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NAS WHITING FIELD  
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SITE ASSESSMENT REPORT FOR AVGAS PIPELINE SECTION E NAS WHITING FIELD FL  
6/1/2003  
TETRA TECH

**Site Assessment Report**  
for  
**AVGAS Pipeline – Section E**

**Naval Air Station Whiting Field**  
Milton, Florida



**Southern Division**  
**Naval Facilities Engineering Command**  
Contract Number N62467-94-D-0888  
Contract Task Order CTO-0200

June 2003



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30 June, 2003

Project Number 4038

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Technical Review Section  
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Reference: Clean Contract No. N62467-94-D0888  
Contract Task Order No. 0200

**Subject: Site Assessment Report  
AvGas Pipeline Section E  
Site 2832  
Naval Air Station Whiting Field  
Milton, Florida**

Dear Mr. Cason:

Tetra Tech NUS, Inc. is pleased to submit the enclosed Site Assessment Report for the AvGas Pipeline Section E, Site 2832, for your review. Electronic files for the subject document are also provided on the enclosed compact disk (CD). The enclosed CD has been scanned using the anti-virus software Norton Anti-Virus 2000™ and Trend Anti-Virus™ and is free of detectable viruses.

If you have any questions regarding this submittal, please contact me at (813) 806-0202, or via e-mail at calliganp@ttnus.com.

Sincerely,

*Richard D. May for*

Paul E. Calligan, P.G.  
Task Order Manager

/pc

Enclosures

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Mark Perry (Unbound Copy and CD)  
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**SITE ASSESSMENT REPORT  
FOR  
AVGAS PIPELINE – SECTION E**

**NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA**

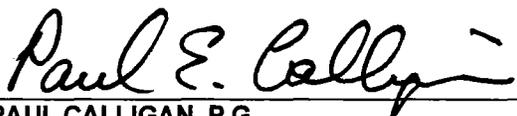
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**CONTRACT NUMBER N62467-94-D-0888  
CONTRACT TASK ORDER 0200**

**JUNE 2003**

**PREPARED UNDER THE SUPERVISION OF:**



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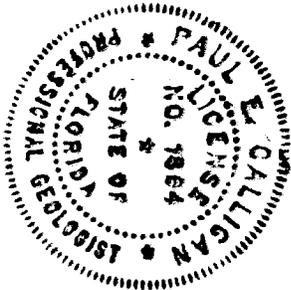


**DEBBIE WROBLEWSKI  
PROGRAM MANAGER  
TETRA TECH NUS, INC.  
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**PROFESSIONAL CERTIFICATION**

**Site Assessment Report  
AvGas Pipeline Section E  
Site 2832  
Naval Air Station Whiting Field  
Milton, Florida**

This Site Assessment Report was prepared under the direct supervision of the undersigned geologist using geologic and hydrogeologic principles standard to the profession at the time the report was prepared. If conditions are determined to exist that differ from those described, the undersigned geologist should be notified to evaluate the effects of additional information on the assessment described in this report. This report was developed specifically for the referenced site and should not be construed to apply to any other site.



*Paul E. Calligan*  
Paul E. Calligan, P.G.  
Florida License No. PG-0001864

6-30-03  
Date

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## EXECUTIVE SUMMARY

Tetra Tech NUS, Inc. (TtNUS) has been authorized by Department of Navy, Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) to prepare site assessment reports for petroleum impacted sites at the Naval Air Station (NAS) Whiting Field located in Santa Rosa County, near Milton Florida. This Site Assessment Report (SAR) has been prepared to evaluate soil and groundwater conditions at the Aviation Gasoline (AVGAS) Pipeline Section E site, located east of Building 2832.

### **Site Assessment Activities**

- Reviewed available Navy documents to identify potential sources and receptors for petroleum hydrocarbons in the site vicinity, identify public and private potable water supply wells, locate nearby surface water bodies, and determine surface hydrology and drainage;
- Conducted a preliminary characterization of soil and groundwater in the vicinity of Building 2832 using a cone penetration testing (CPT) rig equipped with a membrane interface probe (MIP) direct sensing device;
- Advanced 23 soil borings using a direct push technology (DPT) rig to collect soil samples for headspace screening and soil and groundwater samples for screening level laboratory analysis;
- Installed 13 permanent monitoring wells into the perched water bearing zone (approximately 15 to 25 feet below land surface (bls)), and four permanent monitoring wells into the shallow aquifer (approximately 120 to 125 feet bls);
- Collected groundwater samples from the 17 new permanent monitoring wells for laboratory analysis of volatile organic aromatics (VOAs), polynuclear aromatic hydrocarbons (PAHs), ethylene dibromide (EDB), total recoverable petroleum hydrocarbons (TRPH), and lead; and
- Completed an aquifer characterization program to evaluate the movement of groundwater at the site.

### **Conclusions**

- Concentrations of petroleum products contaminants of concern (CoCs) in soil samples collected from the site exceed soil cleanup target levels (SCTLs) specified in Chapter 62-770, Florida Administrative Code (F.A.C.);

- Free phase petroleum product is present in monitoring wells completed in the perched water bearing zone, but is not present in monitoring wells completed in the shallow aquifer (a source removal involving manual bailing of free product from the monitoring wells has been initiated);
- Concentrations of petroleum products CoCs in groundwater samples collected from the perched water bearing zone exceed groundwater cleanup target levels (GCTLs) specified in Chapter 62-770, F.A.C.;
- Concentrations of petroleum products CoCs in groundwater samples collected from the shallow aquifer do not exceed GCTLs specified in Chapter 62-770, F.A.C.; and
- Exposure pathways to human receptors via surface water or supply wells are not complete.

### **Recommendations**

Based upon the hydrogeological and chemical data presented in this SAR, and the requirements of Chapter 62-770, F.A.C., it is recommended that a Remedial Action Plan (RAP) be prepared to address free product and petroleum impacted soil and groundwater in the perched water bearing zone. The RAP should also include a monitoring program for the shallow aquifer to verify that it does not become impacted by petroleum products. In addition, manual free product removal should continue until free product does not appear in any monitoring well for three consecutive events, or a RAP is submitted and approved and an active free product recovery system is installed.

## 1.0 SITE DESCRIPTION AND BACKGROUND INFORMATION

TtNUS, under contract to the Department of Navy, (SOUTHNAVFACENGCOM), is submitting this SAR documenting the findings of the site assessment performed at AVGAS Pipeline Section E near building 2832 located at the NAS Whiting Field near Milton, Florida (Figure 1-1). This SAR was prepared on behalf of the Navy under contract No. N62467-94-D-0888 and summarizes environmental assessment activities conducted by TtNUS at AVGAS Pipeline Section E.

### 1.1 SITE LOCATION AND CONDITIONS

NAS Whiting Field is located on the Western Highlands subdivision of the Coastal Plain Physiographic province, which is characterized by a well-drained southward sloping plateau. Elevations range from 150 to 190 feet above sea level. Streams bound NAS Whiting Field to the west, south, and east. The shallow aquifer at NAS Whiting Field occurs at approximately 100 feet bls with localized perched zones occurring at higher elevations.

The site lies within the northeastern part of Section 2 in Township 2 North, and Range 28 West, as shown on the Milton North, Florida, US Geologic Survey Quadrangle Map (USGS, 1987), (Figure 1-2). Section E of the AVGAS Pipeline is located in the industrial area approximately 150 feet southeast of the oil/water separator investigation area and approximately 300 feet northwest of Site 1438/1439, the former location of two, 218,000 gallon AVGAS storage tanks. The site is currently an open grassed field between building 2832 and a forested area.

Historical information and construction plans provided by NAS Whiting Field personnel indicate that the AVGAS Pipeline was installed for the distribution of AVGAS in approximately 1943 and continued operation until the late 1970s. Figure 1-3 presents the installation layout and the location of the AVGAS Pipeline. The pipeline consists of one 6 inch diameter steel pipe which runs from the former South Field AVGAS Storage Tank Farm [Underground Storage Tanks (USTs) 1466A through 1466G] to the former pump house (Building 1470), located near the intersection of Langley Street and the aircraft tow road. From this point the pipeline divides and two 6 inch diameter steel pipes run from the former pump house (Building 1470) to the former North Field AVGAS Storage Tank Farm (USTs 1467A through 1467H). The overall length of the AVGAS pipeline is approximately 7,050 feet.

## 1.2 SITE HISTORY

A closure assessment was conducted on the AVGAS pipeline in October, 2000. The field investigation included locating the buried portions of the AVGAS pipeline using geophysical techniques, collection of soil samples for headspace screening analysis from borings located along the AVGAS pipeline, collection of confirmatory soil samples for fixed-base laboratory analysis, and groundwater sampling at locations where the depth to groundwater was less than 20 feet below grade. During the closure assessment an area of product saturated soil was detected just north of Site 1438/1439 at soil boring B74 at Section E. A Closure Assessment Report was submitted to the Florida Department of Environmental Protection (FDEP) and the Escambia County Health Department in April, 2001 (TtNUS, 2001). The Closure Assessment Report recommended that a site assessment be conducted at the location where the product saturated soil was detected. A response letter was subsequently issued by the Department concurring with the recommendation to perform a site assessment.

## **2.0 SITE ASSESSMENT METHODOLOGY**

The purpose of this site investigation was to assess an area north of Site 1438/1439 where product saturated soil was detected during a closure assessment conducted on the AVGAS pipeline associated with tanks 1438 and 1439. The product was detected at a depth of approximately 15 to 20 feet bls. Groundwater in the vicinity of NAS Whiting Field is typically encountered at a depth of approximately 100 feet bls. However, localized intermittent perched water bearing lenses have been encountered at higher elevations. It was assumed that the product saturated soil identified during the closure assessment was associated with one of these localized lenses. Therefore, the site assessment was planned and conducted in such a way as to ensure that the clay lens was not breached and the underlying shallow aquifer was not inadvertently contaminated. To ensure this, the assessment was conducted in three phases as outlined below:

The first phase of the assessment involved the use of a CPT rig equipped with a direct sensing MIP. The CPT/MIPs investigation was conducted to evaluate the extent of product saturated soil and determine if it was associated with a localized perched lens. By delineating the extent of the product saturated soil and the perched lens, steps could be taken to ensure that the lens was not breached during subsequent assessment activities.

The second phase of the assessment involved the use of a DPT rig to determine the horizontal and vertical extent of petroleum impacted soil. During the DPT investigation soil samples were collected for Organic Vapor Analyzer – Flame Ionization Detector (OVA-FID) screening, and soil and groundwater samples were collected for screening level laboratory analysis. The soil and groundwater data were used to determine the optimum number and location of permanent monitoring wells.

The third phase of the assessment involved installation and sampling of permanent monitoring wells to delineate the horizontal and vertical extent of petroleum impacted groundwater. The placement of these wells was based on field screening results obtained during the CPT and DPT investigations. The results of the site assessment are discussed in Chapters 3.0 and 4.0.

### **2.1 QUALITY ASSURANCE**

This site assessment was conducted in accordance with the FDEP's Standard Operating Procedures (SOPs) for Field Activities (DEP-SOP-001/01). Equipment used to advance the soil borings, install monitoring wells, and collect soil or groundwater samples was decontaminated

prior to and following each use according to the FDEP SOP. Groundwater generated during well development and sampling was containerized in labeled 55-gallon drums and staged for proper disposal pending laboratory analysis. Organic vapor concentrations were measured with a PhotoVac Micro-FID. Prior to each day's activities, the OVA-FID was field calibrated with 100-parts per million (ppm) methane in air span gas, in accordance with the manufacturer's directions.

Soil and groundwater samples were collected in containers provided by Accutest Laboratories, located in Orlando, Florida. Where appropriate, sample containers were pre-preserved as specified in DEP-SOP-001/01. As part of the groundwater sampling event, quality control samples (e.g. equipment blanks and trip blanks) were prepared and submitted to the laboratory as required by DEP-SOP-001/01. Sampling activities were documented in a site-specific field logbook, and samples were transmitted under chain-of-custody protocols to the laboratory.

## **2.2 SOIL ASSESSMENT PROGRAM**

During the first phase of the assessment approximately 21 soil borings were advanced by Fugro Geosciences, Inc. using a CPT rig equipped with a MIPs direct sensing device. CPT uses tip resistance and friction ratio to determine soil behavioral characteristics. The soil behavioral characteristics can then be used to determine soil classifications. The MIP system consists of a hydrophobic membrane surrounded by a heater block. By heating the area around the membrane, a pressure gradient is created. This pressure gradient pushes volatilized VOCs through the membrane where they are carried to the surface through a trunk line in an inert carrier gas. At the surface the carrier gas and any VOCs that are present are processed through a series of detectors that provide a relative estimate of the concentration of petroleum hydrocarbons.

The first phase of the assessment was conducted from April 29, 2002 through May 3, 2002. During the first phase, approximately 21 soil borings (WHF-2832-SB01 through WHF-2832-SB21) were installed. Soil boring WHF-2832-SB01 was installed at the approximate location of the soil boring where product saturated soil was detected during the closure assessment. Soil borings WHF-2832-SB02 through WHF-2832-SB20 were installed in a grid pattern surrounding WHF-2832-SB01. Soil borings WHF-2832-SB01 through WHF-2832-SB20 were each advanced to a depth of approximately 25 feet bls. Soil boring WHF-2832-SB-21 was installed at the location of WHF-2832-SB01 and advanced to a depth of approximately 94 feet bls. To minimize the potential for cross-contamination of the shallow aquifer, WHF-2832-SB21 was advanced through a surface casing installed to a depth of approximately 25 feet bls. The surface casing consisted

of a 3 inch inside diameter (ID) drive rod installed to a depth of approximately 25 feet bls and sealed in place with bentonite. After the surface casing was sealed the probe was advanced through the casing to log the boring from 25 feet bls to total depth. The CPT soil boring locations are provided on Figure 2-1. The CPT/MIPs results are provided in Appendix A.

The second phase of the assessment was conducted from June 16, 2002 through July 13, 2002. During the second phase of the assessment 23 soil borings (WHF-2832-SB01 through WHF-2832-SB14, WHF-2832-SB16 through WHF-2832-SB18, WHF-2832-SB20, WHF-2832-SB22 through WHF-2832-SB26) were advanced using DPT methods. Soil borings WHF-2832-SB01 through WHF-2832-SB14, WHF-2832-SB16 through WHF-2832-SB18, and WHF-2832-SB20 were placed at previous CPT/MIPs boring locations and were numbered the same as their respective CPT/MIPs borings. Soil borings WHF-2832-SB22 through WHF-2832-SB26 were installed at new locations. Soil samples were collected for headspace screening with an OVA-FID. In addition, soil and groundwater samples were collected from each boring for screening level laboratory analysis. Groundwater samples were collected by installing temporary wells within the borings or using retractable screen-point samplers.

Soil borings were typically advanced until corrected OVA-FID responses were below the 500 ppm threshold for excessively contaminated soil specified in Chapter 62-770, F.A.C.. However, soil borings WHF-2832-SB04, WHF-2832-SB06, WHF-2832-SB07, WHF-2832-SB12, WHF-2832-SB14, WHF-2832-SB18, and WHF-2832-SB22 were advanced to approximately 120 feet bls to facilitate collection of groundwater samples from the shallow aquifer for screening level analysis. To minimize the potential for cross-contamination of the shallow aquifer, soil borings WHF-2832-SB01, WHF-2832-SB03, WHF-2832-SB06, and WHF-2832-SB07 were installed through surface casings. The surface casings were installed by advancing 3 inch ID drive rods to a depth of approximately 20 to 25 feet bls, inserting 2-3/4-inch ID schedule (SCH) 40 polyvinyl chloride (PVC) casing inside the drive rod, then extracting the drive rod while pumping grout into the annular space around the PVC casing. After the grout was allowed to cure for a minimum of 24 hours the boring was continued by advancing the DPT drive point through the casing to the desired depth. The DPT soil boring locations are provided on Figure 2-2.

### **2.2.1 Soil Core Sampling**

Soil samples were collected during the DPT investigation using soil core samplers. The soil core samplers were four feet long and were lined with disposable plastic sleeves. The site geologist recorded the soil properties, including texture, color and soil moisture, for each soil boring and noted staining or odors. Soil boring logs are provided in Appendix B. Soil samples were

collected from select intervals in each soil core for headspace screening. Select soil samples were also submitted to an off-site laboratory for screening level analysis for benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene and methyl-tert butyl ether (MTBE).

### **2.2.2 Soil Headspace Screening**

Soil samples were collected from select intervals for headspace screening in accordance with the procedures outlined in 62-770.200(8) F.A.C. For each sample, two 16-ounce glass jars were half-filled with soil, sealed with aluminum foil, and labeled. The soil samples were allowed to equilibrate to ambient air temperature. The OVA-FID response to total headspace organic vapors was measured by inserting the OVA-FID probe through the foil sample cover and recording the highest instrument reading. If a positive response was observed when screening the first sample jar, a filtered instrument reading was made from the second soil sample jar. A granular activated carbon (GAC) filter was attached to the instrument and a headspace organic vapor measurement was made from the second soil sample. The GAC filter adsorbs heavier organic vapors, such as petroleum hydrocarbons but allows lighter, naturally-occurring organic vapors, such as methane, to be detected by the OVA-FID. The filtered concentration was subtracted from the total vapor concentration to determine the corrected OVA-FID response. The results of the soil headspace screening are discussed in Section 4.1.

### **2.2.3 Soil Sampling for Laboratory Analysis**

Soil samples were collected from select locations for fixed base laboratory analysis to confirm the OVA-FID results. In accordance with Rule 62-770.600(3)(e), the boring locations and sample intervals were selected to coincide with samples that exhibited high, medium, and low OVA-FID results. The laboratory soil samples were collected from soil borings WHF-2832-SB02 (high), WHF-2832-SB06 (medium) and WHF-2832-SB10 (low). The soil samples were analyzed for constituents of the gasoline and kerosene analytical groups (GAG/KAG), as defined by Chapter 62-770, F.A.C. Specifically, volatile organic compounds (VOCs) using SW-846 Method 8260B, polynuclear aromatic hydrocarbons (PAHs) using SW-846 Method 8310, and total recoverable petroleum hydrocarbons (TRPH) using the Florida Petroleum Range Organics (FL-PRO) method. The soil samples were placed on ice and transported under chain-of-custody protocol to Accutest Laboratories in Orlando, Florida for analysis. The soil laboratory analytical report is included in Appendix C. The results of the soil laboratory analysis are discussed in Section 4.1.

## 2.3 MONITORING WELL INSTALLATION PROGRAM

Seventeen monitoring wells were used for this site assessment. Thirteen of the monitoring wells were installed into the perched water bearing zone and four monitoring wells were installed into the shallow aquifer. One perched zone monitoring well (WHF-2832-MW1P) was installed after the closure assessment to confirm the presence of free product. Two shallow aquifer monitoring wells (WHF-2832-MW1S and WHF-2832-MW2S) were installed under the Installation Restoration (IR) program prior to the DPT investigation. The remaining 12 perched water bearing zone monitoring wells (WHF-2832-MW2P through WHF-2832-MW13P) and two shallow aquifer monitoring wells (WHF-2832-MW3S and WHF-2832-MW4S) were installed after the DPT investigation was completed. The monitoring wells were used for groundwater sampling and collecting data to evaluate aquifer properties. Monitoring well placements were selected to provide spatial coverage around the area of the release. The monitoring well locations are provided on Figure 2-3.

### 2.3.1 Perched Water Bearing Zone Monitoring Well Installation

Monitoring wells WHF-2832-MW2P through WHF-2832-MW7P and WHF-2832-MW9P were installed using a truck mounted Geoprobe® drill rig. These wells were constructed of 1-inch ID flush-threaded, schedule 40 PVC riser and 0.010-inch slot well screen with a 6-inch point cap. Monitoring wells WHF-2832-MW1P, WHF-2832-MW8P, and WHF-2832-MW10P through WHF-2832-MW13P were installed with a truck mounted drill rig using 4.25-inch ID hollow stem augers. These wells were constructed of 2 inch ID, flush-threaded, schedule 40 PVC riser and 0.010-inch slot well screen with a 6 inch point cap. The depths of the perched wells ranged from approximately 13.5 to 23.5 feet bls. The wells were installed with 10 foot screen sections positioned to bracket the water table.

The annulus around each well was backfilled to approximately one to two feet above the top of the screen with US Standard Sieve size 20/40 silica sand, followed by a one foot 30/65 fine sand seal. The remainder of the annulus was grouted to the surface with a Type I Portland cement / bentonite slurry. Each well was secured with a locking, watertight cap within an 8 inch diameter steel manhole. The manhole was set in a 24 inch square concrete apron finished slightly above grade. A typical single cased monitoring well installation is illustrated on Figure 2-4. Monitoring well construction details are summarized on Table 2-1 and the monitoring well completion diagrams are provided in Appendix D.

### **2.3.2 Shallow Aquifer Monitoring Well Installation**

Monitoring wells WHF-2832-MW1S through WHF-2832-MW4S were installed with a truck mounted drill rig using mud rotary drilling techniques. The wells were constructed of 2 inch ID, flush-threaded, schedule 40 PVC riser and 0.010-inch slot well screen with a 6 inch point cap. The depths of the shallow aquifer monitoring wells ranged from approximately 120 to 124.5 feet bls with 15 foot screen sections. To prevent cross contamination from the perched water bearing zone, monitoring wells WHF-2832-MW1S and WHF-2832-MW3S were installed through surface casings. The surface casings were installed with a truck mounted drill rig using 8.25 inch ID hollow stem augers. The surface casings were constructed of 6-inch, schedule 40 PVC installed to a depth of approximately 25 feet bls. The surface casings were grouted in place with a Type I Portland cement / bentonite slurry and allowed to cure for a minimum of 24 hours before drilling was continued. The well borings were then advanced through the surface casings using mud rotary drilling techniques.

The annulus around each well was backfilled to approximately 2 feet above the top of the screen with US Standard Sieve size 20/30 silica sand, followed by a 2 to 3 foot 30/65 fine sand seal. The remainder of the annulus was grouted to the surface with a Type I Portland cement / bentonite slurry. Each well was secured with a locking, watertight cap within an 8 inch diameter steel manhole. The manhole was set in a 24 inch square concrete apron finished slightly above grade. A typical double cased monitoring well installation is illustrated on Figure 2-5. Monitoring well construction details are summarized on Table 2-1 and the monitoring well completion diagrams are provided in Appendix D.

### **2.3.3 Monitoring Well Development**

Subsequent to the installation of the monitoring wells, each well was developed using a centrifugal or submersible pump. The grout in each monitoring well was allowed to cure a minimum of 24 hours before development was started. Groundwater physical parameters were monitored during development. Development was considered complete when three consecutive field readings of temperature, pH, and specific conductivity stabilized within the required percentages; and turbidity had fallen to less than 10 NTUs. Potentially contaminated development water was stored in labeled 55 gallon drums and later appropriately disposed of based on the laboratory analytical results from samples collected from the monitoring wells. Monitoring well development records are provided in Appendix E.

## **2.4 GROUNDWATER SAMPLING PROGRAM**

During site assessment activities, groundwater samples were collected from soil borings advanced during the DPT screening investigation and from permanent monitoring wells installed at the site. Groundwater samples collected during the DPT investigation were submitted to an off-site laboratory for screening level analysis for BTEX, naphthalene, and MTBE. Groundwater samples collected from the monitoring wells were submitted to an off-site laboratory to be analyzed for constituents of the GAG/KAG.

### **2.4.1 DPT Groundwater Screening**

A groundwater screening investigation was conducted to evaluate the extent of petroleum impacted groundwater to aid in the placement of permanent monitoring wells. During the DPT investigation, thirteen groundwater samples were collected from the perched water bearing zone (WHF-2832-SB03, WHF-2832-SB05 through WHF-2832-SB08, WHF-2832-SB10 through WHF-2832-SB12, WHF-2832-SB16, WHF-2832-SB17, WHF-2832-SB20, WHF-2832-SB22, and WHF-2832-SB24). In addition, seven groundwater samples were collected from the shallow aquifer (WHF-2832-SB04, WHF-2832-SB06, WHF-2832-SB07, WHF-2832-SB12, WHF-2832-SB14, WHF-2832-SB18, and WHF-2832-SB22).

The screening level groundwater samples from the perched water bearing zone were collected using ¾-inch or 1 inch ID temporary PVC monitoring wells installed within the DPT soil borings. A length of polyethylene (PE) tubing was inserted into the temporary well screen. The PE tubing was connected to a peristaltic pump and several screen volumes were removed from the temporary well to decrease the amount of suspended sediment in the groundwater samples. After sufficient purging, groundwater samples were collected by directing the peristaltic pump discharge directly into the sample containers.

The screening level groundwater samples from the shallow aquifer were collected using Geoprobe® retractable screen-point samplers. To collect the samples, the sampler was advanced to the desired depth and the outer casing retracted to expose the screen to the aquifer and allow groundwater to flow into the sampler. The groundwater sample was then collected using a small diameter bailer.

The screening level groundwater samples were placed on ice and transported under chain-of-custody protocol to Severn Trent Laboratories for screening level analysis for BTEX, naphthalene, and MTBE.

#### **2.4.2 Monitoring Well Sampling**

Groundwater samples were collected from the monitoring wells to evaluate groundwater quality in the perched water bearing zone and shallow aquifer in the vicinity of the site. The groundwater samples were collected using low-flow quiescent purging and sampling methods. Groundwater samples were collected from the perched water bearing zone using peristaltic pumps. Groundwater samples were collected from the shallow aquifer using Waterra pumps. New Teflon® tubing was installed in each well for groundwater sampling. Prior to sampling, approximately three to five well volumes were removed from each well. Temperature, pH, specific conductance, dissolved oxygen concentration, salinity, and turbidity were monitored while the wells were purged. The field measurements and well purge volumes were recorded during well purging and at the time of sample collection. Groundwater sample log sheets are provided in Appendix F.

Groundwater samples were collected from each monitoring well to be analyzed for 1,2-Dibromoethane (ethylene dibromide or EDB) using SW-846 EPA Method 504.1, VOCs (EPA Method 8260B), PAHs (EPA Method 8270C), TRPH (FL-PRO) and Lead (EPA Method 3010A/6010B). The groundwater samples were placed on ice and transported under chain-of-custody protocol to Accutest Laboratories in Orlando, Florida for analysis. Groundwater laboratory analytical reports are presented in Appendix G. The groundwater sampling results are discussed in Section 4.2.

### **2.5 AQUIFER CHARACTERIZATION**

Data was collected during the site investigation to evaluate the movement of groundwater at the site. Groundwater elevations were determined from static water level measurements and the top-of-casing (TOC) elevation survey. Hydraulic conductivity values for the shallow surficial aquifer were calculated from recovery measurements made during slug tests performed in selected monitoring wells at the site.

#### **2.5.1 Monitoring Well Top of Casing Elevation Survey**

On October 16, 2002, the horizontal position (northing and easting), TOC elevation, and ground surface elevation of each of the wells was surveyed by Donaldson, Garrett and Associates, Inc., a Florida registered surveyor. The survey data is discussed further in Section 3.0 of this document.

### **2.5.2            Static Water Level Measurements**

Depth-to-free product and depth-to-groundwater measurements were made in site monitoring wells during two gauging events on October 16, 2002, and December 16, 2002. Measurements were made from the reference points marked on the tops of well casings using an electronic water level indicator or interface probe. Static water level measurements were made to the nearest 0.01-foot. Groundwater elevations were calculated from the TOC elevations and the static water-level measurements.

### **2.5.3            Slug Tests**

On October 17, 2002, slug tests were performed in three monitoring wells to characterize the horizontal hydraulic conductivity (K) in the perched water bearing zone. Slug tests were not performed on the shallow aquifer wells since the results of the investigation indicate that the shallow aquifer has not been impacted by petroleum products chemicals of concern. The well locations (WHF-2832-MW10P, WHF-2832-MW12P, and WHF-2832-MW13P) were selected because they were outside of the source area. Each test was performed by displacing a volume of water with a "slug" and recording the recharge rate of the displaced water in the well. Prior to conducting the tests, the monitoring wells were opened and allowed to equilibrate to ambient conditions. Once a well had stabilized, static water level and total well depth were recorded and used to calculate the height of the water column in the well. A Mini-Troll® pressure transducer and solid slug were then inserted into the well and the water level and temperature allowed to re-stabilize. At the beginning of the test, the slug was removed from the well (slug-out, or rising head test) and the data logger was started. The slug-out method is commonly used for well screens that straddle the water table. This minimizes the cascading effect within the filter pack.

The recharge rate was recorded using an electronic data logger. The Bouwer and Rice methodology for partially penetrating wells in unconfined aquifers was utilized to calculate hydraulic conductivity values for the three monitoring wells as described in Bouwer, 1989 and Bouwer and Rice, 1976. Calculations were performed using the AQTESOLV™ aquifer characterization program as described in Duffield, 1996. Results are reported below in Section 3.2.5. These values for K should be considered to be approximations of the K since the tests reflect localized conditions only. The AQTESOLV™ computer printouts are included in Appendix H. The results of the aquifer characterization tests are discussed in Section 3.2.

### **3.0 GEOLOGY AND HYDROGEOLOGY**

Data collected during the site assessment were used to evaluate geologic and hydrogeologic conditions at the site that may influence the fate and transport of hydrocarbons released to the environment. Lithology and stratigraphy were described for the vadose zone and shallow surficial aquifer at the site. Aquifer properties evaluated as part of the site assessment included depth to groundwater and groundwater elevation, groundwater flow direction and gradient, hydraulic conductivity of the perched water bearing zone, and groundwater flow velocity. Potable water supply and irrigation wells and surface water bodies in the vicinity of the site were investigated as potential groundwater exposure paths.

#### **3.1 SITE STRATIGRAPHY**

NAS Whiting Field is underlain by a thick sequence of tertiary sedimentary formations. Information on the regional hydrogeology presented in this section is summarized from the Remedial Investigation and Feasibility Study, Phase IIA, Technical Memorandum No. 4, Hydrogeologic Assessment, prepared by ABB Environmental Services (ABB, 1995).

Groundwater in Northwest Florida occurs within three major aquifer systems. These aquifer systems include the surficial aquifer system (referred to as the Sand-and-Gravel Aquifer in the western panhandle), the intermediate aquifer system and confining unit, and the Floridan aquifer system.

The sand-and-gravel aquifer is the major water-bearing unit in Santa Rosa County. The aquifer consists of a complex sequence of sand, gravel, silt, and clay that is estimated to be approximately 350 feet thick in the vicinity of NAS Whiting Field. The sand-and-gravel aquifer consists of river and marine terrace deposits of the Pleistocene age, overlying the Pliocene Citronelle formation. The Citronelle formation, in turn, overlies a coarse clastic Miocene unit at the base of the aquifer. These units vary in thickness from 100 to 700 feet. They typically thin out to the north and east, gradually pinching out in central Walton County. Although composed predominantly of sand, the aquifer contains numerous lenses of clay and gravel that are as much as 60 feet thick. Virtually all of the groundwater used in Santa Rosa County is pumped from the sand-and-gravel aquifer. The aquifer is recharged entirely by rainfall. Throughout most of the Florida panhandle the bottom of the sand-and-gravel aquifer is typically marked by the intermediate aquifer system.

The intermediate aquifer separates the sand-and-gravel aquifer from the Upper Floridan aquifer. The intermediate aquifer consists of the upper Pensacola Clay and the lower Pensacola Clay, separated by a relatively thin, permeable unit known as the Escambia sand. The Miocene clays, which are mixed with silts and marls, are dense with low hydraulic conductivities and provide an effective confining unit in the southern half of Escambia and Santa Rosa Counties. The confining units range in thickness from about 300 feet within Escambia and Santa Rosa Counties to less than 10 feet to the northeast of these counties. The Escambia sand is less than 75 feet thick in the area. The intermediate aquifer system throughout most of Escambia and Santa Rosa Counties is not a water-bearing unit. The unit principally serves as a confining layer between the sand-and-gravel and the upper Floridan aquifers.

The Floridan aquifer system is present throughout the Florida panhandle. The system is over 1,000 feet thick in the vicinity of NAS Whiting Field. In Santa Rosa and Escambia Counties the system consists of an upper and lower aquifer separated by a confining layer (the Bucatunna Clay of the Byram Formation). The carbonate sequence containing the upper and lower Floridan aquifers dips below the level of the Gulf of Mexico in Escambia County and becomes saline. Additionally, the carbonate rock is highly soluble in the acidic groundwater, which causes the water to be highly mineralized. Consequently, the aquifer system is not commonly used as a source of water in the western part of the Florida panhandle.

Interpretation of site specific lithology and stratigraphy was based on tip resistance and friction ratio data collected during the CPT investigation, visual examination of soil cores collected from soil borings during the DPT investigation, and drill cuttings observed during the monitoring well installation. Soil boring logs from the DPT investigation are included in Appendix B.

The sediments from near surface to approximately 30 to 35 feet bls consisted of an alternating sequence of silty sandy clay, clay, and silty clayey sand. These sediments have a mottled appearance and range in color from reddish brown to yellowish brown to gray, with a medium stiff density and a slightly plastic consistency. The series is predominantly dry with some zones noted as wet to saturated. Below 35 feet bls the sediments consisted of very fine to fine grained sand ranging in color from white to pink to light gray. These sediments were noted as dry until the shallow aquifer was encountered at approximately 110 to 115 feet bls. Soil boring logs are included as Appendix B. A cross-section location map and generalized cross-sections are provided on Figures 3-1, 3-2, and 3-3.

## **3.2 SITE HYDROGEOLOGY**

Hydrogeologic data were collected during the site assessment to evaluate movement of groundwater in the shallow surficial aquifer at the site. Depth to groundwater and groundwater elevation were used to determine the groundwater flow direction and water table gradient at the site. K values for the shallow surficial aquifer were calculated from data collected during the slug tests. Groundwater flow velocity at the site was estimated from the K and gradient data.

### **3.2.1 Free Product Thickness Measurements**

Free product thickness measurements were recorded from site monitoring wells on October 16, 2002 and December 16, 2002. A measurable thickness of free product was observed in monitoring wells WHF-2832-MW1P, WHF-2832-MW2P, and WHF-2832-MW7P. During the October 16, 2002 event, free product thickness ranged from 0.59 feet in monitoring well WHF-2832-MW2P to 6.61 feet in monitoring well WHF-2832-MW1P. During the December 16, 2002 event, free product thickness ranged from 0.13 feet in monitoring well WHF-2832-MW7P to 0.50 feet in monitoring well WHF-2832-MW1P. Free product measurements for the October 16, 2002 and December 16, 2002 gauging events are summarized on Table 3-1 and depicted on Figures 3-4 and 3-5, respectively.

Free product recovery was initiated on October 18, 2002. The free product is recovered by manually bailing the product from monitoring well WHF-2832-MW1P. Free product recovery events are conducted every other week. The free product is placed in a drum on site for temporary storage. The thickness of the free product decreased from 6.61 feet during the October 16, 2002 event to 0.50 feet during the December 16, 2002 event.

### **3.2.2 Static Water Level and Groundwater Elevations**

Static water level (SWL) measurements in site monitoring wells were measured and recorded on October 16, 2002 and December 16, 2002. On October 16, 2002, the SWL measurements in the perched water bearing zone wells ranged from 3.42 feet below top of casing (btoc) in WHF-2832-MW12P to 19.76 feet btoc in WHF-2832-MW1P. On that same date, the SWL measurements in the shallow aquifer wells ranged from 117.89 feet btoc in WHF-1485C-MW1S to 113.64 feet btoc in WHF-2832-MW3S. On December 16, 2002, the SWL measurements in the perched water bearing zone wells ranged from 4.80 feet btoc in WHF-2832-MW12P to 15.38 feet btoc in WHF-2832-MW3P. On that same date, the SWL measurements in the shallow aquifer wells ranged from 116.39 feet btoc in WHF-1485C-MW1S to 110.04 feet btoc in WHF-2832-MW2S.

The SWL measurements and relative TOC elevations were used to determine a relative groundwater elevation at each well for the two gauging events. On October 16, 2002, the corrected groundwater elevations in the perched water bearing zone wells ranged from 156.72 feet in WHF-2832-MW1P to 170.43 feet in WHF-2832-MW13P. On that same date, the groundwater elevations in the shallow aquifer wells ranged from 56.87 feet in WHF-2832-MW2S to 57.36 feet in WHF-2832-MW3S. On December 16, 2002, the groundwater elevations in the perched water bearing zone wells ranged from 156.59 feet in WHF-2832-MW1P to 163.84 feet in WHF-2832-MW8P. On that same date, the groundwater elevations in the shallow aquifer wells ranged from 58.65 feet in WHF-2832-MW4S to 64.33 feet in WHF-2832-MW2S. The groundwater elevations generally decreased in the perched water bearing zone wells between the two gauging events, while they generally increased in the shallow aquifer wells between the two events. The groundwater elevations are summarized on Table 3-1 and depicted on Figures 3-6, 3-7, 3-8 and 3-9. The static water measurements reported on the figures and in the tables have been corrected to account for the presence of free product.

### **3.2.3 Groundwater Flow Direction**

To evaluate the direction of groundwater flow at the site, the groundwater elevations for the perched water bearing zone and shallow aquifer were plotted on site maps. Groundwater elevation isocontours were drawn from the plotted data. Groundwater flow direction is predicted to be perpendicular to the elevation isocontours. Interpretation of data from both gauging events indicates that groundwater flow in the shallow aquifer is to the south-southwest. The data for the perched water bearing zone are highly irregular. This is likely the result of the variable occurrence of groundwater, which is typically found in intermittent stringers that occur at varying depths throughout the perched water bearing zone. Although the groundwater elevations are very irregular, the data from both gauging events suggest that a groundwater depression is present in the vicinity of monitoring well WHF-2832-MW-1P. This depression correlates with the location of the free product plume.

### **3.2.4 Hydraulic Gradient**

The average horizontal groundwater gradient across the site was calculated for the October 16, 2002 and December 16, 2002 gauging events. The gradient was calculated from the groundwater elevations in the monitoring wells and the estimated groundwater flow direction. The groundwater flow gradient was determined using the following equation:

$$i = \frac{h_1 - h_2}{d}$$

where:

- i = the hydraulic gradient
- $h_1$  = the water elevation at point 1
- $h_2$  = the water elevation at point 2
- d = the distance between point 1 and point 2

The highest and lowest groundwater elevations from each gauging event were used to determine the difference in groundwater elevation in the perched water bearing zone, and the difference in groundwater elevation in the shallow aquifer. The horizontal distance between the high and low groundwater elevation points was measured parallel to the estimated groundwater flow direction.

The highest groundwater elevation in the perched water bearing zone on October 16, 2002 was 170.43 feet in monitoring well WHF-2832-MW13P. The lowest groundwater elevation in the perched water bearing zone on October 16, 2002 was 156.72 feet in monitoring well WHF-2832-MW1P. The horizontal distance parallel to groundwater flow is 45 feet. Based on this data the hydraulic gradient for the perched water bearing zone on October 16, 2002 was 0.30 feet/foot (see calculation below).

$$i = \frac{170.43 \text{ ft} - 156.72 \text{ ft}}{45 \text{ ft}}$$

$$i = \frac{13.71 \text{ ft}}{45 \text{ ft}}$$

$$i = 0.30 \text{ ft/ft}$$

The highest groundwater elevation in the shallow aquifer on October 16, 2002 was 57.36 feet in monitoring well WHF-2832-MW3S. The lowest groundwater elevation in the shallow aquifer on October 16, 2002 was 56.87 feet in monitoring well WHF-2832-MW2S. The horizontal distance parallel to groundwater flow is 188 feet. Based on this data the hydraulic gradient for the shallow aquifer on October 16, 2002 was 0.0026 feet/foot (see calculation below).

$$i = \frac{57.36 \text{ ft} - 56.87 \text{ ft}}{188 \text{ ft}}$$

$$i = \frac{0.49 \text{ ft}}{188 \text{ ft}}$$

$$i = 0.0026 \text{ ft/ft}$$

The highest groundwater elevation in the perched water bearing zone on December 16, 2002 was 163.84 feet in monitoring well WHF-2832-MW8P. The lowest groundwater elevation in the perched water bearing zone on December 16, 2002 was 156.59 feet in monitoring well WHF-2832-MW1P. The horizontal distance parallel to groundwater flow is 124 feet. Based on this

data the hydraulic gradient for the perched water bearing zone on December 16, 2002 was 0.059 feet/foot (see calculation below).

$$i = \frac{163.84 \text{ ft} - 156.59 \text{ ft}}{124 \text{ ft}}$$

$$i = \frac{7.25 \text{ ft}}{124 \text{ ft}}$$

$$i = 0.059 \text{ ft/ft}$$

The highest groundwater elevation in the shallow aquifer on December 16, 2002 was 64.33 feet in monitoring well WHF-2832-MW2S. However, this value is inconsistent and is considered anomalous. Therefore, the elevation from monitoring well WHF-2832-MW1S, 58.82 feet, was used for calculation of hydraulic gradient. The lowest groundwater elevation in the shallow aquifer on December 16, 2002 was 58.65 feet in monitoring well WHF-2832-MW4S. The horizontal distance parallel to groundwater flow is 58 feet. Based on these data the hydraulic gradient for the shallow aquifer on December 16, 2002 was 0.0029 feet/foot (see calculation below).

$$i = \frac{58.82 \text{ ft} - 58.65 \text{ ft}}{58 \text{ ft}}$$

$$i = \frac{0.17 \text{ ft}}{58 \text{ ft}}$$

$$i = 0.0029 \text{ ft/ft}$$

The average hydraulic gradient for each zone was determined by averaging the gradient from the October 16, 2002 with the gradient from the December 16, 2002 event. The average hydraulic gradient for the perched water bearing zone is 0.18 feet/foot. The average K for the shallow aquifer is 0.0014 feet/foot.

### 3.2.5 Hydraulic Conductivity

Rising-head slug tests conducted in monitoring wells WHF-2832-MW10P, WHF-2832-MW12P, and WHF-2832-MW13P were used to estimate the hydraulic conductivity in the perched water bearing zone. K values in the area immediately surrounding the monitoring wells were calculated to be:

$$\text{WHF-2832-MW10P} = 0.01372 \text{ feet/min} = 6.97 \times 10^{-3} \text{ cm/sec}$$

$$\text{WHF-2832-MW12P} = 0.01122 \text{ feet/min} = 5.07 \times 10^{-3} \text{ cm/sec}$$

$$\text{WHF-2832-MW13P} = 0.001013 \text{ feet/min} = 5.15 \times 10^{-4} \text{ cm/sec}$$

The average K was determined by calculating the geometric mean of the three values as follows:

$$\begin{aligned}
 &= e^{\left[ \frac{\ln x_1 + \ln x_2 + \dots + \ln x_n}{n} \right]} \\
 &= e^{\left[ \frac{\ln x_1 + \ln x_2 + \ln x_3}{3} \right]} \\
 &= e^{\left[ \frac{\ln(0.01372 \text{ ft/min}) + \ln(0.01122 \text{ ft/min}) + \ln(0.001013 \text{ ft/min})}{3} \right]} \\
 &= e^{\left[ \frac{-5.22 \text{ ft/min}}{3} \right]} \\
 &= 0.0053825 \text{ ft/min} \\
 &= 2.74 \times 10^{-3} \text{ cm/sec} \\
 &= 7.75 \text{ ft/day}
 \end{aligned}$$

Transmissivity in the perched water bearing zone was determined by multiplying the K by the effective aquifer thickness ( $b_e$ ). The effective aquifer thickness is defined as the depth from the top of the water table (approximately 10 feet bls) to bottom of the perched water bearing zone (approximately 25 feet bls). The transmissivity was calculated as follows:

$$T = Kb_e$$

where:

$$\begin{aligned}
 T &= \text{transmissivity} \\
 K &= \text{hydraulic conductivity} = 7.75 \text{ ft/day} \\
 b_e &= \text{affected aquifer thickness} = 15 \text{ ft}
 \end{aligned}$$

therefore:

$$\begin{aligned}
 T &= 7.75 \text{ ft/day} \times 15 \text{ ft} \\
 T &= 116.25 \text{ ft}^2/\text{day} \\
 T &= 870 \text{ gal/day/ft}
 \end{aligned}$$

### 3.2.6 Groundwater Seepage Velocity

Potential movement of groundwater in the perched water bearing one may be described in terms of transportation by natural flow system in the saturated zone, assuming groundwater flow follows Darcy's Law. Darcy's Law may be expressed as:

$$V = \left( \frac{K}{n} \right) \times i$$

where:

V = average seepage velocity

K = average hydraulic conductivity = 7.75 ft/day

n = effective porosity (assumed) = 0.30

I = average hydraulic gradient = 0.18 ft/ft

therefore:

$$V = \left( \frac{7.75 \text{ ft/day}}{0.30} \right) \times 0.18 \text{ ft/ft}$$

$$V = 4.65 \text{ ft/day}$$

Data from soil borings advanced during the DPT investigation indicate that silty clayey sand and silty sandy clay are the typical lithologies at the site. Review of standard literature suggests that a representative effective porosity for this lithology is approximately 30 percent (%) (Heath, 1983).

Using an average hydraulic conductivity of 7.75 feet/day, an average hydraulic gradient of 0.18 feet/foot, an effective porosity value of 30%, and Darcy's Equation, the estimated groundwater seepage velocity averaged across the site was calculated at 4.65 feet/day.

### 3.2.7 Potable Water Supply Well Survey

The potable water supply information presented in this report was obtained from the Remedial Investigation and Feasibility Study, General Information Report, prepared by ABB Environmental Services, (ABB, 1997). According to this report, potable water for NAS Whiting Field is currently supplied by three wells: North well, W-N4; South well, W-S2; and West well, W-W3. These three wells are within 0.5 mile radius of the Building 2832 and Section-E of the AVGAS pipeline. Six additional potable water supply wells were located at NAS Whiting Field, however, these wells have been abandoned in place. The locations of the currently used wells are shown on Figure 3-10. The three production wells are all screened in the sand and gravel aquifer from approximately 150 to 350 feet bls.

### 3.3 SURFACE WATER

There are no naturally occurring surface water bodies in the immediate vicinity of the site.

## **4.0 SITE ASSESSMENT RESULTS**

Soil samples were collected during the DPT investigation for headspace screening and screening level laboratory analysis. The results of the headspace screening and screening level laboratory analyses were used to determine appropriate locations for the collection of samples for fixed-base laboratory analysis. The fixed-base laboratory samples were compared to the SCTLs specified in Chapter 62-770 of the F.A.C..

Groundwater samples were collected during the DPT investigation for screening level laboratory analysis. The results of the screening level laboratory analysis were used to determine the optimum locations for permanent monitoring wells. Groundwater samples collected from permanent monitoring wells were compared to the GCTLs specified in Chapter 62-770, F.A.C.

### **4.1 SOIL ASSESSMENT RESULTS**

#### **4.1.1 DPT Soil Headspace Screening**

Soils exhibiting a corrected headspace screening response of greater than 500 ppm are considered "excessively contaminated" as defined by Chapter 62-770.200, F.A.C. for the Gasoline Analytical Group (GAG). The extent of excessively contaminated soil was assessed through soil headspace screening performed during the DPT investigation. Soil samples from eight soil borings (WHF-2832-SB01 through WHF-2832-SB03, WHF-2832-SB06 through WHF-2832-SB09, and WHF-2832-SB23) exhibited corrected OVA-FID responses of greater than 500 ppm. A summary of the soil headspace screening results is presented in Table 4-1. Soil boring locations and soil headspace screening results are shown on Figure 4-1.

#### **4.1.2 DPT Soil Laboratory Screening**

Soil samples were collected from select soil borings for screening level laboratory analysis for BTEX, naphthalene, and MTBE. Benzene exceeded the SCTL in the samples collected from soil borings WHF-2832-SB02, WHF-2832-SB03, and WHF-2832-SB07. Toluene, ethylbenzene, total xylenes, and MTBE exceeded their respective SCTLs in samples collected from soil borings WHF-2832-SB02 and WHF-2832-SB07. Naphthalene was not detected in any of the samples submitted for screening level laboratory analysis. The screening level laboratory analytical results for soil are summarized on Table 4-2 and depicted on Figure 4-2.

#### **4.1.3            Laboratory Soil Sample Analysis**

Soil samples were collected from soil borings WHF-2832-SB02, WHF-2832-SB06, and WHF-2832-SB10 for fixed-base laboratory analysis for GAG/KAG constituents. The laboratory analytical report indicates that BTEX were detected in the soil sample collected from soil boring WHF-2832-SB02 at concentrations of 241 micrograms per kilograms ( $\mu\text{g}/\text{kg}$ ), 6,260  $\mu\text{g}/\text{kg}$ , 2,570  $\mu\text{g}/\text{kg}$ , and 2,760  $\mu\text{g}/\text{kg}$  respectively. All of which exceed their respective SCTLs. TRPH was also detected in soil boring WHF-2832-SB02 at a concentration of 27.7 milligrams per kilograms ( $\text{mg}/\text{kg}$ ), which is below the SCTL. Concentrations of all other CoCs reported for WHF-2832-SB02 were below standard laboratory detection limits.

The laboratory analytical report indicates that BTEX and MTBE were detected in the soil sample collected from soil boring WHF-2832-SB06 at concentrations of 635  $\mu\text{g}/\text{kg}$ , 224  $\mu\text{g}/\text{kg}$ , 3,030  $\mu\text{g}/\text{kg}$ , 3,510  $\mu\text{g}/\text{kg}$ , and <220  $\mu\text{g}/\text{kg}$  respectively. The reported concentrations for benzene, ethylbenzene, total xylenes and MTBE exceeded their respective SCTLs, while the reported concentration for toluene was below the SCTL. TRPH was also detected in soil boring WHF-2832-SB06 at a concentration of 8.9  $\text{mg}/\text{kg}$ , which is below the SCTL. Concentrations of all other CoCs reported for WHF-2832-SB06 were below standard laboratory detection limits.

The laboratory analytical report indicates that TRPH was detected in the soil sample collected from WHF-2832-SB10 at a concentration of 42.2  $\text{mg}/\text{kg}$ , which is below the SCTL. Concentrations of all other CoCs reported for WHF-2832-SB10 were below standard laboratory detection limits. The fixed-base laboratory analytical results for soil are summarized on Table 4-3 and depicted on Figure 4-3. The soil laboratory analytical reports are provided in Appendix C.

## **4.2                GROUNDWATER ASSESSMENT RESULTS**

### **4.2.1            DPT Groundwater Screening**

Groundwater samples were collected from select soil borings for screening level laboratory analysis for BTEX, naphthalene, and MTBE. The benzene concentration exceeded the GCTL in samples collected from soil borings WHF-2832-SB03, WHF-2832-SB05, WHF-2832-SB06, WHF-2832-SB07, WHF-2832-SB08, WHF-2832-SB12, WHF-2832-SB16, WHF-2832-SB20, and WHF-2832-SB22. The toluene concentration exceeded the GCTL in the sample collected from soil boring WHF-2832-SB03. The ethylbenzene concentration exceeded the GCTL in samples collected from soil borings WHF-2832-SB03, WHF-2832-SB05, WHF-2832-SB06, WHF-2832-SB07, WHF-2832-SB08, WHF-2832-SB12, and WHF-2832-SB16. The total xylenes concentration exceeded the GCTL in samples collected from soil borings WHF-2832-SB03, WHF-

2832-SB05, WHF-2832-SB06, WHF-2832-SB07, WHF-2832-SB08, and WHF-2832-SB12. The naphthalene and MTBE concentrations exceeded the GCTLs in the samples collected from soil borings WHF-2832-SB03, WHF-2832-SB05, WHF-2832-SB06, WHF-2832-SB07, and WHF-2832-SB08. The screening level laboratory analytical results for groundwater are summarized on Table 4-4. The screening level laboratory analytical results for groundwater samples collected from the perched water bearing zone are depicted on Figure 4-4. The screening level laboratory analytical results for groundwater samples collected from the shallow aquifer are depicted on Figure 4-5. The screening level laboratory analytical reports are provided in Appendix I.

#### **4.2.2 Monitoring Well Sampling**

Groundwater samples were collected from nine perched water bearing zone monitoring wells and four shallow aquifer monitoring wells for fixed-base laboratory analysis for GAG/KAG constituents. Monitoring well locations WHF-2832-MW1P, WHF-2832-MW2P, and WHF-2832-MW7P were not sampled due to the presence of free product.

The laboratory analytical report indicates that the VOCs BTEX, 1,2 dichloroethane, and MTBE were detected in the groundwater sample collected from monitoring well WHF-2832-MW3P at concentrations of 3,030 micrograms per liter ( $\mu\text{g/l}$ ), 51.7  $\mu\text{g/l}$ , <100  $\mu\text{g/l}$ , 651  $\mu\text{g/l}$ , <100  $\mu\text{g/l}$ , and <100  $\mu\text{g/l}$  respectively, all of which exceed their respective GCTLs. The PAH compounds naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were detected in the sample from WHF-2832-MW3P at concentrations of 4.9  $\mu\text{g/l}$ , 0.87  $\mu\text{g/l}$ , and 1.6  $\mu\text{g/l}$  respectively, all of which are below their respective GCTLs. TRPH and lead were also detected in the sample from WHF-2832-MW3P at concentrations of 5.19 milligrams per liter ( $\text{mg/l}$ ) and 61.1  $\mu\text{g/l}$ , which both exceed their respective GCTLs. Concentrations of all other CoCs reported for WHF-2832-MW3P were below standard laboratory detection limits.

The laboratory analytical report indicates that the only CoC detected in the groundwater samples collected from monitoring wells WHF-2832-MW4P and WHF-2832-MW5P was TRPH, at concentrations of 1.01  $\text{mg/l}$  and 1.90  $\text{mg/l}$ , respectively. The TRPH concentration was below the GCTL in both of these wells. Concentrations of all other CoCs reported for WHF-2832-MW4P and WHF-2832-MW5P were below standard laboratory detection limits.

The laboratory analytical report indicates that the VOCs BTEX, 1,2 dichloroethane, and MTBE were detected in the groundwater sample collected from monitoring well WHF-2832-MW6P at concentrations of 12,600  $\mu\text{g/l}$ , 34,400  $\mu\text{g/l}$ , 1,630  $\mu\text{g/l}$ , 1,570  $\mu\text{g/l}$ , <250  $\mu\text{g/l}$ , and <250  $\mu\text{g/l}$ , respectively, all of which exceed their respective GCTLs. The PAH compounds naphthalene, 1-

methylnaphthalene, and 2-methylnaphthalene were detected in the sample from WHF-2832-MW6P at concentrations of 6.1 µg/l, 0.92 µg/l, and 1.7 µg/l respectively, all of which are below their respective GCTLs. TRPH was also detected in the sample from WHF-2832-MW6P at a concentration of 16.7 mg/l, which exceeds the GCTL. Concentrations of all other CoCs reported for WHF-2832-MW6P were below standard laboratory detection limits.

The laboratory analytical report indicates that benzene, toluene, TRPH, and lead were detected in the groundwater sample collected from monitoring well WHF-2832-MW10P at concentrations of 11.7 µg/l, 1.1 µg/l, 0.383 mg/l, and 13.5 µg/l, respectively. Of these, the benzene concentration exceeds the GCTL while the others are below their respective GCTLs. Concentrations of all other CoCs reported for WHF-2832-MW10P were below standard laboratory detection limits.

The laboratory analytical report indicates that BTEX and lead were detected in the groundwater sample collected from monitoring well WHF-2832-MW11P at concentrations of 6.0 µg/l, 4.6 µg/l, 8.0 µg/l, 5.8 µg/l, and 4.4 µg/l, respectively. Of these, the benzene concentration exceeds the GCTL while the others are below their respective GCTLs. Concentrations of all other CoCs reported for WHF-2832-MW11P were below standard laboratory detection limits.

The laboratory analytical report indicates that concentrations of all CoCs reported for WHF-2832-MW8P, WHF-2832-MW12P, WHF-2832-MW13P, WHF-2832-MW1S, WHF-2832-MW2S, WHF-2832-MW3S, WHF-2832-MW4S were below standard laboratory detection limits.

The fixed-base laboratory analytical results for groundwater are summarized on Table 4-5. The fixed-base laboratory analytical results for groundwater samples collected from the perched water bearing zone are depicted on Figure 4-6. The fixed-base laboratory analytical results for groundwater samples collected from the shallow aquifer are depicted on Figure 4-7. The groundwater laboratory analytical reports are provided in Appendix G.

## 5.0 DISCUSSION

### 5.1 SOURCE OF HYDROCARBONS

The AVGAS Pipeline which runs from the former South Field AVGAS Storage Tank Farm (USTs 1466A through 1466G) to the former North Field AVGAS Storage Tank Farm (USTs 1467A through 1467H) appears to be the source of the contamination. A pipeline closure was conducted by Florida Spill Response Corporation (FSRC), a certified pollutant storage systems contractor, in late August and early September 2000. Attempts to clean the pipeline with soft foam pigs were not successful since the pipeline could not be pressurized to advance the pigs. To close the AVGAS pipeline, water that was present in the pipeline was removed for proper offsite disposal and exposed ends of the pipeline were capped with grout plugs. A closure assessment was conducted on the AVGAS pipeline in October, 2000. During the closure assessment an area of product saturated soil was detected north of Site 1438/1439 and east of Building 2832, which is the area that was addressed during this site assessment.

### 5.2 SITE CONDITIONS

The sediments from near surface to approximately 30 to 35 feet bls consisted of an alternating sequence of silty sandy clay, clay, and silty clayey sand. Below 35 feet bls the sediments consisted of very fine to fine grained sand ranging in color from white to pink to light gray. Groundwater in the vicinity of NAS Whiting Field is typically encountered at a depth of approximately 100 feet bls. However, localized intermittent perched water bearing lenses have been encountered at higher elevations. One of these perched water bearing lenses was the focus of this investigation.

Depth to water in the perched water bearing lens ranged from 3.42 feet btoc to 19.76 feet btoc during October 2002 and 4.80 feet btoc to 15.38 btoc during December 2002. Relative groundwater elevations were calculated from the SWL and TOC elevation survey data. This data was used to calculate the groundwater flow direction and water table gradient at the time of each gauging event. The groundwater elevation data for the perched water bearing zone is highly irregular. This is likely the result of the variable occurrence of groundwater, which is typically found in intermittent stringers that occur at varying depths throughout the perched water bearing zone. Although the groundwater elevations are very irregular, the data from both gauging events suggest that a groundwater depression is present in the vicinity of monitoring well WHF-2832-MW-1P. This depression correlates with the location of the free product plume.

The very irregular and intermittent occurrence of groundwater in the perched water bearing zone is illustrated by monitoring wells WHF-2832-MW9P and WHF-2832-MW11P. WHF-2832-MW9P was installed in an area that appeared to have a saturated zone but the well never yielded any significant amount of water. As a result, the well was later abandoned. Monitoring well WHF-2832-MW11P was initially installed approximately 10 feet north of the location depicted on the site maps. However the well would not yield any water so it was reinstalled at the current location.

The average hydraulic gradient calculated for the perched water bearing zone was 0.18 feet per foot. K values for the perched water bearing zone were determined from slug tests and averaged 7.75 feet per day. The groundwater flow velocity was calculated from the hydraulic gradient and the K and was estimated at 4.65 feet/day. However, based on the irregular and intermittent occurrence of groundwater in the perched water bearing zone, the results are questionable and inconclusive. Three potable water supply wells are present within a 0.5 mile radius of the site. The wells are the potable water supply for NAS Whiting Field. The wells (W-N4, W-S2, and W-W3) are completed to depths of approximately 150 to 350 feet bls. There are no naturally occurring surface water bodies in the immediate vicinity of the site.

### **5.3 SOIL ASSESSMENT**

The results of the soil assessment indicate that petroleum constituents are present in the soil around the AVGAS pipeline at concentrations exceeding the requirements specified in Chapter 62-770 F.A.C. Based on the headspace screening results, there is an extensive area of "excessively contaminated" vadose zone soil (Figure 4-1). However, laboratory analytical results indicate that concentrations of petroleum products CoCs exceeded SCTLs in only four soil borings (WHF-2832-SB02, WHF-2832-SB03, WHF-2832-SB06 and WHF-2832-SB07) (Figures 4-2 and 4-3). This indicates a poor correlation between headspace screening results and laboratory analytical results.

The horizontal extent of "excessively contaminated soil" (based on OVA results > 500 ppm) is delineated by soil borings WHF-2832-SB04, WHF-2832-SB05, WHF-2832-SB10, WHF-2832-SB11, WHF-2832-SB16, WHF-2832-SB17, WHF-2832-SB18, and WHF-2832-SB26 (Figure 4-1). The vertical extent of "excessively contaminated soil" is delineated by soil boring WHF-2832-SB01 (Figure 3-2). The "excessively contaminated soil" plume is approximately 8,390 square feet in area (Figure 4-1), and extends to a depth of approximately 25 feet bls. (Figure 3-2).

#### 5.4 GROUNDWATER ASSESSMENT

A single area of free product accumulation exists beneath the AVGAS pipeline and extends to the east and northeast (Figures 3-4 and 3-5). The horizontal extent of free product has been delineated. Laboratory analytical results indicate that concentrations of petroleum products CoCs exceeded the GCTLs in nine DPT sample locations (Figure 4-4) and four permanent monitoring wells (Figure 4-6) installed in the perched water bearing zone. No GCTL exceedances were detected in any of the groundwater samples collected from the shallow aquifer wells (Figure 4-7).

The horizontal extent of the dissolved hydrocarbon plume in the perched water bearing zone is delineated by monitoring wells WHF-2832-MW4P, WHF-2832-MW9P (dry), WHF-2832-MW12P, and WHF-2832-MW13P, (Figure 4-6); and by the dry zones encountered at soil borings WHF-2832-SB13, WHF-2832-SB14, WHF-2832-SB26 (Figure 4-4), and the original location of monitoring well WHF-2832-11P (approximately 10 feet north of the location of MW11P shown on Figure 4-6). The vertical extent of the dissolved hydrocarbon plume in the perched water bearing zone is delineated by the bottom of the perched lens. The dissolved hydrocarbon plume is approximately 12,607 square feet in area (Figure 4-6) and extends to a depth of approximately 25 feet bls (Figure 3-2).

## 6.0 CONCLUSIONS AND RECOMMENDATION

Based on results obtained during the site assessment at the AVGAS Pipeline Section E site, the conclusions and recommendations for the site are summarized as follows:

- Free phase petroleum product is present in monitoring wells WHF-2832-MW1P, WHF-2832-MW2P and WHF-2832-MW7P.
- The horizontal and vertical extent of free product has been delineated.
- Free product removal is currently being performed via hand bailing on an every other week basis.
- Laboratory analytical results from soil samples collected during this site assessment indicate that concentrations of petroleum products CoCs exceed the SCTLs specified in Chapter 62-770, F.A.C.
- Laboratory analytical results from groundwater samples collected during this site assessment indicate that concentrations of petroleum products CoCs exceed the GCTLs specified in Chapter 62-770, F.A.C. in the perched water bearing zone.
- Laboratory analytical results from groundwater samples collected during this site assessment indicate that the shallow aquifer in the vicinity of the site has not been impacted by petroleum products.
- The vertical and horizontal extent of petroleum impacted soil and groundwater has been delineated. The “excessively contaminated soil” plume is approximately 8,390 square feet in area, and extends to a depth of approximately 25 feet bls. The dissolved hydrocarbon plume is approximately 12,607 square feet in area and extends to a depth of approximately 25 feet bls.
- Exposure pathways to human receptors via surface water or supply wells are not complete.

Based upon the hydrogeological and chemical data presented in this SAR, and the requirements of Chapter 62-770, F.A.C., it is recommended that a RAP be prepared to address free product and petroleum impacted soil and groundwater in the perched water bearing zone. The RAP should also include a monitoring program for the shallow aquifer to verify that it does not become

impacted by petroleum products. In addition, manual free product removal should continue until free product does not appear in any monitoring well for three consecutive events, or a RAP is submitted and approved and an active free product recovery system is installed.

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TABLE 2-1

Rev. 1  
6/30/03

**MONITORING WELL CONSTRUCTION DETAILS  
AVGAS PIPELINE SECTION E - SITE ASSESSMENT REPORT  
NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA**

Well No.	Date Installed	Drilling Method	Top of Casing Elevation	A/G Riser Length, If Applicable	Total Well Depth (Feet)	Screened Interval (FBLs)	Well Diameter (Inches)	Lithology of Screened Interval
WHF-1485C-MW1S	5/12/00	MR	175.05	----	120.00	15.00	2	Silty Sand
WHF-2832-MW1S	5/6/02	HSA	171.20	----	120.00	15.00	2	Silty Sand
WHF-2832-MW2S	5/6/02	HSA	174.37	----	120.00	15.00	2	Silty Sand
WHF-2832-MW3S	9/27/02	MR	171.00	----	124.50	20.00	2	Silty Sand
WHF-2832-MW4S	9/28/02	MR	171.99	----	124.50	20.00	2	Silty Sand
WHF-2832-MW1P	6/30/01	HSA	171.19	----	20.00	10.00	2	Silty Clayey Sand/Silty Sandy Clay
WHF-2832-MW2P	7/10/02	DPT	170.94	----	20.00	10.00	1	Silty Clayey Sand/Silty Sandy Clay
WHF-2832-MW3P	6/22/02	DPT	172.22	----	20.00	10.00	1	Silty Clayey Sand/Silty Sandy Clay
WHF-2832-MW4P	7/13/02	DPT	169.88	----	14.50	10.00	1	Silty Clayey Sand/Silty Sandy Clay
WHF-2832-MW5P	6/24/02	DPT	170.03	----	18.00	10.00	1	Silty Clayey Sand/Silty Sandy Clay
WHF-2832-MW6P	6/19/02	DPT	170.80	----	20.00	10.00	1	Silty Clayey Sand/Silty Sandy Clay
WHF-2832-MW7P	6/21/02	DPT	170.44	----	20.00	10.00	1	Silty Clayey Sand/Silty Sandy Clay
WHF-2832-MW8P	9/23/02	HSA	172.61	3 Feet	14.50	10.00	2	Silty Clayey Sand/Silty Sandy Clay
WHF-2832-MW9P	6/25/02	DPT	----	----	20.00	10.00	1	Silty Clayey Sand/Silty Sandy Clay
WHF-2832-MW10P	9/24/02	HSA	171.19	----	19.50	10.00	2	Silty Clayey Sand/Silty Sandy Clay
WHF-2832-MW11P	9/24/02	HSA	169.59	----	14.50	10.00	2	Silty Clayey Sand/Silty Sandy Clay
WHF-2832-MW12P	9/24/02	HSA	----	----	13.50	10.00	2	Silty Clayey Sand/Silty Sandy Clay
WHF-2832-MW13P	9/25/02	HSA	174.16	----	23.50	10.00	2	Silty Clayey Sand/Silty Sandy Clay
NOTES:								
HSA		Hollow Stem Auger						
MR		Mud Rotary						
DPT		Direct Push Technology						
A/G		Above Ground						
NA		Not Applicable						
FBLs		Feet Below Land Surface						

TABLE 3-1

Rev. 1  
6/30/03

**GROUNDWATER ELEVATION SUMMARY  
AVGAS PIPELINE SECTION E - SITE ASSESSMENT REPORT  
NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA  
PAGE 1 OF 3**

<b>Well No.</b>	WHF-1485C-MW1S	WHF-2832-MW1S	WHF-2832-MW2S	WHF-2832-MW3S	WHF-2832-MW4S	WHF-2832-MW1P	WHF-2832-MW2P
<b>Well Diameter</b>	2 inch	2 inch	2 inch	2 inch	2 inch	2 inch	2 inch
<b>Well Depth</b>	120.36	120.00	122.40	124.69	124.55	19.81	19.83
<b>Screened Interval</b>	100.36 - 120.36	100.0 - 120.0	102.4 - 122.4	104.69 - 124.69	104.5 - 124.5	9.81 - 19.81	9.83 - 19.83
<b>TOC Elevation</b>	175.05	171.20	174.37	171.00	171.99	171.19	170.76

Date	ELEV	DTW	FP	ELEV	DTW	FP	ELEV	DTW	FP												
10/16/2002	57.16	117.89	ND	57.31	113.89	ND	56.87	117.50	ND	57.36	113.64	ND	57.17	114.82	ND	156.72	19.76	6.61	158.85	12.38	0.59
12/16/2002	58.66	116.39	ND	58.82	112.38	ND	64.33	110.04	ND	58.79	112.21	ND	58.65	113.34	ND	156.59	15.00	0.50	159.66	11.50	0.50

NOTES:  
 Measurements in feet.  
 TOC elevations surveyed 10/16/02.  
 TOC Top Of Casing  
 ELEV Groundwater Elevation (assumes specific gravity of 0.8 for wells with free product)  
 DTW Depth To Water  
 FP Free Product thickness  
 ND Not Detected  
 NS Not Surveyed

TABLE 3-1

Rev. 1  
6/30/03

**GROUNDWATER ELEVATION SUMMARY  
AVGAS PIPELINE SECTION E - SITE ASSESSMENT REPORT  
NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA  
PAGE 2 OF 3**

<b>Well No.</b>	WHF-2832-MW3P	WHF-2832-MW4P	WHF-2832-MW5P	WHF-2832-MW6P	WHF-2832-MW7P	WHF-2832-MW8P	WHF-2832-MW9P
<b>Well Diameter</b>	2 inch	1 inch	1 inch	2 inch	2 inch	2 inch	2 inch
<b>Well Depth</b>	19.62	14.46	18.00	19.74	19.65	18.85	Abandoned
<b>Screened Interval</b>	9.62 - 19.62	4.46 - 14.46	8.0 - 18.0	9.74 - 19.74	9.65 - 19.65	8.85 - 18.85	
<b>TOC Elevation</b>	171.93	169.88	170.03	170.80	170.44	172.61	

Date	ELEV	DTW	FP	ELEV	DTW	FP	ELEV	DTW	FP	ELEV	DTW	FP	ELEV	DTW	FP	ELEV	DTW	FP	ELEV	DTW	FP	
10/16/2002	163.20	8.73	ND	162.01	7.87	ND	157.97	12.06	ND	159.67	11.13	ND	159.78	11.56	1.13	163.94	8.67	ND				Dry
12/16/2002	156.55	15.38	ND	161.16	8.72	ND	157.57	12.46	ND	159.80	11.00	ND	159.19	11.35	0.13	163.84	8.77	ND				Dry

NOTES:  
 Measurements in feet.  
 TOC elevations surveyed 10/16/02.  
 TOC Top Of Casing  
 ELEV Groundwater Elevation (assumes specific gravity of 0.8 for wells with free product)  
 DTW Depth To Water  
 FP Free Product thickness  
 ND Not Detected  
 NS Not Surveyed

TABLE 3-1

Rev. 1  
6/30/03

**GROUNDWATER ELEVATION SUMMARY  
AVGAS PIPELINE SECTION E - SITE ASSESSMENT REPORT  
NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA  
PAGE 3 OF 3**

<b>Well No.</b>	WHF-2832-MW10P	WHF-2832-MW11P	WHF-2832-MW12P	WHF-2832-MW13P			
<b>Well Diameter</b>	2 inch	2 inch	2 inch	2 inch			
<b>Well Depth</b>	20.00	18.00	13.50	24.00			
<b>Screened Interval</b>	10.0 - 20.0	8.0 - 18.0	3.5 - 13.5	3.5 - 23.5			
<b>TOC Elevation</b>	171.19	169.59	NS	174.16			

Date	ELEV	DTW	FP	ELEV	DTW	FP	ELEV	DTW	FP	ELEV	DTW	FP	ELEV	DTW	FP	ELEV	DTW	FP	ELEV	DTW	FP	
10/16/2002	159.34	11.85	ND	158.09	11.50	ND	NS	3.42	ND	170.43	3.73	ND										
12/16/2002	157.46	13.73	ND	159.41	10.18	ND	NS	4.80	ND	163.24	10.92	ND										

NOTES:  
 Measurements in feet.  
 TOC elevations surveyed 10/16/02.  
 TOC Top Of Casing  
 ELEV Groundwater Elevation (assumes specific gravity of 0.8 for wells with free product)  
 DTW Depth To Water  
 FP Free Product thickness  
 ND Not Detected  
 NS Not Surveyed

TABLE 4-1

**SOIL HEADSPACE SCREENING RESULTS  
AVGAS PIPELINE SECTION E - SITE ASSESSMENT REPORT  
NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA  
PAGE 1 OF 4**

SAMPLE				OVA SCREENING RESULTS			
BORING NO.	DATE COLLECTED	DEPTH TO WATER (ft BGS)	SAMPLE INTERVAL (fbls)	TOTAL READING (ppm)	CARBON FILTERED (ppm)	NET READING (ppm)	COMMENTS
WHF-2832-SB01	6/25/2002	19	0-2	159.2	5.0	154.2	Data from closure assessment
			2-4	5,562.0	4.4	5,557.6	Data from closure assessment
			4-6	5,562.0	9.5	5,552.5	Data from closure assessment
			6-8	1,137.0	71.2	1,065.8	Data from closure assessment
			8-10	5,562.0	4.4	5,557.6	Data from closure assessment
			10-12	319.0	128.0	191.0	Data from closure assessment
			12-14	1,112.0	3.8	1,108.2	Data from closure assessment
			14-16	2,181.0	206.0	1,975.0	Data from closure assessment
			16-18	5,264.0	7.8	5,256.3	Data from closure assessment
			18-20	2,677.0	217.0	2,460.0	Data from closure assessment
			24-25	87.5	0.0	87.5	Surface casing set to 20 feet
			29-30	110.8	0.0	110.8	Free product at 17.5 feet BGS
			34-35	18.5	0.0	18.5	
			39-40	0.0	-	0.0	Analytical Sample
WHF-2832-SB02	7/10/2002	12.6	4-5	2,864.0	0.0	2,864.0	
			9-10	>50,000	0.0	>50,000	Analytical Sample
			12-13	1,422.0	0.0	1,422.0	Free product at 11.8 feet BGS
			19-20	0.0	-	0.0	
WHF-2832-SB03	6/22/2002	11.5	2-3	>4,337	0.0	>4,337	
			4-5	803.6	0.0	803.6	
			9-10	325.1	0.0	325.1	
			14-15	55.7	2.0	53.7	Analytical Sample
			19-20	101.7	58.0	43.7	
WHF-2832-SB04	6/22/2002	Dry	3-4	0.0	-	0.0	
			11-12	0.0	-	0.0	
			14-15	0.0	-	0.0	
			18-19	0.0	-	0.0	
			22-23	0.0	-	0.0	
			28-29	0.0	-	0.0	
			33-34	0.0	-	0.0	
38-39	0.0	-	0.0				
WHF-2832-SB05	7/9/2002	11.5	1-2	0.0	-	0.0	
			4-5	17.4	1.0	16.4	
			9-10	8.8	0.0	8.8	
			10-11	147.0	1.3	145.7	
			14-15	466.2	0.0	466.2	
			19-20	142.4	0.0	142.4	

TABLE 4-1

**SOIL HEADSPACE SCREENING RESULTS  
AVGAS PIPELINE SECTION E - SITE ASSESSMENT REPORT  
NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA  
PAGE 2 OF 4**

SAMPLE				OVA SCREENING RESULTS			
BORING NO.	DATE COLLECTED	DEPTH TO WATER (ft BGS)	SAMPLE INTERVAL (fbls)	TOTAL READING (ppm)	CARBON FILTERED (ppm)	NET READING (ppm)	COMMENTS
WHF-2832-SB06	6/19/2002	11.7	2-3	1,010.0	3.0	1,007.0	Analytical Sample
			3-4	1,205.0	1.3	1,203.7	
			7-8	35.7	0.0	35.7	
			9-10	331.0	0.0	331.0	
			11-12	300.2	95.5	204.7	
			14-15	320.1	0.0	320.1	
	6/21/2002	11.7	16-17	422.6	0.0	422.6	Surface casing set to 20 feet
			21-22	36.8	0.0	36.8	
			24-25	0.0	-	0.0	
			29-30	<10	0.0	<10	
			34-35	31.5	0.0	31.5	
			39-40	0.0	-	0.0	
WHF-2832-SB07	6/22/2002	12.4	4-5	291.5	0.0	291.5	Free product at 10.9 feet BGS
			9-10	>4,337	0.0	>4,337	
			12-13	1,023.5	0.0	1,023.5	
			16-17	420.2	103.5	316.7	
	6/24/2002	12.4	21-22	111.3	0.0	111.3	Surface casing set to 20 feet
			26-27	48.0	0.0	48.0	
			29-30	4.0	0.0	4.0	
			33-34	36.2	0.0	36.2	
WHF-2832-SB08	7/9/2002	11.75	39-40	0.0	-	0.0	Analytical Sample
			4-5	12,086.0	0.0	12,086.0	
			9-10	0.0	-	0.0	
			14-15	849.0	0.0	849.0	
			19-20	414.0	1.8	412.2	
WHF-2832-SB09	7/9/2002	Dry	24-25	230.1	0.0	230.1	Analytical Sample
			3-4	>50,000	0.0	>50,000	
			8-9	38.2	0.0	38.2	
			14-15	0.0	-	0.0	
WHF-2832-SB10	7/11/2002	7	19-20	0.0	-	0.0	Analytical Sample
			4-5	54.7	0.0	54.7	
			9-10	0.0	-	0.0	
			14-15	0.0	-	0.0	
			24-25	0.0	-	0.0	
WHF-2832-SB11	7/11/2002	7.6	4-5	86.4	0.0	86.4	Analytical Sample
			9-10	14.0	0.0	14.0	
			14-15	0.0	-	0.0	

TABLE 4-1

**SOIL HEADSPACE SCREENING RESULTS  
AVGAS PIPELINE SECTION E - SITE ASSESSMENT REPORT  
NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA  
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WHF-2832-SB12	6/22/2002	16.55	3-4	215.1	0.0	215.1	Analytical Sample
			9-10	0.0	-	0.0	
			14-15	0.0	-	0.0	
			18-19	0.0	-	0.0	
			23-24	0.0	-	0.0	
WHF-2832-SB13	7/10/2002	Dry	4-5	0.0	-	0.0	
			9-10	0.0	-	0.0	
			14-15	0.0	-	0.0	
			19-20	0.0	-	0.0	
			24-25	0.0	-	0.0	
WHF-2832-SB14	7/10/2002	Dry	4-5	0.0	-	0.0	
			9-10	0.0	-	0.0	
			14-15	0.0	-	0.0	
			19-20	0.0	-	0.0	
			24-25	0.0	-	0.0	
WHF-2832-SB16	7/10/2002	13.91	4-5	0.0	-	0.0	Analytical Sample
			9-10	351.6	0.0	351.6	
			14-15	0.0	-	0.0	
			19-20	0.0	-	0.0	
WHF-2832-SB17	7/9/2002	13.04	3-4	0.0	-	0.0	Analytical Sample
			8-9	44.6	2.4	42.2	
			13-14	0.0	-	0.0	
			19-20	0.0	-	0.0	
WHF-2832-SB18	6/19/2002	NA	4-5	0.0	-	0.0	
			9-10	0.0	-	0.0	
			14-15	0.0	-	0.0	
			19-20	0.0	-	0.0	
			24-25	0.0	-	0.0	
			29-30	0.0	-	0.0	
			34-35	0.0	-	0.0	
			39-40	0.0	-	0.0	
			44-45	0.0	-	0.0	
			49-50	0.0	-	0.0	
			54-55	0.0	-	0.0	
			59-60	0.0	-	0.0	
			64-65	0.0	-	0.0	
			69-70	0.0	-	0.0	
74-75	0.0	-	0.0				
79-80	0.0	-	0.0				
WHF-2832-SB20	7/10/2002	10.74	4-5	0.0	-	0.0	
			9-10	0.0	-	0.0	
			14-15	0.0	-	0.0	

TABLE 4-1

**SOIL HEADSPACE SCREENING RESULTS  
AVGAS PIPELINE SECTION E - SITE ASSESSMENT REPORT  
NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA  
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WHF-2832-SB22	6/24/2002	11	4-5	0.0	-	0.0	Analytical Sample
			9-10	0.0	-	0.0	
			11-12	49.0	0.0	49.0	
			16-17	0.0	-	0.0	
			24-25	0.0	-	0.0	
			29-30	0.0	-	0.0	
WHF-2832-SB23	7/11/2002	NA	4-5	950.0	0.0	950.0	Analytical Sample
			7-8	81.0	0.0	81.0	
			14-15	0.0	-	0.0	
			19-20	0.0	-	0.3	
WHF-2832-SB24	7/11/2002	5.49	3-4	30.1	0.0	30.1	
			9-10	0.0	-	0.0	
			14-15	0.0	-	0.0	
WHF-2832-SB25	7/12/2002	Dry	3-4	0.0	-	0.0	
			9-10	0.0	-	0.0	
			14-15	0.0	-	0.0	
WHF-2832-SB26	7/12/2002	Dry	3-4	375.0	1.5	373.5	Analytical Sample
			9-10	0.0	-	0.0	
			14-15	0.0	-	0.0	

fbls = feet below land surface

ppm = parts per million

NS = not sampled

TABLE 4-2

**DPT SOIL LABORATORY SCREENING RESULTS  
AVGAS PIPELINE SECTION E - SITE ASSESSMENT REPORT  
NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA**

Sampling Details				OVA	Laboratory Analyses					
Boring ID	Sample ID	Date Collected	Sample Interval (fbls)	Net OVA Reading (ppm)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	Naphthalene (mg/kg)	MTBE (mg/kg)
SCTL					0.007	0.50	0.60	0.20	1.70	0.20
WHF-2832-SB01	WHF 2832 GP1	6/25/2002	39-40	0.0	< 0.0056	.0032J	< 0.0056	< 0.017	< 0.0056	< 0.0056
WHF-2832-SB02	AVGE SSB 0210	7/10/2002	9-10	> 50,000	<b>0.51J</b>	<b>15</b>	<b>3.6</b>	<b>4.5</b>	<0.55	< 0.55
WHF-2832-SB02	AVGE SSB 0220	7/10/2002	19-20	0.0	<b>0.040</b>	0.062	0.021	0.024	<0.0066	<0.0066
WHF-2832-SB03	WHF 2832 GP3 TW	6/22/2002	14-15	53.7	<b>0.057</b>	< 0.0052	< 0.0052	< 0.016	< 0.0052	< 0.0052
WHF-2832-SB06	WHF 2832 GP6 TW	6/19/2002	2.5-4.5	1204	< 0.007	< 0.007	0.0024	< 0.021	< 0.007	< 0.007
WHF-2832-SB06	WHF 2832 GP6	6/21/2002	39-40	0.0	< 0.0062	< 0.0062	<0.0062	< 0.018	< 0.0062	< 0.0062
WHF-2832-SB07	WHF 2832 GP7 TW	6/22/2002	9-10	> 4337	<b>0.82J</b>	<b>25</b>	<b>3.4</b>	<b>7.8</b>	< 1.2	< 1.2
WHF-2832-SB07	WHF 2832 GP7	6/24/2002	39-40	0.0	< 0.0055	< 0.0055	< 0.0055	< 0.016	< 0.0055	< 0.0055
WHF-2832-SB08	AVGE SSB 0805	7/9/2002	4-5	12,086	< 0.0055	0.034	0.012	0.017	< 0.0055	< 0.0055
WHF-2832-SB09	AVGE SSB 0904	7/9/2002	3-4	> 50,000	< 0.0059	< 0.0059	0.011	0.150	< 0.0059	< 0.0059
WHF-2832-SB10	AVGE SSB 10 10	7/11/2002	9-10	0.0	< 0.0038	< 0.0038	< 0.0038	< 0.011	< 0.0038	< 0.0038
WHF-2832-SB11	AVGE SSB 11 05	7/11/2002	4-5	86.4	< 0.0042	< 0.0042	< 0.0042	< 0.012	< 0.0042	< 0.0042
WHF-2832-SB12	WHF 2832 GP12 TW	6/22/2002	4-5	215.1	0.0018J	< 0.0042	0.0011J	< 0.012	< 0.0042	< 0.0042
WHF-2832-SB16	AVGE SSB 1610	7/10/2002	9-10	351.6	< 0.0048	< 0.0048	0.0018J	< 0.014	< 0.0048	< 0.0048
WHF-2832-SB17	AVGE SSB 017 08	7/9/2002	7-8	42.2	< 0.0057	< 0.0057	< 0.0057	< 0.017	< 0.0057	< 0.0057
WHF-2832-SB22	WHF 2832 GP22	6/24/2002	11-12	49.0	< 0.0043	< 0.0043	< 0.0043	< 0.013	< 0.0043	< 0.0043
WHF-2832-SB23	AVGE SSB 23 05	7/11/2002	4-5	950	< 0.004	< 0.004	< 0.004	< 0.012	< 0.004	< 0.004
WHF-2832-SB26	AVGE SSB 26 05	7/12/2002	4-5	373.5	< 0.0036	< 0.0036	< 0.0036	< 0.011	< 0.0036	< 0.0036
NOTES:										
OVA		Organic Vapor Analyzer								
fbls		feet below land surface								
ppm		parts per million								
mg/kg		milligrams per kilogram								
SCTL										
Concentrations exceeding SCTLs are shown in bold.										

TABLE 4-3

**SUMMARY OF FIXED-BASE SOIL ANALYTICAL RESULTS  
AVGAS PIPELINE SECTION E - SITE ASSESSMENT REPORT  
NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA**

COMPOUND	SCTL		SB ID	WHF-2832-SB02	WHF-2832-SB06	WHF-2832-SB10
	Residential	Leaching	Sample ID	AVGELSLB0205	AVGELSLB0604	AVGELSLB1004
			Date	10/1/2002	10/1/2002	10/1/2002
			Depth	5 Feet	4 Feet	4 Feet
<b>PAHs:</b>						
Acenaphthene	1,900,000	2,100		< 800	< 770	< 740
Acenaphthylene	1,100,000	27,000		< 800	< 770	< 740
Anthracene	18,000,000	2,500,000		< 400	< 390	< 370
Benzo(a)anthracene	1,400	3,200		< 400	< 390	< 370
Benzo(a)pyrene	100	8,000		< 80	< 77	< 74
Benzo(b)fluoranthene	1,400	10,000		< 80	< 77	< 74
Benzo(ghi)perylene	2,300,000	32,000,000		< 80	< 77	< 74
Benzo(k)fluoranthene	15,000	25,000		< 80	< 77	< 74
Chrysene	140,000	77,000		< 400	< 390	< 370
Dibenzo(a,h)anthracene	100	30,000		< 80	< 77	< 74
Fluoranthene	2,900,000	1,200,000		< 400	< 390	< 370
Fluorene	2,200,000	160,000		< 400	< 390	< 370
Indeno(1,2,3)pyrene	1,500	28,000		< 80	< 77	< 74
1-Methylnaphthalene	68,000	2,200		< 400	< 390	< 370
2-Methylnaphthalene	80,000	6,100		< 400	< 390	< 370
Naphthalene	40,000	1,700		< 400	< 390	< 370
Phenanthrene	2,000,000	250,000		< 400	< 390	< 370
Pyrene	2,200,000	880,000		< 400	< 390	< 370
<b>VOAs:</b>						
Benzene	1,100	7		<b>241</b>	<b>635</b>	< 4.2
Ethylbenzene	1,100,000	600		<b>2,570</b>	<b>3,030</b>	< 4.2
Toluene	380,000	500		<b>6,260</b>	224	< 4.2
Total Xylenes	5,900,000	200		<b>2,760</b>	<b>3,510</b>	< 13
<b>OTHER ORGANICS:</b>						
Methyl Tert Butyl Ether	3,200,000	200		<b>&lt;220</b>	<b>&lt;190</b>	< 4.2
TRPH (mg/kg)	340	340		27.7	8.9	42.2
<p>Values reported in micrograms per kilogram except where noted.  SCTL = Soil Cleanup Target Level as defined by Chapter 62-770, F.A.C.  J = An estimated quantity less than the reporting limit but above the instrument detection limit.  TRPH = Total Recoverable Petroleum Hydrocarbons  Concentrations exceeding SCTLs are shown in bold.</p>						

TABLE 4-4

DPT GROUNDWATER LABORATORY SCREENING RESULTS  
AVGAS PIPELINE SECTION E - SITE ASSESSMENT REPORT  
NAVAL AIR STATION WHITING FIELD  
MILTON, FLORIDA

Sampling Details				Laboratory Analyses					
Boring ID	Sample ID	Sample Depth (Feet)	Date Collected	Benzene (ug/l)	Toluene (ug/l)	Ethyl-benzene (ug/l)	Total Xylenes (ug/l)	Naphthalene (ug/l)	MTBE (ug/l)
GCTL				1	40	30	20	20	50
WHF-2832-SB03	WHF 2832 GP3 TW	20	6/22/2002	<b>2,900</b>	<b>170</b>	<b>66J</b>	<b>760</b>	<b>&lt;100</b>	<b>&lt;100</b>
WHF-2832-SB04	WHF 2832 GP4	120	6/23/2002	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0
WHF-2832-SB05	AVGE GSB 05 020	20	7/9/2002	<b>1,500</b>	<b>3,400</b>	<b>120J</b>	<b>100J</b>	<b>&lt;150</b>	<b>&lt;150</b>
WHF-2832-SB06	WHF 2832 GP6 GW	120	6/21/2002	<b>20</b>	23	< 1.0	< 3.0	< 1.0	< 1.0
WHF-2832-SB06	WHF 2832 GP6 TW	20	6/22/2002	<b>11,000</b>	<b>36,000</b>	<b>1,200</b>	<b>1200J</b>	<b>&lt;1000</b>	<b>&lt;1000</b>
WHF-2832-SB07	WHF 2832 GP7 TW	20	6/22/2002	<b>1,800</b>	<b>5,500</b>	<b>1,000</b>	<b>1,000</b>	<b>&lt;200</b>	<b>&lt;200</b>
WHF-2832-SB07	WHF 2832 GP7	120	6/24/2002	0.72J	1.7	< 1.0	< 3.0	< 1.0	< 1.0
WHF-2832-SB08	WHF 2832 GP8 TW	20	6/25/2002	<b>1,100</b>	<b>11,000</b>	<b>810</b>	<b>770J</b>	<b>&lt;500</b>	<b>&lt;500</b>
WHF-2832-SB10	AVGE GWB 10 15	15	7/12/2002	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0
WHF-2832-SB11	AVGE GWB 11 20	15	7/11/2002	< 1.0	< 1.0	< 1.0	0.24J	< 1.0	< 1.0
WHF-2832-SB12	WHF 2832 GP12 TW	24	6/23/2002	<b>170</b>	6.4J	<b>200</b>	<b>57</b>	< 8.0	< 8.0
WHF-2832-SB12	WHF 2832 GP12	125	6/23/2002	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0
WHF-2832-SB14	AVGE GWB 14 120	120	7/11/2002	0.91J	0.93J	< 1.0	< 3.0	< 1.0	< 1.0
WHF-2832-SB16	AVGE GWB 16 20	20	7/11/2002	<b>77</b>	34	<b>44</b>	9.5	< 2.0	< 2.0
WHF-2832-SB17	AVGE GWB 17 10	20	7/10/2002	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0
WHF-2832-SB18	WHF 2832 GP 18	120	6/21/2002	< 1.0	0.37J	< 1.0	< 3.0	< 1.0	< 1.0
WHF-2832-SB20	AVGE GWB 20 15	15	7/10/2002	<b>5.2</b>	< 1.0	3.1	0.29J	1.0	< 1.0
WHF-2832-SB22	AVGE GSB 022 020	18	7/9/2002	<b>2.5</b>	10	0.30J	0.83J	< 1.0	< 1.0
WHF-2832-SB22	WHF 2832 GP22	120	6/24/2002	0.29J	0.43J	< 1.0	< 3.0	< 1.0	< 1.0
WHF-2832-SB24	AVGE GWB 24 15	15	7/12/2002	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0

NOTES:  
ug/l = micrograms per liter  
GCTL = groundwater cleanup target level  
Concentrtrions exceeding GCTLs are shown in bold.

TABLE 4-5

**SUMMARY OF FIXED-BASE GROUNDWATER ANALYTICAL RESULTS  
AVGAS PIPELINE SECTION E - SITE ASSESSMENT REPORT  
NAVAL AIR STATION WHITING FIELD, MILTON, FLORIDA  
PAGE 1 OF 2**

COMPOUND	GCTL	MW ID	WHF-2832-MW3P	WHF-2832-MW4P	WHF-2832-MW5P	WHF-2832-MW6P	WHF-2832-MW8P	WHF-2832-MW10P	WHF-2832-MW11P	WHF-2832-MW12P	WHF-2832-MW13P
		Sample ID	AVGEG3P02	AVGEG4P02	AVGEG5P02	AVGEG6P02	AVGEG8P01	AVGEG10P01	AVGEG11P01	AVGEG12P01	AVGEG13P01
		Date	9/29/2002	10/1/2002	10/1/2002	9/29/2002	10/1/2002	9/28/2002	10/1/2002	9/28/2002	9/28/2002
<b>PAHs:</b>											
Acenaphthene	20		< 1.0	< 1.1	< 1.1	< 1.1	< 1.1	< 1.0	< 1.1	< 1.0	< 1.0
Acenaphthylene	210		< 1.0	< 1.1	< 1.1	< 1.1	< 1.1	< 1.0	< 1.1	< 1.0	< 1.0
Anthracene	2,100		< 1.0	< 1.1	< 1.1	< 1.1	< 1.1	< 1.0	< 1.1	< 1.0	< 1.0
Benzo(a)anthracene	0.2		< 0.21	< 0.22	< 0.22	< 0.22	< 0.22	< 0.20	< 0.22	< 0.21	< 0.21
Benzo(a)pyrene	0.2		< 0.21	< 0.22	< 0.22	< 0.22	< 0.22	< 0.20	< 0.22	< 0.21	< 0.21
Benzo(b)fluoranthene	0.2		< 0.21	< 0.22	< 0.22	< 0.22	< 0.22	< 0.20	< 0.22	< 0.21	< 0.21
Benzo(ghi)perylene	210		< 0.21	< 0.22	< 0.22	< 0.22	< 0.22	< 0.20	< 0.22	< 0.21	< 0.21
Benzo(k)fluoranthene	0.5		< 0.21	< 0.22	< 0.22	< 0.22	< 0.22	< 0.20	< 0.22	< 0.21	< 0.21
Chrysene	4.8		< 0.21	< 0.22	< 0.22	< 0.22	< 0.22	< 0.20	< 0.22	< 0.21	< 0.21
Dibenzo(a,h)anthracene	0.2		< 0.21	< 0.22	< 0.22	< 0.22	< 0.22	< 0.20	< 0.22	< 0.21	< 0.21
Fluoranthene	280		< 1.0	< 1.1	< 1.1	< 1.1	< 1.1	< 1.0	< 1.1	< 1.0	< 1.0
Fluorene	280		< 1.0	< 1.1	< 1.1	< 1.1	< 1.1	< 1.0	< 1.1	< 1.0	< 1.0
Indeno(1,2,3)pyrene	0.2		< 0.21	< 0.22	< 0.22	< 0.22	< 0.22	< 0.20	< 0.22	< 0.21	< 0.21
Naphthalene	20		4.9	< 1.1	< 1.1	6.1	< 1.1	< 1.0	< 1.1	< 1.0	< 1.0
1-Methylnaphthalene	20		0.87	< 1.1	< 1.1	0.92	< 1.1	< 1.0	< 1.1	< 1.0	< 1.0
2-Methylnaphthalene	20		1.6	< 1.1	< 1.1	1.7	< 1.1	< 1.0	< 1.1	< 1.0	< 1.0
Phenanthrene	120		< 1.0	< 1.1	< 1.1	< 1.1	< 1.1	< 1.0	< 1.1	< 1.0	< 1.0
Pyrene	210		< 1.0	< 1.1	< 1.1	< 1.1	< 1.1	< 1.0	< 1.1	< 1.0	< 1.0
<b>VOAs:</b>											
Benzene	1		<b>3,030</b>	< 1.0	< 1.0	<b>12,600</b>	< 1.0	<b>11.7</b>	<b>6.0</b>	< 1.0	< 1.0
Ethylbenzene	30		< 100	< 1.0	< 1.0	<b>1,630</b>	< 1.0	< 1.0	<b>8.0</b>	< 1.0	< 1.0
Toluene	40		<b>51.7</b>	< 1.0	< 1.0	<b>34,400</b>	< 1.0	<b>1.1</b>	<b>4.6</b>	< 1.0	< 1.0
Total Xylenes	20		<b>651</b>	< 3.0	< 3.0	<b>1,570</b>	< 3.0	< 3.0	<b>5.8</b>	< 3.0	< 3.0
<b>OTHER ORGANICS:</b>											
1,2-Dibromoethane	0.02		< 0.018	< 0.019	< 0.018	<b>0.41</b>	< 0.018	< 0.018	< 0.019	< 0.018	< 0.018
1,2-Dichloroethane	3		< 100	< 1.0	< 1.0	< 250	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methyl Tert Butyl Ether	50		< 100	< 1.0	< 1.0	< 250	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TRPH (mg/l)	5		<b>5.19</b>	1.01	1.90	<b>16.7</b>	< 0.28	0.383	< 0.27	< 0.26	< 0.26
<b>METALS:</b>											
Lead	15		<b>61.1</b>	5.2	1.2U	<b>151</b>	5.6	13.5	4.4B	1.2U	1.2U

Values reported in micrograms per liter except where noted.

