUMMARY WORKSHEET

"DIRECTION ON REVERSE SIDE"

| PHASE CONTAMINATION | PROPOSED CLEANUP ENDPOINTS | PROPOSED MONITORING TO ACHIEVE ENDPOINTS | | | | PROPOSED POST OPER. MONITORING | | CLOSE SITE OR REACTIVATE SYSTEM |
|------------------------------------|----------------------------|--|---------------------------|--------------------|-------------------------------|--------------------------------|---------------------------|---------------------------------|
| | | SAMPLING LOCATION | SAMPLING FREQUENCY & TYPE | METHOD OF ANALYSIS | SCHEDULE TO ACHIEVE ENDPOINTS | SCHEDULE TO MAINTAIN ENDPOINTS | SAMPLING FREQUENCY & TYPE | |
| FREE PRODUCT | | | | | | | | |
| DISSOLVED PRODUCT IN GW | | | | | | | | |
| RESIDUAL PRODUCT IN SOILS | | | | | | | | |
| VAPOR PRODUCT EXTRACTED FROM SOILS | | | | | | | | |

SYSTEM SHUT DOWN

For SWCB Use: Comments: _____

Reviewed by: _____

Date: _____

Enclosure 5

Local Government Ordinance Form

SUBJECT: Local and Areawide Planning Requirements

TO: Applicants for Virginia Pollution Discharge Elimination System (VPDES), Virginia Pollution Abatement (VPA) and Corrective Action Plan (CAP) Permits

Article 2, 62.1-44.15:3 of the State Water Control Law states:

"No application for a certificate to discharge sewage, industrial wastes and other wastes into or adjacent to state waters shall be considered complete unless the applicant has provided the Executive Director with notification from the governing body of the county, city or town in which the discharge is to take place that the location and operation of the discharging facility is consistent with all ordinances adopted pursuant to Chapter 11 (15.1-427 et seq.) of Title 15.1 of the Code." (These are local zoning and planning ordinances).

In accordance with this section, new applications for VPDES Permits, VPA Permits or CAP Permits will not be considered complete until the information below is submitted to the SWCB Regional Office.

(County, City, or Town
Administrator/Manager) To:

I am in the process of completing a SWCB application form for a certificate. In accordance with Chapter 11 (15.1-427 et seq.) of Title 15.1 of the Code, I request that you sign one of the two statements below certifying my attached application is consistent with your local ordinances. Please return this form to:

(Applicants address) Return to: _____

I hereby certify,

_____ (1) That the proposed location and operation of the facility is consistent with all ordinances adopted pursuant to Chapter 11 (15.1-427 et seq.) of Title 15.1 of the Code or

_____ (2) That no local ordinances are in effect pursuant to Chapter 11 (15.1-427 et seq.) of Title 15.1 of the Code.

Signature

Title

Print Name

Date

SCOPE OF WORK

Title: SITE CHARACTERIZATION STUDY, EAST OF BUILDING 271 (FIRE STATION), ST. JULIENS CREEK ANNEX

TASK: Perform field investigation, soil and groundwater sampling, and laboratory analysis. Prepare a report discussing results and recommendations.

Scope: The A/E shall perform an environmental assessment of the area on the east side of Building 271 (Fire Station), St. Juliens Creek Annex. The assessment shall identify the extent of contamination as the result of a petroleum product release, provide risk assessments, and provide remediation assessment. The final report will be submitted to the Commonwealth of Virginia State Water Control Board (SWCB) by the Norfolk Naval Shipyard (NNSY) for review and acceptance.

The site to be studied is located on the east side of Bldg 271 (Fire Station) and has been contaminated with petroleum through years of misuse.

The results of this site characterization shall provide all information required by Virginia Regulation VR-680-13-02, paragraph 6,4,A, Site Characterization, and the site characterization checklist provided as attachment (1). The report shall include site assessment, risk assessment and remediation assessment.

Proper quality assurance/quality control (QA/QC) procedures shall be used in all sample collection and delivery in accordance with established Environmental Protection Agency methods or methods approved by the SWCB. A written verification that the laboratory used for analysis is certified by the Commonwealth of Virginia shall be submitted prior to any analysis work.

A Health and Safety Plan shall be prepared for this site. The Plan shall consist of contingency plans in the event of an on-site injury or if a potential risk to human health or the environment is discovered. The A/E shall be responsible for all safety considerations and having personnel properly trained and protected at all times. Submit two copies of the Health and Safety Plan for review and approval.

Sampling, testing and analysis shall include:

1. Performing soil borings. The borings shall be drilled to depths sufficient to intersect the water table. NNSY will mark utilities in the vicinity of work prior to the start of drilling. Contact Captain at Fire Station for location of recent burried gas pipe line.
2. Collecting soil samples. A minimum of two soil samples shall be collected from each boring. The number of borings and samples shall be adequate to characterize the vertical and horizontal boundaries of contamination. All samples shall be field checked with an appropriate type of organic vapor analyzer to assist in the selection of samples

that require laboratory analysis, and to reduce unnecessary laboratory analysis. Proper QA/QC procedures shall be used in all sample collection and delivery. A split sample shall be made of all soil samples sent to the laboratory. Soils shall be measured with a photoionization detector (PID). Soils for each boring shall be field classified. Soil samples shall be placed in clean glass jars with teflon lined lids, labeled, preserved on ice, and stored in a protective cooler. Cuttings from the borings shall be placed in properly labeled drums and delivered to a site designated by NNSY, on base, within one mile of the site, for disposal by NNSY.

3. Testing soil samples for BTEX and TPH. Proper QA/QC procedures shall be used in all analysis.

4. Installing groundwater monitoring wells and collecting groundwater samples. NNSY will mark utilities in the vicinity of work prior to the start of drilling. Each PVC well shall be constructed in accordance with State Water Control Board guidelines. The anticipated well depth is 15 feet below land surface. The well shall be completed at the surface with a locking well cover. Development of the wells shall continue until the effluent is as free of visible suspended as possible. Groundwater withdrawn during the development process shall be collected in properly labeled 55 gallon drums and left on site for disposal by NNSY. A minimum of three well volumes shall be purged from the well prior to sampling. The purge water shall be collected in properly labeled 55 gallon drums and delivered to a site designated by NNSY, on base, within one mile of the site for disposal by NNSY. Following completion of the purge, a groundwater sample shall be retrieved and placed into a sample bottle. Proper QA/QC procedures shall be used in all sample collection and delivery.

5. Analyzing groundwater samples for TPH. Proper QA/QC procedures shall be used in all analysis.

The report shall provide a comprehensive evaluation of all available data and include the following sections.