GCTL = Groundwater Cleanup Target Level as defined by Chapter 62-770, F.A.C.

J = An estimated quantity less than the reporting limit but above the instrument detection limit.

B = Result > or = instrument detection limit but < reporting limit.

U = Result < instrument detection limit.

TRPH = Total Recoverable Petroleum Hydrocarbons

Concentrations exceeding GCTLs are shown in bold.

TABLE 4-5

SUMMARY OF FIXED-BASE GROUNDWATER ANALYTICAL RESULTS  
AVGAS PIPELINE SECTION E - SITE ASSESSMENT REPORT  
NAS WHITING FIELD, MILTON, FLORIDA  
PAGE 2 OF 2

COMPOUND	GCTL	MW ID	WHF-2832-MW1S	WHF-2832-MW2S	WHF-2832-MW3S	WHF-2832-MW4S
		Sample ID	AVG EGL1S01	AVG EGL2S01	AVG EGL3S01	AVG EGL4S01
		Date	5/22/2002	5/22/2002	10/1/2002	10/17/2002
<b>PAHs:</b>						
Acenaphthene	20		< 4.4	< 4.0	< 1.0	< 1.0
Acenaphthylene	210		< 4.4	< 4.0	< 1.0	< 1.0
Anthracene	2,100		< 2.2	< 2.0	< 1.0	< 1.0
Benzo(a)anthracene	0.2		< 0.22	< 0.20	< 0.20	< 0.20
Benzo(a)pyrene	0.2		< 0.22	< 0.20	< 0.20	< 0.20
Benzo(b)fluoranthene	0.2		< 0.22	< 0.20	0.10	< 0.20
Benzo(ghi)perylene	210		< 0.22	< 0.20	< 0.20	< 0.20
Benzo(k)fluoranthene	0.5		< 0.22	< 0.20	< 0.20	< 0.20
Chrysene	4.8		< 2.2	< 2.0	< 0.20	< 0.20
Dibenzo(a,h)anthracene	0.2		< 0.22	< 0.20	< 0.20	< 0.20
Fluoranthene	280		< 2.2	< 2.0	< 1.0	< 1.0
Fluorene	280		< 2.2	< 2.0	< 1.0	< 1.0
Indeno(1,2,3)pyrene	0.2		< 0.22	< 0.20	< 0.20	< 0.20
Naphthalene	20		< 2.2	< 2.0	< 1.0	< 1.0
1-Methylnaphthalene	20		< 2.2	< 2.0	< 1.0	< 1.0
2-Methylnaphthalene	20		< 2.2	< 2.0	< 1.0	< 1.0
Phenanthrene	120		< 2.2	< 2.0	< 1.0	< 1.0
Pyrene	210		< 2.2	< 2.0	< 1.0	< 1.0
<b>VOAs:</b>						
Benzene	1		< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	30		< 1.0	< 1.0	< 1.0	< 1.0
Toluene	40		< 1.0	< 1.0	< 1.0	< 1.0
Total Xylenes	20		< 3.0	< 3.0	< 3.0	< 3.0
<b>OTHER ORGANICS:</b>						
1,2-Dibromoethane	0.02		< 0.020	< 0.020	< 0.019	< 0.019
1,2-Dichloroethane	3		< 1.0	< 1.0	< 1.0	< 1.0
Methyl Tert Butyl Ether	50		< 1.0	< 1.0	< 1.0	< 1.0
TRPH (mg/l)	5		< 0.28	< 0.28	< 0.26	< 0.26
<b>METALS:</b>						
Lead	15		5.3	1.2U	10.3	1.2U

Values reported in micrograms per liter except where noted.

GCTL = Groundwater Cleanup Target Level as defined by Chapter 62-770, F.A.C.

J = An estimated quantity less than the reporting limit but above the instrument detection limit.

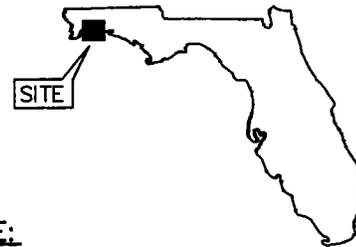
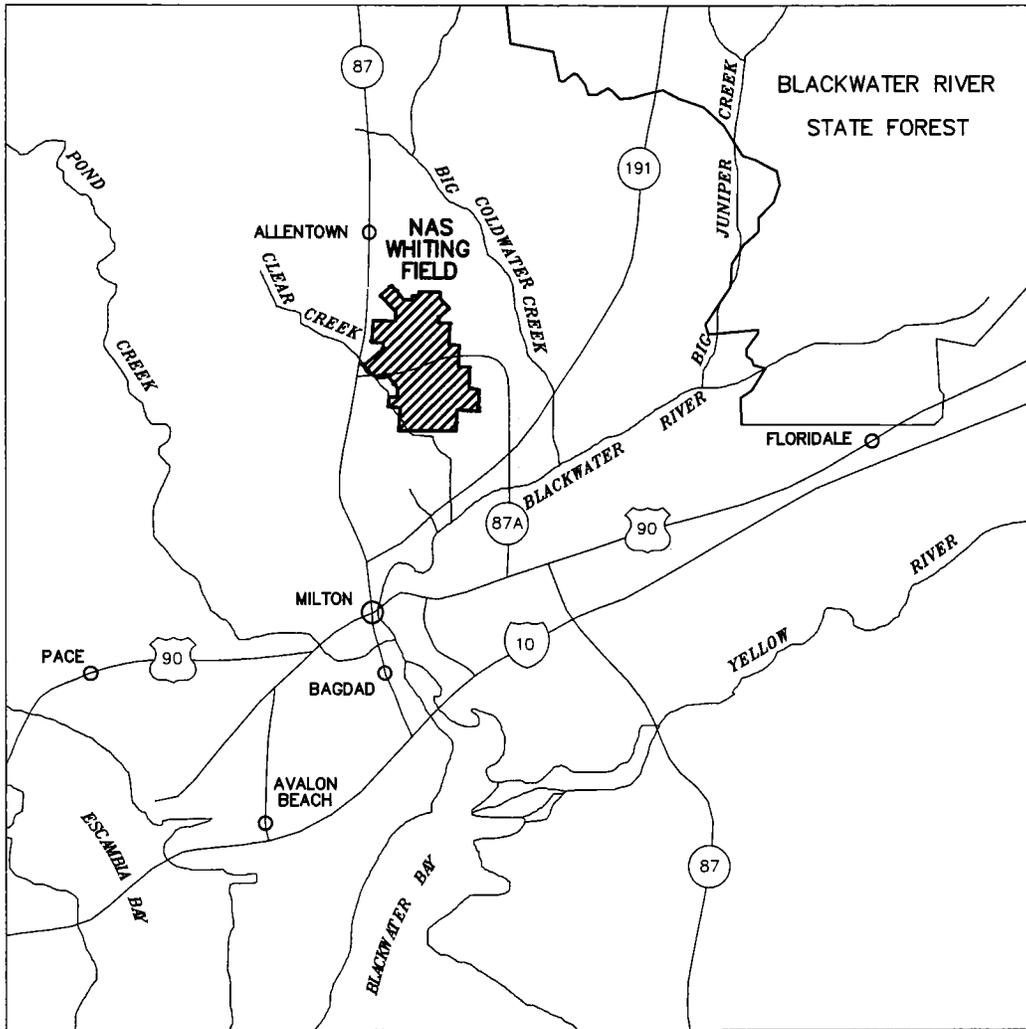
B = Indicates result > or = instrument detection limit but < reporting limit.

U = Result < instrument detection limit.

TRPH = Total Recoverable Petroleum Hydrocarbons

Concentrations exceeding GCTLs are shown in bold.

ACAD: 4038CM11.dwg 03/19/03 MF PIT



**NOTE:**  
NAS = NAVAL AIR STATION

SOURCE: ABB ENVIRONMENTAL SERVICES INC. 1992

DRAWN BY DATE  
MF 3/19/03

CHECKED BY DATE

COST/SCHED-AREA

SCALE  
AS NOTED



REGIONAL MAP  
NAS WHITING FIELD  
SITE 2832  
AVGAS PIPELINE SECTION E  
MILTON, FLORIDA

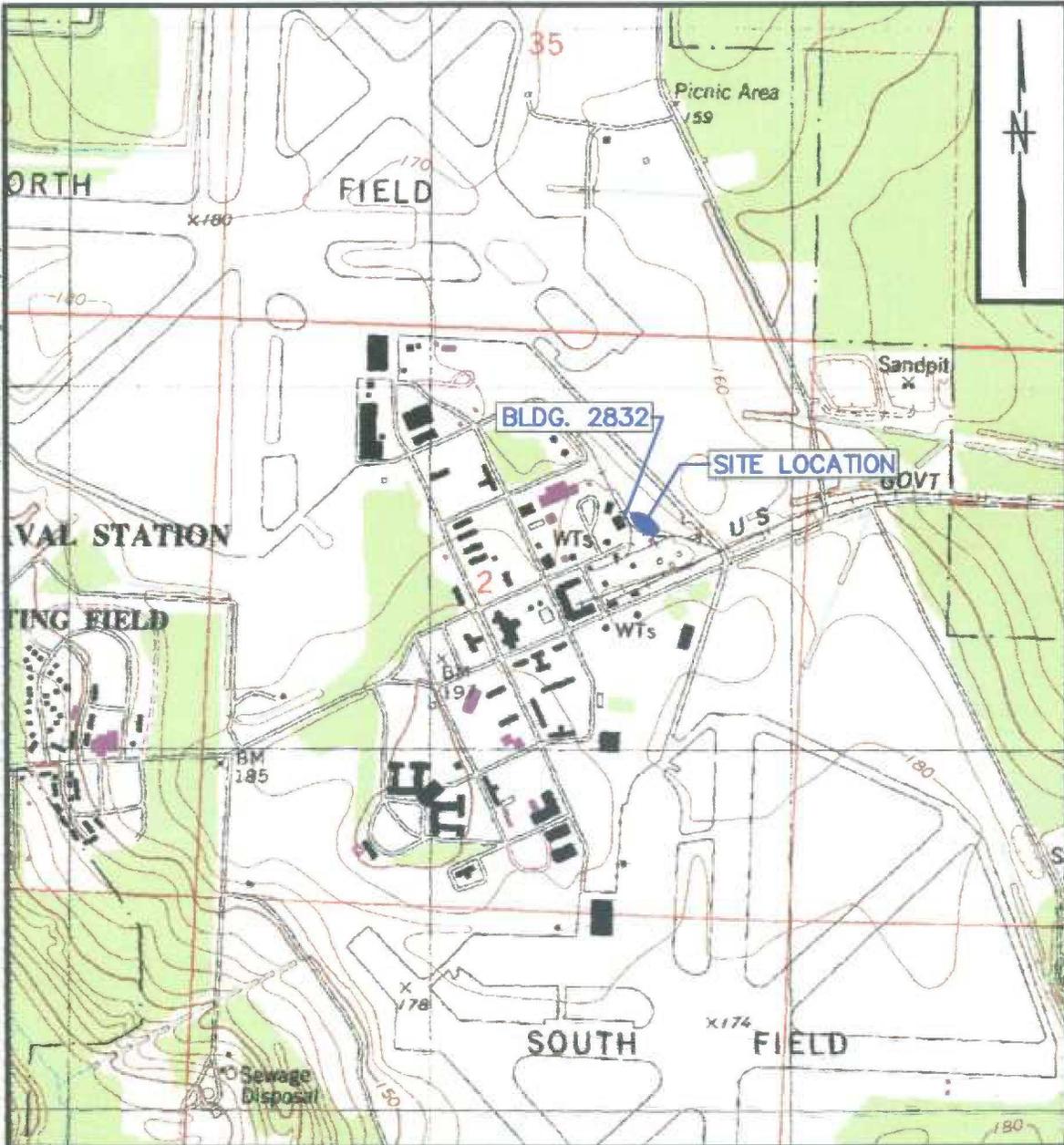
CONTRACT NO.  
4038

APPROVED BY DATE

APPROVED BY DATE

DRAWING NO. REV.  
FIGURE 1-1 0

ACAD: 4036QM11.dwg 03/19/03 MF PIT



SOURCE: USGS MILTON NORTH, FLORIDA QUADRANGLE, PHOTOREVISED 1987.



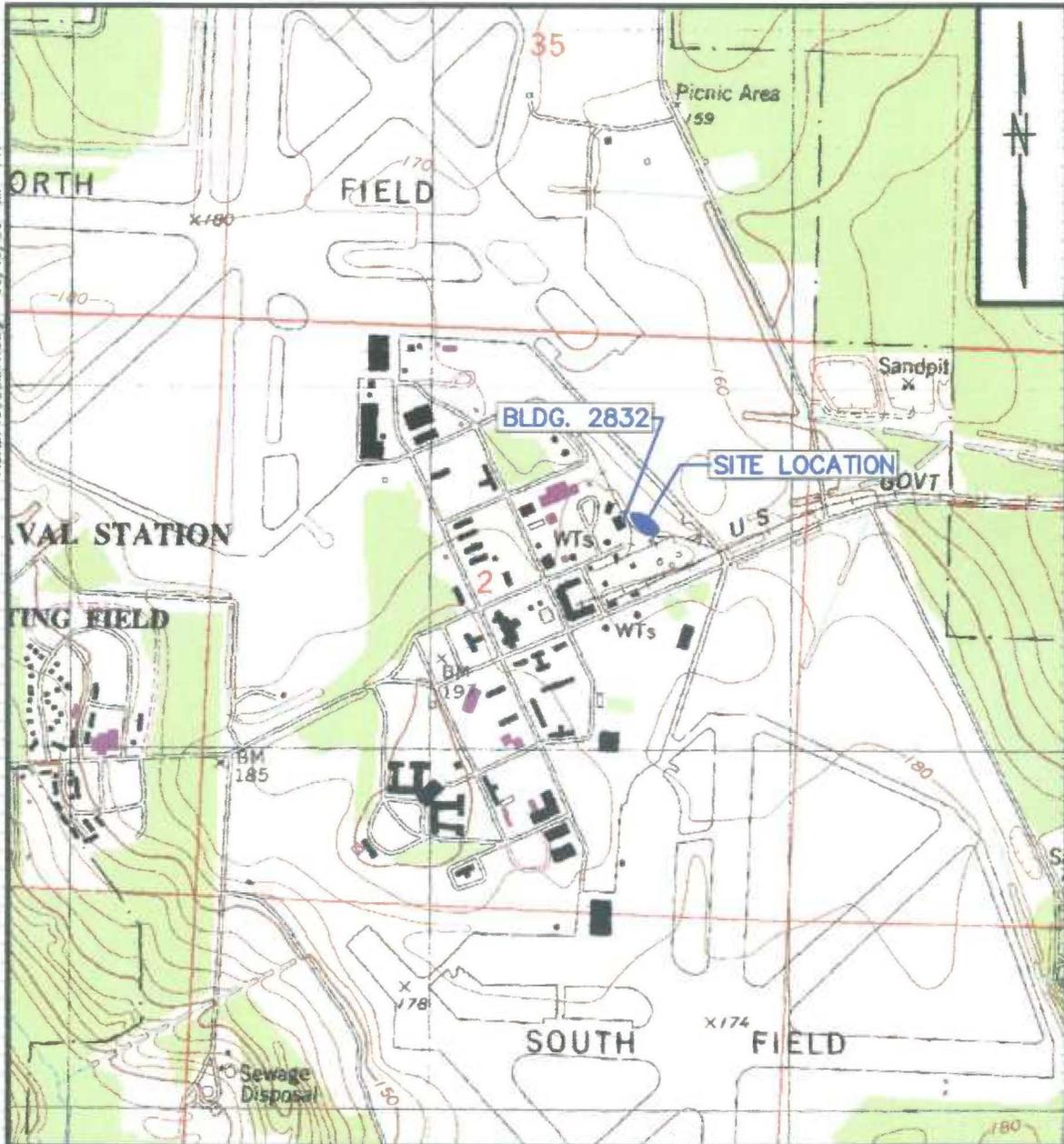
DRAWN BY	DATE
MF	3/19/03
CHECKED BY	DATE
COST/SCHED-AREA	
SCALE AS NOTED	



TOPOGRAPHICAL MAP  
 SITE 2832  
 AVGAS PIPELINE SECTION E  
 NAS WHITING FIELD  
 MILTON, FLORIDA

CONTRACT NO. 4038	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 1-2	REV. 0

ACAD: 4038FM11.dwg 03/19/03 MF PIT



SOURCE: USGS MILTON NORTH, FLORIDA QUADRANGLE, PHOTOREVISED 1987.



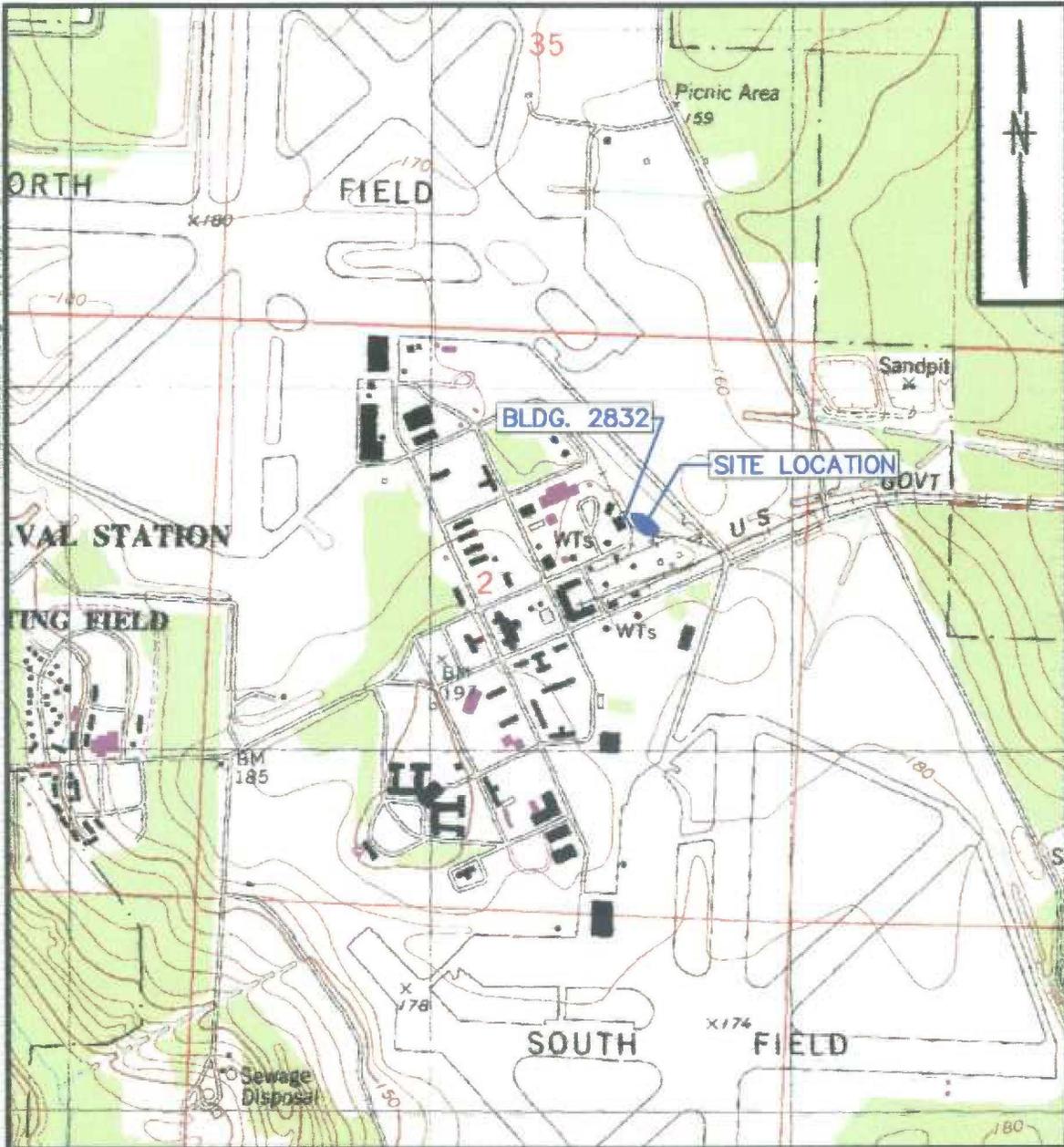
DRAWN BY	DATE
MF	3/19/03
CHECKED BY	DATE
COST/SCHED-AREA	
SCALE AS NOTED	



TOPOGRAPHICAL MAP  
 SITE 2832  
 AVGAS PIPELINE SECTION E  
 NAS WHITING FIELD  
 MILTON, FLORIDA

CONTRACT NO. 4038	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 1-2	REV. 0

ACAD: 4036GM11.dwg 03/19/03 MF PIT



SOURCE: USGS MILTON NORTH, FLORIDA QUADRANGLE, PHOTOREVISED 1987.



DRAWN BY	DATE
MF	3/19/03
CHECKED BY	DATE
COST/SCHED-AREA	
SCALE	
AS NOTED	



TOPOGRAPHICAL MAP  
 SITE 2832  
 AVGAS PIPELINE SECTION E  
 NAS WHITING FIELD  
 MILTON, FLORIDA

CONTRACT NO. 4038	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 1-2	REV. 0

**APPENDIX A**  
**FUGRO GEOSCIENCES CPT/MIPS REPORT**



FUGRO GEOSCIENCES, INC.

May 21, 2002  
Report Number 0305-0742

JUN 10 2002

6105 Rookin  
Houston, TX 77074  
Phone: 713-346-4000  
Fax: 713-346-4002

Tetra Tech NUS, Inc.  
1401 Oven Park Drive  
Suite 201  
Tallahassee, FL 32308

Attn: Mr. Paul Calligan

**Report for  
Cone Penetration Testing,  
Membrane Interface Probe Screening  
and Related Services  
Naval Air Station, Whiting Field  
Milton, Florida  
CTO #0200  
Subcontract Number: N 4038-S2011 (SS)**

Dear Mr. Calligan:

Please find herewith the results of the cone penetration testing / membrane interface probe (CPT/MIP) screening conducted at the above referenced site. CPT/MIP provided continuous characterization of stratigraphy and continuous screening for volatile organic compounds (VOCs) at each location. CPT and MIP logs, and electronic data (diskettes) are included as attachments. A description of the CPT and MIP technologies follows.

**Cone Penetration Testing**

CPT is a proven method for rapidly evaluating the physical characteristics of unconsolidated soils. All CPT soundings completed at this site were performed in accordance with ASTM Standard D-5778-95 "Standard Test Method for Performing Electronic Friction Cone and Piezocone Penetration Testing of Soils".

A piezocone penetrometer was used to complete the CPT soundings. The "tip" on the piezocone had an apex angle of 60 degrees with a base area of 15 square centimeters (cm<sup>2</sup>), and the friction sleeve had a surface area of 200 cm<sup>2</sup>. The pore pressure element was located immediately behind the tip in the U<sub>2</sub> position. Tip resistance and friction ratio data points are used to determine soil behavioral characteristics. Soil classifications are based on Campanella and Robertson's Simplified Soil Behavior Chart (attached). Due to the empirical nature of the soil behavior chart, the soil classification should be verified locally.

**MIP Testing**

For this investigation, the MIP was combined with CPT to screen soils for VOCs. The MIP system consists of a hydrophobic membrane that is surrounded by a heater block, Teflon tubing, and a series of detectors. By heating the area around the membrane, a pressure gradient is created. This pressure gradient pushes volatilized VOCs through the membrane where they are "swept" to the surface using an inert carrier gas. Once at the surface, the carrier gas and any VOCs that are present are fed directly into a series of detectors. This series of detectors includes



a PID, FID, and DELCD. The responses from each of the detectors are then recorded. A brief description of each of the detectors follows.

The Photo Ionized Detector (PID) responds to all aromatics and molecules with carbon double bonds. The PID uses a 10.6eV lamp with a high voltage power supply. Sample laden carrier gas flows into the inlet and through a flow-through cell. When the sample molecules flow into the cell they are bombarded with UV light. Molecules with an ion potential lower than 10.6eV release an ion when struck by the photons. The ions are attracted to a collector electrode, and then sent to the amplifier to produce an analog signal. The PID is nondestructive, so the sample is routed through the PID to subsequent detectors.

The Flame Ionized Detector (FID) responds to any molecule with a carbon-hydrogen bond. In the FID, the carrier gas effluent is mixed with hydrogen then routed through a stainless steel jet. The hydrogen mix supports a diffusion flame at the jet's tip, which ionizes the analyte molecules. Positive and negative ions are produced as each sample component is eluted into the flame. A collector electrode attracts the negative ions to the electrometer amplifier, producing an analog signal for the data system input. Because it uses a hydrogen diffusion flame to ionize compounds for analysis it destroys the sample in the process.

The Dry Electrolytic Conductivity Detector (DELCD) is selective to chlorinated and brominated molecules. The DELCD consists of a small ceramic tube, the DELCD reactor, heated to 1000° C. Inside the reactor, a platinum thermocouple measures the detector temperature, and a nichrome collector electrode measures the conductivity of the gases flowing through the DELCD. The detector response is dependant upon temperature. Therefore, the control circuit must maintain the temperature, within a fraction of a degree, at 1000° C.

Please note that the collected data is presented on multiple plots with various scales. The range of scales allows viewing both the high and low peaks generated during screening. In addition to the plots, a disk containing the digital output from each of the detectors and from the CPT is provided.

#### **Limitations of Environmental Subsurface Work**

Fugro Geosciences' report is based upon data collected during field operations. Given the inherent limitation of environmental subsurface work, Fugro cannot guarantee that the site is free of hazardous or potentially hazardous materials or conditions or that latent or undiscovered conditions will not become evident in the future. Fugro's report was prepared in accordance with our proposal and the General Conditions agreed upon between Fugro and Client and no warranties, representations, or certifications are made.

Fugro Geosciences, Inc. appreciates the opportunity to be of service to your organization. Please do not hesitate to contact us if we can be of further assistance. We look forward to working with you in the future.

Sincerely,

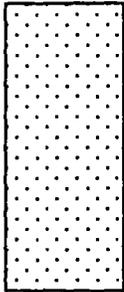
**FUGRO GEOSCIENCES, INC.**

  
Recep Yilmaz  
President

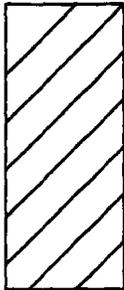
RY:jm

cc: Shawn Scaff

## KEY TO SOIL BEHAVIOR TYPE



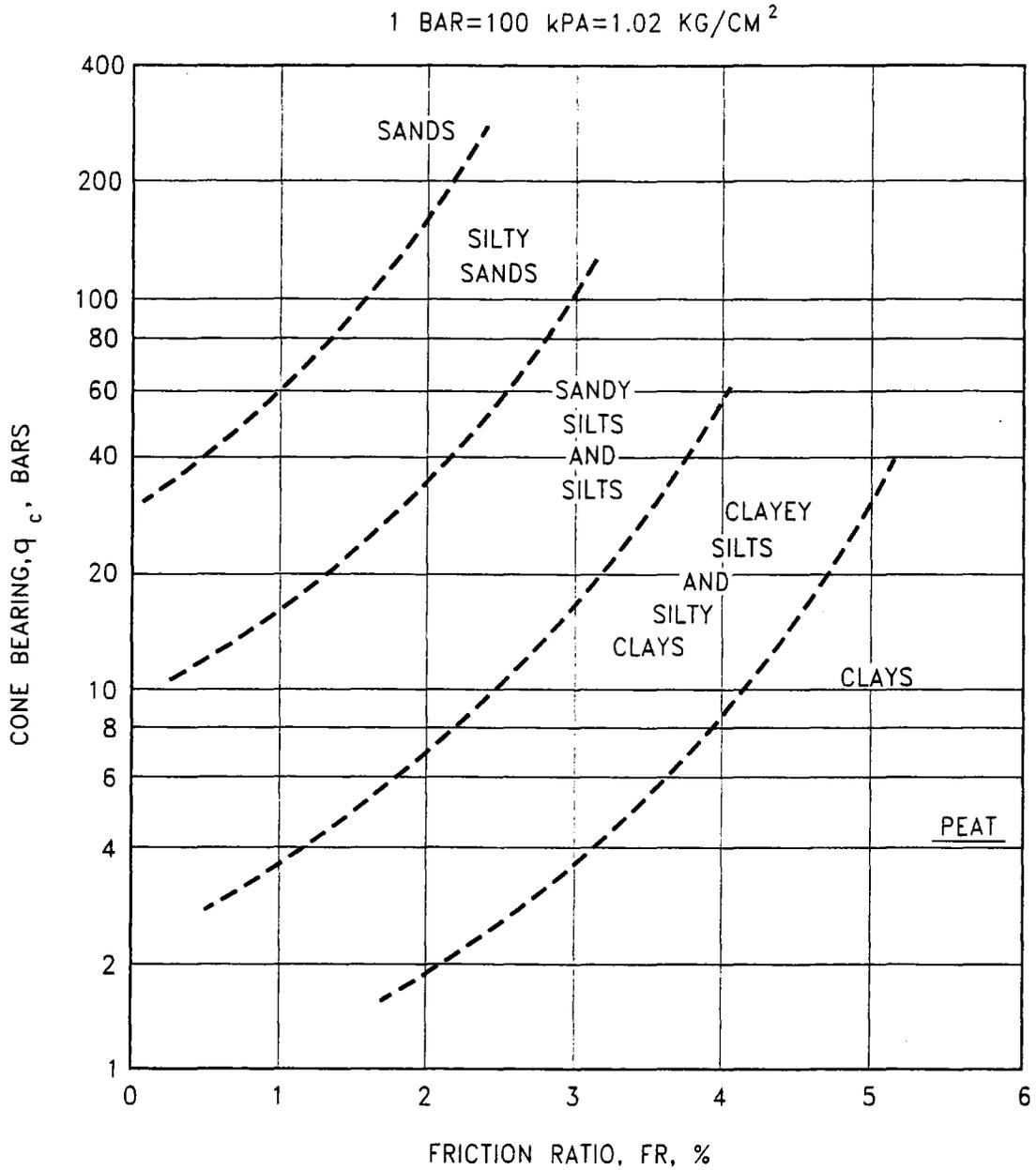
SAND AND SANDY SOIL



CLAY AND CLAYEY SOIL



SILT AND SILTY SOIL

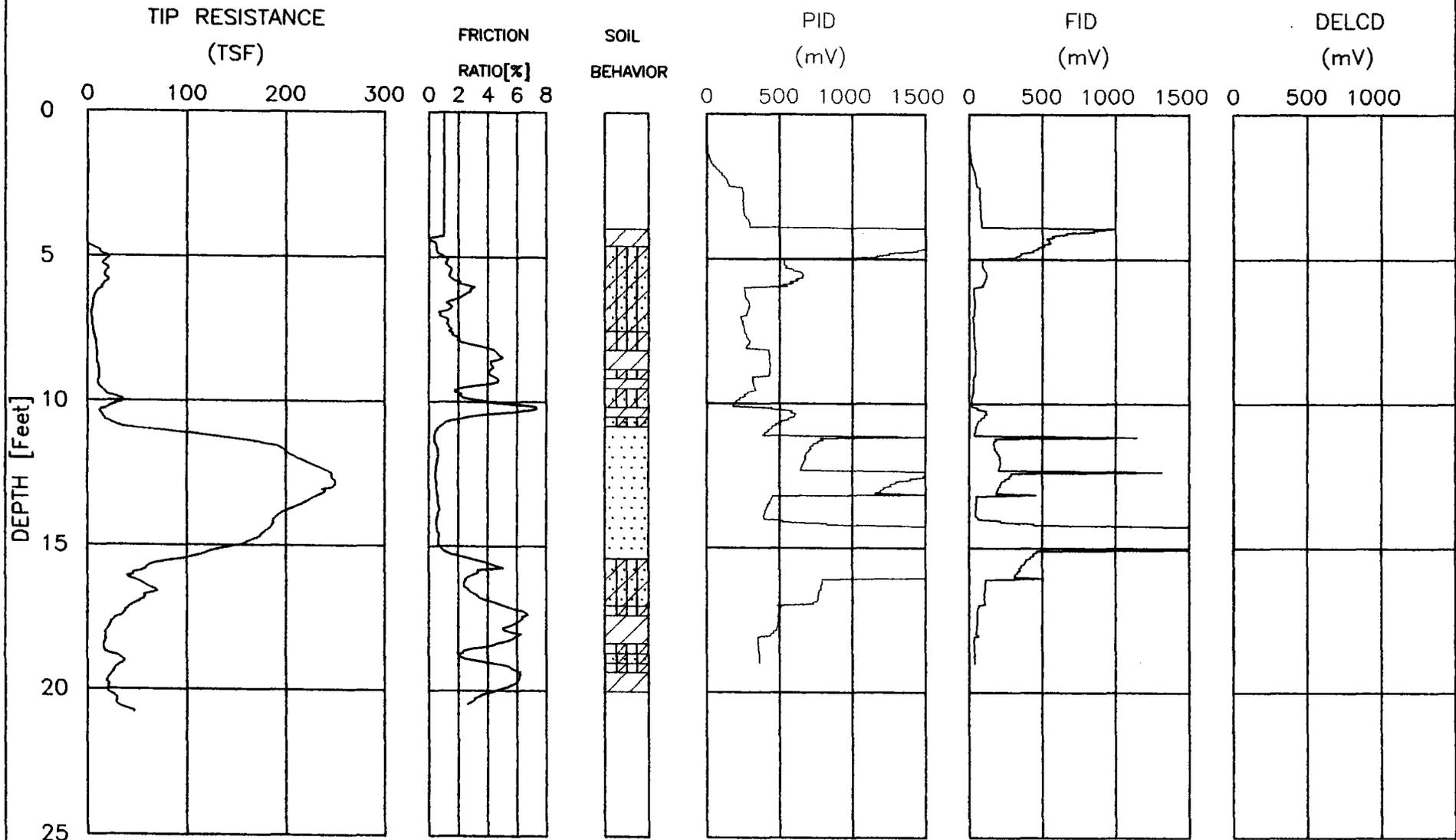


**CAMPANELLA AND ROBERTSON SOIL BEHAVIOR CHART (1983)**



**CPT/MIP LOGS**

# CPT/MIP TEST RESULTS



JOB NUMBER: 0305-0742

ELEVATION: 0.00

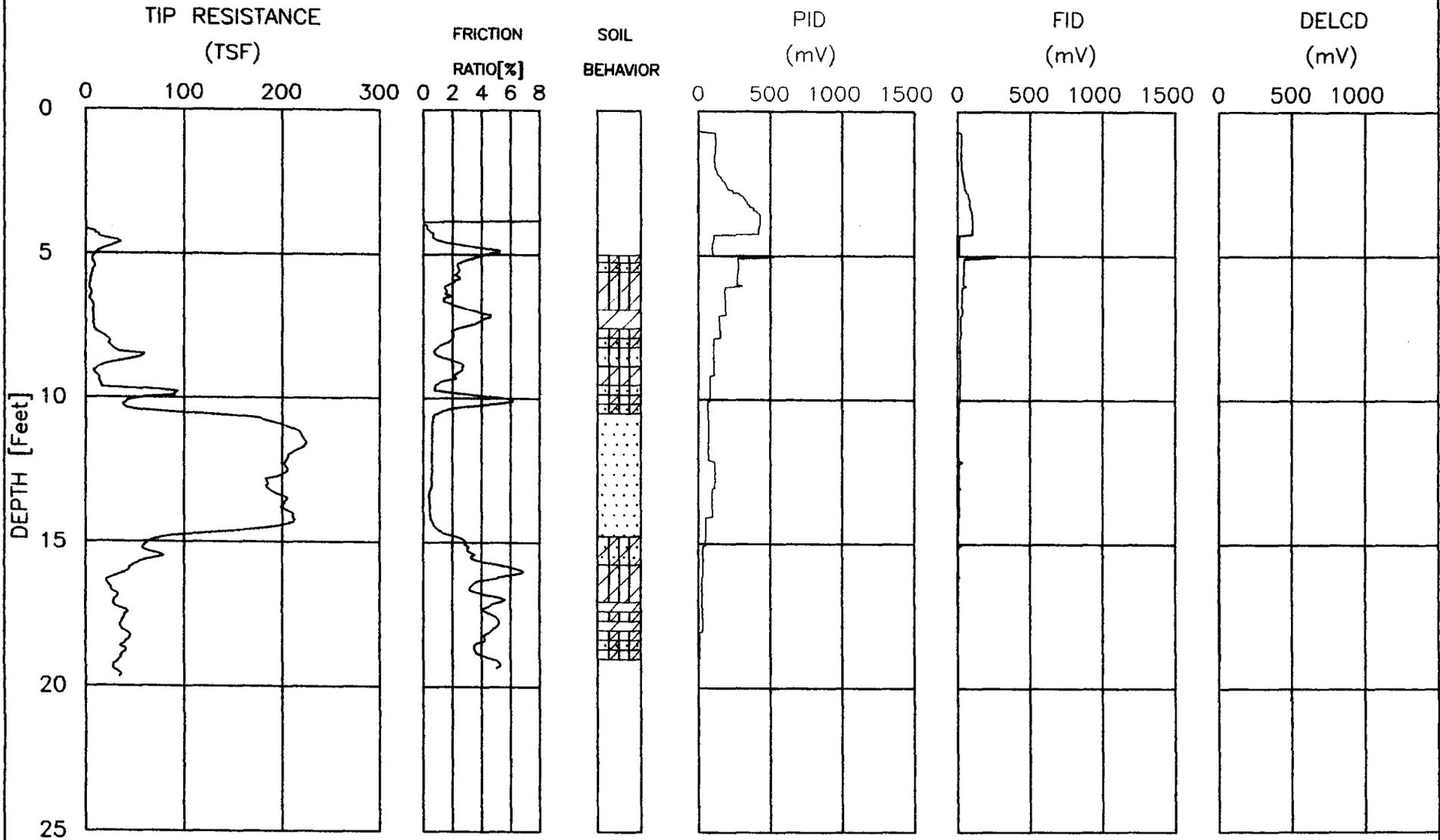
CPT NUMBER: 1

CONE NUMBER: F7.5CKEW892

DATE: 04-29-2002

PLATE: 1 OF 1

# CPT/MIP TEST RESULTS



JOB NUMBER: 0305-0742

ELEVATION: 0.00

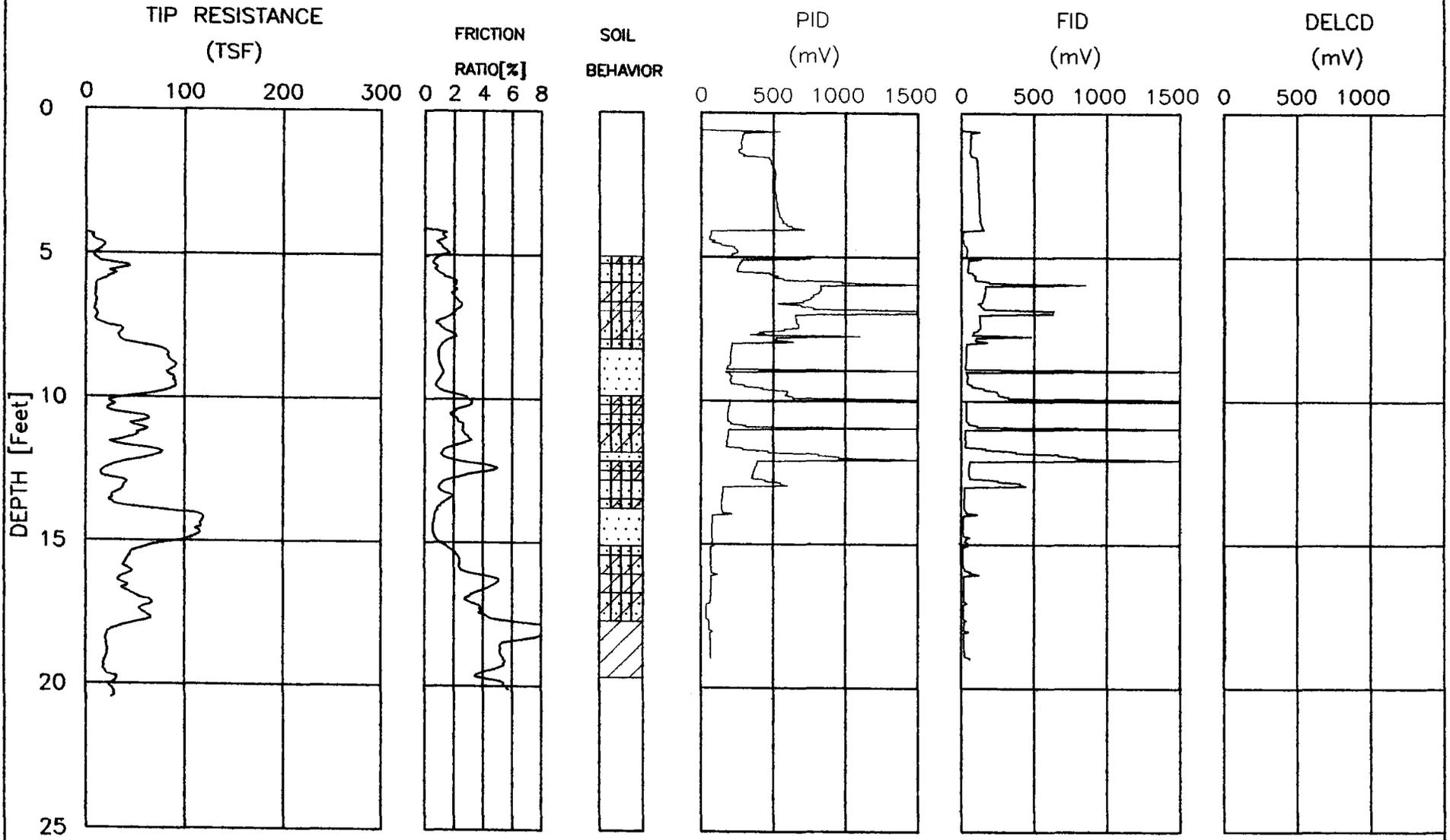
CPT NUMBER: 2

CONE NUMBER: F7.5CKEW892

DATE: 04-29-2002

PLATE: 1 OF 1

# CPT/MIP TEST RESULTS



JOB NUMBER: 0305-0742

ELEVATION: 0.00

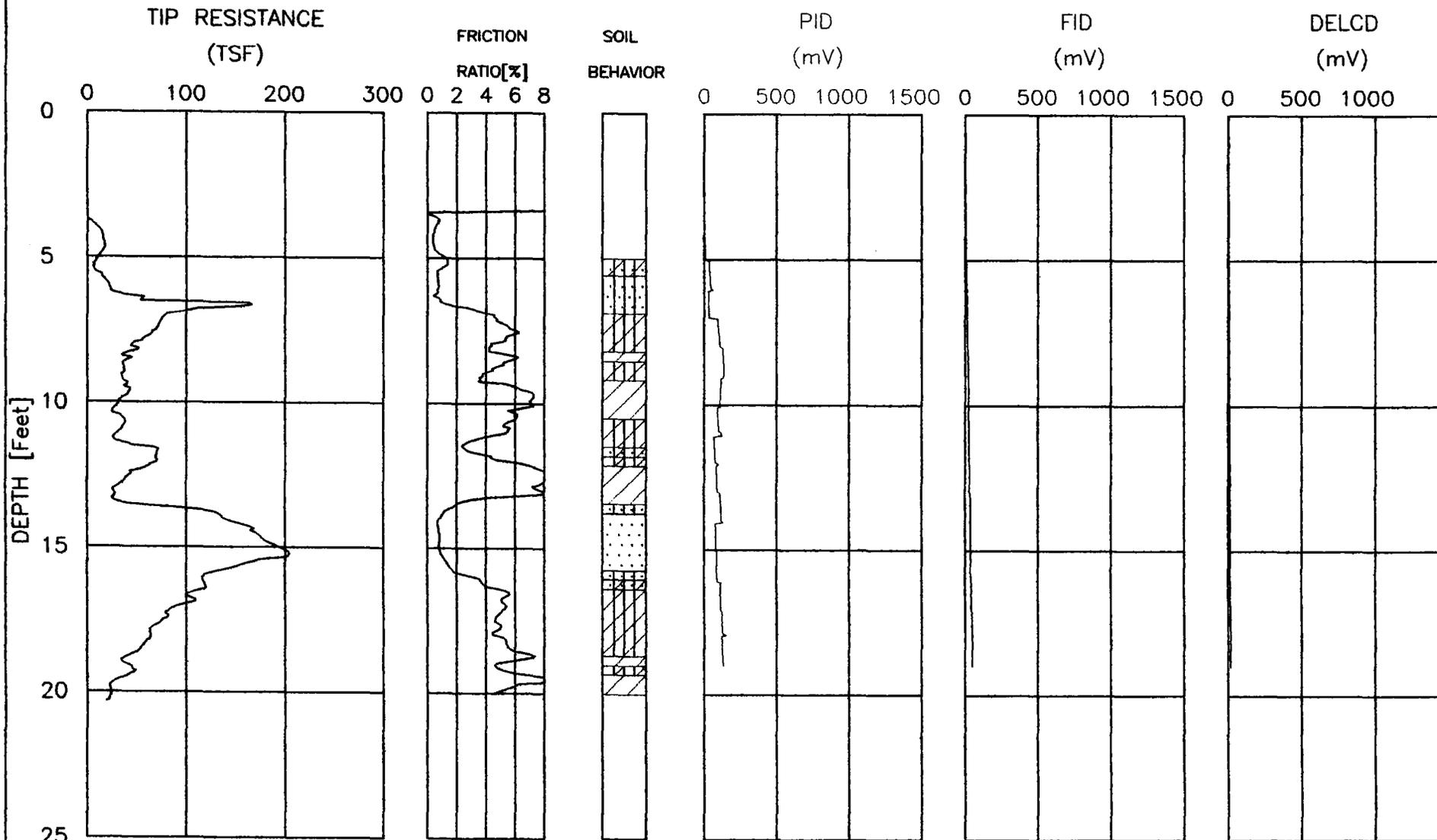
CPT NUMBER: 3

CONE NUMBER: F7.5CKEW892

DATE: 04-30-2002

PLATE: 1 OF 1

# CPT/MIP TEST RESULTS



JOB NUMBER: 0305-0742

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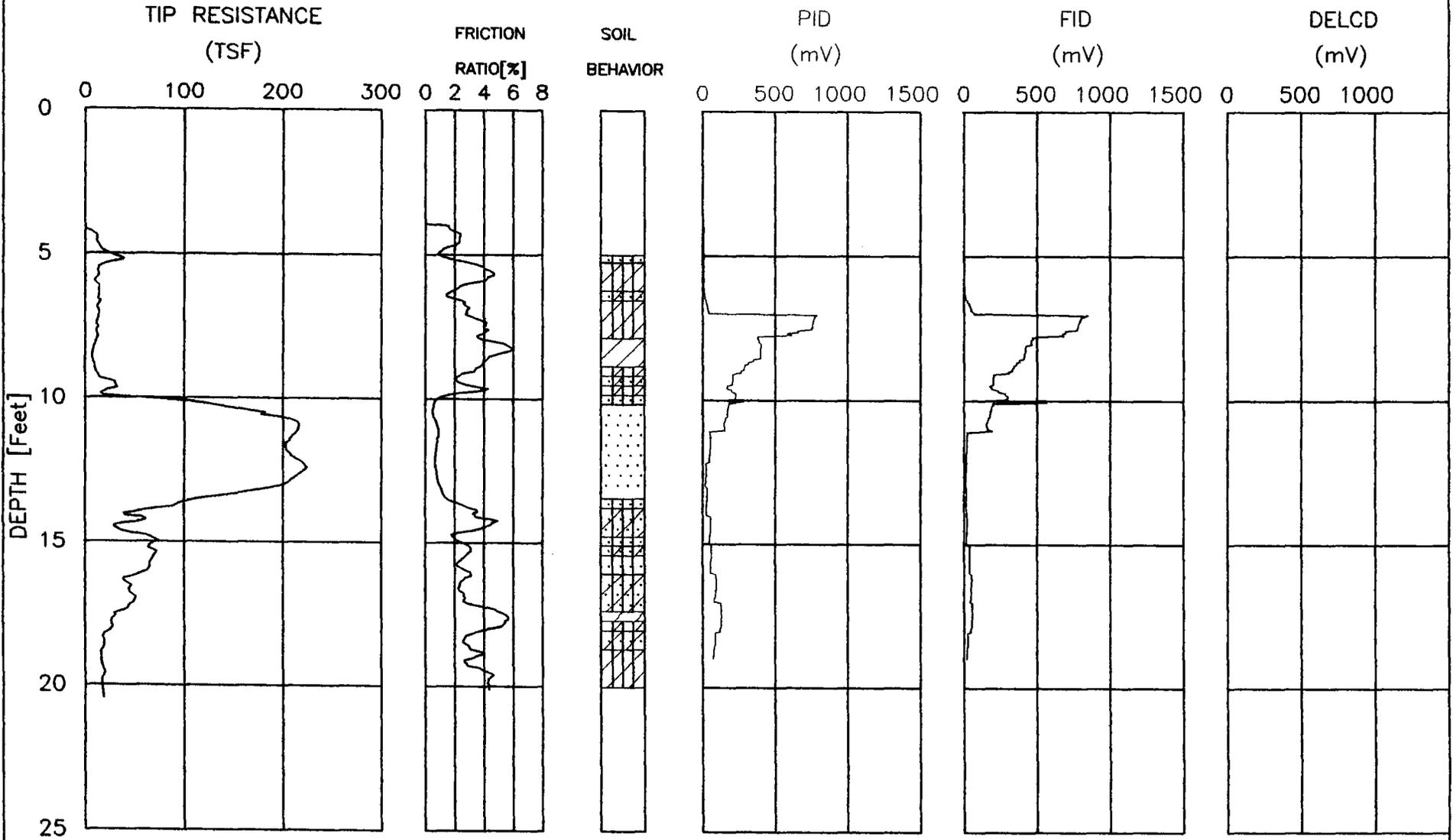
CPT NUMBER: 4

CONE NUMBER: F7.5CKEW892

DATE: 04-30-2002

PLATE: 1 OF 1

# CPT/MIP TEST RESULTS



JOB NUMBER: 0305-0742

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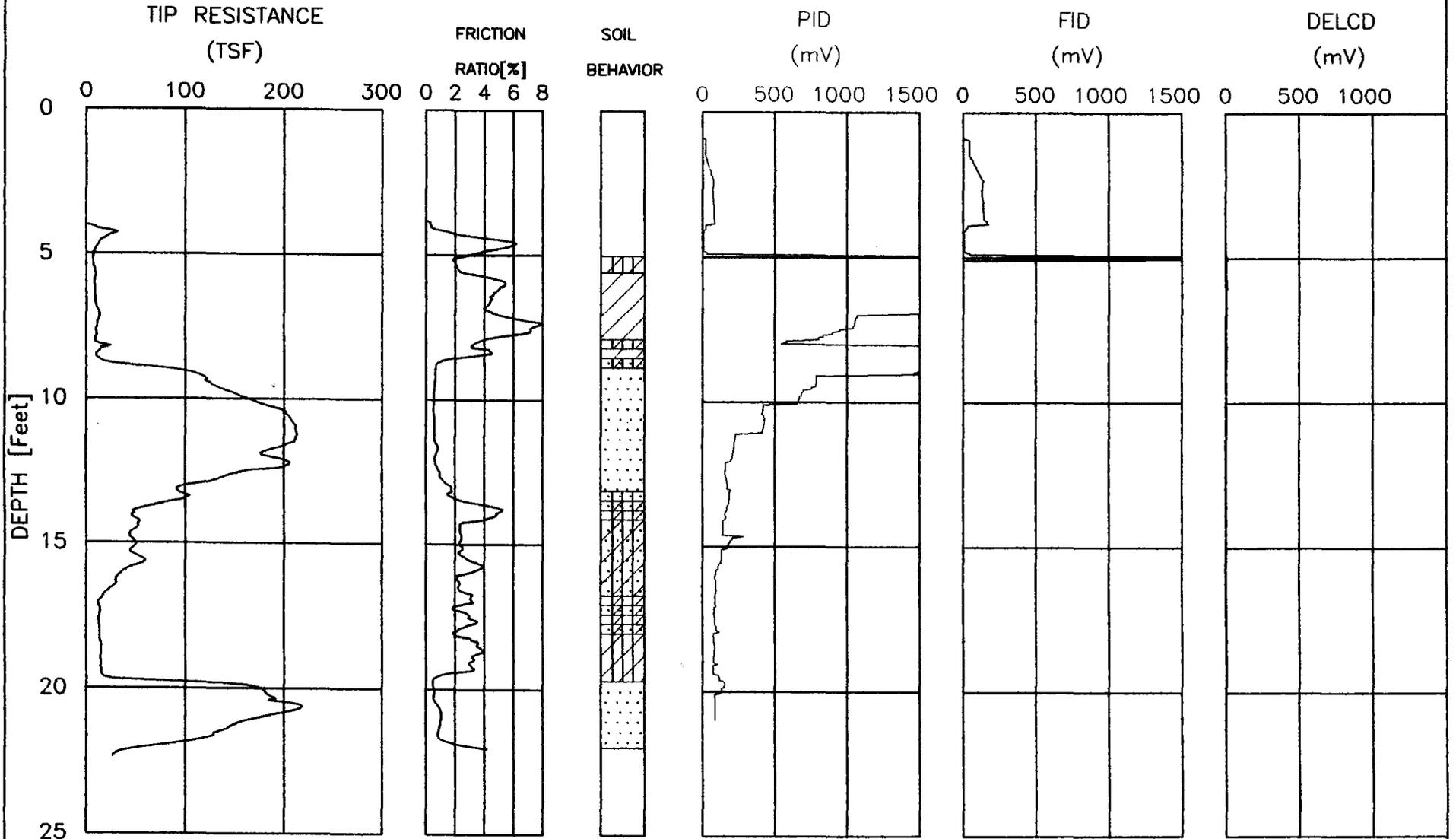
CPT NUMBER: 5

CONE NUMBER: F7.5CKEW892

DATE: 04-30-2002

PLATE: 1 OF 1

# CPT/MIP TEST RESULTS



JOB NUMBER: 0305-0742

ELEVATION: 0.00

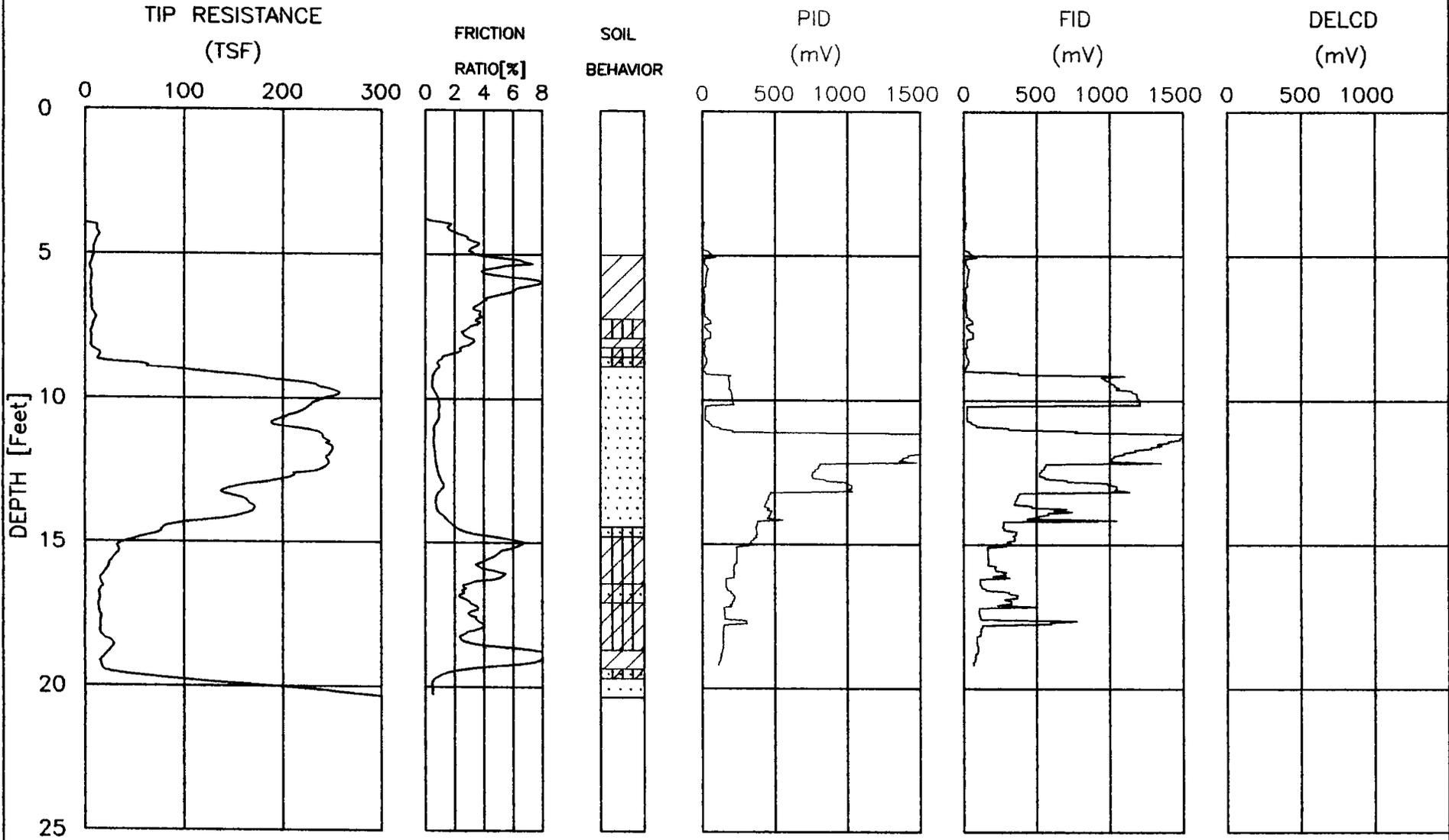
CPT NUMBER: 6

CONE NUMBER: F7.5CKEW892

DATE: 04-30-2002

PLATE: 1 OF 1

# CPT/MIP TEST RESULTS



JOB NUMBER: 0305-0742

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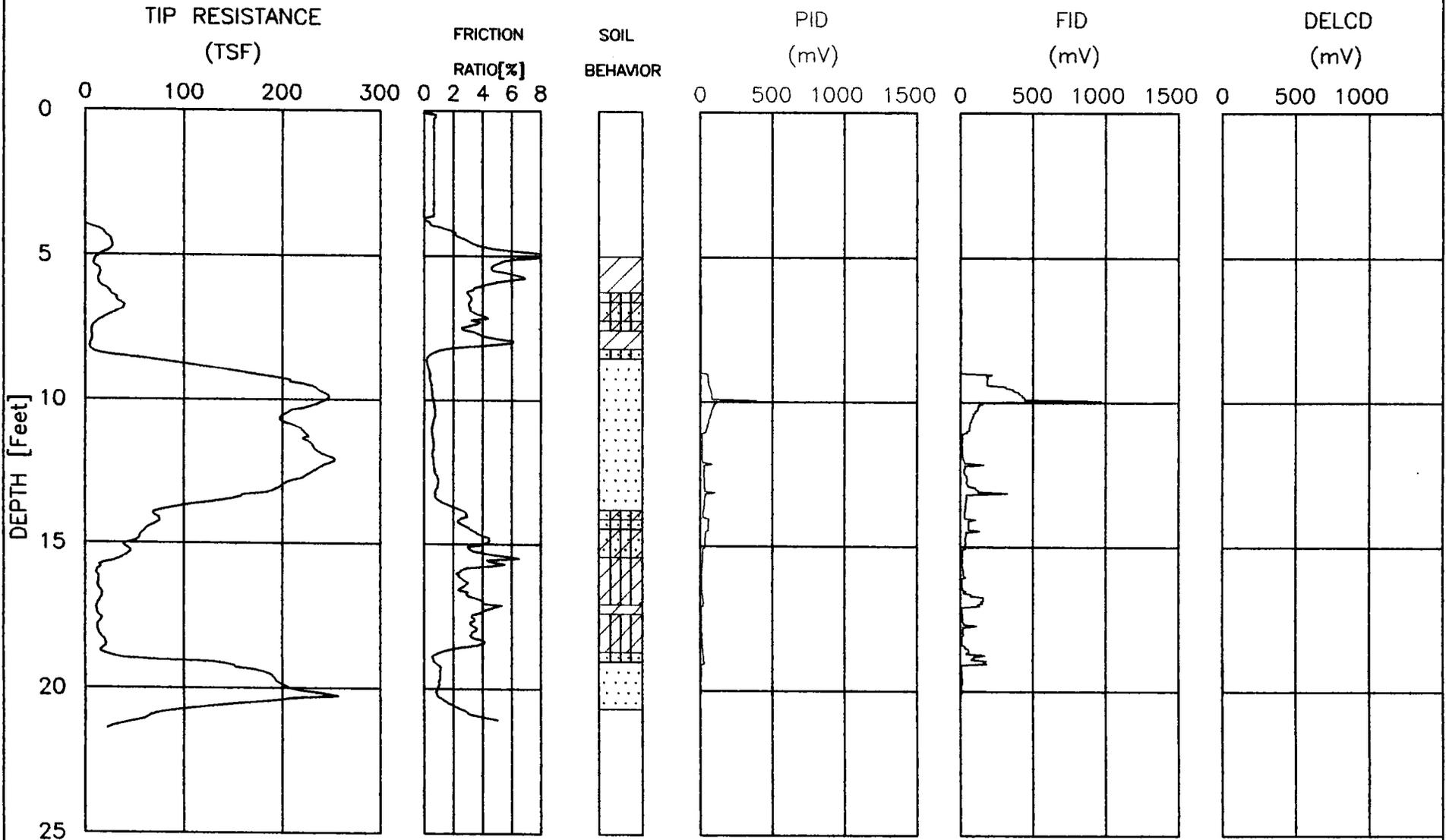
CPT NUMBER: 7

CONE NUMBER: F7.5CKEW892

DATE: 04-30-2002

PLATE: 1 OF 1

# CPT/MIP TEST RESULTS



JOB NUMBER: 0305-0742

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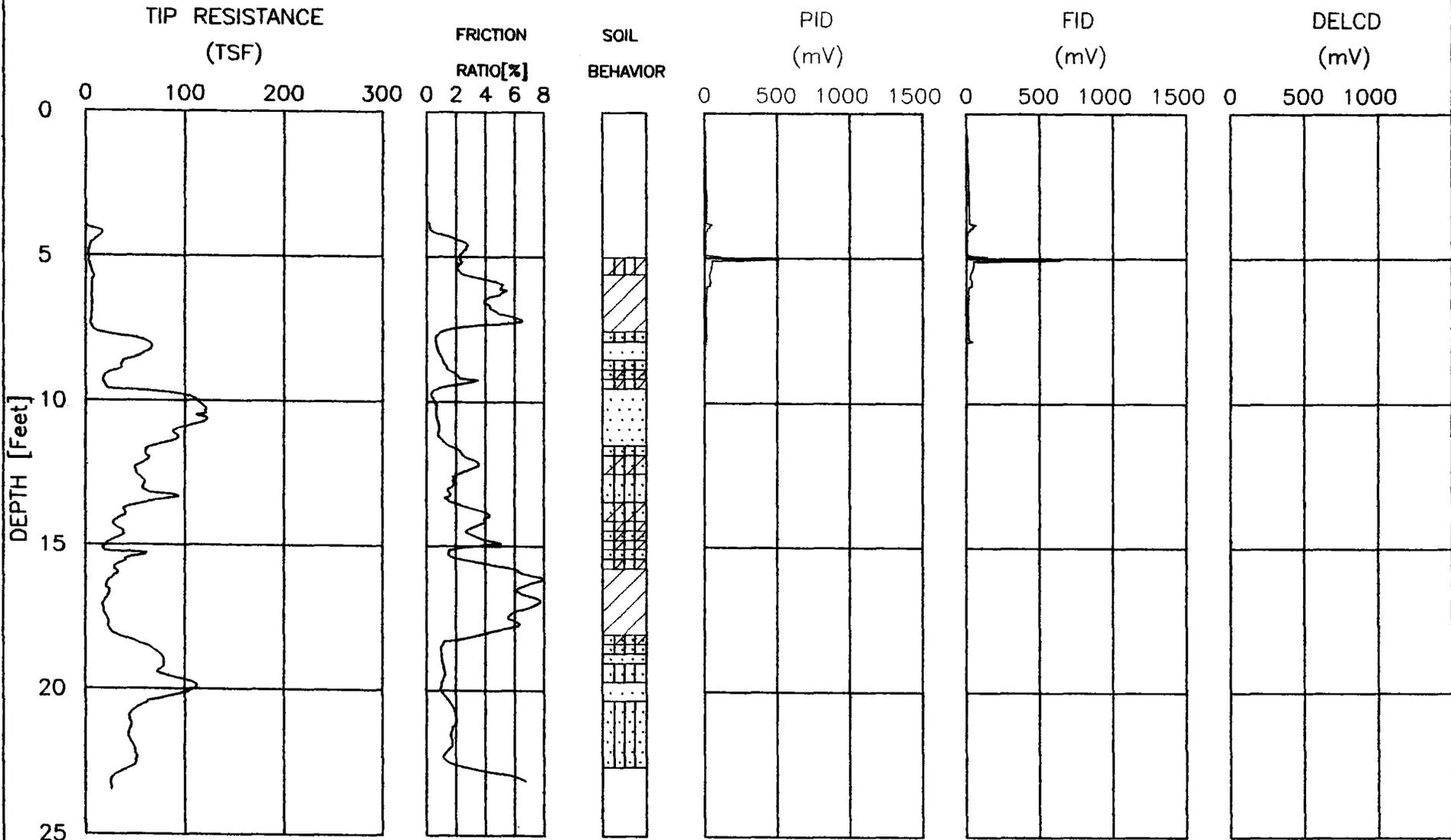
CPT NUMBER: 8

CONE NUMBER: F7.5CKEW892

DATE: 04-30-2002

PLATE: 1 OF 1

# CPT/MIP TEST RESULTS



JOB NUMBER: 0305-0742

ELEVATION: 0.00

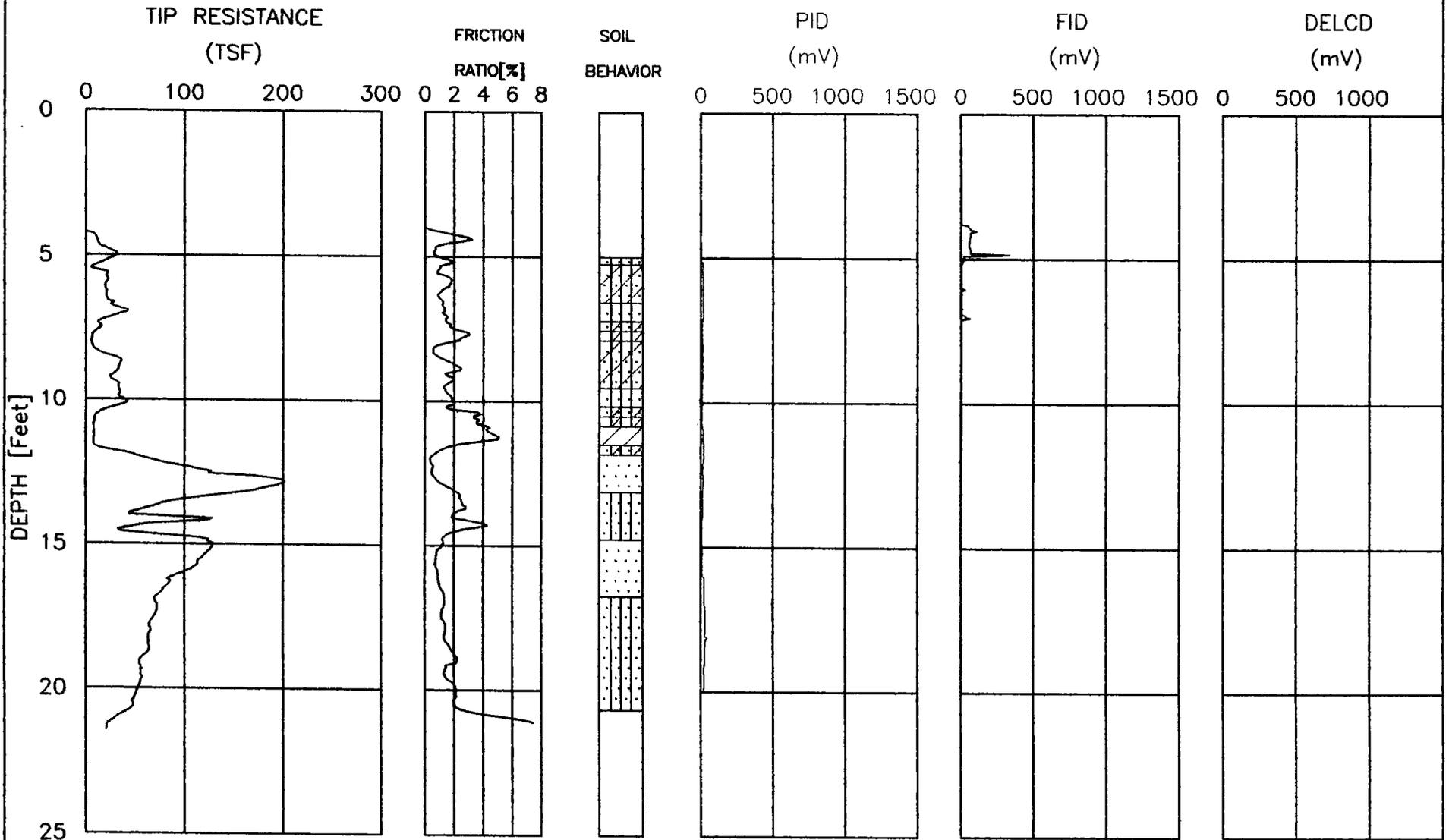
CPT NUMBER: 9

CONE NUMBER: F7.5CKEW892

DATE: 04-30-2002

PLATE: 1 OF 1

# CPT/MIP TEST RESULTS



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ELEVATION: 0.00

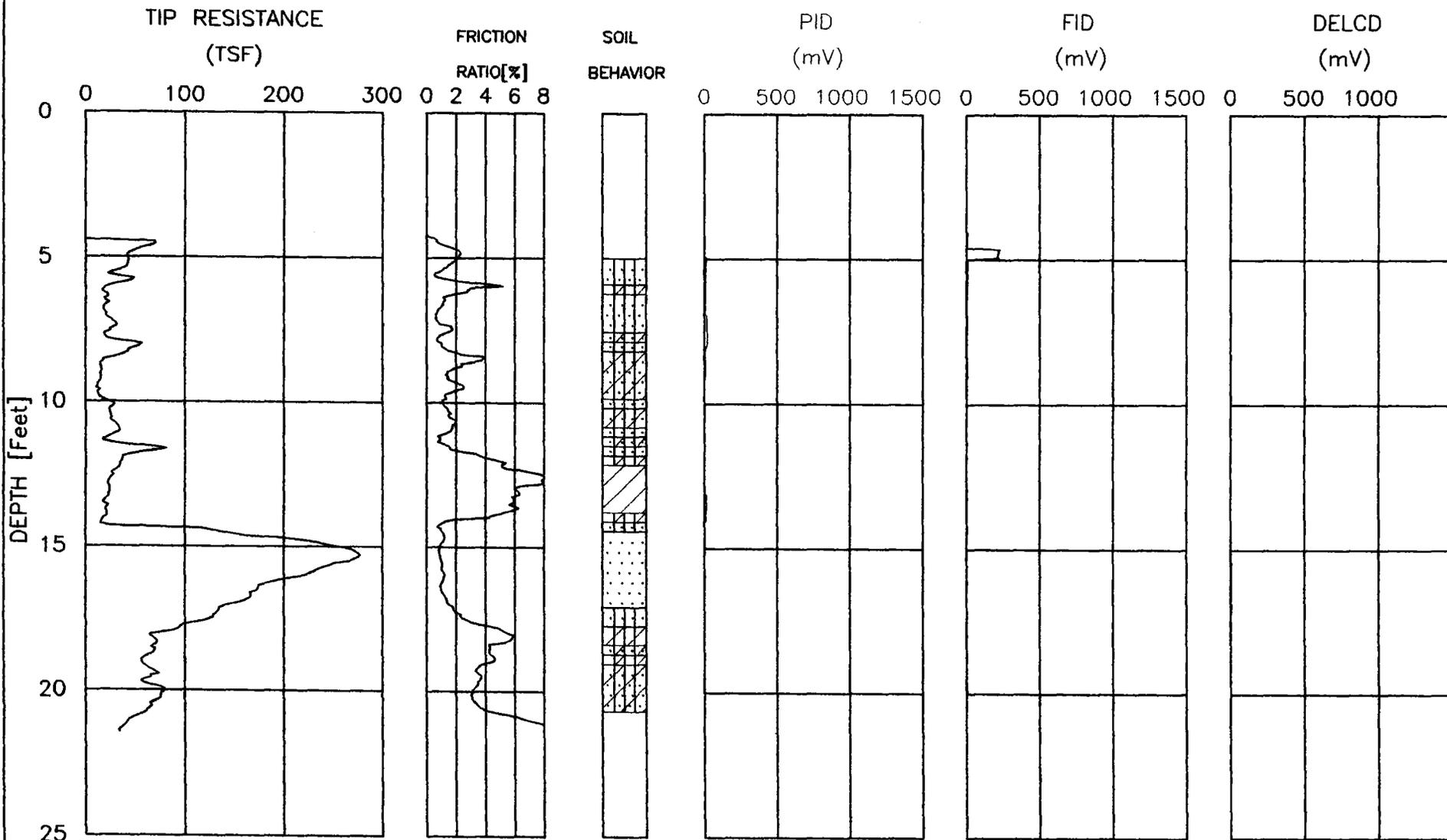
CPT NUMBER: 10

CONE NUMBER: F7.5CKEW892

DATE: 05-01-2002

PLATE: 1 OF 1

# CPT/MIP TEST RESULTS



JOB NUMBER: 0305-0742

ELEVATION: 0.00

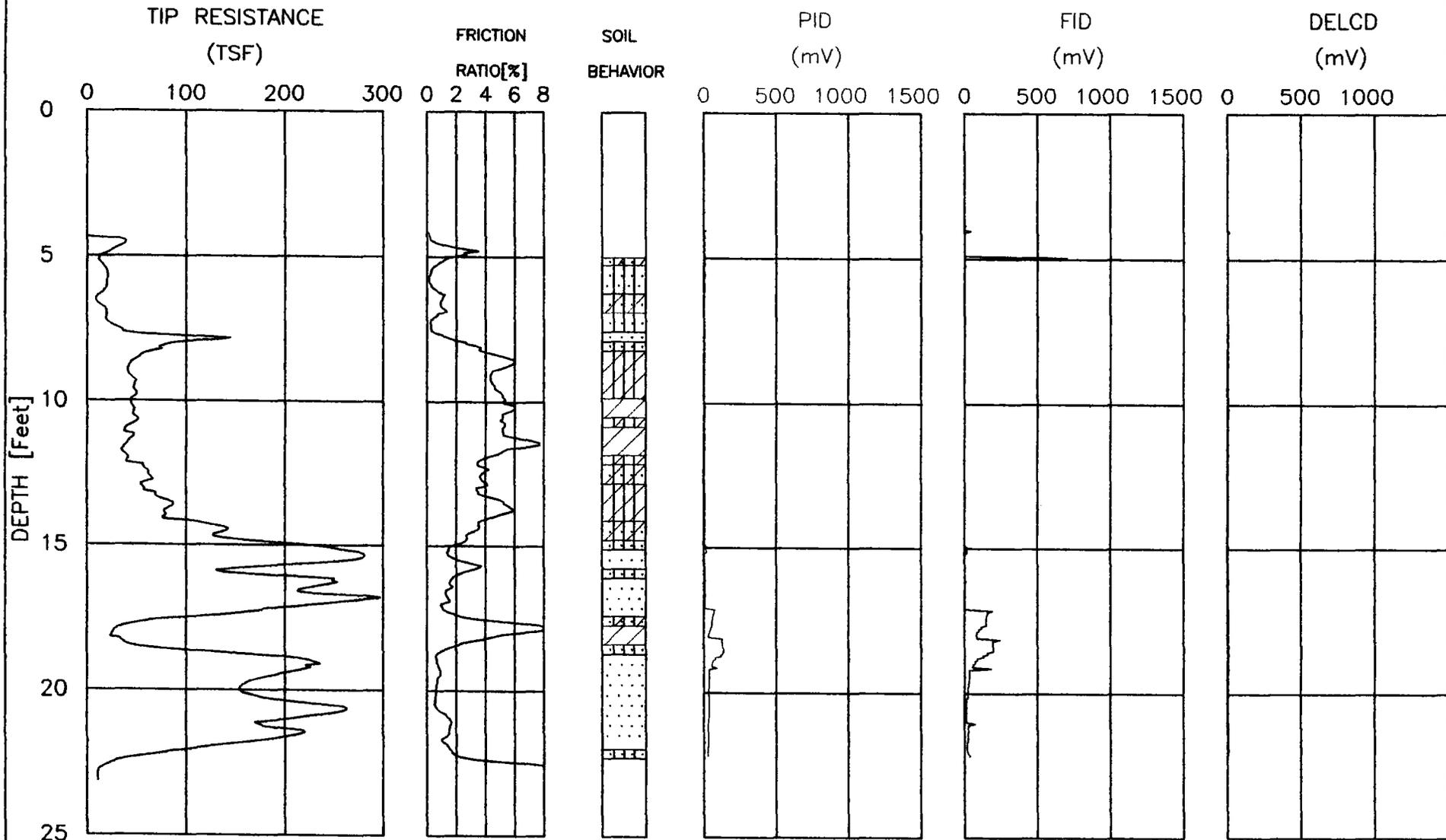
CPT NUMBER: 11

CONE NUMBER: F7.5CKEW892

DATE: 05-01-2002

PLATE: 1 OF 1

# CPT/MIP TEST RESULTS



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ELEVATION: 0.00

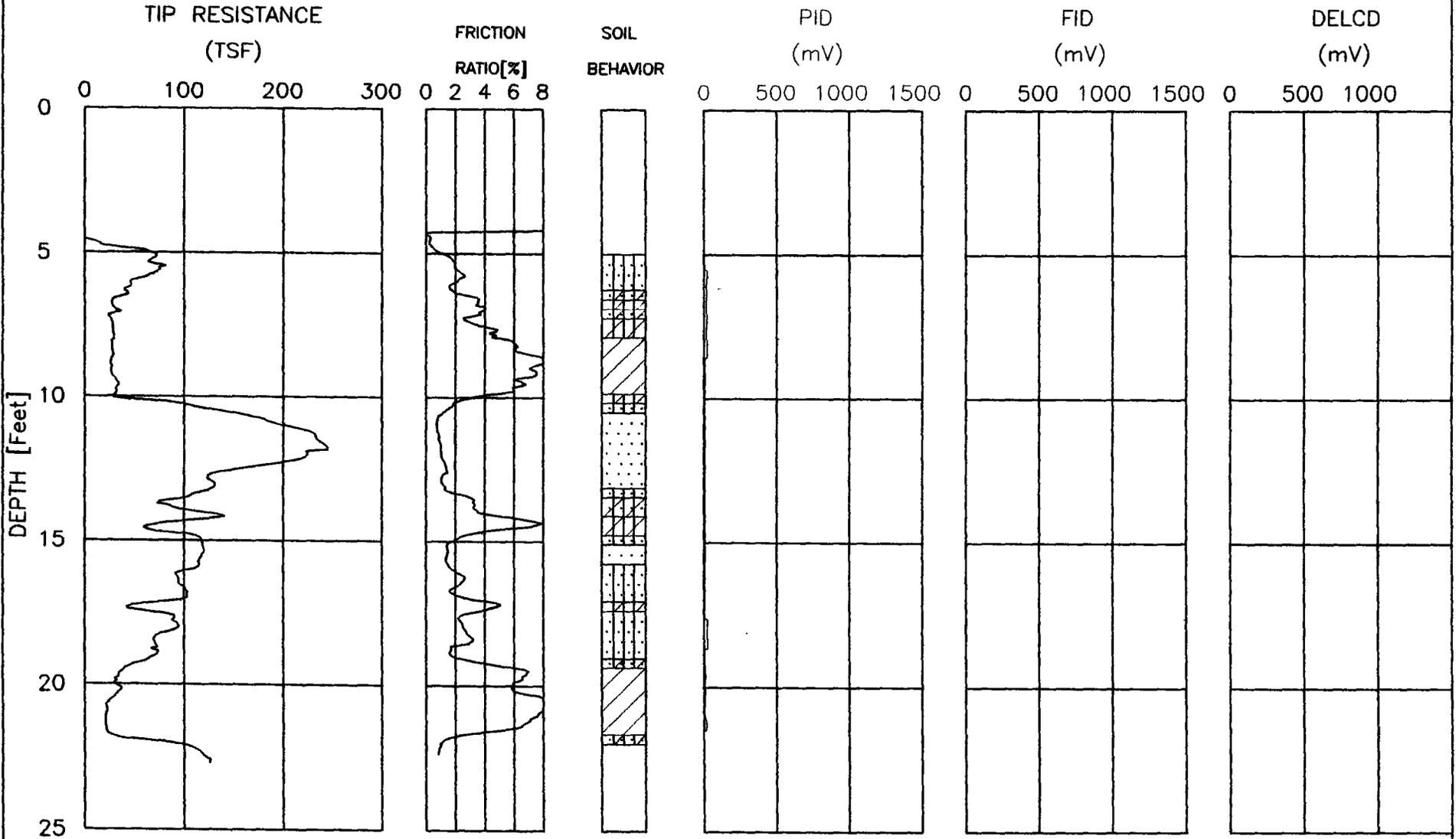
CPT NUMBER: 12

CONE NUMBER: F7.5CKEW892

DATE: 05-01-2002

PLATE: 1 OF 1

# CPT/MIP TEST RESULTS



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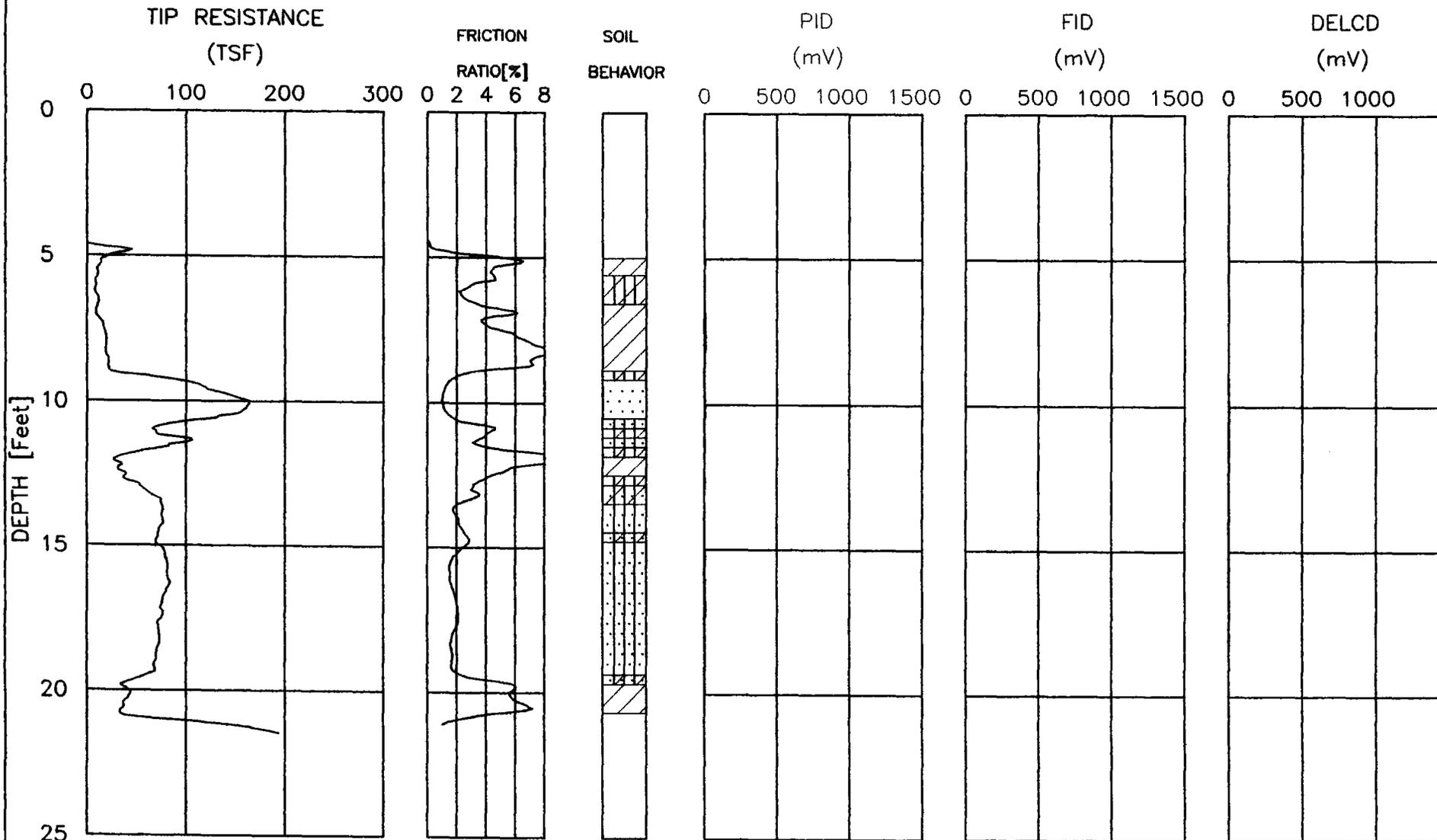
CPT NUMBER: 13

CONE NUMBER: F7.5CKEW892

DATE: 05-01-2002

PLATE: 1 OF 1

# CPT/MIP TEST RESULTS



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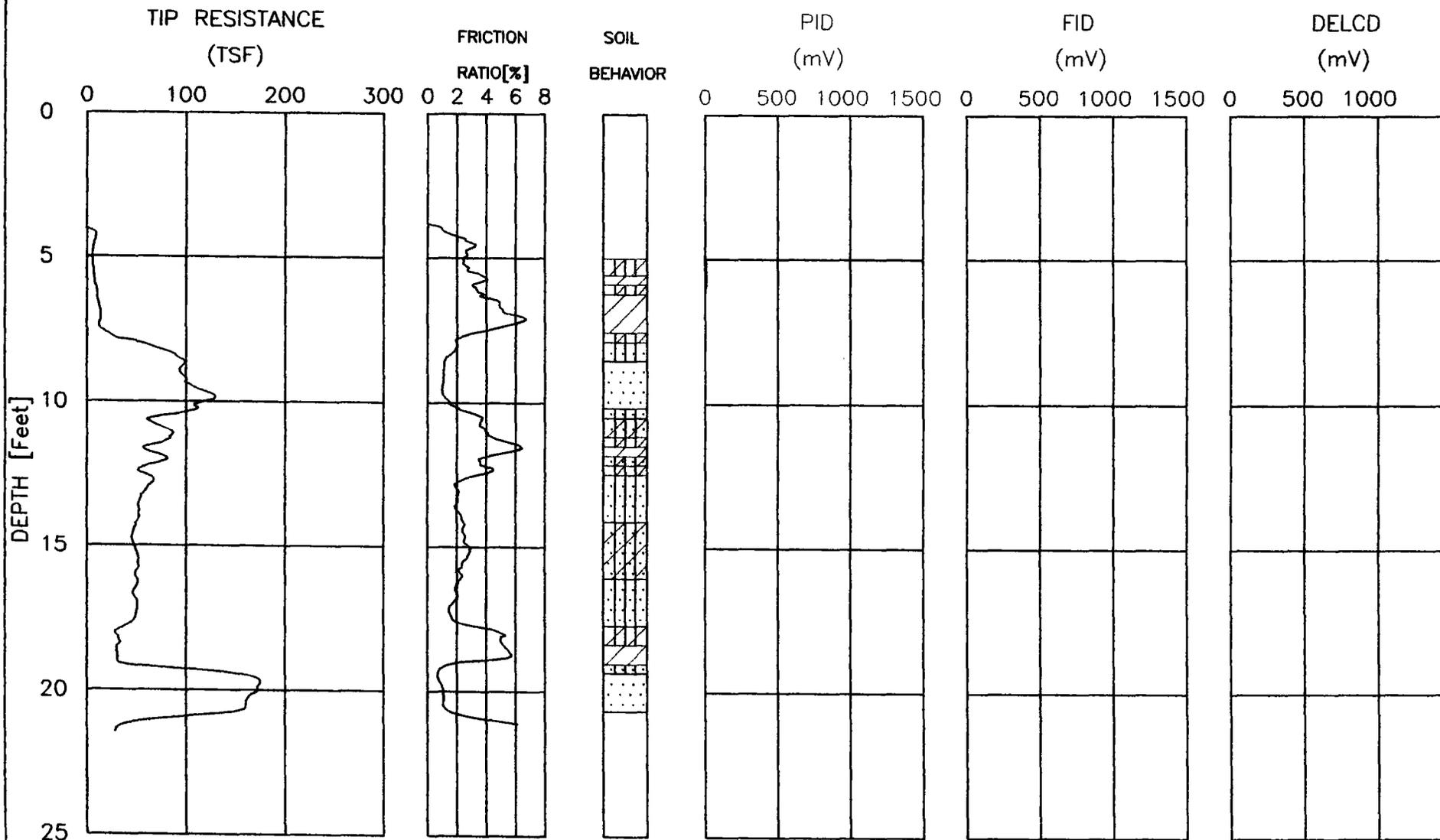
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DATE: 05-01-2002

PLATE: 1 OF 1

# CPT/MIP TEST RESULTS



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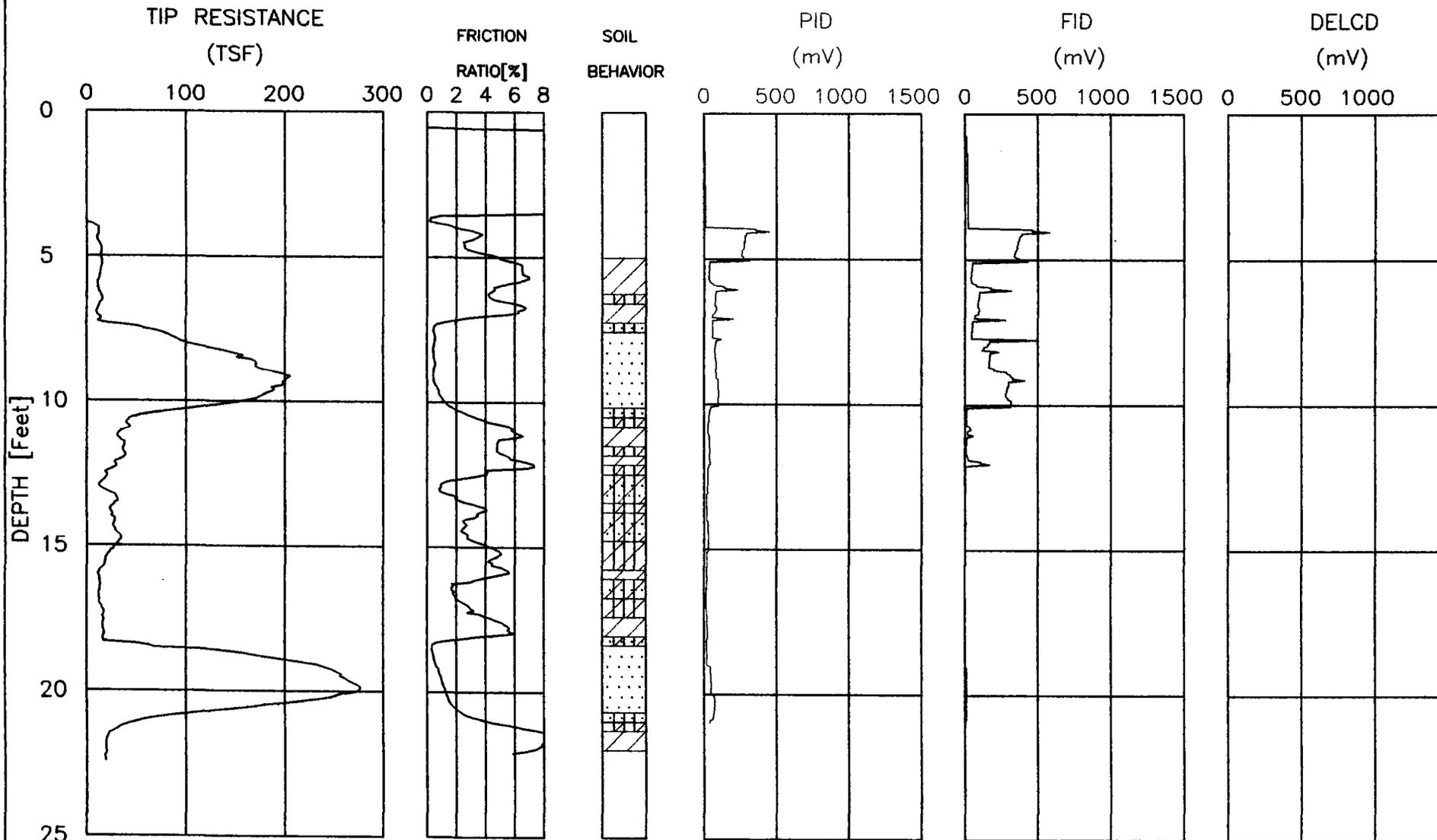
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CONE NUMBER: F7.5CKEW892

DATE: 05-01-2002

PLATE: 1 OF 1

# CPT/MIP TEST RESULTS



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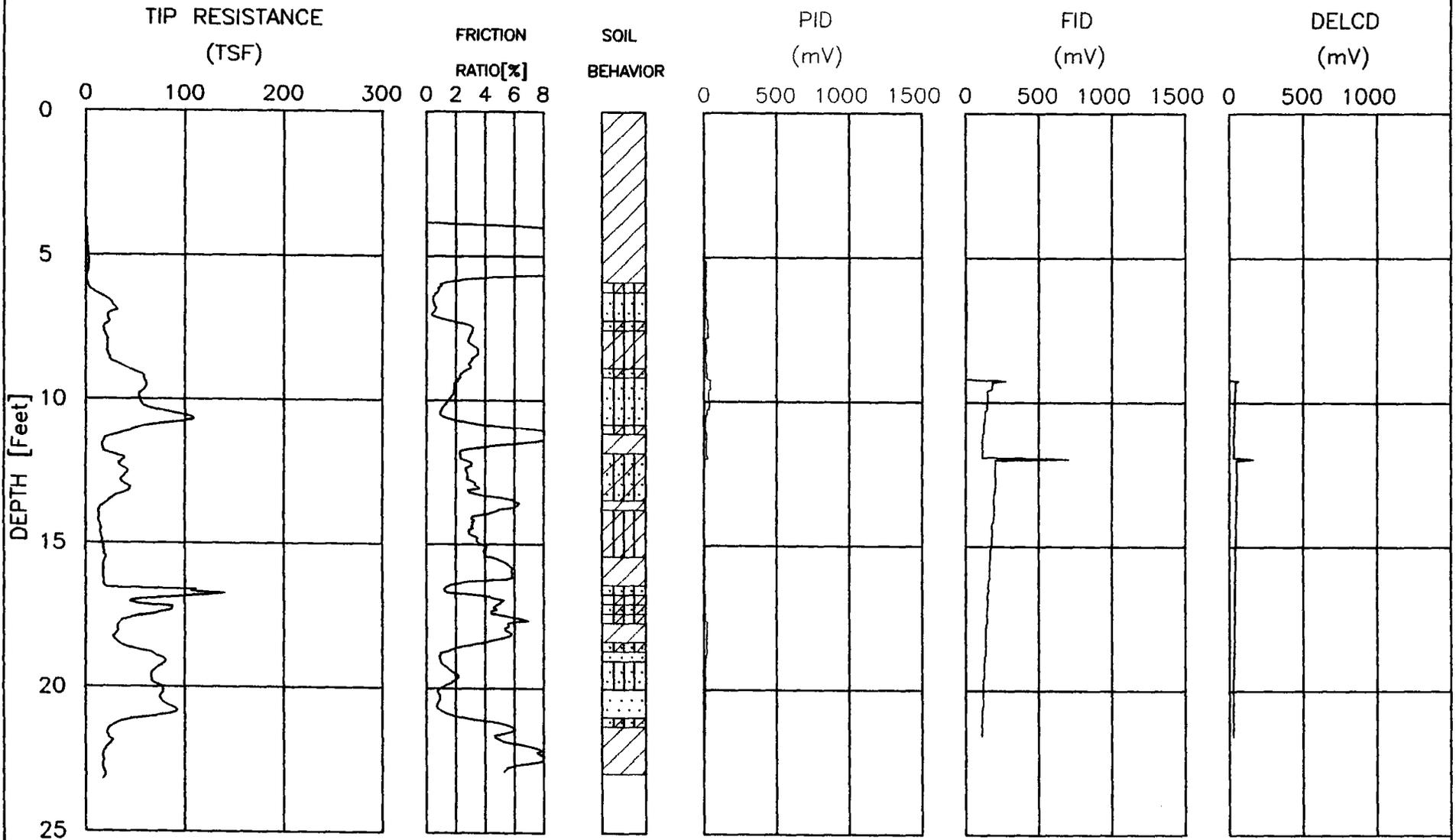
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CONE NUMBER: F7.5CKEW892

DATE: 05-01-2002

PLATE: 1 OF 1

# CPT/MIP TEST RESULTS



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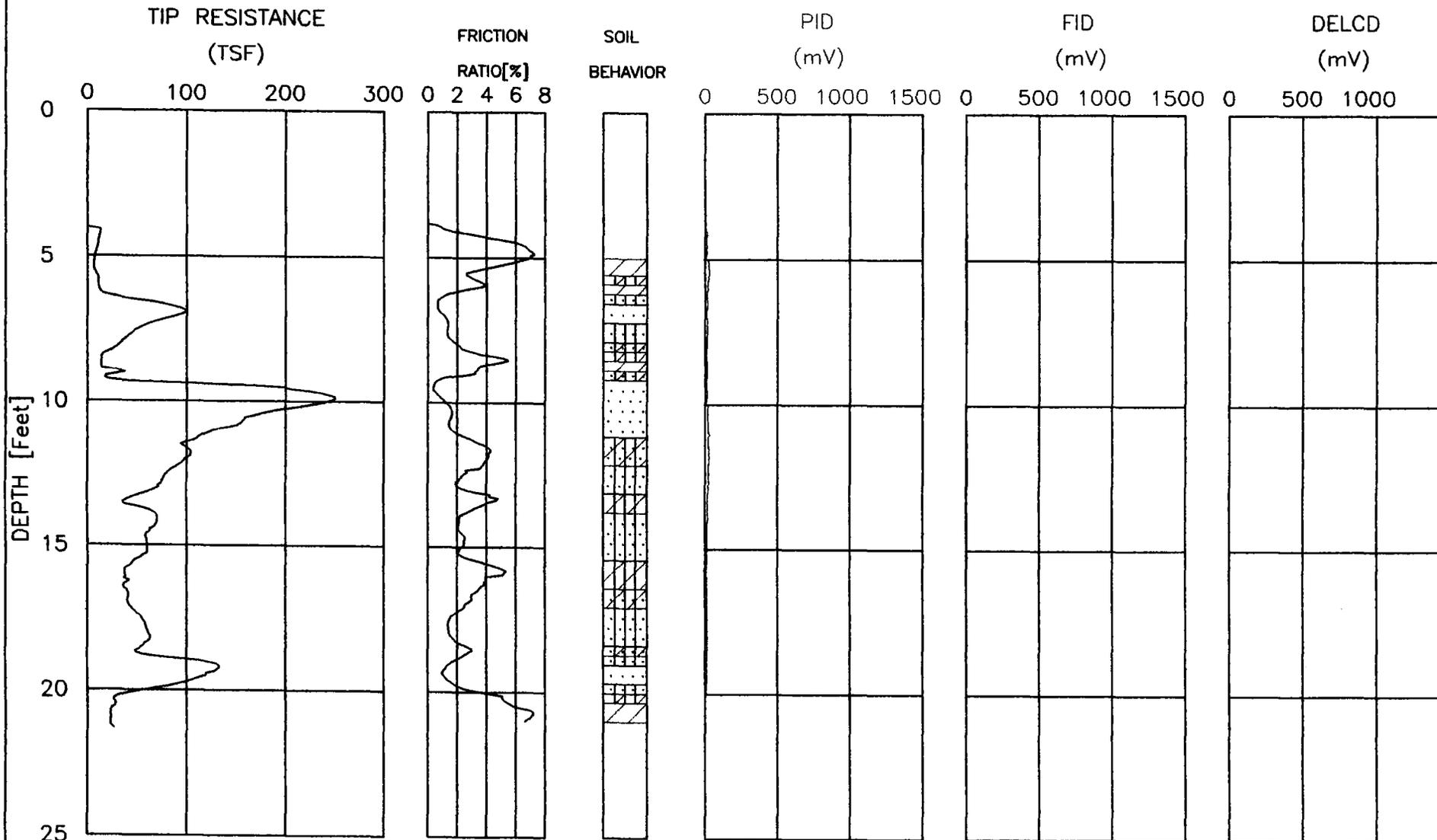
CPT NUMBER: 17

CONE NUMBER: F7.5CKEW892

DATE: 05-02-2002

PLATE: 1 OF 1

# CPT/MIP TEST RESULTS



JOB NUMBER: 0305-0742

ELEVATION: 0.00

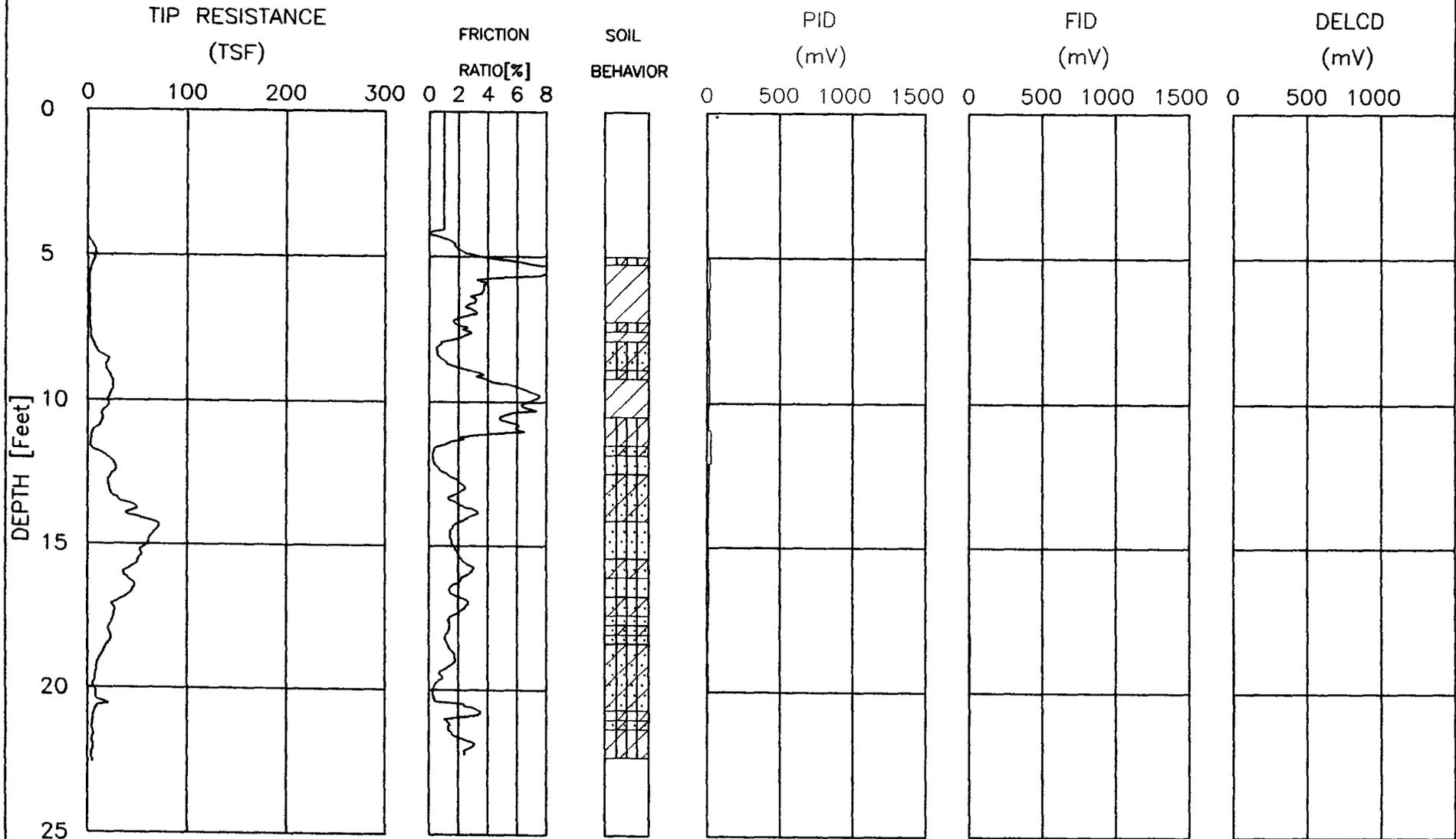
CPT NUMBER: 18

CONE NUMBER: F7.5CKEW892

DATE: 05-02-2002

PLATE: 1 OF 1

# CPT/MIP TEST RESULTS



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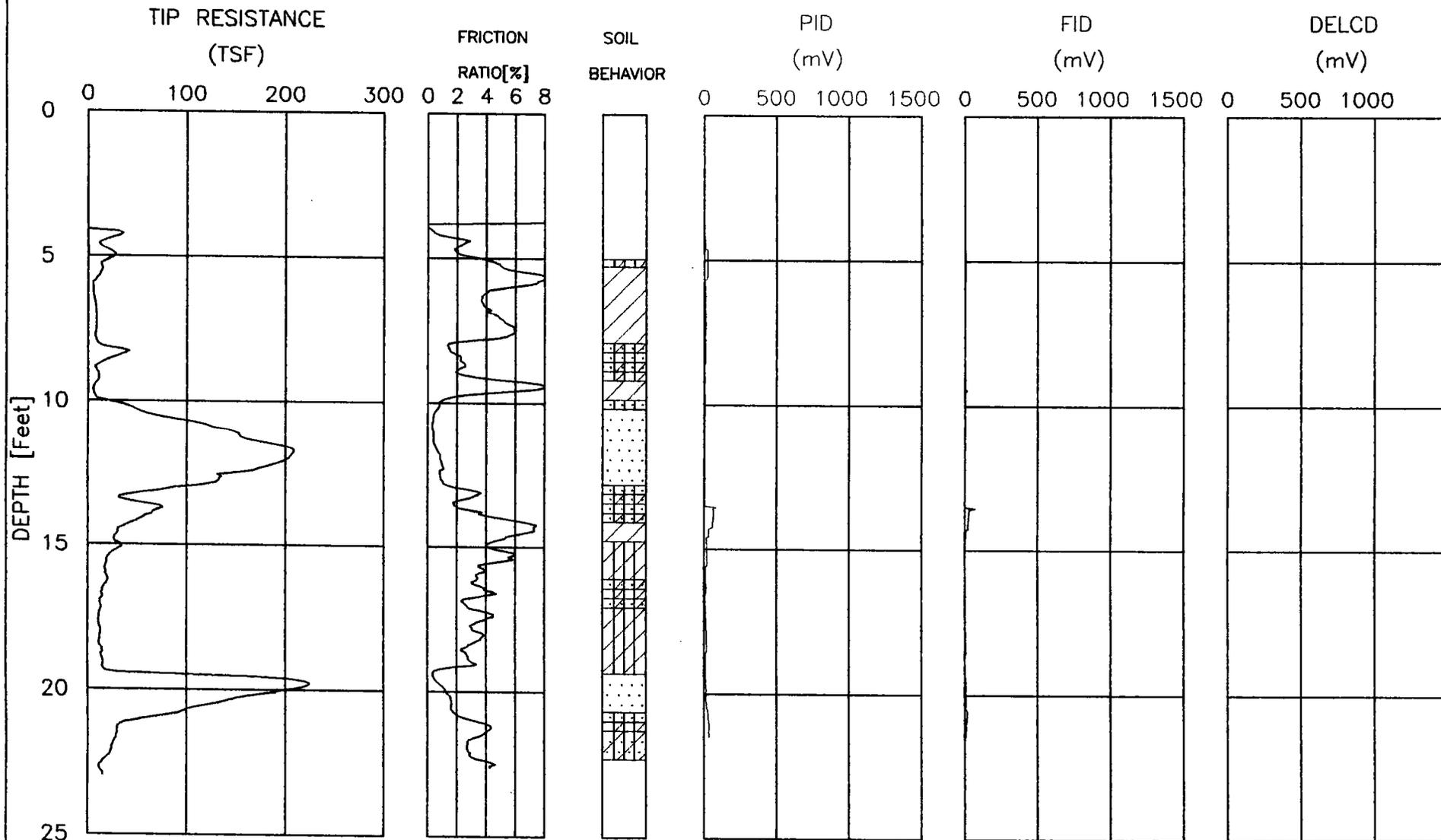
CPT NUMBER: 19

CONE NUMBER: F7.5CKEW892

DATE: 05-02-2002

PLATE: 1 OF 1

# CPT/MIP TEST RESULTS



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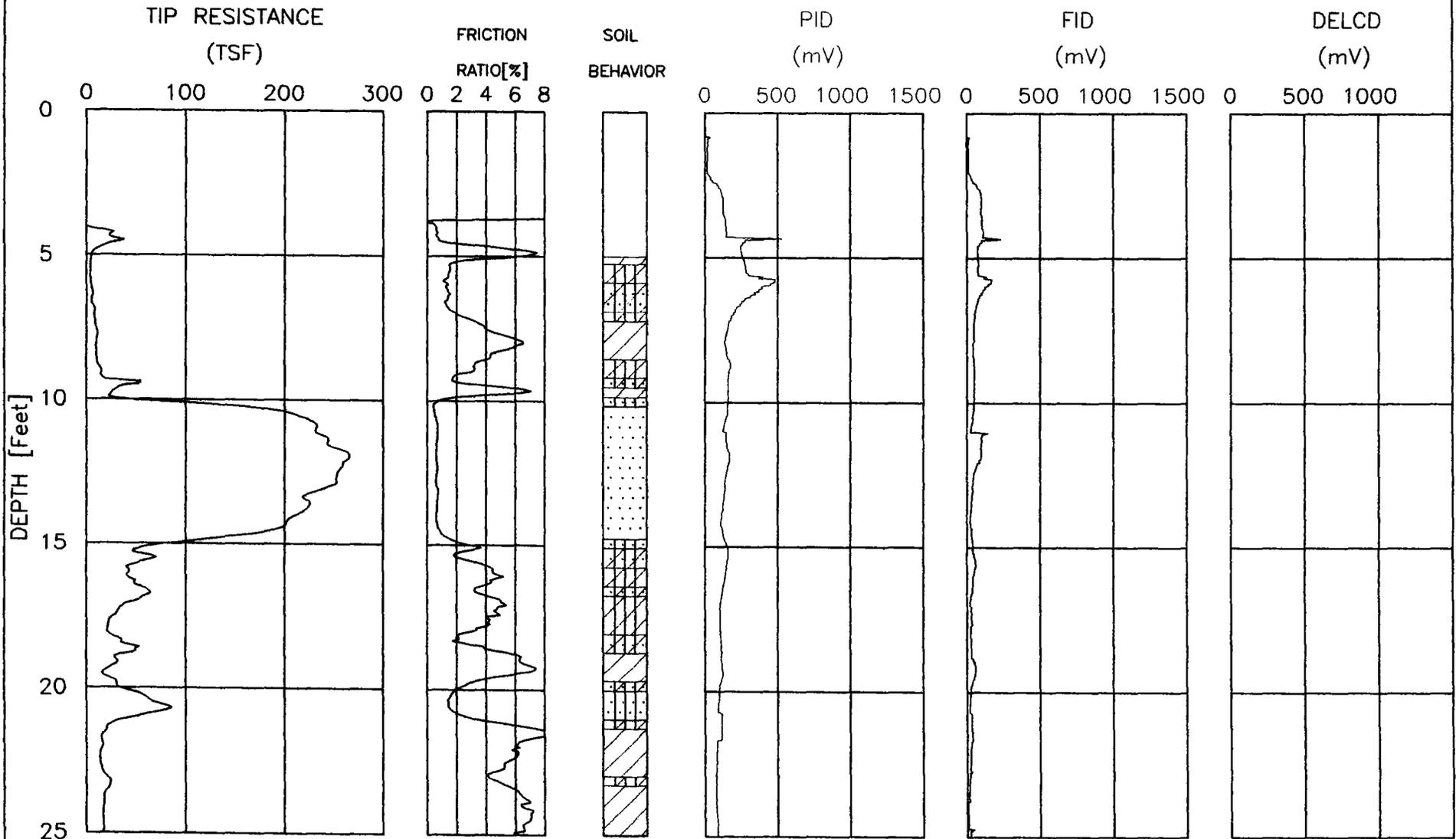
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CONE NUMBER: F7.5CKEW892

DATE: 05-02-2002

PLATE: 1 OF 1

# CPT/MIP TEST RESULTS



JOB NUMBER: 0305-0742

ELEVATION: 0.00

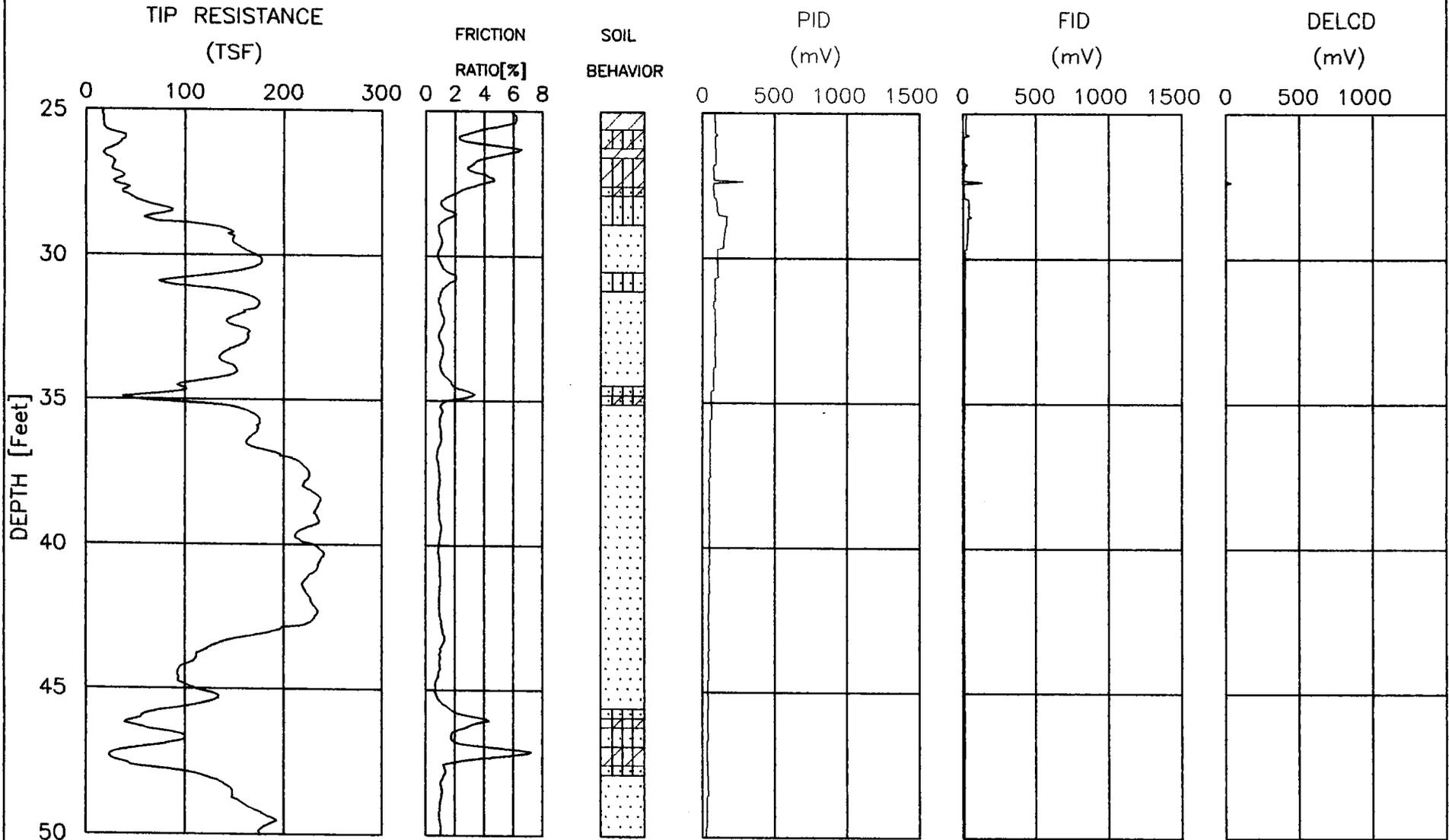
CPT NUMBER: 21

CONE NUMBER: F7.5CKEW892

DATE: 05-03-2002

PLATE: 1 OF 4

# CPT/MIP TEST RESULTS



JOB NUMBER: 0305-0742

ELEVATION: 0.00

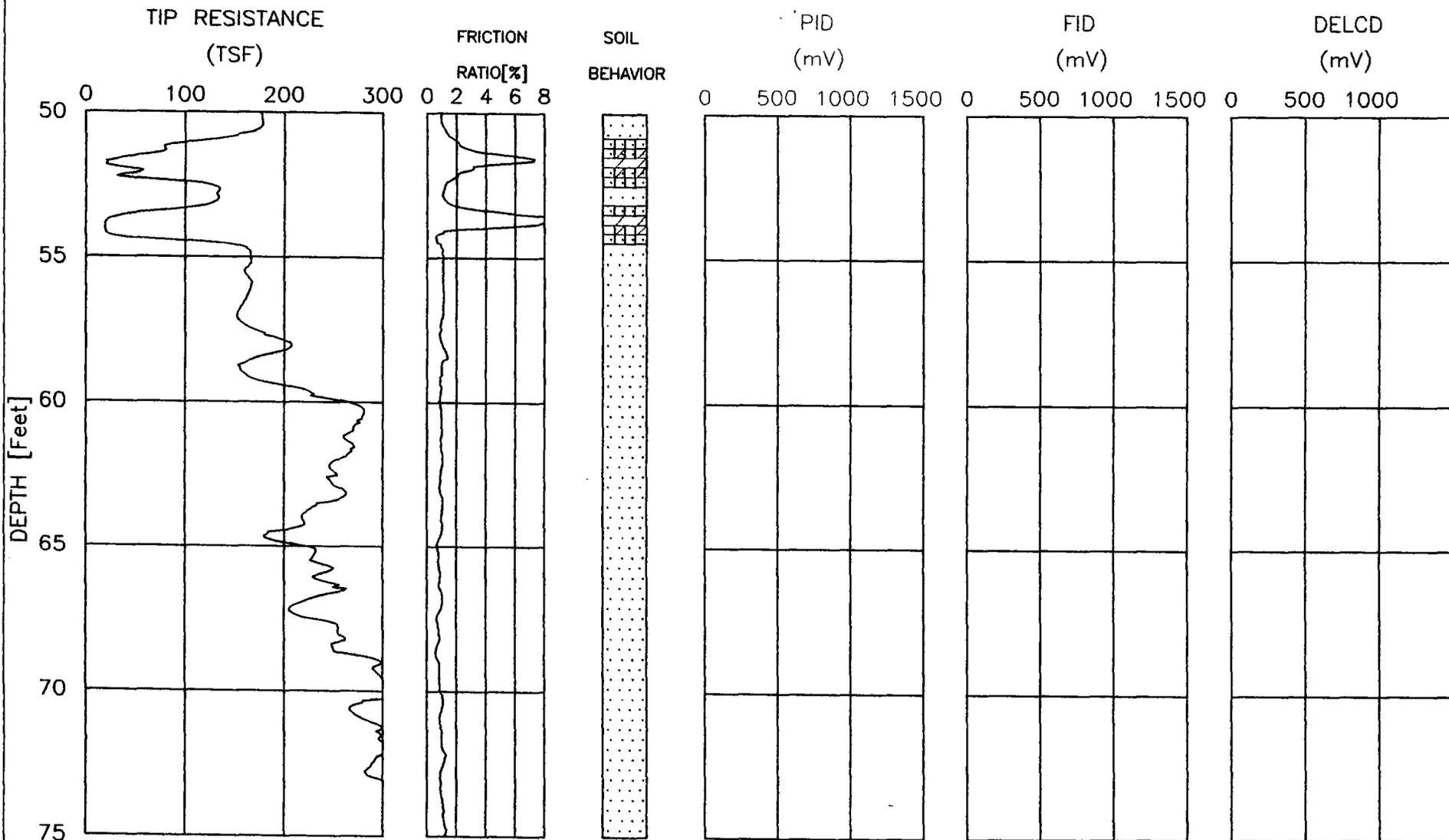
CPT NUMBER: 21

CONE NUMBER: F7.5CKEW892

DATE: 05-03-2002

PLATE: 2 OF 4

# CPT/MIP TEST RESULTS



JOB NUMBER:

ELEVATION:

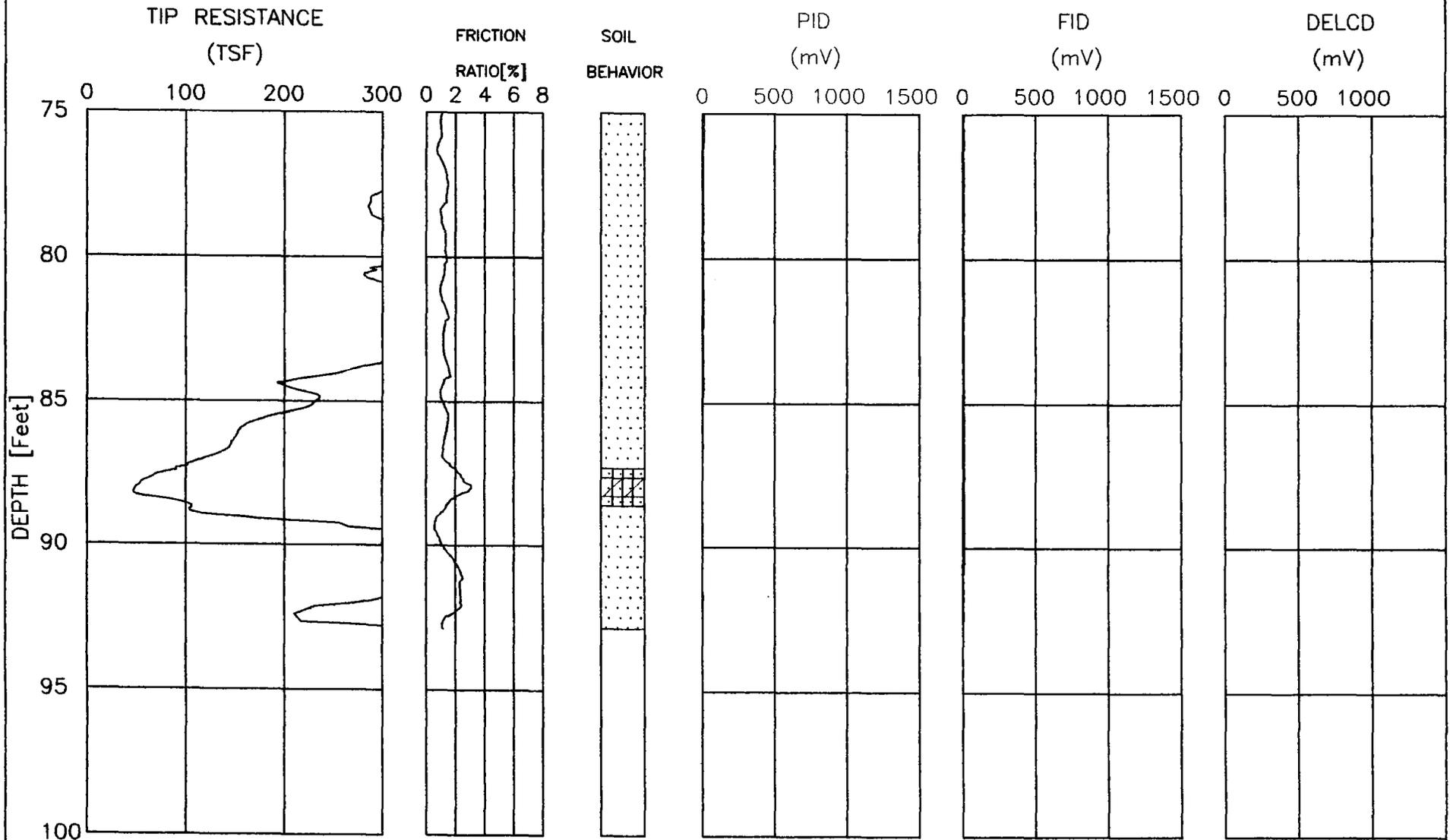
CPT NUMBER:

CONE NUMBER:

DATE:

PLATE:

# CPT/MIP TEST RESULTS



JOB NUMBER: 0305-0742

ELEVATION: 0.00

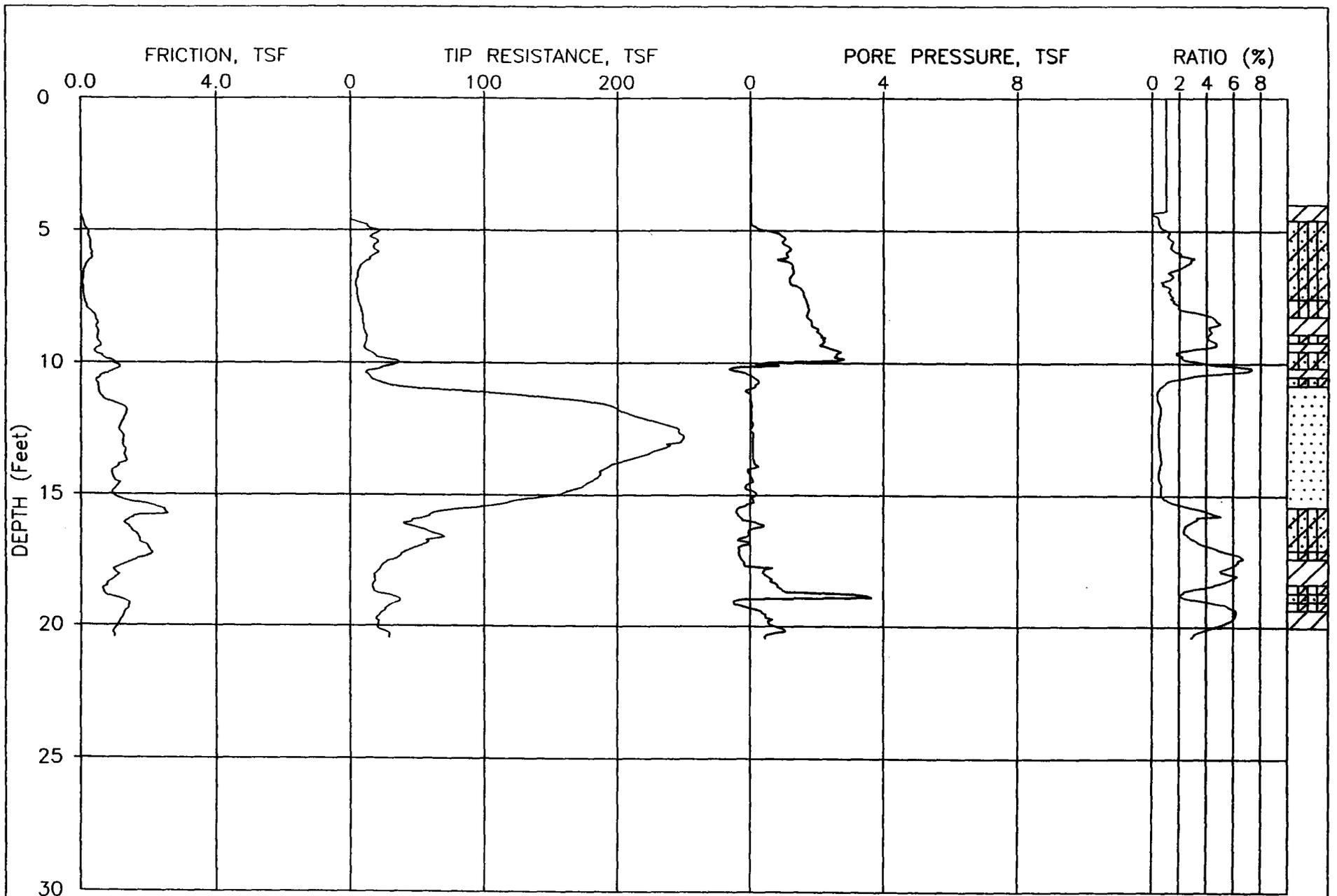
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CONE NUMBER: F7.5CKEW892