- a. Site information including past and present usage
- b. Sampling procedures
- c. Boring logs and well construction logs
- d. Quality control procedures
- e. Analytical methods and parameters
- f. Sample analytical results

g. Site Assessment

- (1) Physical/chemical properties of the contaminant
- (2) Nature, quantity and extent of the release
- (3) Evidence that free product if found to need recovery
- (4) Geologic/hydrologic site characterization
- (5) Current and projected land/water uses
- (6) Water quality
- (7) Subsurface soil condition
- (8) Evidence if contaminated soils in contact with the ground

water

h. Risk Assessment

- (1) Evidence if wells of the area have been affected
 - (2) Use and approximate location of wells potentially affected
- by the release
- (3) Identification of potential and impacted receptors
 - (4) Migration routes
 - (5) Surrounding population
 - (6) Potential for additional environmental damage

i. Remediation Assessment

- (1) Potential for remediation and applicability of different remediation technologies to the site
- remediation technologies to the site
- (2) Free product investigation, methods for determining and
- results
- (3) Recommendation of actions if required

j. Conclusions

Site maps to scale shall be provided showing and monitoring well locations. Analytical data for compounds exceeding detection limits shall be provided in tabular form with a comparison of this data to relevant standards and criteria.

Submit four copies each of the pre-final and final reports. Text shall be singled spaced with double-spacing between paragraphs; copies shall be duplex-printed to reduce bulk. All graphs, charts, illustrations and site plans shall be submitted on 8-1/2" x 11" size paper.

The work shall be completed in accordance with the following schedule:

| <u>TASK</u> | <u>DAY</u> |
|--|------------|
| Delivery Order Award | 0 |
| Submit Laboratory Certification | 5 |
| Submit Health and Safety Plan for Review | 10 |
| Initiate Sampling | 20 |
| Submit Pre-final Report | 50 |
| Pre-final Report Return | 55 |
| Submit Final Report | 60 |

The required completion data is 60 days after award of contract change order.

Hazardous Conditions - Attention is directed to existence of potentially hazardous conditions in the area of work. All due care should be taken to prevent injury to personnel. Any necessary disturbance of any potentially hazardous materials, such as asbestos, or other questionable material, should be brought to the attention of the contracting office before proceeding.

Submittals: A&E submittals for this project shall be at the pre-final and final completion stages. All submittals shall be in accordance with the "Guide for Architect-Engineer Firms Performing Services for the Atlantic Division" with the exception that all submittals shall be directed to the MAILING ADDRESS. The job Order Number is to be referenced in all correspondence. Submittals which are found to be incomplete or contain errors will be returned for corrections.

Quality Control Data: Your firm will be expected to perform a quality control review. Your final submittal shall include a 100% report highlighted to indicate that the review as performed and corrections made and signature of the Project Engineer or Principal of the firm on the cover sheet indicating a quality review was performed.

Contact for job information: Activity Contact: Ronnie Keyes
Telephone: 396-7248

MAILING ADDRESS: Norfolk Naval Shipyard
Environmental Engineering Division
Code 106.31, Bldg M-22
Portsmouth, VA. 23709

ENVIRONMENTAL PROGRAMS DIVISION

SAMPLING AND MONITORING REQUEST FORM

Name: R Reyes
 Code: 106.31A
 Phone: 7661
 Fax: 7026
 Date: 9/11/92

Date Received _____
 Date Completed _____

106- _____

THE FOLLOWING TYPES OF DATA IS PROVIDED TO REQUEST AND SCHEDULE SAMPLING/MONITORING:

Description of project:
Evaluate fuel spill at Fire station (Saint J) East Side
Sample for TPH and use the attached sampling scheme. TAKE 19 samples and analyze each also
Take a background sample
Fire chief (King) will pump water out of hole 1 day
Priority 2 (NO overtime) be sure samples are taken. Coordinate work with ~~the~~ him.

Type of material soil
 Specific analysis required TPH

Point of contact: R Reyes 106.31A 396-7661
NAME CODE PHONE NUMBER

Work generated by Planning/Engineering documents Yes ___ No ___ (If yes, attach a copy) PIN No.

| | | |
|--|---|-------------------------|
| <small>Program Code:</small> <u>Clean water Act</u> | <small>Location:</small> <small>(BE VERY SPECIFIC)</small> <u>Bldg W-22, 3rd Floor</u> | <small>I.D. No.</small> |
|--|---|-------------------------|

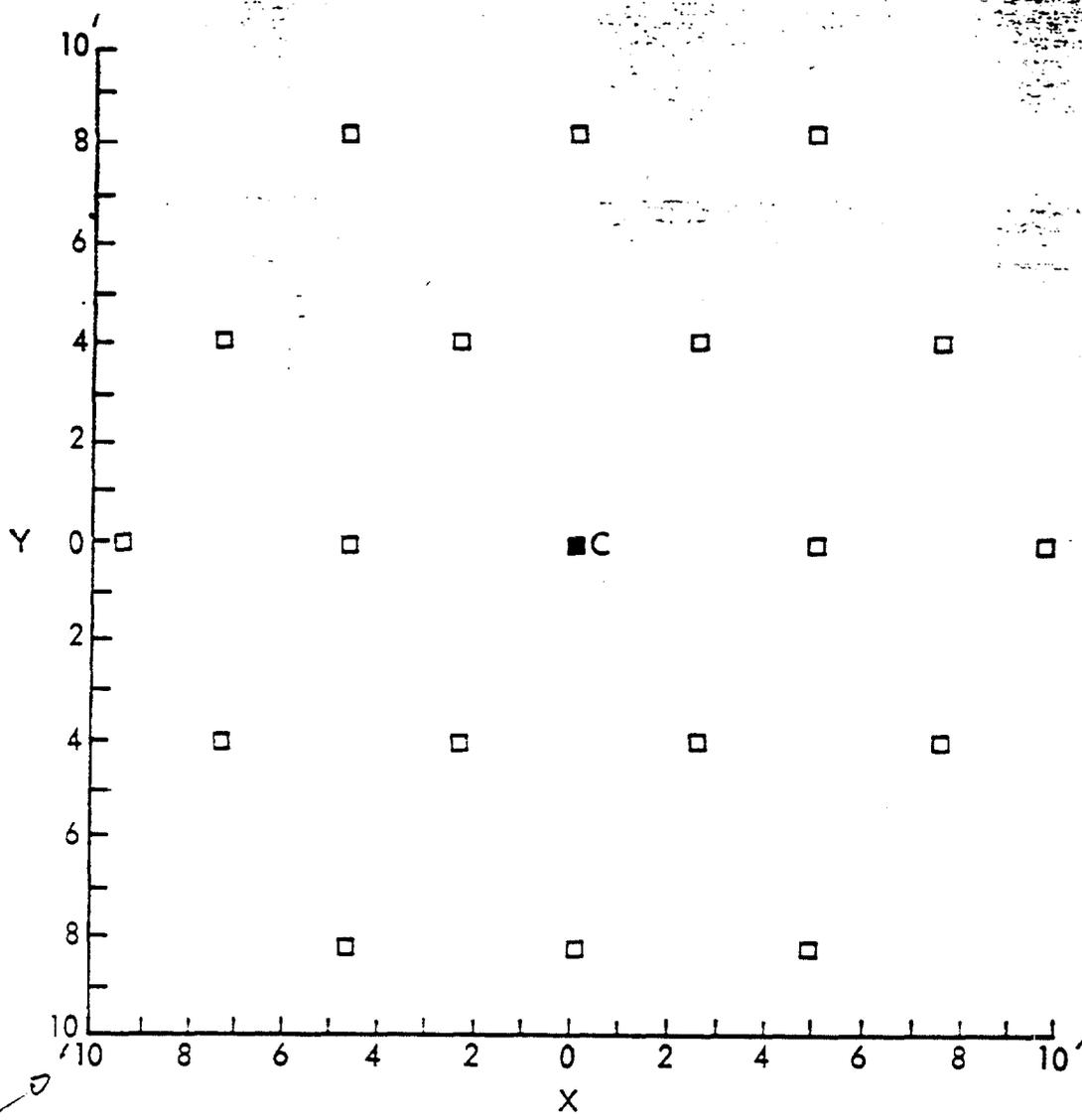
PRIORITY ASSIGNED: 106.323 _____ Lab _____