DATE: 05-03-2002

PLATE: 4 OF 4

**CPT LOGS**



JOB NUMBER: 0305-0742

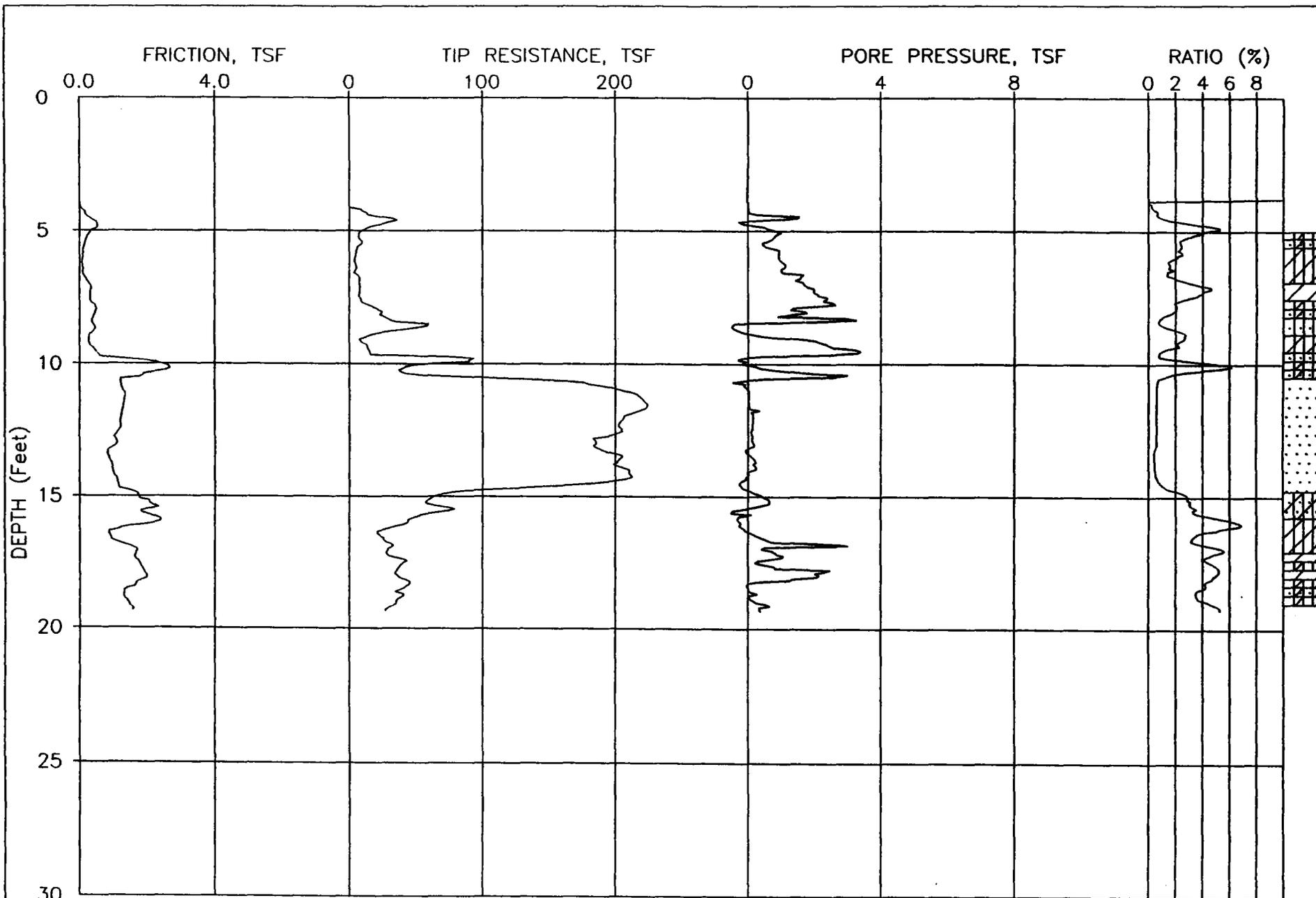
CPT NUMBER: 1

DATE: 04-29-2002

ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 1 OF 1



JOB NUMBER: 0305-0742

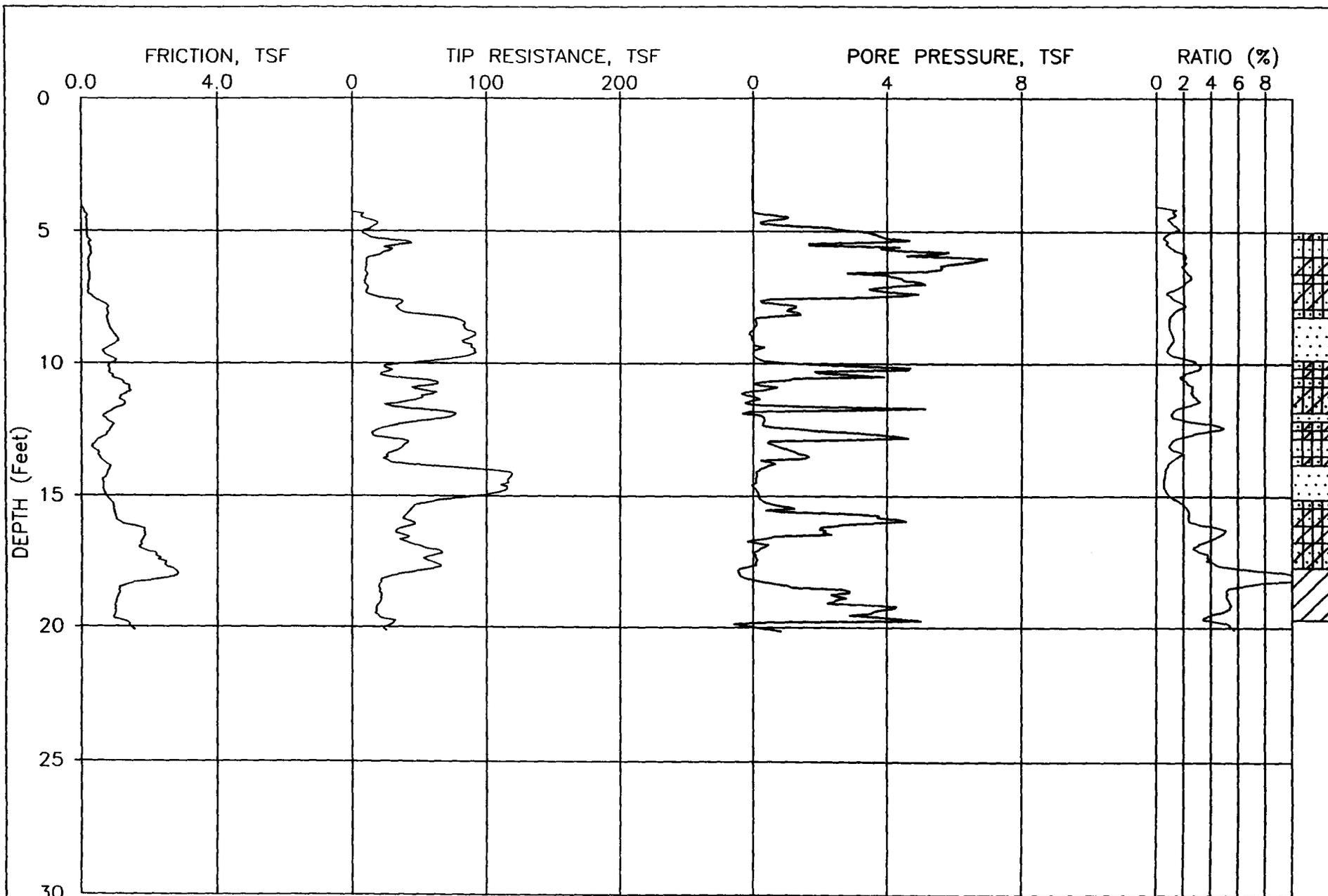
CPT NUMBER: 2

DATE: 04-29-2002

ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 1 OF 1



JOB NUMBER: 0305-0742

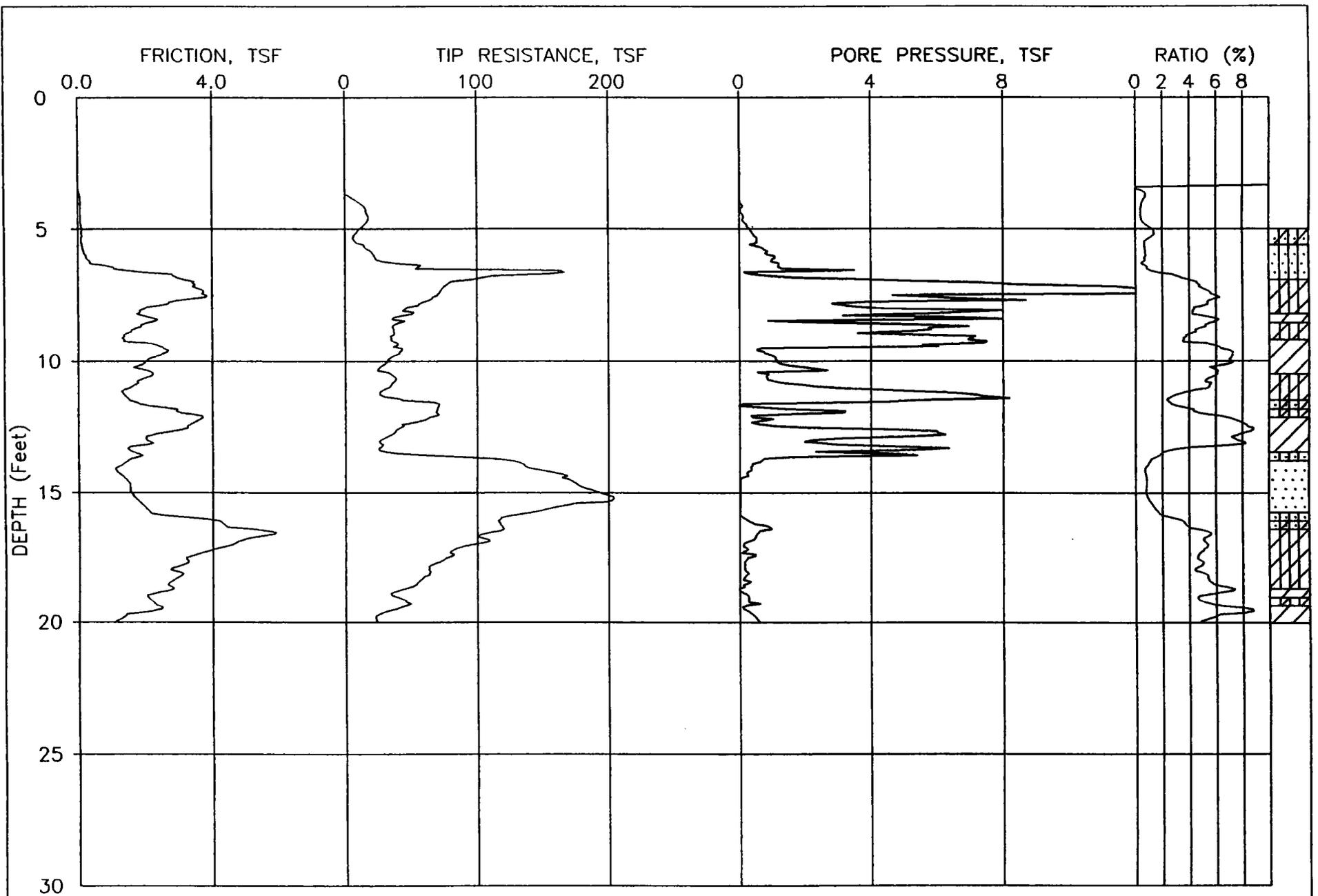
CPT NUMBER: 3

DATE: 04-30-2002

ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 1 OF 1



JOB NUMBER: 0305-0742

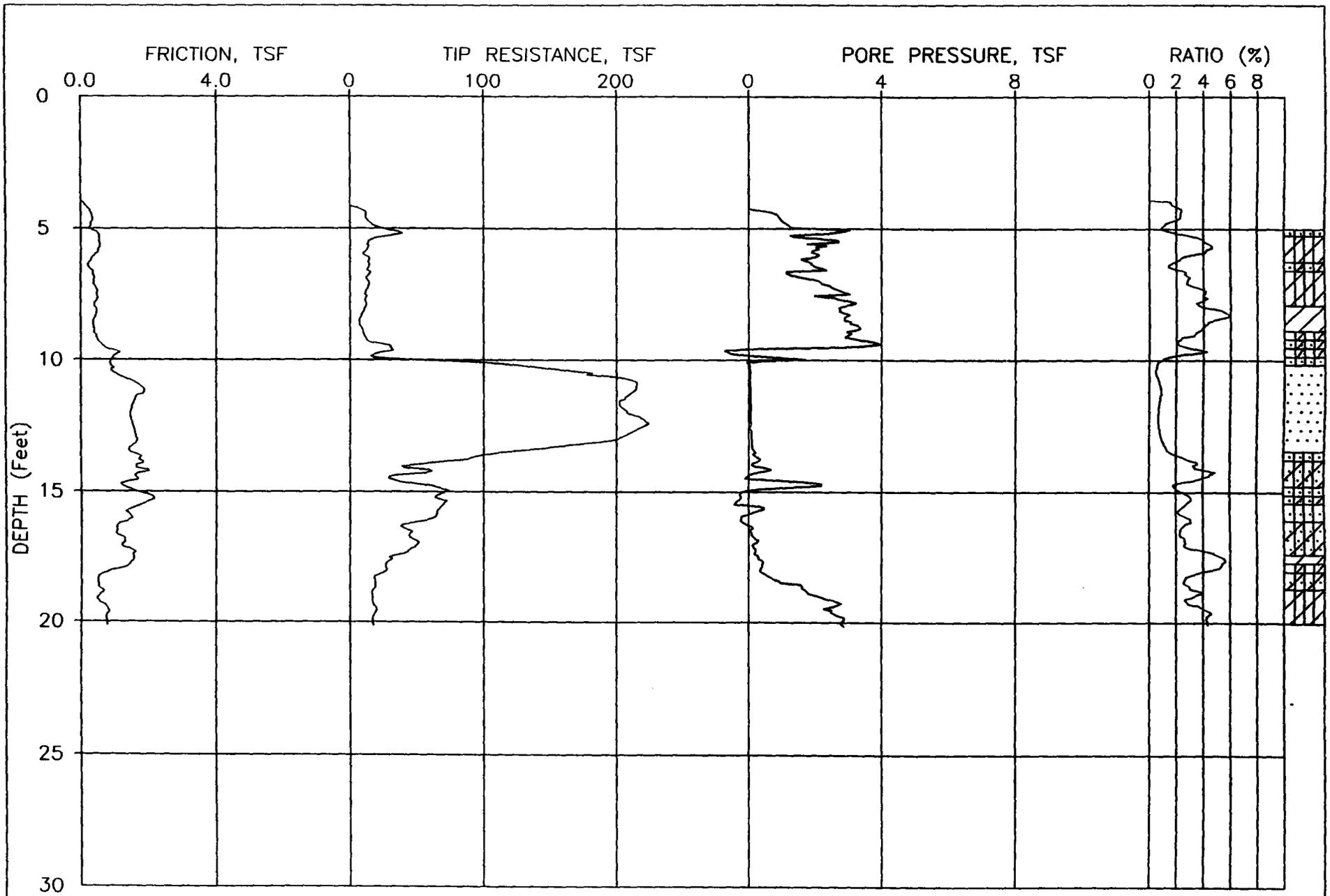
CPT NUMBER: 4

DATE: 04-30-2002

ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 1 OF 1



JOB NUMBER: 0305-0742

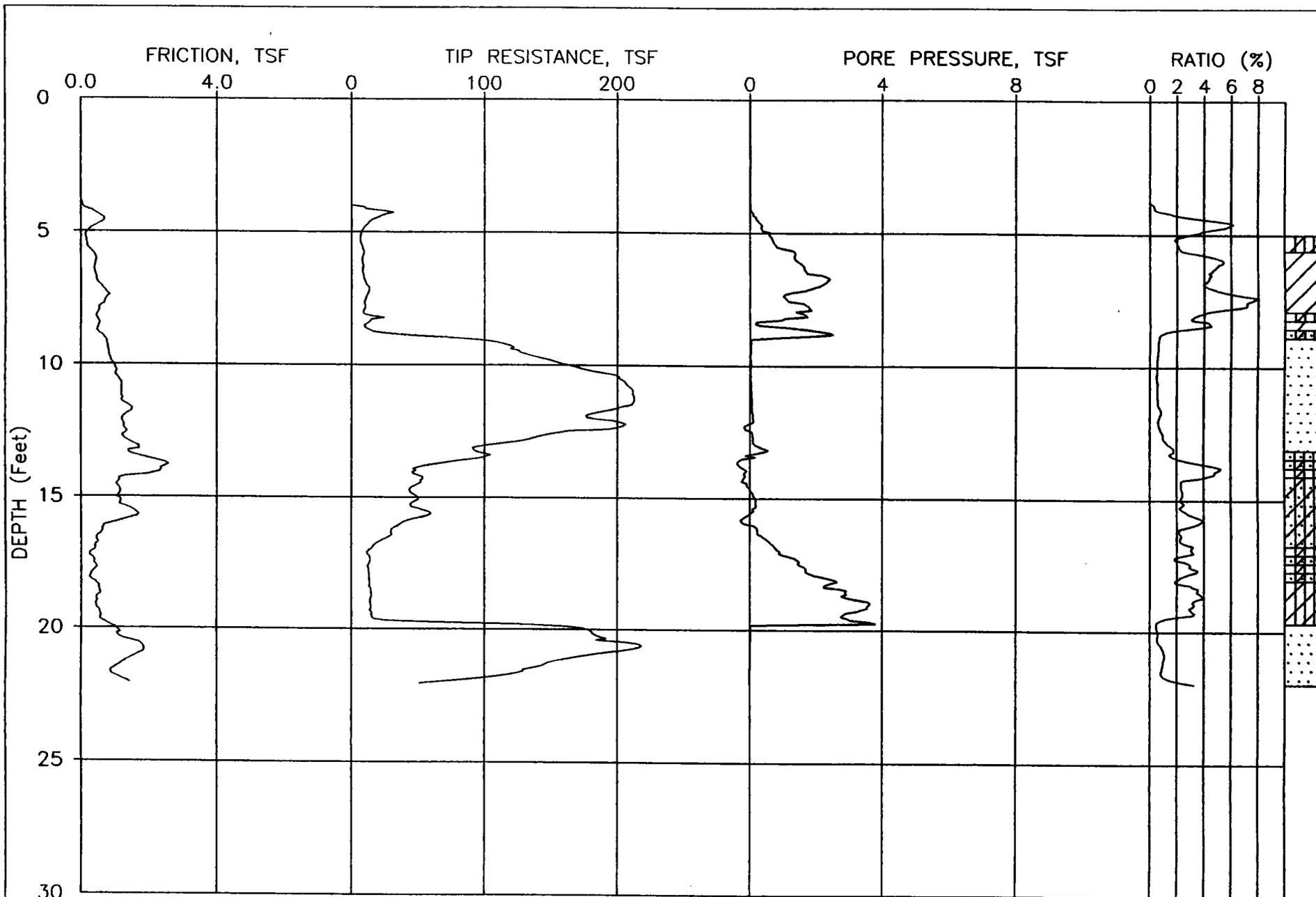
CPT NUMBER: 5

DATE: 04-30-2002

ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 1 OF 1



JOB NUMBER: 0305-0742

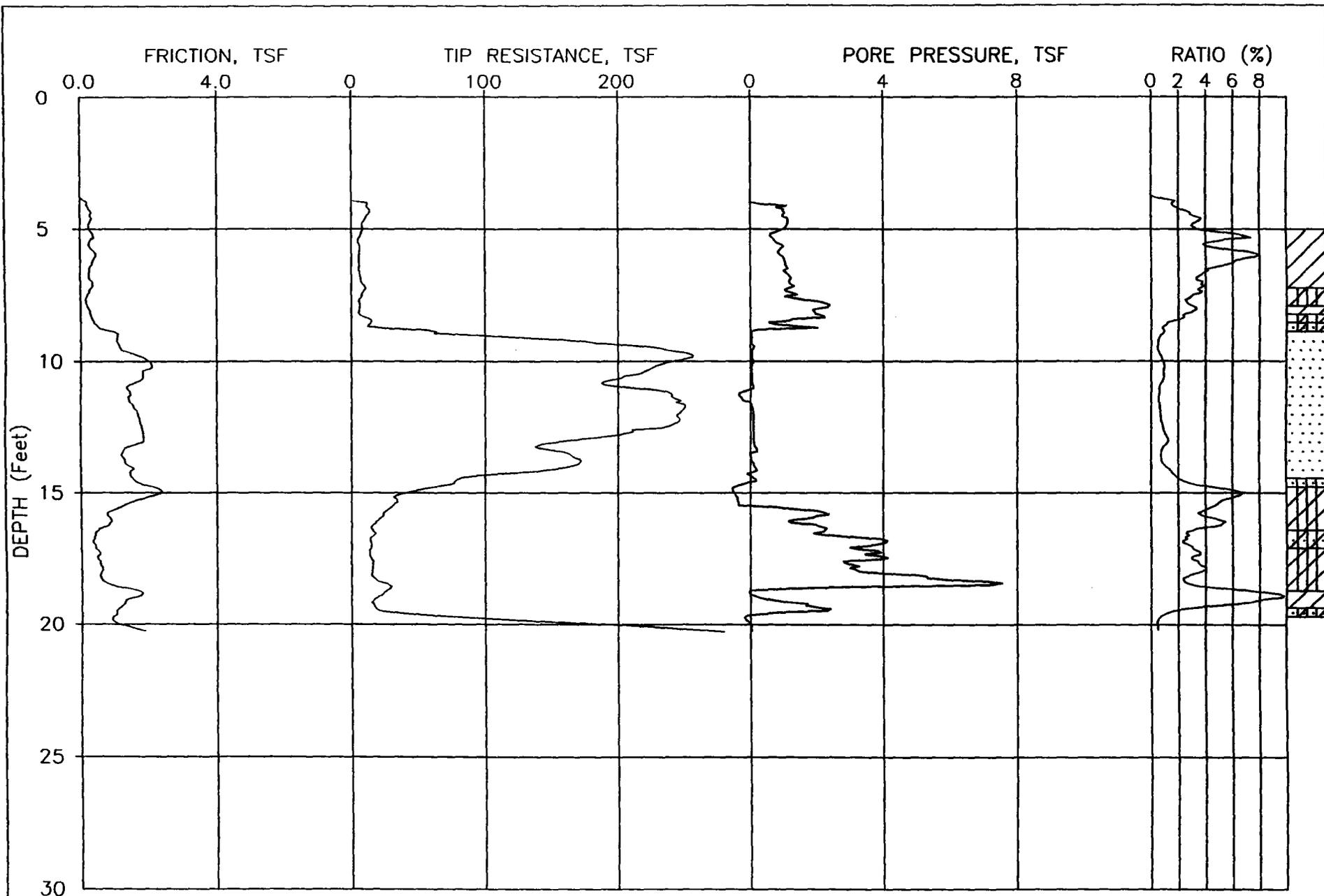
CPT NUMBER: 6

DATE: 04-30-2002

ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 1 OF 1



JOB NUMBER: 0305-0742

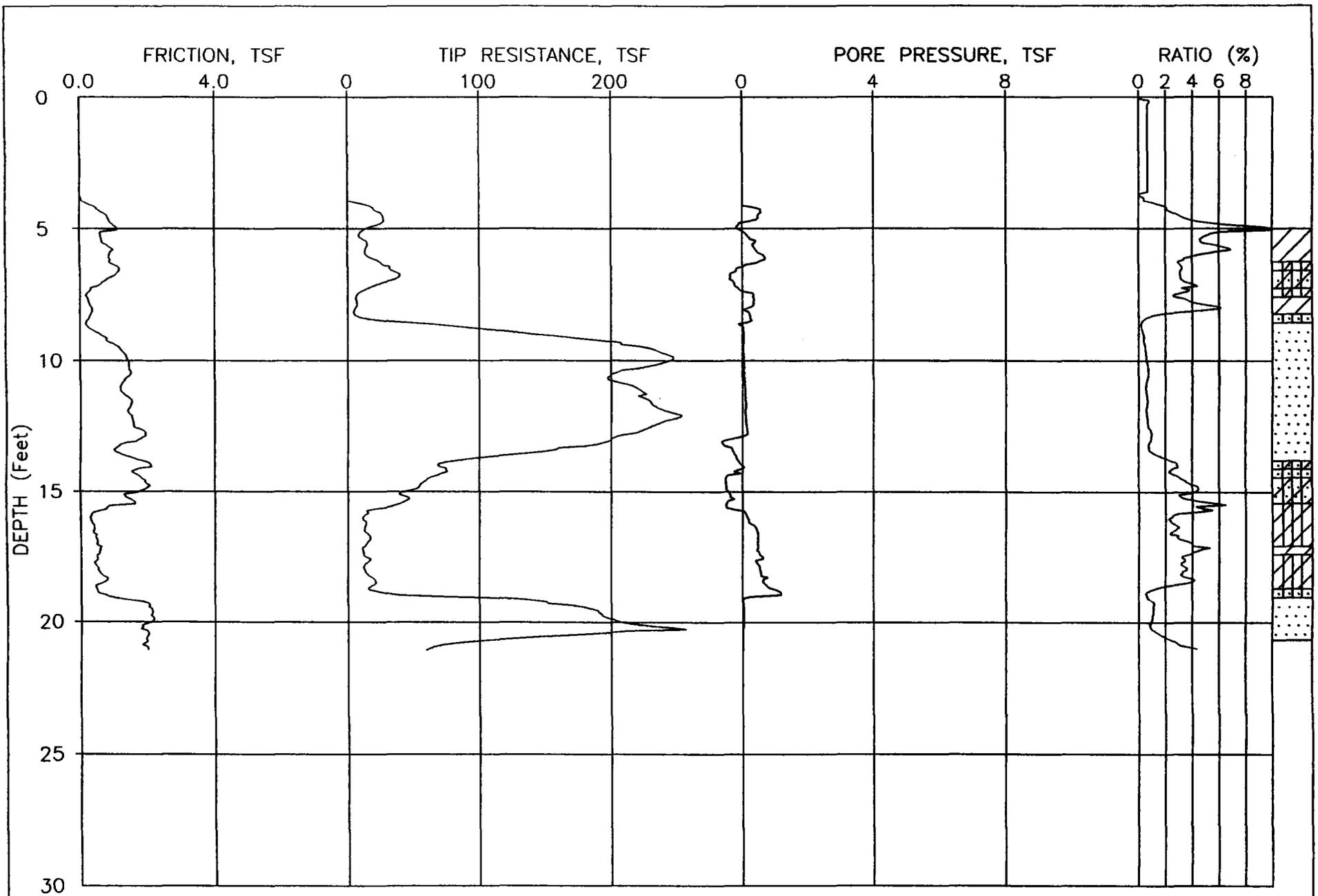
CPT NUMBER: 7

DATE: 04-30-2002

ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 1 OF 1



JOB NUMBER: 0305-0742

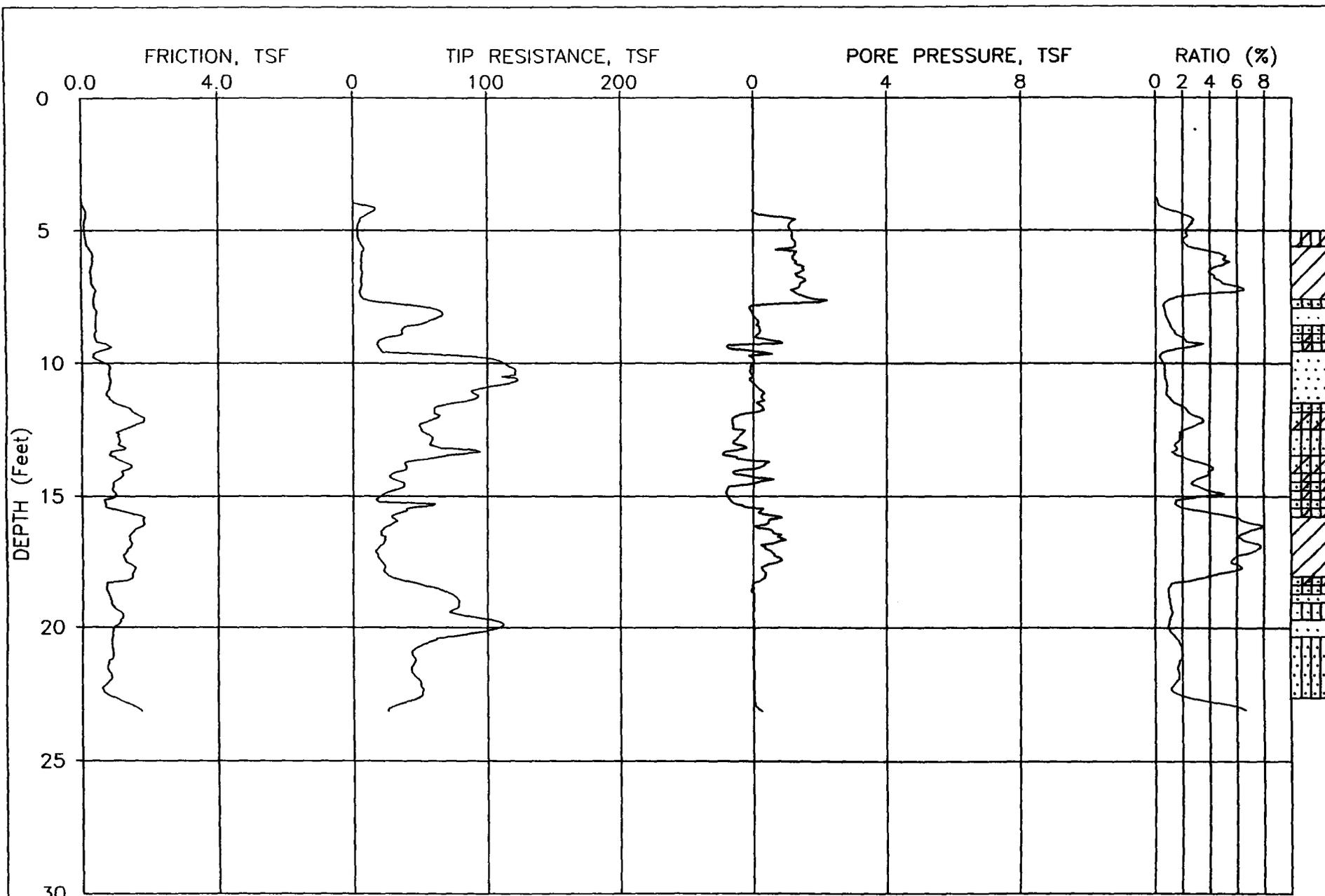
CPT NUMBER: 8

DATE: 04-30-2002

ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 1 OF 1



JOB NUMBER: 0305-0742

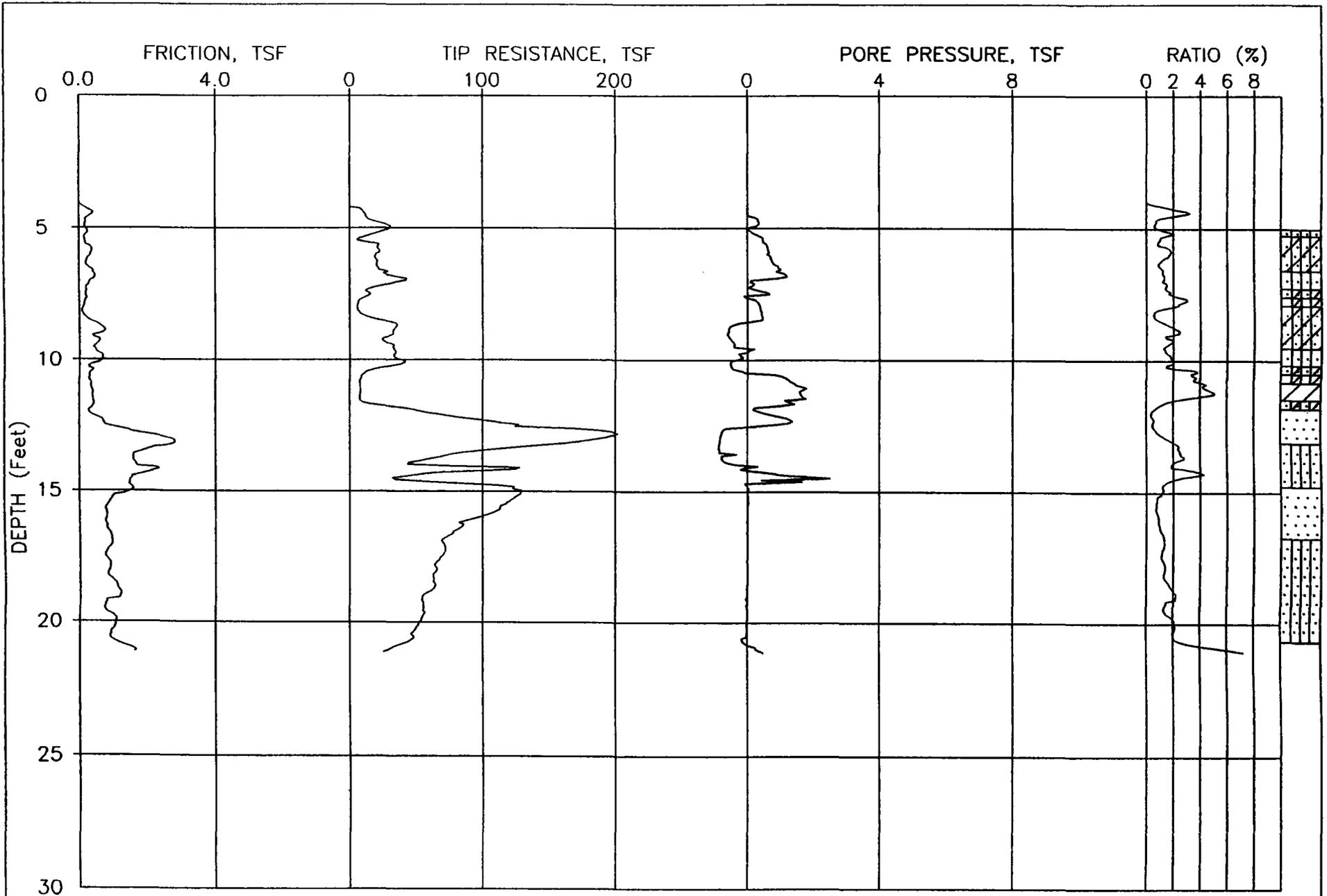
CPT NUMBER: 9

DATE: 04-30-2002

ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 1 OF 1



JOB NUMBER: 0305-0742

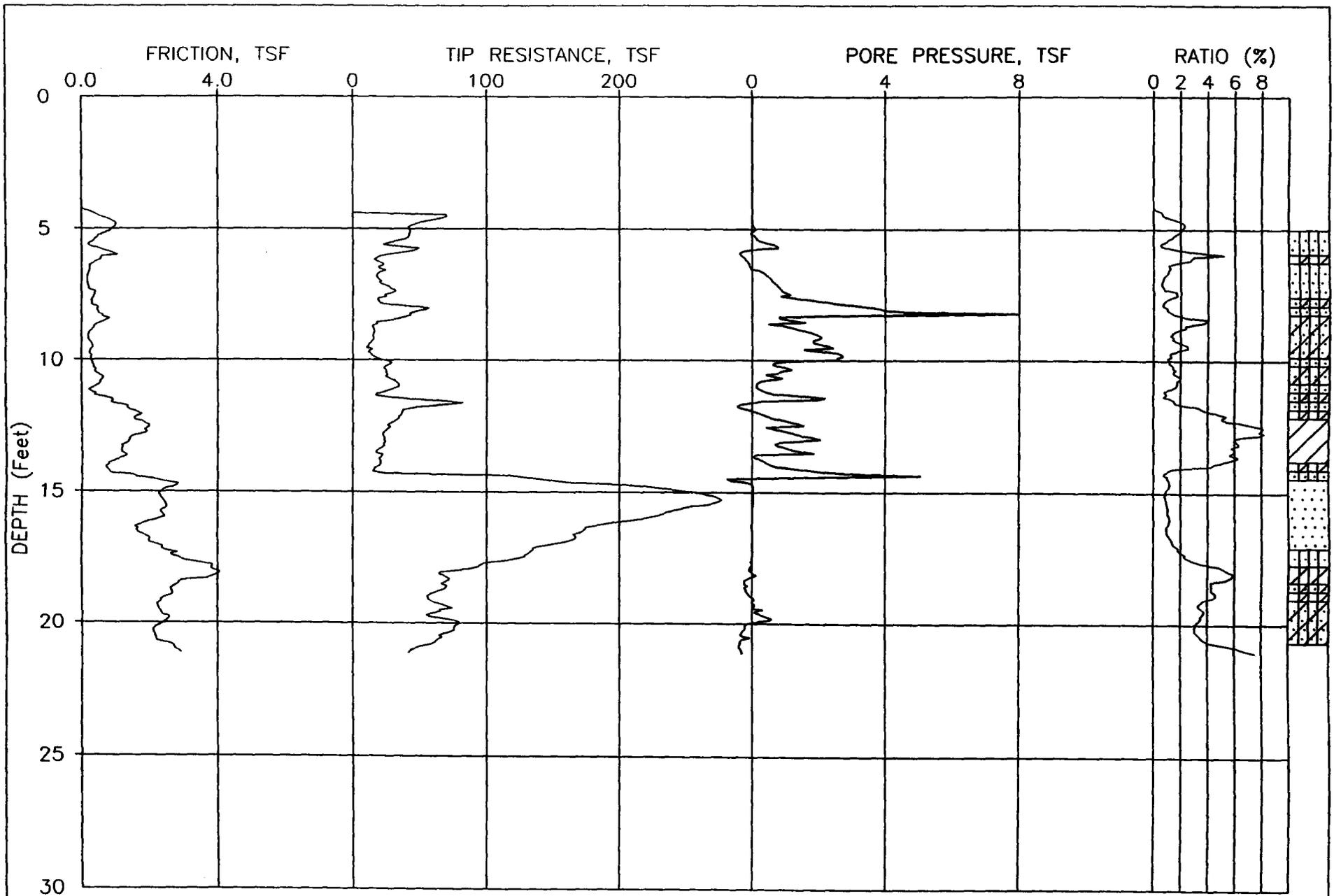
CPT NUMBER: 10

DATE: 05-01-2002

ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 1 OF 1



JOB NUMBER: 0305-0742

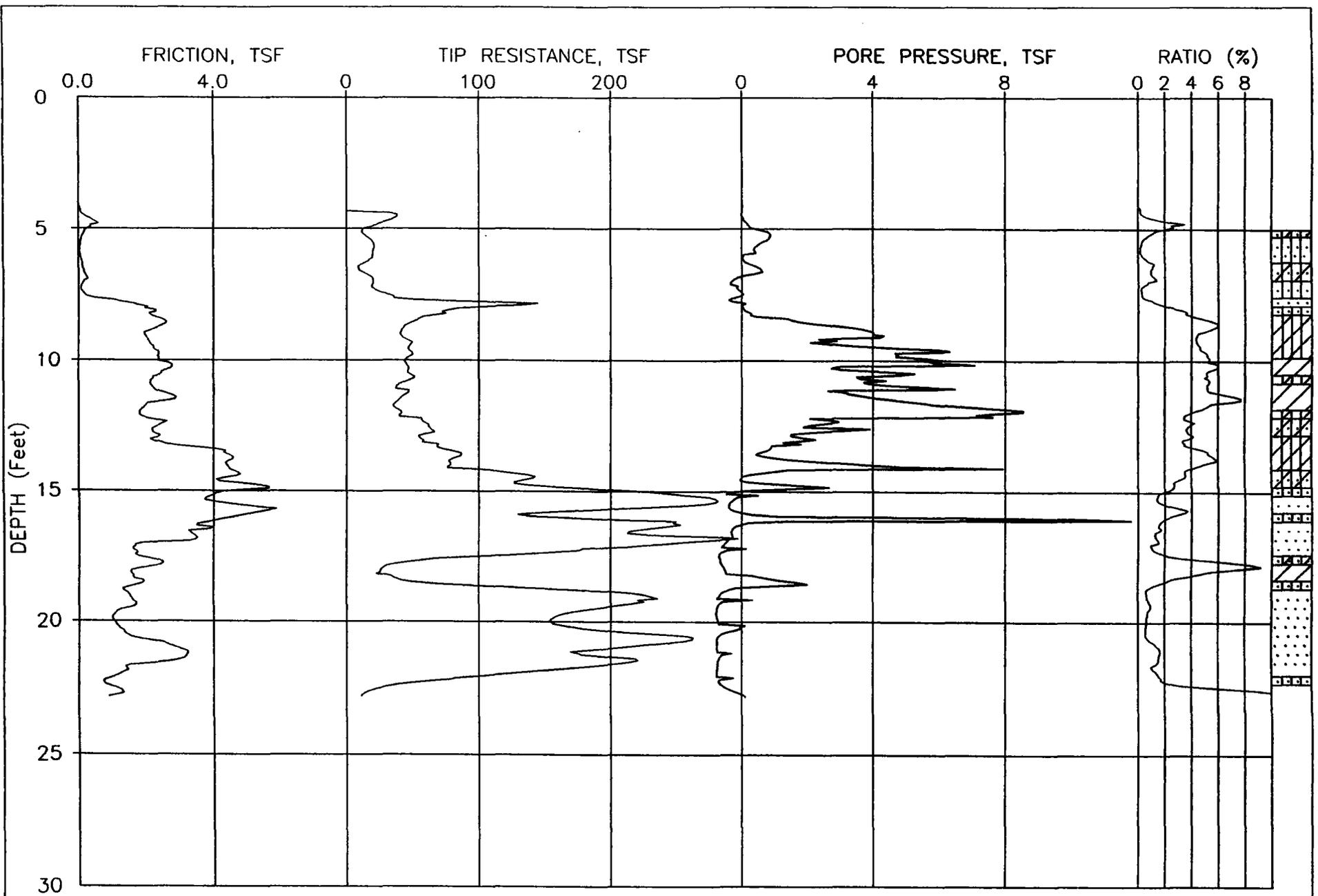
CPT NUMBER: 11

DATE: 05-01-2002

ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 1 OF 1



JOB NUMBER: 0305-0742

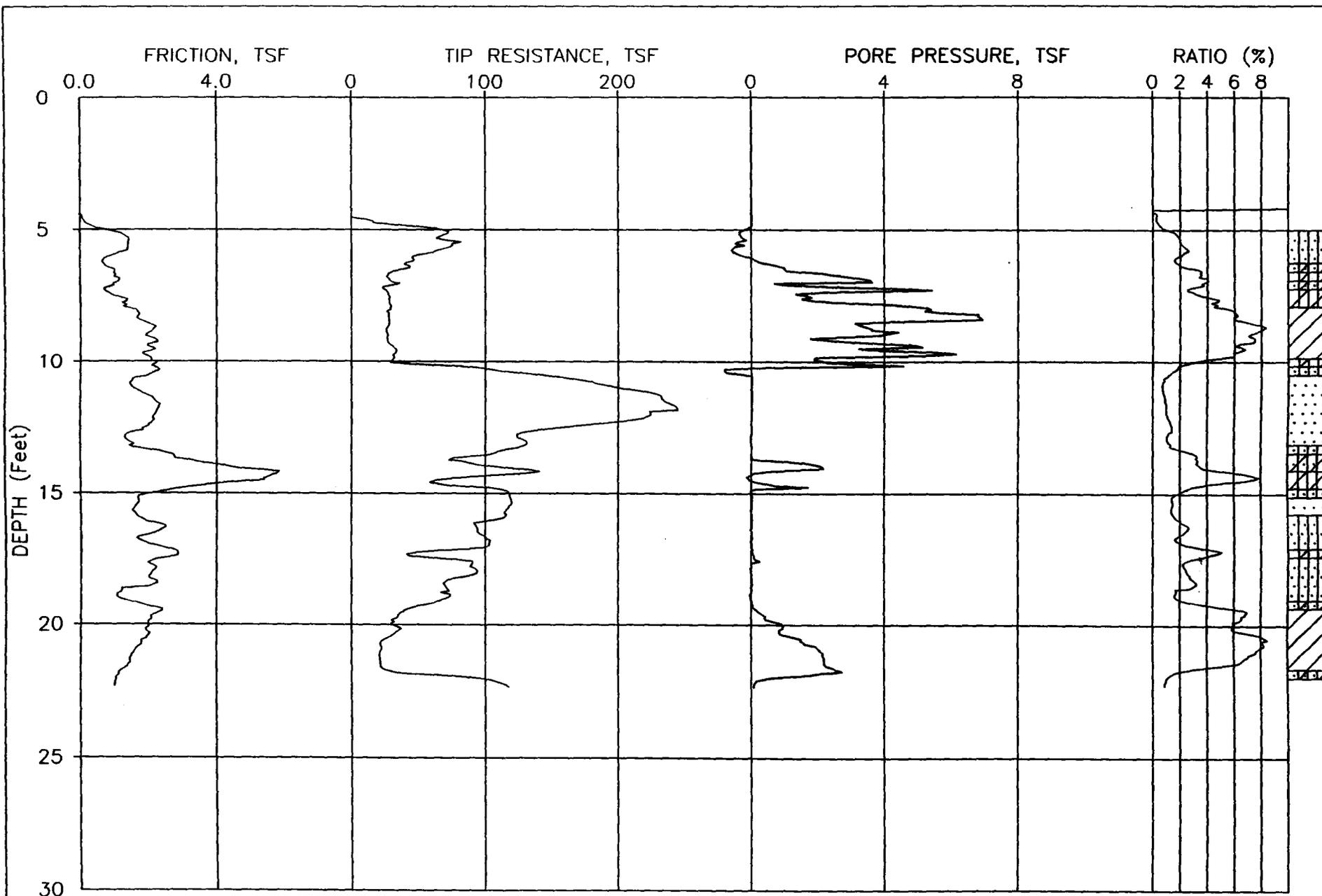
CPT NUMBER: 12

DATE: 05-01-2002

ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 1 OF 1



JOB NUMBER: 0305-0742

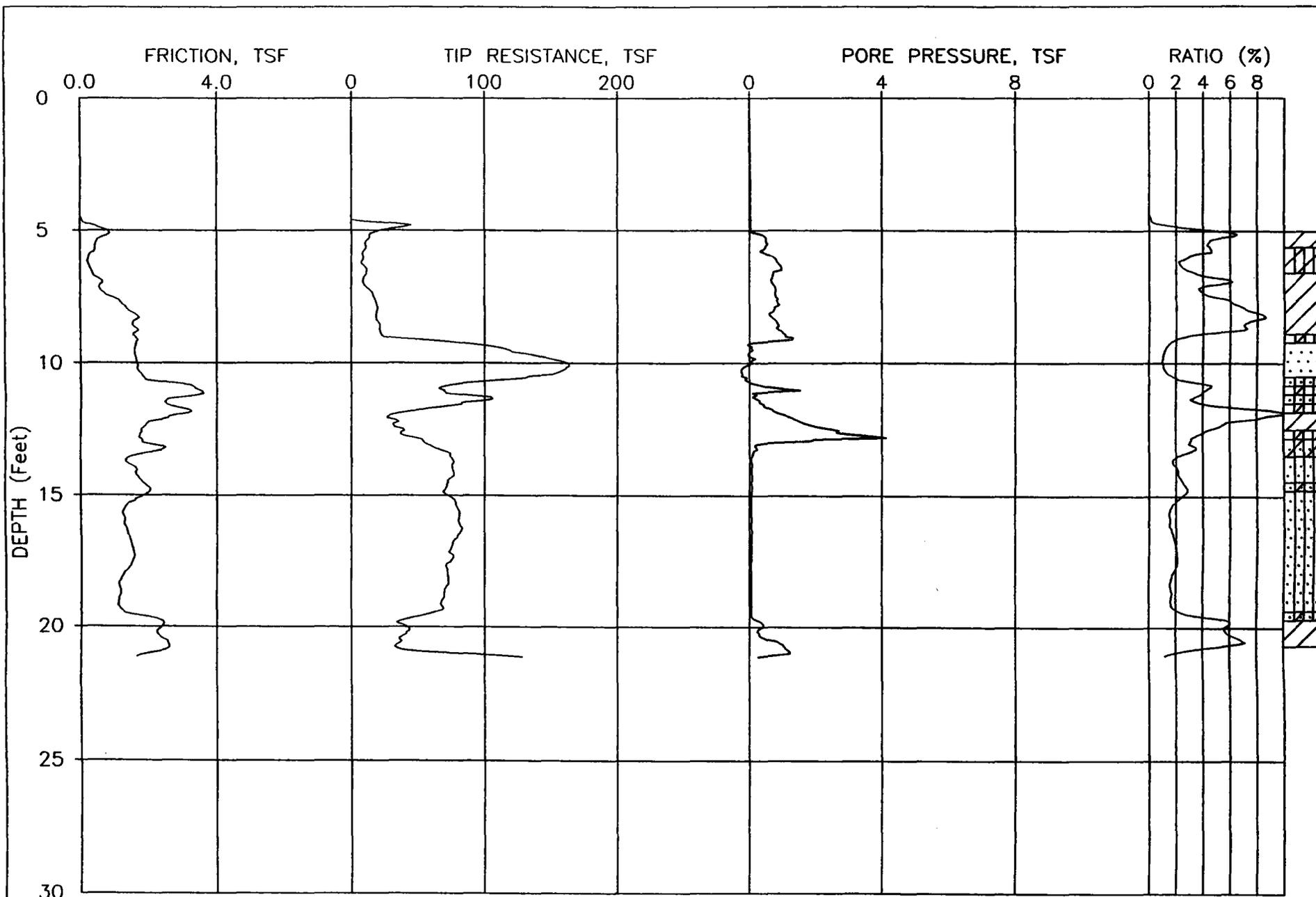
CPT NUMBER: 13

DATE: 05-01-2002

ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 1 OF 1



JOB NUMBER: 0305-0742

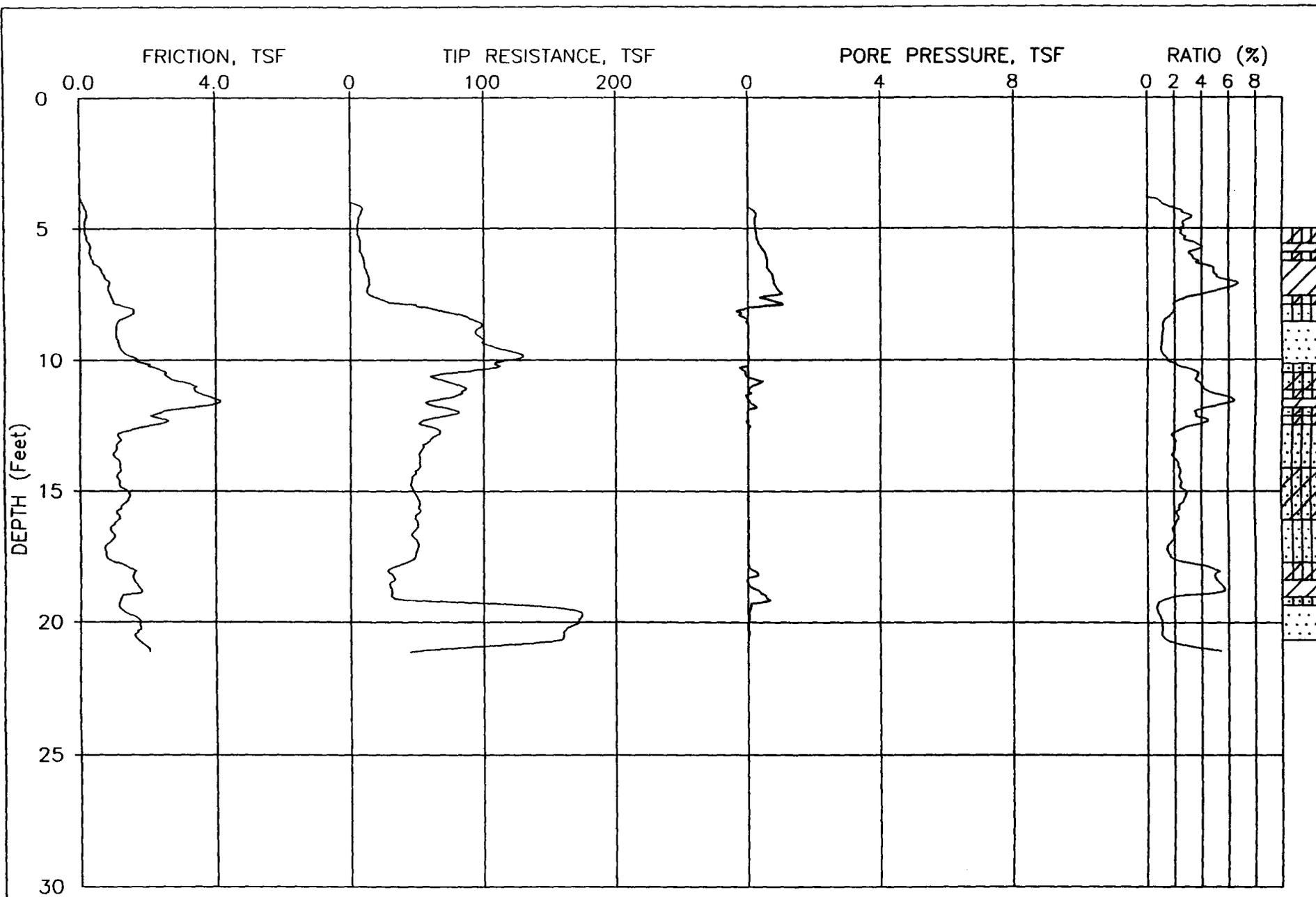
CPT NUMBER: 14

DATE: 05-01-2002

ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 1 OF 1



JOB NUMBER: 0305-0742

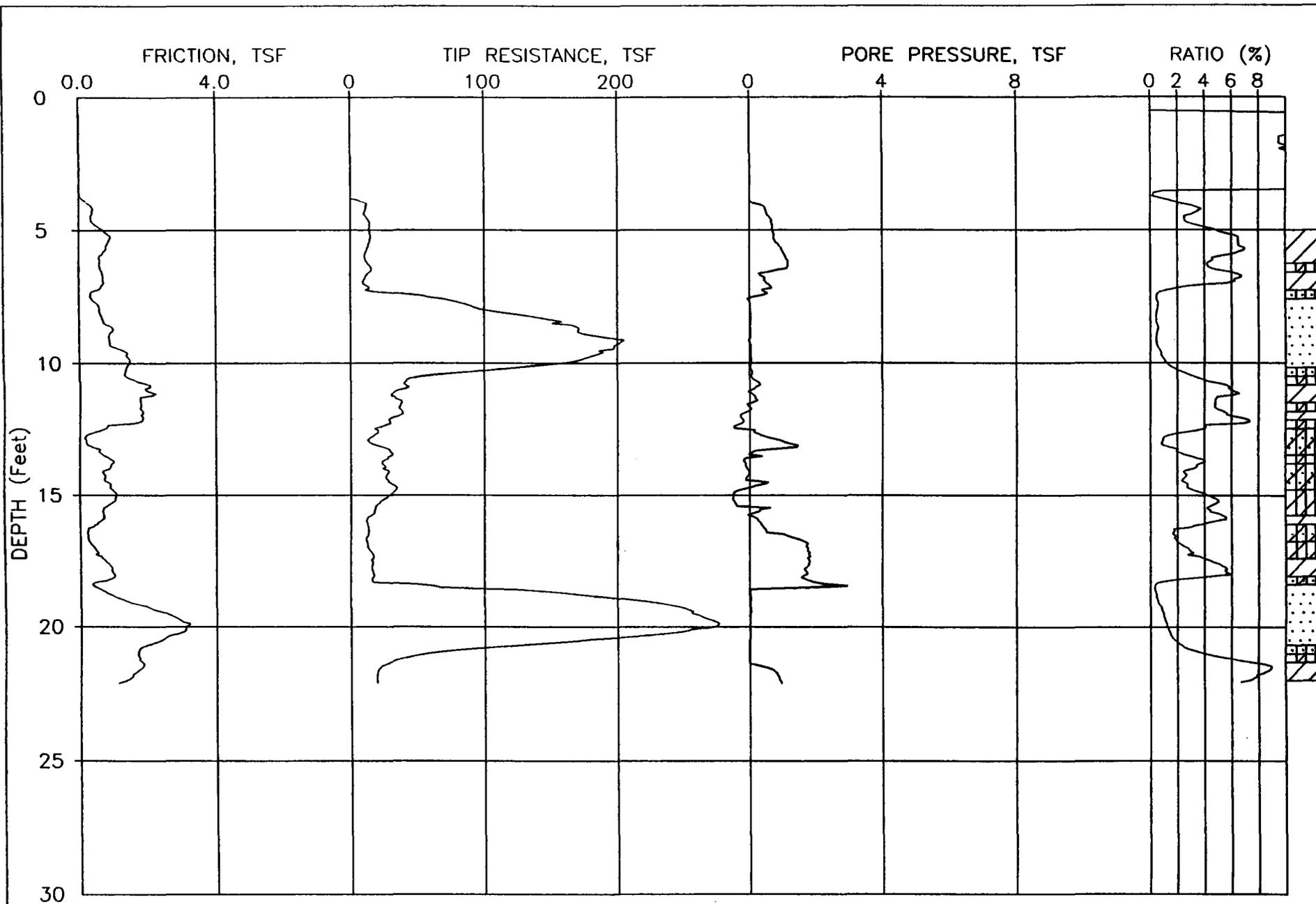
CPT NUMBER: 15

DATE: 05-01-2002

ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 1 OF 1



JOB NUMBER: 0305-0742

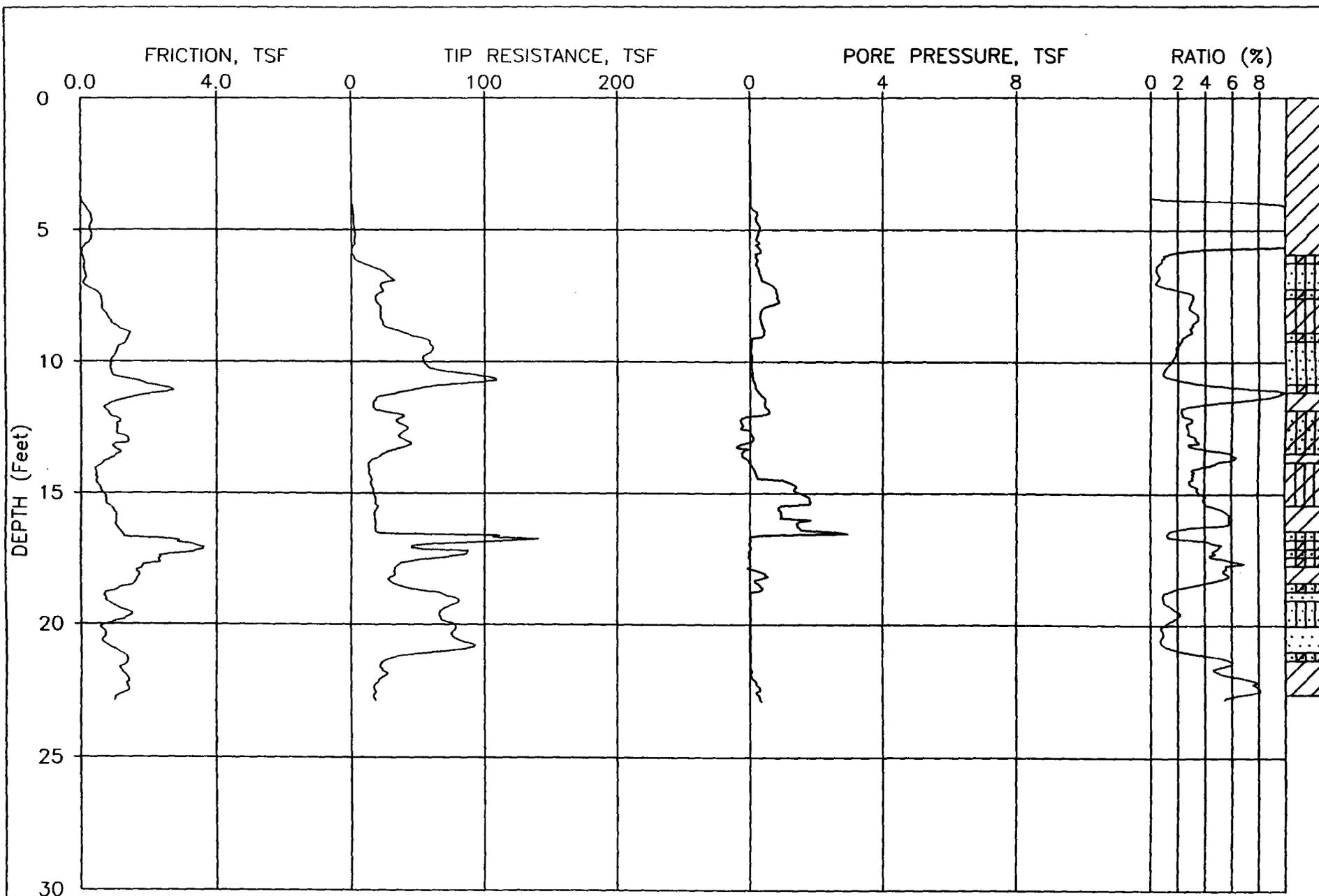
CPT NUMBER: 16

DATE: 05-01-2002

ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 1 OF 1



JOB NUMBER: 0305-0742

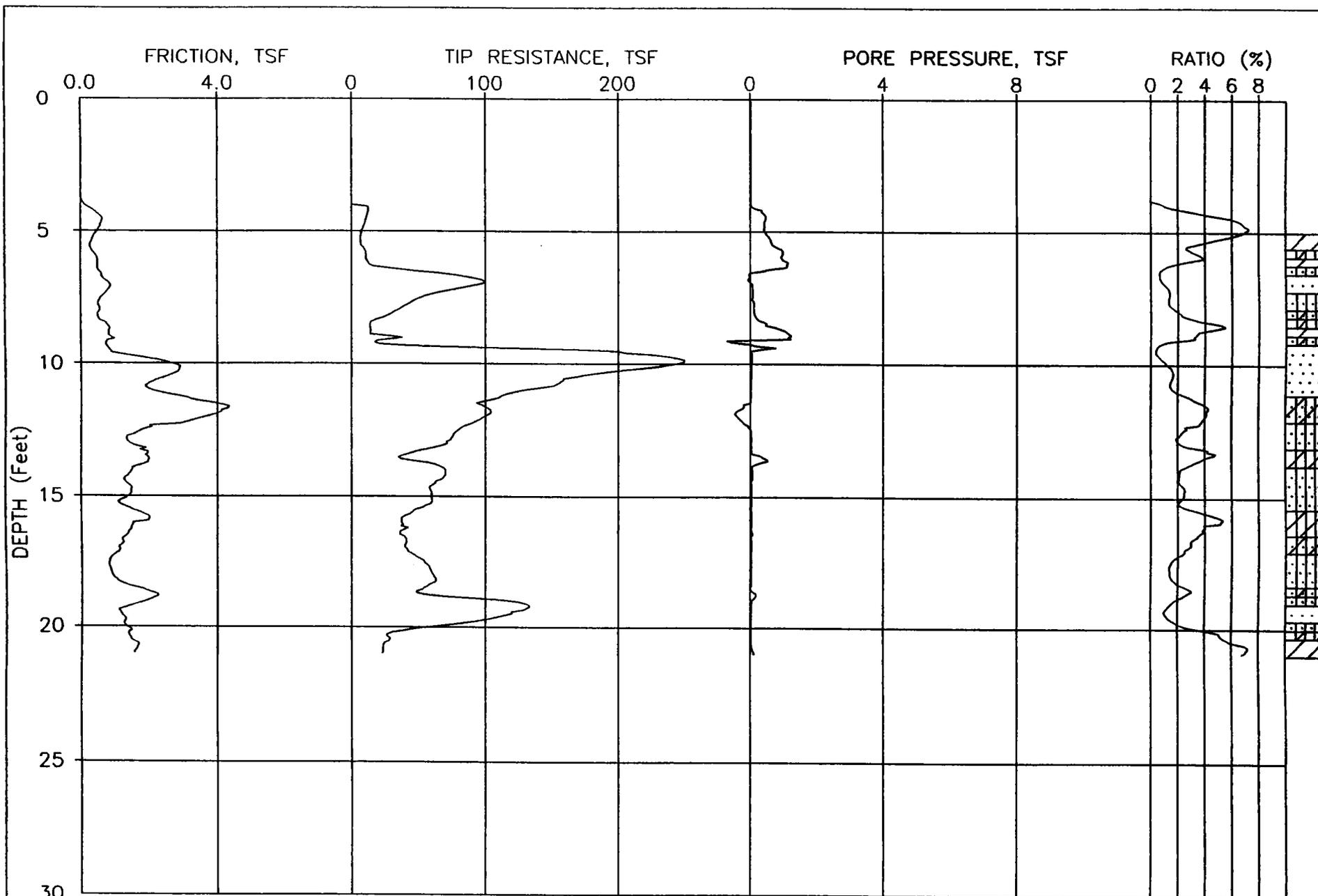
CPT NUMBER: 17

DATE: 05-02-2002

ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 1 OF 1



JOB NUMBER: 0305-0742

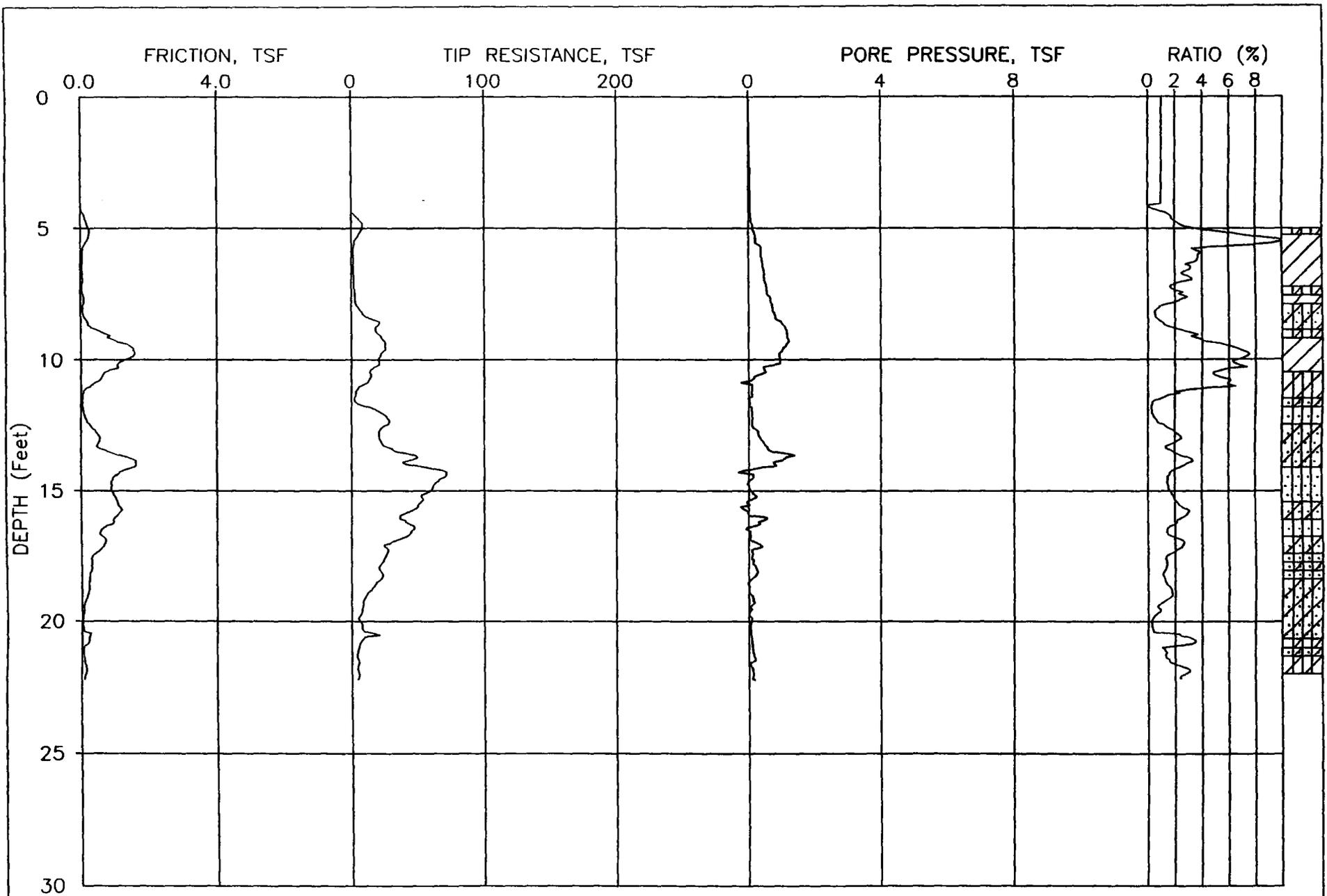
CPT NUMBER: 18

DATE: 05-02-2002

ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 1 OF 1



JOB NUMBER: 0305-0742

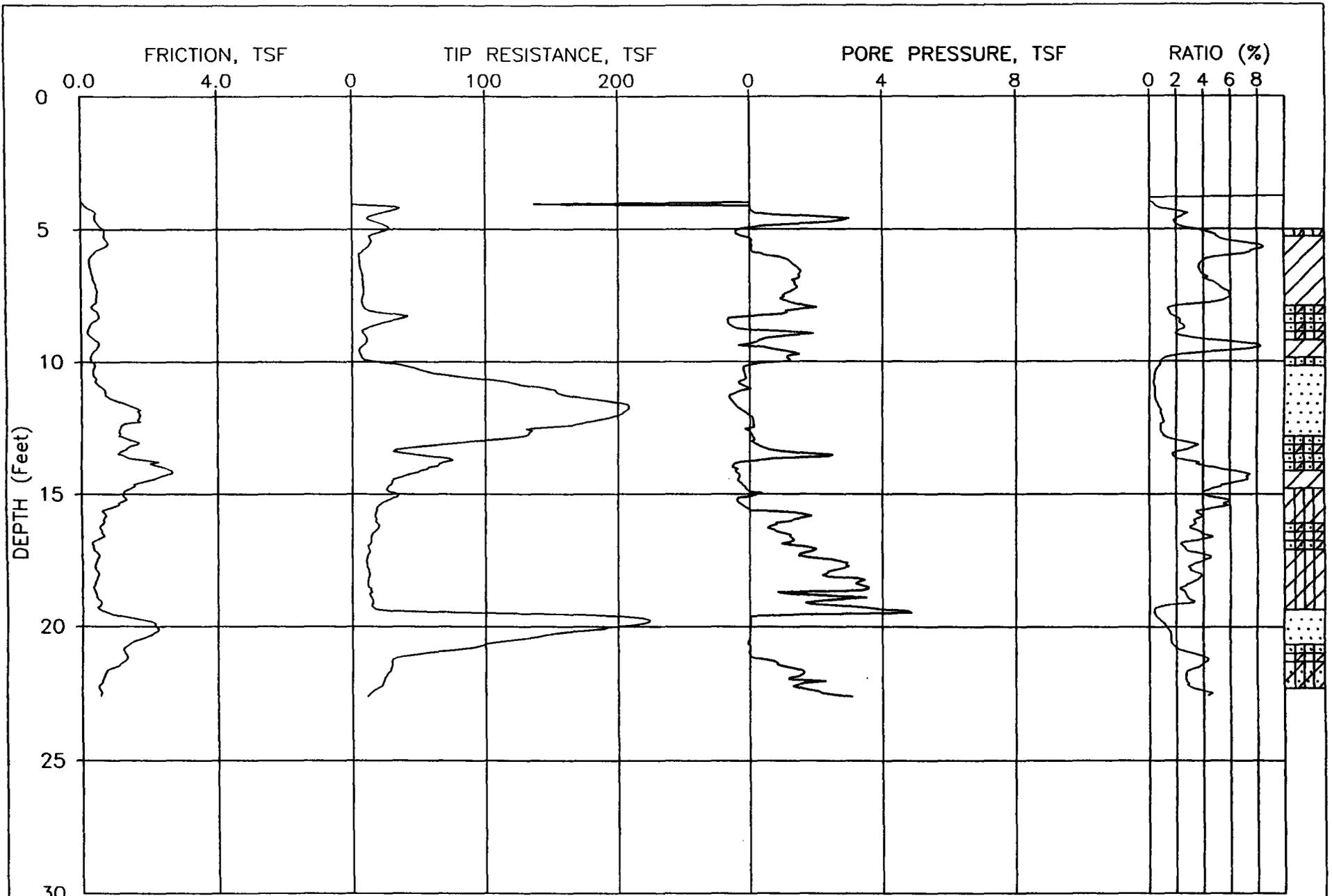
CPT NUMBER: 19

DATE: 05-02-2002

ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 1 OF 1



JOB NUMBER: 0305-0742

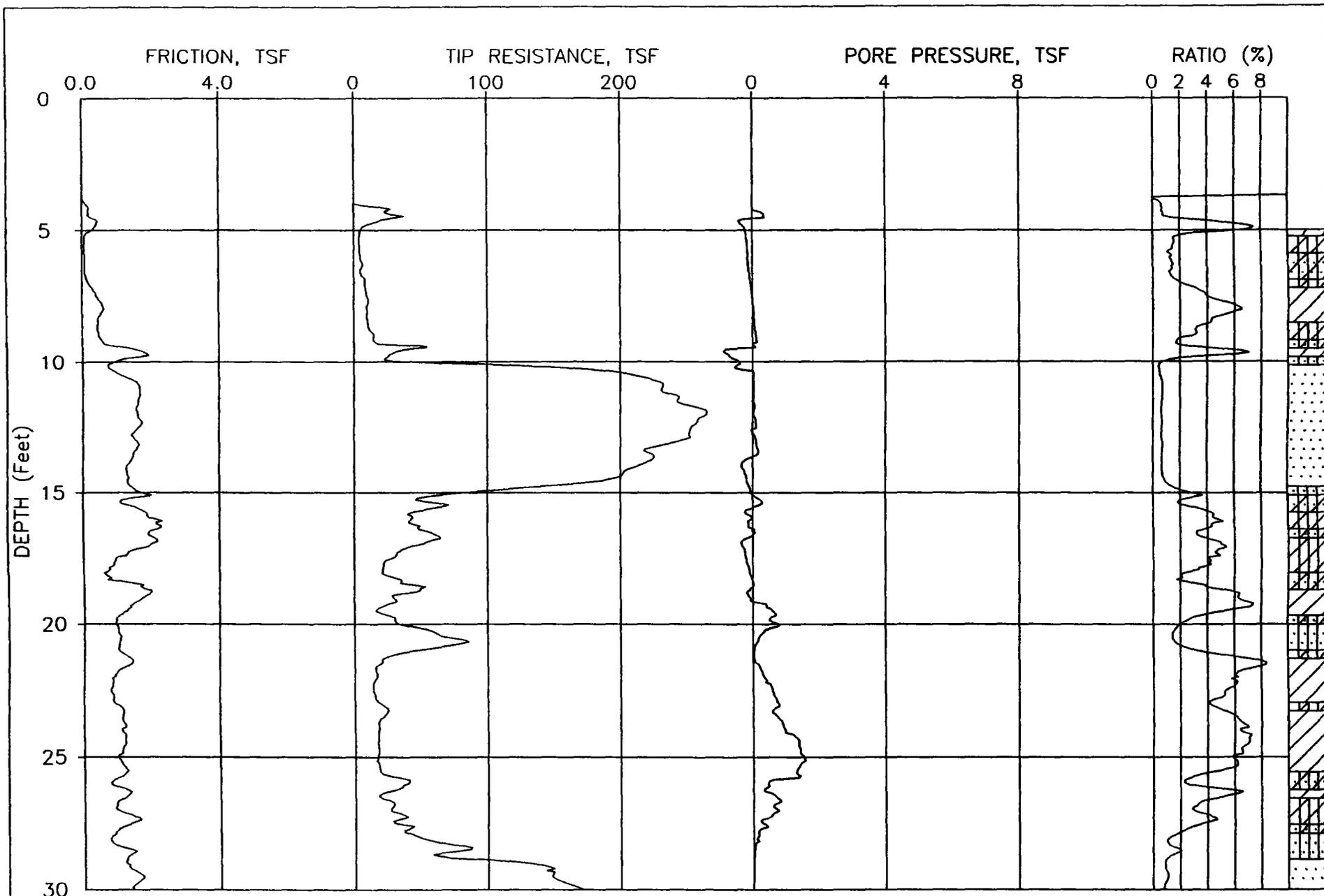
CPT NUMBER: 20

DATE: 05-02-2002

ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 1 OF 1



JOB NUMBER: 0305-0742

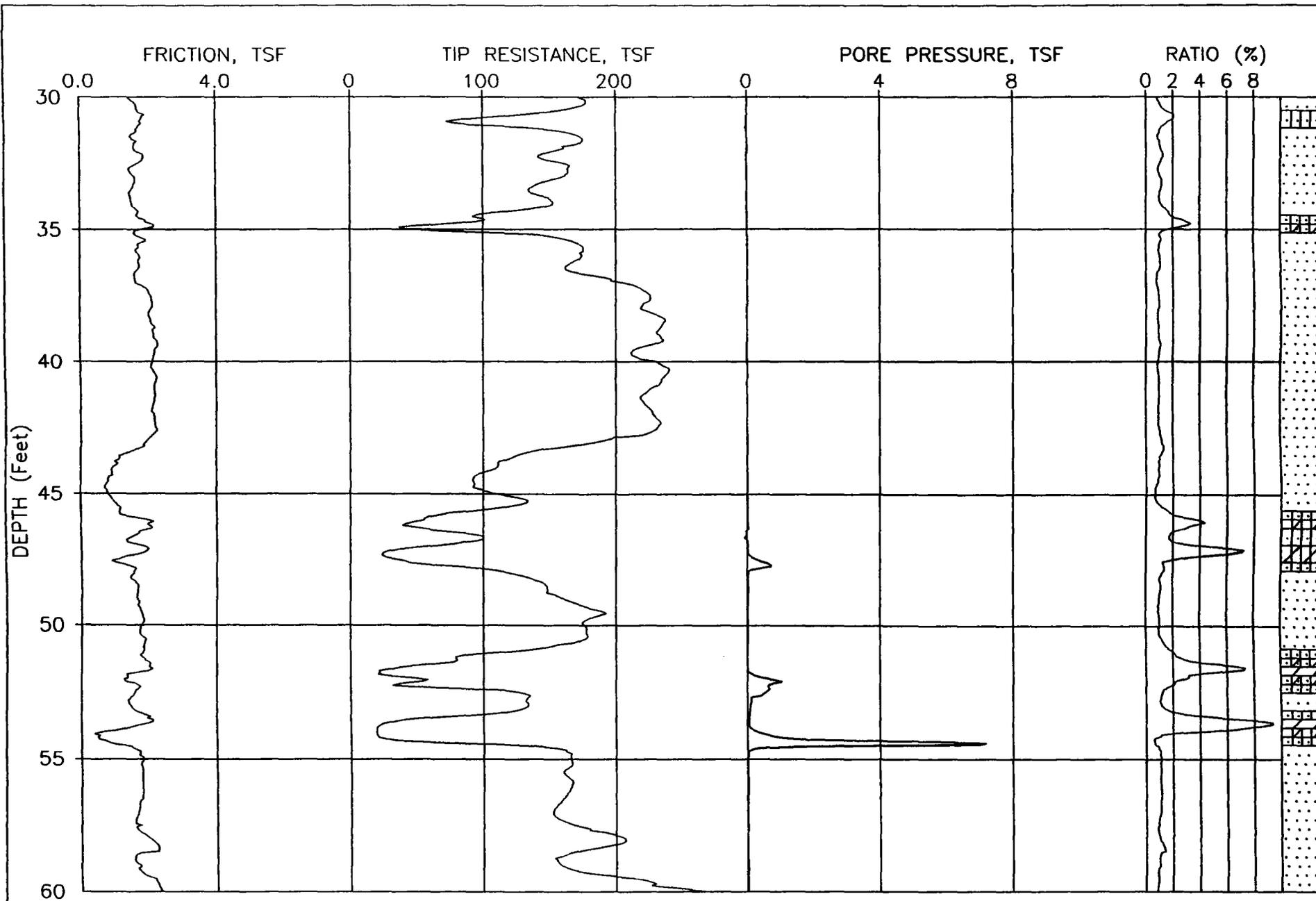
CPT NUMBER: 21

DATE: 05-03-2002

ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 1 OF 4



JOB NUMBER: 0305-0742

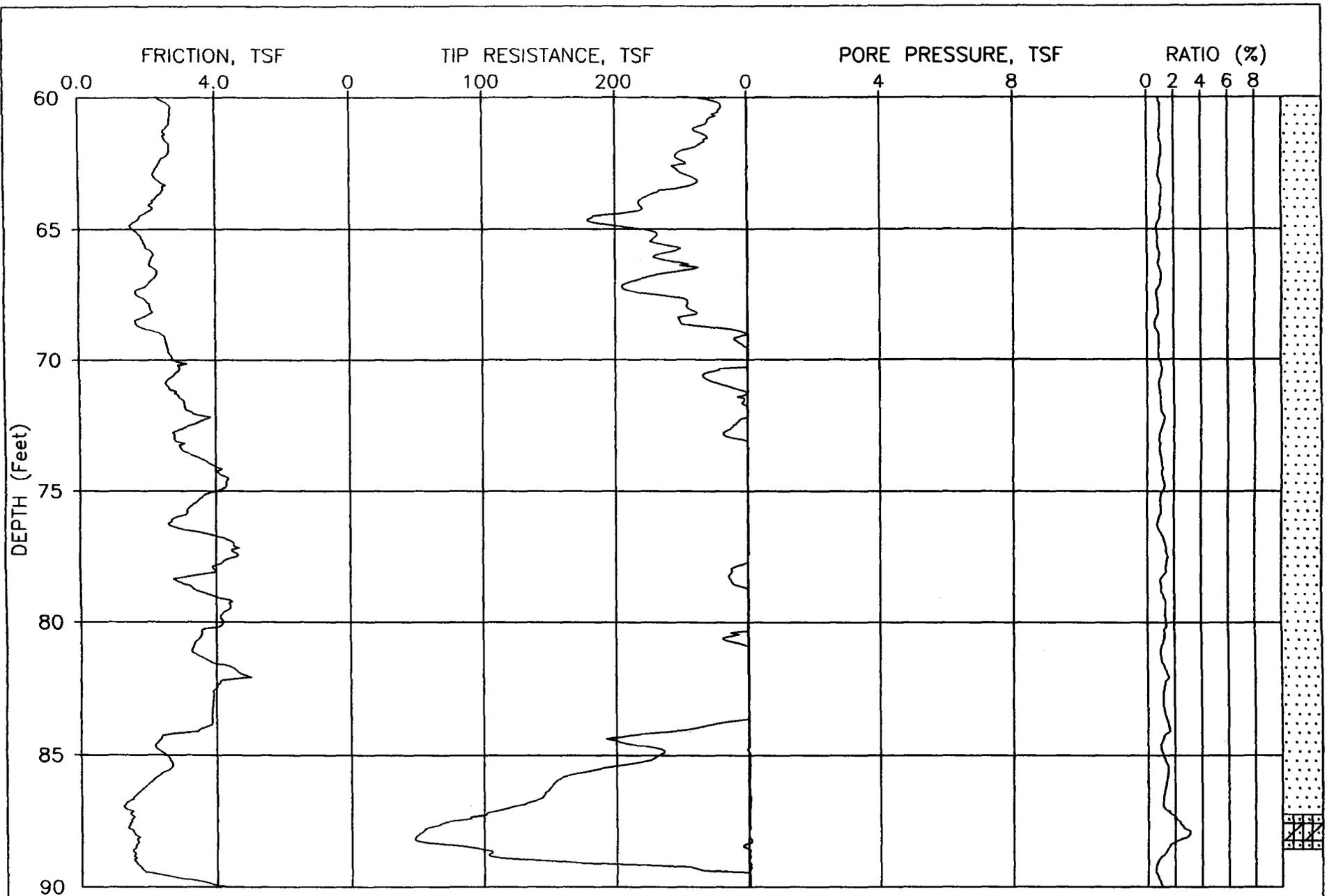
CPT NUMBER: 21

DATE: 05-03-2002

ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 2 OF 4



JOB NUMBER: 0305-0742

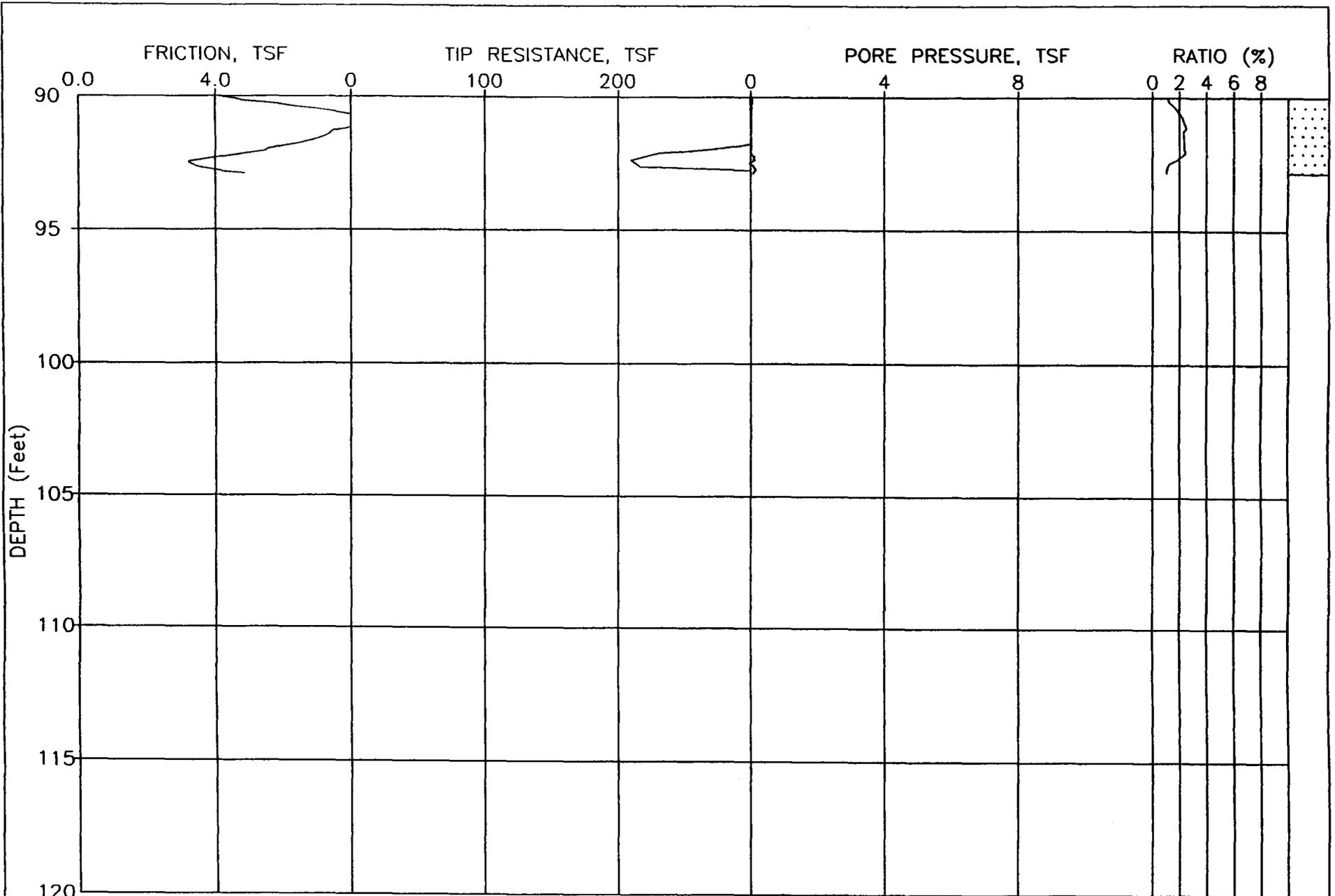
CPT NUMBER: 21

DATE: 05-03-2002

ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 3 OF 4



JOB NUMBER: 0305-0742

CPT NUMBER: 21

DATE: 05-03-2002

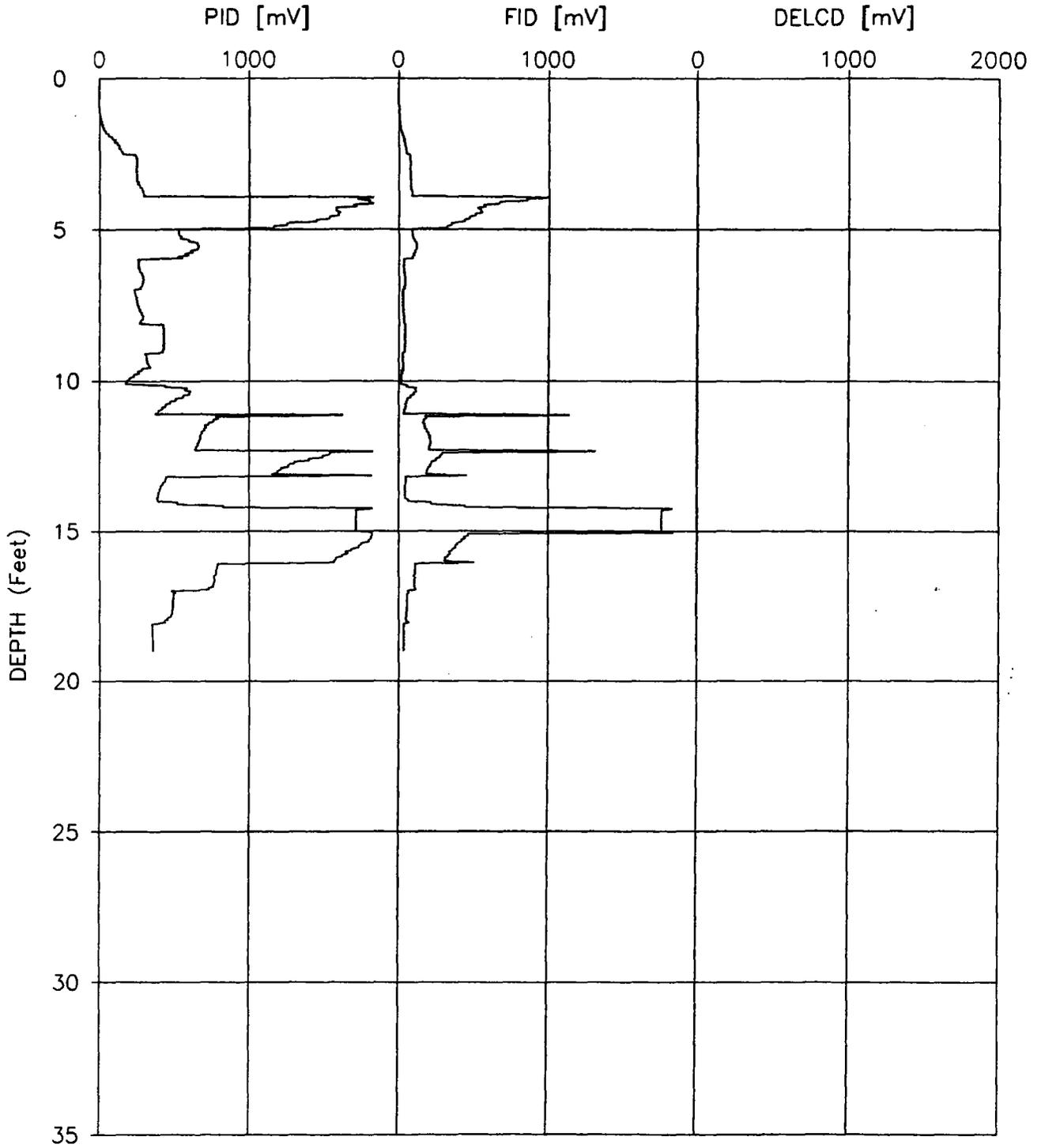
ELEVATION: 0.00

CONE NUMBER: F7.5CKEW892

PLATE: 4 OF 4

**MIP AT 2,000 SCALE**

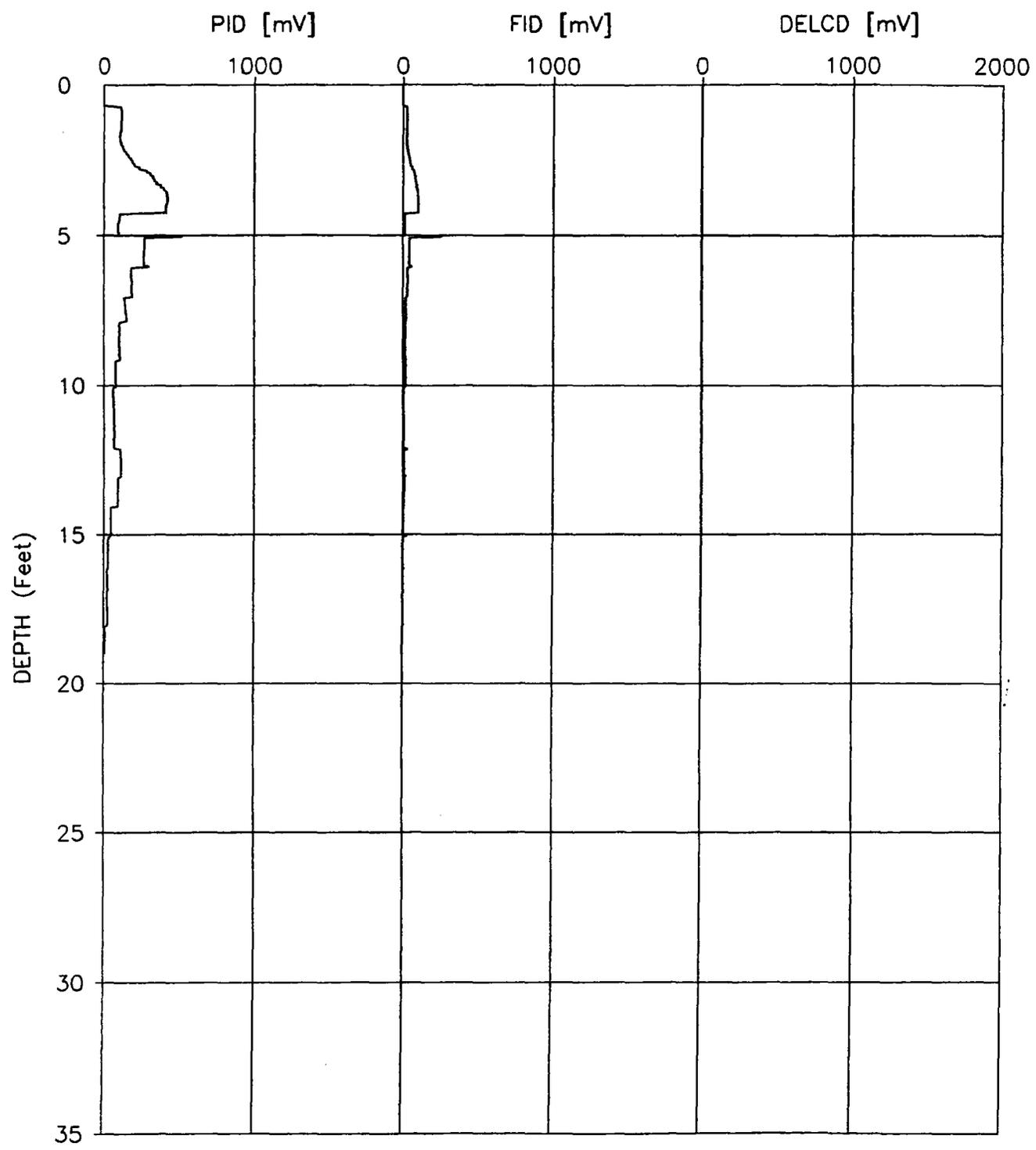
# MIP TEST RESULTS



JOB NUMBER: 0304-0742

MIP TEST: MIP-01

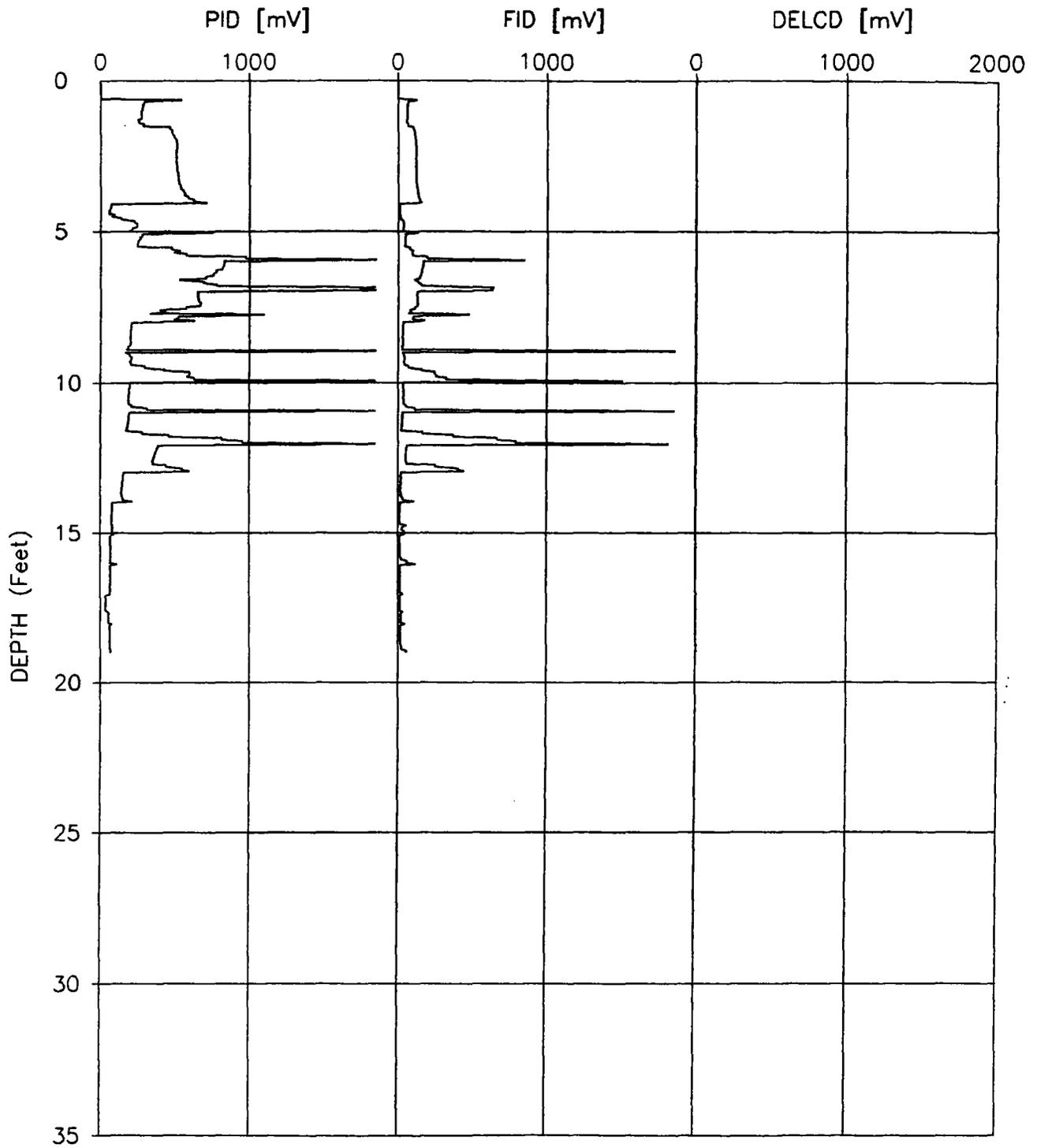
# MIP TEST RESULTS



JOB NUMBER: 0304-0742

MIP TEST: MIP-02

# MIP TEST RESULTS

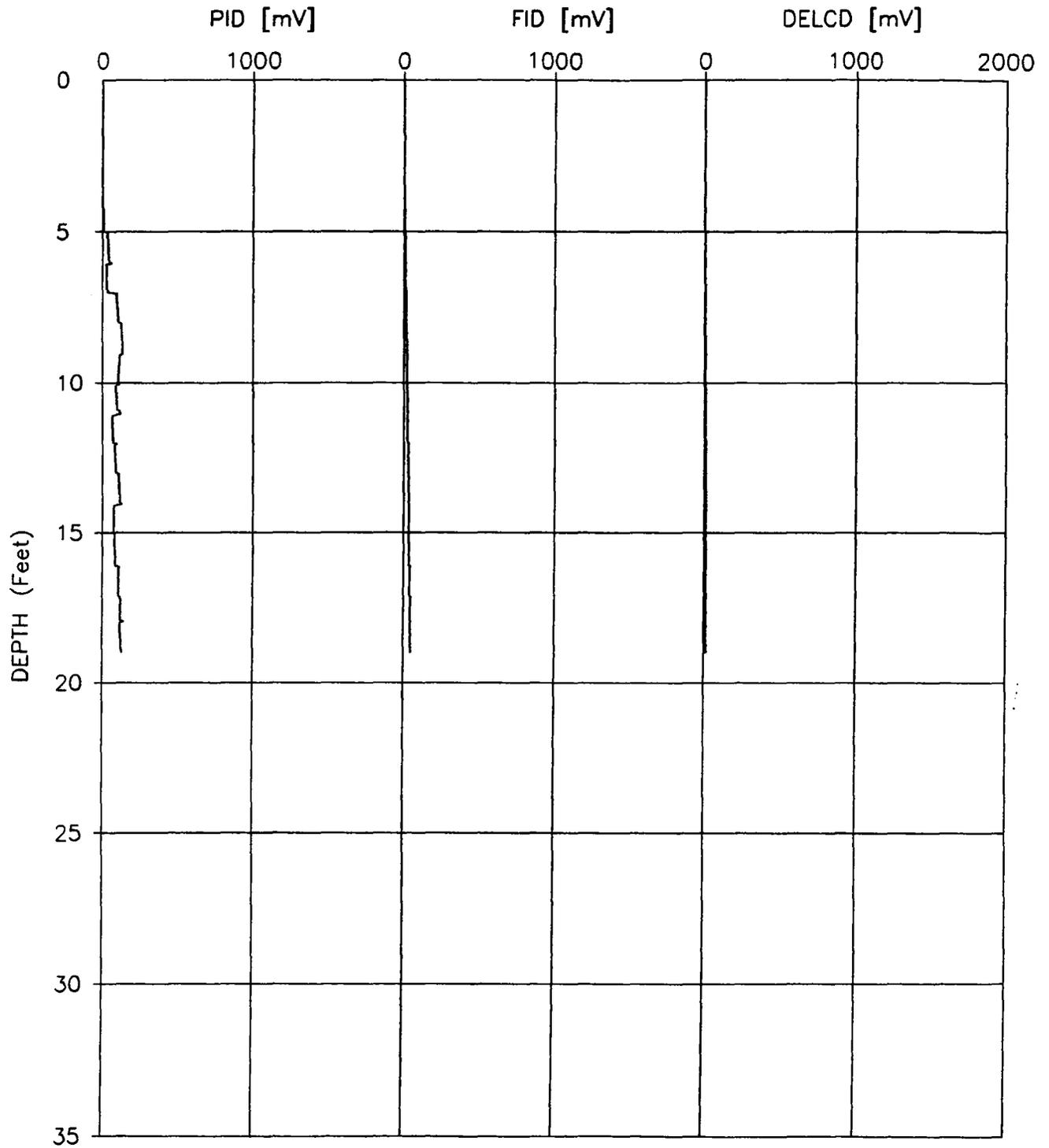


JOB NUMBER: 0304-0742

MIP TEST: MIP-03

PLATE: 1 OF 1

# MIP TEST RESULTS

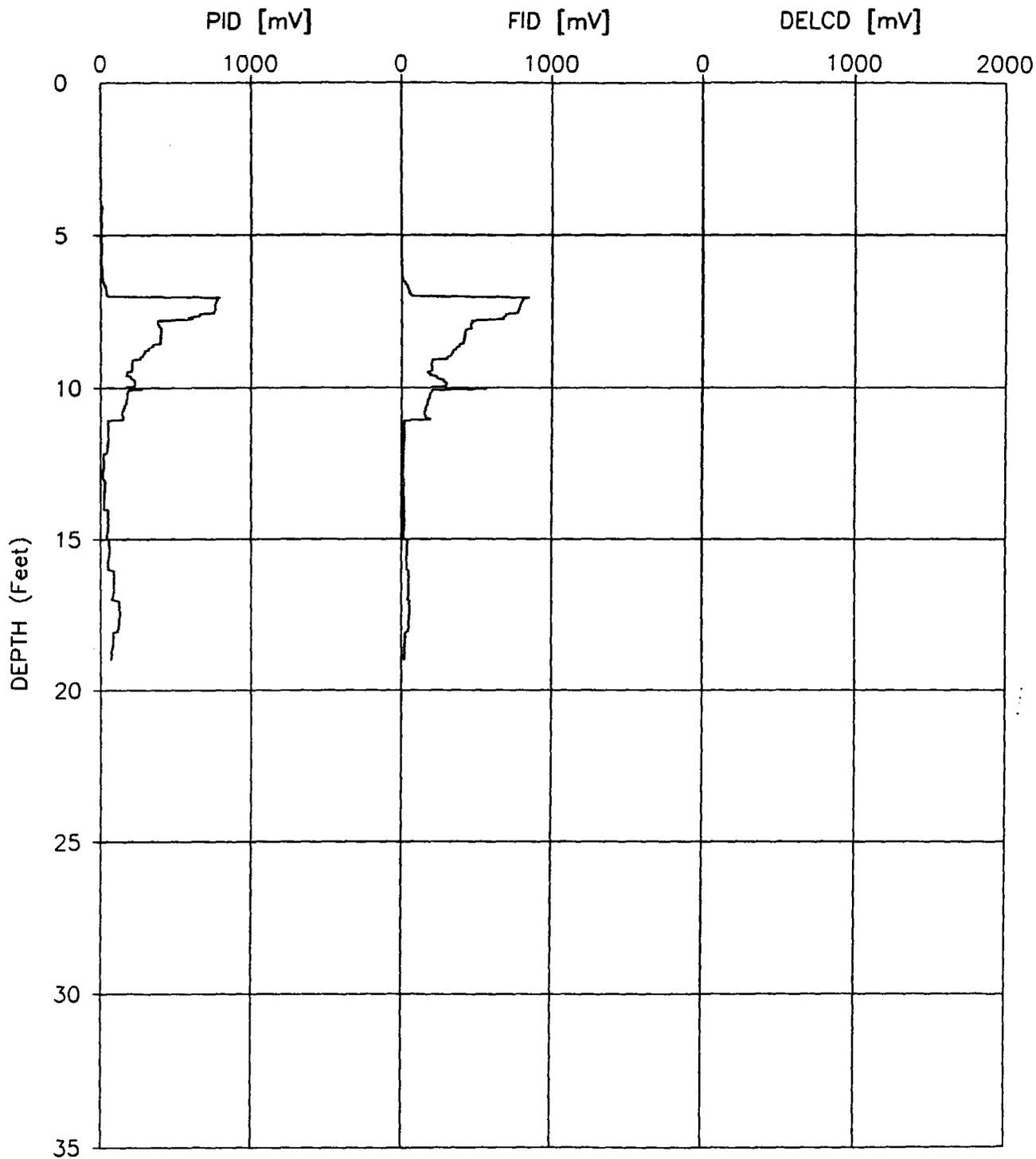


JOB NUMBER: 0304-0742

MIP TEST: MIP-04

PLATE: 1 OF 1

# MIP TEST RESULTS

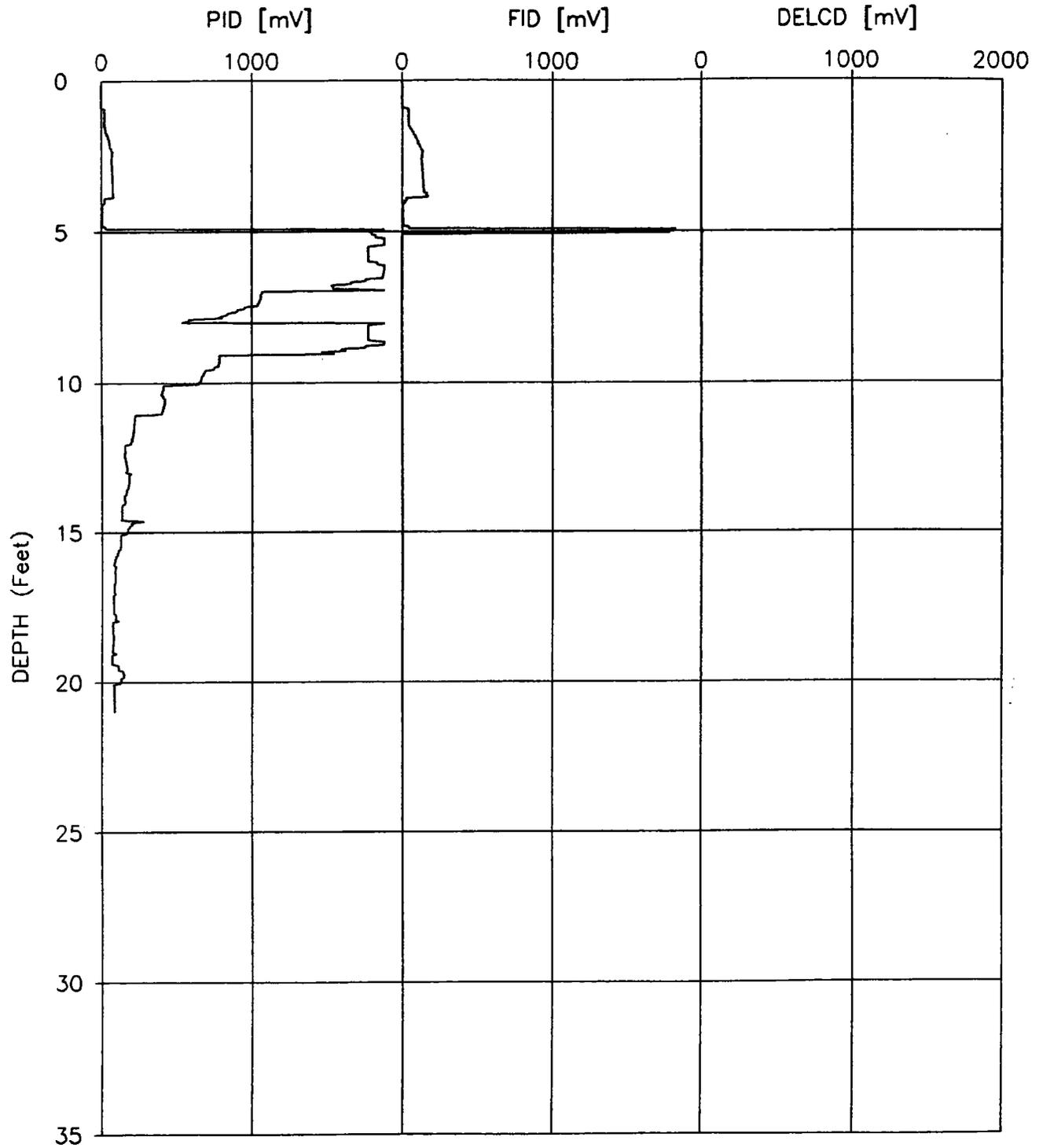


JOB NUMBER: 0304-0742

MIP TEST: MIP-05

PLATE: 1 OF 1

# MIP TEST RESULTS

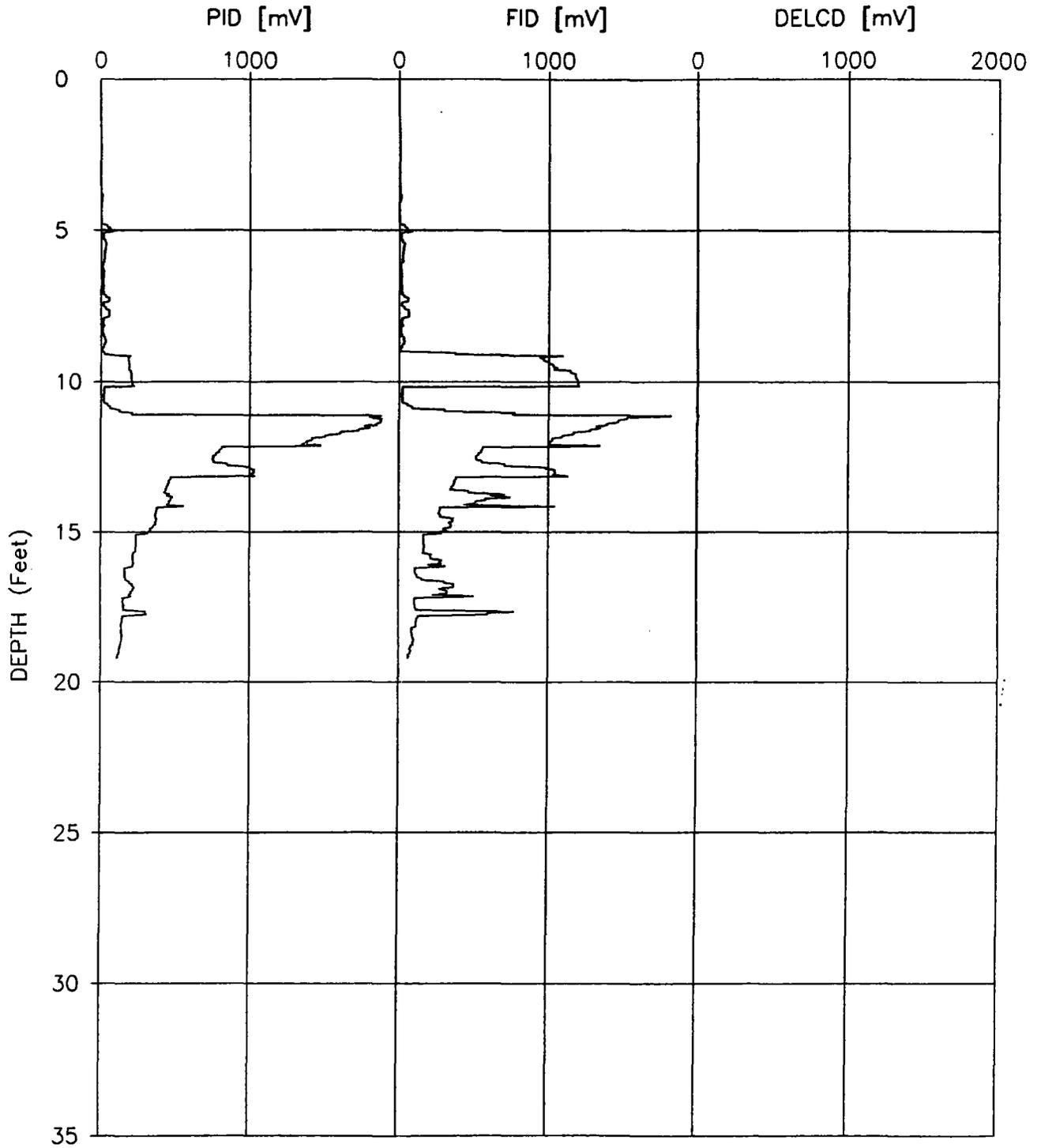


JOB NUMBER: 0304-0742

MIP TEST: MIP-06

PLATE: 1 OF 1

# MIP TEST RESULTS

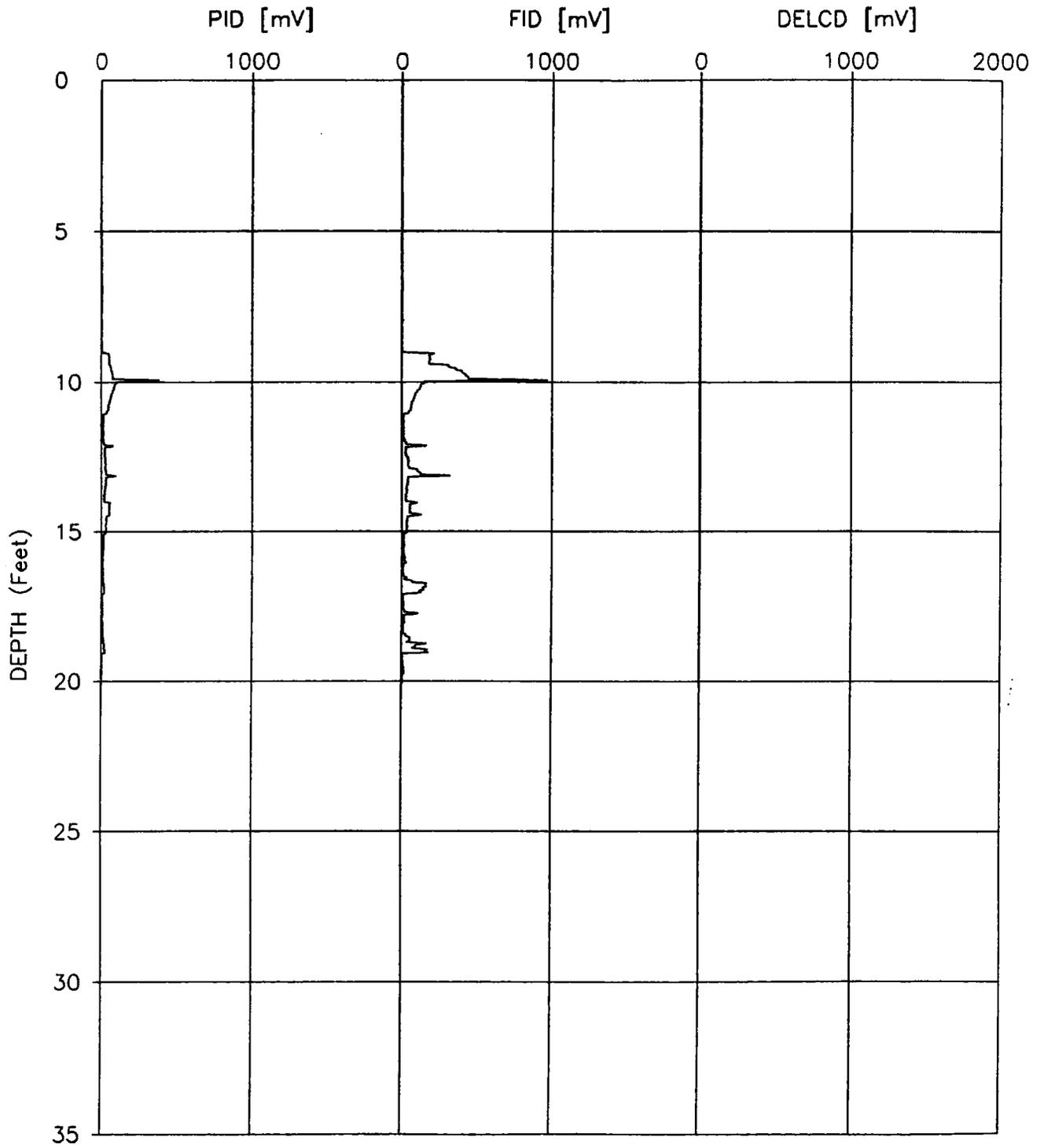


JOB NUMBER: 0304-0742

MIP TEST: MIP-07

PLATE: 1 OF 1

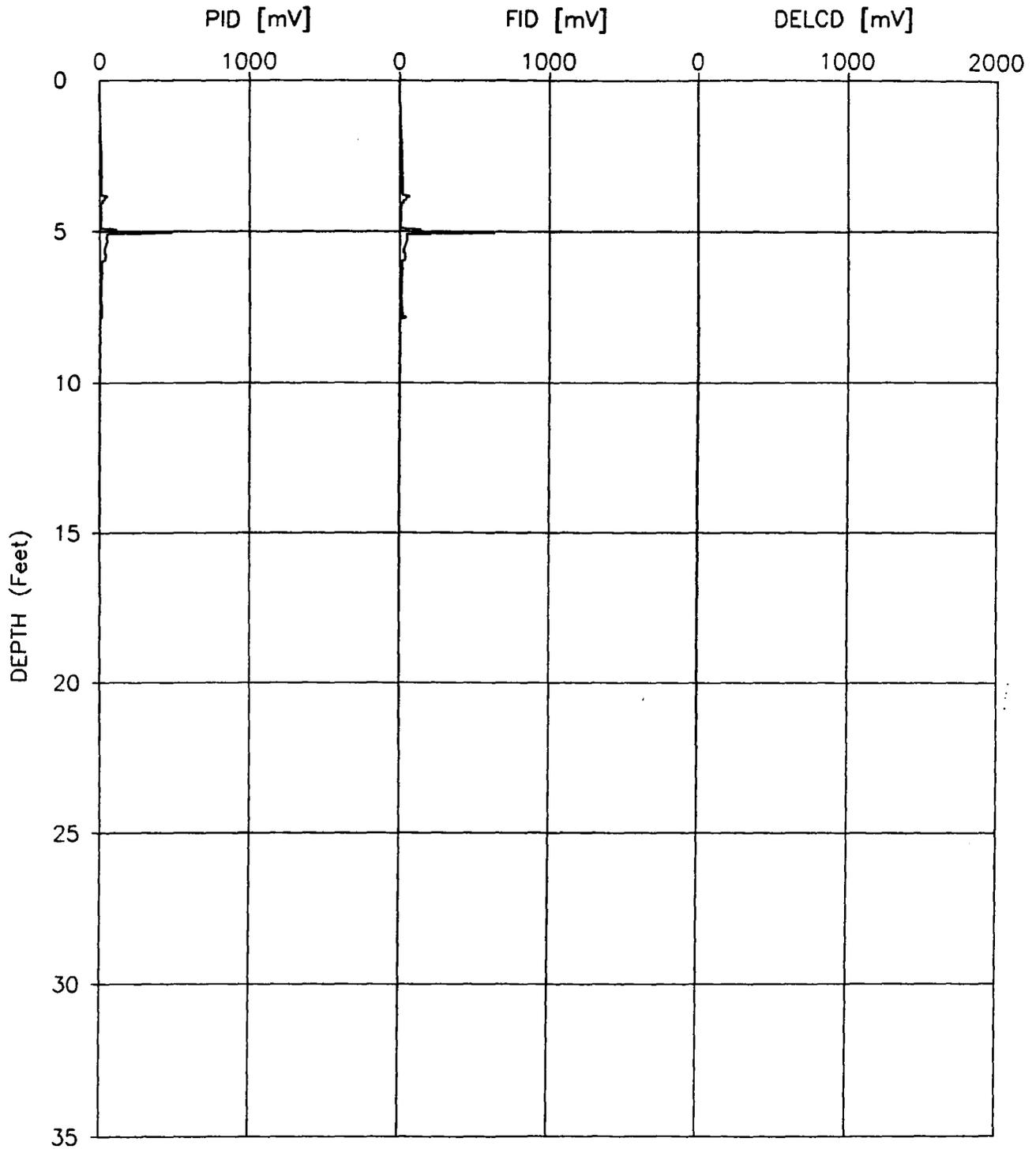
# MIP TEST RESULTS



JOB NUMBER: 0304-0742

MIP TEST: MIP-08

# MIP TEST RESULTS

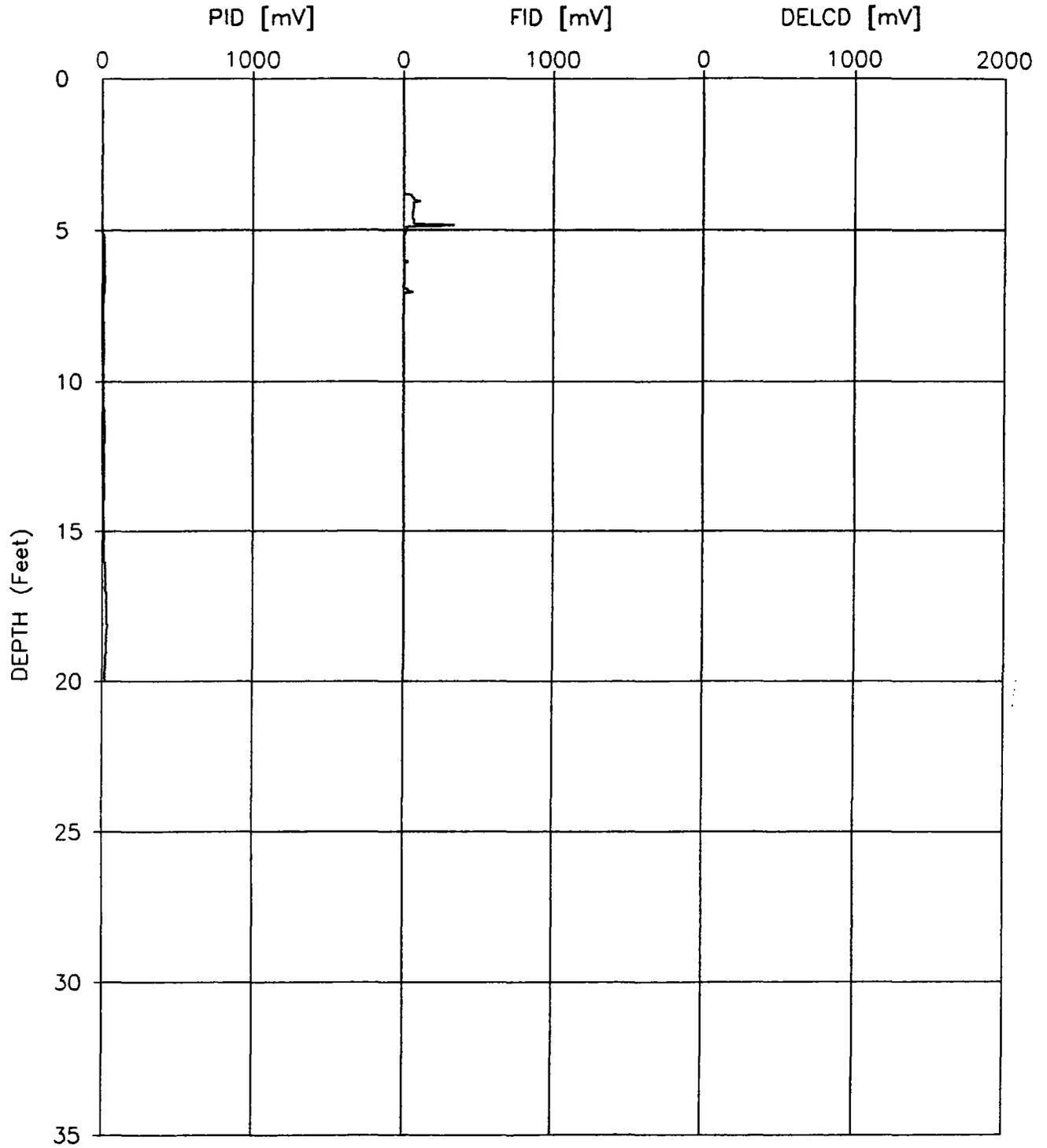


JOB NUMBER: 0304-0742

MIP TEST: MIP-09

PLATE: 1 OF 1

# MIP TEST RESULTS

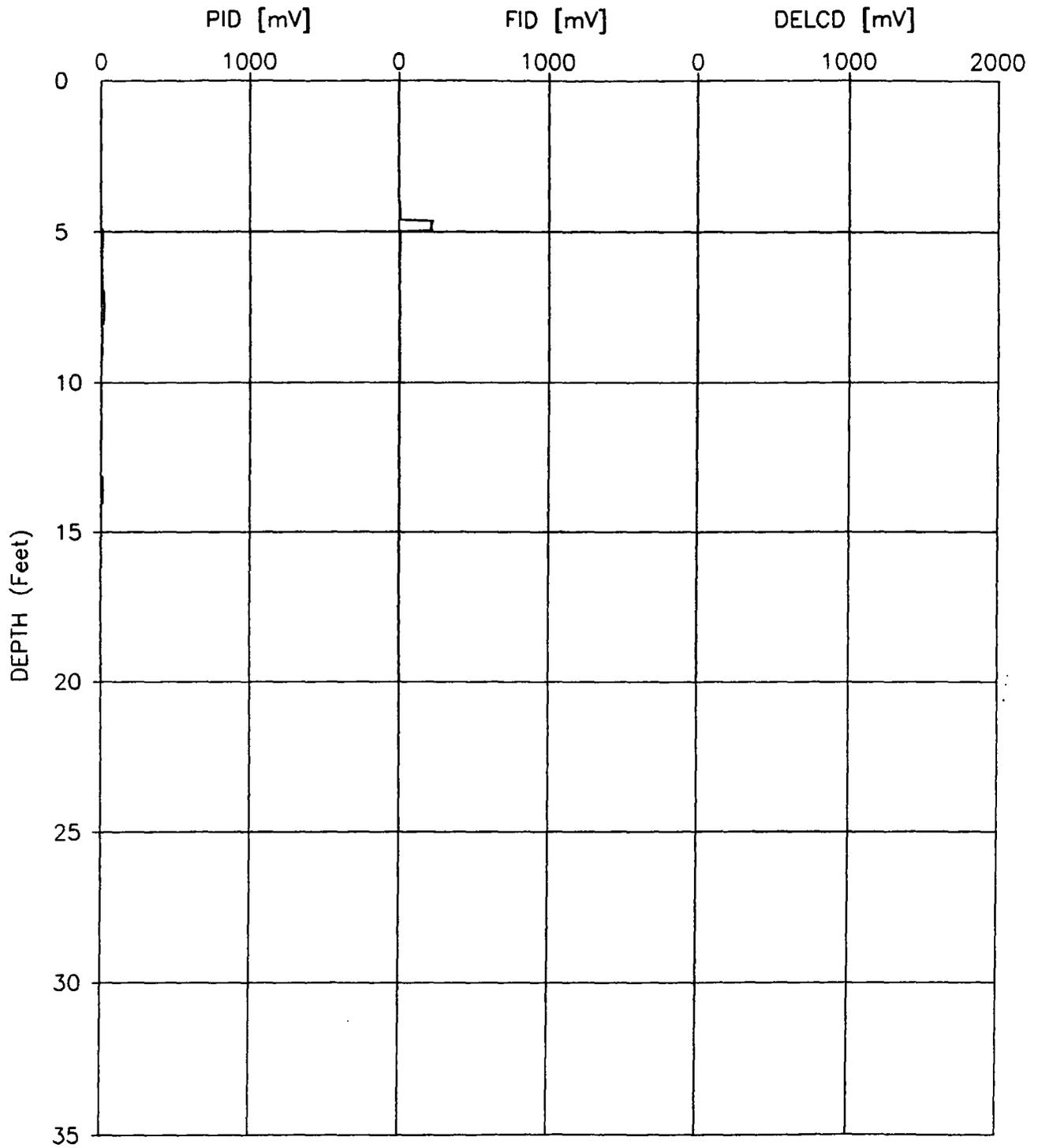


JOB NUMBER: 0304-0742

MIP TEST: MIP-10

PLATE: 1 OF 1

# MIP TEST RESULTS

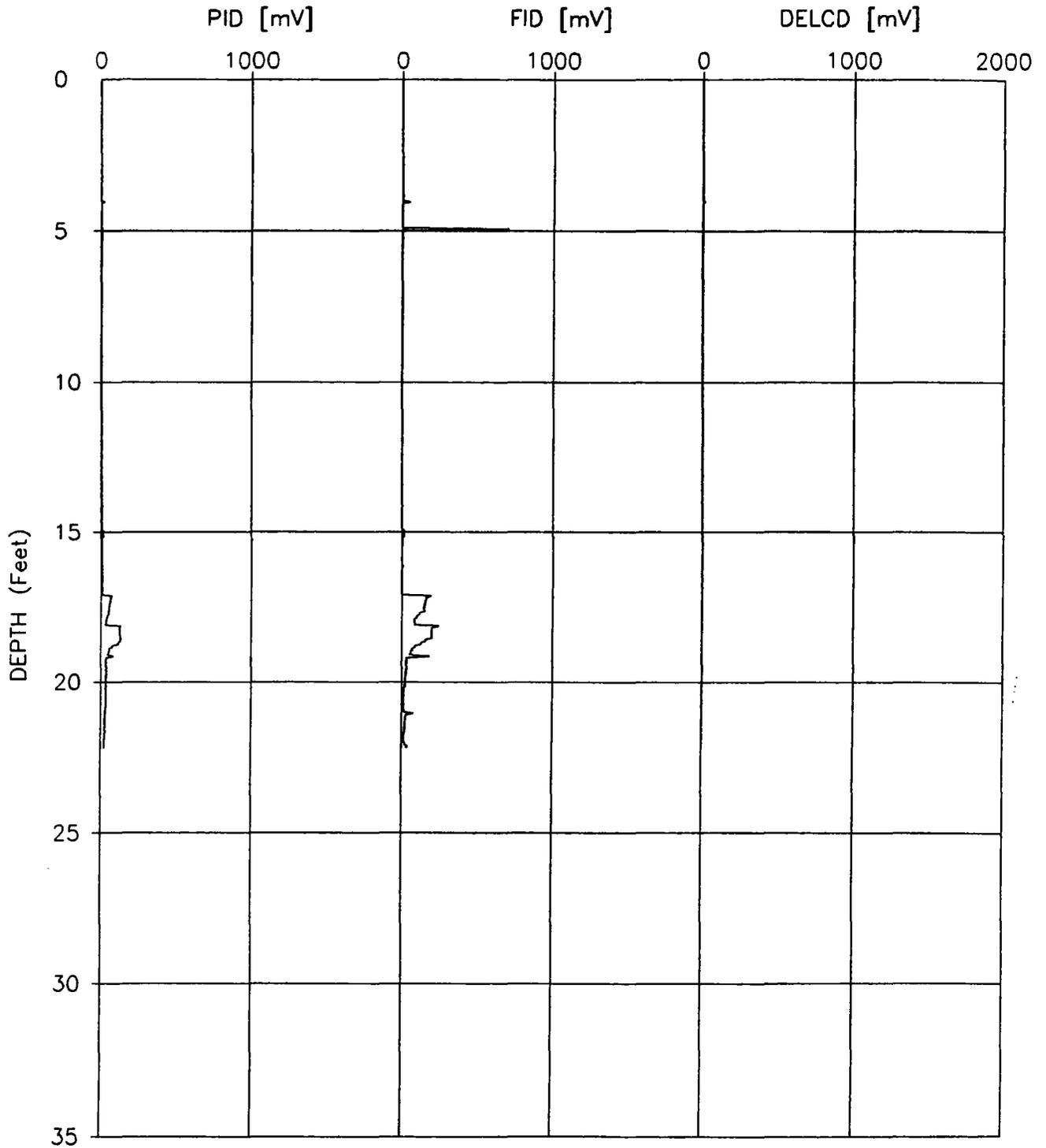


JOB NUMBER: 0304-0742

MIP TEST: MIP-11

PLATE: 1 OF 1

# MIP TEST RESULTS

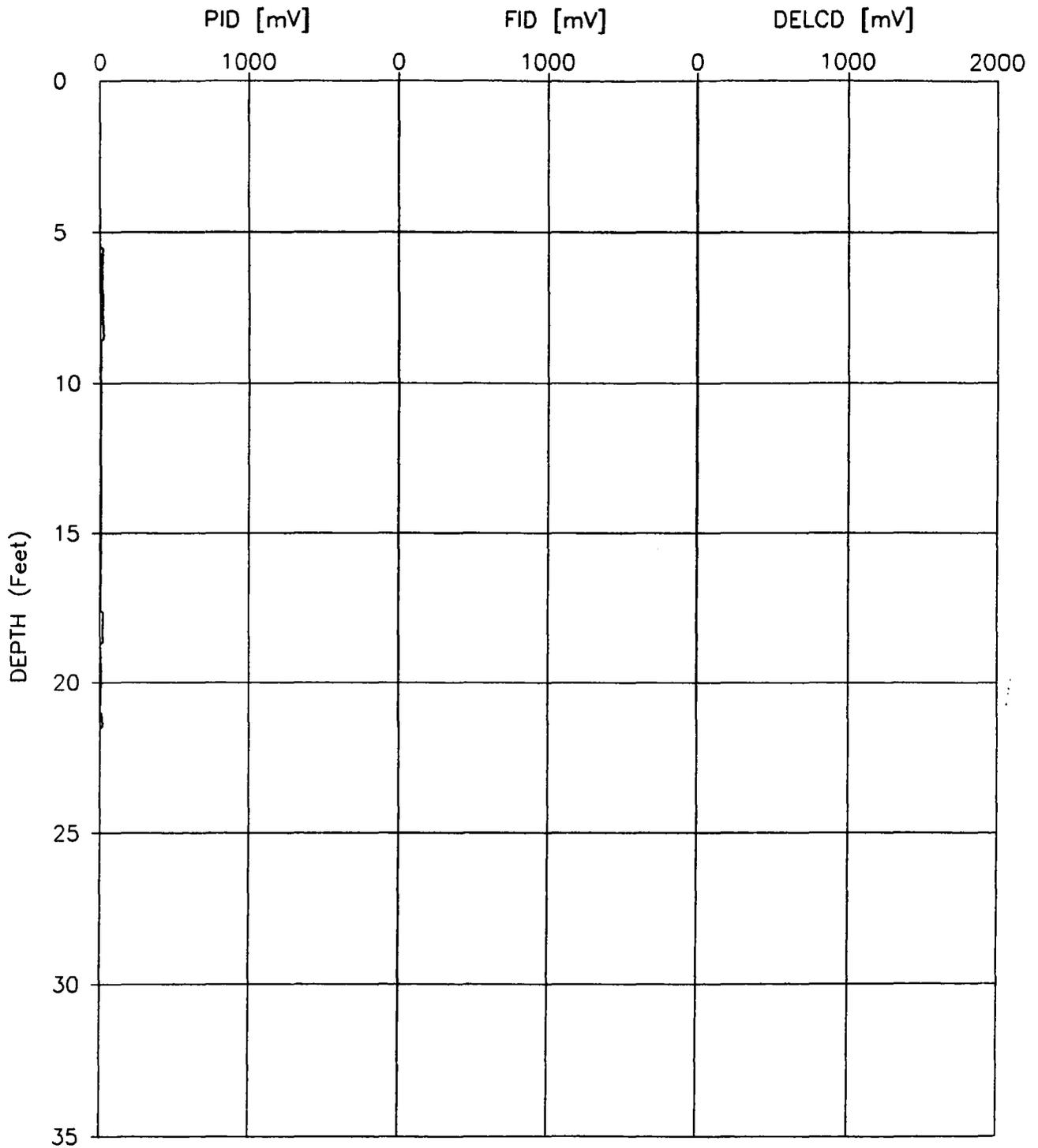


JOB NUMBER: 0304-0742

MIP TEST: MIP-12

PLATE: 1 OF 1

# MIP TEST RESULTS

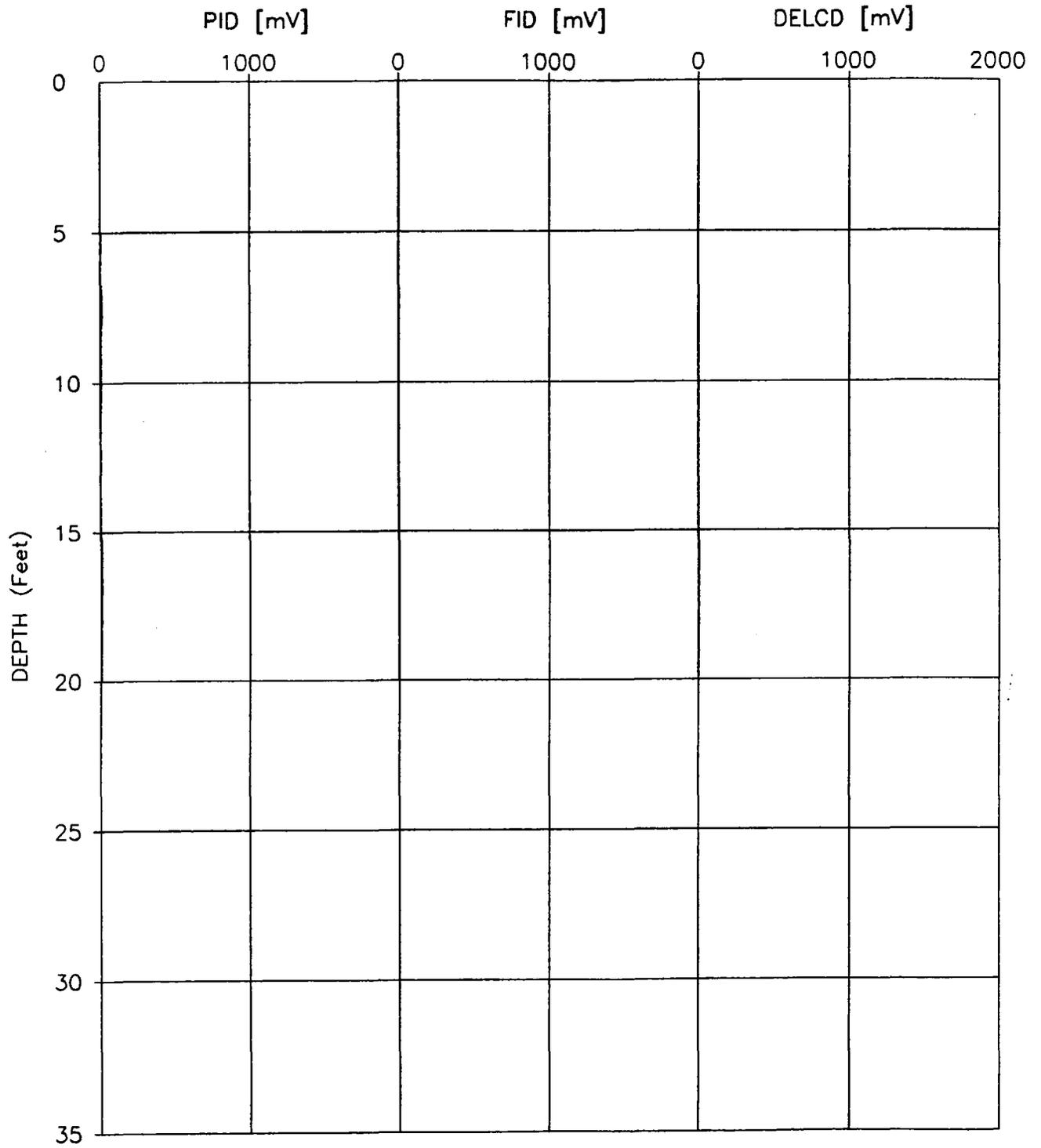


JOB NUMBER: 0304-0742

MIP TEST: MIP-13

PLATE: 1 OF 1

# MIP TEST RESULTS



JOB NUMBER: 0304-0742

MIP TEST: MIP-14

PLATE: 1 OF 1

# MIP TEST RESULTS

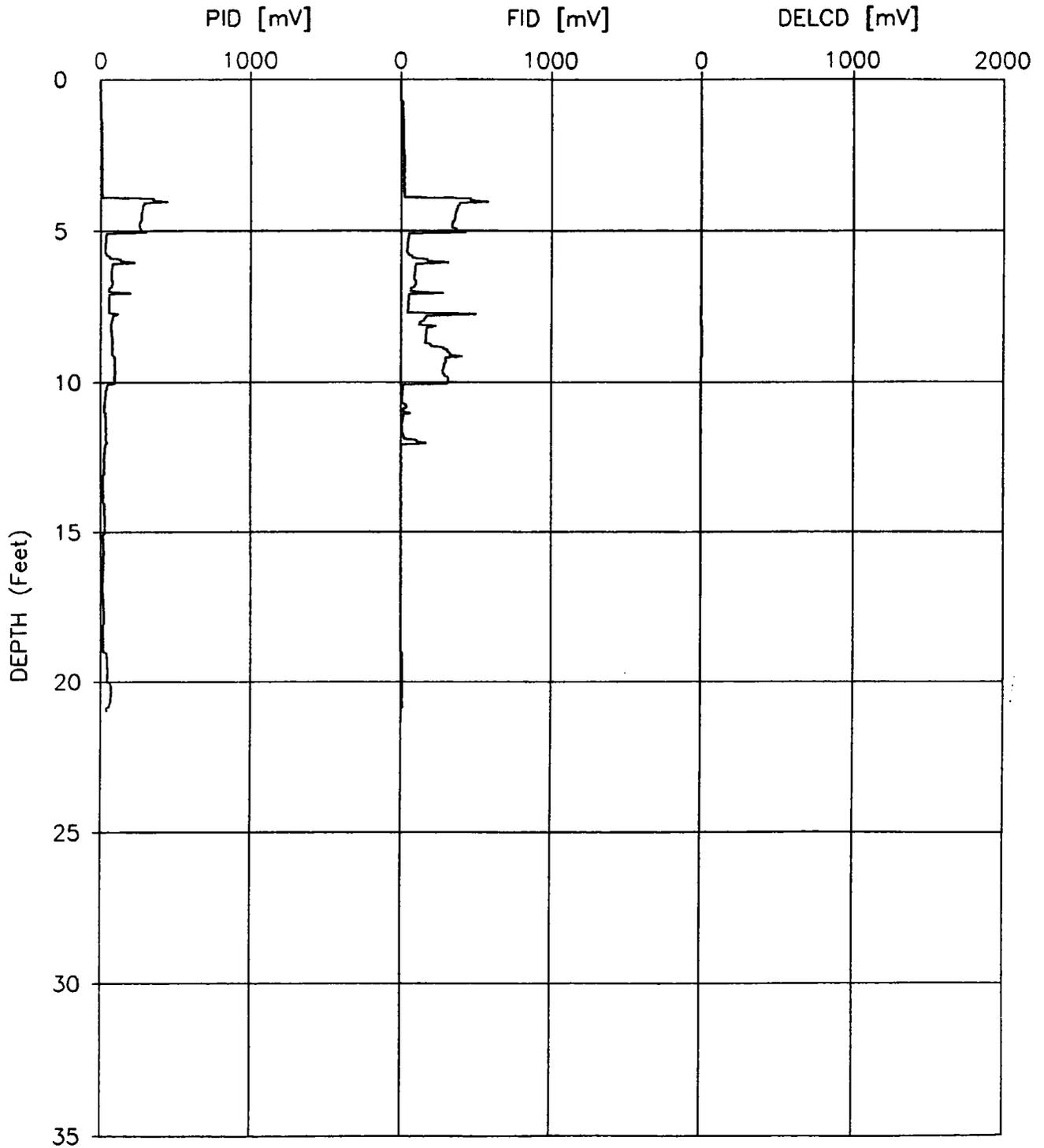
DEPTH (Feet)	PID [mV]		FID [mV]		DELCD [mV]	
	0	1000	0	1000	0	1000 2000
0						
5						
10						
15						
20						
25						
30						
35						