ANALYSIS TO BE PERFORMED BY:
 Code 134 Contract _____
 To be completed by 106.323 only

JOB ORDER NUMBER (All programs must have a JOB ORDER NUMBER)
 J.O.# 9404 03 WATR J.O.# FOR 134.12 same J.O.
 DATE VERIFIED 9/11/92

R Reyes 106.31A 9/11/92 396- 7661
PROGRAM MANAGER'S SIGNATURE CODE DATE PHONE

LIVE 15
↑



Fire
Static
→

The outer boundary of the contaminated area is assumed to be 10 feet from the center (C) of the spill site.

~~Figure 1~~ Location of sampling points in a 19-point grid.

20 SAMPLES TOTAL

— Background sample

50

*
↑

DATE: 4/22/92

From: Name R. Keller
Code C-104-31A
Extension 7001

To: Code 412.3

Subj: SAMPLING/MONITORING REQUEST

The following data is provided so that you can schedule the sampling/monitoring that is required. (Circle One)

a. Type of sampling or monitoring that must be performed.
Sail

b. Description of the project: Attach additional sheets of paper:

Evacuate oil spill at Fire Station
Saint "1"
TAKE 7 samples $\frac{1}{2}$ each
Sample for TPH
Priority "1"

c. Location: Be very specific:

Fire Station at Saint "1"

d. Frequency and duration of project:

one time sample

e. When you want project to begin: Allow two weeks for scheduling:

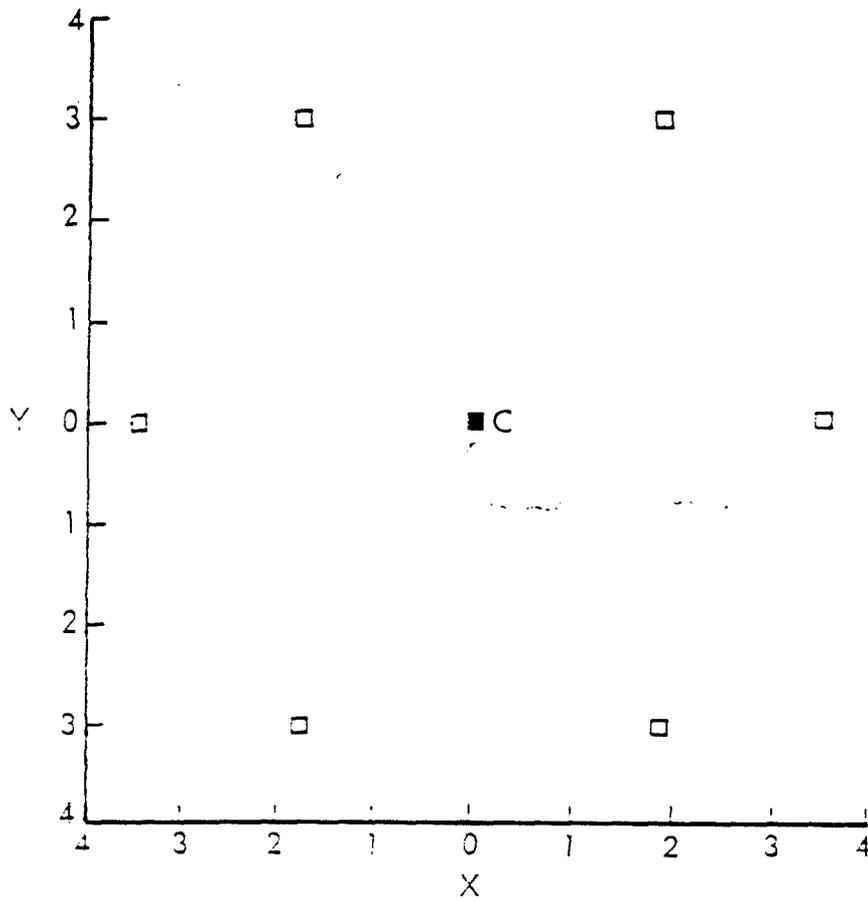
ASAP

f. Point of contact: (Who results must go to, if different). Give Name, Code, and Phone Number.

g. Job Order Number Charge to work: All projects must have a job order number before beginning.

Signature [Handwritten Signature]

Date 4/22/92



The outer boundary of the contaminated area is assumed to be 4 feet from the center (C) of the spill site.

~~Figure~~ Location of sampling points in a 7-point grid.

REPORTS MAY BE DUPLICATED,
BUT ONLY IN THEIR ENTIRETY.

REPORT NUMBER

92NN05861

APR. 17 1992

LABORATORY DIVISION
NORFOLK NAVAL SHIPYARD
PORTSMOUTH, VA. 23709-5000

Customer's Ref. No.: 106-2105-0260
Submitted by: KEYS
Shop/Code : C106.3
Phone : 7661

Program Code : TSCA
Job Order Number: 991003TSCA
Sample Received: 920414
Sample Source: SOIL(FIRE STATION)

ENVIRONMENTAL LABORATORY REPORT

DESCRIPTION: SOIL

| TESTS | UNITS | Results | | | | Specification Limits | |
|----------------------|-------|----------|--|--|--|----------------------|---------|
| | | 001 | | | | (Lower) | (Upper) |
| OIL&GREASE on SOLIDS | ppm | 21050260 | | | | | |
| | | 300 | | | | | |

Remarks:

| | | | | |
|-------------------------|---------|----------------------|---------|--------------|
| ** Reviewer (signature) | Date: | Released (signature) | Date: | Code: 134.12 |
| <i>MOM Davis</i> | 4/17/92 | <i>BP Davis</i> | 4/17/92 | Phone 6-3029 |

** The person designated to sign for an action verifies, based on personal observation, certified records, or direct report from watchstanders, and certifies by his signature that the action has been performed in accordance with the specified requirements.

Distribution:

**ENVIRONMENTAL CHEMISTRY LABORATORY
ANALYSIS REQUEST FORM**

I ADMINISTRATIVE INFORMATION

Priority: 1 2 3 (Circle one)

Requested completion date 4/17/92

Lab Rpt # Q2NN5861

Analyst Key D Code 106 Phone _____ Date 4/14/92

106 - 2105-0260

Program Manager Key D Code 106 Phone 6-7461

J.O.# 991003TSCA

Priority approved by WVKW This is a RESAMPLE of reference # _____

Program Code TSCA

Additional sample information and intended data use: No OT

II ANALYSIS REQUEST

| | | | | | | |
|-----------------|-------------|-----------------|--------------------|--------------------|-----------------|---------------------|
| ORGANICS | RCRA | NITROGEN | IC | GRAPHITE AA | pH | BOILING PT |
| TOC | FLASH PT | AMMONIA | NITRATE | ARSENIC | COND | COLOR |
| TOX | | NITRATE | NITRITE | SILVER | SP. GRAV. | AGGRESSIVITY |
| TX | CORROSIVITY | NITRITE | CHLORIDE | LEAD | COO | |
| ORGANIC SCREEN | PH | PHOSPHATE | FLUORIDE | | TSS | BACTERIOLOGY |
| MAJOR I.D. | 1020 | ORTHO | | COLD VAPOR | TDS | CHT |
| TPH | | TOTAL | METALS | MERCURY | | SURFACE |
| | REACTIVITY | PHOSPHOROUS | | | RESIDUES | POTABLE |
| PCB | CYANIDE | TOTAL | TEST GROUPS | ICP-METALS | 105°C | |
| SHIPE | SULFIDE | | TOXIC | ARSENIC | FXED 550°C | T. COLI |
| SOLID | | CYANIDE | HRSD | CADMIUM | VOL 550°C | F. COLI |
| OIL | TCLP | AMENABLE | RDF | CHROME | TOTAL SLDS | F. STREP |
| WATER | METALS | TOTAL | NPDES | COPPER | | RESID. CL |
| | ORGANICS | PHENOL | CRANEY | IRON | ACIDITY | HPC |
| | | SULFATE | | LEAD | ALKALINITY | |
| | | SULFITE | FLAME AA | SILVER | MBAS | |
| | | SULFIDE | CHROME 6 | ZINC | OIL&GREASE | |

SPECIAL ANALYSIS AND INSTRUCTIONS: 1

III FIELD INFORMATION

Container ID 106-2105-0260

Source SOIL

Location FIRE STATION SAINT J

Grab Thief Comp A Other comp

PIN # (RCRA only) _____ pH _____ Temp _____ ° F

Sample description: SOIL

IV CHAIN OF CUSTODY Collected by J. Hancey

Date 4-14-92 Time 1415 Code 106 Phone 3632

Relinquished by J. Hancey Received by MEM Madans

Date 4/14/92 Time 1500 Code 134.A Phone 6-3629

Relinquished by _____ Received by _____

Date _____ Time _____ Code _____ Phone _____

Relinquished by _____ Received by _____

Date _____ Time _____ Code _____ Phone _____

Relinquished by _____ Received by _____

Date _____ Time _____ Code _____ Phone _____

Multiple Sample Record Total number of samples _____

| | |
|-----|-----|
| 001 | 013 |
| 002 | 014 |
| 003 | 015 |
| 004 | 016 |
| 005 | 017 |
| 006 | 018 |
| 007 | 019 |
| 008 | 020 |
| 009 | 021 |
| 010 | 022 |
| 011 | 023 |
| 012 | 024 |

Check here if sample IDs are continued on back.

V LABORATORY INFORMATION

Sample description: _____

Phase 1 _____ Phase 2 _____ Phase 3 _____

Phase sample number P1 _____ P2 _____ P3 _____

Sample Preservation: Sat. _____ Corrected _____ by _____

Wmcy R 4/14/92

DATE: 4/14/92

From: Name R. Reyes
Code 106.31A
Extension 7661

To: Code ~~412-3~~ 106.323

Subj: SAMPLING/MONITORING REQUEST

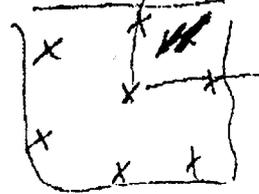
The following data is provided so that you can schedule the sampling/monitoring that is required. (Circle One)

a. Type of sampling or monitoring that must be performed.

b. Description of the project: (Attach additional sheets of paper)

Soil sample - 7 samples (composite sample)

Analyze
Sample for TPH
PRIORITY - 1



c. Location: (Be very specific)

Fire Station Saint J

d. Frequency and duration of project:

one time sampling

e. When you want project to begin: (Allow two weeks for scheduling).

ASAP To support Department at Saint J

f. Point of contact: (Who results must go to, if different), Give Name, Code, and Phone Number.

Same

g. Job Order Number Charge to work: (All projects must have a job order number before beginning). O.H.

Signature Cary Reyes

Date 4/14/92

ENVIRONMENTAL CHEMISTRY LABORATORY ANALYSIS REQUEST FORM

I ADMINISTRATIVE INFORMATION

Priority 1 & 2 (Circle one)