JOB NUMBER: 0304-0742

MIP TEST: MIP-15

PLATE: 1 OF 1

# MIP TEST RESULTS

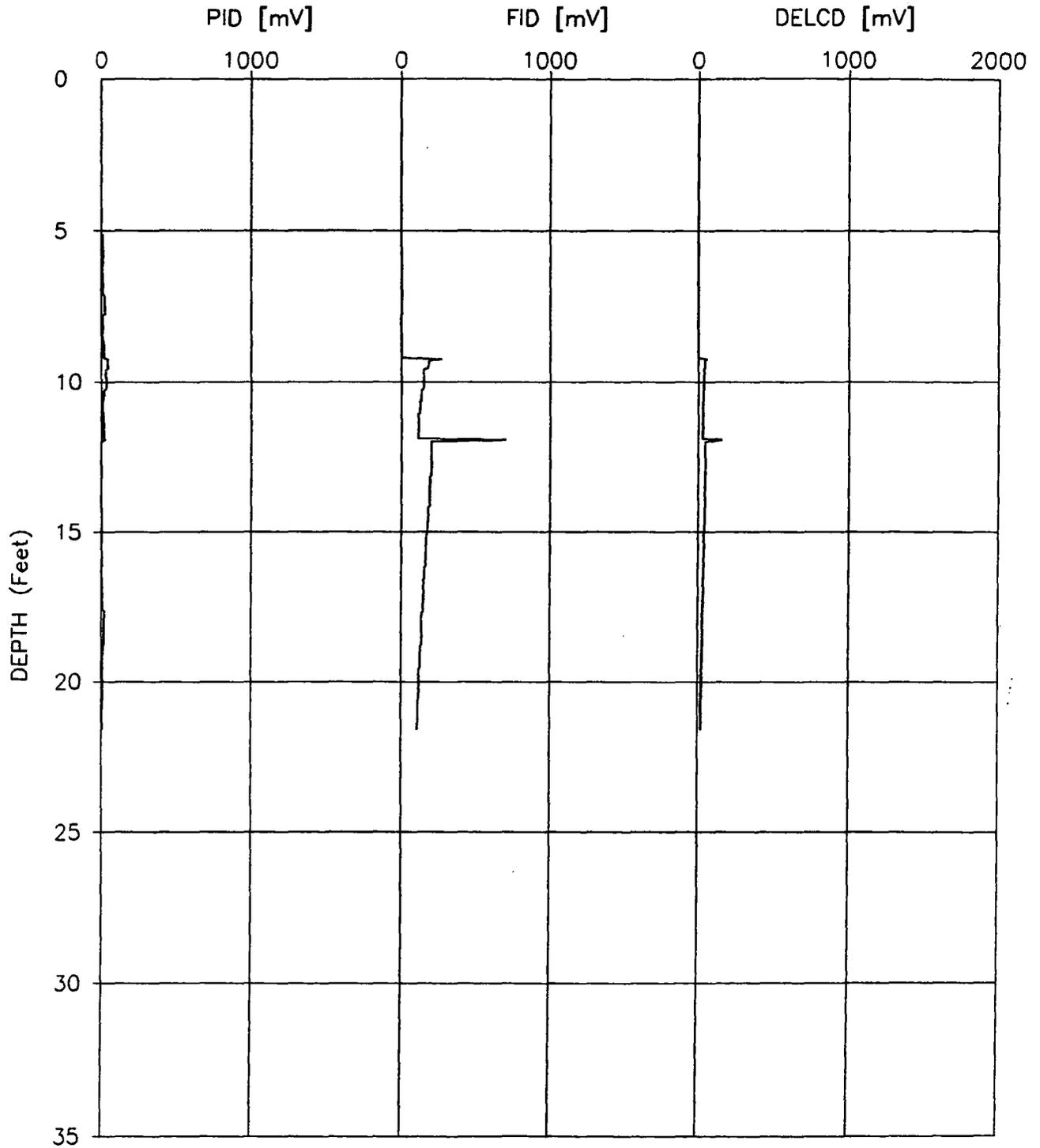


JOB NUMBER: 0304-0742

MIP TEST: MIP-16

PLATE: 1 OF 1

# MIP TEST RESULTS

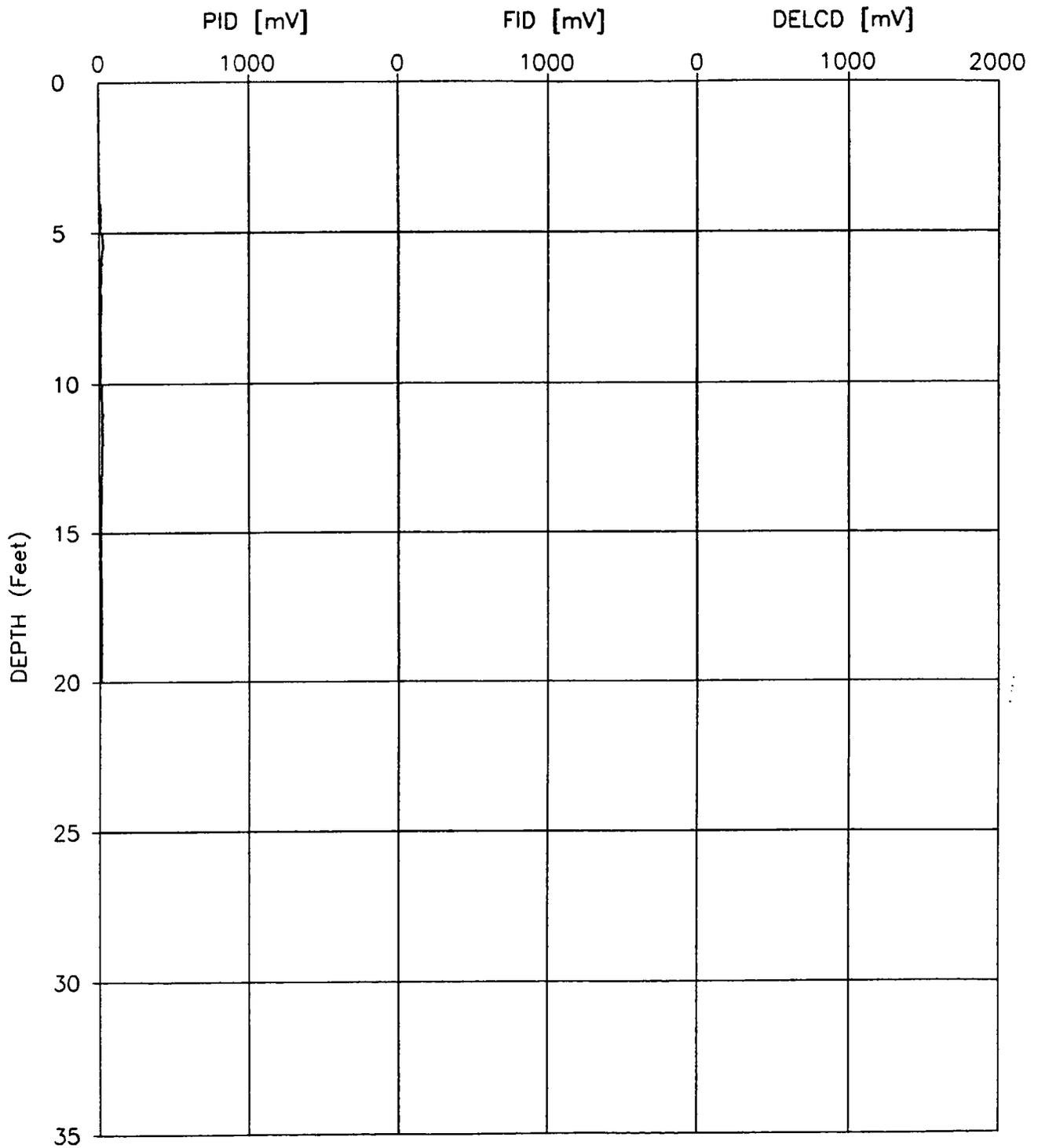


JOB NUMBER: 0304-0742

MIP TEST: MIP-17

PLATE: 1 OF 1

# MIP TEST RESULTS

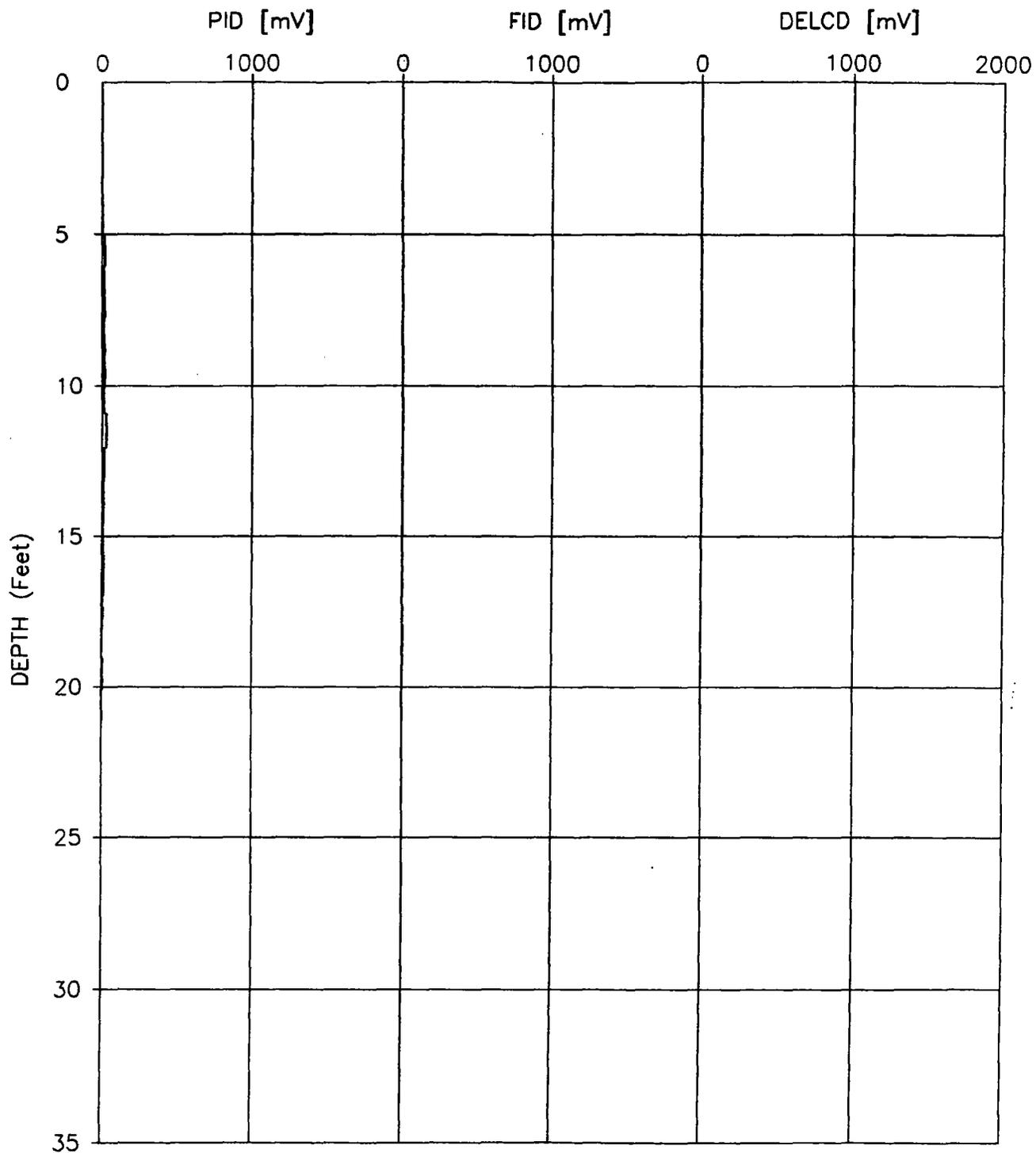


JOB NUMBER: 0304-0742

MIP TEST: MIP-18

PLATE: 1 OF 1

# MIP TEST RESULTS

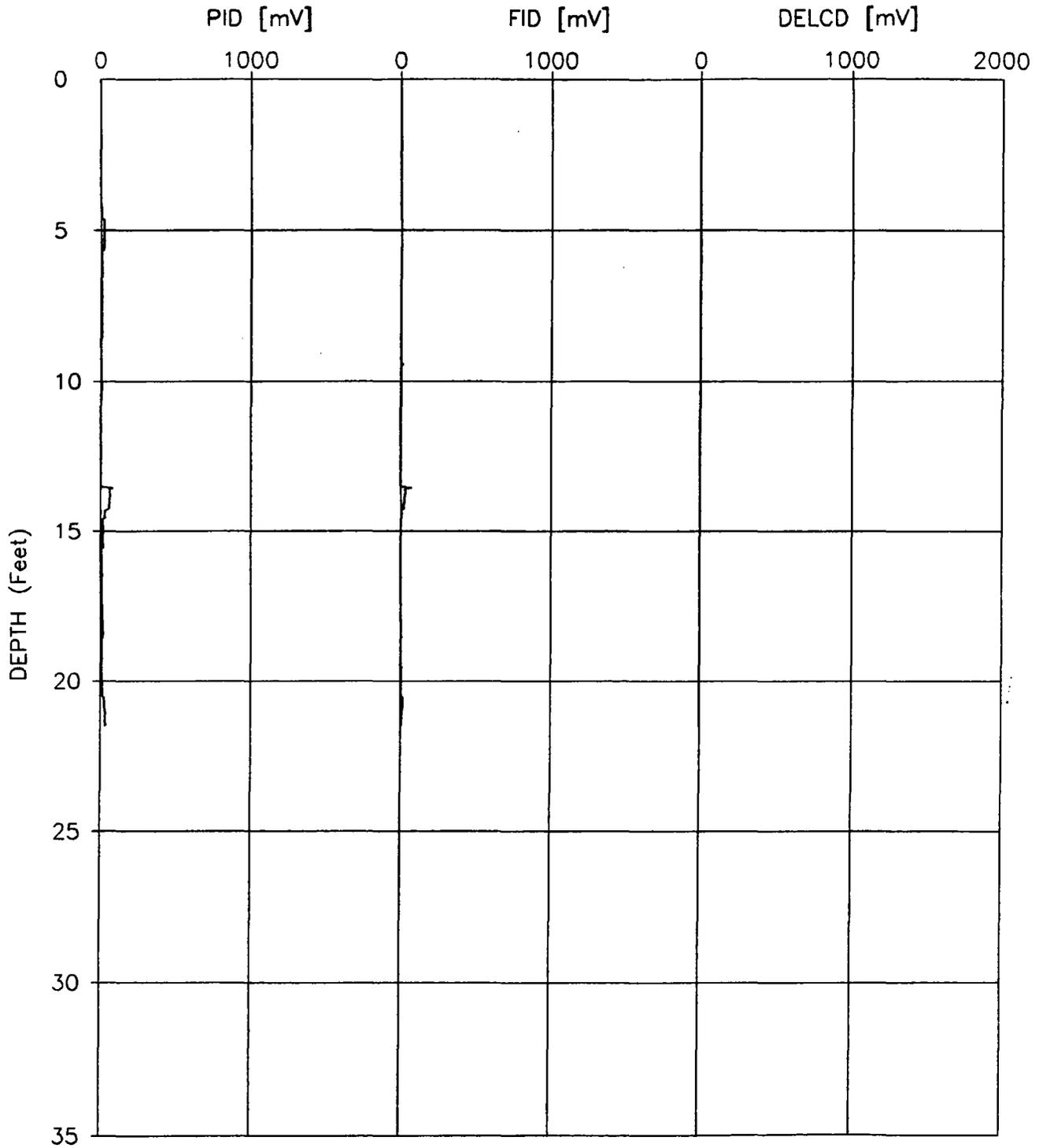


JOB NUMBER: 0304-0742

MIP TEST: MIP-19

PLATE: 1 OF 1

# MIP TEST RESULTS

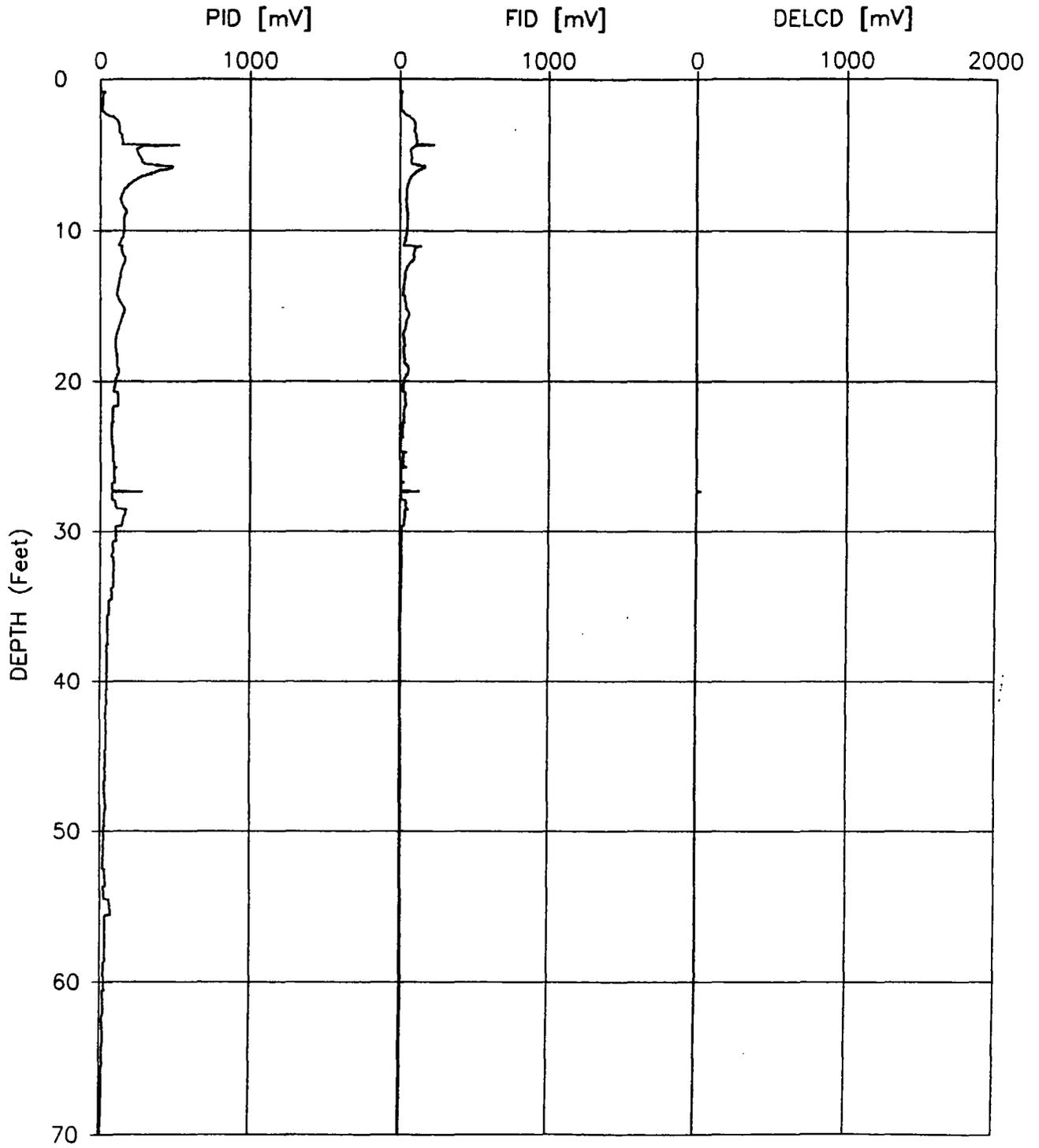


JOB NUMBER: 0304-0742

MIP TEST: MIP-20

PLATE: 1 OF 1

# MIP TEST RESULTS

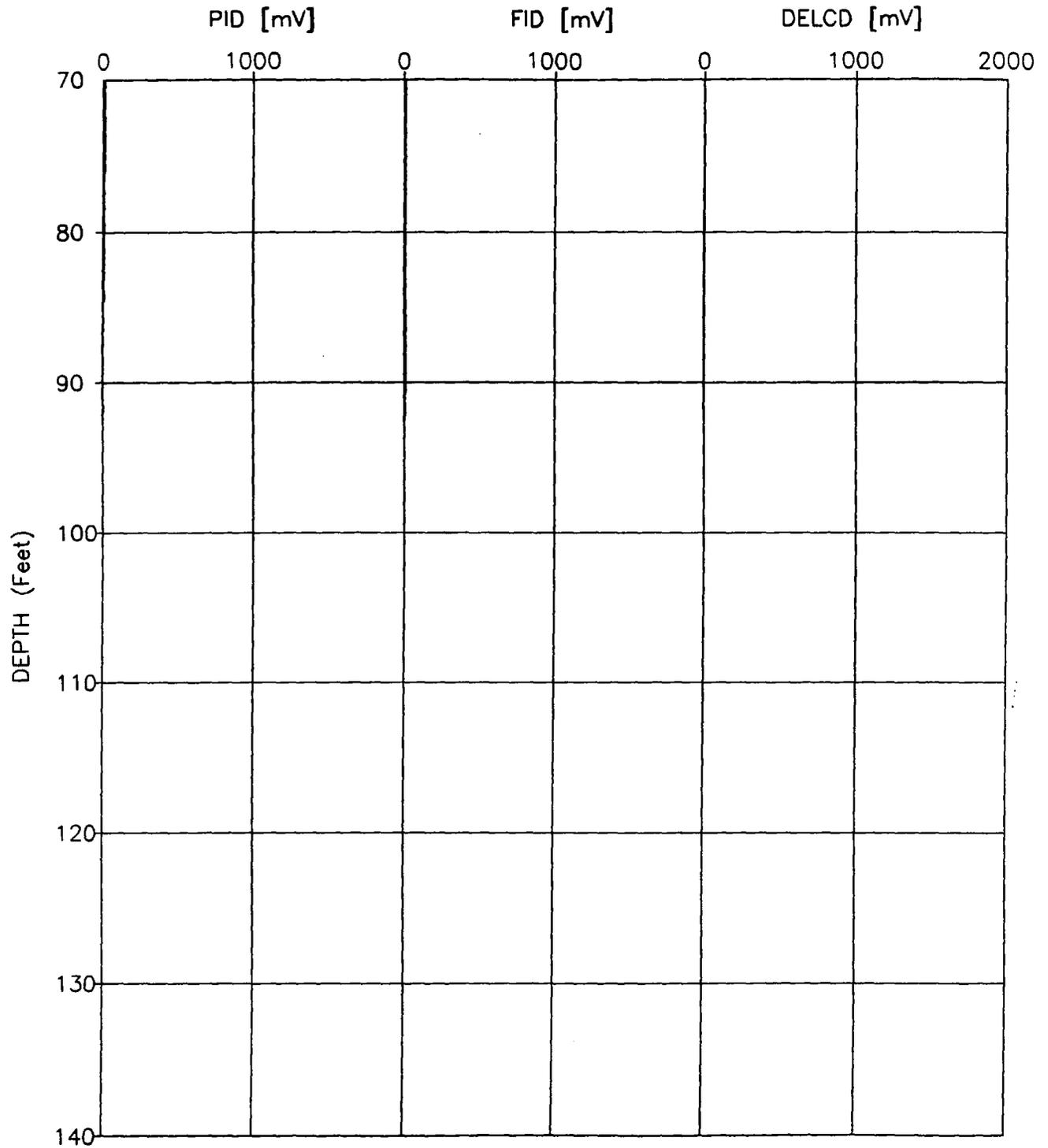


JOB NUMBER: 0304-0742

MIP TEST: MIP-21

PLATE: 1 OF 2

# MIP TEST RESULTS



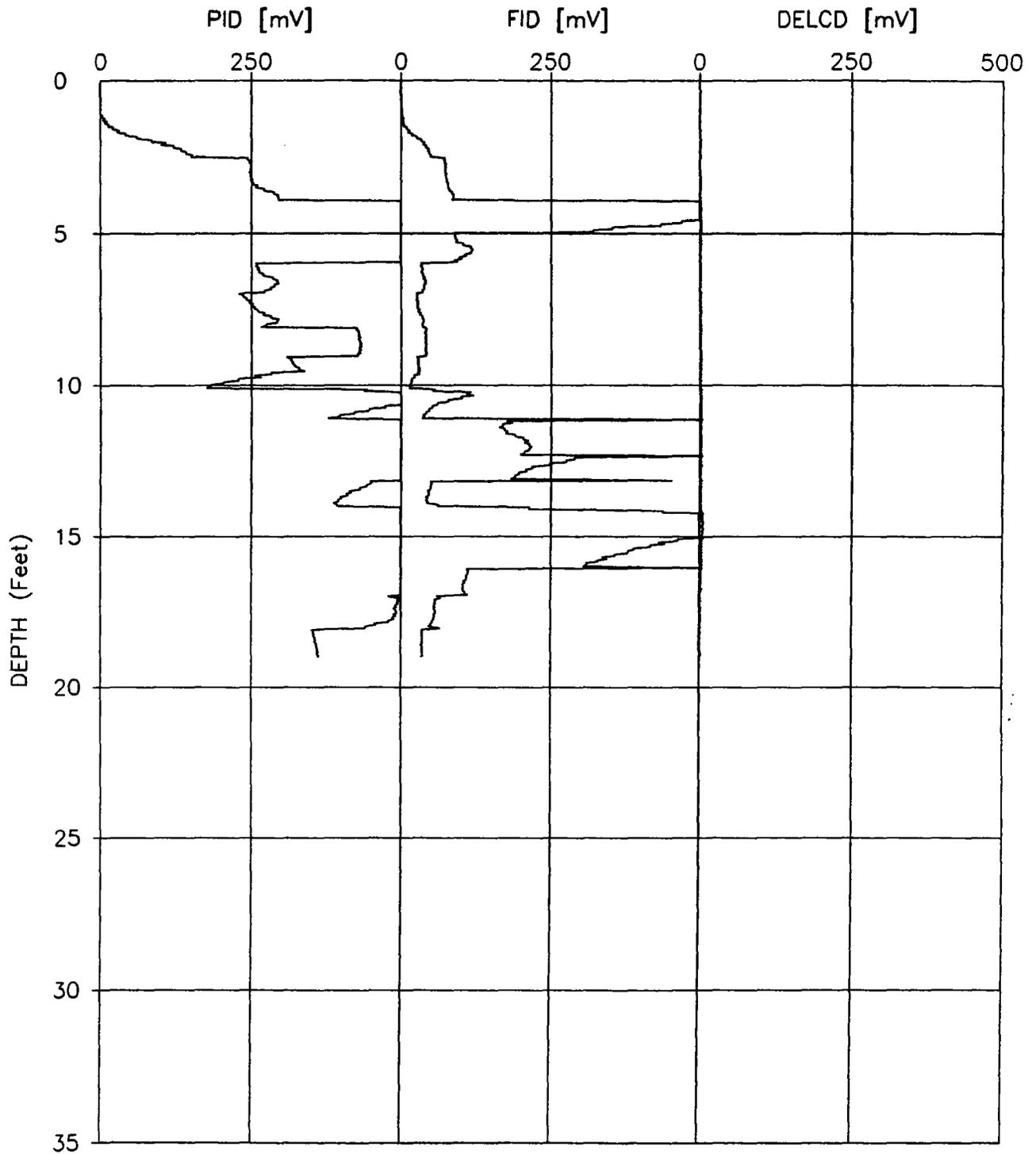
JOB NUMBER: 0304-0742

MIP TEST: MIP-21

PLATE: 2 OF 2

**MIP AT 500 SCALE**

# MIP TEST RESULTS

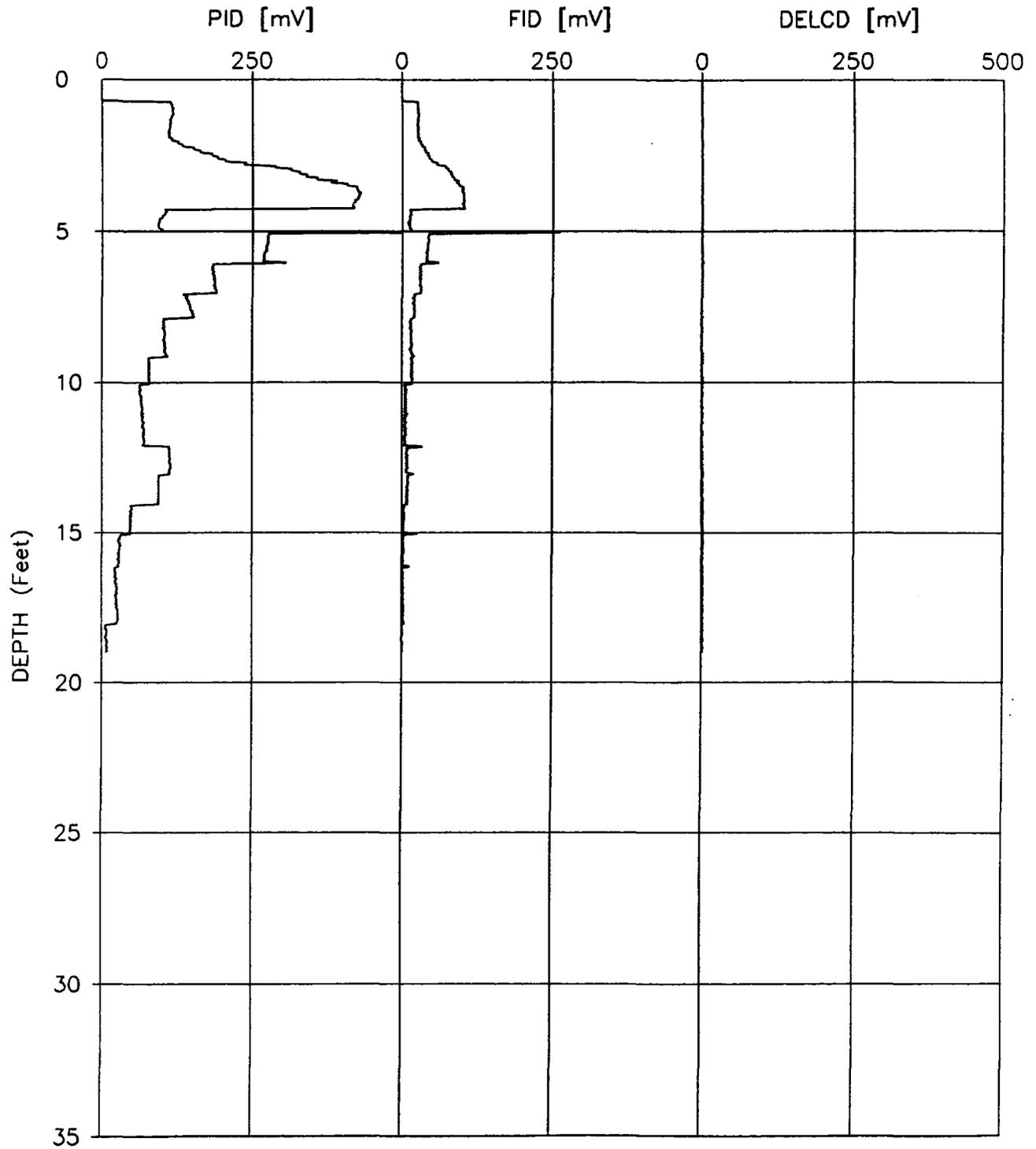


JOB NUMBER: 0304-0742

MIP TEST: MIP-01

PLATE: 1 OF 1

# MIP TEST RESULTS

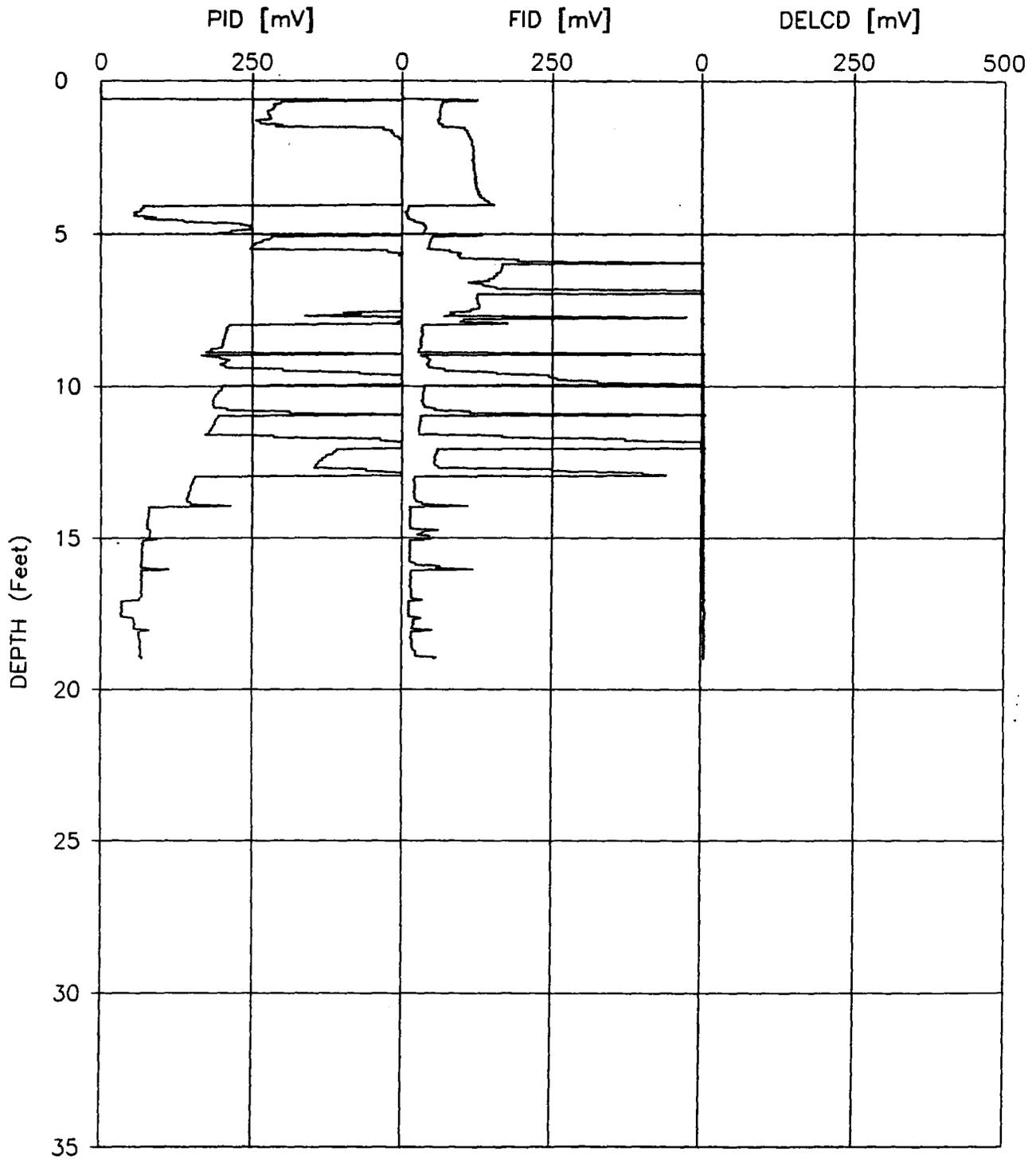


JOB NUMBER: 0304-0742

MIP TEST: MIP-02

PLATE: 1 OF 1

# MIP TEST RESULTS

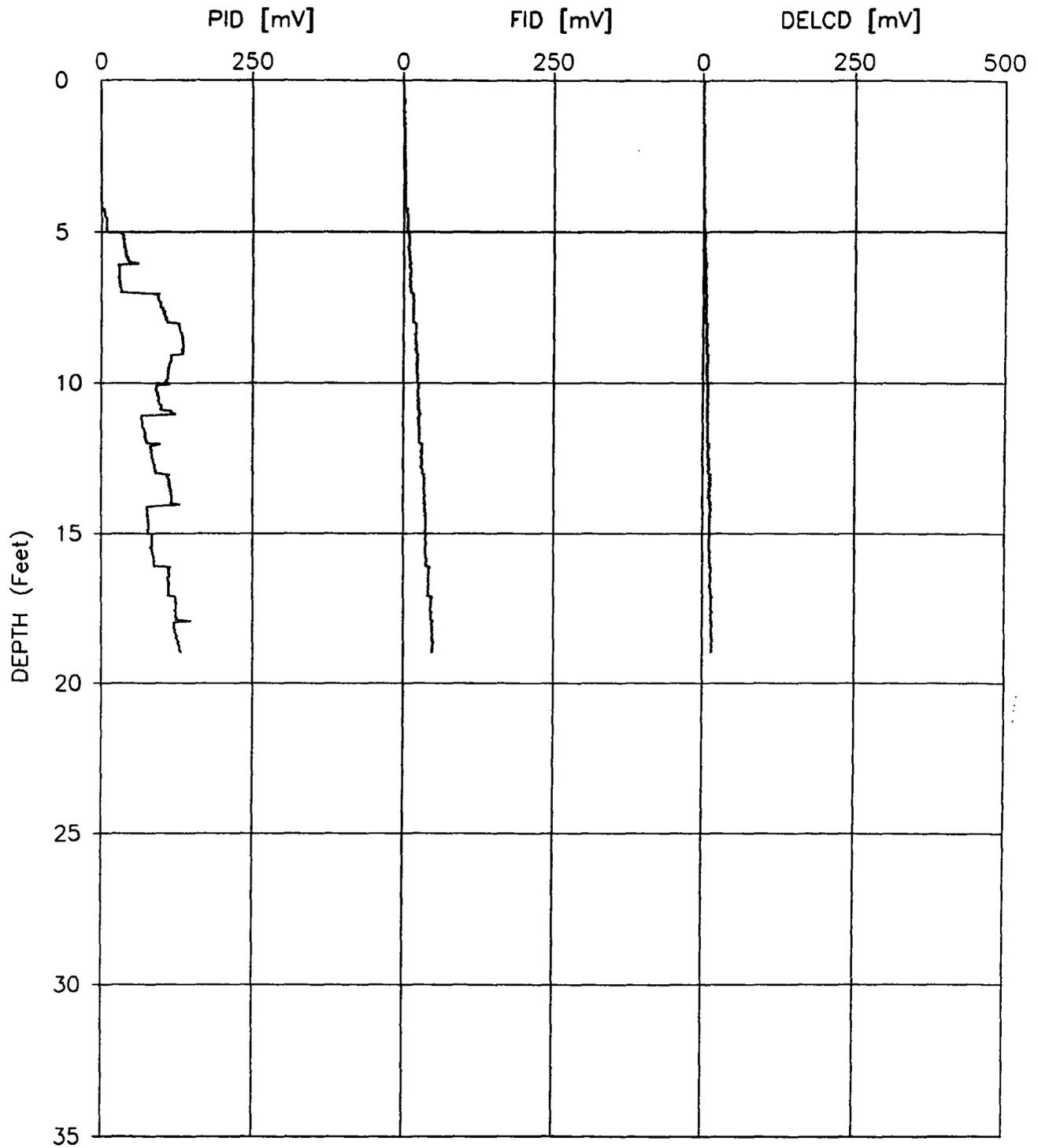


JOB NUMBER: 0304-0742

MIP TEST: MIP-03

PLATE: 1 OF 1

# MIP TEST RESULTS

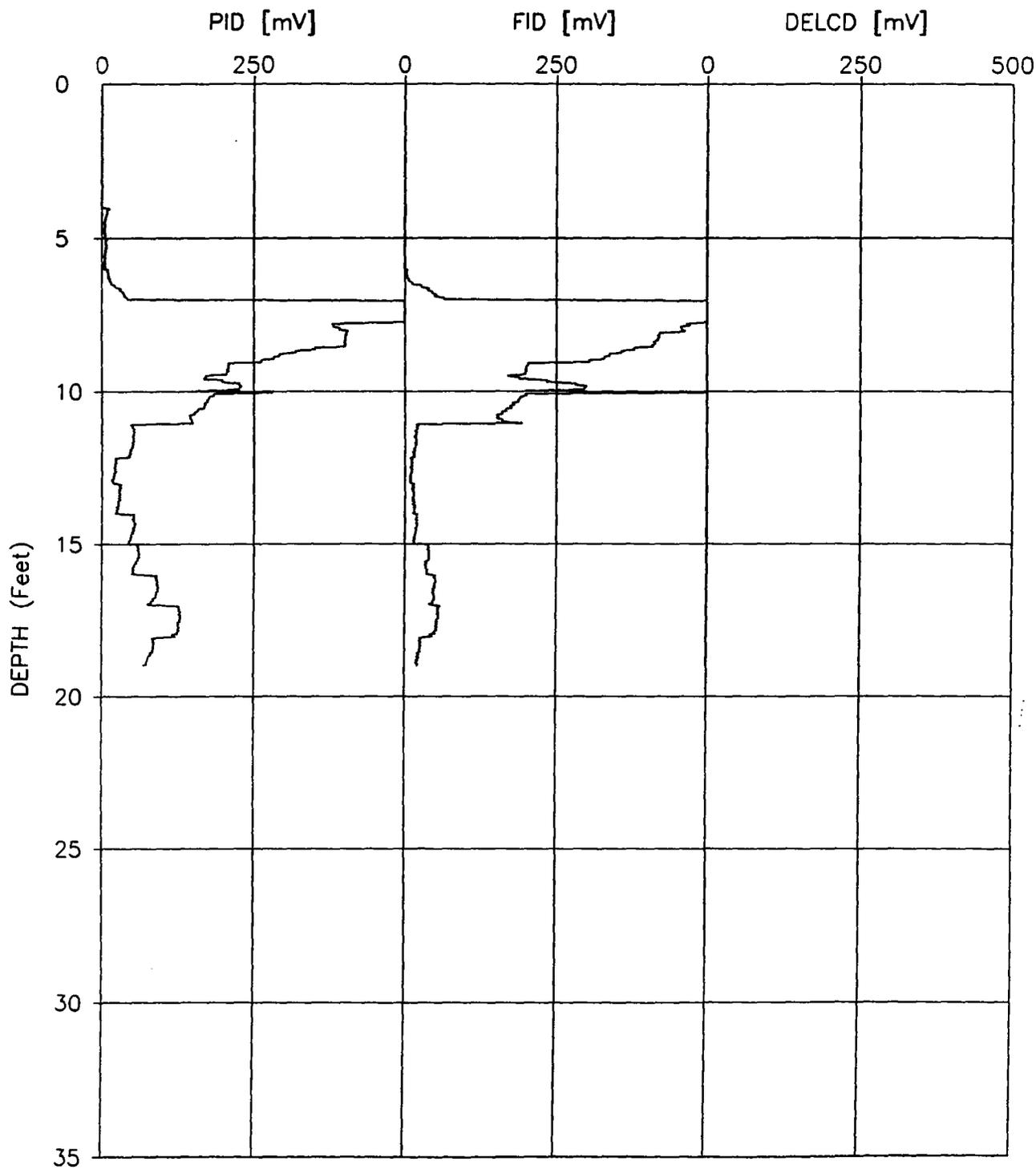


JOB NUMBER: 0304-0742

MIP TEST: MIP-04

PLATE: 1 OF 1

# MIP TEST RESULTS

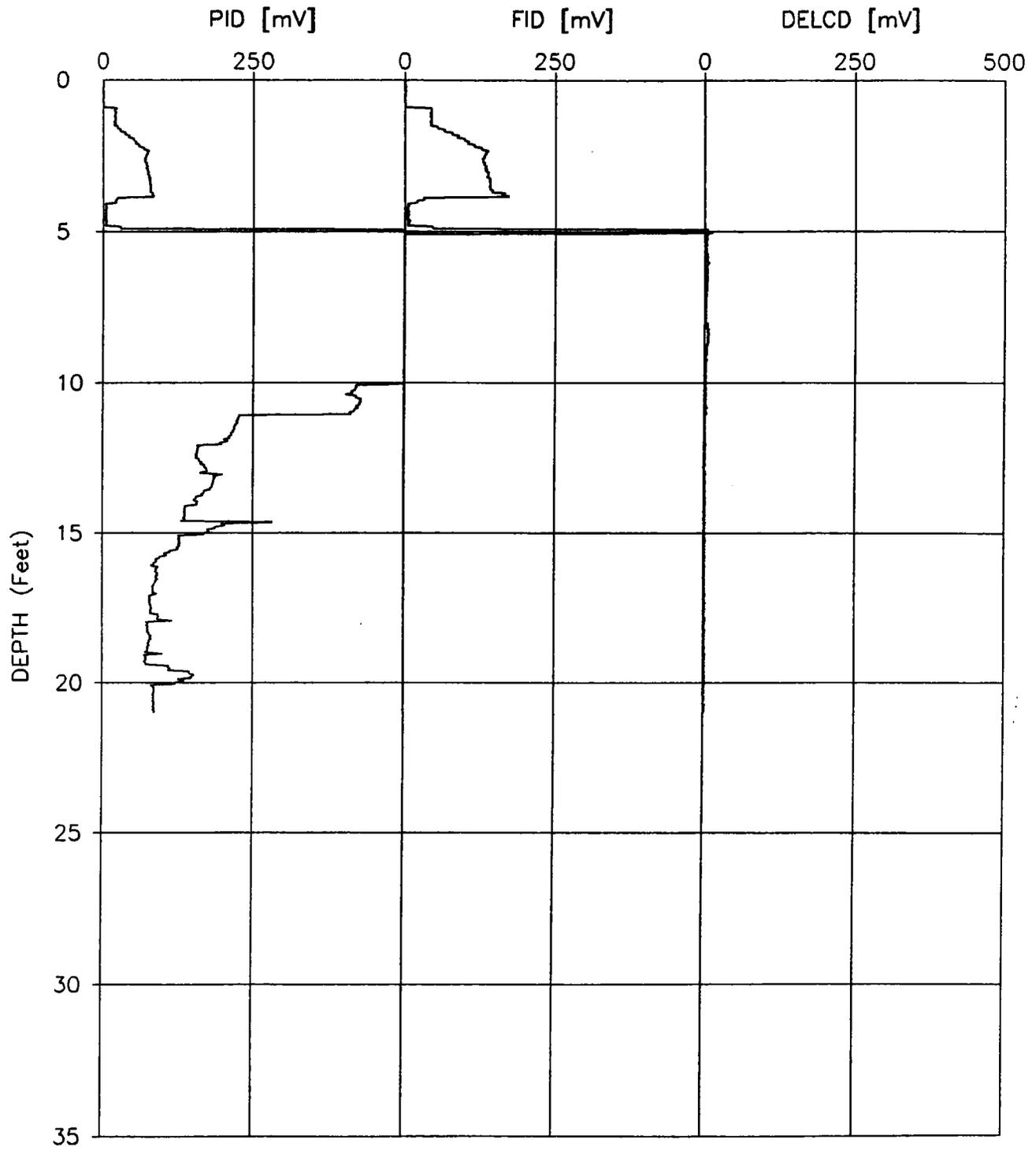


JOB NUMBER: 0304-0742

MIP TEST: MIP-05

PLATE: 1 OF 1

# MIP TEST RESULTS

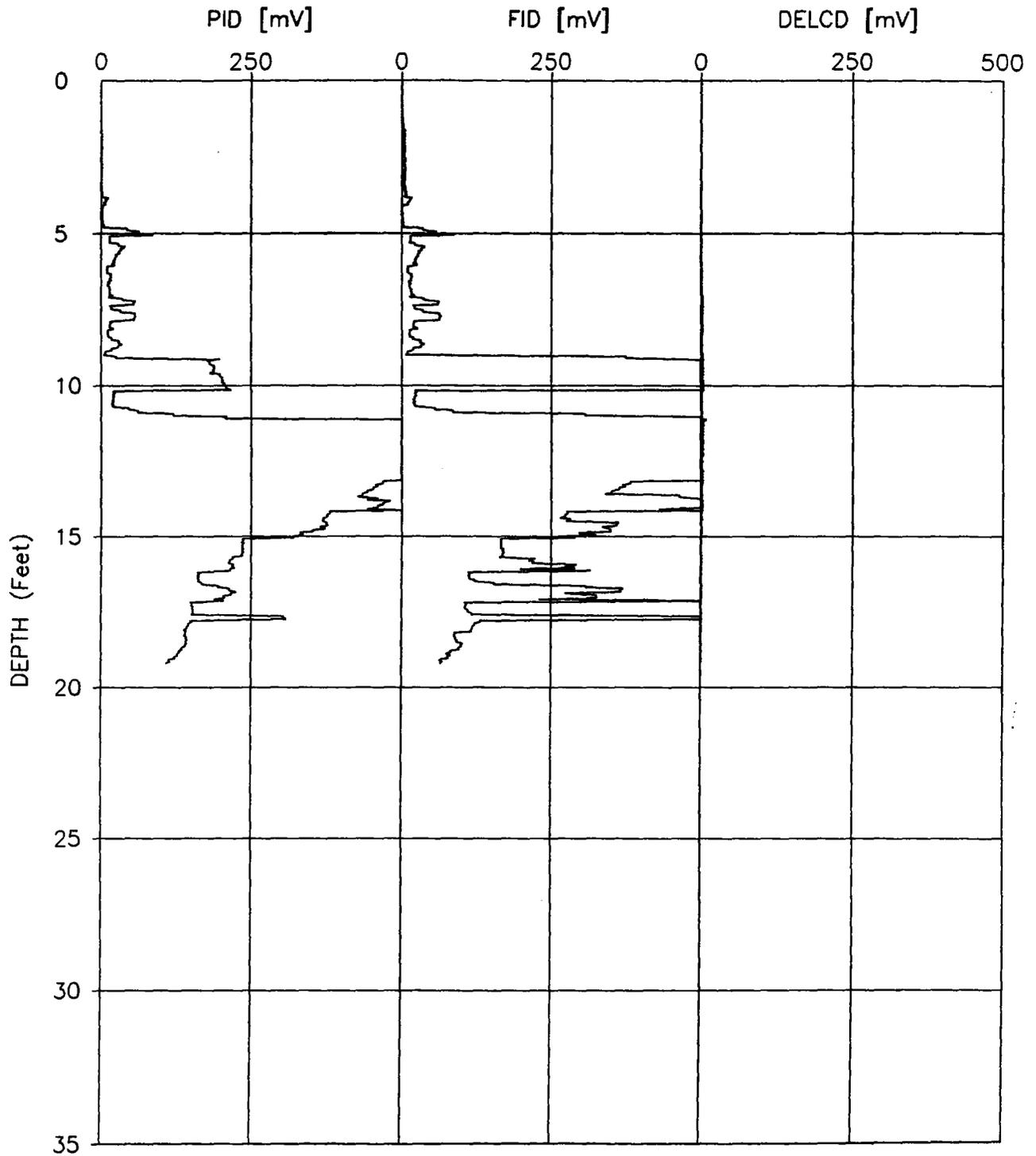


JOB NUMBER: 0304-0742

MIP TEST: MIP-06

PLATE: 1 OF 1

# MIP TEST RESULTS

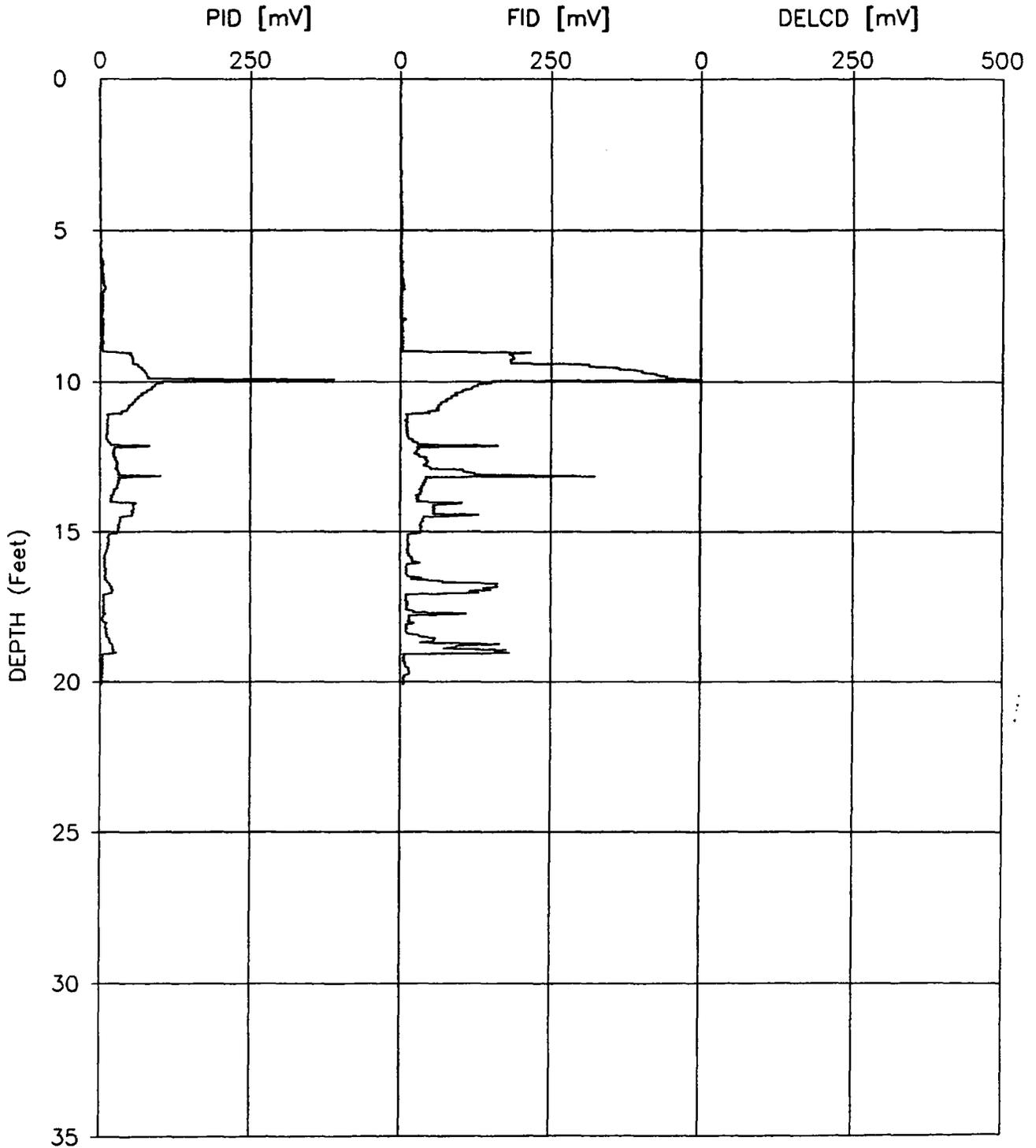


JOB NUMBER: 0304-0742

MIP TEST: MIP-07

PLATE: 1 OF 1

# MIP TEST RESULTS

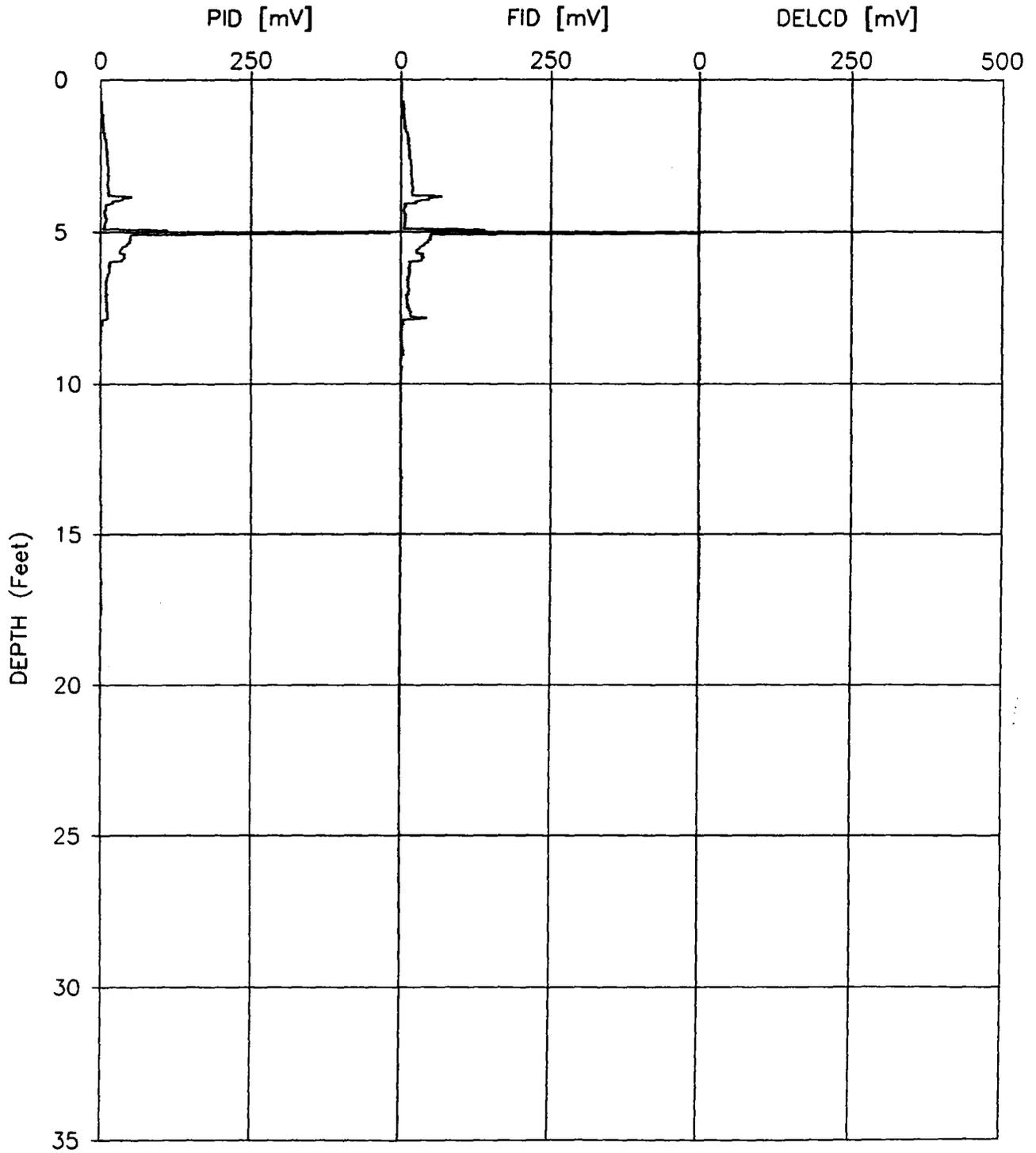


JOB NUMBER: 0304-0742

MIP TEST: MIP-08

PLATE: 1 OF 1

# MIP TEST RESULTS

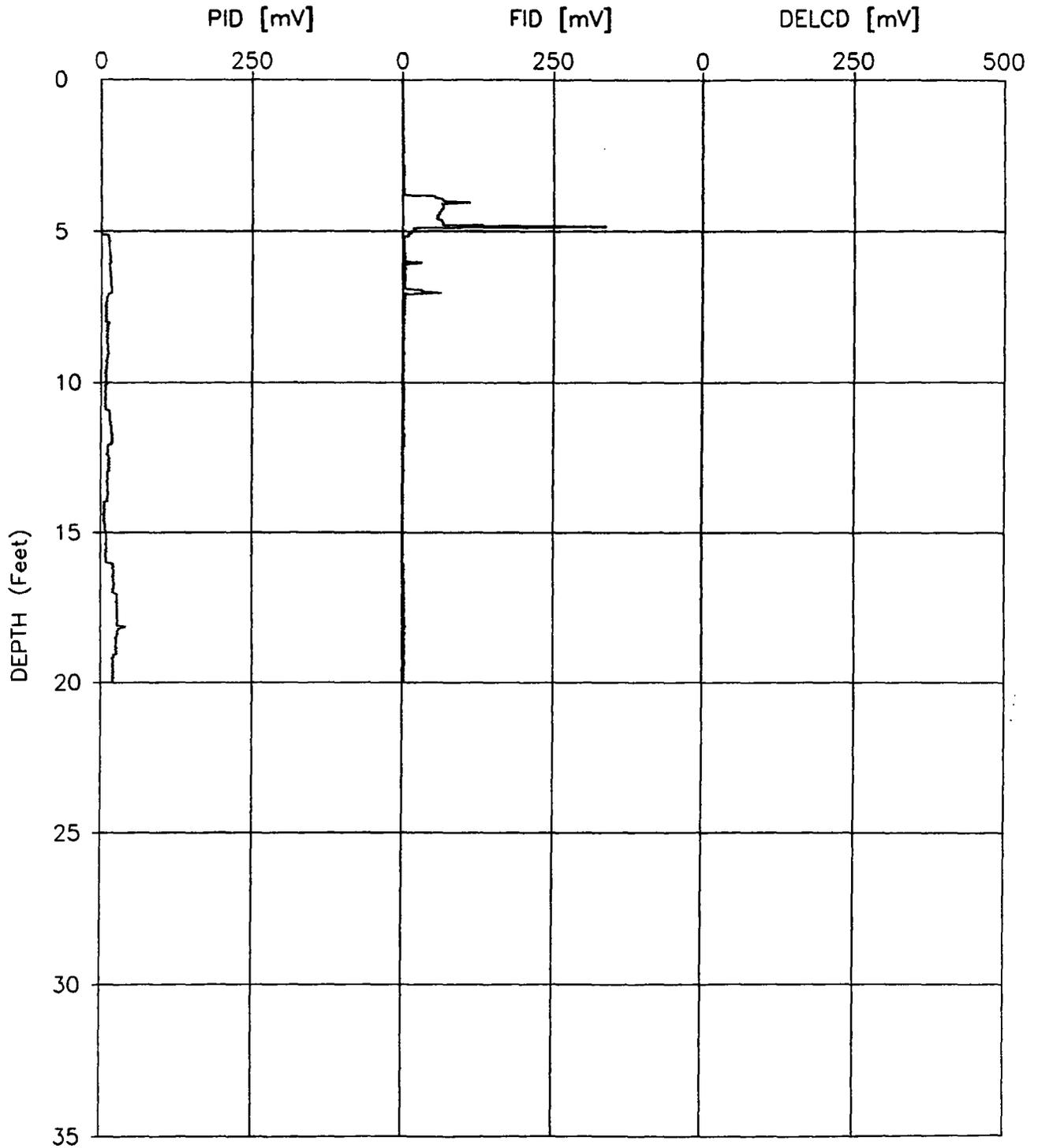


JOB NUMBER: 0304-0742

MIP TEST: MIP-09

PLATE: 1 OF 1

# MIP TEST RESULTS

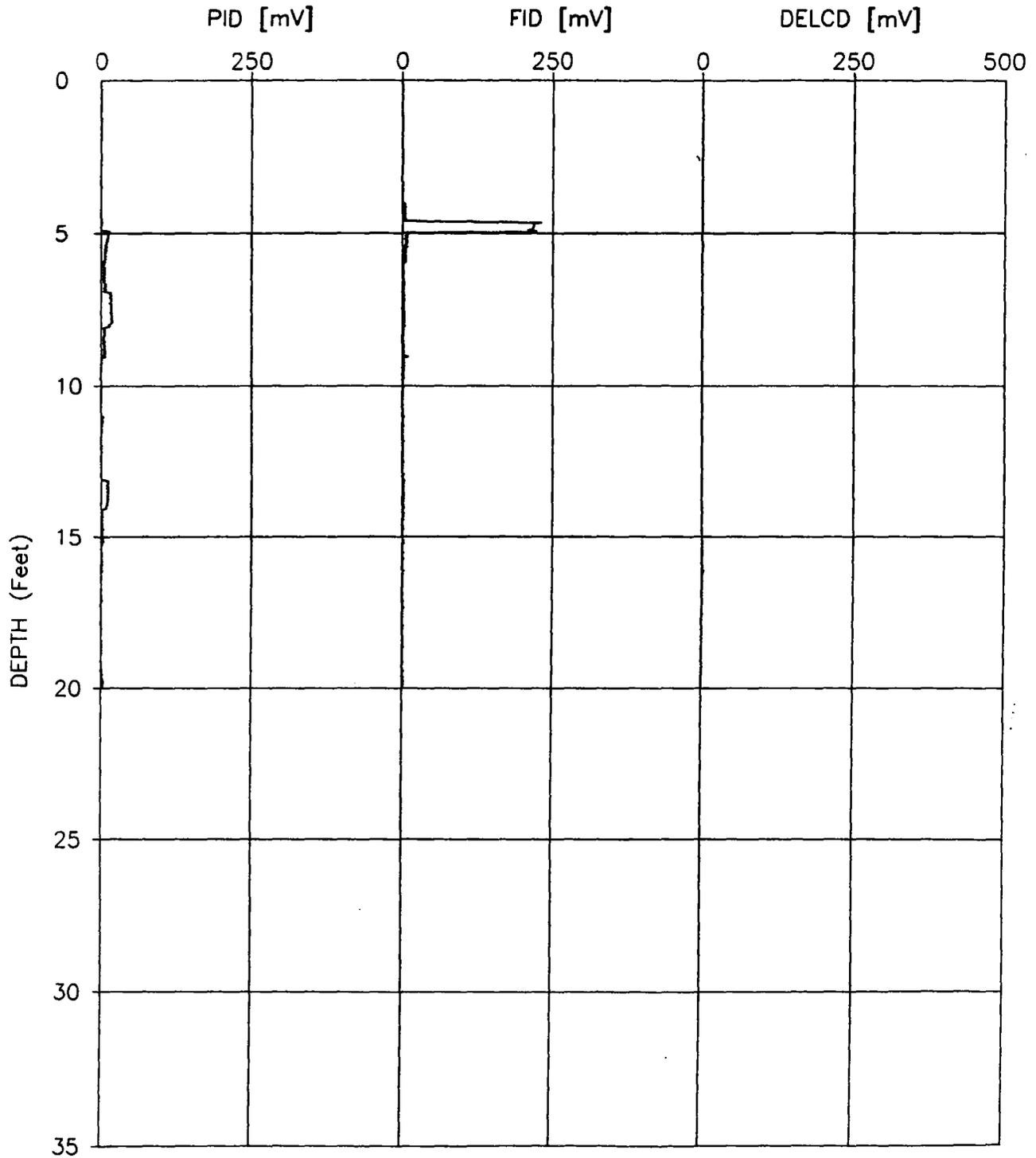


JOB NUMBER: 0304-0742

MIP TEST: MIP-10

PLATE: 1 OF 1

# MIP TEST RESULTS

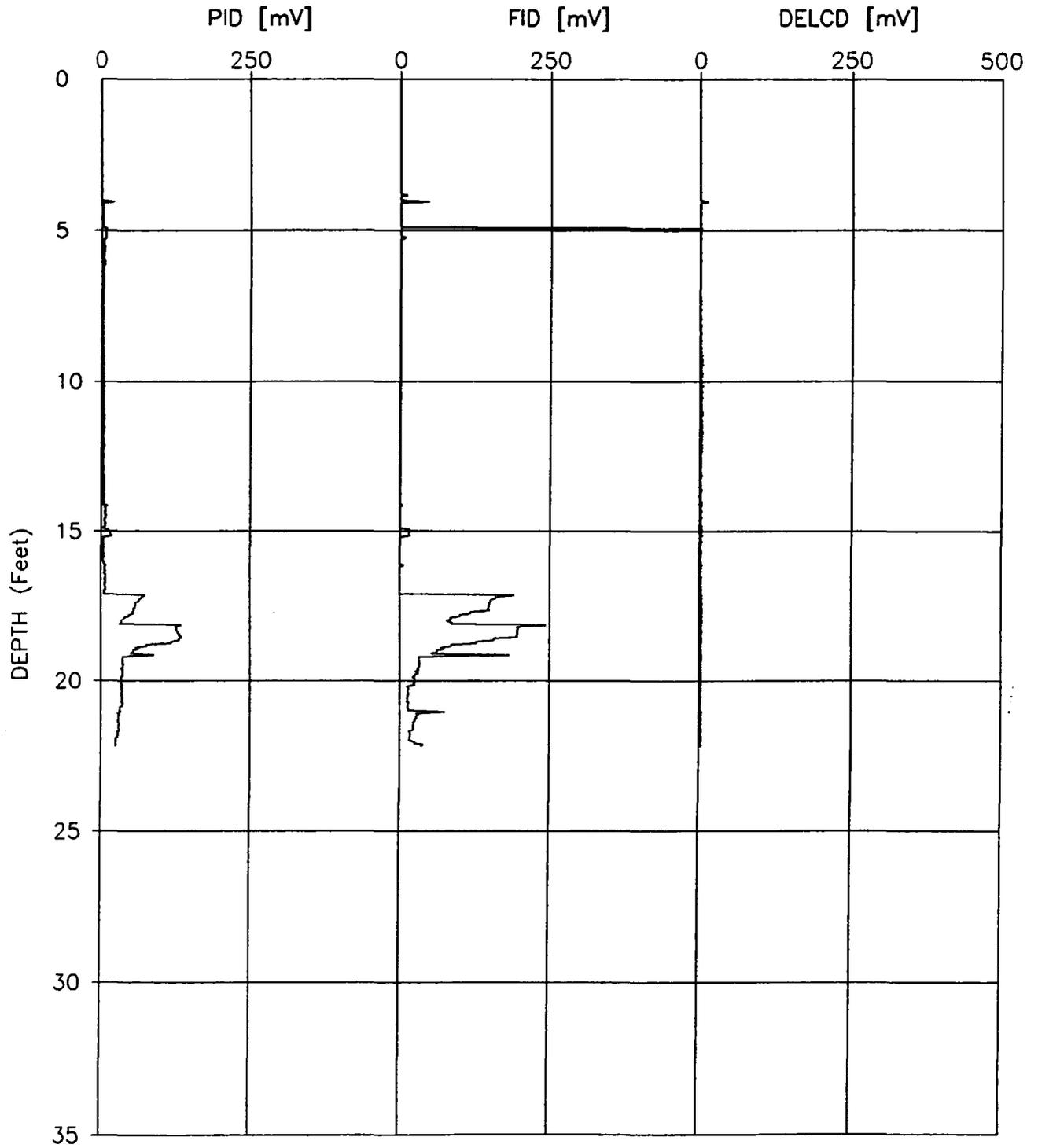


JOB NUMBER: 0304-0742

MIP TEST: MIP-11

PLATE: 1 OF 1

# MIP TEST RESULTS

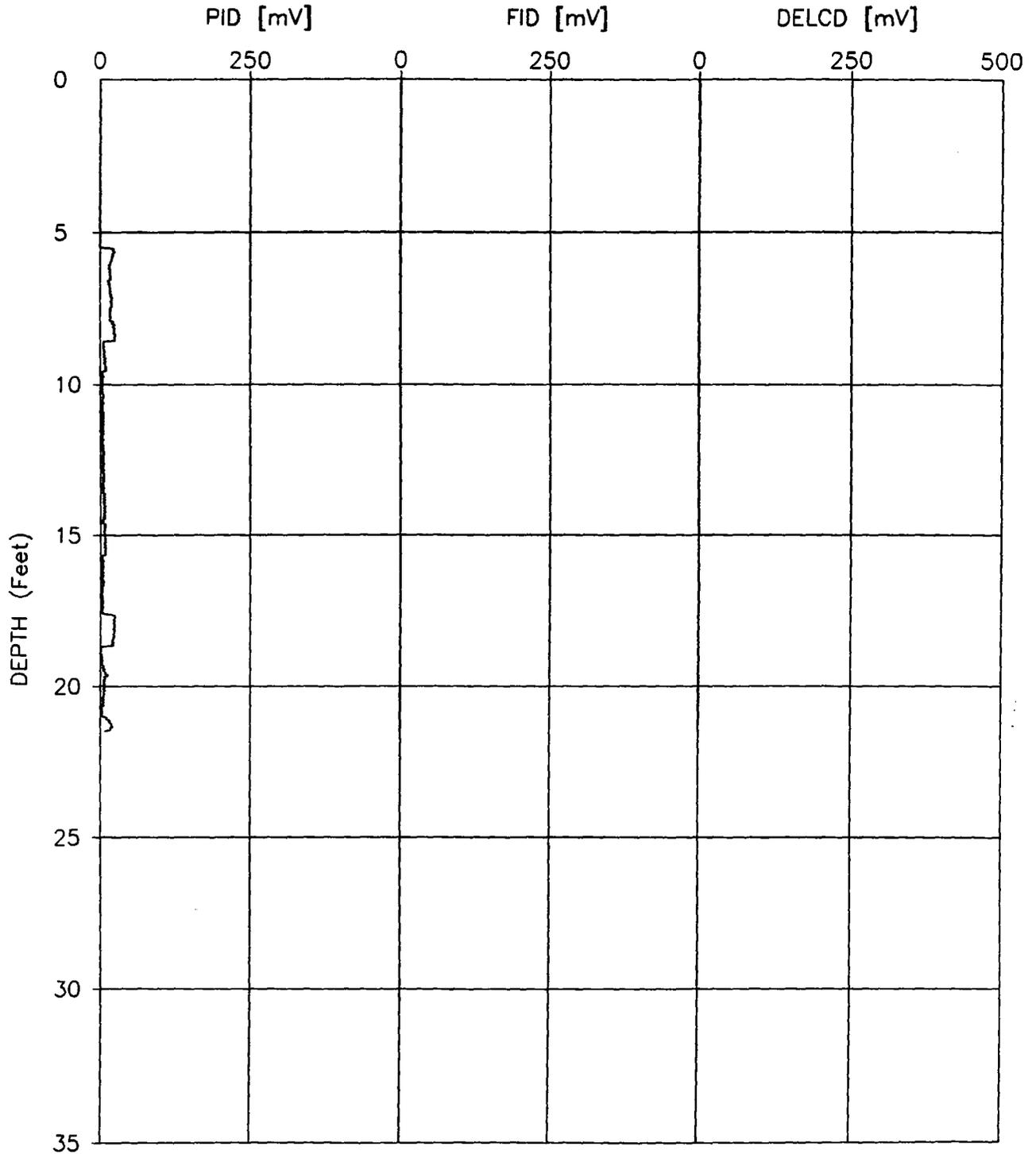


JOB NUMBER: 0304-0742

MIP TEST: MIP-12

PLATE: 1 OF 1

# MIP TEST RESULTS

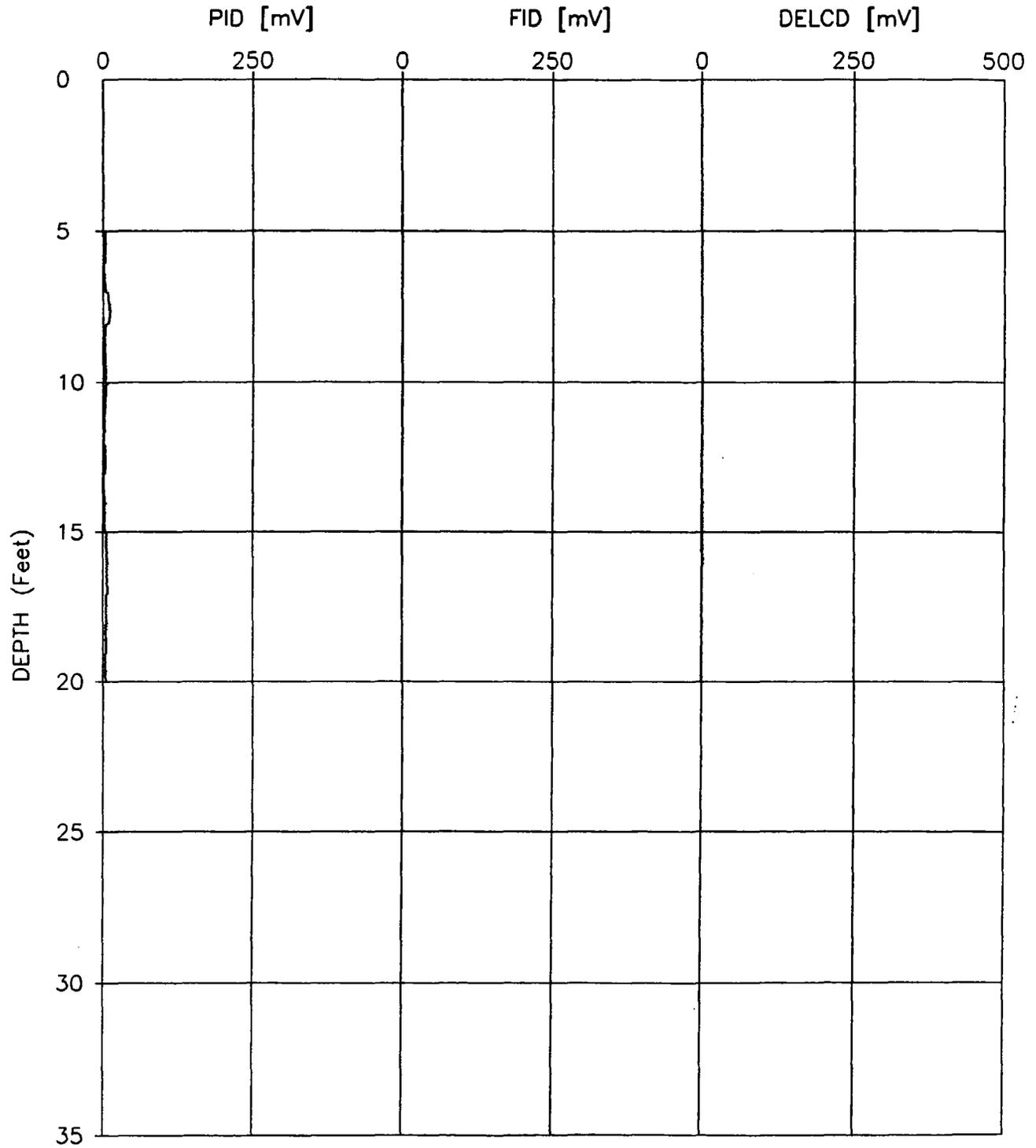


JOB NUMBER: 0304-0742

MIP TEST: MIP-13

PLATE: 1 OF 1

# MIP TEST RESULTS

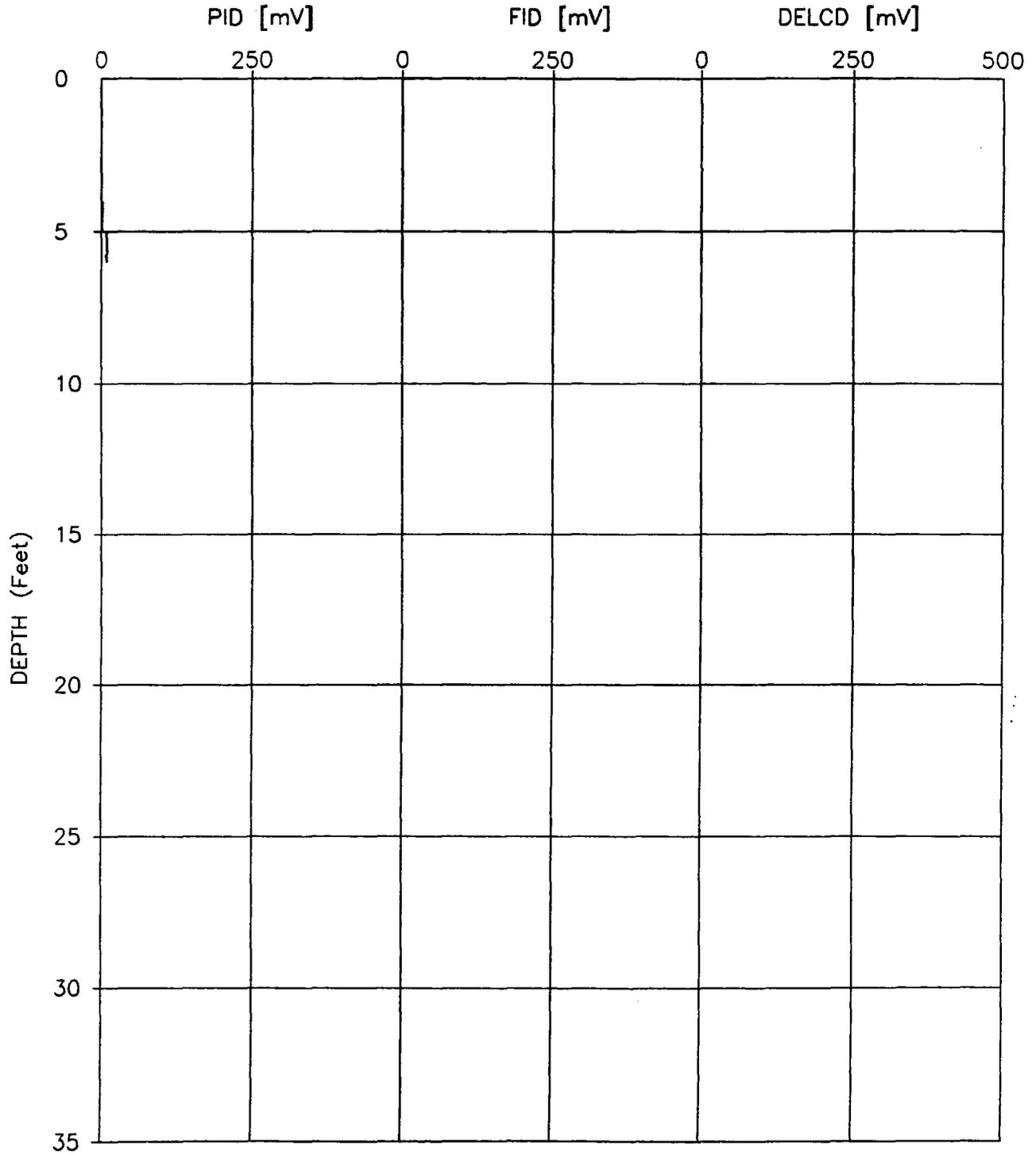


JOB NUMBER: 0304-0742

MIP TEST: MIP-14

PLATE: 1 OF 1

# MIP TEST RESULTS

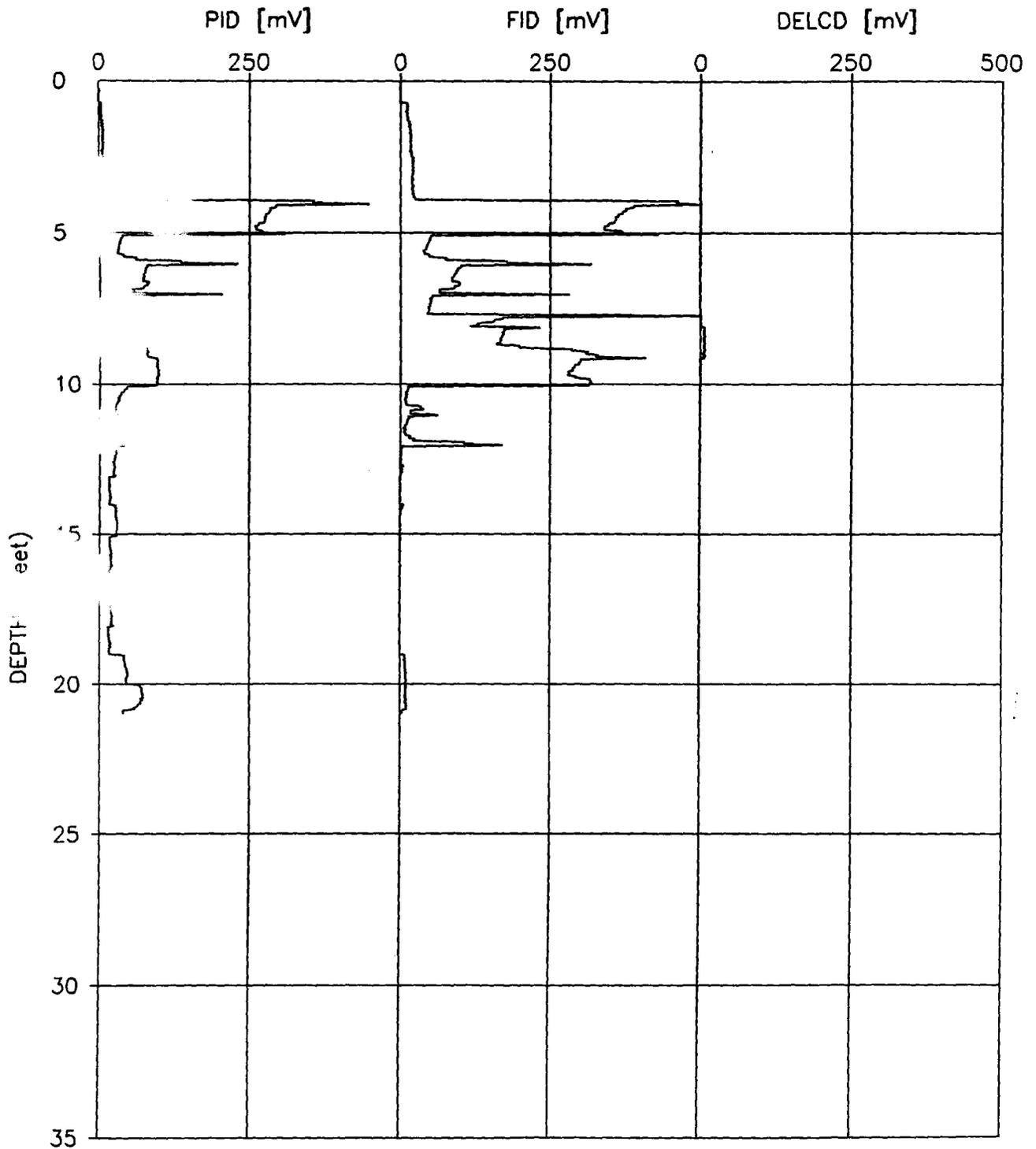


JOB NUMBER: 0304-0742

MIP TEST: MIP-15

PLATE: 1 OF 1

# MIP TEST RESULTS

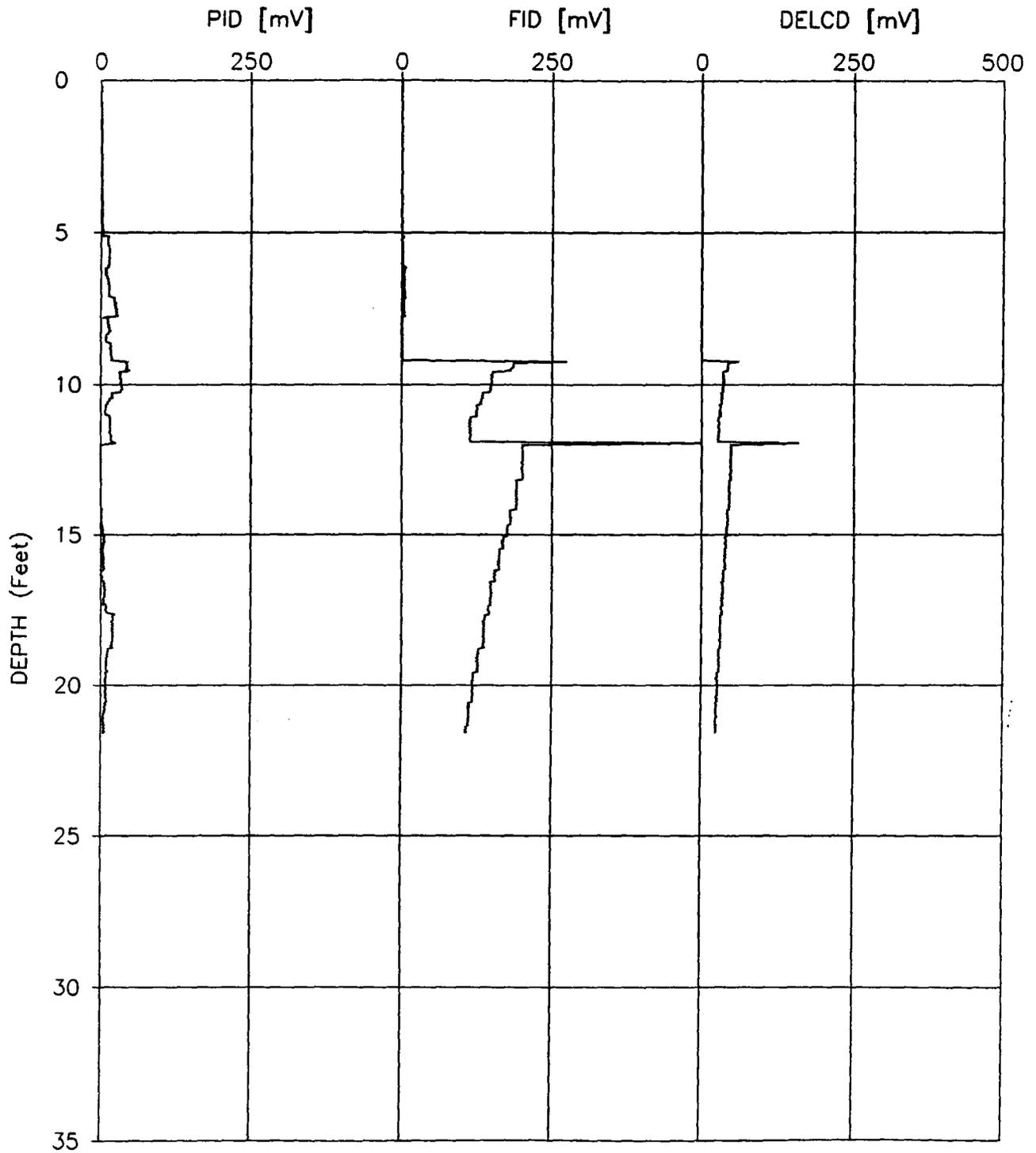


JOB NUMBER: 0304-0742

MIP TEST: MIP-16

PLATE: 1 OF 1

# MIP TEST RESULTS

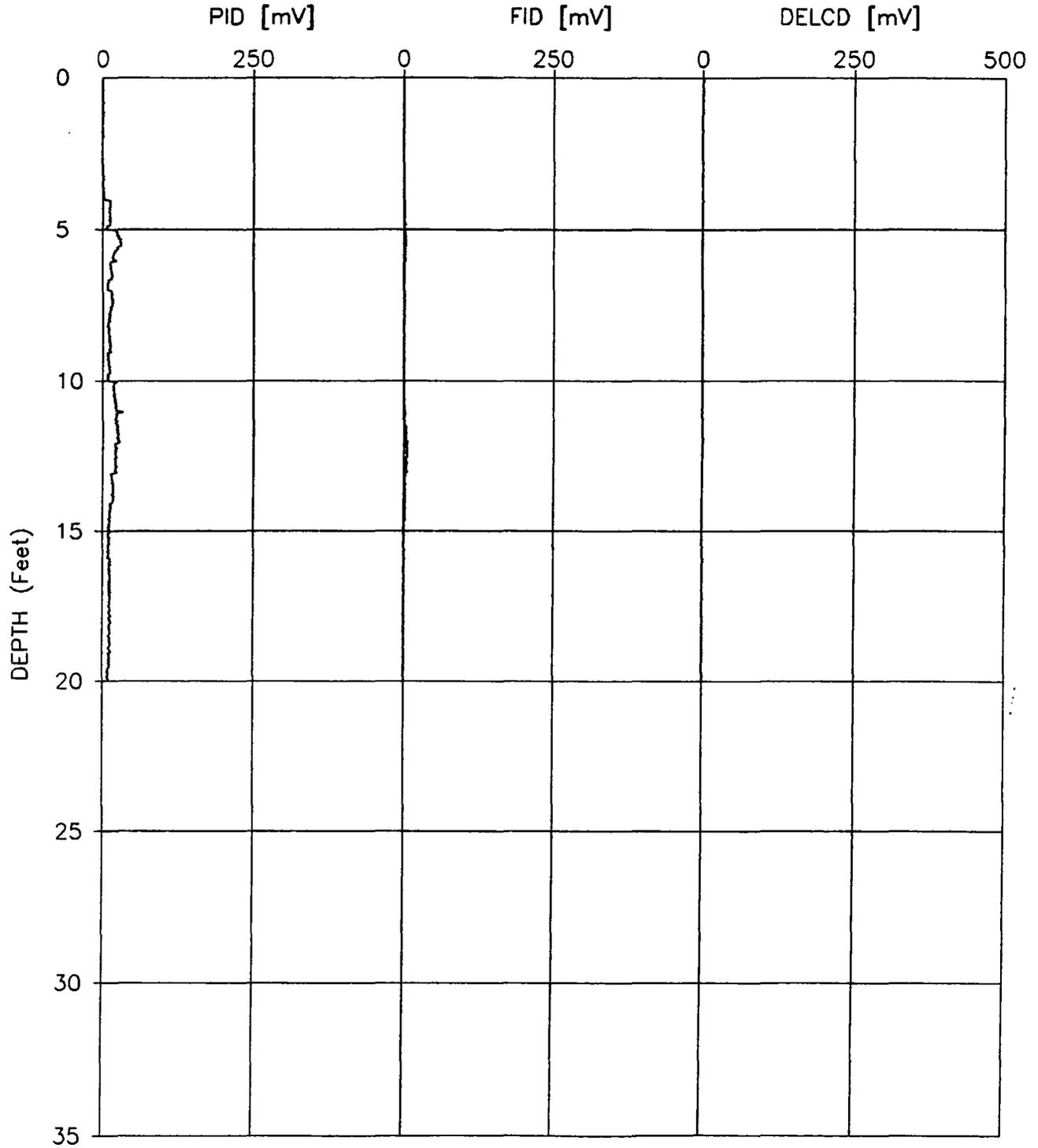


JOB NUMBER: 0304-0742

MIP TEST: MIP-17

PLATE: 1 OF 1

# MIP TEST RESULTS

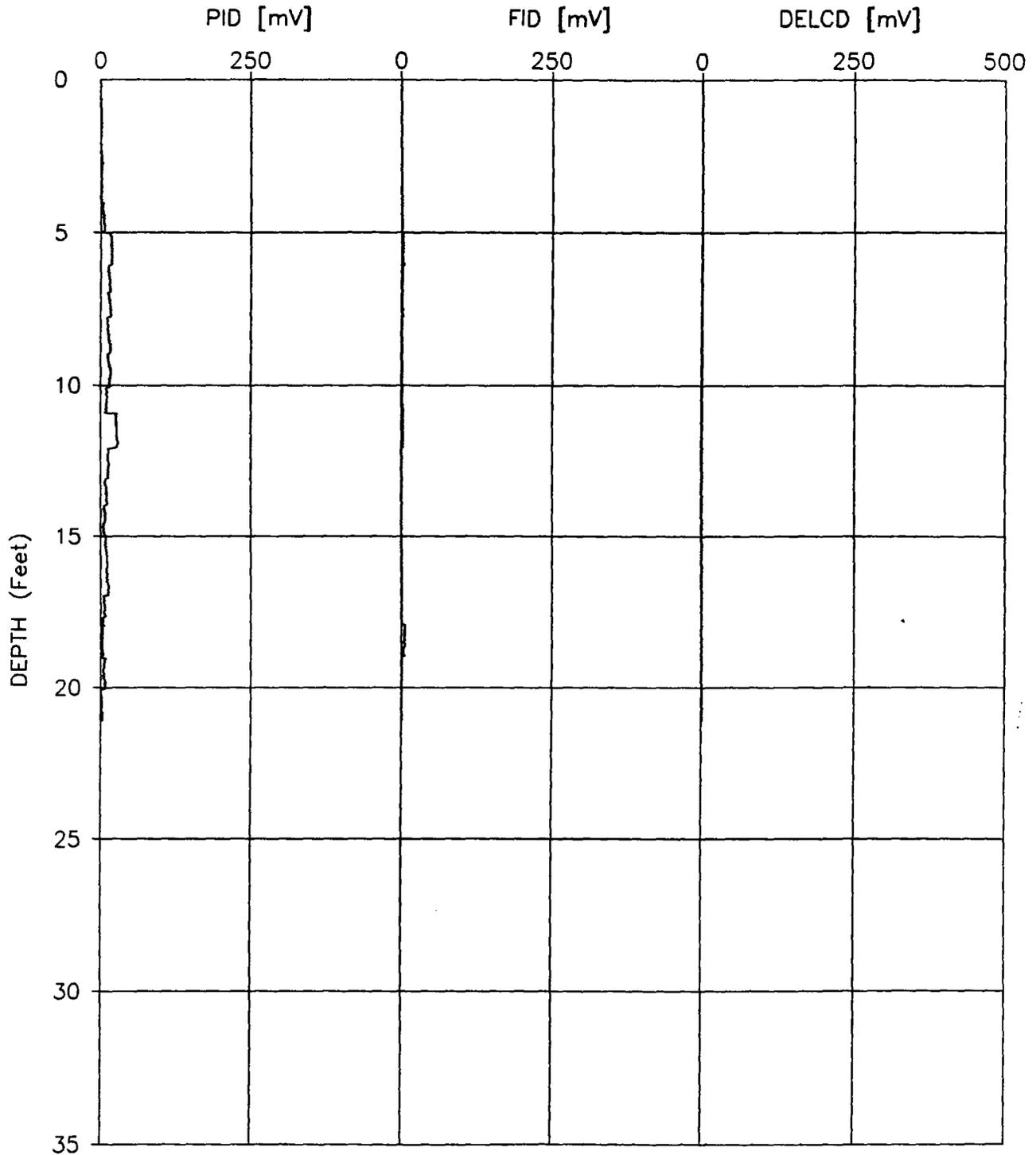


JOB NUMBER: 0304-0742

MIP TEST: MIP-18

PLATE: 1 OF 1

# MIP TEST RESULTS

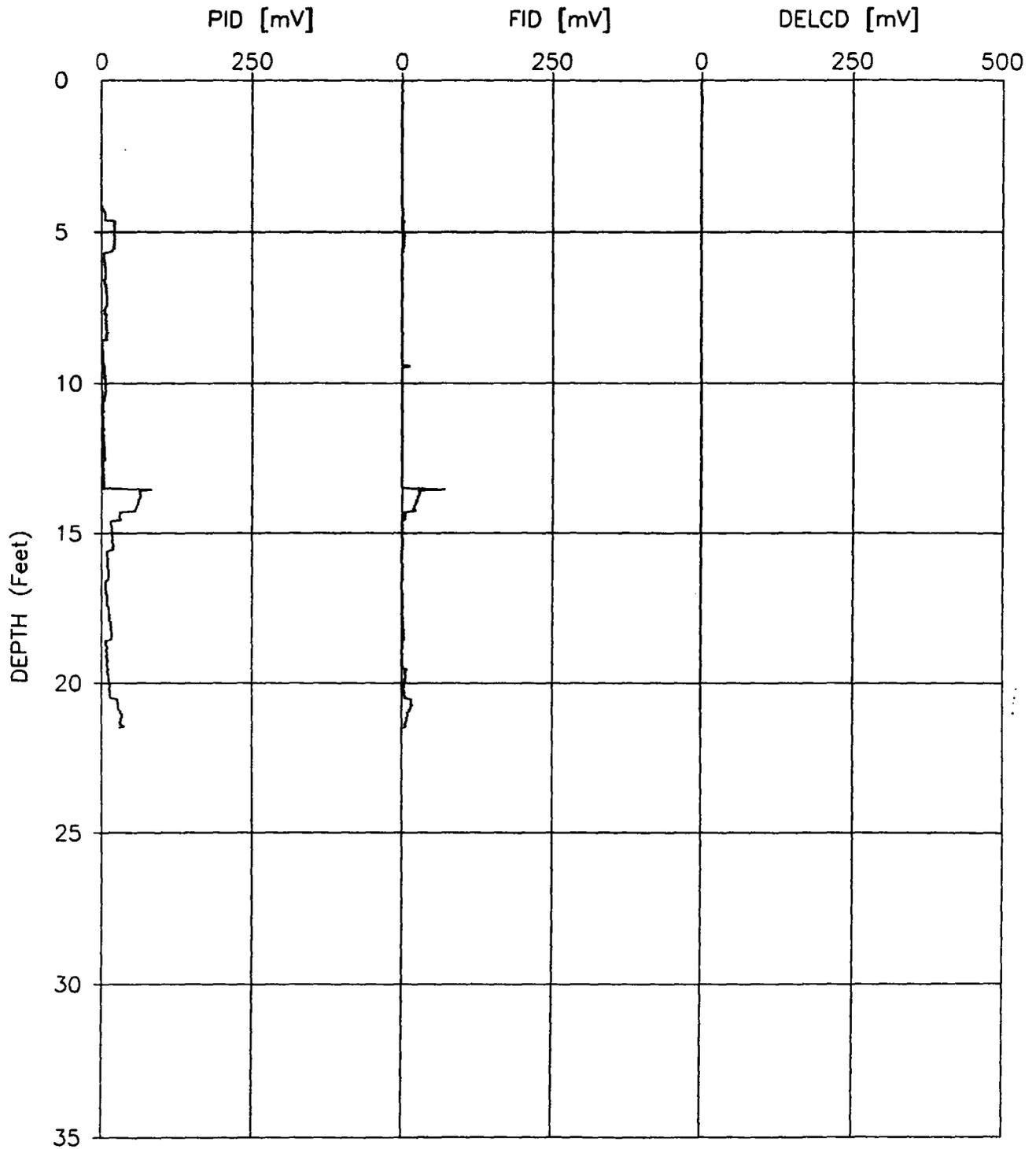


JOB NUMBER: 0304-0742

MIP TEST: MIP-19

PLATE: 1 OF 1

# MIP TEST RESULTS

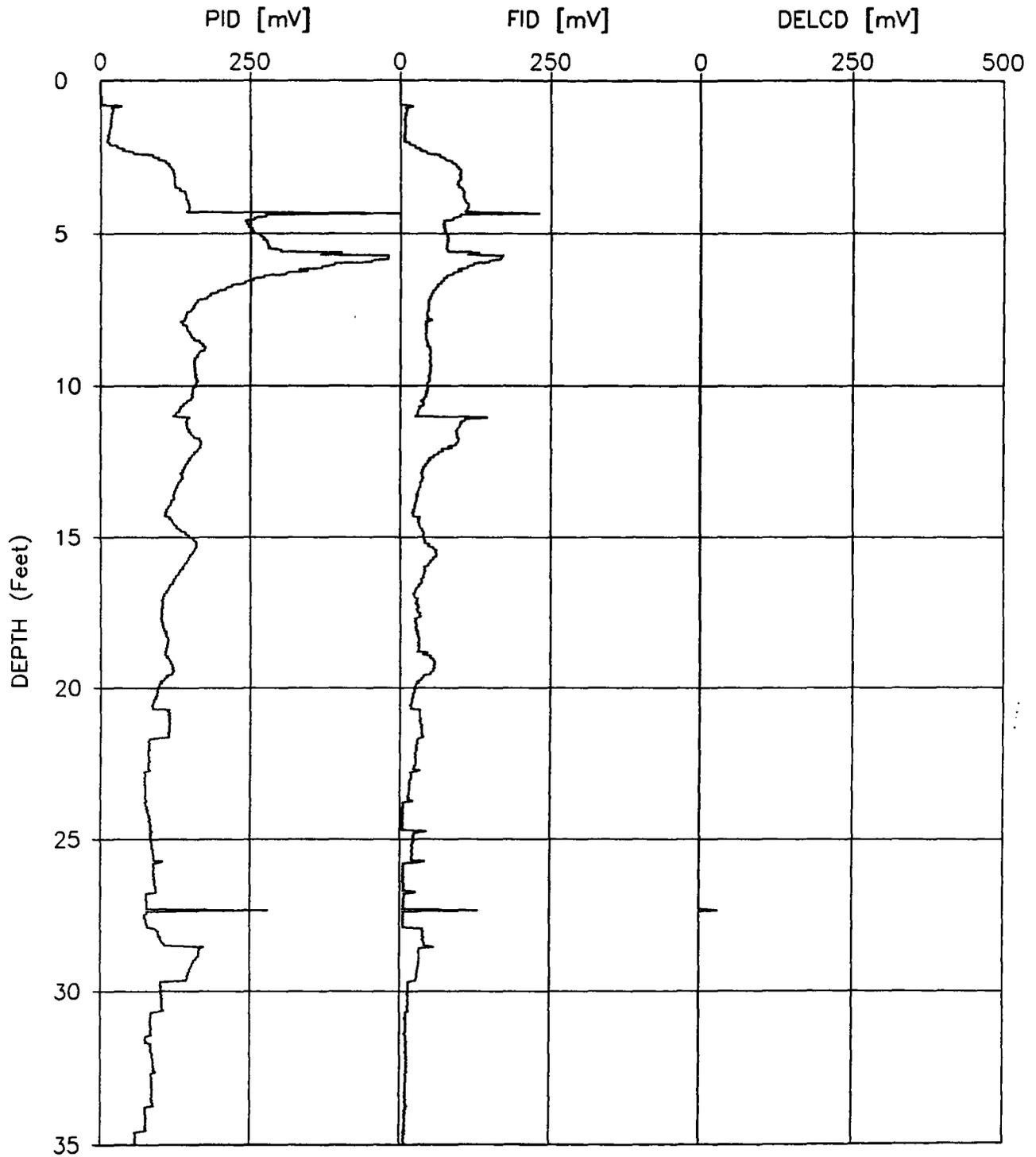


JOB NUMBER: 0304-0742

MIP TEST: MIP-20

PLATE: 1 OF 1

# MIP TEST RESULTS

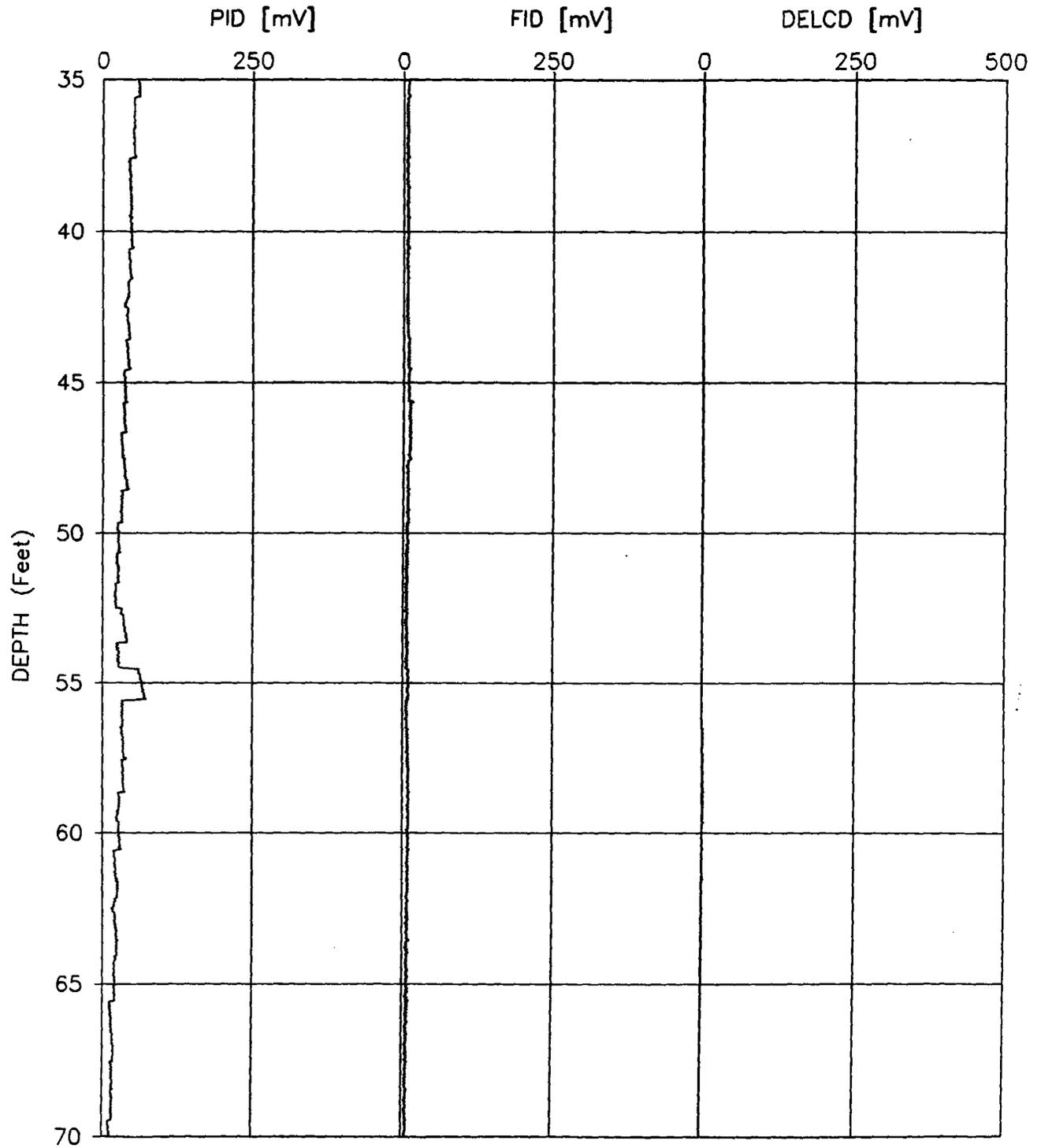


JOB NUMBER: 0304-0742

MIP TEST: MIP-21

PLATE: 1 OF 3

# MIP TEST RESULTS

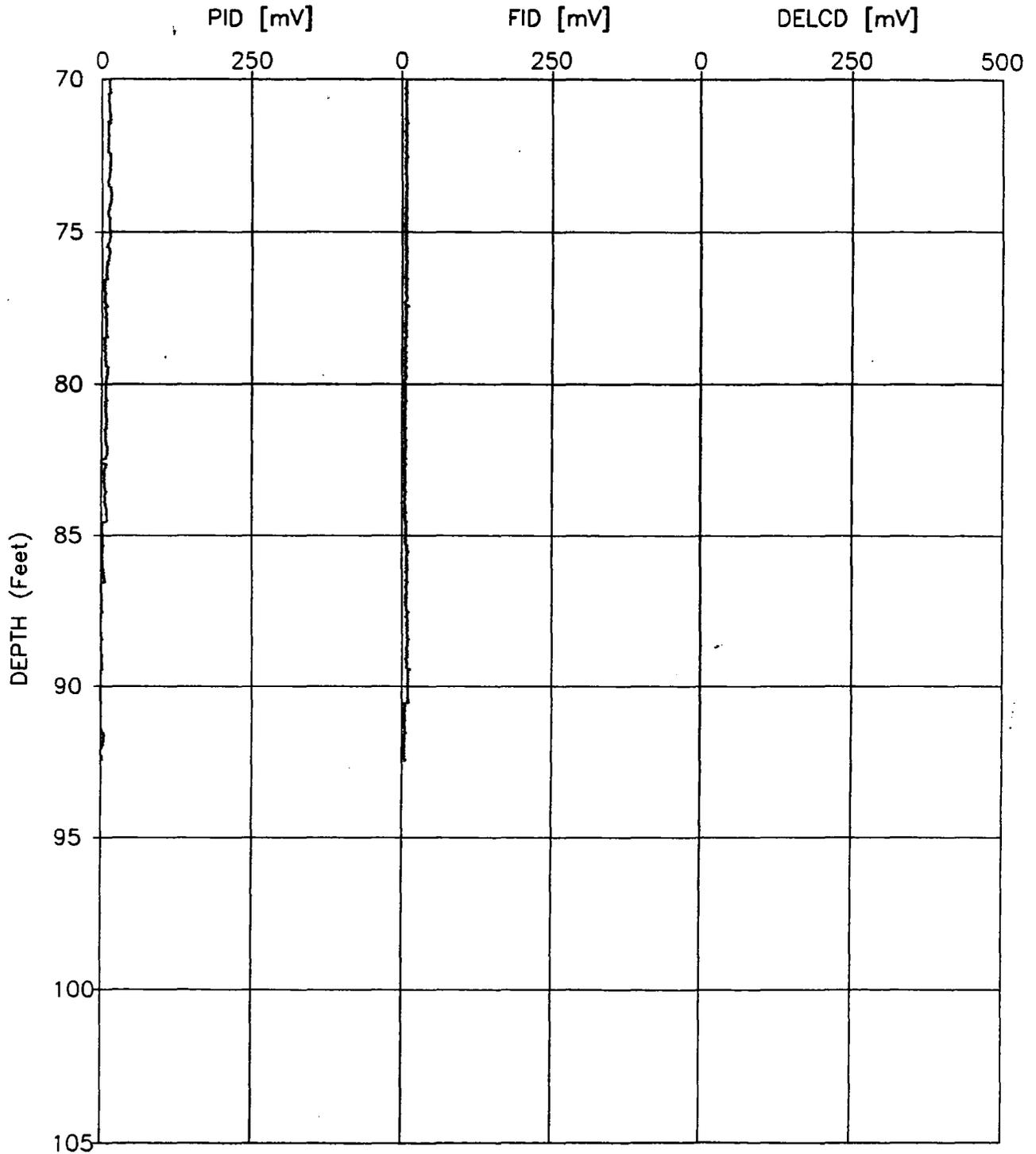


JOB NUMBER: 0304-0742

MIP TEST: MIP-21

PLATE: 2 OF 3

# MIP TEST RESULTS



JOB NUMBER: 0304-0742

MIP TEST: MIP-21

PLATE: 3 OF 3

**APPENDIX B**  
**SOIL BORING LOGS**



**BORING LOG**

BASE:	NAS Whiting Field	SITE ID:	AVGAS-E/2832	PROJECT NO:	N4038
BORING ID:	WHF-2832-SB01	PIEZOMETER ID:	N/A	WELL ID:	N/A
CONTRACTOR:	Fugro	COMPLETION DATE:	6/25/02	LOGGED BY:	G. Davis
METHOD:	DPT	BORING DIAMETER:	3 inch	TOTAL DEPTH (FT BLS):	40
TOC ELEVATION (FT MSL):	N/A	SCREEN INTERVAL:	N/A	DEPTH TO GW (FT BLS):	~17

DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (FT)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-1									Blind drilling to 20 feet bls to set surface casing.		
-2									See CPT/MIPs log in Appendix A for lithology.		
-3											
-4											
-5											
-6											
-7											
-8											
-9											
-10											
-11											
-12											
-13											
-14											
-15											
-16											
-17											
-18											
-19											
-20									Reddish Brown, Silty Clayey Sand, ~ 20% Clay, Loose	SC	



**BORING LOG**

BORING ID:		WHF-2832-SB01			LOGGED BY:		G. Davis			COMPLETION DATE:		6/25/03	
DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS		
			UNFILTERED	FILTERED	CORRECTED								
-21													
-22							Saturated		Reddish Brown, Silty Clayey Sand, ~ 20% Clay, Loose	SC			
-23								Strong Petrol Odor					
-24							Damp		Reddish Brown to Light Gray, Laminated, Silty Clay Trace Fine Sand	CL			
-25			87.5	0	87.5		36"						
-26									Loose to Soft, Reddish Brown, Silty, Clayey Fine Sand 30 to 40% Clay/ 10 to 20% Silt	SC			
-27							Moist to Damp		Hematite Silty, Clayey Sand, Laminated Reddish Brown to Light Gray Silty Clay	CL			
-28									1-2" Layers, Stiff, Reddish Brown, Silty Clay to Loose, Yellowish Brown, Silty Sand	SC			
-29								Slight Petrol Odor		CL			
-30			110.8	0	110.8		60"		As above, 2-5% Clay'	SC			
-31									Dense, Reddish Brown, Silty Clayey Sand, ~ 30 to 40% Clay	SM			
-32									Reddish to Yellow Brown Silty Sand, Trace Clay	SM			
-33									Gradational Color Change to White Beach Sand	SM			
-34									Trace Clay	SM			
-35			18.5	0	18.5		60"			SM			
-36									Loose, Reddish Brown, Silty, Clayey Sand	SC			
-37									Yellow 1.5" to 2", White then to 3-4" Light Olive Gray with 1/4" Dark gray	SM			
-38									Sharp Contact With White Beach Sand				
-39							Dry		Reddish Brown, Silty Sand				
-40	X	WHF2832GP1						None	White Beach Sand, Silty Sand, Boring Terminated				



**BORING LOG**

BASE:	NAS Whiting Field	SITE ID:	AVGAS-E/2832	PROJECT NO:	N4038
BORING ID:	WHF-AVGE-SB02	PIEZOMETER ID:	N/A	WELL ID:	N/A
CONTRACTOR:	Fugro	COMPLETION DATE:	7/10/02	LOGGED BY:	G. Davis
METHOD:	DPT	BORING DIAMETER:	3 inch	TOTAL DEPTH (FT BLS):	20
TOC ELEVATION (FT MSL):	N/A	SCREEN INTERVAL:	N/A	DEPTH TO GW (FT BLS):	9

DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (Inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-1									Dense, Brown Silty Clayey Sand, ~ 20-30% clay	SC	
-2							Damp	None	"		
-3									Medium-Dense, Black to Dark Gray Silty Clayey Sand, ~20 to 30% clay	SL	
-4							Wet	Strong Petrol	Soft, Light Gray Silty Sandy Clay	CL	
-5			2864	0	2864		54	Damp	Medium-Dense, Yellow Brown Silty Clayey Sand, ~40% clay	SC	
-6							Wet		Soft, Yellowish Brown Silty Sandy Clay	CL	
-7									"		
-8									Light Gray Silty Sand, Soft	CL	
-9							Saturated		Light Buff Brown Silty Sand, Loose, Red Hematitic Cement	SM	
-10			>5000	0	>5000		60	Strong Petrol	Redish to Yellowish Brown Silty Clayey Sand, Loose	CL/SL	
-11									Yellow to Light Buff brown Silty Sand with trace Clay, Loose	SM	
-12									"		
-13	X	AVGESSB0210	1422	0	1422				"		
-14							Saturated		Yellowish Brown Silty Clayey Sand, ~10-20% clay	SC	
-15							60		"		
-16									"		
-17							Saturated		Light Gray Silty Clayey Sand, ~10-20% clay, Loose	SC	
-18									"		
-19							Damp		Reddish Brown to Light Gray Mottled Silty Clay, ~ 5% fine sand, Stiff	CL	
-20	X	AVGESSB0220	0	0	0		60		"		



**BORING LOG**

BASE:	Whiting Field	SITE ID:	AVGAS-E/2832	PROJECT NO:	N4038
BORING ID:	WHF-2832-SB03	PIEZOMETER ID:	N/A	WELL ID:	N/A
CONTRACTOR:	Fugro	COMPLETION DATE:	6/22/02	LOGGED BY:	G. Davis
METHOD:	DPT	BORING DIAMETER:	3 inch	TOTAL DEPTH (FT BLS):	20
TOC ELEVATION (FT MSL):	N/A	SCREEN INTERVAL:	N/A	DEPTH TO GW (FT BLS):	12

DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (Inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-1									Yellow Brown Silty Clayey Sand, ~ 10-20% clay, Dense	SC	
-2									"		
-3			> 4337	0	>4337				Black to Light Gray, Staining present, ~35-45% clay, Soft	SC	
-4							Wet to Saturated		"		
-5			803.6	0	803.6		60		"		
-6									Yellow Orange to Yellow brown Silty Sandy Clay. ~ 60% clay, Soft to Dense	CL	
-7									"		
-8									"		
-9									Yellowish Brown to Light Gray Mottled Medium Sand, Dense	SC	
-10			325.1	0	325.1		60	Damp to Wet	"		
-11									"		
-12									Yellowish Brown to Light Gray Silty Sandy Clay, ~ 30 to 40% clay, Stiff	CL	
-13									"		
-14							Wet to Saturated		"		
-15	X	WHF2832GP3TW	55.7	2.0	53.7				Yellowish Brown to Light Gray Silty Sand, ~ 2 to 5% clay, Loose to Dense	SM	
-16									Light Gray Silty Sandy Clay, ~30 to 40% clay, Dense	SC	
-17									Reddish Brown Silty Sandy Clay, ~30 to 40% clay, Dense	CL	
-18									Yellowish Brown Silty Sandy Clay, ~30 to 40% clay, Dense	CL	
-19									"		
-20	X	WHF2832GP3TW	136	58	78				Light Gray Silty Sandy Clay, ~2% silt, 5-10% fine sand	CL	



**BORING LOG**

BASE:	NAS Whiting Field	SITE ID:	AVGAS-E/2832	PROJECT NO:	N4038
BORING ID:	WHF-2832-SB04	PIEZOMETER ID:	N/A	WELL ID:	N/A
CONTRACTOR:	FUGRO	COMPLETION DATE:	6/22/02	LOGGED BY:	G. Davis
METHOD:	DPT	BORING DIAMETER:	3 inch	TOTAL DEPTH (FT BLS):	40
TOC ELEVATION (FT MSL):	N/A	SCREEN INTERVAL:	N/A	DEPTH TO GW (FT BLS):	Dry

DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (Inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-1									Stiff to dense, brown to reddish brown		
-2									Silty, clayey sand, 30 to 40% clay	SC	
-3									Dark gray to black staining, rootlets		
-4			0	0	0				Soft to loose, greenish gray silty clayey sand,		
-5							54"	Wet to Saturated	20 to 30% clay		
-6									"		
-7									Color change to dark, reddish brown, silty clayey sand 40 to 50% clay	SC	
-8								Moist to Damp	"		
-9			0	0	0				Dense		
-10							60"		"	SC	
-11								Wet to Saturated	Soft to loose, same as above except 20 to 30% clay		
-12									"		
-13									"		
-14			0	0	0			Damp	Very stiff, reddish brown to light gray, mottled silty clay, 2% sand	CL	
-15							60"		"	SC	
-16									Dense, stiff clay stringer, reddish brown to yellowish brown, silty, clayey sand	CL	
-17									"	SC	
-18									Dense	CL	
-19			0	0	0				Dense clay stringer, stiff, 40 to 50% clay	SC	
-20							48"		Silty, clayey sand	SC	



**BORING LOG**

BORING ID:		WHF-2832-SB04		LOGGED BY:		G. Davis		COMPLETION DATE:		6/22/02	
DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (Inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-21										Stiff, reddish to yellowish silty clay with trace fine sand	CL
-22								Damp		"	
-23										Brown to light gray, mottled	CL
-24			0	0	0					Sand stringer	SC
-25							24"	Damp		Stiff, mottled clay as above	CL
-26										Stiff, reddish to yellow brown to light gray	CL
-27										Mottled clay w/ yellowish brown silty clayey sand stringers, 2 to 5% fine sand, 2% silt. Some laminations	SC
-28								Damp		Silty sandy clay 2 to 5% fine sand, 2% silt. Some laminations	CL
-29			0	0	0			Damp		"	
-30							60"			"	
-31										Loose, reddish brown to yellowish, silty, clayey sand	SC
-32								Damp		Stiff reddish brown to light gray silty clay, 2% silt, 2% fine sand	CL
-33										Soft, reddish to yellowish brown, silty sandy clay, 30% sand	CL
-34			0	0	0			Damp Moist		Loose, yellowish brown to light buff white to light gray, laminated, silty sand with trace clay	SM
-35							60"			"	
-36										Soft, reddish brown, silty sandy clay, 20% fine sand	CL
-37								Damp Moist		"	
-38										Loose, hematitic, reddish brown, to white 1ft from bottom, "beach" sand silty sand, trace clay	SM
-39			0	0	0					"	
-40							60"			Blind drilled to 120 ft bls to collect gw screening sample WHF2832GP4	



**BORING LOG**

BASE:	NAS Whiting Field	SITE ID:	AVGAS-E/2832	PROJECT NO:	N4038
BORING ID:	WHF-2832-SB05	PIEZOMETER ID:	N/A	WELL ID:	N/A
CONTRACTOR:	Fugro	COMPLETION DATE:	7/9/02	LOGGED BY:	G. Davis
METHOD:	DPT	BORING DIAMETER:	3 inch	TOTAL DEPTH (FT BLS):	20
TOC ELEVATION (FT MSL):	N/A	SCREEN INTERVAL:	N/A	DEPTH TO GW (FT BLS):	11

DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-1								Damp Wet	Dense, brown silty clayey sand	SC	
-2									Med-Dense, black to dark gray, silty, clayey sand, 20 to 30% clay	SC	
-3									"		
-4									Dense, yellowish brown to light gray, silty, clayey sand, 40% clay	SC	
-5			17.4	1.0	16.4		60"		"		
-6								Damp Wet	Dense to stiff, yellowish brown, silty sandy clay, 30% fine sand	CL	
-7									"		
-8									"		
-9									Hematitic, red silty sand, 5% clay	SM	
-10			8.8	0	8.8		60"		Dense, yellowish brown, silty, sand, 5% clay	SM	
-11									"	SM	
-12			147	1.3	145.7			Saturated	"		
-13									"		
-14								Wet	"		
-15			466.2	0	466.2		60"		Dense, light gray, silty clayey sand, 30 to 40% clay	SC	
-16									Stiff, light gray, silty sandy clay, 10 to 15% fine sand	CLI	
-17									"		
-18									"		
-19									"		
-20	X	AVGEGSB05020	142.4	0	142.4		60"		Stiff, reddish to yellowish brown, laminated, silty, sandy clay, 20% fine sand	CL	



**BORING LOG**

BASE:	NAS Whiting Field	SITE ID:	AVGAS-E/2832	PROJECT NO:	N4038
BORING ID:	WHF-2832-SB06	PIEZOMETER ID:	N/A	WELL ID:	N/A
CONTRACTOR:	Fugro	COMPLETION DATE:	6/21/02	LOGGED BY:	G. Davis
METHOD:	DPT	BORING DIAMETER:	3 inch	TOTAL DEPTH (FT BLS):	45
TOC ELEVATION (FT MSL):	N/A	SCREEN INTERVAL:	N/A	DEPTH TO GW (FT BLS):	11

DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-1									Light Brown Silty Clayey Sand, Dense	SC	
-2									"		
-3			1010	3.0	1007				Black to Dark Gray Silty Clayey Sand, Black Petroleum staining, Dense	SC	
-4			1205	1.3	1204				Black to Dark Gray Silty Clayey Sand, Black Petroleum staining, Loose	SC	
-5	X	WHF2832GP6TW					60	Wet	Yellow orange Silty Sand, gravelly clay, Soft	CL	
-6									Light Gray to Yellowish Orange Silty Clay, Medium Stiff, very little sand, no gravel	CL	
-7									"		
-8			35.7	0	35.7				"		
-9									"		
-10			331	0	331		60	Wet	Reddish Brown Silty Clayey Sand	SC	
-11									Light Buff Brown to Light Gray, mottled Silty Clayey Sand, ~20% clay	SC	
-12			300.2	95.5	204.5				"		
-13									"		
-14									"		
-15			320	0	320		60	Damp	"		
-16									As above, medium dense ~15% clay	SC	
-17			422.6	0	423				As above, loose		
-18									"		
-19								Saturated	Light Buff Brown to Light Gray, Silty Clay, Medium Stiff	CL	
-20							60		"		



**BORING LOG**

BORING ID:		WHF-2832-SB06			LOGGED BY:		G. DAVIS			COMPLETION DATE:		6/19/02	
DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (Inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS		
			UNFILTERED	FILTERED	CORRECTED								
-21								Wet		Light Reddish Brown to yellow Brown Silty Clayey Sand, ~20 to 30% clay, Medium Dense	CL		
-22			36.8	0	36.8					"	SC		
-23									Slight Petro	"	SC		
-24								Damp		Light reddish Brown to Yellowish Brown to Light Gray, mottled Silty Sandy Clay, ~5% Silt, 5% Sand, Stiff	CL		
-25						60				"	CL		
-26										"	CL		
-27										Yellow Brown to Buff Brown Silty Sand, ~1-2% clay, Loose	SM		
-28									Slight Petro	"	SM		
-29								Dry		"	SM		
-30			<10	0	<10		48			Light Gray to Reddish Brown Laminated Silty Sand, ~1-2% clay, Loose	SM		
-31										"	SM		
-32										White Silty Sand, ~1-2% clay, 10-15% Silt, 80-90% fine sand, Loose	SM		
-33										"	SM		
-34										"	SM		
-35			31.5	0	31.5		48	Damp/Dry		"	SM		
-36										"	SM		
-37										"	SM		
-38										Reddish to Yellowish Brown Silty Clayey Sand, ~5-10% clay, Loose	SM		
-39										Reddish to Yellowish Brown Silty Clayey Sand, ~5-10% clay, Loose	SC		
-40	X	WHF2832GP6	0	0	0		30	Dry to Moist		White Silty Sand, Loose	SM		



### BORING LOG

BORING ID: WHF-2832-SB06		LOGGED BY: G. Davis		COMPLETION DATE: 6/19/02							
DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (Inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-41										White Silty Sand, Loose	SM
-42										"	SM
-43										Yellowish Brown to reddish Brown Silty Sand, Loose	SM
-44										White Silty Sand, Loose	SM
-45			0	0	0		54	Dry to Moist		White Silty Sand, Loose	SM
-46											
-47											
-48											
-49											
-50											
-51											
-52											
-53											
-54											
-55											
-56											
-57											
-58											
-59											
-60										Blind drilled to 120 ft bls to collect gw screening sample WHF2832GP6GW	





**BORING LOG**

BORING ID:		WHF-2832-SBO7			LOGGED BY:		G. Davis		COMPLETION DATE:		6/24/02	
DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (Inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS	
			UNFILTERED	FILTERED	CORRECTED							
-21			111.3	0	111.3			Saturated	Slight Petrol	Siff to loose, reddish to yellowish brown silty sand, 2 to 5% clay	CL	
-22										Stiff, yellowish brown, silty, sandy clay	SM	
-23										"	CL	
-24								Damp		"		
-25							24"			"		
-26			48.0	0	48.0				Slight Petrol	Soft, light gray, silty, sandy clay. 10 to 20% fine, 10% silty, sand	CL	
-27								Damp		"		
-28										Loose to stiff, 2-3" layers, silty sand, and silty, sandy clay	SM CL	
-29										Loose, yellowish to reddish brown silty sand	SM	
-30			4.0	0	4.0		60"			"		
-31								Damp Moist		Loose, reddish to yellow brown to buff, light brown silty sand with trace clay	SM	
-32										"		
-33			36.2	0	36.2				Slight Petrol	Color change, hematiti, reddish brown, silty sand		
-34								Dry		Loose, white, beach sand, silty sand with trace clay	SM	
-35							60"			"		
-36								Wet Damp		Soft, med-dense, reddish to yellowish brown, silty, clayey sand	CL SC	
-37										"		
-38									Very Slight	Loose, white, beach sand, silty sand with trace clay		
-39										"		
-40			0	0	0		48"			Blind drilled to 120 feet to collect gw screening sample WHF2832GP7		



**BORING LOG**

BASE:	NAS Whiting Field	SITE ID:	AVGAS-E/2832	PROJECT NO:	N4038
BORING ID:	WHF-2832-SB08	PIEZOMETER ID:	N/A	WELL ID:	N/A
CONTRACTOR:	Fugro	COMPLETION DATE:	7/9/02	LOGGED BY:	G. Davis
METHOD:	DPT	BORING DIAMETER:	3inch	TOTAL DEPTH (FT BLS):	25
TOC ELEVATION (FT MSL):	N/A	SCREEN INTERVAL:	N/A	DEPTH TO GW (FT BLS):	3

DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-1									Loose, brown silty, clayey sand to dense, black to dark gray, silty, clayey sand, 40% clay	SC	
-2											
-3							Wet		Loose, light brown to light gray, silty, clayey sand, 20 % clay		
-4									"		
-5	X	AVGESSB0805	1208.6	0	1208.6		54"		Stiff, light gray silty, sandy clay, 20% sand		
-6									"		
-7									Dense, light gray, silty, clayey sand, 20% clay	SC	
-8							Damp		Stiff, light gray, silty clay, with trace sand	CL	
-9									"		
-10			0	0	0		60"	Wet	Strong Petrol	Loose, buff brown, fine silty sand, 5 to 10% clay	SM
-11										Stiff, light gray, silty, sandy clay	CL
-12							Saturated	Strong Petrol	Loose, light gray to light buff brown, silty, fine sand, with trace clay	SM	
-13									"		
-14									"		
-15			849	0	849		Saturated		"		
-16									Dense, light gray, silty, clayey sand, 30% clay	SC	
-17									Loose, light gray to lt buff brown	SM	
-18							Saturated	None	"		
-19									Silty sand with trace clay		
-20		WHF2832GP8TW	414	1.8	412.2				"		





**BORING LOG**

BASE:	NAS Whiting Field	SITE ID:	AVGAS-E/2832	PROJECT NO:	N4038
BORING ID:	WHF-2832-SB09	PIEZOMETER ID:	N/A	WELL ID:	N/A
CONTRACTOR:	Fugro	COMPLETION DATE:	7/9/02	LOGGED BY:	G. Davis
METHOD:	DPT	BORING DIAMETER:	3inch	TOTAL DEPTH (FT BLS):	25
TOC ELEVATION (FT MSL):	N/A	SCREEN INTERVAL:	N/A	DEPTH TO GW (FT BLS):	4

DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (Inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-1								Damp		Loose, brown silty, clayey sand	SC
-2										Stiff, yellowish brown, silty clay	CL
-3								Petrol		Dense, dark black to dark gray, mottled, silty, clayey sand, 30% clay	SC
-4	X	AVGESSB0904	> 50,000	0	> 50,000			Damp		"	
-5						60"				Stiff, yellowish brown, silty clay, ~5% silt and fine sand	CL
-6								Damp		"	
-7										Stiff, light gray, silty clay	CL
-8										"	
-9								Damp		Loose, light yellowish brown to light gray, silty, clayey sand, 20% clay	SC
-10			38.2	0	38.2	60"		Dry		Dense, hematitic, red, silty sand	SM
-11										"	
-12										Dense, light gray, silty, clayey sand, 30 to 40% clay	SC
-13								Damp		Stiff, reddish to yellowish brown, silty clay	CL
-14										Dense, light gray, silty, clayey sand	SC
-15			0	0	0					Stiff, reddish to yellowish brown, silty, clay	CL SM
-16										Dense, light gray, silty sand, 5 to 10% clay	
-17										Stiff, light gray, silty, sandy clay, 5% fine sand	CL
-18								Damp		Soft, yellowish brown, silty, sandy clay. 30% fine sand	CL
-19										Dense, reddish brown to yellowish brown, laminated, silty, clayey sand, 30 to 40% clay	
-20			0	0	0					"	



**BORING LOG**

BASE:	NAS Whiting Field	SITE ID:	AVGAS/2832	PROJECT NO:	N4038
BORING ID:	WHF-2832-SB10	PIEZOMETER ID:	N/A	WELL ID:	N/A
CONTRACTOR:	Fugro	COMPLETION DATE:	7/11/02	LOGGED BY:	G. Davis
METHOD:	DPT	BORING DIAMETER:	3inch	TOTAL DEPTH (FT BLS):	25
TOC ELEVATION (FT MSL):	N/A	SCREEN INTERVAL:	N/A	DEPTH TO GW (FT BLS):	6

DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-1									Dense, brown to reddish brown, silty, clayey sand, ~20-30% clay	SC	
-2							Damp		"		
-3									"		
-4								Slight Petrol	Soft, yellowish brown to gray, to black, silty, clayey sand, ~30 to 40% clay		
-5	X		54.7	0	54.7		54"		"	SC	
-6							Wet	Slight Petrol	Soft to loose, yellowish brown to light gray to brown, silty, clayey sand, ~20 to 30% clay	SC	
-7									"		
-8									~5 to 10% coarse sand to fine gravel		
-9							Wet		Sharp contact		
-10	X	AVGESSB1010	0	0	0		60"		Med-dense, yellowish brown to light gray, mottled, silty, clayey sand, ~15 to 20% clay	SC	
-11									Stiff, reddish to yellowish brown, to light gray mottled, silty sandy clay, ~5-10% silt, ~5-10% fine sand	CL	
-12							Damp		"		
-13									"		
-14									"		
-15	X	AVGEGWB1015	0	0	0		60"		Dense, mottled, reddish to yellowish brown, silty, clayey sand, 10 to 20% clay, hematitic red seams	SC	
-16									Stiff, yellowish brown ochre, sandy clay, ~20% fine sand	CL	
-17							Damp		Dense, pinkish red to light buff brown, silty, clayey, fine sand, 5 to 10% clay	SM	
-18									"		
-19									Stiff, reddish to yellowish silty clay	CL	
-20			0	0	0		60"	Damp to Wet	Dense, pinkish red to light gray, silty, clayey fine sand	SM	







**BORING LOG**

BASE:	NAS Whiting Field	SITE ID:	AVGAS-E/2832	PROJECT NO:	N4038
BORING ID:	WHF-2832-SB12	PIEZOMETER ID:	N/A	WELL ID:	N/A
CONTRACTOR:	Fugro	COMPLETION DATE:	6/22/02	LOGGED BY:	G. Davis
METHOD:	DPT	BORING DIAMETER:	3 inch	TOTAL DEPTH (FT BLS):	24
TOC ELEVATION (FT MSL):	NA	SCREEN INTERVAL:	N/A	DEPTH TO GW (FT BLS):	6

DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-1									Soft, light brown to reddish brown, to brown, silty, clayey sand, ~30 to 40% clay, ~10% silt	SC	
-2									"		
-3									Dense, grayish brown, silty, clayey sand, ~30 to 40% clay, ~10% silt	SC	
-4									"		
-5	X	WHF2832GP12TW	215.1	0	215.1		48"		"		
-6							Wet to Saturated		Soft to dense, yellowish brown to hematitic reddish brown, silty clayey sand, ~40 to 50% clay, ~10% silt	SC	
-7									"		
-8									"		
-9									"		
-10							60"	Damp	"		
-11									Dense, dark reddish brown, clayey, silty sand, ~40 to 50% clay, ~10% silt	SC	
-12									"		
-13									"		
-14									"		
-15							60"	Damp	"		
-16									"		
-17									"		
-18									"		
-19									"		
-20							60"	Damp	"	SC	



**BORING LOG**

BORING ID: WHF-2832-SB12		LOGGED BY: G. Davis		COMPLETION DATE: 6/22/02							
DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (Inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-21								Wet Saturated		Med dense to loose, yellowish brown, silty, clayey sand, ~10% clay, ~10% silt	SC
-22										"	
-23										"	
-24		WHF2832GP12TW						Damp		Stiff, silty, sandy clay	CL
-25							48"				
-26											
-27											
-28											
-29											
-30											
-31											
-32											
-33											
-34											
-35											
-36											
-37											
-38											
-39											
-40										Blind drilled to 125 ft bls to collect gw screening sample WHF2832GP12	



**BORING LOG**

DEPTH (FT)		SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
				UNFILTERED	FILTERED	CORRECTED						
BASE:		NAS Whiting Field			SITE ID:		AVGAS-E-Bldg-2832			PROJECT NO: N4038		
BORING ID:		WHF-2832-SB13			PIEZOMETER ID:		N/A			WELL ID: N/A		
CONTRACTOR:		Fugro			COMPLETION DATE:		7/10/02			LOGGED BY: G. Davis		
METHOD:		DPT			BORING DIAMETER:		3 inch			TOTAL DEPTH (FT BLS): 25		
TOC ELEVATION (FT MSL):					SCREEN INTERVAL:		N/A			DEPTH TO GW (FT BLS): 6		
-1								Dry		Dense, reddish brown, silty, clayey sand, rootlets	SC	
-2										Dense, dark black to gray		
-3			0	0	0					Dense, light gray, silty, clayey sand, ~30 to 40% clay		
-4										"		
-5							60"			Yellowish brown, silty, clayey sand. 30% clay	SC	
-6								Damp		Soft	SC	
-7									Slight Petrol	Yellowish brown, silty, sandy clay	CL	
-8								Damp		Stiff, reddish to yellowish brown, to light gray, mottled, silty, sandy clay, ~20% fine sand	CL	
-9										"		
-10			0	0	0		60"			"		
-11										Sharp contact, 1" to 1" thick layers	SM	
-12								Damp Dry		Loose, reddish brown, silty, clayey sand, ~5 to 10% clay	SM	
-13										Med-dense, light buff brown, silty sand, with trace clay	SM	
-14										"		
-15			0	0	0		60"	Dry		1-1/2" reddish brown, silty, sandy clay, ~5 to 10% fine sand	CL SM	
-16										Med-dense to dense, light pink to light buff brown, mottled, silty, fine sand, with trace clay,		
-17								Dry		very fine grained	SM	
-18										"		
-19										"		
-20			0	0	0		60"	Moist Damp		Dense to stiff, light pinkish red, silty, clayey sand, ~30 to 40% clay	SC	





**BORING LOG**

BASE:	NAS Whiting Field	SITE ID:	AVGAS-E/2832	PROJECT NO:	N4038
BORING ID:	WHF-2832-SB14	PIEZOMETER ID:	N/A	WELL ID:	N/A
CONTRACTOR:	Fugro	COMPLETION DATE:	7/10/02	LOGGED BY:	G. Davis
METHOD:	DPT	BORING DIAMETER:	3inch	TOTAL DEPTH (FT BLS):	25
TOC ELEVATION (FT MSL):	N/A	SCREEN INTERVAL:	N/A	DEPTH TO GW (FT BLS):	6

DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (Inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-1									Dense, brown, silty, clayey sand, ~20% clay	SC	
-2									Med-dense, black to gray, to yellowish brown, silty clayey sand, ~20 to 30% clay		
-3									"		
-4								Damp	Dense, 30 to 40% clay		
-5			0	0	0		60"		"		
-6								Damp	Soft to loose, yellowish brown to light gray, mottled, silty sandy clay, ~5 to 10% fine sand	CL	
-7									"		
-8								Damp	Stiff, silty, sandy clay	CL	
-9									Dense, dark reddish brown, silty, clayey sand, ~20 to 30% clay	SC	
-10			0	0	0		60"		"		
-11								Damp	Dense, yellowish brown, silty, clayey sand, ~10 to 20% clay	SC	
-12									Stiff, reddish to yellowish brown clay, ~5% fine sand	CL SC	
-13									Yellowish brown, silty, clayey sand, ~30 to 40% clay	SC	
-14								Damp	Dense, reddish to yellowish brown, to light pinkish red, mottled, silty, clayey, ~10 to 20% clay		
-15			0	0	0		60"		"		
-16									"		
-17									"		
-18								Damp	"		
-19									"		
-20			0	0	0		60"	Dry	Stiff, dark reddish brown to light yellowish brown, mottled, sandy clay, 20% fine sand	CL	



**BORING LOG**

BORING ID: WHF-2832-SB14		LOGGED BY: G. Davis		COMPLETION DATE: 7/10/02							
DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (Inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-21										Continued from 20'	CL
-22								Dry		Loose, reddish brown to light buff brown, silty sand with trace clay	SM
-23										Stiff, reddish brown to light pinkish red, mottled, silty, sandy clay, ~5 to 10% fine sand	CL
-24										"	
-25			0	0	0		60"			Lt pinkish red, silty san, very fine grained	SM
-26											
-27											
-28											
-29											
-30											
-31											
-32											
-33											
-34											
-35											
-36											
-37											
-38											
-39											
-40										Blind drilled to 120 ft bls to collect gw screening sample AVGEGWB14120	



**BORING LOG**

BASE:	NAS Whiting Field	SITE ID:	AVGAS-E/2832	PROJECT NO:	N4038
BORING ID:	WHF-2832-SB16	PIEZOMETER ID:	N/A	WELL ID:	N/A
CONTRACTOR:	Fugro	COMPLETION DATE:	7/10/02	LOGGED BY:	G. Davis
METHOD:	DPT	BORING DIAMETER:	3inch	TOTAL DEPTH (FT BLS):	20
TOC ELEVATION (FT MSL):	N/A	SCREEN INTERVAL:	N/A	DEPTH TO GW (FT BLS):	13

DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (Inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-1									Dense, brown, silty, clayey sand, ~20 to 30% clay	SC	
-2							Damp		Soft to med-dense, black to dark gray, ~30 to 40% clay		
-3									"		
-4							Moist Wet		Dense, gray, ~10 to 20% clay		
-5			0	0	0		60"		Dense, light gray, silty, clayey sand, ~40 to 50% clay		
-6									"		
-7							Damp		Soft to med-dense, light gray, silty clay	SC	
-8									"		
-9								Slight Petrol	Stiff to dense, angular contact, with greenish to yellowish brown, silty, clayey sand	CL	
-10	X	AVGESSB1610	351.6	0	351.6		60"	Damp	Loose, white to light gray silty sand, with trace clay	SC SM	
-11							Wet Saturated		"		
-12									Dense, light gray, silty, clayey sand	SC	
-13									"		
-14							Damp Wet		"		
-15			0	0	0		60"		"		
-16							Saturated		Soft to loose		
-17									"		
-18									Med dense		
-19									Stiff, hard, ochre to hematitic red, iron cemented, silty sand, with trace clay		
-20		AVGEGWB1620	0	0	0		60"	Damp Dry	Loose, light buff brown, silty sand	SM	



**BORING LOG**

BASE:	NAS Whiting Field	SITE ID:	AVGAS-E/2832	PROJECT NO:	N4038
BORING ID:	WHF-2832-SB17	PIEZOMETER ID:	N/A	WELL ID:	N/A
CONTRACTOR:	Fugro	COMPLETION DATE:	7/9/02	LOGGED BY:	G. Davis
METHOD:	DPT	BORING DIAMETER:	3inch	TOTAL DEPTH (FT BLS):	20
TOC ELEVATION (FT MSL):	N/A	SCREEN INTERVAL:	N/A	DEPTH TO GW (FT BLS):	3

DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-1									Dense, brown, silty, clayey sand. 40% clay	SC	
-2									Black to dark gray, silty, clayey sand		
-3							Wet Saturated		Loose to, cont' below		
-4									Dense, light brown, silty, clayey sand. 10% clay	SC	
-5						54"			Stiff, yellowish brown, silty, sandy clay. 10% fine sand	CL	
-6							Damp		"	CL SC	
-7							Wet		Loose, light gray, silty, clayey sand. 10% clay		
-8	X	AVGESSB1708	44.6	2.4	42.2				1/4" greenish, yellowish brown, cemented, silty sand, to loose, yellowish brown, to light gray. 5 to 10% clay	SM SM	
-9							Damp to Wet		"		
-10						42"			"		
-11									" Loose	" SM	
-12									1/4" greenish, yellowish brown, cemented, silty sand. 30 to 40% clay		
-13									Dense, light gray, silty, clayey sand. 30 to 40% clay	SC	
-14			0	0	0				"	CL	
-15						60"			Yellowish brown, silty clay. 2" hematitic, silty sand. Hard iron cemented		
-16									Stiff, reddish brown to yellowish brown, to light gray, laminated, silty, sandy clay. 5% fine sand		
-17							Damp		"	CL	
-18									"		
-19							Damp		Dense-stiff, mottled, reddish to dense yellowish brown, silty, clayey sand. 30 to 40% clay	SC CL	
-20		AVGEGWB1710	0	0	0				"	SC	



**BORING LOG**

BASE:	NAS Whiting Field	SITE ID:	AVGAS-E/2832	PROJECT NO:	N4038
BORING ID:	WHF-2832-SB18	PIEZOMETER ID:	N/A	WELL ID:	N/A
CONTRACTOR:	Fugro	COMPLETION DATE:	6/19/02	LOGGED BY:	G. Davis
METHOD:	DPT	BORING DIAMETER:	3inch	TOTAL DEPTH (FT BLS):	110
TOC ELEVATION (FT MSL):		SCREEN INTERVAL:	N/A	DEPTH TO GW (FT BLS):	120

DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (Inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-1									Light brown to dark gray, silty, clayey sand	SC	
-2							Dry		"		
-3									"		
-4									Stiff, yellow orange to light gray, silty, sandy clay. 20% fine sand, 10% silt	CL	
-5			0	0	0		60"		"		
-6							Moist		"		
-7									"	CL	
-8									Loose, light gray, silty sand. 5% clay	SC	
-9							Saturated		"		
-10			0	0	0		60"		Stiff, mottled, yellow brown to light gray Dense, bright reddish brown, silty, clayey sand	CL SC	
-11									"		
-12									Dense, light buff brown to light gray, mottled, silty, clayey sand. 5 to 10% clay		
-13							Damp		"	SC	
-14									Light gray, fine grained sand		
-15							42"		"		
-16									Stiff, reddish brown to yellowish brown, to light gray. 30% fine sand	CL	
-17									"		
-18							Damp		"		
-19									"		
-20			0	0	0		42"	Dry	Loose, light buff brown, silty sand	SM	



**BORING LOG**

BORING ID:		WHF-2832-SB18		LOGGED BY:		G. Davis		COMPLETION DATE:		6/19/02	
DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (Inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-21								Dry		Continued from 20'	
-22										Loose to dense, reddish to yellow brown, to light gray, mottled, silty, clayey sand	Sc
-23										"	
-24								Moist Dry		"	
-25			0	0	0		24"			Stiff, silty, sandy clay	CL
-26										Loose, yellowish brown to light buff brown, silty sand. 25% clay	
-27										"	SM
-28										Dark purplish red (rust colored). 3" layer	
-29								Dry		"	
-30							36"			"	SM
-31										Light reddish pink layers	
-32								Dry		Loose, to white beach sand at bottom, fine, silty sand 2 to 5% clay, 10 to 15% silt	
-33										"	
-34										"	
-35							36"			"	
-36										"	
-37										Loose, white, beach sand. Fine, rare, laminate of mica-biotite.	
-38										Fine, silty sand	
-39								Damp		Trace clay	
-40							36"			10 to 15% silt, fine sand	SM



**BORING LOG**

BORING ID: WHF-2832-SB18		LOGGED BY: G. Davis		COMPLETION DATE: 6/19/02							
DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-41										Continued from 40'	"
-42										Loose, same as above, except 5% coarse sand	
-43											SC
-44										Med-stiff, very light pinkish gray, silty clay. 5 to 10% silt. Muscovite silt, with 6" layer of clay	CL
-45							42"			Loose, white, beach sand as above, except fine with muscovite	SM
-46											
-47										Dense, laminated, reddish brown to light brown, silty, clayey sand	
-48											SM
-49										Loose, white, beach sand. Same as above, (45')	
-50							30"				
-51											
-52										Loose, white, beach sand	
-53								Damp		Silty sand	SM
-54										Trace clay	
-55							24"			Stiff, very light, pinkish gray, silty clay White, beach sand	CL SC
-56								Damp		Dense, light pinkish brown, silty, clayey sand. 30 to 40% clay. 10 to 15% silt	
-57											
-58										Loose, white, beach sand	
-59											
-60							42"	Dry		Fine, silty sand	SM



**BORING LOG**

BORING ID: WHF-2832-SB18		LOGGED BY: G. Davis		COMPLETION DATE: 6/20/02							
DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (Inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-61										Liner jammed. No recovery to 63'	
-62										"	
-63										"	
-64										Dense, light brown, obtained screening sample	SC
-65	X						30"			Loose, white, beach sand	SM
-66								Damp		Dense, pinkish brown, silty, clayey sand Soft, light pinkish brown, silty clay	SC CL
-67										Dense, silty, clayey sand	CL SC
-68								Dry		Loose, white, beach sand	SM
-69										Silty sand	
-70										"	
-71										Liner jammed. No recovery. washed out of smple tube. Somewhat clayey	
-72										"	
-73										"	
-74	X									"	
-75										Loose, white beach sand, and silty sand, obtained screening sample	
-76										"	
-77										Loose, white beach sand. Liner jammed	
-78										Silty sand, fine at top to med grained at bottom	
-79										"	
-80							40"			" clay Screening sample obtained	"



**BORING LOG**

BORING ID: WHF-2832-SB18		LOGGED BY: G. Davis		COMPLETION DATE: 6/20/02							
DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-81										Problems with sampler getting jammed	
-82										and piston getting jammed, due to haing to drive	
-83										with the hammer to sampling point	
-84										Changed to pre-probe point to drive to 110' without	
-85							NR			sampling. There we will attempt to sample	
-86										above the water table at 113', based on the	
-87										water levels in adjacent wells	
-88										"	
-89										"	
-90							NR			"	
-91										"	
-92										"	
-93										"	
-94										"	
-95							NR			Soft to push without hammering. Probable clay layers	
-96										"	
-97										"	
-98										"	
-99										"	
-100							NR			"	



**BORING LOG**

BORING ID: WHF-2832-SB18		LOGGED BY: G. Davis		COMPLETION DATE: 6/20/02							
DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (Inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-101										" Continued from 100'	"
-102										" Probable clay as before	"
-103										" Hammering again	"
-104										"	
-105							NR			"	
-106										"	
-107										"	
-108										"	
-109										Tried to open sampler at 108' after hammering. To no avail. Will drive screen point sampler to collect water.	
-110							NR			"	
-111											
-112											
-113											
-114											
-115											
-116											
-117											
-118											
-119											
-120	X	WHF2832GP18								Drove to 120' to collect gw screening sample	





**BORING LOG**

BASE:	NAS Whiting Field	SITE ID:	AVGAS-E/2832	PROJECT NO:	N4038
BORING ID:	WHF-2832-SB22	PIEZOMETER ID:	N/A	WELL ID:	N/A
CONTRACTOR:	Fugro	COMPLETION DATE:	6/24/02	LOGGED BY:	G. Davis
METHOD:	DPT	BORING DIAMETER:	3inch	TOTAL DEPTH (FT BLS):	30
TOC ELEVATION (FT MSL):	N/A	SCREEN INTERVAL:	N/A	DEPTH TO GW (FT BLS):	6

DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-1									Loose, light brown, silty sand	SC	
-2									Dense, dark brown, silty, clayey sand. 20 to 30% clay	SC	
-3									Dense, light buff brown, silty, clayey sand	SC	
-4							Damp		"		
-5			0	0	0		60"		Stiff, light buff brown to gray, silty, sandy clay. 5 to 10% fine sand	CL	
-6							Wet		Loose, light brown to light gray, silty sand. 2 to 5% clay	SM	
-7									"		
-8									"		
-9									Stiff, light gray, silty, sandy clay. 2% silt, 5 to 10% fine sand		
-10			0	0	0		48"	Damp	"		
-11									"	SC	
-12	X	WHF2832GP22	49.0	0	49.0			Saturated Wet	Loose, light gray, silty, clayey sand. 20 to 30% clay		
-13									"		
-14									"		
-15			0	0	0		42"		Loose, color change to yellowish brown, to light gray. 20 to 30% clay. Mn concretions	SC	
-16									Magnsite concretions		
-17								Wet Saturated	Light gray, silty, clayey sand. 30 to 40% clay	SC	
-18		AVGEGSB022020							"		
-19									Hematitic gravel, Reddish brown to buff brown, to white, silty sand., with trace clay	SM	
-20			0	0	0		54"		Hematitic gravel & iron cemented sand	SM	



**BORING LOG**

BORING ID: WHF-2832-SB22		LOGGED BY: G. Davis		COMPLETION DATE: 6/24/02							
DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6')	RECOVERY (Inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-21										" Continued from 20' "	
-22								Dry		Reddish to yellowish brown, silty sand, with trace clay	
-23										"	
-24										"	SM
-25			0	0	0		60"			"	
-26								Wet		Yellowish brown to light gray, silty sand, with trace clay. 2 to 5% clay	
-27										"	
-28								Damp Moist		Hematitic gravel	SM
-29								Wet Saturated		White, beach sand	
-30			0	0	0		36"	Damp Wet		3" yellowish brown, silty, sandy clay, with trace clay	CL SM
-31								Dry		White, beach sand	SM
-32											
-33											
-34											
-35											
-36											
-37											
-38											
-39											
-40										Blind drilled to 120 ft bls to collect gw screening sample WHF2832GP22	



**BORING LOG**

BASE:	NAS Whiting Field	SITE ID:	AVGAS-E/2832	PROJECT NO:	N4038
BORING ID:	WHF-2832-SB23	PIEZOMETER ID:	N/A	WELL ID:	N/A
CONTRACTOR:	Fugro	COMPLETION DATE:	7/11/03	LOGGED BY:	G. Davis
METHOD:	DPT	BORING DIAMETER:	3inch	TOTAL DEPTH (FT BLS):	20
TOC ELEVATION (FT MSL):	N/A	SCREEN INTERVAL:	N/A	DEPTH TO GW (FT BLS):	6

DEPTH (FT)	SAMPLE INTERVAL	SAMPLE ID	FID (PPM)			SPT BLOWS (PER 6")	RECOVERY (Inches)	MOISTURE	ODOR	LITHOLOGIC DESCRIPTION	USCS
			UNFILTERED	FILTERED	CORRECTED						
-1									Dense, black, silty clayey sand, 20 to 30% clay	SC	
-2									"		
-3									"		
-4									"		
-5	X	AVGESSB2305	950	0	950		54"		Soft to medium dense, black, silty, clayey sand, 20 to 30% clay	SC	
-6								Wet	Lt Gray to yellowish brown, mottled		
-7									Loose to soft, 20 to 30% clay		
-8			81	0	81				"		
-9									"		
-10							60"		Stiff, yellowish brown, silty clay w/ trace fine sand	CL	
-11								Damp	"		
-12									"		
-13									Dense, light yellowish brown to light gray, clayey silt	SM	
-14									Stiff/Hard, Light yellow, silty clay, hrmatited red, cemented	CL	
-15			0	0	0		60"	Damp	Loose, Light pinkish red, silty sand. Fine to medium grained. 2 to 5% clay	SM	
-16									"		
-17								Dry Damp	Dense, light pinkish red to light buff brown, clayey silt to silty, fine sand. 2 to 20% clay. Very fine grained	SM	
-18									"		
-19									"		
-20			0	0	0		60"		"		







**APPENDIX C**  
**SOIL LABORATORY ANALYTICAL REPORTS**

## Report of Analysis

<b>Client Sample ID:</b> AVGELSLB0205		<b>Date Sampled:</b> 10/01/02	
<b>Lab Sample ID:</b> F14890-11		<b>Date Received:</b> 10/03/02	
<b>Matrix:</b> SO - Soil		<b>Percent Solids:</b> 81.1	
<b>Method:</b> SW846 8260B			
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038			

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K010598.D	1	10/14/02	NAF	n/a	n/a	VK421
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	7.15 g	5.0 ml	100 ul
Run #2			

## VOA Special List

CAS No.	Compound	Result	RL	Units	Q
71-43-2	Benzene	241	220	ug/kg	
75-27-4	Bromodichloromethane	ND	220	ug/kg	
75-25-2	Bromoform	ND	220	ug/kg	
108-90-7	Chlorobenzene	ND	220	ug/kg	
75-00-3	Chloroethane	ND	220	ug/kg	
67-66-3	Chloroform	ND	220	ug/kg	
56-23-5	Carbon tetrachloride	ND	220	ug/kg	
75-34-3	1,1-Dichloroethane	ND	220	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	220	ug/kg	
107-06-2	1,2-Dichloroethane	ND	220	ug/kg	
78-87-5	1,2-Dichloropropane	ND	220	ug/kg	
124-48-1	Dibromochloromethane	ND	220	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	220	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	220	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	220	ug/kg	
541-73-1	m-Dichlorobenzene	ND	220	ug/kg	
95-50-1	o-Dichlorobenzene	ND	220	ug/kg	
106-46-7	p-Dichlorobenzene	ND	220	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	220	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	220	ug/kg	
100-41-4	Ethylbenzene	2570	220	ug/kg	
74-83-9	Methyl bromide	ND	220	ug/kg	
74-87-3	Methyl chloride	ND	220	ug/kg	
75-09-2	Methylene chloride	ND	430	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	220	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	220	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	220	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	220	ug/kg	
127-18-4	Tetrachloroethylene	ND	220	ug/kg	
108-88-3	Toluene	6260	220	ug/kg	
79-01-6	Trichloroethylene	ND	220	ug/kg	
75-69-4	Trichlorofluoromethane	ND	220	ug/kg	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

000063

## Report of Analysis

<b>Client Sample ID:</b> AVGELSLB0205	<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-11	<b>Date Received:</b> 10/03/02
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 81.1
<b>Method:</b> SW846 8260B	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

## VOA Special List

CAS No.	Compound	Result	RL	Units	Q
75-01-4	Vinyl chloride	ND	220	ug/kg	
1330-20-7	Xylene (total)	2760	650	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	90%		70-130%
2037-26-5	Toluene-D8	101%		79-121%
460-00-4	4-Bromofluorobenzene	99%		77-133%
17060-07-0	1,2-Dichloroethane-D4	88%		72-133%

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

000064

## Report of Analysis

<b>Client Sample ID:</b> AVGELSLB0205	<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-11	<b>Date Received:</b> 10/03/02
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 81.1
<b>Method:</b> FLORIDA-PRO SW846 3550B	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP24440.D	1	10/10/02	SKW	10/07/02	OP6043	GOP863
Run #2							

Run #	Initial Weight	Final Volume
Run #1	29.4 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH (C8-C40)	27.7	10	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	90%		57-127%	

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

000065

Report of Analysis

<b>Client Sample ID:</b> AVGELSLB0205	<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-11	<b>Date Received:</b> 10/03/02
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 81.1
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Metals Analysis

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	12.1	0.57	0.32	mg/kg	1	10/16/02	10/17/02 DM	SW846 6010B	SW846 3050B
Cadmium	0.32 B	0.46	0.030	mg/kg	1	10/16/02	10/17/02 DM	SW846 6010B	SW846 3050B
Chromium	56.7	1.1	0.049	mg/kg	1	10/16/02	10/17/02 DM	SW846 6010B	SW846 3050B
Lead	11.9	11	0.14	mg/kg	1	10/16/02	10/17/02 DM	SW846 6010B	SW846 3050B

RL = Reporting Limit  
 IDL = Instrument Detection Limit

U = Indicates a result < IDL  
 B = Indicates a result > ~~0.00066~~ RL

## Report of Analysis

<b>Client Sample ID:</b> AVGESLB0205B	<b>Date Sampled:</b> 11/20/02
<b>Lab Sample ID:</b> F15551-3	<b>Date Received:</b> 11/22/02
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 80.8
<b>Method:</b> EPA 8310 SW846 3550B	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AA013258.D	1	12/03/02	MRE	11/25/02	OP6442	GAA628
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.9 g	5.0 ml
Run #2		

## Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	800	200	ug/kg	
208-96-8	Acenaphthylene	ND	800	200	ug/kg	
120-12-7	Anthracene	ND	400	200	ug/kg	
56-55-3	Benzo(a)anthracene	ND	400	100	ug/kg	
50-32-8	Benzo(a)pyrene	ND	80	20	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	80	20	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	80	20	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	80	20	ug/kg	
218-01-9	Chrysene	ND	400	100	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	80	20	ug/kg	
206-44-0	Fluoranthene	ND	400	100	ug/kg	
86-73-7	Fluorene	ND	400	200	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	80	20	ug/kg	
91-20-3	Naphthalene	ND	400	100	ug/kg	
90-12-0	1-Methylnaphthalene	ND	400	100	ug/kg	
91-57-6	2-Methylnaphthalene	ND	400	100	ug/kg	
85-01-8	Phenanthrene	ND	400	200	ug/kg	
129-00-0	Pyrene	ND	400	100	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	85%		38-139%
92-94-4	p-Terphenyl	96%		46-149%

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> AVGELSLB0604	<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-9	<b>Date Received:</b> 10/03/02
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 84.8
<b>Method:</b> SW846 8260B	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #1	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K010597.D	1	10/14/02	NAF	n/a	n/a	VK421
Run #2							

Run #1	Initial Weight	Final Volume	Methanol Aliquot
Run #1	7.85 g	5.0 ml	100 ul
Run #2			

## VOA Special List

CAS No.	Compound	Result	RL	Units	Q
71-43-2	Benzene	635	190	ug/kg	
75-27-4	Bromodichloromethane	ND	190	ug/kg	
75-25-2	Bromoform	ND	190	ug/kg	
108-90-7	Chlorobenzene	ND	190	ug/kg	
75-00-3	Chloroethane	ND	190	ug/kg	
67-66-3	Chloroform	ND	190	ug/kg	
56-23-5	Carbon tetrachloride	ND	190	ug/kg	
75-34-3	1,1-Dichloroethane	ND	190	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	190	ug/kg	
107-06-2	1,2-Dichloroethane	ND	190	ug/kg	
78-87-5	1,2-Dichloropropane	ND	190	ug/kg	
124-48-1	Dibromochloromethane	ND	190	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	190	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	190	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	190	ug/kg	
541-73-1	m-Dichlorobenzene	ND	190	ug/kg	
95-50-1	o-Dichlorobenzene	ND	190	ug/kg	
106-46-7	p-Dichlorobenzene	ND	190	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	190	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	190	ug/kg	
100-41-4	Ethylbenzene	3030	190	ug/kg	
74-83-9	Methyl bromide	ND	190	ug/kg	
74-87-3	Methyl chloride	ND	190	ug/kg	
75-09-2	Methylene chloride	ND	380	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	190	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	190	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	190	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	190	ug/kg	
127-18-4	Tetrachloroethylene	ND	190	ug/kg	
108-88-3	Toluene	224	190	ug/kg	
79-01-6	Trichloroethylene	ND	190	ug/kg	
75-69-4	Trichlorofluoromethane	ND	190	ug/kg	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

000055

## Report of Analysis

<b>Client Sample ID:</b>	AVGELSLB0604	<b>Date Sampled:</b>	10/01/02
<b>Lab Sample ID:</b>	F14890-9	<b>Date Received:</b>	10/03/02
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	84.8
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	NAS Whiting Field- (CTO#200) N4038		

## VOA Special List

CAS No.	Compound	Result	RL	Units	Q
75-01-4	Vinyl chloride	ND	190	ug/kg	
1330-20-7	Xylene (total)	3510	560	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	92%		70-130%
2037-26-5	Toluene-D8	109%		79-121%
460-00-4	4-Bromofluorobenzene	99%		77-133%
17060-07-0	1,2-Dichloroethane-D4	89%		72-133%

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

000056

**Report of Analysis**

<b>Client Sample ID:</b> AVGELSLB0604	<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-9	<b>Date Received:</b> 10/03/02
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 84.8
<b>Method:</b> FLORIDA-PRO SW846 3550B	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP24438.D	1	10/10/02	SKW	10/07/02	OP6043	GOP863
Run #2							

Run #	Initial Weight	Final Volume
Run #1	29.9 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH (C8-C40)	8.94	9.9	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	88%		57-127%

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

**000057**

## Report of Analysis

<b>Client Sample ID:</b> AVGELSLB0604	<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-9	<b>Date Received:</b> 10/03/02
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 84.8
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

**Metals Analysis**

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	11.8	0.54	0.30	mg/kg	1	10/16/02	10/17/02 DM	SW846 6010B	SW846 3050B
Cadmium	0.15 B	0.43	0.028	mg/kg	1	10/16/02	10/17/02 DM	SW846 6010B	SW846 3050B
Chromium	60.9	1.1	0.046	mg/kg	1	10/16/02	10/17/02 DM	SW846 6010B	SW846 3050B
Lead	8.4 B	11	0.13	mg/kg	1	10/16/02	10/17/02 DM	SW846 6010B	SW846 3050B

RL = Reporting Limit  
 IDL = Instrument Detection Limit

U = Indicates a result < IDL  
 B = Indicates a result >= IDL but < RL

**000058**

## Report of Analysis

<b>Client Sample ID:</b> AVGESLB0604B	<b>Date Sampled:</b> 11/20/02
<b>Lab Sample ID:</b> F15551-2	<b>Date Received:</b> 11/22/02
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.8
<b>Method:</b> EPA 8310 SW846 3550B	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AA013257.D	1	12/03/02	MRE	11/25/02	OP6442	GAA628
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.2 g	5.0 ml
Run #2		

## Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	770	190	ug/kg	
208-96-8	Acenaphthylene	ND	770	190	ug/kg	
120-12-7	Anthracene	ND	390	190	ug/kg	
56-55-3	Benzo(a)anthracene	ND	390	96	ug/kg	
50-32-8	Benzo(a)pyrene	ND	77	19	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	77	19	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	77	19	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	77	19	ug/kg	
218-01-9	Chrysene	ND	390	96	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	77	19	ug/kg	
206-44-0	Fluoranthene	ND	390	96	ug/kg	
86-73-7	Fluorene	ND	390	190	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	77	19	ug/kg	
91-20-3	Naphthalene	ND	390	96	ug/kg	
90-12-0	1-Methylnaphthalene	ND	390	96	ug/kg	
91-57-6	2-Methylnaphthalene	ND	390	96	ug/kg	
85-01-8	Phenanthrene	ND	390	190	ug/kg	
129-00-0	Pyrene	ND	390	96	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	83%		38-139%
92-94-4	p-Terphenyl	97%		46-149%

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

0012

## Report of Analysis

<b>Client Sample ID:</b> AVGELSLB1004	<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-8	<b>Date Received:</b> 10/03/02
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 79.5
<b>Method:</b> SW846 8260B	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K010596.D	1	10/14/02	NAF	n/a	n/a	VK421
Run #2							

Run #	Initial Weight
Run #1	7.48 g
Run #2	

## VOA Special List

CAS No.	Compound	Result	RL	Units	Q
71-43-2	Benzene	ND	4.2	ug/kg	
75-27-4	Bromodichloromethane	ND	4.2	ug/kg	
75-25-2	Bromoform	ND	4.2	ug/kg	
108-90-7	Chlorobenzene	ND	4.2	ug/kg	
75-00-3	Chloroethane	ND	4.2	ug/kg	
67-66-3	Chloroform	ND	4.2	ug/kg	
56-23-5	Carbon tetrachloride	ND	4.2	ug/kg	
75-34-3	1,1-Dichloroethane	ND	4.2	ug/kg	
75-35-4	1,1-Dichloroethylene	ND	4.2	ug/kg	
107-06-2	1,2-Dichloroethane	ND	4.2	ug/kg	
78-87-5	1,2-Dichloropropane	ND	4.2	ug/kg	
124-48-1	Dibromochloromethane	ND	4.2	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	4.2	ug/kg	
156-59-2	cis-1,2-Dichloroethylene	ND	4.2	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	4.2	ug/kg	
541-73-1	m-Dichlorobenzene	ND	4.2	ug/kg	
95-50-1	o-Dichlorobenzene	ND	4.2	ug/kg	
106-46-7	p-Dichlorobenzene	ND	4.2	ug/kg	
156-60-5	trans-1,2-Dichloroethylene	ND	4.2	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	4.2	ug/kg	
100-41-4	Ethylbenzene	ND	4.2	ug/kg	
74-83-9	Methyl bromide	ND	4.2	ug/kg	
74-87-3	Methyl chloride	ND	4.2	ug/kg	
75-09-2	Methylene chloride	ND	8.4	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	4.2	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	4.2	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	4.2	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	4.2	ug/kg	
127-18-4	Tetrachloroethylene	ND	4.2	ug/kg	
108-88-3	Toluene	ND	4.2	ug/kg	
79-01-6	Trichloroethylene	ND	4.2	ug/kg	
75-69-4	Trichlorofluoromethane	ND	4.2	ug/kg	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

000051

**Report of Analysis**

<b>Client Sample ID:</b> AVGELSLB1004		<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-8		<b>Date Received:</b> 10/03/02
<b>Matrix:</b> SO - Soil		<b>Percent Solids:</b> 79.5
<b>Method:</b> SW846 8260B		
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
75-01-4	Vinyl chloride	ND	4.2	ug/kg	
1330-20-7	Xylene (total)	ND	13	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	97%		70-130%
2037-26-5	Toluene-D8	100%		79-121%
460-00-4	4-Bromofluorobenzene	110%		77-133%
17060-07-0	1,2-Dichloroethane-D4	100%		72-133%

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

**000052**

**Report of Analysis**

<b>Client Sample ID:</b> AVGELSLB1004	
<b>Lab Sample ID:</b> F14890-8	<b>Date Sampled:</b> 10/01/02
<b>Matrix:</b> SO - Soil	<b>Date Received:</b> 10/03/02
<b>Method:</b> FLORIDA-PRO SW846 3550B	<b>Percent Solids:</b> 79.5
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP24437.D	1	10/10/02	SKW	10/07/02	OP6043	GOP863
Run #2							

Run #	Initial Weight	Final Volume
Run #1	29.7 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH (C8-C40)	42.2	11	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	92%		57-127%

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b>	AVGELSLB1004	<b>Date Sampled:</b>	10/01/02
<b>Lab Sample ID:</b>	F14890-8	<b>Date Received:</b>	10/03/02
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	79.5
<b>Project:</b>	NAS Whiting Field- (CTO#200) N4038		

**Metals Analysis**

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	0.37 U	0.66	0.37	mg/kg	1	10/16/02	10/17/02 DM	SW846 6010B	SW846 3050B
Cadmium	0.034 U	0.52	0.034	mg/kg	1	10/16/02	10/17/02 DM	SW846 6010B	SW846 3050B
Chromium	13.2	1.3	0.056	mg/kg	1	10/16/02	10/17/02 DM	SW846 6010B	SW846 3050B
Lead	6.3 B	13	0.16	mg/kg	1	10/16/02	10/17/02 DM	SW846 6010B	SW846 3050B

RL = Reporting Limit  
 IDL = Instrument Detection Limit

U = Indicates a result < IDL  
 B = Indicates a result >= IDL but < RL

**000054**

Report of Analysis

<b>Client Sample ID:</b> AVGESLB1004B	<b>Date Sampled:</b> 11/20/02
<b>Lab Sample ID:</b> F15551-1	<b>Date Received:</b> 11/22/02
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 89.1
<b>Method:</b> EPA 8310 SW846 3550B	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AA013256.D	1	12/03/02	MRE	11/25/02	OP6442	GAA628
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.2 g	5.0 ml
Run #2		

Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	740	190	ug/kg	
208-96-8	Acenaphthylene	ND	740	190	ug/kg	
120-12-7	Anthracene	ND	370	190	ug/kg	
56-55-3	Benzo(a)anthracene	ND	370	93	ug/kg	
50-32-8	Benzo(a)pyrene	ND	74	19	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	74	19	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	74	19	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	74	19	ug/kg	
218-01-9	Chrysene	ND	370	93	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	74	19	ug/kg	
206-44-0	Fluoranthene	ND	370	93	ug/kg	
86-73-7	Fluorene	ND	370	190	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	74	19	ug/kg	
91-20-3	Naphthalene	ND	370	93	ug/kg	
90-12-0	1-Methylnaphthalene	ND	370	93	ug/kg	
91-57-6	2-Methylnaphthalene	ND	370	93	ug/kg	
85-01-8	Phenanthrene	ND	370	190	ug/kg	
129-00-0	Pyrene	ND	370	93	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	84%		38-139%
92-94-4	p-Terphenyl	96%		46-149%

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound



# CHAIN OF CUSTODY

4405 VINELAND ROAD • SUITE C-15  
 ORLANDO, FL 32811  
 TEL: 407-425-6700 • FAX: 407-425-0707

ACCUTEST JOB #: **F14890**  
 ACCUTEST QUOTE #:

CLIENT INFORMATION		FACILITY INFORMATION		ANALYTICAL INFORMATION				MATRIX CODES	
NAME: Tetra Tech Nus		PROJECT NAME: AVGAS-E, Bldg. 2832		8260B FL-PRO As, Cd, Cr, Pb				DW - DRINKING WATER	
ADDRESS: 5421 Beaumont Center Blvd, Ste 660		LOCATION: Whiting Field NAS						GW - GROUND WATER	
CITY, STATE, ZIP: Tampa FL 33639		PROJECT NO.:						WW - WASTE WATER	
SEND REPORT TO: Paul Calligan		FAX #: 813-806-0405						SO - SOIL	
PHONE #: 813 806-0202								SL - SLUDGE	
						OI - OIL			
						LIQ - OTHER LIQUID			
						SOL - OTHER SOLID			

ACCUTEST SAMPLE #	FIELD ID / POINT OF COLLECTION	COLLECTION			MATRIX	# OF BOTTLES	PRESERVATION						LAB USE ONLY		
		DATE	TIME	SAMPLED BY:			HCl	NH <sub>4</sub> OH	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NONE	Other			
3	AVGESLB1004	10-01-02	1030	YJD	SO	5						3	1	1	
4	AVGESLB0604	10-01-02	1055	YJD	SO	5						3	1	1	
10	AVGESLB0904	10-01-02	1515	YJD	SO	5						3	1	1	
11	AVGESLB0205	10-01-02	1700	YJD	SO	5						3	1	1	
12	AVGESLFDW	10-01-02	2000	YJD	SO	5						3	1	1	

DATA TURNAROUND INFORMATION	DATA DELIVERABLE INFORMATION	COMMENTS/REMARKS
<input checked="" type="checkbox"/> STANDARD <input type="checkbox"/> 48 HOUR RUSH <input type="checkbox"/> 24 HOUR EMERGENCY <input type="checkbox"/> OTHER _____ APPROVED BY: _____ EMERGENCY OR RUSH IS FAX DATA UNLESS PREVIOUSLY APPROVED	<input type="checkbox"/> STANDARD <input type="checkbox"/> COMMERCIAL "B" <input type="checkbox"/> DISK DELIVERABLE <input type="checkbox"/> STATE FORMS <input type="checkbox"/> OTHER (SPECIFY) _____	_____ _____ _____

**SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY**

RELINQUISHED BY: 1. <i>Angie J. Davis</i>	DATE TIME: 10-02-02 / 1100	RECEIVED BY: 1. <i>FedEx</i>	RELINQUISHED BY: 2. _____	DATE TIME: 10/30/02-0805	RECEIVED BY: 2. <i>Paul Calligan</i>
RELINQUISHED BY: 3. _____	DATE TIME: _____	RECEIVED BY: 3. _____	RELINQUISHED BY: 4. _____	DATE TIME: _____	RECEIVED BY: 4. _____
RELINQUISHED BY: 5. _____	DATE TIME: _____	RECEIVED BY: 5. _____	SEAL # _____	PRESERVE WHERE APPLICABLE <input type="checkbox"/>	ON ICE <input checked="" type="checkbox"/> 24.18.20a



# CHAIN OF CUSTODY

4405 VINELAND ROAD • SUITE C-15  
ORLANDO, FL 32811  
TEL: 407-425-6700 • FAX: 407-425-0707

ACCUTEST JOB #: **F15551**  
ACCUTEST QUOTE #:

<b>CLIENT INFORMATION</b> NAME: <u>Tetra Tech NUS, Inc.</u> ADDRESS: <u>5421 Beaumont Center Blvd.</u> <u>Suite 660</u> CITY: <u>Tampa</u> STATE: <u>FL</u> ZIP: <u>33634</u> SEND REPORT TO: <u>Paul Calligan</u> PHONE #: <u>(813) 806-0202</u>		<b>FACILITY INFORMATION</b> PROJECT NAME: <u>NAS Whiting Field</u> LOCATION: <u>Av Gas Pipeline section E (2832)</u> <u>N4038</u> PROJECT NO.: <u>CTO-200</u> FAX #: <u>(813) 806-0405</u>		<b>ANALYTICAL INFORMATION</b>				<b>MATRIX CODES</b> DW - DRINKING WATER GW - GROUND WATER WW - WASTE WATER SO - SOIL SL - SLUDGE OI - OIL LIQ - OTHER LIQUID SOL - OTHER SOLID	
---	--	---	--	-------------------------------	--	--	--	--	--

ACCUTEST SAMPLE #	FIELD ID / POINT OF COLLECTION	COLLECTION			MATRIX	# OF BOTTLES	PRESERVATION					PAHs (2310)	LAB USE ONLY
		DATE	TIME	SAMPLED BY:			HCl	NiOH	HNO3	H2SO4	NONE		
1)	AVGESLB1φφ4B	11-20-02	14:30	P. Calligan	soil	1					X		
2)	AVGESLBφ6φ4B	11-20-02	15:00	P. Calligan	soil	1					X		
3)	AVGESLBφ2φ5B	11-20-02	15:30	P. Calligan	soil	1					X		

<b>DATA TURNAROUND INFORMATION</b> <input checked="" type="checkbox"/> STANDARD <input type="checkbox"/> 48 HOUR RUSH <input type="checkbox"/> 24 HOUR EMERGENCY <input type="checkbox"/> OTHER _____ EMERGENCY OR RUSH IS FAX DATA UNLESS PREVIOUSLY APPROVED		<b>APPROVED BY:</b> _____ <input type="checkbox"/> STANDARD <input type="checkbox"/> COMMERCIAL "B" <input type="checkbox"/> DISK DELIVERABLE <input type="checkbox"/> STATE FORMS <input checked="" type="checkbox"/> OTHER (SPECIFY) <u>As per MSA-0402-N413-04 AND WR N4038-WR01</u>		<b>DATA DELIVERABLE INFORMATION</b>		<b>COMMENTS/REMARKS</b> <u>Work Release N4038-WR01</u>	
---	--	--	--	-------------------------------------	--	---	--

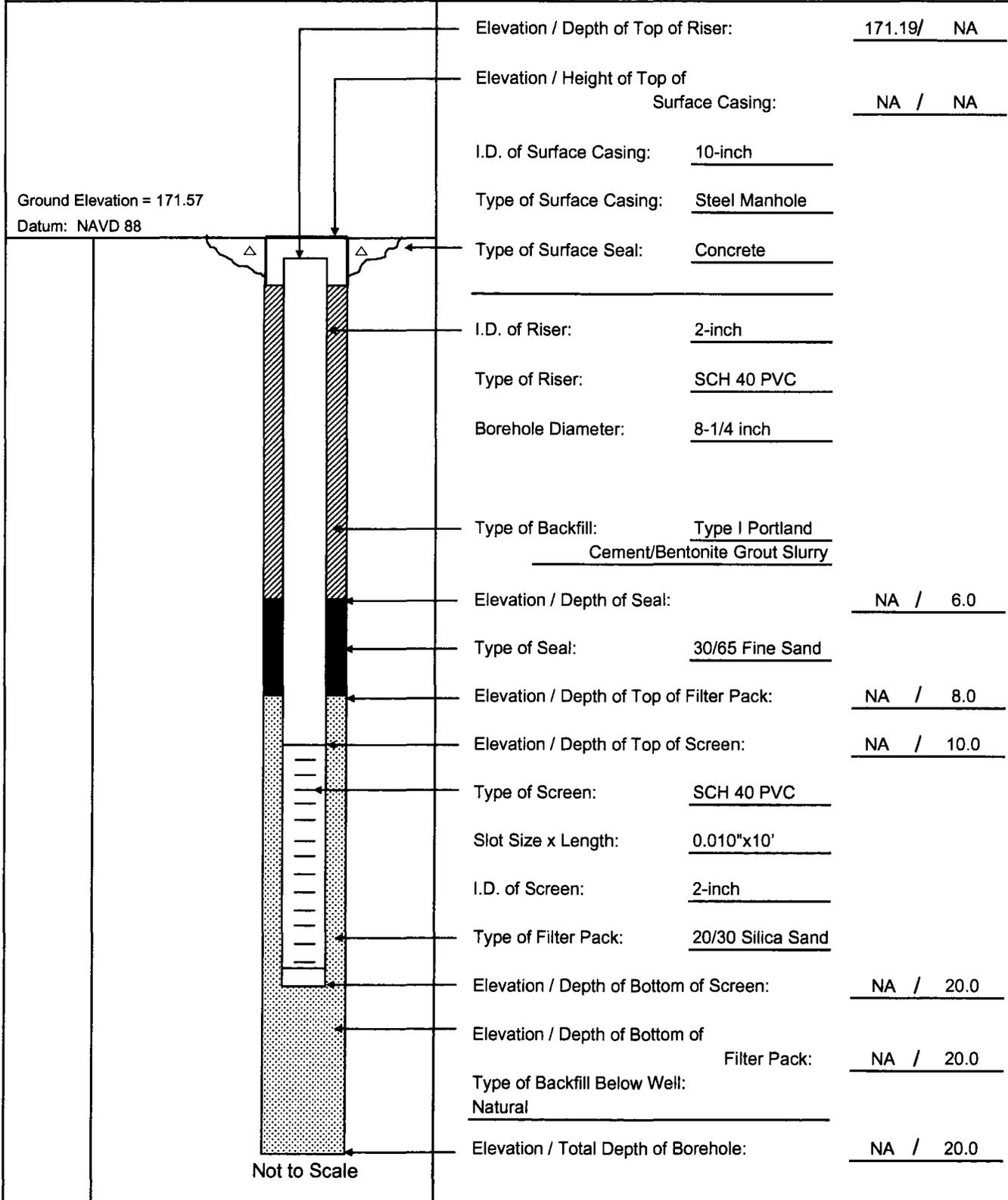
SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY					
RELINQUISHED BY: <u>Paul E. Calligan</u>	DATE TIME: <u>11-21-02/18335</u>	RECEIVED BY: <u>Fed Ex Air Bill</u>	RELINQUISHED BY: <u>FedEx</u>	DATE TIME: <u>11-20-000</u>	RECEIVED BY: <u>[Signature]</u>
1. # <u>837567911358</u>		2. #			
RELINQUISHED BY: _____	DATE TIME: _____	RECEIVED BY: _____	RELINQUISHED BY: _____	DATE TIME: _____	RECEIVED BY: _____
3.		3.	4.		4.
RELINQUISHED BY: _____	DATE TIME: _____	RECEIVED BY: _____	SEAL # _____	PRESERVE WHERE APPLICABLE <input type="checkbox"/>	ON ICE <input checked="" type="checkbox"/> 24 TEMPERATURE _____ C
5.		5.			