Requested completion date 7/6/92

Lab Rpt # _____

Requestor KEYES Code 106 Phone 266 Date 6/29/92

106 - 2181-0410

Program Manager KEYES Code 106 Phone _____

S.O.# 991003 TSCA

Priority approved by [Signature] This is a RESAMPLE of reference # _____

Program Code TSCA

Additional sample information and intended data use: RE SAMPLE OF 106-2105-0260

II ANALYSIS REQUEST

| | | | | | | |
|-----------------------------------|--------------------------------------|-------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|---------------------------------------|
| <input type="checkbox"/> ORGANICS | <input type="checkbox"/> SO4 | <input type="checkbox"/> NITROGEN | <input type="checkbox"/> ZN | <input type="checkbox"/> GRAPHITE PA | <input type="checkbox"/> PH | <input type="checkbox"/> BOILING PT |
| <input type="checkbox"/> TOC | <input type="checkbox"/> FLASH PT | <input type="checkbox"/> AMMONIA | <input type="checkbox"/> NITRATE | <input type="checkbox"/> ARSENIC | <input type="checkbox"/> COND | <input type="checkbox"/> COLOR |
| <input type="checkbox"/> TOX | <input type="checkbox"/> CORROSIVITY | <input type="checkbox"/> NITRATE | <input type="checkbox"/> NITRITE | <input type="checkbox"/> SILVER | <input type="checkbox"/> SP. GRAV. | <input type="checkbox"/> AGGRESSIVITY |
| <input type="checkbox"/> TOX | <input type="checkbox"/> PH | <input type="checkbox"/> NITRITE | <input type="checkbox"/> CHLORIDE | <input type="checkbox"/> LEAD | <input type="checkbox"/> COC | <input type="checkbox"/> BACTERIOLOGY |
| <input type="checkbox"/> ORGANIC | <input type="checkbox"/> TOSS | <input type="checkbox"/> PHOSPHATE | <input type="checkbox"/> FLUORIDE | <input type="checkbox"/> COLD VAPOR | <input type="checkbox"/> TSS | <input type="checkbox"/> CHL |
| <input type="checkbox"/> MERCEN | <input type="checkbox"/> TOSS | <input type="checkbox"/> ORTHO | <input type="checkbox"/> METALS | <input type="checkbox"/> MERCURY | <input type="checkbox"/> TDS | <input type="checkbox"/> SURFACE |
| <input type="checkbox"/> SULFATED | <input type="checkbox"/> REACTIVITY | <input type="checkbox"/> TOTAL | <input type="checkbox"/> TEST GROUPS | <input type="checkbox"/> TOX.METALS | <input type="checkbox"/> RESIDUES | <input type="checkbox"/> POTABLE |
| <input type="checkbox"/> TPH | <input type="checkbox"/> CYANIDE | <input type="checkbox"/> PHOSPHORUS | <input type="checkbox"/> TOXIC | <input type="checkbox"/> ARSENIC | <input type="checkbox"/> 205°C | <input type="checkbox"/> T. COLI |
| <input type="checkbox"/> TOX | <input type="checkbox"/> SULFIDE | <input type="checkbox"/> TOTAL | <input type="checkbox"/> HROD | <input type="checkbox"/> CADMIUM | <input type="checkbox"/> FIXED 850°C | <input type="checkbox"/> F. COLI |
| <input type="checkbox"/> SHAPE | <input type="checkbox"/> TCLP | <input type="checkbox"/> CYANIDE | <input type="checkbox"/> PCF | <input type="checkbox"/> CHROME | <input type="checkbox"/> VOL 850°C | <input type="checkbox"/> F. STRIP |
| <input type="checkbox"/> SOLID | <input type="checkbox"/> METALS | <input type="checkbox"/> REMEDIABLE | <input type="checkbox"/> IPDES | <input type="checkbox"/> COPPER | <input type="checkbox"/> TOTAL SLDS | <input type="checkbox"/> PES20. CL |
| <input type="checkbox"/> OIL | <input type="checkbox"/> ORGANICS | <input type="checkbox"/> TOTAL | <input type="checkbox"/> CRANEY | <input type="checkbox"/> IRON | <input type="checkbox"/> ACIDITY | <input type="checkbox"/> IPC |
| <input type="checkbox"/> WATER | | <input type="checkbox"/> PHENOL | <input type="checkbox"/> FLAME AA | <input type="checkbox"/> LEAD | <input type="checkbox"/> ALKALINITY | |
| | | <input type="checkbox"/> SULFATE | <input type="checkbox"/> CHROME 6 | <input type="checkbox"/> SILVER | <input type="checkbox"/> PHAS | |
| | | <input type="checkbox"/> SULFITE | | <input type="checkbox"/> ZINC | <input type="checkbox"/> OILGREASE | |
| | | <input type="checkbox"/> SULFIDE | | | | |

SPECIAL ANALYSIS AND INSTRUCTIONS:

III FIELD INFORMATION

Container ID 106-2181-0410

Sample source Soil

Location FIRE STATION SAINT "J"

Grab Yiel Comp A Other comp

PZN # (RCRA only) _____ pH _____ Temp _____ °F

Sample description: Soil

Multiple Sample Record Total number of samples _____

| | |
|-----|-------|
| 001 | _____ |
| 002 | _____ |
| 003 | _____ |
| 004 | _____ |
| 005 | _____ |
| 006 | _____ |
| 007 | _____ |
| 008 | _____ |
| 009 | _____ |
| 010 | _____ |
| 011 | _____ |
| 012 | _____ |

Check here if sample IDs are continued on back.

IV CHAIN OF CUSTODY

Collected by [Signature]

Date 6/29/92 Time 1:55 Code 106 Phone 3632

Relinquished by [Signature] Received by 106 STORAGE

Date 6/29/92 Time 9:30 Code 106 Phone 3632

Relinquished by [Signature] Received by MM McNamee

Date 6/29/92 Time 1:53 Code 3412 Phone 6-3029

Relinquished by _____ Received by _____

Date _____ Time _____ Code _____ Phone _____

Relinquished by _____ Received by _____

Date _____ Time _____ Code _____ Phone _____

V LABORATORY INFORMATION

Sample description: _____

Phase 1 _____ Phase 2 _____ Phase 3 _____

Phase sample number P1 _____ P2 _____ P3 _____

Sample Preservation: Sat. _____ Corrected _____ by _____

King

More digging required. If we
are down 2' we have to go to
3' and take more samples.

Keays

4/22/92

Code 870

FAX 396-0016

To: File.

Tel/Con - 4/22/92 0920

Tom Madison - SWCB.

Reported the results of soil samples at FIRE STATION
Fire Extinguisher Training Area. - 300 TPH

Per Madison he suggested that we perform additional
excavation and re-sample. If re-sample is
< 100 TPH then no additional reporting/site
action is required.

Otherwise the same overall action would be similar
to those of UST sites; i.e. site characterization, CAP,
Remedial action, Monitoring.

Notified X-07 Towler to excavate additional
1 ft to 18 inches. 6-4324 called - tomorrow
4/23/92 start

Will provide C-06.323 with additional samples req. (Keyes)

BUT ONLY IN THEIR ENTIRETY.

REPORT NUMBER

92NN05861

APR. 17 1992

LABORATORY DIVISION
NORFOLK NAVAL SHIPYARD
PORTSMOUTH, VA. 23709-5000

Customer's Ref. No.: 106-2105-0260
Submitted by: KEYS
Shop/Code : C106.3
Phone : 7661

Program Code : TSCA
Job Order Number: 991003TSCA
Sample Received: 920414
Sample Source: SOIL(FIRE STATION)

ENVIRONMENTAL LABORATORY REPORT

DESCRIPTION: SOIL

| TESTS | UNITS | Results | | | | Specification Limits | |
|----------------------|-------|----------|--|--|--|----------------------|---------|
| | | 001 | | | | (Lower) | (Upper) |
| OIL&GREASE on SOLIDS | ppm | 21050260 | | | | | |
| | | 300 | | | | | |

Remarks:

| | | | | |
|-------------------------|----------------|-----------------------|----------------|--------------|
| ** Reviewer (signature) | Date: | Released (signature) | Date: | Code: 134.12 |
| <i>MOM Davis</i> | <i>4/17/92</i> | <i>BP [Signature]</i> | <i>4/17/92</i> | Phone 6-3029 |

** The person designated to sign for an action verifies, based on personal observation, certified records, or direct report from watchstanders, and certifies by his signature that the action has been performed in accordance with the specified requirements.

Distribution:

Received C-106.31 4/22/92 0900

Hot Rec'd 4/14/92
NMCY R 4/14/92

DATE: 4/14/92

From: Name R. Kenes
Code 106.31A
Extension 7161

To: Code 412-3 106.323

Subj: SAMPLING/MONITORING REQUEST

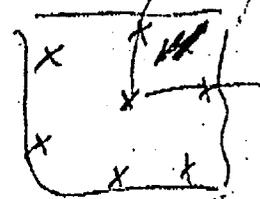
The following data is provided so that you can schedule the sampling/monitoring that is required. (Circle One)

a. Type of sampling or monitoring that must be performed.

b. Description of the project: (Attach additional sheets of paper)

soil sample - 7 samples (composite sample)

Analyze
Sample for TPH
PRIORITY - 1



c. Location: (Be very specific)

Fire Station Saint J

d. Frequency and duration of project:

one time sampling

e. When you want project to begin: (Allow two weeks for scheduling).

ASAP To support Department at Saint J

f. Point of contact: (Who results must go to, if different), Give Name, Code, and Phone Number.