**APPENDIX D**  
**MONITORING WELL COMPLETION FORMS**



**MONITORING WELL SHEET**

PROJECT:	<u>AVGAS-E</u>	DRILLING Co.:	<u>Kelly Drilling</u>	BORING No.:	<u>N/A</u>
PROJECT No.:	<u>N4038</u>	DRILLER:		DATE COMPLETED:	<u>06/30/01</u>
SITE:	<u>BLDG 2832</u>	DRILLING METHOD:	<u>Hollow Stem Auger</u>	NORTHING:	<u>631,881.35</u>
GEOLOGIST:	<u>Gary Davis</u>	DEV. METHOD:	<u>Centrifugal Pump</u>	EASTING:	<u>1,178,137.63</u>



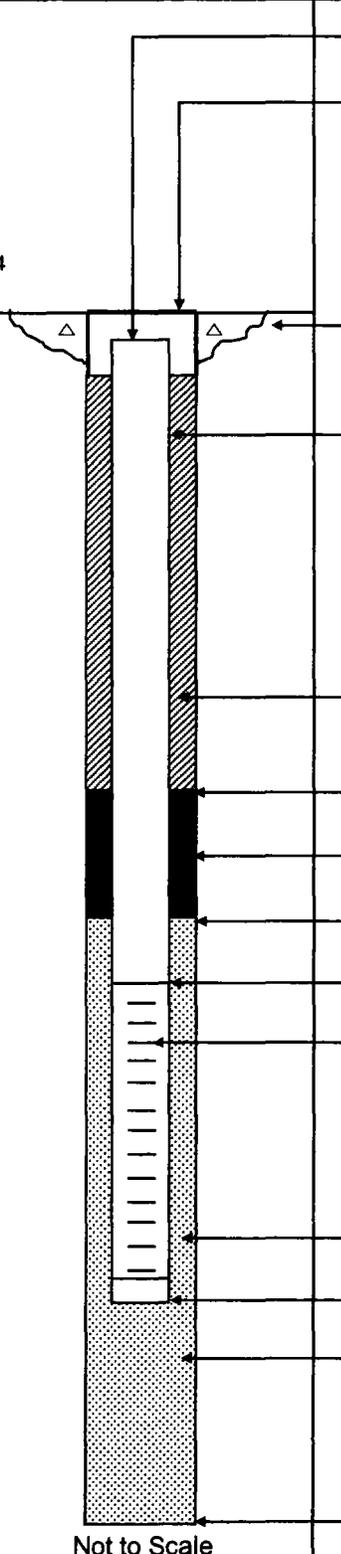
Elevation / Depth of Top of Riser:	<u>171.19/ NA</u>
Elevation / Height of Top of Surface Casing:	<u>NA / NA</u>
I.D. of Surface Casing:	<u>10-inch</u>
Type of Surface Casing:	<u>Steel Manhole</u>
Type of Surface Seal:	<u>Concrete</u>
I.D. of Riser:	<u>2-inch</u>
Type of Riser:	<u>SCH 40 PVC</u>
Borehole Diameter:	<u>8-1/4 inch</u>
Type of Backfill:	<u>Type I Portland Cement/Bentonite Grout Slurry</u>
Elevation / Depth of Seal:	<u>NA / 6.0</u>
Type of Seal:	<u>30/65 Fine Sand</u>
Elevation / Depth of Top of Filter Pack:	<u>NA / 8.0</u>
Elevation / Depth of Top of Screen:	<u>NA / 10.0</u>
Type of Screen:	<u>SCH 40 PVC</u>
Slot Size x Length:	<u>0.010"x10'</u>
I.D. of Screen:	<u>2-inch</u>
Type of Filter Pack:	<u>20/30 Silica Sand</u>
Elevation / Depth of Bottom of Screen:	<u>NA / 20.0</u>
Elevation / Depth of Bottom of Filter Pack:	<u>NA / 20.0</u>
Type of Backfill Below Well:	<u>Natural</u>
Elevation / Total Depth of Borehole:	<u>NA / 20.0</u>



MONITORING WELL SHEET

PROJECT:	<u>AVGAS-E</u>	DRILLING Co.:	<u>Fugro</u>	BORING No.:	<u>WHF-2832-SB02</u>
PROJECT No.:	<u>N4038</u>	DRILLER:	<u>Mark Decker</u>	DATE COMPLETED:	<u>07/10/02</u>
SITE:	<u>BLDG 2832</u>	DRILLING METHOD:	<u>DPT</u>	NORTHING:	<u>631,906.12</u>
GEOLOGIST:	<u>Gary Davis</u>	DEV. METHOD:	<u>Peristaltic Pump</u>	EASTING:	<u>1,178,131.71</u>

Ground Elevation = 170.94  
Datum: NAVD 88



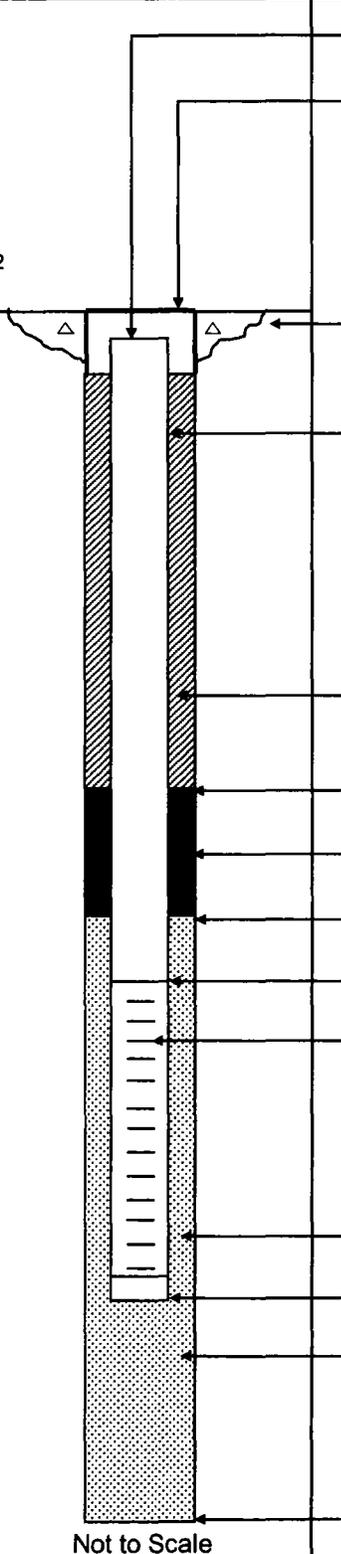
Elevation / Depth of Top of Riser:	<u>170.76/ NA</u>
Elevation / Height of Top of Surface Casing:	<u>NA / NA</u>
I.D. of Surface Casing:	<u>8-inch</u>
Type of Surface Casing:	<u>Steel Manhole</u>
Type of Surface Seal:	<u>Concrete</u>
I.D. of Riser:	<u>1-inch</u>
Type of Riser:	<u>SCH 40 PVC</u>
Borehole Diameter:	<u>2-inch</u>
Type of Backfill:	<u>Type I Portland Cement/Bentonite Grout Slurry</u>
Elevation / Depth of Seal:	<u>NA / 6.0</u>
Type of Seal:	<u>30/65 Fine Sand</u>
Elevation / Depth of Top of Filter Pack:	<u>NA / 8.0</u>
Elevation / Depth of Top of Screen:	<u>NA / 10.0</u>
Type of Screen:	<u>SCH 40 PVC</u>
Slot Size x Length:	<u>0.010"x10'</u>
I.D. of Screen:	<u>1-inch</u>
Type of Filter Pack:	<u>20/30 Silica Sand</u>
Elevation / Depth of Bottom of Screen:	<u>NA / 20.0</u>
Elevation / Depth of Bottom of Filter Pack:	<u>NA / 20.0</u>
Type of Backfill Below Well:	<u>Natural</u>
Elevation / Total Depth of Borehole:	<u>NA / 20.0</u>



**MONITORING WELL SHEET**

PROJECT:	<u>AVGAS-E</u>	DRILLING Co.:	<u>Fugro</u>	BORING No.:	<u>WHF-2832-SB03</u>
PROJECT No.:	<u>N4038</u>	DRILLER:	<u>Mark Decker</u>	DATE COMPLETED:	<u>06/22/02</u>
SITE:	<u>BLDG 2832</u>	DRILLING METHOD:	<u>DPT</u>	NORTHING:	<u>631,847.41</u>
GEOLOGIST:	<u>Gary Davis</u>	DEV. METHOD:	<u>Peristaltic Pump</u>	EASTING:	<u>1,178,152.74</u>

Ground Elevation = 172.22  
Datum: NAVD 88



Elevation / Depth of Top of Riser:	<u>171.93/ NA</u>
Elevation / Height of Top of Surface Casing:	<u>NA / NA</u>
I.D. of Surface Casing:	<u>8-inch</u>
Type of Surface Casing:	<u>Steel Manhole</u>
Type of Surface Seal:	<u>Concrete</u>
I.D. of Riser:	<u>1-inch</u>
Type of Riser:	<u>SCH 40 PVC</u>
Borehole Diameter:	<u>2-inch</u>
Type of Backfill:	<u>Type I Portland Cement/Bentonite Grout Slurry</u>
Elevation / Depth of Seal:	<u>NA / 6.0</u>
Type of Seal:	<u>30/64 Fine Sand</u>
Elevation / Depth of Top of Filter Pack:	<u>NA / 8.0</u>
Elevation / Depth of Top of Screen:	<u>NA / 10.0</u>
Type of Screen:	<u>SCH 40 PVC</u>
Slot Size x Length:	<u>0.010"x10'</u>
I.D. of Screen:	<u>1-inch</u>
Type of Filter Pack:	<u>20/30 Silica Sand</u>
Elevation / Depth of Bottom of Screen:	<u>NA / 20.0</u>
Elevation / Depth of Bottom of Filter Pack:	<u>NA / 20.0</u>
Type of Backfill Below Well:	<u>Natural</u>
Elevation / Total Depth of Borehole:	<u>NA / 20.0</u>

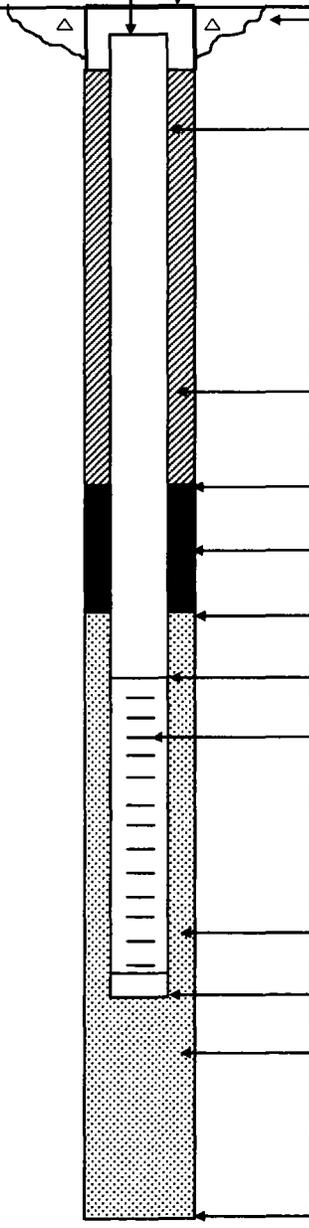
Not to Scale



MONITORING WELL SHEET

PROJECT:	<u>AVGAS-E</u>	DRILLING Co.:	<u>Fugro</u>	BORING No.:	<u>WHF-2832-SB04</u>
PROJECT No.:	<u>N4038</u>	DRILLER:	<u>Mark Decker</u>	DATE COMPLETED:	<u>06/22/02</u>
SITE:	<u>BLDG 2832</u>	DRILLING METHOD:	<u>DPT</u>	NORTHING:	<u>631,964.00</u>
GEOLOGIST:	<u>Gary Davis</u>	DEV. METHOD:		EASTING:	<u>1,178,170.33</u>

Ground Elevation = 170.09  
Datum: NAVD 88



Elevation / Depth of Top of Riser:	<u>169.88/ NA</u>
Elevation / Height of Top of Surface Casing:	<u>NA / NA</u>
I.D. of Surface Casing:	<u>8-inch</u>
Type of Surface Casing:	<u>Steel Manhole</u>
Type of Surface Seal:	<u>Concrete</u>
I.D. of Riser:	<u>1- inch</u>
Type of Riser:	<u>SCH 40 PVC</u>
Borehole Diameter:	<u>2-inch</u>
Type of Backfill:	<u>Type I Portland Cement/Bentonite Grout Slurry</u>
Elevation / Depth of Seal:	<u>NA / 2.5</u>
Type of Seal:	<u>30/65 Fine Sand</u>
Elevation / Depth of Top of Filter Pack:	<u>NA / 3.5</u>
Elevation / Depth of Top of Screen:	<u>NA / 4.5</u>
Type of Screen:	<u>SCH 40 PVC</u>
Slot Size x Length:	<u>0.010"x10'</u>
I.D. of Screen:	<u>1-inch</u>
Type of Filter Pack:	<u>2/30 Silica Sand</u>
Elevation / Depth of Bottom of Screen:	<u>NA / 14.5</u>
Elevation / Depth of Bottom of Filter Pack:	<u>NA / 14.5</u>
Type of Backfill Below Well:	<u>Natural</u>
Elevation / Total Depth of Borehole:	<u>NA / 14.5</u>

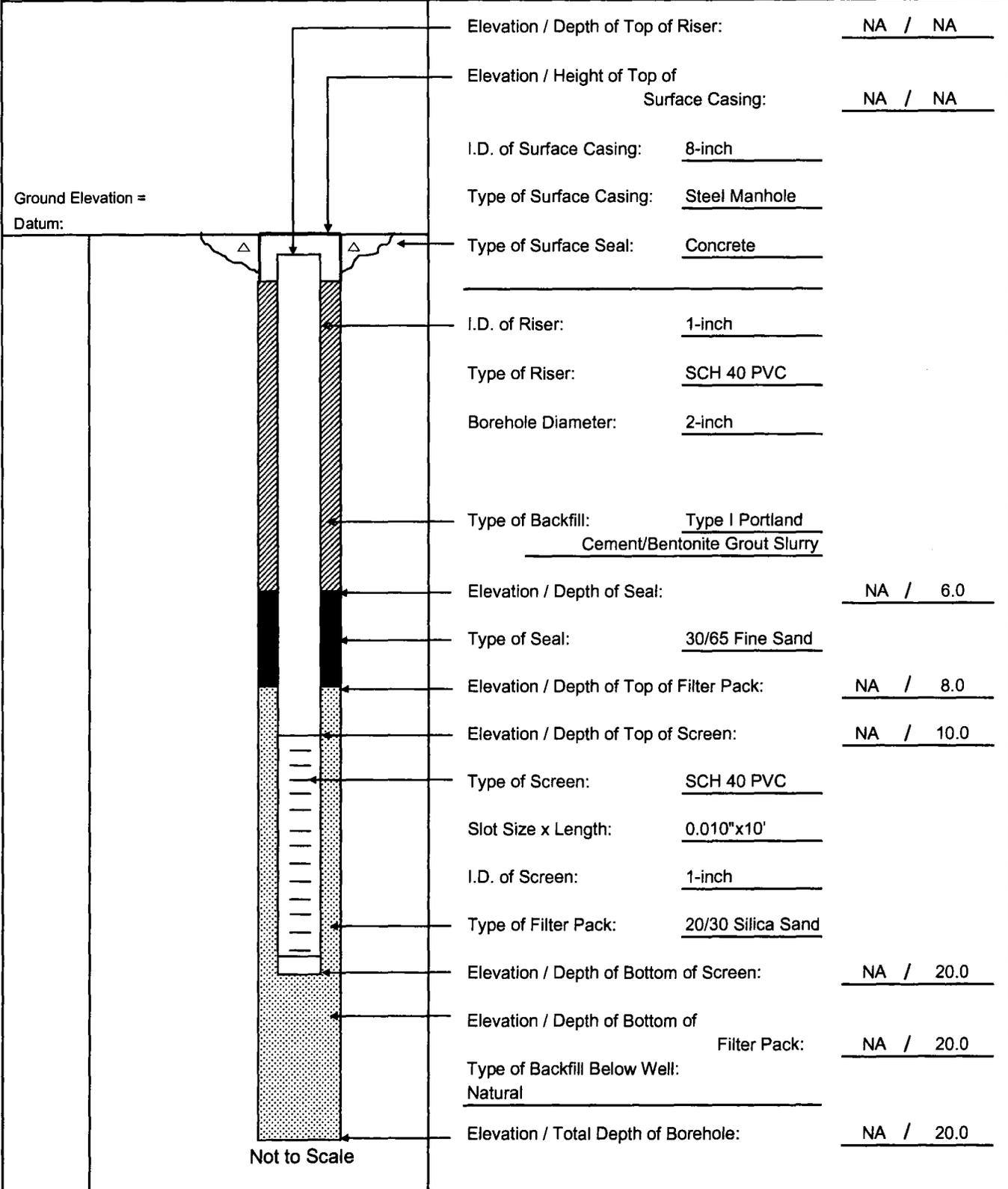
Not to Scale





MONITORING WELL SHEET

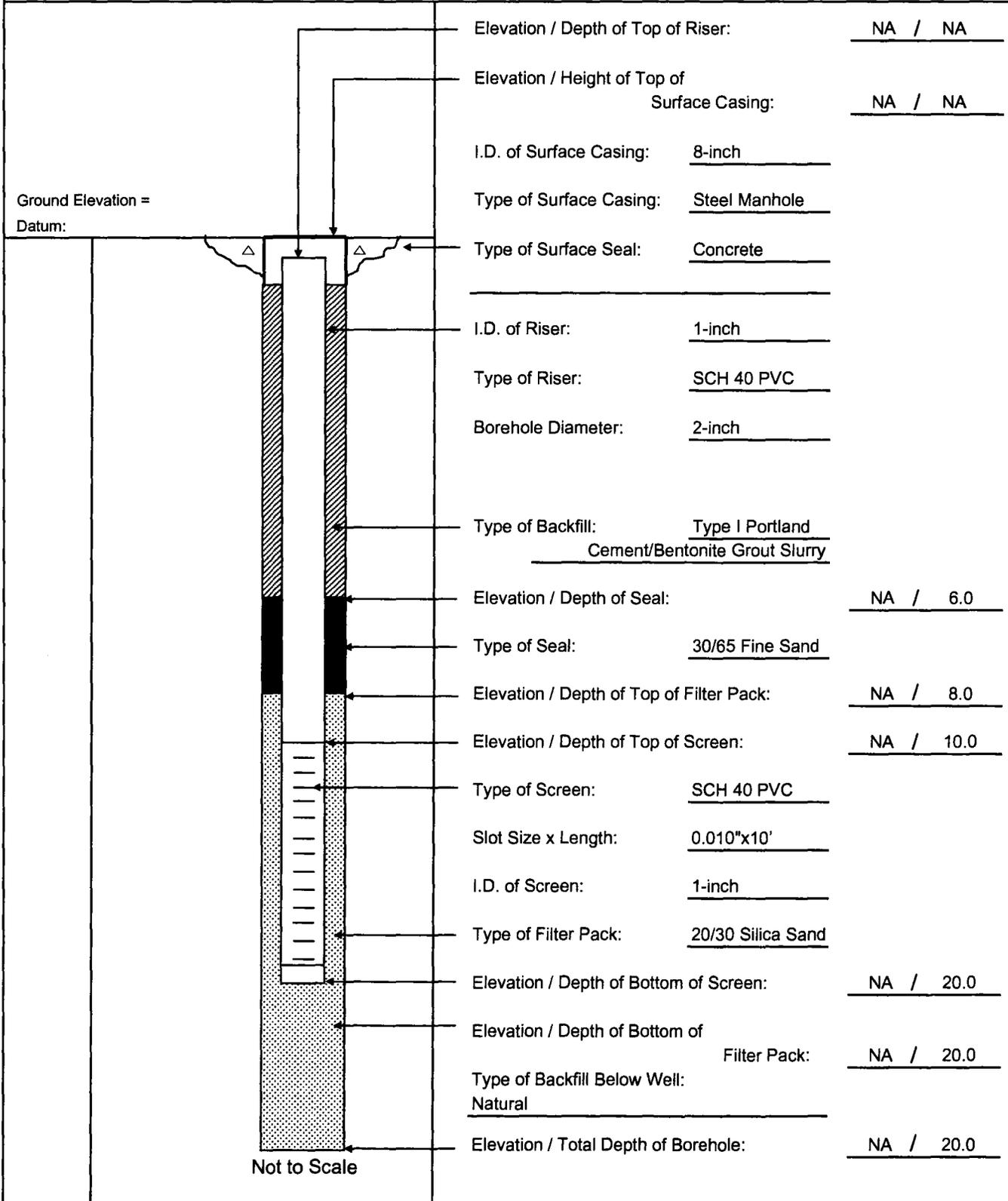
PROJECT:	<u>AVGAS-E</u>	DRILLING Co.:	<u>Fugro</u>	BORING No.:	<u>WHF-2832-SB06</u>
PROJECT No.:	<u>N4038</u>	DRILLER:	<u>Mark Decker</u>	DATE COMPLETED:	<u>06/19/02</u>
SITE:	<u>BLDG 2832</u>	DRILLING METHOD:	<u>DPT</u>	NORTHING:	<u>NA</u>
GEOLOGIST:	<u>Gary Davis</u>	DEV. METHOD:	<u>Peristaltic Pump</u>	EASTING:	<u>NA</u>





**MONITORING WELL SHEET**

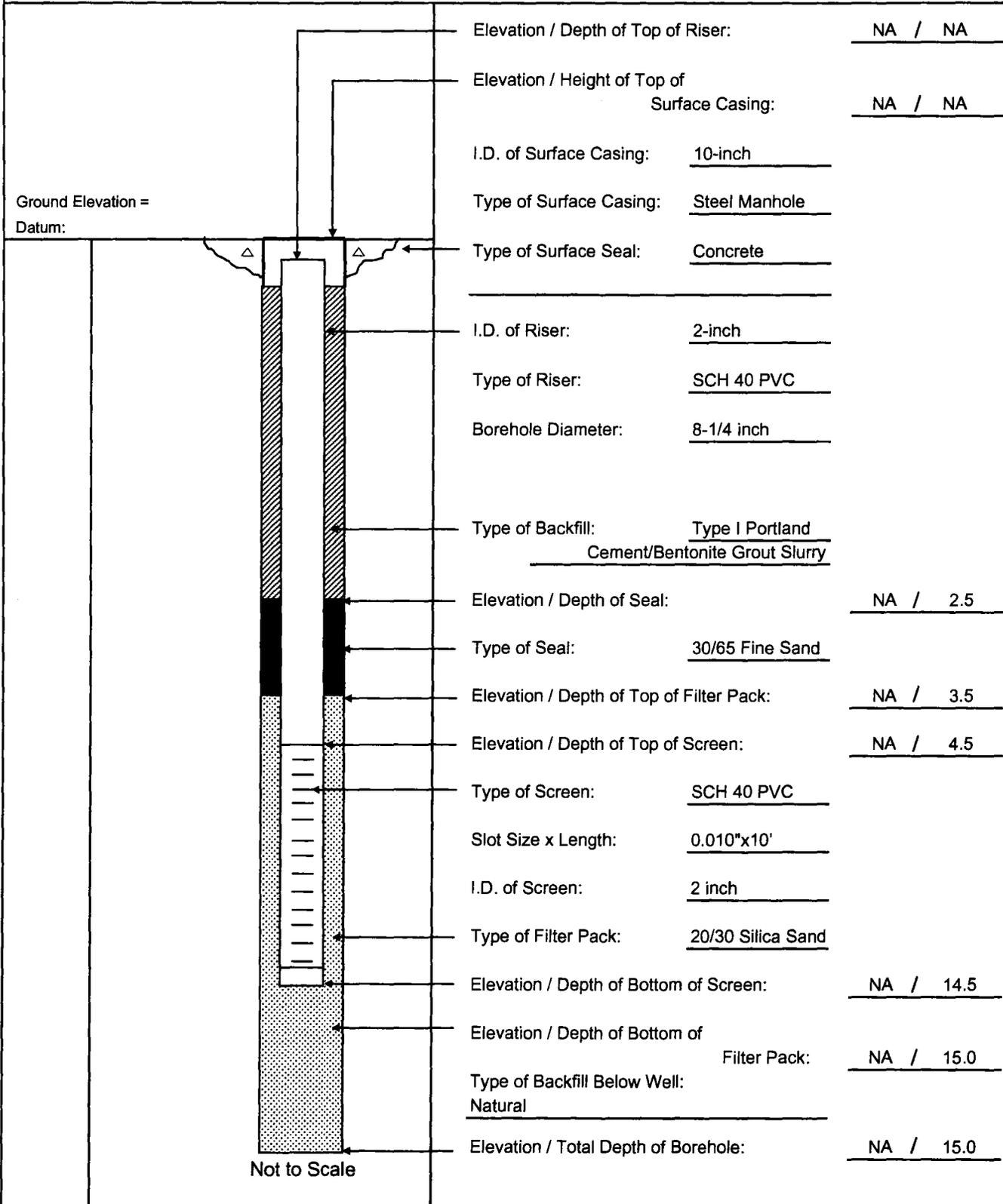
PROJECT:	<u>AVGAS-E</u>	DRILLING Co.:	<u>Fugro</u>	BORING No.:	<u>WHF-2832-SB07</u>
PROJECT No.:	<u>N4038</u>	DRILLER:	<u>Mark Decker</u>	DATE COMPLETED:	<u>06/21/02</u>
SITE:	<u>BLDG 2832</u>	DRILLING METHOD:	<u>DPT</u>	NORTHING:	<u>NA</u>
GEOLOGIST:	<u>Gary Davis</u>	DEV. METHOD:	<u>Peristaltic Pump</u>	EASTING:	<u>NA</u>





**MONITORING WELL SHEET**

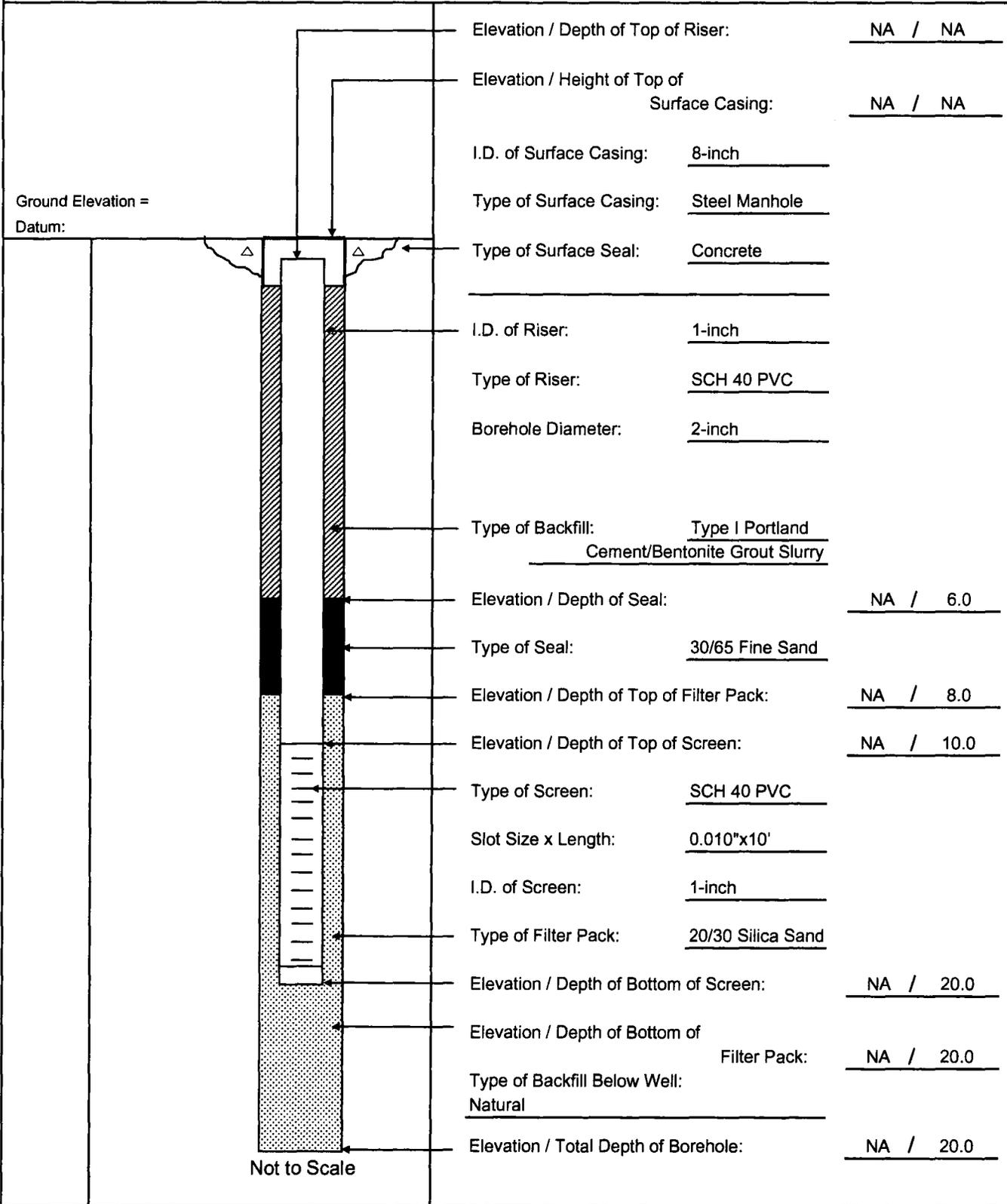
PROJECT:	<u>AVGAS-E</u>	DRILLING Co.:	<u>ProSonic</u>	BORING No.:	<u>NA</u>
PROJECT No.:	<u>N4038</u>	DRILLER:	<u>Joey Mock</u>	DATE COMPLETED:	<u>09/23/02</u>
SITE:	<u>BLDG 2832</u>	DRILLING METHOD:	<u>Hollow Stem Auger</u>	NORTHING:	<u>NA</u>
GEOLOGIST:	<u>Gary Davis</u>	DEV. METHOD:	<u>Centrifugal Pump</u>	EASTING:	<u>NA</u>





MONITORING WELL SHEET

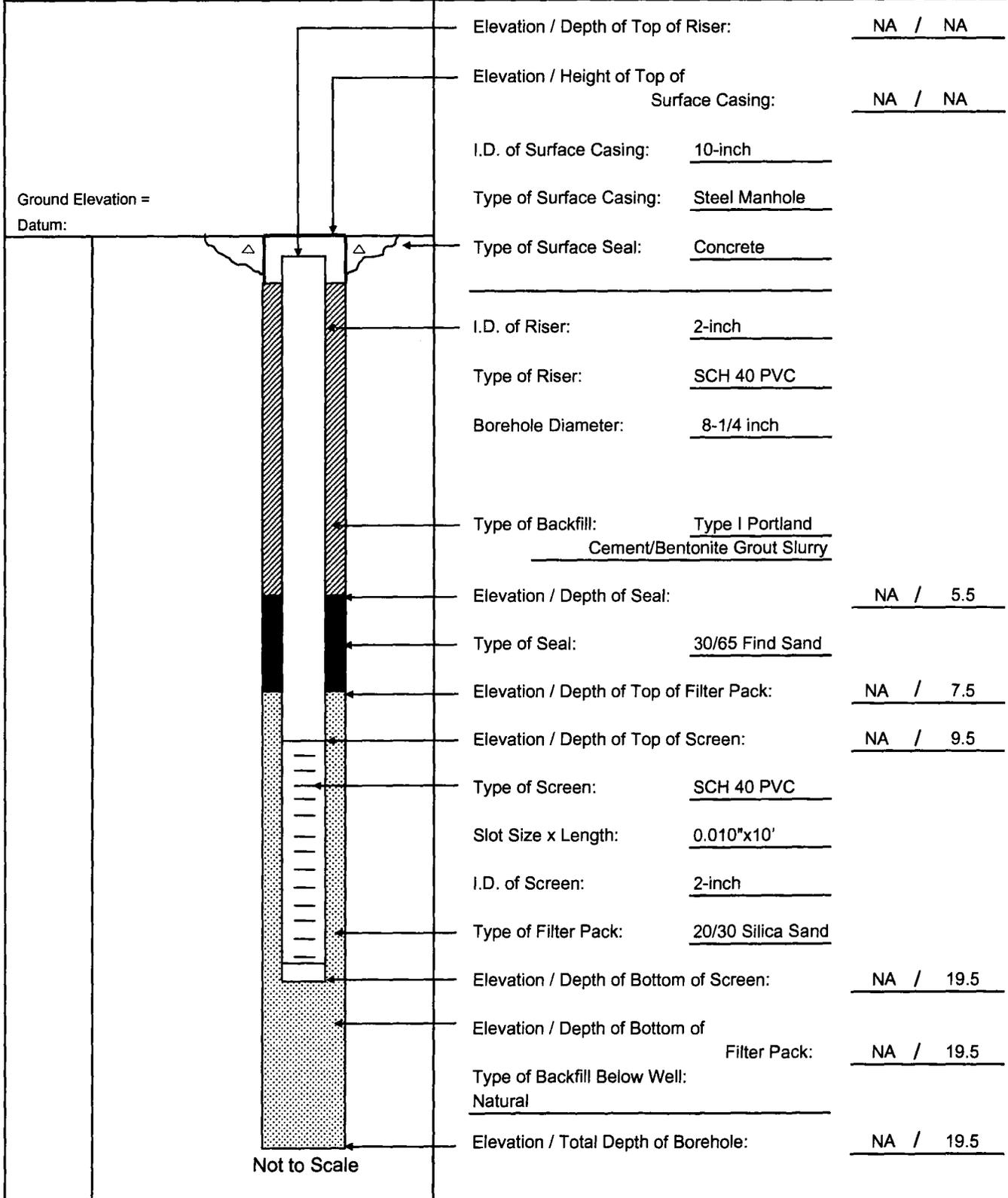
PROJECT:	<u>AVGAS-E</u>	DRILLING Co.:	<u>Fugro</u>	BORING No.:	<u>NA</u>
PROJECT No.:	<u>N4038</u>	DRILLER:	<u>Mark Decker</u>	DATE COMPLETED:	<u>06/25/02</u>
SITE:	<u>BLDG 2832</u>	DRILLING METHOD:	<u>DPT</u>	NORTHING:	<u>NA</u>
GEOLOGIST:	<u>Gary Davis</u>	DEV. METHOD:	<u>Peristaltic Pump</u>	EASTING:	<u>NA</u>





MONITORING WELL SHEET

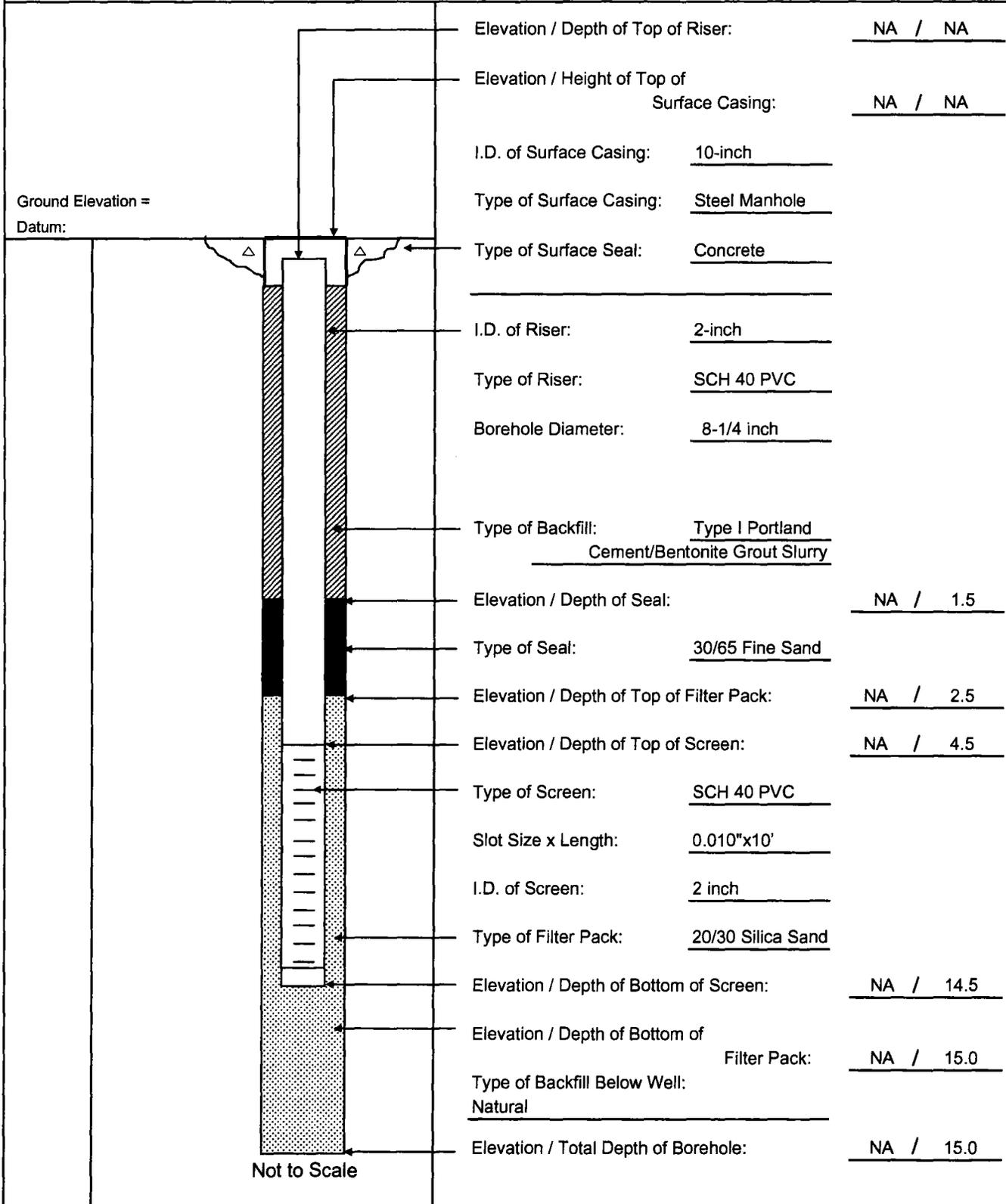
PROJECT:	<u>AVGAS-E</u>	DRILLING Co.:	<u>ProSonic</u>	BORING No.:	<u>NA</u>
PROJECT No.:	<u>N4038</u>	DRILLER:	<u>Joey Mock</u>	DATE COMPLETED:	<u>09/24/02</u>
SITE:	<u>BLDG 2832</u>	DRILLING METHOD:	<u>Hollow Stem Auger</u>	NORTHING:	<u>NA</u>
GEOLOGIST:	<u>Gary Davis</u>	DEV. METHOD:	<u>Centrifugal Pump</u>	EASTING:	<u>NA</u>





**MONITORING WELL SHEET**

PROJECT:	<u>AVGAS-E</u>	DRILLING Co.:	<u>ProSonic</u>	BORING No.:	<u>NA</u>
PROJECT No.:	<u>N4038</u>	DRILLER:	<u>Joey Mock</u>	DATE COMPLETED:	<u>09/29/02</u>
SITE:	<u>BLDG 2832</u>	DRILLING METHOD:	<u>Hollow Stem Auger</u>	NORTHING:	<u>NA</u>
GEOLOGIST:	<u>Gary Davis</u>	DEV. METHOD:	<u>Centrifugal Pump</u>	EASTING:	<u>NA</u>

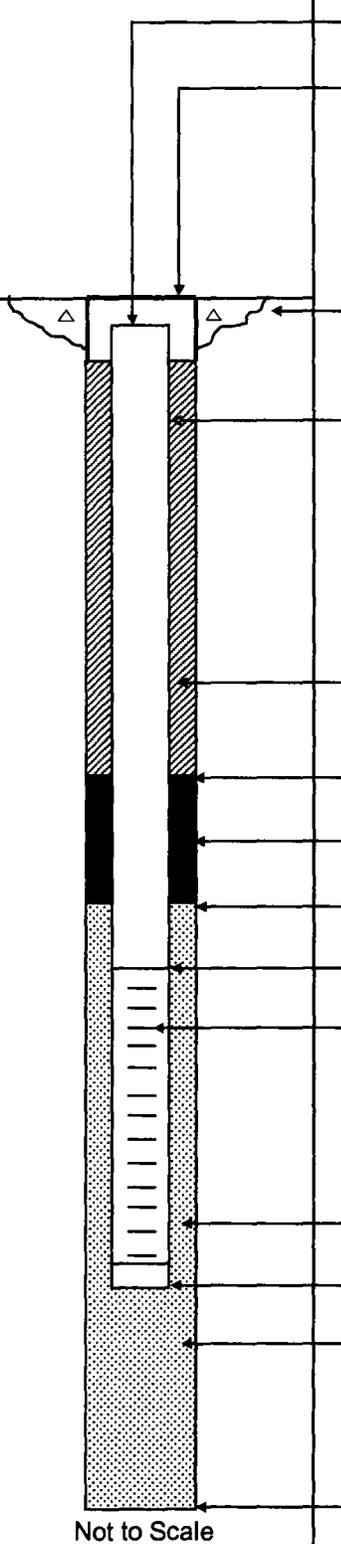




MONITORING WELL SHEET

PROJECT:	<u>AVGAS-E</u>	DRILLING Co.:	<u>ProSonic</u>	BORING No.:	<u>NA</u>
PROJECT No.:	<u>N4038</u>	DRILLER:	<u>Joey Mock</u>	DATE COMPLETED:	<u>09/24/02</u>
SITE:	<u>BLDG 2832</u>	DRILLING METHOD:	<u>Hollow Stem Auger</u>	NORTHING:	<u>NA</u>
GEOLOGIST:	<u>Gary Davis</u>	DEV. METHOD:	<u>Centrifugal Pump</u>	EASTING:	<u>NA</u>

Ground Elevation = Datum:



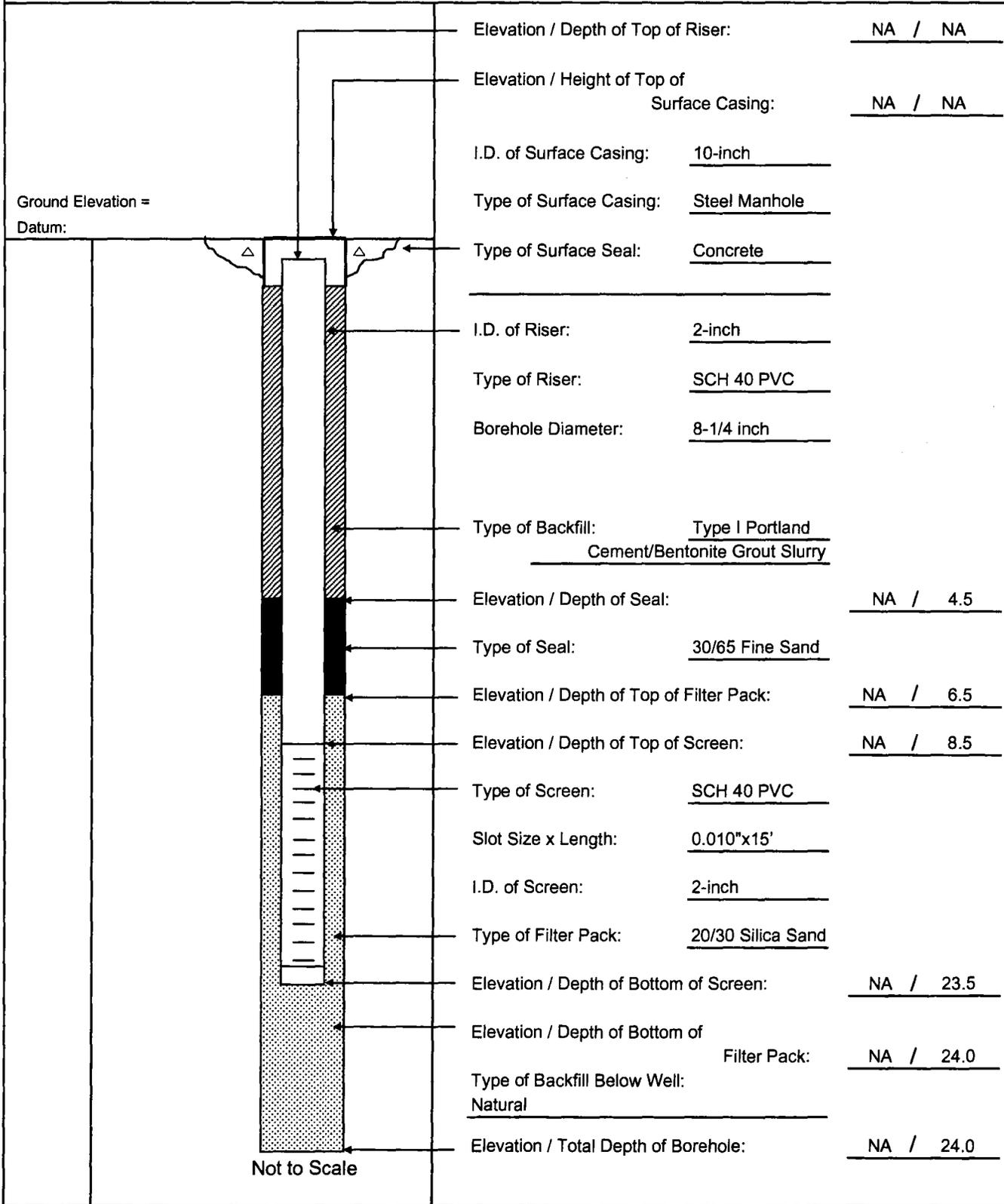
Elevation / Depth of Top of Riser:	<u>NA / NA</u>
Elevation / Height of Top of Surface Casing:	<u>NA / NA</u>
I.D. of Surface Casing:	<u>10-inch</u>
Type of Surface Casing:	<u>Steel Manhole</u>
Type of Surface Seal:	<u>Concrete</u>
I.D. of Riser:	<u>2-inch</u>
Type of Riser:	<u>SCH 40 PVC</u>
Borehole Diameter:	<u>8-1/4 inch</u>
Type of Backfill:	<u>Type I Portland Cement/Bentonite Grout Slurry</u>
Elevation / Depth of Seal:	<u>NA / 1.0</u>
Type of Seal:	<u>30/65 Fine Sand</u>
Elevation / Depth of Top of Filter Pack:	<u>NA / 2.0</u>
Elevation / Depth of Top of Screen:	<u>NA / 3.5</u>
Type of Screen:	<u>SCH 40 PVC</u>
Slot Size x Length:	<u>0.010"x10"</u>
I.D. of Screen:	<u>2 inch</u>
Type of Filter Pack:	<u>20/30 Silica Sand</u>
Elevation / Depth of Bottom of Screen:	<u>NA / 13.5</u>
Elevation / Depth of Bottom of Filter Pack:	<u>NA / 14.0</u>
Type of Backfill Below Well:	<u>Natural</u>
Elevation / Total Depth of Borehole:	<u>NA / 14.0</u>

Not to Scale



MONITORING WELL SHEET

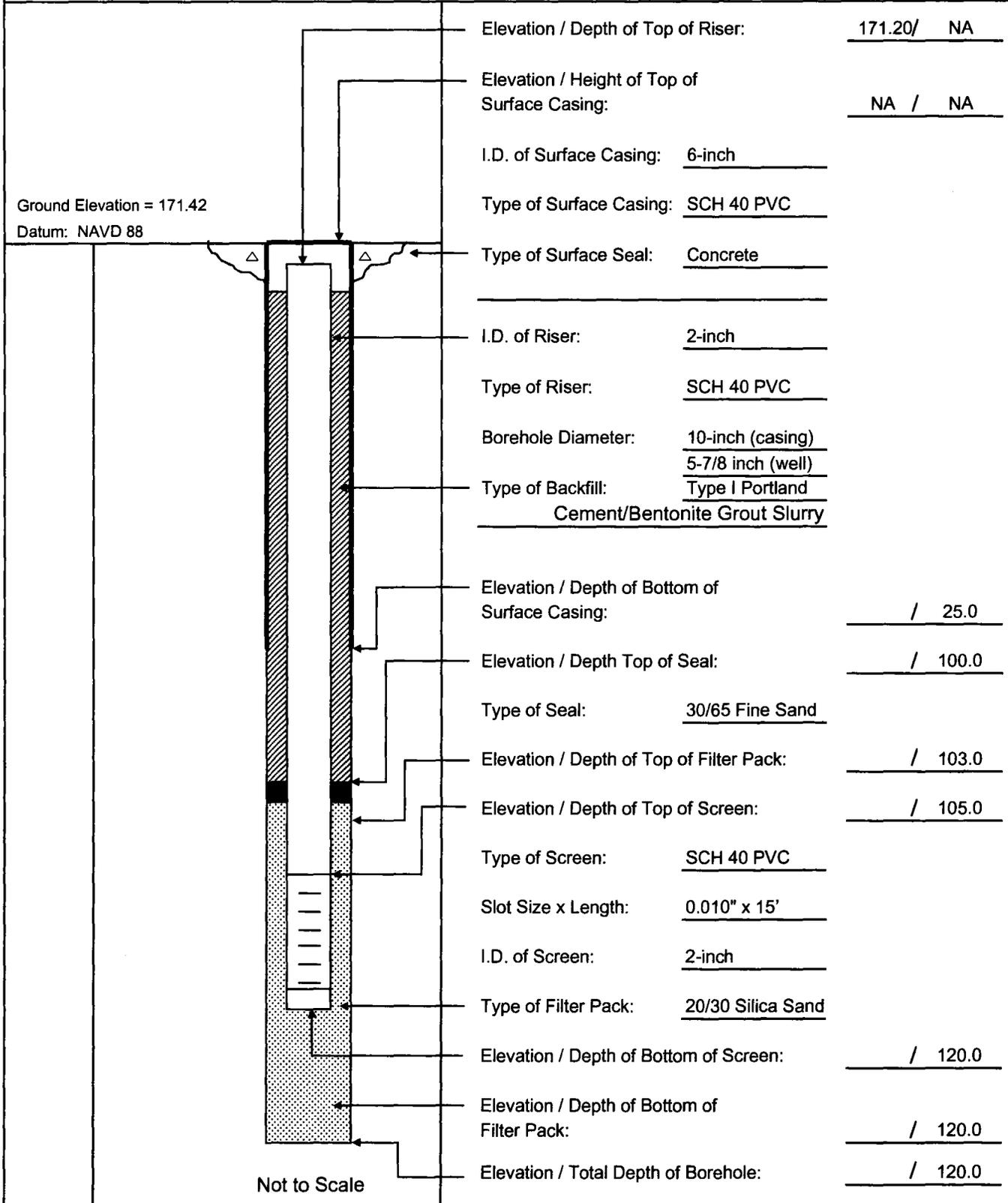
PROJECT:	<u>AVGAS-E</u>	DRILLING Co.:	<u>ProSonic</u>	BORING No.:	<u>NA</u>
PROJECT No.:	<u>N4038</u>	DRILLER:	<u>Joey Mock</u>	DATE COMPLETED:	<u>09/25/02</u>
SITE:	<u>BLDG 2832</u>	DRILLING METHOD:	<u>Hollow Stem Auger</u>	NORTHING:	<u>NA</u>
GEOLOGIST:	<u>Gary Davis</u>	DEV. METHOD:	<u>Centrifugal Pump</u>	EASTING:	<u>NA</u>





**DOUBLE CASED MONITORING WELL SHEET**

PROJECT:	<u>NAS Whiting Field</u>	DRILLING Co.:	<u>Kelly Drilling</u>	BORING No.:	<u>NA</u>
PROJECT No.:	<u>N4038</u>	DRILLER:	<u></u>	DATE COMPLETED:	<u>05/06/02</u>
SITE:	<u>AVGAS-E</u>	DRILLING METHOD:	<u>Mud Rotary</u>	NORTHING:	<u>631,889.28</u>
GEOLOGIST:	<u>Larry Smith</u>	DEV. METHOD:	<u>Submersible Pump</u>	EASTING:	<u>1,178,134.68</u>

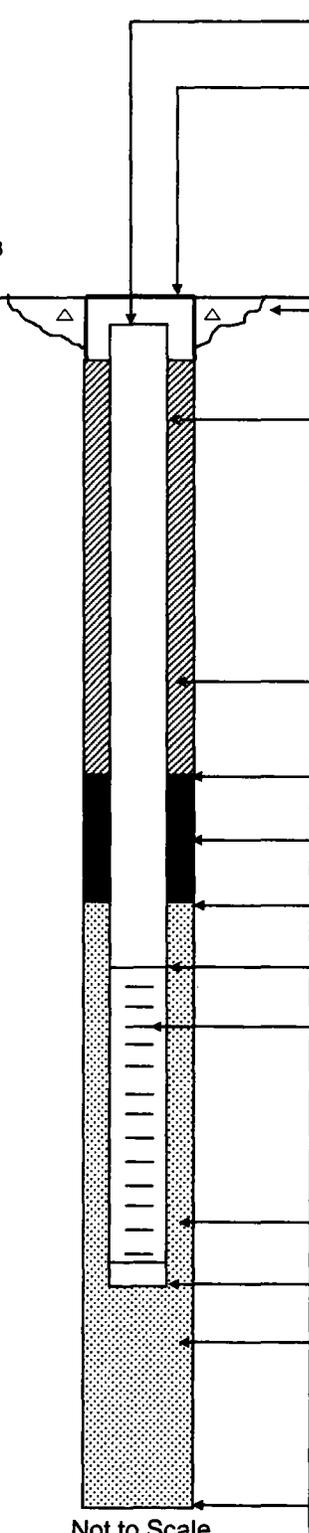




MONITORING WELL SHEET

PROJECT:	<u>NAS Whiting Field</u>	DRILLING Co.:	<u>Kelly Drilling</u>	BORING No.:	<u>NA</u>
PROJECT No.:	<u>N4038</u>	DRILLER:	<u></u>	DATE COMPLETED:	<u>05/06/02</u>
SITE:	<u>AVGAS-E</u>	DRILLING METHOD:	<u>Mud Rotary</u>	NORTHING:	<u>631,690.41</u>
GEOLOGIST:	<u>Larry Smith</u>	DEV. METHOD:	<u>Submersible Pump</u>	EASTING:	<u>1,178,165.74</u>

Ground Elevation = 174.63  
Datum: NAVD 88



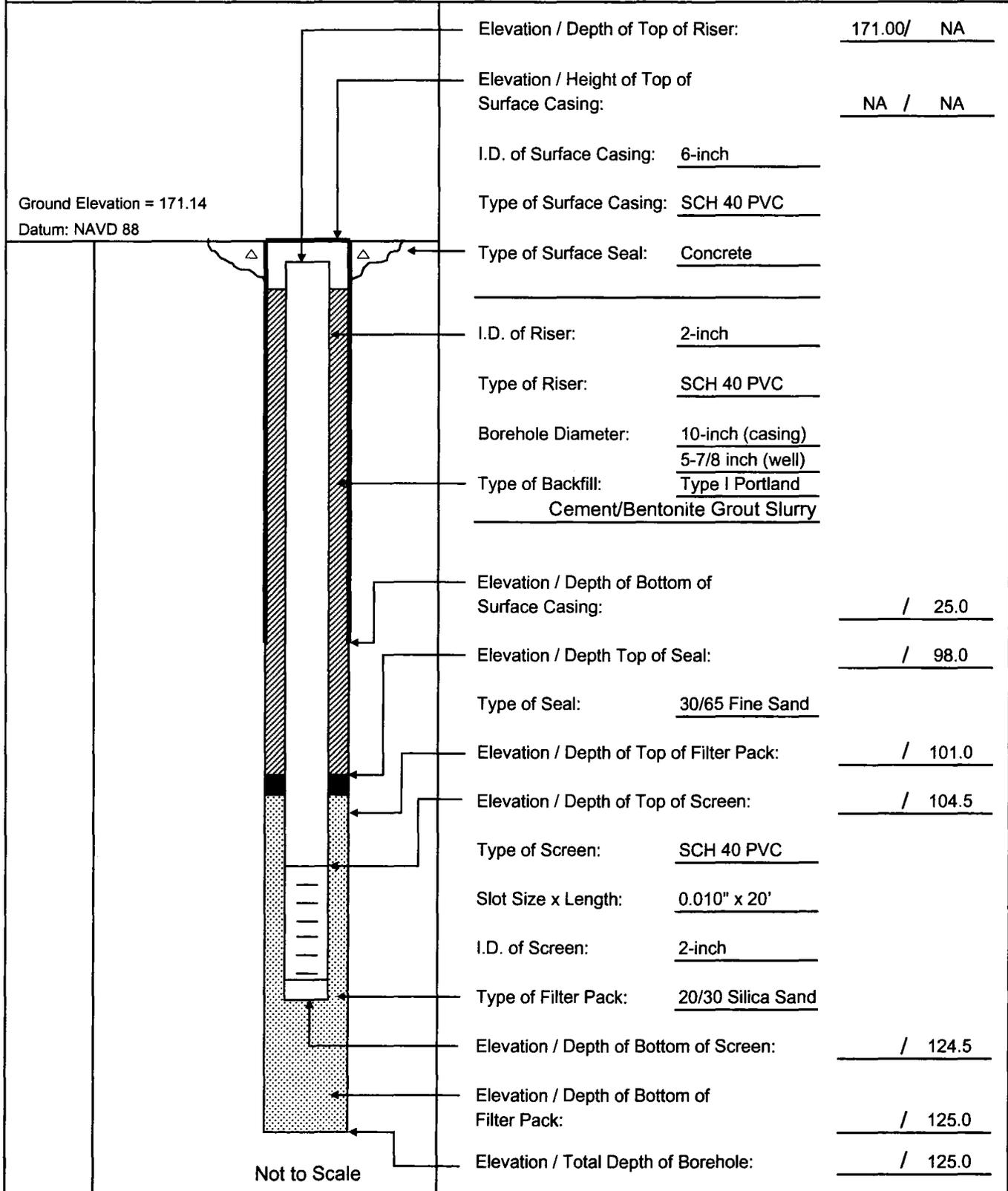
Elevation / Depth of Top of Riser:	<u>174.37/ NA</u>
Elevation / Height of Top of Surface Casing:	<u>NA / NA</u>
I.D. of Surface Casing:	<u>10-inch</u>
Type of Surface Casing:	<u>Steel Manhole</u>
Type of Surface Seal:	<u>Concrete</u>
I.D. of Riser:	<u>2-inch</u>
Type of Riser:	<u>SCH 40 PVC</u>
Borehole Diameter:	<u>6-inch</u>
Type of Backfill:	<u>Type I Portland Cement/Bentonite Grout Slurry</u>
Elevation / Depth of Seal:	<u>NA / 100.0</u>
Type of Seal:	<u>30/65 Fine Sand</u>
Elevation / Depth of Top of Filter Pack:	<u>NA / 103.0</u>
Elevation / Depth of Top of Screen:	<u>NA / 105.0</u>
Type of Screen:	<u>SCH 40 PVC</u>
Slot Size x Length:	<u>0.010"x15'</u>
I.D. of Screen:	<u>2-inch</u>
Type of Filter Pack:	<u>20/30 Silica Sand</u>
Elevation / Depth of Bottom of Screen:	<u>NA / 120.0</u>
Elevation / Depth of Bottom of Filter Pack:	<u>NA / 120.0</u>
Type of Backfill Below Well:	<u>Natural</u>
Elevation / Total Depth of Borehole:	<u>NA / 120.0</u>

Not to Scale



**DOUBLE CASED MONITORING WELL SHEET**

PROJECT:	<u>NAS Whiting Field</u>	DRILLING Co.:	<u>Prosonic</u>	BORING No.:	<u>NA</u>
PROJECT No.:	<u>N4038</u>	DRILLER:		DATE COMPLETED:	<u>09/28/03</u>
SITE:	<u>AVGAS-E</u>	DRILLING METHOD:	<u>Mud Rotary</u>	NORTHING:	<u>631,884.32</u>
GEOLOGIST:	<u>Gary Davis</u>	DEV. METHOD:	<u>Submersible Pump</u>	EASTING:	<u>1,178,170.26</u>

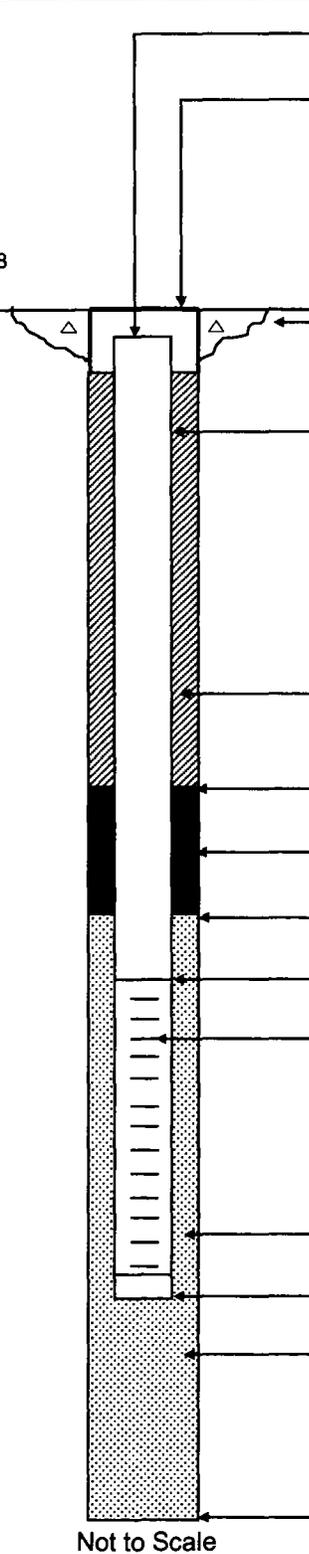




MONITORING WELL SHEET

PROJECT:	<u>NAS Whiting Field</u>	DRILLING Co.:	<u>Prosonic</u>	BORING No.:	<u>NA</u>
PROJECT No.:	<u>N4038</u>	DRILLER:		DATE COMPLETED:	<u>09/29/02</u>
SITE:	<u>AVGAS-E</u>	DRILLING METHOD:	<u>Mud Rotary</u>	NORTHING:	<u>631,808.73</u>
GEOLOGIST:	<u>Gary Davis</u>	DEV. METHOD:	<u>Submersible Pump</u>	EASTING:	<u>1,178,206.91</u>

Ground Elevation = 172.18  
Datum: NAVD 88



Elevation / Depth of Top of Riser:	<u>171.99/ NA</u>
Elevation / Height of Top of Surface Casing:	<u>NA / NA</u>
I.D. of Surface Casing:	<u>10-inch</u>
Type of Surface Casing:	<u>Steel Manhole</u>
Type of Surface Seal:	<u>Concrete</u>
I.D. of Riser:	<u>2-inch</u>
Type of Riser:	<u>SCH 40 PVC</u>
Borehole Diameter:	<u>6-inch</u>
Type of Backfill:	<u>Type I Portland Cement/Bentonite Grout Slurry</u>
Elevation / Depth of Seal:	<u>NA / 100.0</u>
Type of Seal:	<u>30/65 Fine Sand</u>
Elevation / Depth of Top of Filter Pack:	<u>NA / 102.0</u>
Elevation / Depth of Top of Screen:	<u>NA / 104.5</u>
Type of Screen:	<u>SCH 40 PVC</u>
Slot Size x Length:	<u>0.010"x15'</u>
I.D. of Screen:	<u>2-inch</u>
Type of Filter Pack:	<u>20/30 Silica Sand</u>
Elevation / Depth of Bottom of Screen:	<u>NA / 124.5</u>
Elevation / Depth of Bottom of Filter Pack:	<u>NA / 125.0</u>
Type of Backfill Below Well:	<u>Natural</u>
Elevation / Total Depth of Borehole:	<u>NA / 125.0</u>

Not to Scale

**APPENDIX E**  
**MONITORING WELL DEVELOPMENT RECORDS**



















**APPENDIX F**  
**GROUNDWATER SAMPLE LOGS**







## GROUNDWATER SAMPLE LOG SHEET

Project Site Name:	Naval Air Station Whiting Field	Sample ID No.:	AVGEGL13P01
Project No.:	CTO-200 / Job # N4038	Sample Location:	WHF-2832-MW13P
<input type="checkbox"/> Domestic Well Data		Sampled By:	C. Gleaton
<input checked="" type="checkbox"/> Monitoring Well Data		C.O.C. No.:	
<input type="checkbox"/> Other Well Type:		Type of Sample:	
<input type="checkbox"/> QA Sample Type:		<input checked="" type="checkbox"/> Low Concentration	
		<input type="checkbox"/> High Concentration	

## SAMPLING DATA:

Date:	Time	Color	pH	S.C.	Temp.	Turbidity	DO	Drawdown
		Visual	Standard	mS/cm	°C	NTU	mg/l	DTW
9/28/2002	12:15	Clear						

## PURGE DATA:

Date:	Time	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	DTW
9/28/2002	12:25		6.52	0.231	28.34	32.6	7.39	12.18
Method: Peristaltic Pump	12:30		5.95	0.212	28.2	8.2	3.26	13.05
Monitor Reading (ppm): N/A	12:35		6.14	0.212	28.73	34.3	3.04	13.15
Well Casing Diameter & Material	9:15		6.58	0.214	29.00	41.7	3.09	12.98
Type: 2" PVC			6.62	0.214	28.42	42.3	3.7	12.98
Total Well Depth (TD): 24'			6.59	0.213	28.32	19.7	2.9	13.14
Static Water Level (WL): 11.49'			6.59	0.213	28.28	12.4	2.87	13.23
One Casing Volume(gal/L):			6.58	0.214	27.68	11.3	2.85	13.28
Start Purge (hrs): 1215			6.58	0.214	28.24	10.3	2.77	13.32
End Purge (hrs): 1325			6.59	0.215	28.36	6.7	2.8	13.38
Total Purge Time (min): 70			6.59	0.214	28.64	4.5	2.8	13.95
Total Vol. Purged (gal/L): 4.5L								

## SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOCs 8260	HCL	3 - 40 ml Vials	X
PAHs 8270C	None	2 - 1liter Amber	X
EDB 504.1	None	3 - 40 ml Vials	X
PB	HNO3	1 - 500 ml Polyethylene	X
TRPH (FL-PRO)	H2SO4	2 - liter Amber	X

## OBSERVATIONS / NOTES:

--

## Circle if Applicable:

MS/MSD	Duplicate ID No.:	Signature(s):
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## GROUNDWATER SAMPLE LOG SHEET

Project Site Name:	Naval Air Station Whiting Field	Sample ID No.:	AVGEGL3P01
Project No.:	CTO-200 / Job # N4038	Sample Location:	WHF-2832-MW3P
		Sampled By:	C. Gleaton
<input type="checkbox"/> Domestic Well Data		C.O.C. No.:	
<input checked="" type="checkbox"/> Monitoring Well Data		Type of Sample:	
<input type="checkbox"/> Other Well Type:		<input checked="" type="checkbox"/> Low Concentration	
<input type="checkbox"/> QA Sample Type:		<input type="checkbox"/> High Concentration	

## SAMPLING DATA:

Date:	Time	Color	pH	S.C.	Temp.	Turbidity	DO	Drawdown
		Visual	Standard	mS/cm	°C	NTU	mg/l	DTW
9/29/2002	10:45	Clear	6.69	0.402	25.59	9.7	0.13	10.41

## PURGE DATA:

Date:	Time	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	DTW
10/1/2002	9:45		5.85	0.084	25.14	224	2.06	
Method: Peristaltic	9:45							
Monitor Reading (ppm): N/A	9:50		6.22	0.087	25.03	70.8	0.56	
Well Casing Diameter & Material	9:55		6.47	0.092	25.31	58.3	0.41	
Type: 1" PVC	10:00		6.48	0.094	25.33	31.6	1.86	
Total Well Depth (TD): 20'	10:05		6.49	0.095	25.3	23.8	0.65	
Static Water Level (WL): 10.41	10:10		6.063	0.403	25.74	14.3	0.22	
One Casing Volume(gal/L):	10:15		6.69	0.409	25.77	11.3	0.22	
Start Purge (hrs): 0940	10:20		6.64	0.406	25.69	11.8	0.32	
End Purge (hrs): 1045	10:25		6.65	0.406	25.79	12	0.80	
Total Purge Time (min): 65	10:35		6.65	0.401	25.93	9.9	0.17	
Total Vol. Purged (gal/L): 3.5	10:45		6.69	0.402	25.59	9.7	0.13	

## SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOCs 8260	HCL	3 - 40 ml Vials	X
PAHs 8270C	None	2 - 1liter Amber	X
EDB 504.1	None	3 - 40 ml Vials	X
PB	HNO3	1 - 500 ml Polyethylene	X
TRPH (FL-PRO)	H2SO4	2 - liter Amber	X

## OBSERVATIONS / NOTES:

--

Circle if Applicable:		Signature(s):
MS/MSD	Duplicate ID No.:	



## GROUNDWATER SAMPLE LOG SHEET

Project Site Name:	Naval Air Station Whiting Field	Sample ID No.:	AVGEGL6P01
Project No.:	CTO-200 / Job # N4038	Sample Location:	WHF-2832-MW6P
		Sampled By:	C. Gleaton
<input type="checkbox"/> Domestic Well Data		C.O.C. No.:	
<input checked="" type="checkbox"/> Monitoring Well Data		Type of Sample:	
<input type="checkbox"/> Other Well Type:		<input checked="" type="checkbox"/> Low Concentration	
<input type="checkbox"/> QA Sample Type:		<input type="checkbox"/> High Concentration	

## SAMPLING DATA:

Date:	Time	Color	pH	S.C.	Temp.	Turbidity	DO	Drawdown
		Visual	Standard	mS/cm	°C	NTU	mg/l	DTW
9/29/2002	1530	Clear						11.27

## PURGE DATA:

Date:	Time	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	DTW
9/29/2002	1420		5.03	0.135	25.34	132	3.89	
Method: Peristaltic								
Monitor Reading (ppm): N/A	1430		5.40	0.129	25.37	143	1.01	
Well Casing Diameter & Material	1440		5.46	0.130	25.97	71.4	0.58	
Type: 1" PVC	1450		5.66	0.130	25.38	34.2	0.39	
Total Well Depth (TD): 20'	1500		5.66	0.130	25.43	21.5	0.37	
Static Water Level (WL): 11.27'	1505		5.67	0.131	25.34	22.3	0.38	
One Casing Volume(gal/L):	1510		5.68	0.133	25.38	13.2	1.39	
Start Purge (hrs): 1415	1515		5.66	0.132	25.38	11.1	0.56	
End Purge (hrs): 1530	1520		5.67	0.132	25.43	4.6	0.35	
Total Purge Time (min): 75	1525		5.68	0.139	25.3	5.1	0.35	
Total Vol. Purged (gal/L): 4.3L	1530		5.68	0.133	25.2	4.3	0.35	

## SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOCs 8260	HCL	3 - 40 ml Vials	X
PAHs 8270C	None	2 - 1liter Amber	X
EDB 504.1	None	3 - 40 ml Vials	X
PB	HNO3	1 - 500 ml Polyethylene	X
TRPH (FL-PRO)	H2SO4	2 - liter Amber	X

## OBSERVATIONS / NOTES:

Duplicate collected

Circle if Applicable:		Signature(s):
MS/MSD	Duplicate ID No.:	



# GROUNDWATER SAMPLE LOG SHEET

Project Site Name:	Naval Air Station Whiting Field	Sample ID No.:	AVGEGL5P01
Project No.:	CTO-200 / Job # N4038	Sample Location:	WHF-2832-MW5P
<input type="checkbox"/> Domestic Well Data		Sampled By:	C. Gleaton
<input checked="" type="checkbox"/> Monitoring Well Data		C.O.C. No.:	
<input type="checkbox"/> Other Well Type:		Type of Sample:	
<input type="checkbox"/> QA Sample Type:		<input checked="" type="checkbox"/> Low Concentration	
		<input type="checkbox"/> High Concentration	

**SAMPLING DATA:**

Date:	Time	Color	pH	S.C.	Temp.	Turbidity	DO	Drawdown
		Visual	Standard	mS/cm	°C	NTU	mg/l	DTW
9/28/2002	1800	Clear	6.17	0.345	23.64	0	3.45	12.84

**PURGE DATA:**

Date:	Time	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	DTW
9/28/2002	1740		6.93	0.345	23.52	3.8	3.65	
Method: Peristaltic	1745		5.98	0.347	23.05	0	0.94	
Monitor Reading (ppm): N/A	1750		6.03	0.347	23.29	0	2.16	
Well Casing Diameter & Material	1755		6.13	0.345	23.55	0	2.91	
Type: Microwell 3/4" PVC								
Total Well Depth (TD): 18'	1800		6.17	0.345	23.64	0	3.45	
Static Water Level (WL): 12.84'								
One Casing Volume (gal/L):								
Start Purge (hrs): 1725								
End Purge (hrs): 1800								
Total Purge Time (min): 55								
Total Vol. Purged (gal/L): 2.1L								

**SAMPLE COLLECTION INFORMATION:**

Analysis	Preservative	Container Requirements	Collected
VOCs 8260	HCL	3 - 40 ml Vials	X
PAHs 8270C	None	2 - 1liter Amber	X
EDB 504.1	None	3 - 40 ml Vials	X
PB	HNO3	1 - 500 ml Polyethylene	X
TRPH (FL-PRO)	H2SO4	2 - liter Amber	X

**OBSERVATIONS / NOTES:**

<b>Circle if Applicable:</b>		<b>Signature(s):</b>
<input type="checkbox"/> MS/MSD	<input type="checkbox"/> Duplicate ID No.:	



## GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Naval Air Station Whiting Field  
 Project No.: CTO-200 / Job # N4038

Sample ID No.: AVGEGL4P01

Sample Location: WHF-2832-MW4P

Sampled By: C. Gleaton

C.O.C. No.: \_\_\_\_\_

- Domestic Well Data  
 Monitoring Well Data  
 Other Well Type: \_\_\_\_\_  
 QA Sample Type: \_\_\_\_\_

Type of Sample:  
 Low Concentration  
 High Concentration

**SAMPLING DATA:**

Date:	9/30/2002	Time	Color	pH	S.C.	Temp.	Turbidity	DO	Drawdown
Time:	1730	Visual	Standard	mS/cm	°C	NTU	mg/l	DTW	
Method:	10:45	Clear	6.69	0.402	25.59	9.7	0.13	10.41	

**PURGE DATA:**

Date:	9/30/2002	Time	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	DTW
Method:	Peristaltic	8:00		4.55	0.071	22.17	999	5.63	10.27
Monitor Reading (ppm):	N/A	8:20		4.87	0.001	22.61	893	1.27	10.27
Well Casing Diameter & Material		8:30		5.32	0.069	22.64	666	1.1	10.27
Type:	1" PVC	8:40		5.47	0.072	22.99	640	0.61	10.27
Total Well Depth (TD):	14.46'	9:00		5.51	0.073	23.19	520	0.62	10.27
Static Water Level (WL):	6.30'	9:20		5.58	0.077	23.79	431	0.38	10.27
One Casing Volume(gal/L):		9:40		5.60	0.079	23.75	387	0.31	10.27
Start Purge (hrs):	0750	10:00		5.66	0.078	23.87	194	0.38	10.27
End Purge (hrs):	1100	10:10		5.65	0.082	23.83	340	0.71	10.27
Total Purge Time (min):	190	10:40		5.26	0.083	23.23	214	0.23	10.27
Total Vol. Purged (gal/L):	10L	11:00		5.66	0.085	23.28	215	0.18	10.27

**SAMPLE COLLECTION INFORMATION:**

Analysis	Preservative	Container Requirements	Collected
VOCs 8260	HCL	3 - 40 ml Vials	X
PAHs 8270C	None	2 - 1liter Amber	X
EDB 504.1	None	3 - 40 ml Vials	X
PB	HNO3	1 - 500 ml Polyethylene	X
TRPH (FL-PRO)	H2SO4	2 - liter Amber	X

**OBSERVATIONS / NOTES:**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.:

\_\_\_\_\_



# GROUNDWATER SAMPLE LOG SHEET

Project Site Name:	<u>Naval Air Station Whiting Field</u>	Sample ID No.:	<u>AVGEGL3S01</u>
Project No.:	<u>CTO-200 / Job # N4038</u>	Sample Location:	<u>WHF-2832-MW3S</u>
<input type="checkbox"/> Domestic Well Data		Sampled By:	<u>C. Gleaton</u>
<input checked="" type="checkbox"/> Monitoring Well Data		C.O.C. No.:	_____
<input type="checkbox"/> Other Well Type:	_____	Type of Sample:	<input checked="" type="checkbox"/> Low Concentration
<input type="checkbox"/> QA Sample Type:	_____		<input type="checkbox"/> High Concentration

**SAMPLING DATA:**

Date:	Time	Color	pH	S.C.	Temp.	Turbidity	DO	Drawdown
		Visual	Standard	mS/cm	°C	NTU	mg/l	DTW
10/1/2002								
	1215							
Method:		Clear						

**PURGE DATA:**

Date:	Time	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	DTW
10/1/2002								
Method: Wattera	1400		5.85	0.084	26.15	140		
Monitor Reading (ppm): N/A	1415		6.22	0.087	26.22	210		
Well Casing Diameter & Material	1430		6.47	0.092	26.33	255		
Type:	1445		6.48	0.094	26.35	260		
Total Well Depth (TD): 124.69	1505		6.49	0.095	26.35	267		
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs): 1400								
End Purge (hrs): 1505								
Total Purge Time (min): 65								
Total Vol. Purged (gal/L):								

**SAMPLE COLLECTION INFORMATION:**

Analysis	Preservative	Container Requirements	Collected
VOCs 8260	HCL	3 - 40 ml Vials	X
PAHs 8270C	None	2 - 1liter Amber	X
EDB 504.1	None	3 - 40 ml Vials	X
PB	HNO3	1 - 500 ml Polyethylene	X
TRPH (FL-PRO)	H2SO4	2 - liter Amber	X

**OBSERVATIONS / NOTES:**

Sampled Upon completion of development

<b>Circle if Applicable:</b>		<b>Signature(s):</b>
MS/MSD	Duplicate ID No.:	



# GROUNDWATER SAMPLE LOG SHEET

Project Site Name:	Naval Air Station Whiting Field	Sample ID No.:	AVGEGL8P01
Project No.:	CTO-200 / Job # N4038	Sample Location:	WHF-2832-MW8P
<input type="checkbox"/> Domestic Well Data		Sampled By:	C. Gleaton
<input checked="" type="checkbox"/> Monitoring Well Data		C.O.C. No.:	
<input type="checkbox"/> Other Well Type:		Type of Sample:	
<input type="checkbox"/> QA Sample Type:		<input checked="" type="checkbox"/> Low Concentration	
		<input type="checkbox"/> High Concentration	

**SAMPLING DATA:**

Date:	Time	Color	pH	S.C.	Temp.	Turbidity	DO	Drawdown
		Visual	Standard	mS/cm	°C	NTU	mg/l	DTW
9/30/2002	1700	Clear	5.85	0.192	25.93	124.3	9.31	11.27

**PURGE DATA:**

Date:	Time	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	DTW
9/30/2002	8:50		6.33	0.241	23.11	551	8.50	
Method: Peristaltic	9:00		6.00	0.900	23.17	362	8.39	
Monitor Reading (ppm): N/A	9:10		6.03	0.873	23.15	321	8.37	
Well Casing Diameter & Material	9:20		6.07	0.077	23.58	246	8.58	
Type: 2" PVC	9:30		5.93	0.205	23.66	263	8.07	
Total Well Depth (TD): 18.85'	9:40		5.89	0.193	23.98	105.2	8.82	
Static Water Level (WL): 13.73'	9:50		5.95	0.191	24.20	120.3	8.22	
One Casing Volume(gal/L):	10:00		5.87	0.195	24.80	85.2	8.59	
Start Purge (hrs): 0830	10:10		5.92	0.203	25.70	74.3	9.17	
End Purge (hrs): 1050	10:30		5.90	0.201	25.80	101.3	8.19	
Total Purge Time (min): 140	10:40		5.85	0.192	25.93	129.3	9.31	
Total Vol. Purged (gal/L): 5L								

**SAMPLE COLLECTION INFORMATION:**

Analysis	Preservative	Container Requirements	Collected
VOCs 8260	HCL	3 - 40 ml Vials	X
PAHs 8270C	None	2 - 1liter Amber	X
EDB 504.1	None	3 - 40 ml Vials	X
PB	HNO3	1 - 500 ml Polyethylene	X
TRPH (FL-PRO)	H2SO4	2 - liter Amber	X

**OBSERVATIONS / NOTES:**

<b>Circle if Applicable:</b>		<b>Signature(s):</b>
<input type="checkbox"/> MS/MSD	<input type="checkbox"/> Duplicate ID No.:	



# GROUNDWATER SAMPLE LOG SHEET

Project Site Name:	Naval Air Station Whiting Field	Sample ID No.:	AVGEGL12P01
Project No.:	CTO-200 / Job # N4038	Sample Location:	WHF-2832-MW12P
<input type="checkbox"/> Domestic Well Data		Sampled By:	C. Gleaton
<input checked="" type="checkbox"/> Monitoring Well Data		C.O.C. No.:	
<input type="checkbox"/> Other Well Type:		Type of Sample:	
<input type="checkbox"/> QA Sample Type:		<input checked="" type="checkbox"/> Low Concentration	
		<input type="checkbox"/> High Concentration	

**SAMPLING DATA:**

Date:	Time	Color	pH	S.C.	Temp.	Turbidity	DO	Drawdown
		Visual	Standard	mS/cm	°C	NTU	mg/l	DTW
9/28/2002	8:35	Clear						
Method:								

**PURGE DATA:**

Date:	Time	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	DTW
9/28/2002	8:55		6.06	0.371	26.39	0	4.83	4.21
Method: Peristaltic Pump								
Monitor Reading (ppm):	N/A		6.07	0.364	26.78	0	4.85	4.39
Well Casing Diameter & Material	9:10		6.16	0.364	26.95	0	4.48	4.59
Type: 2" PVC	9:15		6.18	0.367	26.95	0	4.66	4.68
Total Well Depth (TD):	18'							
Static Water Level (WL):	16.74'							
One Casing Volume(gal/L):								
Start Purge (hrs):	0835							
End Purge (hrs):	0915							
Total Purge Time (min):	40							
Total Vol. Purged (gal/L):	2.5L							

**SAMPLE COLLECTION INFORMATION:**

Analysis	Preservative	Container Requirements	Collected
VOCs 8260	HCL	3 - 40 ml Vials	X
PAHs 8270C	None	2 - 1liter Amber	X
EDB 504.1	None	3 - 40 ml Vials	X
PB	HNO3	1 - 500 ml Polyethylene	X
TRPH (FL-PRO)	H2SO4	2 - liter Amber	X

**OBSERVATIONS / NOTES:**

<b>Circle if Applicable:</b>		<b>Signature(s):</b>
<input type="checkbox"/> MS/MSD	<input type="checkbox"/> Duplicate ID No.:	



## GROUNDWATER SAMPLE LOG SHEET

Project Site Name:	Naval Air Station Whiting Field	Sample ID No.:	AVGEGL11P01
Project No.:	CTO-200 / Job # N4038	Sample Location:	WHF-2832-MW11P
<input type="checkbox"/> Domestic Well Data		Sampled By:	C. Gleaton
<input checked="" type="checkbox"/> Monitoring Well Data		C.O.C. No.:	
<input type="checkbox"/> Other Well Type:		Type of Sample:	
<input type="checkbox"/> QA Sample Type:		<input checked="" type="checkbox"/> Low Concentration	
		<input type="checkbox"/> High Concentration	

## SAMPLING DATA:

Date:	Time	Color	pH	S.C.	Temp.	Turbidity	DO	Drawdown
		Visual	Standard	mS/cm	°C	NTU	mg/l	DTW
10/1/2002	1600	Clear	5.33	0.121	23.22	290	0.18	

## PURGE DATA:

Date:	Time	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	DTW
10/1/2002	1500		5.34	0.120	23.1	387		16.89
Method: Peristaltic Pump	1510		5.34	0.120	23.32	380		
Monitor Reading (ppm): N/A	1520		5.33	0.120	23.17	346		
Well Casing Diameter & Material	1530		5.28	0.121	23.21	247		
Type: 2" PVC	1540		5.31	0.122	23.22	210		17.32
Total Well Depth (TD): 18'	1550		5.3	0.120	23.21	253		17.35
Static Water Level (WL): 16.74'	1600		5.33	0.120	23.21	243		17.39
One Casing Volume(gal/L):	1610		5.33	0.121	23.22	240		17.38
Start Purge (hrs): 1500								
End Purge (hrs): 1610								
Total Purge Time (min): 70								
Total Vol. Purged (gal/L): 6.5L								

## SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOCs 8260	HCL	3 - 40 ml Vials	X
PAHs 8270C	None	2 - 1liter Amber	X
EDB 504.1	None	3 - 40 ml Vials	X
PB	HNO3	1 - 500 ml Polyethylene	X
TRPH (FL-PRO)	H2SO4	2 - liter Amber	X

## OBSERVATIONS / NOTES:

Turbidity was a constant high due to high levels of clay in the well. Sampled after development completed.

## Circle if Applicable:

MS/MSD	Duplicate ID No.:	Signature(s):
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**APPENDIX G**  
**GROUNDWATER LABORATORY ANALYTICAL REPORTS**

## Report of Analysis

<b>Client Sample ID:</b> AVGEGL3P02	<b>Date Sampled:</b> 09/29/02
<b>Lab Sample ID:</b> F14838-2	<b>Date Received:</b> 10/01/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8260B	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	C0012481.D	100	10/12/02	JG	n/a	n/a	VC553
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

## VOA Special List

CAS No.	Compound	Result	RL	Units	Q
71-43-2	Benzene	3030	100	ug/l	
75-27-4	Bromodichloromethane	ND	100	ug/l	
75-25-2	Bromoform	ND	100	ug/l	
108-90-7	Chlorobenzene	ND	100	ug/l	
75-00-3	Chloroethane	ND	100	ug/l	
67-66-3	Chloroform	ND	100	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	500	ug/l	
56-23-5	Carbon tetrachloride	ND	100	ug/l	
75-34-3	1,1-Dichloroethane	ND	100	ug/l	
75-35-4	1,1-Dichloroethylene	ND	100	ug/l	
107-06-2	1,2-Dichloroethane	ND	100	ug/l	
78-87-5	1,2-Dichloropropane	ND	100	ug/l	
124-48-1	Dibromochloromethane	ND	100	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	100	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	100	ug/l	
541-73-1	m-Dichlorobenzene	ND	100	ug/l	
95-50-1	o-Dichlorobenzene	ND	100	ug/l	
106-46-7	p-Dichlorobenzene	ND	100	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	100	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	100	ug/l	
100-41-4	Ethylbenzene	ND	100	ug/l	
74-83-9	Methyl bromide	ND	100	ug/l	
74-87-3	Methyl chloride	ND	100	ug/l	
75-09-2	Methylene chloride	ND	500	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	100	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	100	ug/l	
79-34-5	1,1,1,2-Tetrachloroethane	ND	100	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	100	ug/l	
127-18-4	Tetrachloroethylene	ND	100	ug/l	
108-88-3	Toluene	51.7	100	ug/l	J
79-01-6	Trichloroethylene	ND	100	ug/l	
75-01-4	Vinyl chloride	ND	100	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

000018

Report of Analysis

<b>Client Sample ID:</b> AVGEG3P02	
<b>Lab Sample ID:</b> F14838-2	<b>Date Sampled:</b> 09/29/02
<b>Matrix:</b> AQ - Ground Water	<b>Date Received:</b> 10/01/02
<b>Method:</b> SW846 8260B	<b>Percent Solids:</b> n/a
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

VOA Special List

CAS No.	Compound	Result	RL	Units	Q
1330-20-7	Xylene (total)	651	300	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	94%		86-115%
17060-07-0	1,2-Dichloroethane-D4	99%		78-125%
2037-26-5	Toluene-D8	107%		87-113%
460-00-4	4-Bromofluorobenzene	103%		84-117%

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

000019

Report of Analysis

<b>Client Sample ID:</b> AVGEG3P02	<b>Date Sampled:</b> 09/29/02
<b>Lab Sample ID:</b> F14838-2	<b>Date Received:</b> 10/01/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8270C BY SIM SW846 3510C	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W012368.D	1	10/06/02	ME	10/04/02	OP6025	SW668
Run #2							

Run #	Initial Volume	Final Volume
Run #1	970 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	1.0	ug/l	
208-96-8	Acenaphthylene	ND	1.0	ug/l	
120-12-7	Anthracene	ND	1.0	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.21	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.21	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.21	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.21	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.21	ug/l	
218-01-9	Chrysene	ND	0.21	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.21	ug/l	
206-44-0	Fluoranthene	ND	1.0	ug/l	
86-73-7	Fluorene	ND	1.0	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.21	ug/l	
90-12-0	1-Methylnaphthalene	0.87	1.0	ug/l	J
91-57-6	2-Methylnaphthalene	1.6	1.0	ug/l	
91-20-3	Naphthalene	4.9	1.0	ug/l	
85-01-8	Phenanthrene	ND	1.0	ug/l	
129-00-0	Pyrene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	51%		49-119%
321-60-8	2-Fluorobiphenyl	90%		45-118%
1718-51-0	Terphenyl-d14	76%		46-135%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

000020

**Report of Analysis**

<b>Client Sample ID:</b>	AVGEG3P02	<b>Date Sampled:</b>	09/29/02
<b>Lab Sample ID:</b>	F14838-2	<b>Date Received:</b>	10/01/02
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	EPA 504.1 EPA 504		
<b>Project:</b>	NAS Whiting Field- (CTO#200) N4038		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST16662.D	1	10/04/02	SKW	10/03/02	OP6022	GST616
Run #2							

	Initial Volume	Final Volume
Run #1	38.9 ml	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.018	ug/l	

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

**000021**

## Report of Analysis

<b>Client Sample ID:</b>	AVGEGL3P02	<b>Date Sampled:</b>	09/29/02
<b>Lab Sample ID:</b>	F14838-2	<b>Date Received:</b>	10/01/02
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	FLORIDA-PRO SW846 3510C		
<b>Project:</b>	NAS Whiting Field- (CTO#200) N4038		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP24186.D	4	10/04/02	SKW	10/03/02	OP6013	GOP858
Run #2							

Run #	Initial Volume	Final Volume
Run #1	920 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH (C8-C40)	5.19	1.1	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	92%		51-125%	

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

000022

# Report of Analysis

<b>Client Sample ID:</b> AVGEGL3P02	<b>Date Sampled:</b> 09/29/02
<b>Lab Sample ID:</b> F14838-2	<b>Date Received:</b> 10/01/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

**Metals Analysis**

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Lead	61.1	5.0	1.2	ug/l	1	10/11/02	10/14/02 DM	SW846 6010B	SW846 3010A

RL = Reporting Limit  
 IDL = Instrument Detection Limit

U = Indicates a result < IDL  
 B = Indicates a result >= IDL but < RL

**000023**

## Report of Analysis

<b>Client Sample ID:</b> AVGEG4P02	<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-4	<b>Date Received:</b> 10/03/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8260B	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	C0012494.D	1	10/12/02	JG	n/a	n/a	VC553
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

## VOA Special List

CAS No.	Compound	Result	RL	Units	Q
71-43-2	Benzene	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
541-73-1	m-Dichlorobenzene	ND	1.0	ug/l	
95-50-1	o-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	p-Dichlorobenzene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
74-83-9	Methyl bromide	ND	1.0	ug/l	
74-87-3	Methyl chloride	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

000031

## Report of Analysis

<b>Client Sample ID:</b> AVGEGL4P02	<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-4	<b>Date Received:</b> 10/03/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8260B	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

## VOA Special List

CAS No.	Compound	Result	RL	Units	Q
1330-20-7	Xylene (total)	ND	3.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	94%		86-115%
17060-07-0	1,2-Dichloroethane-D4	98%		78-125%
2037-26-5	Toluene-D8	108%		87-113%
460-00-4	4-Bromofluorobenzene	105%		84-117%

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

000032

## Report of Analysis

<b>Client Sample ID:</b> AVGEGL4P02		<b>Date Sampled:</b> 10/01/02	
<b>Lab Sample ID:</b> F14890-4		<b>Date Received:</b> 10/03/02	
<b>Matrix:</b> AQ - Ground Water		<b>Percent Solids:</b> n/a	
<b>Method:</b> SW846 8270C BY SIM SW846 3510C			
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038			

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L014780.D	1	10/10/02	ME	10/07/02	OP6047	SL818
Run #2							

Run #	Initial Volume	Final Volume
Run #1	920 ml	1.0 ml
Run #2		

## BN PAH List

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	1.1	ug/l	
208-96-8	Acenaphthylene	ND	1.1	ug/l	
120-12-7	Anthracene	ND	1.1	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.22	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.22	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.22	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.22	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.22	ug/l	
218-01-9	Chrysene	ND	0.22	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.22	ug/l	
206-44-0	Fluoranthene	ND	1.1	ug/l	
86-73-7	Fluorene	ND	1.1	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.22	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.1	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.1	ug/l	
91-20-3	Naphthalene	ND	1.1	ug/l	
85-01-8	Phenanthrene	ND	1.1	ug/l	
129-00-0	Pyrene	ND	1.1	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	87%		49-119%
321-60-8	2-Fluorobiphenyl	87%		45-118%
1718-51-0	Terphenyl-d14	91%		46-135%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

000033

**Report of Analysis**

<b>Client Sample ID:</b> AVGEGL4P02	
<b>Lab Sample ID:</b> F14890-4	<b>Date Sampled:</b> 10/01/02
<b>Matrix:</b> AQ - Ground Water	<b>Date Received:</b> 10/03/02
<b>Method:</b> EPA 504.1 EPA 504	<b>Percent Solids:</b> n/a
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST16884.D	1	10/09/02	SKW	10/08/02	OP6058	GST618
Run #2							

	Initial Volume	Final Volume
Run #1	37.8 ml	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.019	ug/l	

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

**000034**

## Report of Analysis

<b>Client Sample ID:</b> AVGEG4P02	<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-4	<b>Date Received:</b> 10/03/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> FLORIDA-PRO SW846 3510C	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP24415.D	1	10/09/02	SKW	10/08/02	OP6051	GOP863
Run #2							

Run #	Initial Volume	Final Volume
Run #1	890 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units Q
	TPH (C8-C40)	1.01	0.28	mg/l

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	98%		51-125%

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

000035

## Report of Analysis

<b>Client Sample ID:</b> AVGEGL4P02	<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-4	<b>Date Received:</b> 10/03/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

**Metals Analysis**

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Lead	5.2	5.0	1.2	ug/l	1	10/11/02	10/14/02 DM	SW846 6010B	SW846 3010A

RL = Reporting Limit  
 IDL = Instrument Detection Limit

U = Indicates a result < IDL  
 B = Indicates a result >= IDL but < RL

**000036**

## Report of Analysis

<b>Client Sample ID:</b> AVGEG5P02		<b>Date Sampled:</b> 10/01/02	
<b>Lab Sample ID:</b> F14890-1		<b>Date Received:</b> 10/03/02	
<b>Matrix:</b> AQ - Ground Water		<b>Percent Solids:</b> n/a	
<b>Method:</b> SW846 8260B			
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038			

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	C0012491.D	1	10/12/02	JG	n/a	n/a	VC553
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

## VOA Special List

CAS No.	Compound	Result	RL	Units	Q
71-43-2	Benzene	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
541-73-1	m-Dichlorobenzene	ND	1.0	ug/l	
95-50-1	o-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	p-Dichlorobenzene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
74-83-9	Methyl bromide	ND	1.0	ug/l	
74-87-3	Methyl chloride	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

000013

## Report of Analysis

<b>Client Sample ID:</b> AVGEGLSP02	<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-1	<b>Date Received:</b> 10/03/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8260B	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
1330-20-7	Xylene (total)	ND	3.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	96%		86-115%
17060-07-0	1,2-Dichloroethane-D4	100%		78-125%
2037-26-5	Toluene-D8	102%		87-113%
460-00-4	4-Bromofluorobenzene	104%		84-117%

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

000014

## Report of Analysis

<b>Client Sample ID:</b> AVGEGLSPO2	<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-1	<b>Date Received:</b> 10/03/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8270C BY SIM SW846 3510C	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L014777.D	1	10/10/02	ME	10/07/02	OP6047	SL818
Run #2							

Run #	Initial Volume	Final Volume
Run #1	900 ml	1.0 ml
Run #2		

## BN PAH List

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	1.1	ug/l	
208-96-8	Acenaphthylene	ND	1.1	ug/l	
120-12-7	Anthracene	ND	1.1	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.22	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.22	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.22	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.22	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.22	ug/l	
218-01-9	Chrysene	ND	0.22	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.22	ug/l	
206-44-0	Fluoranthene	ND	1.1	ug/l	
86-73-7	Fluorene	ND	1.1	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.22	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.1	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.1	ug/l	
91-20-3	Naphthalene	ND	1.1	ug/l	
85-01-8	Phenanthrene	ND	1.1	ug/l	
129-00-0	Pyrene	ND	1.1	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	84%		49-119%
321-60-8	2-Fluorobiphenyl	84%		45-118%
1718-51-0	Terphenyl-d14	84%		46-135%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

000015

# Report of Analysis

<b>Client Sample ID:</b> AVGEGL5P02	<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-1	<b>Date Received:</b> 10/03/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> EPA 504.1 EPA 504	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST16878.D	1	10/09/02	SKW	10/08/02	OP6058	GST618
Run #2							

	Initial Volume	Final Volume
Run #1	37.9 ml	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.018	ug/l	

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

000016

## Report of Analysis

<b>Client Sample ID:</b> AVGEGL5P02	<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-1	<b>Date Received:</b> 10/03/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> FLORIDA-PRO SW846 3510C	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP24411.D	1	10/09/02	SKW	10/08/02	OP6051	GOP863
Run #2							

Run #	Initial Volume	Final Volume
Run #1	880 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH (C8-C40)	1.90	0.28	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	95%		51-125%	

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

000017

# Report of Analysis

<b>Client Sample ID:</b> AVGEGLSPO2	<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-1	<b>Date Received:</b> 10/03/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

## Metals Analysis

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Lead	1.2 U	5.0	1.2	ug/l	1	10/11/02	10/14/02 DM	SW846 6010B	SW846 3010A

RL = Reporting Limit  
IDL = Instrument Detection Limit

U = Indicates a result < IDL  
B = Indicates a result >= IDL but < RL

**000018**

## Report of Analysis

<b>Client Sample ID:</b>	AVGEGGL6P02	<b>Date Sampled:</b>	09/29/02
<b>Lab Sample ID:</b>	F14838-1	<b>Date Received:</b>	10/01/02
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	NAS Whiting Field- (CTO#200) N4038		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	C0012479.D	250	10/12/02	JG	n/a	n/a	VC553
Run #2	C0012505.D	500	10/13/02	JG	n/a	n/a	VC554

Run #	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

## VOA Special List

CAS No.	Compound	Result	RL	Units	Q
71-43-2	Benzene	12600	250	ug/l	
75-27-4	Bromodichloromethane	ND	250	ug/l	
75-25-2	Bromoform	ND	250	ug/l	
108-90-7	Chlorobenzene	ND	250	ug/l	
75-00-3	Chloroethane	ND	250	ug/l	
67-66-3	Chloroform	ND	250	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	1300	ug/l	
56-23-5	Carbon tetrachloride	ND	250	ug/l	
75-34-3	1,1-Dichloroethane	ND	250	ug/l	
75-35-4	1,1-Dichloroethylene	ND	250	ug/l	
107-06-2	1,2-Dichloroethane	ND	250	ug/l	
78-87-5	1,2-Dichloropropane	ND	250	ug/l	
124-48-1	Dibromochloromethane	ND	250	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	250	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	250	ug/l	
541-73-1	m-Dichlorobenzene	ND	250	ug/l	
95-50-1	o-Dichlorobenzene	ND	250	ug/l	
106-46-7	p-Dichlorobenzene	ND	250	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	250	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	250	ug/l	
100-41-4	Ethylbenzene	1630	250	ug/l	
74-83-9	Methyl bromide	ND	250	ug/l	
74-87-3	Methyl chloride	ND	250	ug/l	
75-09-2	Methylene chloride	ND	1300	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	250	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	250	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	250	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	250	ug/l	
127-18-4	Tetrachloroethylene	ND	250	ug/l	
108-88-3	Toluene	34400 *	500	ug/l	
79-01-6	Trichloroethylene	ND	250	ug/l	
75-01-4	Vinyl chloride	ND	250	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

000012

## Report of Analysis

<b>Client Sample ID:</b>	AVGEGL6P02	<b>Date Sampled:</b>	09/29/02
<b>Lab Sample ID:</b>	F14838-1	<b>Date Received:</b>	10/01/02
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	NAS Whiting Field- (CTO#200) N4038		

## VOA Special List

CAS No.	Compound	Result	RL	Units	Q
1330-20-7	Xylene (total)	1570	750	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	93%	95%	86-115%
17060-07-0	1,2-Dichloroethane-D4	100%	99%	78-125%
2037-26-5	Toluene-D8	106%	106%	87-113%
460-00-4	4-Bromofluorobenzene	104%	105%	84-117%

(a) Result is from Run# 2

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

000013

## Report of Analysis

<b>Client Sample ID:</b>	AVGEG6P02	<b>Date Sampled:</b>	09/29/02
<b>Lab Sample ID:</b>	F14838-1	<b>Date Received:</b>	10/01/02
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8270C BY SIM SW846 3510C		
<b>Project:</b>	NAS Whiting Field- (CTO#200) N4038		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W012367.D	1	10/06/02	ME	10/04/02	OP6025	SW668
Run #2							

Run #	Initial Volume	Final Volume
Run #1	920 ml	1.0 ml
Run #2		

## BN PAH List

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	1.1	ug/l	
208-96-8	Acenaphthylene	ND	1.1	ug/l	
120-12-7	Anthracene	ND	1.1	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.22	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.22	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.22	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.22	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.22	ug/l	
218-01-9	Chrysene	ND	0.22	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.22	ug/l	
206-44-0	Fluoranthene	ND	1.1	ug/l	
86-73-7	Fluorene	ND	1.1	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.22	ug/l	
90-12-0	1-Methylnaphthalene	0.92	1.1	ug/l	J
91-57-6	2-Methylnaphthalene	1.7	1.1	ug/l	
91-20-3	Naphthalene	6.1	1.1	ug/l	
85-01-8	Phenanthrene	ND	1.1	ug/l	
129-00-0	Pyrene	ND	1.1	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	85%		49-119%
321-60-8	2-Fluorobiphenyl	88%		45-118%
1718-51-0	Terphenyl-d14	77%		46-135%

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

000014

## Report of Analysis

<b>Client Sample ID:</b>	AVGEGP02	<b>Date Sampled:</b>	09/29/02
<b>Lab Sample ID:</b>	F14838-1	<b>Date Received:</b>	10/01/02
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	EPA 504.1 EPA 504		
<b>Project:</b>	NAS Whiting Field- (CTO#200) N4038		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 <sup>a</sup>	ST16659.D	1	10/04/02	SKW	10/03/02	OP6022	GST616
Run #2							

Run #	Initial Volume	Final Volume
Run #1	39.1 ml	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
106-93-4	1,2-Dibromoethane	0.41	0.018	ug/l	

(a) All hits confirmed by dual column analysis.