Same

g. Job Order Number Charge to work: (All projects must have a job order number before beginning). O.H.

Signature Cary Moore

Date 4/14/92

To: R. KEYS C-106

ENVIRONMENTAL CHEMISTRY LABORATORY
ANALYSIS REQUEST FORM

I ADMINISTRATIVE INFORMATION

Priority: 2 2 3 (Circle one)

Requested completion date 4/17/92

Lab Rpt # _____

Requestor Keys

Code 106 Phone _____

Date 4/14/92

106 - 2105-0260

Program Manager Keys

Code 106 Phone 6-7461

J.O.# 991003TSCA

Priority approved by WWKW

This is a RESAMPLE of reference # _____

Program Code TSCA

Additional sample information and intended data use: No OT

II ANALYSIS REQUEST

| | | | | | | |
|---|-------------|-------------|-------------|-------------|-----------------------|--------------|
| ORGANICS | RCRA | NITROGEN | IC | GRAPHITE AA | PH | BOILING PT |
| TOC | FLASH PT | AMMONIA | NITRATE | ARSENIC | COND | COLOR |
| TOX | | NITRATE | NITRITE | SILVER | SP. GRAV. | AGGRESSIVITY |
| TX | CORROSIVITY | NITRITE | CHLORIDE | LEAD | COO | |
| ORGANIC | PH | PHOSPHATE | FLUORIDE | | TSS | BACTERIOLOGY |
| SCREEN | 1020 | ORTHO | | COLD VAPOR | TDS | CHT |
| MAJORID | | TOTAL | METALS | MERCURY | | SURFACE |
| TPH <input checked="" type="checkbox"/> | REACTIVITY | PHOSPHOROUS | | | RESIDUES | POTABLE |
| | CYANIDE | TOTAL | TEST GROUPS | ICP METALS | 105 ^{0c} | T. COLI |
| PCB | SULFIDE | | TOXIC | ARSENIC | FXD 550 ^{0c} | F. COLI |
| SHIPE | | CYANIDE | HRSD | CADMIUM | VOL 550 ^{0c} | F. STREP |
| SOLID | TCLP | AMENABLE | RDF | CHROME | TOTAL SLDS | RESID. CL |
| OIL | METALS | TOTAL | NPDES | COPPER | | HPC |
| WATER | ORGANICS | PHENOL | CRANEY | IRON | ACIDITY | |
| | | SULFATE | | LEAD | ALKALINITY | |
| | | SULFITE | FLAME AA | SILVER | MBAS | |
| | | SULFIDE | CHROME 6 | ZINC | OIL&GREASE | |

SPECIAL ANALYSIS AND INSTRUCTIONS: 1

III FIELD INFORMATION

Container ID 106-2105-0260

Source SOIL

Location FIRE STATION SAINT J

Grab Thief Comp A Other comp

PIN # (RCRA only) _____ pH _____ Temp _____ ° F

Sample description: SOIL

Multiple Sample Record Total number of samples _____

| | |
|-----|-----|
| 001 | 013 |
| 002 | 014 |
| 003 | 015 |
| 004 | 016 |
| 005 | 017 |
| 006 | 018 |
| 007 | 019 |
| 008 | 020 |
| 009 | 021 |
| 010 | 022 |
| 011 | 023 |
| 012 | 024 |

Check here if sample IDs are continued on back.

IV CHAIN OF CUSTODY Collected by J. Hancey

Date 4-14-92 Time 1415 Code 106 Phone 3632

Relinquished by J. Hancey Received by M. McAdams

Date 4/14/92 Time 1500 Code 134.A Phone 6-3629

Relinquished by _____ Received by _____

Date _____ Time _____ Code _____ Phone _____

Relinquished by _____ Received by _____

Date _____ Time _____ Code _____ Phone _____

Relinquished by _____ Received by _____

Date _____ Time _____ Code _____ Phone _____

V LABORATORY INFORMATION

Sample description: _____

Phase 1 _____ Phase 2 _____ Phase 3 _____

Phase sample number P1 _____ P2 _____ P3 _____

Sample Preservation: Sat. _____ Corrected _____ by _____

MESSAGE CONFIRMATION

DATE:05/13/93 TIME:07:58

ID:ENV PROG DIV C-

| DATE | TIME | TX-TIME | DISTANT STATION ID | MODE | PAGES | RESULT |
|-------|-------|---------|--------------------|------|-------|--------|
| 05/13 | 07:57 | 00'42" | 63904 | G3-S | 001 | OK |



Groundwater Technology Government Services, Inc.
1244 B Executive Boulevard, Suite 106, Chesapeake, VA 23320
Tel: (804) 436-7881 Fax: (804) 436-2312

May 12, 1993

Faxed 5/12/93

Mr. John Lancaster
Resident Officer in Charge of Construction
Norfolk Naval Shipyard
Portsmouth, Virginia

RE: Security Clearance
Building 271, St. Julian Annex
Portsmouth, VA

Dear Mr. Lancaster:

As per our telephone conversation today, Groundwater Technology Government Services, Inc. will need a security pass for May 10 through May 21, 1993, for the following personnel:

Name: Neil Frasco
S.S. # 015-62-0646
DOB: June 16, 1967
Place of Birth: Lawrence, MA

If you should have any questions, please do not hesitate to contact me at (804) 436-7881.

Sincerely,

**GROUNDWATER TECHNOLOGY
GOVERNMENT SERVICES, INC.**

**William L. Hughes
Geologist**

cc: File

From: Code 106.31
TO: Code 1123.1

13 MAY 1993

IT IS REQUESTED THAT A BADGE BE ISSUED FOR THE ABOVE MENTIONED Groundwater Technology representative for the time period of 13 May 1993 through 21 May 1993. Access to the CIA is NOT required. A Vehicle pass is required

John B. Bennett for
W. W. Din
Code 106.31
Oct 6-39 %

MESSAGE CONFIRMATION

DATE: 05/13/93 TIME: 07:42

ID: ENV PROG DIV C-

| DATE | TIME | TX-TIME | DISTANT STATION ID | MODE | PAGES | RESULT |
|-------|-------|---------|--------------------|------|-------|--------|
| 05/13 | 07:41 | 00'54" | 63904 | G3-S | 001 | OK |

OSHA Trained and NWWA Certified

BEDFORD ENVIRONMENTAL DRILLING SERVICES

118 Center Street
Bedford, Virginia 24523
(703) 586-1449
Fax (703) 586-8510

May 12, 1993

Bill Hughes
John Lancaster

Listed below please find the names of the personnel for the Norfolk and Portsmouth, VA drilling jobs:

Steve Boblett/3/1/50/Buchanan, VA/223 74 3747
Charles Collier/8/10/72/Bedford, VA/227 37 0711
Kenneth Newcomb/7/15/63/Lexington, VA/229 15 6281

Should you have questions, please contact our office.

Regards

Jim Stevens

Jim Stevens

13 MAY 1993

From: 106.31

To: C1123.1

IT IS REQUESTED THAT BADGES BE ISSUED FOR THE ABOVE MENTIONED
Bedford ENVIRONMENTAL PERSONNEL FOR THE TIME PERIOD OF 13 MAY
1993 THROUGH 21 MAY 1993. ACCESS TO THE CIA IS NOT REQUIRED.
Vehicle passes ARE REQUIRED.