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

000015

**Report of Analysis**

<b>Client Sample ID:</b> AVGEGL6P02		
<b>Lab Sample ID:</b> F14838-1		<b>Date Sampled:</b> 09/29/02
<b>Matrix:</b> AQ - Ground Water		<b>Date Received:</b> 10/01/02
<b>Method:</b> FLORIDA-PRO SW846 3510C		<b>Percent Solids:</b> n/a
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP24185.D	10	10/04/02	SKW	10/03/02	OP6013	GOP858
Run #2							

	Initial Volume	Final Volume
Run #1	990 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH (C8-C40)	16.7	2.5	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	102%		51-125%	

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

**000016**

**Report of Analysis**

<b>Client Sample ID:</b>	AVGEGL6P02	<b>Date Sampled:</b>	09/29/02
<b>Lab Sample ID:</b>	F14838-1	<b>Date Received:</b>	10/01/02
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	NAS Whiting Field- (CTO#200) N4038		

**Metals Analysis**

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Lead	151	5.0	1.2	ug/l	1	10/11/02	10/14/02 DM	SW846 6010B	SW846 3010A

RL = Reporting Limit  
 IDL = Instrument Detection Limit

U = Indicates a result < IDL  
 B = Indicates a result >= IDL but < RL

**000017**

## Report of Analysis

<b>Client Sample ID:</b> AVGEGL8P01		<b>Date Sampled:</b> 10/01/02	
<b>Lab Sample ID:</b> F14890-3		<b>Date Received:</b> 10/03/02	
<b>Matrix:</b> AQ - Ground Water		<b>Percent Solids:</b> n/a	
<b>Method:</b> SW846 8260B			
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038			

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	C0012493.D	1	10/12/02	JG	n/a	n/a	VC553
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

## VOA Special List

CAS No.	Compound	Result	RL	Units	Q
71-43-2	Benzene	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
541-73-1	m-Dichlorobenzene	ND	1.0	ug/l	
95-50-1	o-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	p-Dichlorobenzene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
74-83-9	Methyl bromide	ND	1.0	ug/l	
74-87-3	Methyl chloride	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

000025

## Report of Analysis

<b>Client Sample ID:</b> AVGEGL8P01	<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-3	<b>Date Received:</b> 10/03/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8260B	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
1330-20-7	Xylene (total)	ND	3.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	95%		86-115%
17060-07-0	1,2-Dichloroethane-D4	101%		78-125%
2037-26-5	Toluene-D8	107%		87-113%
460-00-4	4-Bromofluorobenzene	108%		84-117%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**000026**

## Report of Analysis

<b>Client Sample ID:</b> AVGEGL8P01	
<b>Lab Sample ID:</b> F14890-3	<b>Date Sampled:</b> 10/01/02
<b>Matrix:</b> AQ - Ground Water	<b>Date Received:</b> 10/03/02
<b>Method:</b> SW846 8270C BY SIM SW846 3510C	<b>Percent Solids:</b> n/a
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L014779.D	1	10/10/02	ME	10/07/02	OP6047	SL818
Run #2							

Run #	Initial Volume	Final Volume
Run #1	910 ml	1.0 ml
Run #2		

## BN PAH List

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	1.1	ug/l	
208-96-8	Acenaphthylene	ND	1.1	ug/l	
120-12-7	Anthracene	ND	1.1	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.22	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.22	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.22	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.22	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.22	ug/l	
218-01-9	Chrysene	ND	0.22	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.22	ug/l	
206-44-0	Fluoranthene	ND	1.1	ug/l	
86-73-7	Fluorene	ND	1.1	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.22	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.1	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.1	ug/l	
91-20-3	Naphthalene	ND	1.1	ug/l	
85-01-8	Phenanthrene	ND	1.1	ug/l	
129-00-0	Pyrene	ND	1.1	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	96%		49-119%
321-60-8	2-Fluorobiphenyl	94%		45-118%
1718-51-0	Terphenyl-d14	94%		46-135%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

000027

## Report of Analysis

<b>Client Sample ID:</b>	AVGEGL8P01	<b>Date Sampled:</b>	10/01/02
<b>Lab Sample ID:</b>	F14890-3	<b>Date Received:</b>	10/03/02
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	EPA 504.1 EPA 504		
<b>Project:</b>	NAS Whiting Field- (CTO#200) N4038		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST16883.D	1	10/09/02	SKW	10/08/02	OP6058	GST618
Run #2							

	Initial Volume	Final Volume
Run #1	38.1 ml	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.018	ug/l	

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

000028

## Report of Analysis

<b>Client Sample ID:</b>	AVGEGL8P01	<b>Date Sampled:</b>	10/01/02
<b>Lab Sample ID:</b>	F14890-3	<b>Date Received:</b>	10/03/02
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	FLORIDA-PRO SW846 3510C		
<b>Project:</b>	NAS Whiting Field- (CTO#200) N4038		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP24414.D	1	10/09/02	SKW	10/08/02	OP6051	GOP863
Run #2							

	Initial Volume	Final Volume
Run #1	900 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH (C8-C40)	ND	0.28	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	91%		51-125%	

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

000029

## Report of Analysis

<b>Client Sample ID:</b> AVGEGL8P01	<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-3	<b>Date Received:</b> 10/03/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

**Metals Analysis**

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Lead	5.6	5.0	1.2	ug/l	1	10/11/02	10/14/02 DM	SW846 6010B	SW846 3010A

RL = Reporting Limit  
 IDL = Instrument Detection Limit

U = Indicates a result < IDL  
 B = Indicates a result >= IDL but < RL

000050

## Report of Analysis

Client Sample ID:	AVGEGL10P01	Date Sampled:	09/28/02
Lab Sample ID:	F14838-4	Date Received:	10/01/02
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	NAS Whiting Field- (CTO#200) N4038		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	C0012471.D	1	10/11/02	JG	n/a	n/a	VC552
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

## VOA Special List

CAS No.	Compound	Result	RL	Units	Q
71-43-2	Benzene	11.7	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
541-73-1	m-Dichlorobenzene	ND	1.0	ug/l	
95-50-1	o-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	p-Dichlorobenzene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
74-83-9	Methyl bromide	ND	1.0	ug/l	
74-87-3	Methyl chloride	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	1.1	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

000030

## Report of Analysis

<b>Client Sample ID:</b>	AVGEGL10P01	<b>Date Sampled:</b>	09/28/02
<b>Lab Sample ID:</b>	F14838-4	<b>Date Received:</b>	10/01/02
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	NAS Whiting Field- (CTO#200) N4038		

## VOA Special List

CAS No.	Compound	Result	RL	Units	Q
1330-20-7	Xylene (total)	ND	3.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	97%		86-115%
17060-07-0	1,2-Dichloroethane-D4	98%		78-125%
2037-26-5	Toluene-D8	105%		87-113%
460-00-4	4-Bromofluorobenzene	103%		84-117%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

000031

**Report of Analysis**

<b>Client Sample ID:</b> AVGEG10P01	
<b>Lab Sample ID:</b> F14838-4	<b>Date Sampled:</b> 09/28/02
<b>Matrix:</b> AQ - Ground Water	<b>Date Received:</b> 10/01/02
<b>Method:</b> SW846 8270C BY SIM SW846 3510C	<b>Percent Solids:</b> n/a
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W012370.D	1	10/06/02	ME	10/04/02	OP6025	SW668
Run #2							

Run #	Initial Volume	Final Volume
Run #1	990 ml	1.0 ml
Run #2		

**BN PAH List**

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	1.0	ug/l	
208-96-8	Acenaphthylene	ND	1.0	ug/l	
120-12-7	Anthracene	ND	1.0	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	ug/l	
218-01-9	Chrysene	ND	0.20	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	ug/l	
206-44-0	Fluoranthene	ND	1.0	ug/l	
86-73-7	Fluorene	ND	1.0	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	ug/l	
91-20-3	Naphthalene	ND	1.0	ug/l	
85-01-8	Phenanthrene	ND	1.0	ug/l	
129-00-0	Pyrene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	84%		49-119%
321-60-8	2-Fluorobiphenyl	81%		45-118%
1718-51-0	Terphenyl-d14	80%		46-135%

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

000032

## Report of Analysis

Client Sample ID:	AVGEGL10P01	
Lab Sample ID:	F14838-4	Date Sampled: 09/28/02
Matrix:	AQ - Ground Water	Date Received: 10/01/02
Method:	EPA 504.1 EPA 504	Percent Solids: n/a
Project:	NAS Whiting Field- (CTO#200) N4038	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST16664.D	1	10/04/02	SKW	10/03/02	OP6022	GST616
Run #2							

	Initial Volume	Final Volume
Run #1	38.6 ml	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.018	ug/l	

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

**000033**

**Report of Analysis**

<b>Client Sample ID:</b> AVGEGL10P01	
<b>Lab Sample ID:</b> F14838-4	<b>Date Sampled:</b> 09/28/02
<b>Matrix:</b> AQ - Ground Water	<b>Date Received:</b> 10/01/02
<b>Method:</b> FLORIDA-PRO SW846 3510C	<b>Percent Solids:</b> n/a
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP24188.D	1	10/04/02	SKW	10/03/02	OP6013	GOP858
Run #2							

	Initial Volume	Final Volume
Run #1	960 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH (C8-C40)	0.383	0.26	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	90%		51-125%

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

**000034**

## Report of Analysis

<b>Client Sample ID:</b> AVGEGL10P01	<b>Date Sampled:</b> 09/28/02
<b>Lab Sample ID:</b> F14838-4	<b>Date Received:</b> 10/01/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

**Metals Analysis**

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Lead	13.5	5.0	1.2	ug/l	1	10/11/02	10/14/02 DM	SW846 6010B	SW846 3010A

RL = Reporting Limit  
 IDL = Instrument Detection Limit

U = Indicates a result < IDL  
 B = Indicates a result > IDL

0000.35L

## Report of Analysis

<b>Client Sample ID:</b>	AVGEG11P01	<b>Date Sampled:</b>	10/01/02
<b>Lab Sample ID:</b>	F14890-2	<b>Date Received:</b>	10/03/02
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	NAS Whiting Field- (CTO#200) N4038		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	C0012492.D	1	10/12/02	JG	n/a	n/a	VC553
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

## VOA Special List

CAS No.	Compound	Result	RL	Units	Q
71-43-2	Benzene	6.0	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
541-73-1	m-Dichlorobenzene	ND	1.0	ug/l	
95-50-1	o-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	p-Dichlorobenzene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	8.0	1.0	ug/l	
74-83-9	Methyl bromide	ND	1.0	ug/l	
74-87-3	Methyl chloride	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	4.6	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

000019

## Report of Analysis

<b>Client Sample ID:</b> AVGEGL11P01	<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-2	<b>Date Received:</b> 10/03/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8260B	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

## VOA Special List

CAS No.	Compound	Result	RL	Units	Q
1330-20-7	Xylene (total)	5.8	3.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	93%		86-115%
17060-07-0	1,2-Dichloroethane-D4	100%		78-125%
2037-26-5	Toluene-D8	111%		87-113%
460-00-4	4-Bromofluorobenzene	106%		84-117%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

000020

## Report of Analysis

<b>Client Sample ID:</b> AVGEGL11P01	
<b>Lab Sample ID:</b> F14890-2	<b>Date Sampled:</b> 10/01/02
<b>Matrix:</b> AQ - Ground Water	<b>Date Received:</b> 10/03/02
<b>Method:</b> SW846 8270C BY SIM SW846 3510C	<b>Percent Solids:</b> n/a
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	LO14778.D	1	10/10/02	ME	10/07/02	OP6047	SL818
Run #2							

Run #	Initial Volume	Final Volume
Run #1	910 ml	1.0 ml
Run #2		

## BN PAH List

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	1.1	ug/l	
208-96-8	Acenaphthylene	ND	1.1	ug/l	
120-12-7	Anthracene	ND	1.1	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.22	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.22	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.22	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.22	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.22	ug/l	
218-01-9	Chrysene	ND	0.22	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.22	ug/l	
206-44-0	Fluoranthene	ND	1.1	ug/l	
86-73-7	Fluorene	ND	1.1	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.22	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.1	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.1	ug/l	
91-20-3	Naphthalene	ND	1.1	ug/l	
85-01-8	Phenanthrene	ND	1.1	ug/l	
129-00-0	Pyrene	ND	1.1	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	90%		49-119%
321-60-8	2-Fluorobiphenyl	85%		45-118%
1718-51-0	Terphenyl-d14	88%		46-135%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

000021

**Report of Analysis**

<b>Client Sample ID:</b> AVGEGL11P01	
<b>Lab Sample ID:</b> F14890-2	<b>Date Sampled:</b> 10/01/02
<b>Matrix:</b> AQ - Ground Water	<b>Date Received:</b> 10/03/02
<b>Method:</b> EPA 504.1 EPA 504	<b>Percent Solids:</b> n/a
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST16880.D	1	10/09/02	SKW	10/08/02	OP6058	GST618
Run #2							

	Initial Volume	Final Volume
Run #1	37.5 ml	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.019	ug/l	

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

**000022**

## Report of Analysis

<b>Client Sample ID:</b> AVGEGL11P01		<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-2		<b>Date Received:</b> 10/03/02
<b>Matrix:</b> AQ - Ground Water		<b>Percent Solids:</b> n/a
<b>Method:</b> FLORIDA-PRO SW846 3510C		
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP24412.D	1	10/09/02	SKW	10/08/02	OP6051	GOP863
Run #2							

Run #	Initial Volume	Final Volume
Run #1	910 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH (C8-C40)	ND	0.27	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	95%		51-125%	

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

000023

## Report of Analysis

<b>Client Sample ID:</b> AVGEGL11P01	<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-2	<b>Date Received:</b> 10/03/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

**Metals Analysis**

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Lead	4.4 B	5.0	1.2	ug/l	1	10/11/02	10/14/02 DM	SW846 6010B	SW846 3010A

RL = Reporting Limit  
 IDL = Instrument Detection Limit

U = Indicates a result < IDL  
 B = Indicates a result >= IDL but < RL

**000024**

## Report of Analysis

<b>Client Sample ID:</b> AVGEG12P01	
<b>Lab Sample ID:</b> F14838-6	<b>Date Sampled:</b> 09/28/02
<b>Matrix:</b> AQ - Ground Water	<b>Date Received:</b> 10/01/02
<b>Method:</b> SW846.8260B	<b>Percent Solids:</b> n/a
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	C0012473.D	1	10/11/02	JG	n/a	n/a	VC552
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

## VOA Special List

CAS No.	Compound	Result	RL	Units	Q
71-43-2	Benzene	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
541-73-1	m-Dichlorobenzene	ND	1.0	ug/l	
95-50-1	o-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	p-Dichlorobenzene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
74-83-9	Methyl bromide	ND	1.0	ug/l	
74-87-3	Methyl chloride	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

000042

**Report of Analysis**

<b>Client Sample ID:</b> AVGEGL12P01	<b>Date Sampled:</b> 09/28/02
<b>Lab Sample ID:</b> F14838-6	<b>Date Received:</b> 10/01/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8260B	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
1330-20-7	Xylene (total)	ND	3.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		86-115%
17060-07-0	1,2-Dichloroethane-D4	102%		78-125%
2037-26-5	Toluene-D8	105%		87-113%
460-00-4	4-Bromofluorobenzene	101%		84-117%

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive **000018** compound

## Report of Analysis

<b>Client Sample ID:</b>	AVGEGL12P01		
<b>Lab Sample ID:</b>	F14838-6	<b>Date Sampled:</b>	09/28/02
<b>Matrix:</b>	AQ - Ground Water	<b>Date Received:</b>	10/01/02
<b>Method:</b>	SW846 8270C BY SIM SW846 3510C	<b>Percent Solids:</b>	n/a
<b>Project:</b>	NAS Whiting Field- (CTO#200) N4038		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W012374.D	1	10/06/02	ME	10/04/02	OP6025	SW668
Run #2							

Run #	Initial Volume	Final Volume
Run #1	970 ml	1.0 ml
Run #2		

## BN PAH List

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	1.0	ug/l	
208-96-8	Acenaphthylene	ND	1.0	ug/l	
120-12-7	Anthracene	ND	1.0	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.21	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.21	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.21	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.21	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.21	ug/l	
218-01-9	Chrysene	ND	0.21	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.21	ug/l	
206-44-0	Fluoranthene	ND	1.0	ug/l	
86-73-7	Fluorene	ND	1.0	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.21	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	ug/l	
91-20-3	Naphthalene	ND	1.0	ug/l	
85-01-8	Phenanthrene	ND	1.0	ug/l	
129-00-0	Pyrene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	90%		49-119%
321-60-8	2-Fluorobiphenyl	93%		45-118%
1718-51-0	Terphenyl-d14	79%		46-135%

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

000044

## Report of Analysis

<b>Client Sample ID:</b> AVGEGL12P01		<b>Date Sampled:</b> 09/28/02
<b>Lab Sample ID:</b> F14838-6		<b>Date Received:</b> 10/01/02
<b>Matrix:</b> AQ - Ground Water		<b>Percent Solids:</b> n/a
<b>Method:</b> EPA 504.1 EPA 504		
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST16666.D	1	10/04/02	SKW	10/03/02	OP6022	GST616
Run #2							

	Initial Volume	Final Volume
Run #1	38.9 ml	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units Q
106-93-4	1,2-Dibromoethane	ND	0.018	ug/l

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

000045

### Report of Analysis

<b>Client Sample ID:</b> AVGEGL12P01	<b>Date Sampled:</b> 09/28/02
<b>Lab Sample ID:</b> F14838-6	<b>Date Received:</b> 10/01/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> FLORIDA-PRO SW846 3510C	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP24160.D	1	10/04/02	SKW	10/03/02	OP6013	GOP857
Run #2							

Run #	Initial Volume	Final Volume
Run #1	970 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH (C8-C40)	ND	0.26	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	93%		51-125%	

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

000046

## Report of Analysis

<b>Client Sample ID:</b> AVGEGL13P01	<b>Date Sampled:</b> 09/28/02
<b>Lab Sample ID:</b> F14838-5	<b>Date Received:</b> 10/01/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8260B	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	C0012472.D	1	10/11/02	JG	n/a	n/a	VC552
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

## VOA Special List

CAS No.	Compound	Result	RL	Units	Q
71-43-2	Benzene	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
541-73-1	m-Dichlorobenzene	ND	1.0	ug/l	
95-50-1	o-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	p-Dichlorobenzene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
74-83-9	Methyl bromide	ND	1.0	ug/l	
74-87-3	Methyl chloride	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

000036

## Report of Analysis

<b>Client Sample ID:</b> AVGEG13P01	<b>Date Sampled:</b> 09/28/02
<b>Lab Sample ID:</b> F14838-5	<b>Date Received:</b> 10/01/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8270C BY SIM SW846.3510C	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W012373.D	1	10/06/02	ME	10/04/02	OP6025	SW668
Run #2							

Run #	Initial Volume	Final Volume
Run #1	970 ml	1.0 ml
Run #2		

## BN PAH List

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	1.0	ug/l	
208-96-8	Acenaphthylene	ND	1.0	ug/l	
120-12-7	Anthracene	ND	1.0	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.21	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.21	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.21	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.21	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.21	ug/l	
218-01-9	Chrysene	ND	0.21	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.21	ug/l	
206-44-0	Fluoranthene	ND	1.0	ug/l	
86-73-7	Fluorene	ND	1.0	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.21	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	ug/l	
91-20-3	Naphthalene	ND	1.0	ug/l	
85-01-8	Phenanthrene	ND	1.0	ug/l	
129-00-0	Pyrene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	82%		49-119%
321-60-8	2-Fluorobiphenyl	80%		45-118%
1718-51-0	Terphenyl-d14	71%		46-135%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

000038

## Report of Analysis

<b>Client Sample ID:</b> AVGEGL13P01	<b>Date Sampled:</b> 09/28/02
<b>Lab Sample ID:</b> F14838-5	<b>Date Received:</b> 10/01/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> FLORIDA-PRO SW846 3510C	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP24159.D	1	10/04/02	SKW	10/03/02	OP6013	GOP857
Run #2							

Run #	Initial Volume	Final Volume
Run #1	970 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH (C8-C40)	ND	0.26	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	90%		51-125%	

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

000040

## Report of Analysis

<b>Client Sample ID:</b> DUP	
<b>Lab Sample ID:</b> F14838-3	<b>Date Sampled:</b> 09/29/02
<b>Matrix:</b> AQ - Ground Water	<b>Date Received:</b> 10/01/02
<b>Method:</b> SW846 8260B	<b>Percent Solids:</b> n/a
<b>Project:</b> NAs Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	C0012480.D	250	10/12/02	JG	n/a	n/a	VC553
Run #2	C0012506.D	500	10/13/02	JG	n/a	n/a	VC554

Run #	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

## VOA Special List

CAS No.	Compound	Result	RL	Units	Q
71-43-2	Benzene	12600	250	ug/l	
75-27-4	Bromodichloromethane	ND	250	ug/l	
75-25-2	Bromoform	ND	250	ug/l	
108-90-7	Chlorobenzene	ND	250	ug/l	
75-00-3	Chloroethane	ND	250	ug/l	
67-66-3	Chloroform	ND	250	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	1300	ug/l	
56-23-5	Carbon tetrachloride	ND	250	ug/l	
75-34-3	1,1-Dichloroethane	ND	250	ug/l	
75-35-4	1,1-Dichloroethylene	ND	250	ug/l	
107-06-2	1,2-Dichloroethane	ND	250	ug/l	
78-87-5	1,2-Dichloropropane	ND	250	ug/l	
124-48-1	Dibromochloromethane	ND	250	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	250	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	250	ug/l	
541-73-1	m-Dichlorobenzene	ND	250	ug/l	
95-50-1	o-Dichlorobenzene	ND	250	ug/l	
106-46-7	p-Dichlorobenzene	ND	250	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	250	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	250	ug/l	
100-41-4	Ethylbenzene	1570	250	ug/l	
74-83-9	Methyl bromide	ND	250	ug/l	
74-87-3	Methyl chloride	ND	250	ug/l	
75-09-2	Methylene chloride	ND	1300	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	250	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	250	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	250	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	250	ug/l	
127-18-4	Tetrachloroethylene	ND	250	ug/l	
108-88-3	Toluene	33900 *	500	ug/l	
79-01-6	Trichloroethylene	ND	250	ug/l	
75-01-4	Vinyl chloride	ND	250	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

000024

## Report of Analysis

<b>Client Sample ID:</b> DUP	<b>Date Sampled:</b> 09/29/02
<b>Lab Sample ID:</b> F14838-3	<b>Date Received:</b> 10/01/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8270C BY SIM SW846 3510C	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W012369.D	1	10/06/02	ME	10/04/02	OP6025	SW668
Run #2							

Run #	Initial Volume	Final Volume
Run #1	950 ml	1.0 ml
Run #2		

## BN PAH List

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	1.1	ug/l	
208-96-8	Acenaphthylene	ND	1.1	ug/l	
120-12-7	Anthracene	ND	1.1	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.21	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.21	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.21	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.21	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.21	ug/l	
218-01-9	Chrysene	ND	0.21	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.21	ug/l	
206-44-0	Fluoranthene	ND	1.1	ug/l	
86-73-7	Fluorene	ND	1.1	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.21	ug/l	
90-12-0	1-Methylnaphthalene	0.85	1.1	ug/l	J
91-57-6	2-Methylnaphthalene	1.5	1.1	ug/l	
91-20-3	Naphthalene	5.3	1.1	ug/l	
85-01-8	Phenanthrene	ND	1.1	ug/l	
129-00-0	Pyrene	ND	1.1	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	80%		49-119%
321-60-8	2-Fluorobiphenyl	83%		45-118%
1718-51-0	Terphenyl-d14	74%		46-135%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

000026

## Report of Analysis

<b>Client Sample ID:</b> DUP	
<b>Lab Sample ID:</b> F14838-3	<b>Date Sampled:</b> 09/29/02
<b>Matrix:</b> AQ - Ground Water	<b>Date Received:</b> 10/01/02
<b>Method:</b> FLORIDA-PRO SW846 3510C	<b>Percent Solids:</b> n/a
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP24187.D	10	10/04/02	SKW	10/03/02	OP6013	GOP858
Run #2							

Run #	Initial Volume	Final Volume
Run #1	940 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units Q
	TPH (C8-C40)	15.6	2.7	mg/l
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	92%		51-125%

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

000028



## Report of Analysis

<b>Client Sample ID:</b> AVGEGLS01	
<b>Lab Sample ID:</b> F14890-5	<b>Date Sampled:</b> 10/01/02
<b>Matrix:</b> AQ - Ground Water	<b>Date Received:</b> 10/03/02
<b>Method:</b> SW846 8260B	<b>Percent Solids:</b> n/a
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	C0012495.D	1	10/12/02	JG	n/a	n/a	VC553
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

## VOA Special List

CAS No.	Compound	Result	RL	Units	Q
71-43-2	Benzene	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
541-73-1	m-Dichlorobenzene	ND	1.0	ug/l	
95-50-1	o-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	p-Dichlorobenzene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
74-83-9	Methyl bromide	ND	1.0	ug/l	
74-87-3	Methyl chloride	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

000037

**Report of Analysis**

<b>Client Sample ID:</b> AVGEG3S01	<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-5	<b>Date Received:</b> 10/03/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8270C BY SIM SW846 3510C	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L014781.D	1	10/10/02	ME	10/07/02	OP6047	SL818
Run #2							

	Initial Volume	Final Volume
Run #1	980 ml	1.0 ml
Run #2		

**BN PAH List**

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	1.0	ug/l	
208-96-8	Acenaphthylene	ND	1.0	ug/l	
120-12-7	Anthracene	ND	1.0	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	ug/l	
205-99-2	Benzo(b)fluoranthene	0.10	0.20	ug/l	J
191-24-2	Benzo(g,h,i)perylene	ND	0.20	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	ug/l	
218-01-9	Chrysene	ND	0.20	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	ug/l	
206-44-0	Fluoranthene	ND	1.0	ug/l	
86-73-7	Fluorene	ND	1.0	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	ug/l	
91-20-3	Naphthalene	ND	1.0	ug/l	
85-01-8	Phenanthrene	ND	1.0	ug/l	
129-00-0	Pyrene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	88%		49-119%
321-60-8	2-Fluorobiphenyl	83%		45-118%
1718-51-0	Terphenyl-d14	86%		46-135%

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

000039

**Report of Analysis**

<b>Client Sample ID:</b> AVGEGL3S01	<b>Date Sampled:</b> 10/01/02
<b>Lab Sample ID:</b> F14890-5	<b>Date Received:</b> 10/03/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> FLORIDA-PRO SW846 3510C	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP24416.D	1	10/09/02	SKW	10/08/02	OP6051	GOP863
Run #2							

	Initial Volume	Final Volume
Run #1	950 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH (C8-C40)	ND	0.26	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	84%		51-125%	

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

**000041**



# CHAIN OF CUSTODY

4405 VINELAND ROAD • SUITE C-15  
ORLANDO, FL 32811  
TEL: 407-425-6700 • FAX: 407-425-0707

ACCUTEST JOB #: **F14890**  
ACCUTEST QUOTE #:

CLIENT INFORMATION		FACILITY INFORMATION				ANALYTICAL INFORMATION										MATRIX CODE
<b>Tetra Tech NUS</b> NAME 5421 Beaumont Center Blvd St600 ADDRESS Tampa FL 33639 CITY STATE ZIP Paul Calligon SEND REPORT TO: PHONE # 813 806 0202		<b>AVGAS-E Bldg 2E32</b> PROJECT NAME Whiting Field LOCATION CTO 200 PROJECT NO. FAX # 813 806 0405				VOC 8260 8270C PAHS 504.1 EOB Pb FL-PRC										DW - DRINKING WATER GW - GROUND WATER WW - WASTE WATER SO - SOIL SL - SLUDGE OI - OIL LIQ - OTHER LIQUID SOL - OTHER SOLID
ACCUTEST SAMPLE #	FIELD ID / POINT OF COLLECTION	COLLECTION			PRESERVATION						LAB USE ONLY					
		DATE	TIME	SAMPLED BY:	MATRIX	# OF BOTTLES	NO	NOCH	INOC	NOBIO		NONE				
1	AVG EGLSP02	9/28/02	1800	ES	GW	11	X	X	X	X	X	X	X			
2	AVG EGLIIP01	10/11/02	1600	ES	GW	11	X	X	X	X	X	X	X			
3	AVG EGL8P01	9/30/02	1700	ES	GW	11	X	X	X	X	X	X	X			
4	AVG EGL4P02	9/30/02	1730	ES	GW	11	X	X	X	X	X	X	X			
5	AVG EGL3501	10/11/02	1730	ES	GW	11	X	X	X	X	X	X	X			
6	AVG EEL00101	10/11/02	1800	ES	GL	11	X	X	X	X	X	X	X			
7	Trip Blank	10/11/02														

DATA TURNAROUND INFORMATION	DATA DELIVERABLE INFORMATION	COMMENTS/REMARKS
<input checked="" type="checkbox"/> STANDARD <input type="checkbox"/> 48 HOUR RUSH <input type="checkbox"/> 24 HOUR EMERGENCY <input type="checkbox"/> OTHER APPROVED BY: _____ EMERGENCY OR RUSH IS FAX DATA UNLESS PREVIOUSLY APPROVED	<input type="checkbox"/> STANDARD <input type="checkbox"/> COMMERCIAL "B" <input type="checkbox"/> DISK DELIVERABLE <input type="checkbox"/> STATE FORMS <input type="checkbox"/> OTHER (SPECIFY) _____	

**SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY**

RELINQUISHED BY: 1. <i>C. Glab</i>	DATE TIME: 10/11/02 2:14	RECEIVED BY: 1. <i>Andy J. Davis</i>	RELINQUISHED BY: 2. _____	DATE TIME: _____	RECEIVED BY: 2. _____
RELINQUISHED BY: 3. <i>Andy J. Davis</i>	DATE TIME: 10-02-02/1100	RECEIVED BY: 3. <i>[Signature]</i>	RELINQUISHED BY: 4. _____	DATE TIME: 10-02-02-0905	RECEIVED BY: 4. <i>[Signature]</i>
RELINQUISHED BY: 5. _____	DATE TIME: _____	RECEIVED BY: 5. _____	SEAL # _____	PRESERVE WHERE APPLICABLE ON ICE	

Report of Analysis

<b>Client Sample ID:</b> AVGEGLS01	
<b>Lab Sample ID:</b> F15109-2	<b>Date Sampled:</b> 10/17/02
<b>Matrix:</b> AQ - Ground Water	<b>Date Received:</b> 10/19/02
<b>Method:</b> SW846 8260B	<b>Percent Solids:</b> n/a
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
1330-20-7	Xylene (total)	ND	3.0	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		86-115%
17060-07-0	1,2-Dichloroethane-D4	100%		78-125%
2037-26-5	Toluene-D8	100%		87-113%
460-00-4	4-Bromofluorobenzene	104%		84-117%

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> AVGEGL4S01	<b>Date Sampled:</b> 10/17/02
<b>Lab Sample ID:</b> F15109-2	<b>Date Received:</b> 10/19/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> EPA 504.1 EPA 504	
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB23263.D	1	10/25/02	NJ	10/24/02	OP6177	GAB849
Run #2							

	Initial Volume	Final Volume
Run #1	36.7 ml	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.019	0.0095	ug/l	

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

### Report of Analysis

<b>Client Sample ID:</b> AVGEGLAS01	<b>Date Sampled:</b> 10/17/02
<b>Lab Sample ID:</b> F15109-2	<b>Date Received:</b> 10/19/02
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Project:</b> NAS Whiting Field- (CTO#200) N4038	

#### Metals Analysis

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Lead	1.2 U	5.0	1.2	ug/l	1	10/22/02	10/23/02 DM	SW846 6010B	SW846 3010A

RL = Reporting Limit  
IDL = Instrument Detection Limit

U = Indicates a result < IDL  
B = Indicates a result >= IDL but < RL

021

## Report of Analysis

Client Sample ID:	WHF-2832-MW-1S	Date Sampled:	05/22/02
Lab Sample ID:	F13317-1	Date Received:	05/24/02
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	NAS Whiting Field PO#NOO52-MSA0200-014		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B0009964.D	1	05/28/02	JG	n/a	n/a	VB432
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

## VOA TCL List

CAS No.	Compound	Result	RL	Units	Q
67-64-1	Acetone	ND	5.0	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
75-15-0	Carbon disulfide	ND	5.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
540-59-0	1,2-Dichloroethene (total)	ND	2.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
591-78-6	2-Hexanone	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	ug/l	
74-83-9	Methyl bromide	ND	1.0	ug/l	
74-87-3	Methyl chloride	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	WHF-2832-MW-1S	Date Sampled:	05/22/02
Lab Sample ID:	F13317-1	Date Received:	05/24/02
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 504.1 EPA 504		
Project:	NAS Whiting Field PO#NOO52-MSA0200-014		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST15058.D	1	05/31/02	NJ	05/30/02	OP5243	GST557
Run #2							

CAS No.	Compound	Result	RL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.020	ug/l	

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID:	WHF-2832-MW-1S	Date Sampled:	05/22/02
Lab Sample ID:	F13317-1	Date Received:	05/24/02
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	FLORIDA-PRO SW846 3510C		
Project:	NAS Whiting Field PO#NOO52-MSA0200-014		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP21100.D	1	05/29/02	SKW	05/28/02	OP5230	GOP781
Run #2							

Run #	Initial Volume	Final Volume
Run #1	950 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH (C8-C40)	ND	0.28	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	94%		55-130%	

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID:	WHF-2832-MW-2S	Date Sampled:	05/22/02
Lab Sample ID:	F13317-2	Date Received:	05/24/02
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	NAS Whiting Field PO#NOO52-MSA0200-014		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B0009963.D	1	05/28/02	JG	n/a	n/a	VB432
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

## VOA TCL List

CAS No.	Compound	Result	RL	Units	Q
67-64-1	Acetone	ND	5.0	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
75-15-0	Carbon disulfide	ND	5.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
540-59-0	1,2-Dichloroethene (total)	ND	2.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
591-78-6	2-Hexanone	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	ug/l	
74-83-9	Methyl bromide	ND	1.0	ug/l	
74-87-3	Methyl chloride	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
79-01-6	Trichloroethylene	0.76	1.0	ug/l	J

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID:	WHF-2832-MW-2S	Date Sampled:	05/22/02
Lab Sample ID:	F13317-2	Date Received:	05/24/02
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 504.1 EPA 504		
Project:	NAS Whiting Field PO#NOO52-MSA0200-014		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	ST15059.D	1	05/31/02	NJ	05/30/02	OP5243	GST557
Run #2							

CAS No.	Compound	Result	RL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.020	ug/l	

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: WHF-2832-MW-2S Lab Sample ID: F13317-2 Matrix: AQ - Ground Water Method: FLORIDA-PRO SW846 3510C Project: NAS Whiting Field PO#NOO52-MSA0200-014	Date Sampled: 05/22/02 Date Received: 05/24/02 Percent Solids: n/a
--	--

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP21101.D	1	05/29/02	SKW	05/28/02	OP5230	GOP781
Run #2							

Run #	Initial Volume	Final Volume
Run #1	950 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH (C8-C40)	ND	0.28	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	96%		55-130%	

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound



# CHAIN OF CUSTODY

4405 VINELAND ROAD • SUITE C-15  
 ORLANDO, FL 32811  
 TEL: 407-425-6700 • FAX: 407-425-0707

ACCUTEST JOB #:

ACCUTEST QUOTE #:

**F13317**

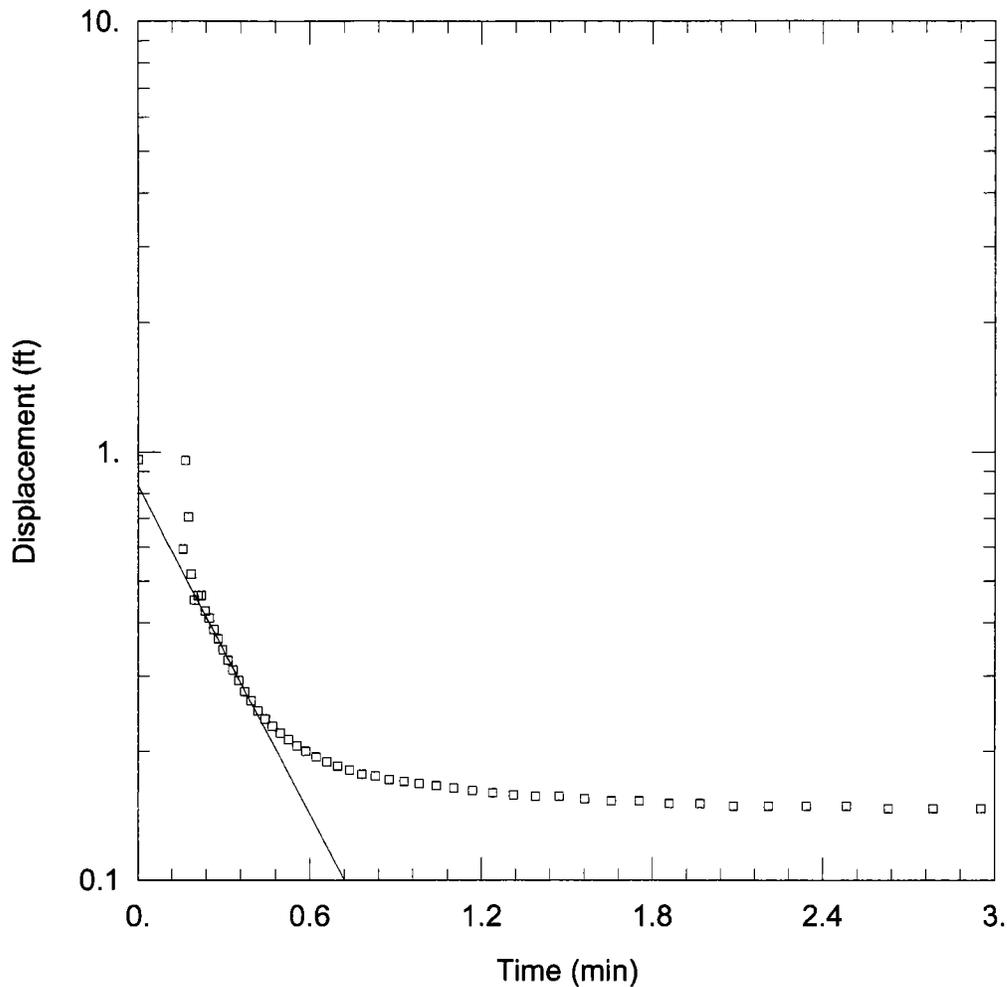
CLIENT INFORMATION		FACILITY INFORMATION				ANALYTICAL INFORMATION										MATRIX CODES						
<b>TETRA TECH NUS, INC.</b> NAME 1401 OVEN PARK DR STE 201 ADDRESS TALLAHASSEE FL 32312 CITY STATE ZIP LARRY SMITH SEND REPORT TO: PHONE # 850-385-9899		<b>WHITING FIELD ANGAS PERLINE</b> PROJECT NAME <b>NAS WHITING FIELD</b> LOCATION <b>N0052 / CTO 079</b> PROJECT NO. FAX #				TCL VOLs 8260B TCL SVOCs 8270C TCL PEST 8081A TCL PAHs 8310 TCL PCBs 8002 TCL Metals/Cr 9018 EDB 504.1 TRPH FOP-FL PRO										DW - DRINKING WATER GW - GROUND WATER WW - WASTE WATER SO - SOIL SL - SLUDGE OI - OIL LIQ - OTHER LIQUID SOL - OTHER SOLID						
ACCUTEST SAMPLE #	FIELD ID / POINT OF COLLECTION	COLLECTION			MATRIX	# OF BOTTLES	PRESERVATION															LAB USE ONLY
		DATE	TIME	SAMPLED BY:			HCl	NaOH	HNO3	H2SO4	NONE											
1	WHF-2832-MW-1S	05/22/02	15:15	MTA/LS	GW	18	X	X	X	X	X	3	2	2	2	2	1	3	2			
2	WHF-2832-MW-2S	↓	13:40	↓	↓	17	X	X	X	X	X	3	2	2	2	2	1	3	2			
	TRIP BLANK			MTA 5/22/02	↓	↓						3										

DATA TURNAROUND INFORMATION		DATA DELIVERABLE INFORMATION		COMMENTS/REMARKS
<input checked="" type="checkbox"/> STANDARD <input type="checkbox"/> 48 HOUR RUSH <input type="checkbox"/> 24 HOUR EMERGENCY <input type="checkbox"/> OTHER	APPROVED BY: _____ _____ _____	<input type="checkbox"/> STANDARD <input type="checkbox"/> COMMERCIAL "B" <input type="checkbox"/> DISK DELIVERABLE <input type="checkbox"/> STATE FORMS <input checked="" type="checkbox"/> OTHER (SPECIFY) <b>TENUS</b>		<b>FedEx AIRBILL # 831152528935</b> <b>2.500ml Plastic sent for Metals for MW-1S</b>

**SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY**

RELINQUISHED BY: <i>[Signature]</i>	DATE TIME: 5/23/02 09:00	RECEIVED BY: 1.	RELINQUISHED BY:	DATE TIME: 5/24/02	RECEIVED BY: 2. <i>[Signature]</i>
RELINQUISHED BY:	DATE TIME:	RECEIVED BY: 3.	RELINQUISHED BY:	DATE TIME: 4/06	RECEIVED BY: 4. <i>[Signature]</i>
RELINQUISHED BY:	DATE TIME:	RECEIVED BY: 5.	SEAL #	PRESERVE WHERE APPLICABLE	TEMPERATURE

**APPENDIX H**  
**AQUIFER SLUG TEST DATA**



WELL TEST ANALYSIS

Data Set: C:\DDrive~1\NAVY\NASWHI~1\CTO-0200\FIELD~1\2832\SLUGTE~1\MW10P.AQT  
 Date: 04/04/03 Time: 17:24:15

PROJECT INFORMATION

Company: Tetra Tech NUS, Inc.  
 Client: SOUTH DIV  
 Project: CTO-200  
 Test Location: NAS Whiting Field  
 Test Well: WHF-2832-MW10P  
 Test Date: 10/17/02

AQUIFER DATA

Saturated Thickness: 8.15 ft Anisotropy Ratio ( $K_z/K_r$ ): 1.

WELL DATA

Initial Displacement: 0.96 ft Water Column Height: 8.15 ft  
 Casing Radius: 0.0833 ft Wellbore Radius: 0.3333 ft  
 Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined  $K = 0.01372$  ft/min  
 Solution Method: Bouwer-Rice  $y_0 = 0.8344$  ft

Data Set: C:\DRIVE~1\NAVY\NASWHI~1\CTO-0200\FIELD~1\2832\SLUGTE~1\MW10P.AQT

Date: 04/04/03

Time: 17:24:24

PROJECT INFORMATION

Company: Tetra Tech NUS, Inc.

Client: SOUTH DIV

Project: CTO-200

Location: NAS Whiting Field

Test Date: 10/17/02

Test Well: WHF-2832-MW10P

AQUIFER DATA

Saturated Thickness: 8.15 ft

Anisotropy Ratio (Kz/Kr): 1.

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MW10P

X Location: 0. ft

Y Location: 0. ft

No. of observations: 100

<u>Observation Data</u>					
<u>Time (min)</u>	<u>Displacement (ft)</u>	<u>Time (min)</u>	<u>Displacement (ft)</u>	<u>Time (min)</u>	<u>Displacement (ft)</u>
0.1328	0.	0.928	0.17	6.64	0.149
0.1407	0.001	0.983	0.168	7.035	0.151
0.149	0.039	1.041	0.166	7.453	0.151
0.1578	0.594	1.103	0.164	7.896	0.153
0.167	0.956	1.168	0.162	8.366	0.153
0.177	0.706	1.238	0.16	8.865	0.153
0.1875	0.519	1.311	0.158	9.391	0.154
0.1985	0.452	1.39	0.157	9.95	0.156
0.2102	0.463	1.473	0.157	10.54	0.156
0.2227	0.463	1.561	0.155	11.17	0.158
0.2358	0.426	1.655	0.153	11.83	0.158
0.2498	0.41	1.753	0.153	12.53	0.16
0.2647	0.386	1.858	0.151	13.28	0.16
0.2803	0.367	1.968	0.151	14.07	0.162
0.297	0.346	2.085	0.149	14.91	0.164
0.3147	0.327	2.21	0.149	15.79	0.166
0.3333	0.31	2.341	0.149	16.73	0.166
0.3532	0.293	2.481	0.149	17.72	0.167
0.3742	0.276	2.63	0.147	18.78	0.171
0.3963	0.263	2.786	0.147	19.89	0.171
0.4198	0.249	2.953	0.147	21.07	0.173
0.4447	0.238	3.13	0.147	22.32	0.175
0.4697	0.229	3.316	0.147	23.65	0.177
0.4963	0.221	3.515	0.145	25.05	0.179
0.5247	0.213	3.725	0.147	26.54	0.181

<u>Time (min)</u>	<u>Displacement (ft)</u>	<u>Time (min)</u>	<u>Displacement (ft)</u>	<u>Time (min)</u>	<u>Displacement (ft)</u>
0.5547	0.206	3.946	0.147	28.12	0.182
0.5863	0.2	4.181	0.147	29.79	0.184
0.6213	0.194	4.43	0.147	31.55	0.186
0.6578	0.189	4.693	0.147	33.43	0.188
0.6963	0.185	4.973	0.147	35.41	0.192
0.738	0.181	5.27	0.147	37.51	0.194
0.7813	0.177	5.583	0.147	39.74	0.196
0.828	0.175	5.915	0.149		
0.8763	0.172	6.266	0.149		

SOLUTION

Aquifer Model: Unconfined  
 Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

<u>Parameter</u>	<u>Estimate</u>	
K	0.01372	ft/min
y0	0.8344	ft

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

<u>Parameter</u>	<u>Estimate</u>	<u>Std. Error</u>	
K	0.01211	3.005E-05	ft/min
y0	0.7457	0.01709	ft

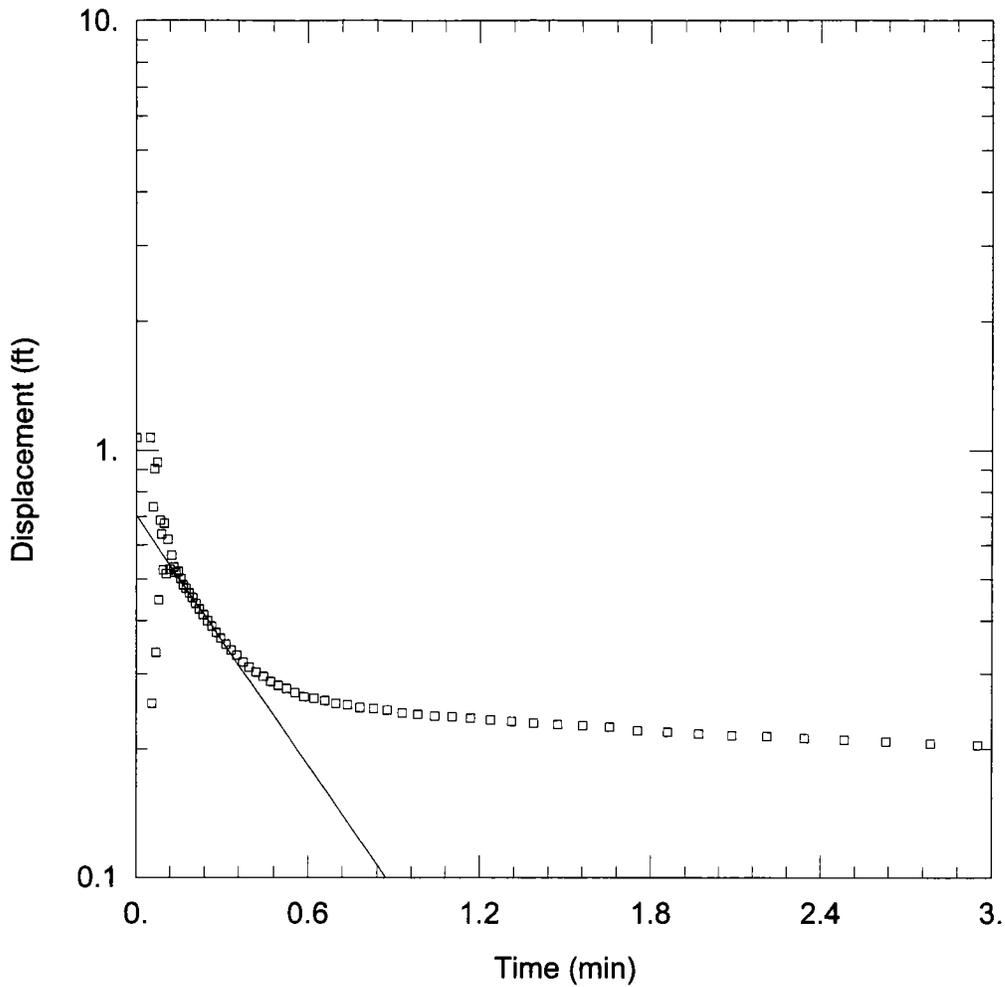
Parameter Correlations

	<u>K</u>	<u>y0</u>
K	1.00	0.53
y0	0.53	1.00

Residual Statistics

for weighted residuals

Sum of Squares . . . . . 1.646 ft<sup>2</sup>  
 Variance . . . . . 0.01679 ft<sup>2</sup>  
 Std. Deviation . . . . . 0.1296 ft  
 Mean . . . . . 0.0006822 ft  
 No. of Residuals . . . . . 100.  
 No. of Estimates . . . . . 2



WELL TEST ANALYSIS

Data Set: C:\DDRIVE~1\NAVY\NASWHI~1\CTO-0200\FIELDD~1\2832\SLUGTE~1\MW12P.AQT  
 Date: 04/04/03 Time: 17:20:01

PROJECT INFORMATION

Company: Tetra Tech NUS, Inc.  
 Client: SOUTHDIV  
 Project: CTO-200  
 Test Location: NAS Whiting Field  
 Test Well: WHF-2832-MW12P  
 Test Date: 10/17/02

AQUIFER DATA

Saturated Thickness: 10.88 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 1.07 ft Water Column Height: 10.88 ft  
 Casing Radius: 0.0833 ft Wellbore Radius: 0.3333 ft  
 Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 0.01122 ft/min  
 Solution Method: Bouwer-Rice y0 = 0.7044 ft

Data Set: C:\DDRIVE~1\NAVY\NASWHI~1\CTO-0200\FIELDD~1\2832\SLUGTE~1\MW12P.AQT  
 Date: 04/04/03  
 Time: 17:20:08

PROJECT INFORMATION

Company: Tetra Tech NUS, Inc.  
 Client: SOUTH DIV  
 Project: CTO-200  
 Location: NAS Whiting Field  
 Test Date: 10/17/02  
 Test Well: WHF-2832-MW12P

AQUIFER DATA

Saturated Thickness: 10.88 ft  
 Anisotropy Ratio (Kz/Kr): 1.

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MW12P

X Location: 0. ft  
 Y Location: 0. ft

No. of observations: 127

Observation Data					
Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.035	0.	0.6213	0.263	7.453	0.162
0.05	1.07	0.6578	0.26	7.896	0.16
0.055	0.256	0.6963	0.256	8.366	0.158
0.06	0.737	0.738	0.254	8.865	0.154
0.065	0.905	0.7813	0.25	9.391	0.152
0.07	0.337	0.828	0.249	9.95	0.148
0.075	0.938	0.8763	0.247	10.54	0.146
0.08	0.447	0.928	0.243	11.17	0.144
0.0848	0.686	0.983	0.241	11.83	0.141
0.09	0.637	1.041	0.239	12.53	0.139
0.095	0.525	1.103	0.238	13.28	0.135
0.1	0.676	1.168	0.236	14.07	0.133
0.1058	0.515	1.238	0.234	14.91	0.129
0.112	0.619	1.311	0.232	15.79	0.127
0.1185	0.527	1.39	0.23	16.73	0.123
0.1255	0.568	1.473	0.228	17.72	0.122
0.1328	0.534	1.561	0.227	18.78	0.118
0.1407	0.517	1.655	0.225	19.89	0.116
0.149	0.521	1.753	0.221	21.07	0.112
0.1578	0.502	1.858	0.219	22.32	0.11
0.167	0.485	1.968	0.217	23.65	0.106
0.177	0.476	2.085	0.215	25.05	0.104
0.1875	0.464	2.21	0.214	26.54	0.1
0.1985	0.453	2.341	0.212	28.12	0.1
0.2102	0.439	2.481	0.21	29.79	0.095

---

<u>Time (min)</u>	<u>Displacement (ft)</u>	<u>Time (min)</u>	<u>Displacement (ft)</u>	<u>Time (min)</u>	<u>Displacement (ft)</u>
0.2227	0.426	2.63	0.208	31.55	0.093
0.2358	0.413	2.786	0.206	33.43	0.091
0.2498	0.4	2.953	0.204	35.41	0.087
0.2647	0.388	3.13	0.202	37.51	0.085
0.2803	0.375	3.316	0.198	39.74	0.083
0.297	0.364	3.515	0.196	42.1	0.079
0.3147	0.352	3.725	0.195	44.6	0.078
0.3333	0.341	3.946	0.193	47.24	0.076
0.3532	0.332	4.181	0.189	50.05	0.072
0.3742	0.32	4.43	0.187	53.01	0.07
0.3963	0.311	4.693	0.185	56.16	0.068
0.4198	0.303	4.973	0.181	59.49	0.066
0.4447	0.296	5.27	0.179	63.02	0.062
0.4697	0.288	5.583	0.177	66.76	0.057
0.4963	0.282	5.915	0.173	70.72	0.053
0.5247	0.277	6.266	0.169	74.91	0.051
0.5547	0.271	6.64	0.167		
0.5863	0.265	7.035	0.165		

---

SOLUTION

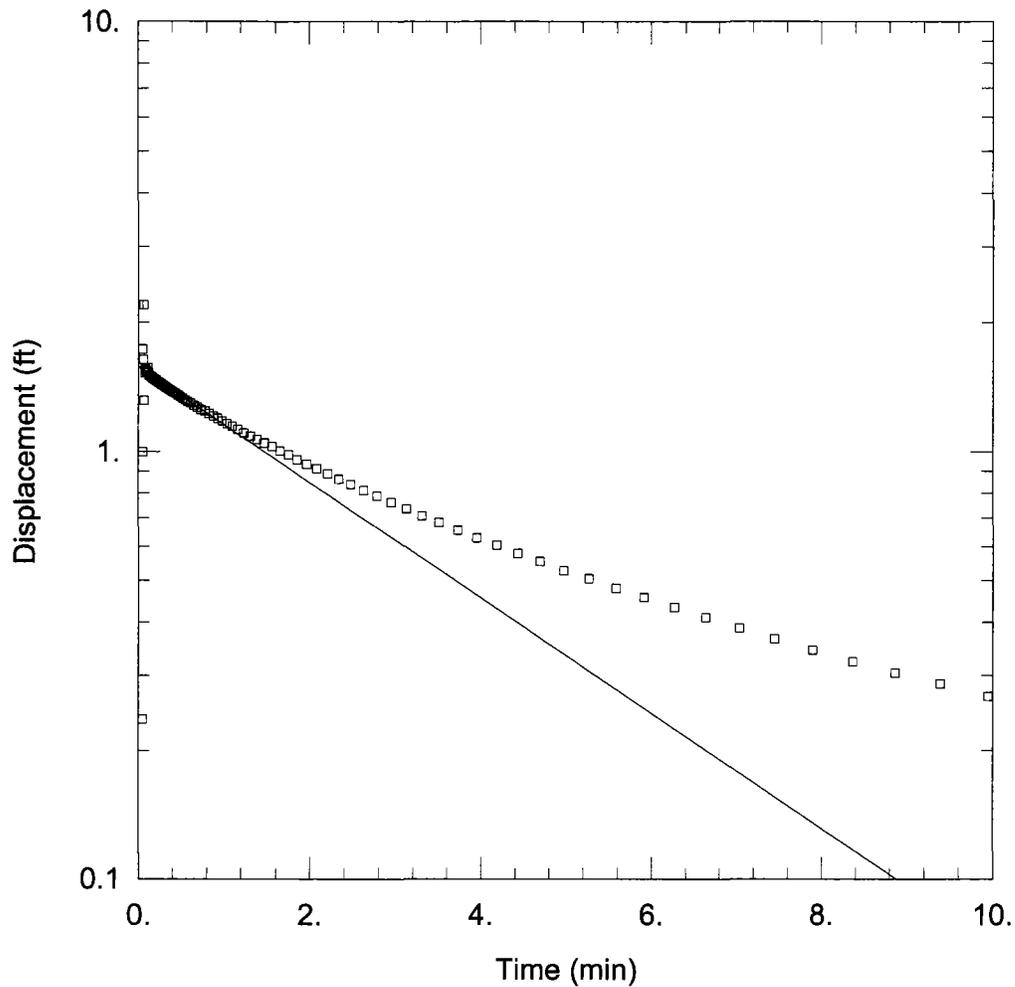
Aquifer Model: Unconfined  
 Solution Method: Bouwer-Rice

---

VISUAL ESTIMATION RESULTS

Estimated Parameters

<u>Parameter</u>	<u>Estimate</u>	
K	0.01122	ft/min
y0	0.7044	ft



WHF-2832-MW13P

Data Set: C:\DDRIVE~1\NAVY\NASWHI~1\CTO-0200\FIELDD~1\2832\SLUGTE~1\MW13P.AQT  
 Date: 04/04/03 Time: 17:21:39

PROJECT INFORMATION

Company: Tetra Tech NUS, Inc.  
 Client: SOUTHDIV  
 Project: CTO-200  
 Test Location: NAS Whiting Field  
 Test Well: WHF-2832-MW13P  
 Test Date: 10/17/02

AQUIFER DATA

Saturated Thickness: 8.814 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 2.198 ft Water Column Height: 8.814 ft  
 Casing Radius: 0.0833 ft Wellbore Radius: 0.3333 ft  
 Screen Length: 15. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 0.001013 ft/min  
 Solution Method: Bouwer-Rice y0 = 1.58 ft

Data Set: C:\DDRIVE~1\NAVY\NASWHI~1\CTO-0200\FIELDD~1\2832\SLUGTE~1\MW13P.AQT  
 Title: WHF-2832-MW13P  
 Date: 04/04/03  
 Time: 17:21:48

---

PROJECT INFORMATION

Company: Tetra Tech NUS, Inc.  
 Client: SOUTH DIV  
 Project: CTO-200  
 Location: NAS Whiting Field  
 Test Date: 10/17/02  
 Test Well: WHF-2832-MW13P

---

AQUIFER DATA

Saturated Thickness: 8.814 ft  
 Anisotropy Ratio (Kz/Kr): 1.

---

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MW13P

X Location: 0. ft  
 Y Location: 0. ft

No. of observations: 120

Observation Data					
Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.04	0.	0.4963	1.342	4.973	0.527
0.045	0.237	0.5247	1.332	5.27	0.505
0.05	1.732	0.5547	1.321	5.583	0.48
0.055	0.997	0.5863	1.308	5.915	0.457
0.06	1.639	0.6213	1.297	6.266	0.433
0.065	2.198	0.6578	1.283	6.64	0.41
0.07	1.316	0.6963	1.27	7.035	0.387
0.075	1.526	0.738	1.255	7.453	0.365
0.08	1.562	0.7813	1.244	7.896	0.344
0.0848	1.56	0.828	1.227	8.366	0.323
0.09	1.547	0.8763	1.211	8.865	0.304
0.095	1.543	0.928	1.196	9.391	0.287
0.1	1.537	0.983	1.179	9.95	0.268
0.1058	1.528	1.041	1.162	10.54	0.249
0.112	1.528	1.103	1.145	11.17	0.23
0.1185	1.565	1.168	1.126	11.83	0.213
0.1255	1.509	1.238	1.105	12.53	0.2
0.1328	1.505	1.311	1.087	13.28	0.185
0.1407	1.501	1.39	1.066	14.07	0.171
0.149	1.494	1.473	1.047	14.91	0.156
0.1578	1.49	1.561	1.026	15.79	0.145
0.167	1.484	1.655	1.003	16.73	0.132
0.177	1.48	1.753	0.982	17.72	0.12
0.1875	1.476	1.858	0.958	18.78	0.109

---

<u>Time (min)</u>	<u>Displacement (ft)</u>	<u>Time (min)</u>	<u>Displacement (ft)</u>	<u>Time (min)</u>	<u>Displacement (ft)</u>
0.1985	1.471	1.968	0.935	19.89	0.096
0.2102	1.465	2.085	0.912	21.07	0.086
0.2227	1.459	2.21	0.888	22.32	0.075
0.2358	1.454	2.341	0.863	23.65	0.067
0.2498	1.448	2.481	0.839	25.05	0.062
0.2647	1.44	2.63	0.812	26.54	0.054
0.2803	1.433	2.786	0.788	28.12	0.048
0.297	1.425	2.953	0.761	29.79	0.046
0.3147	1.418	3.13	0.735	31.55	0.042
0.3333	1.408	3.316	0.708	33.43	0.035
0.3532	1.401	3.515	0.682	35.41	0.031
0.3742	1.391	3.725	0.655	37.51	0.025
0.3963	1.382	3.946	0.629	39.74	0.023
0.4198	1.372	4.181	0.604	42.1	0.021
0.4447	1.365	4.43	0.578	44.6	0.015
0.4697	1.353	4.693	0.554	47.24	0.01

---

SOLUTION

Aquifer Model: Unconfined  
 Solution Method: Bouwer-Rice

---

VISUAL ESTIMATION RESULTS

Estimated Parameters

<u>Parameter</u>	<u>Estimate</u>	
K	0.001013	ft/min
y0	1.58	ft

**APPENDIX I**

**DPT SCREENING LEVEL LABORATORY REPORTS**

# SEVERN TRENT LABORATORIES, INC.

## PRELIMINARY DATA SUMMARY

-----  
The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.  
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**Lot #:** C2G120118      **Tetra Tech NUS Inc**      **DATE REPORTED:** 7/12/02      **PAGE** 3  
NAS Whiting, Milton, Florida  
Project Number: NAS WHITING

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
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**Client Sample ID: AVGE GWB 11 20**

Sample #: 005      Date Sampled: 07/11/02 16:00      Date Received: 07/12/02      Matrix: WATER

Volatile Organics by GC/MS

Reviewed

J Estimated result. Result is less than RL.

**Client Sample ID: AVGE SSB 23 05**

Sample #: 006      Date Sampled: 07/11/02 16:20      Date Received: 07/12/02      Matrix: SOLID

Volatile Organics by GC/MS

Reviewed

Toluene	ND	** 4.0	ug/kg	SW846 8260B
Xylenes (total)	ND	** 12	ug/kg	SW846 8260B
Benzene	ND	** 4.0	ug/kg	SW846 8260B
Ethylbenzene	ND	** 4.0	ug/kg	SW846 8260B
Methyl tert-butyl ether (MTBE)	ND	** 4.0	ug/kg	SW846 8260B
Naphthalene	ND	** 4.0	ug/kg	SW846 8260B

Results or reporting limits flagged with a \*\* have not been corrected for dry weight.

Inorganic Analysis  
**Total Residue as  
Percent Solids**

‡

In Review  
**MCAWW 160.3 MOD**

# SEVERN TRENT LABORATORIES, INC.

## PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C2G120118      **Tetra Tech NUS Inc**      PAGE 2  
NAS Whiting, Milton, Florida      Date Reported: 7/12/02  
Project Number: NAS WHITING

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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### Client Sample ID: AVGE SSB 11 05

Sample #: 003      Date Sampled: 07/11/02 10:20      Date Received: 07/12/02      Matrix: SOLID

Volatile Organics by GC/MS      Reviewed

Toluene	ND	** 4.2	ug/kg	SW846 8260B
Xylenes (total)	ND	** 12	ug/kg	SW846 8260B

Results or reporting limits flagged with a \*\* have not been corrected for dry weight.

Inorganic Analysis      In Review

Total Residue as Percent Solids	%	MCAWW 160.3 MOD
---------------------------------	---	-----------------

### Client Sample ID: AVGE GWB 14 120

Sample #: 004      Date Sampled: 07/11/02 15:00      Date Received: 07/12/02      Matrix: WATER

Volatile Organics by GC/MS      Reviewed

<b>Benzene</b>	<b>0.91 J</b>	<b>1.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
Methyl tert-butyl ether (MTBE)	ND	1.0	ug/L	SW846 8260B
Naphthalene	ND	1.0	ug/L	SW846 8260B
<b>Toluene</b>	<b>0.93 J</b>	<b>1.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>
Xylenes (total)	ND	3.0	ug/L	SW846 8260B

J Estimated result. Result is less than RL.

### Client Sample ID: AVGE GWB 11 20

Sample #: 005      Date Sampled: 07/11/02 16:00      Date Received: 07/12/02      Matrix: WATER

Volatile Organics by GC/MS      Reviewed

Benzene	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
Methyl tert-butyl ether (MTBE)	ND	1.0	ug/L	SW846 8260B
Naphthalene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
<b>Xylenes (total)</b>	<b>0.24 J</b>	<b>3.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>

(Continued on next page)

# SEVERN TRENT LABORATORIES, INC.

## PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Tetra Tech NUS Inc PAGE 1

Lot #: C2G120118 NAS Whiting, Milton, Florida Date Reported: 7/12/02  
Project Number: NAS WHITING

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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**Client Sample ID: AVGE SSB 10 10**

Sample #: 001    Date Sampled: 07/11/02 09:00    Date Received: 07/12/02    Matrix: SOLID

Volatile Organics by GC/MS				Reviewed
Benzene	ND	** 3.8	ug/kg	SW846 8260B
Ethylbenzene	ND	** 3.8	ug/kg	SW846 8260B
Methyl tert-butyl ether (MTBE)	ND	** 3.8	ug/kg	SW846 8260B
Naphthalene	ND	** 3.8	ug/kg	SW846 8260B
Toluene	ND	** 3.8	ug/kg	SW846 8260B
Xylenes (total)	ND	** 11	ug/kg	SW846 8260B

Results or reporting limits flagged with a \*\* have not been corrected for dry weight.

Inorganic Analysis				In Review
<b>Total Residue as Percent Solids</b>			%	<b>MCAWW 160.3 MOD</b>

**Client Sample ID: AVGE GWB 16 20**

Sample #: 002    Date Sampled: 07/11/02 09:30    Date Received: 07/12/02    Matrix: WATER

Volatile Organics by GC/MS				Reviewed
<b>Benzene</b>	<b>77</b>	<b>2.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>
<b>Ethylbenzene</b>	<b>44</b>	<b>2.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>
Methyl tert-butyl ether (MTBE)	ND	2.0	ug/L	SW846 8260B
Naphthalene	ND	2.0	ug/L	SW846 8260B
<b>Toluene</b>	<b>34</b>	<b>2.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>
<b>Xylenes (total)</b>	<b>9.5</b>	<b>6.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>

**Client Sample ID: AVGE SSB 11 05**

Sample #: 003    Date Sampled: 07/11/02 10:20    Date Received: 07/12/02    Matrix: SOLID

Volatile Organics by GC/MS				Reviewed
Benzene	ND	** 4.2	ug/kg	SW846 8260B
Ethylbenzene	ND	** 4.2	ug/kg	SW846 8260B
Methyl tert-butyl ether (MTBE)	ND	** 4.2	ug/kg	SW846 8260B
Naphthalene	ND	** 4.2	ug/kg	SW846 8260B

(Continued on next page)

**SEVERN TRENT LABORATORIES, INC.**

**PRELIMINARY DATA SUMMARY**

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The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.  
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**Lot #:** C2G110126      **Tetra Tech NUS Inc**      **Date Reported:** 7/12/02      **PAGE** 3  
NAS Whiting, Milton, Florida  
Project Number: NAS WHITING

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
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**Client Sample ID: AVGE SSB 0220**

**Sample #:** 005      **Date Sampled:** 07/10/02 17:00      **Date Received:** 07/11/02      **Matrix:** SOLID

Volatile Organics by GC/MS      Reviewed  
**Xylenes (total)**      **24**      **20**      **ug/kg**      **SW846 8260B**

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis      Reviewed  
**Total Residue as**      **86.1**      **%**      **MCAWW 160.3 MOD**  
**Percent Solids**

# SEVERN TRENT LABORATORIES, INC.

## PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Tetra Tech NUS Inc PAGE 2

Lot #: C2G110126 NAS Whiting, Milton, Florida Date Reported: 7/12/02  
Project Number: NAS WHITING

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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**Client Sample ID: AVGE SSB 0210**

Sample #: 003    Date Sampled: 07/10/02 16:25    Date Received: 07/11/02    Matrix: SOLID

Volatile Organics by GC/MS					Reviewed
Methyl tert-butyl ether (MTBE)	ND	550	ug/kg	SW846 8260B	
Naphthalene	ND	550	ug/kg	SW846 8260B	
<b>Toluene</b>	<b>15000</b>	<b>550</b>	<b>ug/kg</b>	<b>SW846 8260B</b>	
<b>Xylenes (total)</b>	<b>4500</b>	<b>1700</b>	<b>ug/kg</b>	<b>SW846 8260B</b>	

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Inorganic Analysis					Reviewed
<b>Total Residue as Percent Solids</b>	<b>94.2</b>		<b>%</b>	<b>MCAWW 160.3 MOD</b>	

**Client Sample ID: AVGE GWB 1710**

Sample #: 004    Date Sampled: 07/10/02 16:30    Date Received: 07/11/02    Matrix: WATER

Volatile Organics by GC/MS					Reviewed
Benzene	ND	1.0	ug/L	SW846 8260B	
Ethylbenzene	ND	1.0	ug/L	SW846 8260B	
Methyl tert-butyl ether (MTBE)	ND	1.0	ug/L	SW846 8260B	
Naphthalene	ND	1.0	ug/L	SW846 8260B	
Toluene	ND	1.0	ug/L	SW846 8260B	
Xylenes (total)	ND	3.0	ug/L	SW846 8260B	

**Client Sample ID: AVGE SSB 0220**

Sample #: 005    Date Sampled: 07/10/02 17:00    Date Received: 07/11/02    Matrix: SOLID

Volatile Organics by GC/MS					Reviewed
<b>Benzene</b>	<b>40</b>	<b>6.6</b>	<b>ug/kg</b>	<b>SW846 8260B</b>	
<b>Ethylbenzene</b>	<b>21</b>	<b>6.6</b>	<b>ug/kg</b>	<b>SW846 8260B</b>	
Methyl tert-butyl ether (MTBE)	ND	6.6	ug/kg	SW846 8260B	
Naphthalene	ND	6.6	ug/kg	SW846 8260B	
<b>Toluene</b>	<b>62</b>	<b>6.6</b>	<b>ug/kg</b>	<b>SW846 8260B</b>	

(Continued on next page)

# SEVERN TRENT LABORATORIES, INC.

## PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Tetra Tech NUS Inc PAGE 1

Lot #: C2G110126 NAS Whiting, Milton, Florida Date Reported: 7/12/02  
Project Number: NAS WHITING

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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**Client Sample ID: AVGE SSB 1610**

Sample #: 001    Date Sampled: 07/10/02 14:00    Date Received: 07/11/02    Matrix: SOLID

Volatile Organics by GC/MS

Reviewed

Benzene	ND	4.8	ug/kg	SW846 8260B
<b>Ethylbenzene</b>	<b>1.8 J</b>	<b>4.8</b>	<b>ug/kg</b>	<b>SW846 8260B</b>
Methyl tert-butyl ether (MTBE)	ND	4.8	ug/kg	SW846 8260B
Naphthalene	ND	4.8	ug/kg	SW846 8260B
Toluene	ND	4.8	ug/kg	SW846 8260B
Xylenes (total)	ND	14	ug/kg	SW846 8260B

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Inorganic Analysis

Reviewed

<b>Total Residue as Percent Solids</b>	<b>87.7</b>	<b>%</b>	<b>MCAWW 160.3 MOD</b>
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**Client Sample ID: AVGE GWB 2015**

Sample #: 002    Date Sampled: 07/10/02 16:00    Date Received: 07/11/02    Matrix: WATER

Volatile Organics by GC/MS

Reviewed

Benzene	5.2	1.0	ug/L	SW846 8260B
<b>Ethylbenzene</b>	<b>3.1</b>	<b>1.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>
Methyl tert-butyl ether (MTBE)	ND	1.0	ug/L	SW846 8260B
<b>Naphthalene</b>	<b>1.0</b>	<b>1.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>
Toluene	ND	1.0	ug/L	SW846 8260B
<b>Xylenes (total)</b>	<b>0.29 J</b>	<b>3.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>

J Estimated result. Result is less than RL.

**Client Sample ID: AVGE SSB 0210**

Sample #: 003    Date Sampled: 07/10/02 16:25    Date Received: 07/11/02    Matrix: SOLID

Volatile Organics by GC/MS

Reviewed

Benzene	510 J	550	ug/kg	SW846 8260B
<b>Ethylbenzene</b>	<b>3600</b>	<b>550</b>	<b>ug/kg</b>	<b>SW846 8260B</b>

(Continued on next page)

# SEVERN TRENT LABORATORIES, INC.

## PRELIMINARY DATA SUMMARY

-----  
The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.  
-----

Lot #: C2G100125      **Tetra Tech NUS Inc**      PAGE 3  
NAS Whiting, Milton, Florida      Date Reported: 7/11/02  
Project Number: NAS WHITING

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
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Client Sample ID: AVGE GSB 05 020

Sample #: 004      Date Sampled: 07/09/02 15:40      Date Received: 07/10/02      Matrix: WATER

Volatile Organics by GC/MS

Reviewed

Toluene	3400	150	ug/L	SW846 8260B
Xylenes (total)	100 J	450	ug/L	SW846 8260B

J Estimated result. Result is less than RL.

Client Sample ID: AVGE GSB 022 020

Sample #: 005      Date Sampled: 07/09/02 16:10      Date Received: 07/10/02      Matrix: WATER

Volatile Organics by GC/MS

Reviewed

Benzene	2.5	1.0	ug/L	SW846 8260B
Ethylbenzene	0.30 J	1.0	ug/L	SW846 8260B
Methyl tert-butyl ether (MTBE)	ND	1.0	ug/L	SW846 8260B
Naphthalene	ND	1.0	ug/L	SW846 8260B
Toluene	10	1.0	ug/L	SW846 8260B
Xylenes (total)	0.83 J	3.0	ug/L	SW846 8260B

J Estimated result. Result is less than RL.

# SEVERN TRENT LABORATORIES, INC.

## PRELIMINARY DATA SUMMARY

-----  
 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.  
 -----

Tetra Tech NUS Inc PAGE 2  
 Lot #: C2G100125 NAS Whiting, Milton, Florida Date Reported: 7/11/02  
Project Number: NAS WHITING

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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**Client Sample ID: AVGE SSB 0805**

Sample #: 002    Date Sampled: 07/09/02 09:27    Date Received: 07/10/02    Matrix: SOLID

Volatile Organics by GC/MS					Reviewed
<b>Xylenes (total)</b>	17	16	ug/kg	SW846 8260B	

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis					In Review
<b>Total Residue as Percent Solids</b>	93.2	%		MCAWW 160.3 MOD	

**Client Sample ID: AVGE SSB 017 08**

Sample #: 003    Date Sampled: 07/09/02 14:00    Date Received: 07/10/02    Matrix: SOLID

Volatile Organics by GC/MS					Reviewed
Benzene	ND	5.7	ug/kg	SW846 8260B	
Ethylbenzene	ND	5.7	ug/kg	SW846 8260B	
Methyl tert-butyl ether (MTBE)	ND	5.7	ug/kg	SW846 8260B	
Naphthalene	ND	5.7	ug/kg	SW846 8260B	
Toluene	ND	5.7	ug/kg	SW846 8260B	
Xylenes (total)	ND	17	ug/kg	SW846 8260B	

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis					In Review
<b>Total Residue as Percent Solids</b>	82.9	%		MCAWW 160.3 MOD	

**Client Sample ID: AVGE GSB 05 020**

Sample #: 004    Date Sampled: 07/09/02 15:40    Date Received: 07/10/02    Matrix: WATER

Volatile Organics by GC/MS					Reviewed
<b>Benzene</b>	1500	150	ug/L	SW846 8260B	
<b>Ethylbenzene</b>	120 J	150	ug/L	SW846 8260B	
Methyl tert-butyl ether (MTBE)	ND	150	ug/L	SW846 8260B	
Naphthalene	ND	150	ug/L	SW846 8260B	

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# SEVERN TRENT LABORATORIES, INC.

## PRELIMINARY DATA SUMMARY

-----  
 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.  
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PAGE 1

Lot #: C2G100125      **Tetra Tech NUS Inc**      Date Reported: 7/11/02  
                                  NAS Whiting, Milton, Florida  
                                  Project Number: NAS WHITING

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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**Client Sample ID: AVGE SSB 0904**

Sample #: 001      Date Sampled: 07/09/02 10:30      Date Received: 07/10/02      Matrix: SOLID

Volatile Organics by GC/MS				Reviewed
Benzene	ND	5.9	ug/kg	SW846 8260B
<b>Ethylbenzene</b>	<b>11</b>	<b>5.9</b>	<b>ug/kg</b>	<b>SW846 8260B</b>
Methyl tert-butyl ether (MTBE)	ND	5.9	ug/kg	SW846 8260B
Naphthalene	ND	5.9	ug/kg	SW846 8260B
Toluene	ND	5.9	ug/kg	SW846 8260B
<b>Xylenes (total)</b>	<b>150</b>	<b>18</b>	<b>ug/kg</b>	<b>SW846 8260B</b>

Results and reporting limits have been adjusted for dry weight.

Volatile Organics by GC/MS				Reviewed
Benzene	ND	5.4	ug/kg	SW846 8260B
<b>Ethylbenzene</b>	<b>2.9 J</b>	<b>5.4</b>	<b>ug/kg</b>	<b>SW846 8260B</b>
Methyl tert-butyl ether (MTBE)	ND	5.4	ug/kg	SW846 8260B
Naphthalene	ND	5.4	ug/kg	SW846 8260B
Toluene	ND	5.4	ug/kg	SW846 8260B
<b>Xylenes (total)</b>	<b>50</b>	<b>16</b>	<b>ug/kg</b>	<b>SW846 8260B</b>

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Inorganic Analysis				In Review
<b>Total Residue as Percent Solids</b>	<b>80.1</b>		<b>‡</b>	<b>MCAWW 160.3 MOD</b>

**Client Sample ID: AVGE SSB 0805**

Sample #: 002      Date Sampled: 07/09/02 09:27      Date Received: 07/10/02      Matrix: SOLID

Volatile Organics by GC/MS				Reviewed
Benzene	ND	5.5	ug/kg	SW846 8260B
<b>Ethylbenzene</b>	<b>12</b>	<b>5.5</b>	<b>ug/kg</b>	<b>SW846 8260B</b>
Methyl tert-butyl ether (MTBE)	ND	5.5	ug/kg	SW846 8260B
Naphthalene	ND	5.5	ug/kg	SW846 8260B
<b>Toluene</b>	<b>34</b>	<b>5.5</b>	<b>ug/kg</b>	<b>SW846 8260B</b>

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# SEVERN TRENT LABORATORIES, INC.

## PRELIMINARY DATA SUMMARY

-----  
The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.  
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**Tetra Tech NUS Inc** PAGE 1  
Lot #: C2F270110 NAS Whiting, Milton, Florida Date Reported: 6/28/02  
Project Number: NAS WHITING

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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**Client Sample ID: WHF 2832 GP1**

Sample #: 001 Date Sampled: 06/25/02 10:00 Date Received: 06/27/02 Matrix: SOLID

Volatile Organics by GC/MS

Reviewed

Benzene	ND	5.6	ug/kg	SW846 8260B
Ethylbenzene	ND	5.6	ug/kg	SW846 8260B
Methyl tert-butyl ether (MTBE)	ND	5.6	ug/kg	SW846 8260B
Naphthalene	ND	5.6	ug/kg	SW846 8260B
<b>Toluene</b>	<b>3.2 J</b>	<b>5.6</b>	<b>ug/kg</b>	<b>SW846 8260B</b>
Xylenes (total)	ND	17	ug/kg	SW846 8260B

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Inorganic Analysis

Reviewed

<b>Total Residue as Percent Solids</b>	<b>95.2</b>	<b>‡</b>	<b>MCAWW 160.3 MOD</b>
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**Client Sample ID: WHF 2832 GP8 TW**

Sample #: 002 Date Sampled: 06/25/02 11:45 Date Received: 06/27/02 Matrix: WATER

Volatile Organics by GC/MS

Reviewed

<b>Benzene</b>	<b>1100</b>	<b>500</b>	<b>ug/L</b>	<b>SW846 8260B</b>
<b>Ethylbenzene</b>	<b>810</b>	<b>500</b>	<b>ug/L</b>	<b>SW846 8260B</b>
Methyl tert-butyl ether (MTBE)	ND	500	ug/L	SW846 8260B
Naphthalene	ND	500	ug/L	SW846 8260B
<b>Toluene</b>	<b>11000</b>	<b>500</b>	<b>ug/L</b>	<b>SW846 8260B</b>
<b>Xylenes (total)</b>	<b>770 J</b>	<b>1500</b>	<b>ug/L</b>	<b>SW846 8260B</b>

J Estimated result. Result is less than RL.

# SEVERN TRENT LABORATORIES, INC.

## PRELIMINARY DATA SUMMARY

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The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.  
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Lot #: C2F250125      **Tetra Tech NUS Inc**      PAGE 6  
NAS Whiting, Milton, Florida      Date Reported: 6/27/02  
Project Number: NAS WHITING

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
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**Client Sample ID: WHF 2832 GP22**

Sample #: 012      Date Sampled: 06/24/02 14:00      Date Received: 06/25/02      Matrix: SOLID

Volatile Organics by GC/MS      Reviewed

Naphthalene	ND	4.3	ug/kg	SW846 8260B
Toluene	ND	4.3	ug/kg	SW846 8260B
Xylenes (total)	ND	13	ug/kg	SW846 8260B

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis      Reviewed

<b>Total Residue as Percent Solids</b>	<b>84.2</b>	<b>‡</b>	<b>MCAWW 160.3 MOD</b>
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**Client Sample ID: WHF 2832 GP22**

Sample #: 013      Date Sampled: 06/24/02 17:00      Date Received: 06/25/02      Matrix: WATER

Volatile Organics by GC/MS      Reviewed

<b>Benzene</b>	<b>0.29 J</b>	<b>1.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
Methyl tert-butyl ether (MTBE)	ND	1.0	ug/L	SW846 8260B
Naphthalene	ND	1.0	ug/L	SW846 8260B
<b>Toluene</b>	<b>0.43 J</b>	<b>1.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>
Xylenes (total)	ND	3.0	ug/L	SW846 8260B

J Estimated result. Result is less than RL.

**Client Sample ID: TRIP BLANK**

Sample #: 014      Date Sampled: 06/24/02 17:00      Date Received: 06/25/02      Matrix: WATER

Volatile Organics by GC/MS      Reviewed

Benzene	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
Methyl tert-butyl ether (MTBE)	ND	1.0	ug/L	SW846 8260B
Naphthalene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
Xylenes (total)	ND	3.0	ug/L	SW846 8260B

# SEVERN TRENT LABORATORIES, INC.

## PRELIMINARY DATA SUMMARY

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The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.  
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Lot #: C2F250125      **Tetra Tech NUS Inc**      PAGE 5  
NAS Whiting, Milton, Florida      Date Reported: 6/27/02  
Project Number: NAS WHITING

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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**Client Sample ID: WHF 2832 GP7**

Sample #: 010      Date Sampled: 06/24/02 09:15      Date Received: 06/25/02      Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Volatile Organics by GC/MS					Reviewed
Benzene	ND	5.5	ug/kg	SW846 8260B	
Ethylbenzene	ND	5.5	ug/kg	SW846 8260B	
Methyl tert-butyl ether (MTBE)	ND	5.5	ug/kg	SW846 8260B	
Naphthalene	ND	5.5	ug/kg	SW846 8260B	
Toluene	ND	5.5	ug/kg	SW846 8260B	
Xylenes (total)	ND	16	ug/kg	SW846 8260B	

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis					Reviewed
<b>Total Residue as Percent Solids</b>	<b>95.8</b>		<b>%</b>	<b>MCAWW 160.3 MOD</b>	

**Client Sample ID: WHF 2832 GP7**

Sample #: 011      Date Sampled: 06/24/02 10:30      Date Received: 06/25/02      Matrix: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Volatile Organics by GC/MS					Reviewed
<b>Benzene</b>	<b>0.72 J</b>	<b>1.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>	
Ethylbenzene	ND	1.0	ug/L	SW846 8260B	
Methyl tert-butyl ether (MTBE)	ND	1.0	ug/L	SW846 8260B	
Naphthalene	ND	1.0	ug/L	SW846 8260B	
<b>Toluene</b>	<b>1.7</b>	<b>1.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>	
Xylenes (total)	ND	3.0	ug/L	SW846 8260B	

J Estimated result. Result is less than RL.

**Client Sample ID: WHF 2832 GP22**

Sample #: 012      Date Sampled: 06/24/02 14:00      Date Received: 06/25/02      Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Volatile Organics by GC/MS					Reviewed
Benzene	ND	4.3	ug/kg	SW846 8260B	
Ethylbenzene	ND	4.3	ug/kg	SW846 8260B	
Methyl tert-butyl ether (MTBE)	ND	4.3	ug/kg	SW846 8260B	

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# SEVERN TRENT LABORATORIES, INC.

## PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C2F250125      **Tetra Tech NUS Inc**      PAGE 4  
NAS Whiting, Milton, Florida      Date Reported: 6/27/02  
Project Number: NAS WHITING

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
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**Client Sample ID: WHF 2832 GP12 TW**

Sample #: 008      Date Sampled: 06/23/02 13:45      Date Received: 06/25/02      Matrix: WATER

Volatile Organics by GC/MS      Reviewed

<b>Benzene</b>	<b>180 E</b>	<b>1.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>
<b>Ethylbenzene</b>	<b>240 E</b>	<b>1.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>
Methyl tert-butyl ether (MTBE)	ND	1.0	ug/L	SW846 8260B
<b>Naphthalene</b>	<b>2.0</b>	<b>1.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>
<b>Toluene</b>	<b>7.5</b>	<b>1.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>
<b>Xylenes (total)</b>	<b>80</b>	<b>3.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>

E Estimated result. Result concentration exceeds the calibration range.

Volatile Organics by GC/MS      Reviewed

<b>Benzene</b>	<b>170</b>	<b>8.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>
<b>Ethylbenzene</b>	<b>200</b>	<b>8.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>
Methyl tert-butyl ether (MTBE)	ND	8.0	ug/L	SW846 8260B
<b>Naphthalene</b>	<b>ND</b>	<b>8.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>
<b>Toluene</b>	<b>6.4 J</b>	<b>8.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>
<b>Xylenes (total)</b>	<b>57</b>	<b>24</b>	<b>ug/L</b>	<b>SW846 8260B</b>

J Estimated result. Result is less than RL.

**Client Sample ID: WHF 2832 GP12**

Sample #: 009      Date Sampled: 06/23/02 15:30      Date Received: 06/25/02      Matrix: WATER

Volatile Organics by GC/MS      Reviewed

Benzene	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
Methyl tert-butyl ether (MTBE)	ND	1.0	ug/L	SW846 8260B
<b>Naphthalene</b>	<b>ND</b>	<b>1.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>
<b>Toluene</b>	<b>ND</b>	<b>1.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>
<b>Xylenes (total)</b>	<b>ND</b>	<b>3.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>

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# SEVERN TRENT LABORATORIES, INC.

## PRELIMINARY DATA SUMMARY

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The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.  
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**Tetra Tech NUS Inc** PAGE 3  
Lot #: C2F250125 NAS Whiting, Milton, Florida Date Reported: 6/27/02  
Project Number: NAS WHITING

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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**Client Sample ID: WHF 2832 GP6 TW**

Sample #: 005 Date Sampled: 06/22/02 13:30 Date Received: 06/25/02 Matrix: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	Reviewed
Volatile Organics by GC/MS					
Methyl tert-butyl ether (MTBE)	ND	1000	ug/L	SW846 8260B	
Naphthalene	ND	1000	ug/L	SW846 8260B	
<b>Toluene</b>	<b>36000</b>	<b>1000</b>	<b>ug/L</b>	<b>SW846 8260B</b>	
<b>Xylenes (total)</b>	<b>1200 J</b>	<b>3000</b>	<b>ug/L</b>	<b>SW846 8260B</b>	

J Estimated result. Result is less than RL.

**Client Sample ID: WHF 2832 GP7 TW**

Sample #: 006 Date Sampled: 06/22/02 14:00 Date Received: 06/25/02 Matrix: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	Reviewed
Volatile Organics by GC/MS					
<b>Benzene</b>	<b>1800</b>	<b>200</b>	<b>ug/L</b>	<b>SW846 8260B</b>	
<b>Ethylbenzene</b>	<b>1000</b>	<b>200</b>	<b>ug/L</b>	<b>SW846 8260B</b>	
Methyl tert-butyl ether (MTBE)	ND	200	ug/L	SW846 8260B	
Naphthalene	ND	200	ug/L	SW846 8260B	
<b>Toluene</b>	<b>5500</b>	<b>200</b>	<b>ug/L</b>	<b>SW846 8260B</b>	
<b>Xylenes (total)</b>	<b>1000</b>	<b>600</b>	<b>ug/L</b>	<b>SW846 8260B</b>	

**Client Sample ID: WHF 2832 GP4**

Sample #: 007 Date Sampled: 06/23/02 13:00 Date Received: 06/25/02 Matrix: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	Reviewed
Volatile Organics by GC/MS					
Benzene	ND	1.0	ug/L	SW846 8260B	
Ethylbenzene	ND	1.0	ug/L	SW846 8260B	
Methyl tert-butyl ether (MTBE)	ND	1.0	ug/L	SW846 8260B	
Naphthalene	ND	1.0	ug/L	SW846 8260B	
Toluene	ND	1.0	ug/L	SW846 8260B	
<b>Xylenes (total)</b>	<b>ND</b>	<b>3.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>	

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# SEVERN TRENT LABORATORIES, INC.

## PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: C2F250125      **Tetra Tech NUS Inc**      PAGE 2  
NAS Whiting, Milton, Florida      Date Reported: 6/27/02  
Project Number: NAS WHITING

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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**Client Sample ID: WHF 2832 GP12 TW**

Sample #: 003      Date Sampled: 06/22/02 14:45      Date Received: 06/25/02      Matrix: SOLID

Volatile Organics by GC/MS      Reviewed

<b>Benzene</b>	1.8 J	4.2	ug/kg	SW846 8260B
<b>Ethylbenzene</b>	1.1 J	4.2	ug/kg	SW846 8260B
Methyl tert-butyl ether (MTBE)	ND	4.2	ug/kg	SW846 8260B
Naphthalene	ND	4.2	ug/kg	SW846 8260B
Toluene	ND	4.2	ug/kg	SW846 8260B
Xylenes (total)	ND	12	ug/kg	SW846 8260B

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Inorganic Analysis      Reviewed

<b>Total Residue as Percent Solids</b>	83.1	%	MCAWW 160.3 MOD
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**Client Sample ID: WHF 2832 GP3 TW**

Sample #: 004      Date Sampled: 06/22/02 14:50      Date Received: 06/25/02      Matrix: WATER

Volatile Organics by GC/MS      Reviewed

<b>Benzene</b>	2900	100	ug/L	SW846 8260B
<b>Ethylbenzene</b>	66 J	100	ug/L	SW846 8260B
Methyl tert-butyl ether (MTBE)	ND	100	ug/L	SW846 8260B
Naphthalene	ND	100	ug/L	SW846 8260B
<b>Toluene</b>	170	100	ug/L	SW846 8260B
<b>Xylenes (total)</b>	760	300	ug/L	SW846 8260B

J Estimated result. Result is less than RL.

**Client Sample ID: WHF 2832 GP6 TW**

Sample #: 005      Date Sampled: 06/22/02 13:30      Date Received: 06/25/02      Matrix: WATER

Volatile Organics by GC/MS      Reviewed

<b>Benzene</b>	11000	1000	ug/L	SW846 8260B
<b>Ethylbenzene</b>	1200	1000	ug/L	SW846 8260B

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# SEVERN TRENT LABORATORIES, INC.

## PRELIMINARY DATA SUMMARY

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The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.  
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Lot #: C2F220110      **Tetra Tech NUS Inc**      PAGE 2  
NAS Whiting, Milton, Florida      Date Reported: 6/25/02  
Project Number: NAS WHITING

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
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Client Sample ID: WHF 2832 GP6 GW

Sample #: 003      Date Sampled: 06/21/02 17:00      Date Received: 06/22/02      Matrix: WATER

Volatile Organics by GC/MS					Reviewed
Methyl tert-butyl ether (MTBE)	ND	1.0	ug/L	SW846 8260B	
Naphthalene	ND	1.0	ug/L	SW846 8260B	
Toluene	23	1.0	ug/L	SW846 8260B	
Xylenes (total)	ND	3.0	ug/L	SW846 8260B	

Client Sample ID: WHF 2832 GP6

Sample #: 004      Date Sampled: 06/21/02 15:30      Date Received: 06/22/02      Matrix: SOLID

Volatile Organics by GC/MS					Reviewed
Benzene	ND	6.2	ug/kg	SW846 8260B	
Ethylbenzene	ND	6.2	ug/kg	SW846 8260B	
Methyl tert-butyl ether (MTBE)	ND	6.2	ug/kg	SW846 8260B	
Naphthalene	ND	6.2	ug/kg	SW846 8260B	
Toluene	ND	6.2	ug/kg	SW846 8260B	
Xylenes (total)	ND	18	ug/kg	SW846 8260B	

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis					Reviewed
Total Residue as Percent Solids	95.9		‡	MCAWW 160.3 MOD	

# SEVERN TRENT LABORATORIES, INC.

## PRELIMINARY DATA SUMMARY

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 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.  
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PAGE 1

Lot #: C2F220110      **Tetra Tech NUS Inc**      Date Reported: 6/25/02  
 NAS Whiting, Milton, Florida  
 Project Number: NAS WHITING

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
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**Client Sample ID: WHF 2832 GP6 TW**

Sample #: 001      Date Sampled: 06/19/02 09:20      Date Received: 06/22/02      Matrix: SOLID

**Volatile Organics by GC/MS**

Benzene	ND	7.0	ug/kg	SW846 8260B
<b>Ethylbenzene</b>	<b>2.4 J</b>	<b>7.0</b>	<b>ug/kg</b>	<b>SW846 8260B</b>
Methyl tert-butyl ether (MTBE)	ND	7.0	ug/kg	SW846 8260B
Naphthalene	ND	7.0	ug/kg	SW846 8260B
Toluene	ND	7.0	ug/kg	SW846 8260B
Xylenes (total)	ND	21	ug/kg	SW846 8260B

Reviewed

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

**Inorganic Analysis**

<b>Total Residue as Percent Solids</b>	77.6			MCAW 160.3 MOD
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Reviewed

**Client Sample ID: WHF 2832 GP 18**

Sample #: 002      Date Sampled: 06/21/02 10:00      Date Received: 06/22/02      Matrix: WATER

**Volatile Organics by GC/MS**

Benzene	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
Methyl tert-butyl ether (MTBE)	ND	1.0	ug/L	SW846 8260B
Naphthalene	ND	1.0	ug/L	SW846 8260B
<b>Toluene</b>	<b>0.37 J</b>	<b>1.0</b>	<b>ug/L</b>	<b>SW846 8260B</b>
Xylenes (total)	ND	3.0	ug/L	SW846 8260B

Reviewed

J Estimated result. Result is less than RL.

**Client Sample ID: WHF 2832 GP6 GW**

Sample #: 003      Date Sampled: 06/21/02 17:00      Date Received: 06/22/02      Matrix: WATER

**Volatile Organics by GC/MS**

Benzene	20	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B

Reviewed

(Continued on next page)