John B. Hamilton for
W. W. Dine
Code 106.31
Ext 6-3490

MESSAGE CONFIRMATION

DATE:05/10/93 TIME:07:47

ID:ENV PROG DIV C-

| DATE | TIME | TX-TIME | DISTANT STATION ID | MODE | PAGES | RESULT |
|-------|-------|---------|--------------------|------|-------|--------|
| 05/10 | 07:46 | 00'42" | 63904 | G3-S | 001 | OK |

| | | |
|--|----------------|--------------|
| Post-It™ brand fax transmittal memo 7671 | | # of pages ▶ |
| To | John Lancaster | From |
| Co. | NNS4 | Co. |
| Dept. | 396-7026 | Phone # |
| Fax # | 804-396-3499 | Fax # |



May 6, 1993

Groundwater Technology Government Services, Inc.
1244 B Executive Boulevard, Suite 106, Chesapeake, VA 23320
Tel: (804) 436-7881 Fax: (804) 436-2312

Mr. John Lancaster
Resident Officer in Charge of Construction
Norfolk Naval Shipyard
Portsmouth, Virginia

RE: Security Clearance, Building 271, St. Julian Annex, Portsmouth, Virginia

As per our telephone conversation today. Groundwater Technology Government Services, Inc. will need a security pass for May 10 through May 21, 1993, for the following personnel:

| | |
|----------------------|------------------|
| Name: | William Hughes |
| Social Security No.: | 561-98-6059 |
| Date of Birth: | July 10, 1961 |
| Place of Birth: | San Jose, Calif. |

If you should have any questions, please do not hesitate to contact me at (804) 436-7881.

Groundwater Technology Government Services, Inc.

William L. Hughes
William Hughes
Geologist

cc: File

7 May 1993

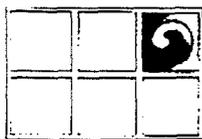
From: Code 106.31
To: Code 1123.1

PLEASE provide A BADGE for the ABOVE MENTIONED Groundwater Technology GOVERNMENT SERVICES representative for the time period of 10 MAY through 21 MAY 1993. ACCESS TO THE CIA will NOT BE required. A vehicle pass is required.

John Blumenthal
W. W. DIN
Code 106.31
EXT 6-3490

Post-It™ brand fax transmittal memo 7671 # of pages > 1

| | | | |
|-------|----------------|---------|----------------|
| To | JOHN LANCASTER | From | Bill Hughes |
| Co. | NNS4 | Co. | |
| Dept. | 396-7026 | Phone # | (804) 436-7881 |
| Fax # | 804-396-3499 | Fax # | |



**GROUNDWATER
TECHNOLOGY
GOVERNMENT SERVICES**

May 6, 1993

Groundwater Technology Government Services, Inc.
1244 B Executive Boulevard, Suite 106, Chesapeake, VA 23320
Tel: (804) 436-7881 Fax: (804) 436-2312

Mr. John Lancaster
Resident Officer in Charge of Construction
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Date of Birth: July 10, 1961
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If you should have any questions, please do not hesitate to contact me at (804) 436-7881.

Groundwater Technology Government Services, Inc.

William L. Hughes
William Hughes
Geologist

cc: File

MESSAGE CONFIRMATION

DATE:03/10/93 TIME:14:19

ID:ENV PROG DIV C-

| DATE | TIME | TX-TIME | DISTANT STATION ID | MODE | PAGES | RESULT |
|-------|-------|---------|--------------------|------|-------|--------|
| 03/10 | 14:18 | 00'51" | 804 445 6662 | G3-S | 001 | OK |

SITE CHECK REQUEST FORM

Memorandum

date: 3/10/93

From: NORFOLK NAVAL SHIPYARD (activity name)
JOHN B. LANCETTA (Point of contact)
902 396 3499 (Phone number)

To: LANTDIV Code 1821

Subj: NEED FOR SITE CHECK AT SUSPECTED LEAKING UST SITE

- 1. UST ID Number: 271-3 FUEL STORAGE TANK
- 2. Nearest building number: BUILDING 271 (SJCA)
- 3. Date Regulator was notified: N/A
- 4. Did you report either suspected or confirmed release (please circle one)? N/A
- 5. Why is released suspected?
 - a. Initial tank test
 - b. Annual tank test
 - c. Tank removal
 - d. Monthly monitoring
 - e. Discovered during construction
 - f. Fuel coming out of ground
 - g. Other (please explain) _____

Please enclose any backup data, such as testing results and site sketches that you may have on this site.

6. If suspected contamination is the result of a past event, such as a spill, please provide relevant information (such as date of event, nature of event, size of spill, type of product, etc.) in the following space:

7. Please fax this to (804)445-6662, attention Code 1821, as soon as possible.

John B Lantetta

Signature of Environmental Coordinator

Please feel free to include any other information on the suspected release that you may feel is useful to us (a site sketch would be nice).

SHIPYARD TO FUND: \$ 10 366

CONCUR
A 3/9/93.

SITE CHECK REQUEST FORM

Memorandum

date: _____

From: _____ (activity name)
_____ (Point of contact)
_____ (Phone number)

To: LANTDIV Code 1821

Subj: NEED FOR SITE CHECK AT SUSPECTED LEAKING UST SITE

1. UST ID Number: _____
2. Nearest building number: _____
3. Date Regulator was notified: _____
4. Did you report either suspected or confirmed release (please circle one)?
5. Why is released suspected?
 - a. Initial tank test
 - b. Annual tank test
 - c. Tank removal
 - d. Monthly monitoring
 - e. Discovered during construction
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Signature of Environmental Coordinator

Please feel free to include any other information on the suspected release that you may feel is useful to us (a site sketch would be nice).

End (1)

SITE CHECK REQUEST FORM

Memorandum

date: _____

From: _____ (activity name)
_____ (Point of contact)
_____ (Phone number)

To: LANTDIV Code 1821

Subj: NEED FOR SITE CHECK AT SUSPECTED LEAKING UST SITE

1. UST ID Number: _____
2. Nearest building number: _____
3. Date Regulator was notified: _____
4. Did you report either suspected or confirmed release (please circle one)?
5. Why is released suspected?
 - a. Initial tank test
 - b. Annual tank test
 - c. Tank removal
 - d. Monthly monitoring
 - e. Discovered during construction
 - f. Fuel coming out of ground
 - g. Other (please explain) _____

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End (1)



DEPARTMENT OF THE NAVY

NAVY PUBLIC WORKS CENTER
NORFOLK, VIRGINIA 23511-0698

DATE: 1/6/93

FACSIMILE TRANSMISSION COVER SHEET

TOTAL NUMBER OF PAGES
INCLUDING COVER SHEET: 5

TO: _____
AGENCY: NNSY
DE: ENVIRONMENTAL
ATTN: MIKE HOST
TELEPHONE: _____
FACSIMILE NUMBER(S): 396-4826

MIKE,
PLEASE TREAT THIS BACKUP
AS CONFIDENTIAL. CALL AT
YOUR CONVENIENCE SO WE
CAN DISCUSS.

FRANK

FROM: _____
DEPARTMENT: _____
CODE: 421
NAME: FRANK COLE
TELEPHONE: (304) 444-3765
AUTOVON: _____

FIELD INVESTIGATION (BACK SIDE COSTS)

INDUSTRIAL HYGIENIST - ALLOW 12 MH FOR FIELD WORK \Rightarrow 1.5 MANDAYS

PROJECT GEOLOGIST - ALLOW 12 HR DAYS:

{ FIVE WELLS } (ONE DAY/WELL) = 5 DAYS
{ 6 SOIL BORINGS } ($\frac{1}{2}$ DAY/BORING) = 3 DAYS

ALLOW 2 ADDITIONAL DAYS FOR FIELD WORK

\Rightarrow (10 DAYS) (12 MH/DAY) = 120 MH \Rightarrow 15 EIGHT-HR MANDAYS

STUDY PREPARATION (FRONT SIDE COSTS)

INDUSTRIAL HYGIENIST - ALLOW 48 MH FOR RISK & REMEDIATION ASSESSMENTS

PROJECT GEOLOGIST - ALLOW 80 MH FOR SITE ASSESSMENT AND REPORT PREPARATION

DESIGN DRAFTER - ALLOW 32 MH FOR SKETCHES AND TABLES/CHARTS

PROJECT ENGINEER - ALLOW 14 MH FOR PROJECT MANAGEMENT, COORDINATION, AND REVIEW

TYPIST -

(60 PAGES) ($\frac{1}{2}$ HR/PAGE) = ALLOW 30 MH

CODE
421
 CIVIL-STRUCTURAL
 ENGINEERING BRANCH

TITLE: SITE CHARACTERIZATION STUDY

BLDG: 271, ST. S. JO# 1532588 PAGE: 2 OF 4

BY: TEB DATE: 11/3/92 CHKD: _____ DATE: _____

SITE INVESTIGATION (DRILLING, SAMPLING, AND ANALYSIS)

| TASK | UNITS | QTY | RATE | COST | REMARKS |
|-------------------|----------|-----|---------|---------|-----------------|
| MOBILIZATION | LS | 1 | \$ 250 | \$ 250 | SITE WORK |
| MONITORING WELLS | FT | 75 | \$ 40 | \$ 3000 | SITE WORK |
| SPLIT SPOONS | EA | 25 | \$ 15 | \$ 375 | SITE WORK |
| DEVELOPMENT | EA | 5 | \$ 100 | \$ 500 | SITE WORK |
| DECONTAMINATION | EA | 5 | \$ 90 | \$ 450 | SITE WORK |
| ASPHALT PATCHES | EA | 3 | \$ 25 | \$ 75 | SITE WORK |
| DRUMS | EA | 16 | \$ 40 | \$ 640 | SITE WORK |
| SAFETY SUPPLIES | DAYS | 10 | \$ 30 | \$ 300 | SITE WORK |
| SAFETY INSTRUMENT | DAYS | 10 | \$ 30 | \$ 300 | SITE WORK |
| SOILS - TPH | EA | 22 | \$ 95 | \$ 2090 | LAB ANALYSIS |
| SOILS - BTEX | EA | 22 | \$ 95 | \$ 2090 | LAB ANALYSIS |
| WATER - TPH | EA | 7 | \$ 95 | \$ 665 | LAB ANALYSIS |
| WATER - BTEX | EA | 8 | \$ 75 | \$ 600 | LAB ANALYSIS |
| SOILS - TCLP | EA | 1 | \$ 1160 | \$ 1160 | LAB ANALYSIS |
| SURVEY | DAYS | 1 | \$ 550 | \$ 550 | SURVEYS |
| SURVEY PLOTTING | DAYS | 1 | \$ 201 | \$ 201 | SURVEYS |
| SAMPLE SHIPPENT | COOLERS | 4 | \$ 75 | \$ 300 | SAMPLE SHIPPING |
| EXPRESS | PACKAGES | 6 | \$ 20 | \$ 120 | SAMPLE SHIPPING |
| SUPPLIES | LS | 1 | \$ 250 | \$ 250 | SITE WORK |
| SOIL BORINGS | FT. | 36 | \$ 15 | \$ 540 | SITE WORK |
| CONCRETE & CAP | EA | 5 | \$ 300 | \$ 1500 | SITE WORK |

PWC
 ZORR
 OLK

CODE
421
 CIVIL-STRUCTURAL
 ENGINEERING BRANCH

TITLE: SITE CHARACTERIZATION STUDY

BLDG: 271, ST. J. JO# 1532588 PAGE: 3 OF 4

BY: TEB DATE: 11/3/92 CHKD: _____ DATE: _____

| TASK | UNITS | QTY | RATE | COST | REMARKS |
|-------------|-------|-----|------|--------|-----------------|
| SOILS - PCB | EA | 22 | \$65 | \$1430 | LAB ANALYSIS |
| WATER - PCB | EA | 5 | \$65 | \$325 | LAB ANALYSIS |
| TOTALS | | | | \$8180 | SITE WORK |
| | | | | \$751 | SURVEYS |
| | | | | \$420 | SAMPLE SHIPPING |
| | | | | \$8360 | LAB ANALYSIS |

PWC NORFOLK

CODE

421

CIVIL-STRUCTURAL
ENGINEERING BRANCH

TITLE: SITE CHARACTERIZATION STUDY

BLDG: 271 ST. S. JO# 1532588 PAGE: 4 OF 4

BY: TEB DATE: 11/3/92 CHKD: _____ DATE: _____

DUPLICATION

(6 COPIES) (75 PAGES) (\$0.66/PAGE) = \$27; SAY \$30

TRAVEL & SUBSISTENCE

| TASK | UNITS | QTY | RATE | COST |
|-------------|------------|-----|-------|-------|
| AIRFARE | ROUND TRIP | 1 | \$400 | \$400 |
| CAR RENTAL | DAYS | 1 | \$35 | \$35 |
| SUBSISTENCE | DAYS | 1 | \$26 | \$26 |
| TOTAL | | | | \$461 |

LABORATORY ANALYSIS

| FIRM | SOIL-TPH | SOIL-BTEX | SOIL-PCB | SOIL-TELP | WATER-TPH | WATER-BTEX | WATER-PCB | PHONE NO. |
|------------------|----------|-----------|----------|-----------|-----------|------------|-----------|-----------|
| ① ETS | \$95 | \$95 | \$65 | \$1160 | \$95 | \$75 | \$65 | 461-3874 |
| ② JENNINGS LAB | 70 | 75 | 80 | 830 | 60 | 55 | 60 | 425-1498 |
| ③ MARINE CHEMIST | 40 | 85 | 110 | 1200 | 30 | 85 | 110 | 627-9933 |
| ④ F&R | 95 | 95 | 110 | 1250 | 95 | 95 | 95 | 436-1111 |

→ SELECT PRICES FROM ETS AS MOST REPRESENTATIVE

PWC NORFOLK