Location (Fort Stewart or Hunter Army Airfield), Georgia

Corrective Action Plan – Part B

Former Aboveground Storage Tanks
7001 & 7003
Bulk Fuel Facility – HAA-09 Release #3
Hunter Army Airfield, Savannah, GA
Facility ID No. 9-025113*3

March 9, 2009

Army Environmental Command
Under Contract Number W91ZLK-05-D-0015
D.O.0003

ARCADIS
Infrastructure, environment, buildings

DOCUMENT 13

ARCADIS

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Senior Engineer

Corrective Action Plan – Part B Former ASTs 7001 & 7003 (Bulk Fuel Facility: HAA-09)
Release #3
Facility ID No. 9-025113*3

Hunter Army Air Field
Savannah, Georgia

Prepared for:
Army Environmental Command

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Our Ref.:
GP08HAFS.H09A

Date:
March 9, 2009

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Acronyms

ACL	Alternate Concentration Limit
ATL	Alternate Threshold Level
AT123D	Analytical Transient 1,2,3-Dimensional
AST	Aboveground Storage Tanks
ASTM	American Society of Testing Material
BFF	Bulk Fuel Facility
BGS	Below Ground Surface
BLS	Below Land Surface
BTEX	Benzene, Toluene, Ethylbenzene, And Xylenes
CAP	Corrective Action Plan
COPC	Chemical of Potential Concern
C&D	Construction and Demolition
DAF	Dilution Attenuation Factor
DPT	Direct Push Technology
DPW	Directorate of Public Works
DRO	Diesel Range Organics
EFR	Enhanced Fluid Recovery
ft	Feet
FP	Free Product
F&T	Fate and Transport
GA EPD	Georgia Environmental Protection Division
GRO	Gasoline Range Organics
GUST	Georgia Underground Storage Tank
HAAF	Hunter Army Airfield
IWQS	In-Stream Water Quality Standard
LNAPL	Light Non-Aqueous Phase Liquid
NFA	No Further Action
PAH	Polyaromatic Hydrocarbon
PID	Photo Ionization Detector
ppm	Parts per million

List of Acronyms (continued)

PVC	Polyvinyl Chloride
RBCA	Risk-Based Corrective Action
SAIC	Science Applications International Corporation
SESOIL	Seasonal Soil
TCLP	Toxicity Characteristic Leaching Procedure
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compounds

1. Corrective Action Plan Certification – Part B

Facility Name: Former AST 7001/7003 (HAA-9) Street Address: Bulk Fuel Facility

Facility ID: 9-025113*3 City: Hunter Army Airfield County: Chatham Zip Code: 31409

Latitude: 32° 00′ 54″ Longitude: 81° 08′ 26″

Submitted by UST Owner/Operator:		Prepared by Consultant/Contractor:	
Name:	Tressa Rutland/ Environmental Branch	Name:	Charles Bertz
Company:	U. S. Army/HQ 3d, Inf. Div. (Mech)	Company:	ARCADIS
Address:	DPW ENRD ENV. Br. (Fry)	Address:	801 Corporate Center Dr.
	1550 Frank Cochran Drive, Bldg. 1137		Suite 300
City:	Fort Stewart State: GA	City:	Raleigh State: NC
Zip Code:	31314-4927	Zip Code:	27607
Telephone:	(912) 767-2010	Telephone:	(919) 854-1282

I. PLAN CERTIFICATION:

A. UST OWNER/OPERATOR

I hereby certify that the information contained in this plan and in all the attachments is true, accurate, and the plan satisfies all criteria and requirements of rule 391-3-15-09 of the Georgia Rules for Underground Storage tank Management.

Name: Tressa Rutland
Signature:_____ Date:_____

B. REGISTERED PROFESSIONAL ENGINEER OR PROFESSIONAL GEOLOGIST CERTIFICATION

I hereby certify that I have directed and supervised the fieldwork and preparation of this plan in accordance with State Rules and Regulations. As a registered professional geologist and/or professional engineer, I certify that I am a qualified groundwater professional, as defined by the Georgia State Board of Professional Geologists. All of the information and laboratory data in this plan and in all of the attachments are true, accurate, complete, and in accordance with applicable State Rules and Regulations.

Name: Scott Bostian, PE
Signature: Scott Bostian
Date: 3/10/09

GEORGIA REGISTERED PE026133 PROFESSIONAL ENGINEER CURTIS SCOTT BOSTIAN
Georgia Stamp or Seal

Check all boxes that apply. Attach supporting documentation, i.e. narrative, figures, tables, maps, boring/well logs, etc., for all items checked. Supporting documentation should be three-hole punched and prepared in conformity with the guidance document "Underground Storage Tank (UST) Release: Corrective Action Plan-Part B (CAP-B) Content", GUST 7B.

1. Corrective Action Plan Certification – Part B

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Name: Scott Bostian, PE
Signature: _____
Date: _____ Georgia Stamp or Seal

Check all boxes that apply. Attach supporting documentation, i.e. narrative, figures, tables, maps, boring/well logs, etc., for all items checked. Supporting documentation should be three-hole punched and prepared in conformity with the guidance document "Underground Storage Tank (UST) Release: Corrective Action Plan-Part B (CAP-B) Content", GUST 7B.

II. SITE INVESTIGATION REPORT

☐ **Not Applicable** **The extent of contamination, and the local & site hydrogeology requirements have been fulfilled under the CAP Part A, therefore additional SIR reporting is not necessary.**

☒ **Extent of Contamination:**

☒ Soil ☐ Groundwater ☒ Free Product ☐ Surface water

☒ **Local and Site Hydrogeology:**

☒ Documentation of Local Groundwater Conditions

☒ Stratigraphic Boring Logs

☐ Stratigraphic Cross Sections

☒ Referenced or Documented Calculations of Relevant Aquifer Parameters

☒ Direction of Groundwater Flow

☒ Table of Monitoring Well Data

☒ Potentiometric Map

☒ Flow Net Superimposed on a Base Map

III. REMEDIAL ACTION PLAN

A. Corrective Action Completed or In-Progress:

☐ Not Applicable

☒ Recovery/Removal of Free Product (Non-Aqueous Phase Hydrocarbons)

☐ Remediation/Treatment of Contaminated Soils

☐ Other (specify)

_____

_____

B. Objectives of Corrective Action:

☐ No Further Action

☒ Remove Free Product That Exceeds One-Eighth Inch

☒ Remediate Groundwater Contamination That Exceeds:

☐ Maximum Contaminant Levels (MCLs)

OR

☒ In-stream Water Quality Standards

B. Objectives of Corrective Action (CONTINUED):

☒ Remediate Soil Contamination That Exceeds:

☐ Threshold Values Listed In Table A

OR

☐ Threshold Values Listed In Table B

OR

☒ Alternate Threshold Levels (ATLs) (Reference CAP A App. I)

☐ Provide Risk-Based Corrective Action (Reference CAP B App. I):

☒ Remediate Soil and/or Groundwater Contamination That Exceeds Alternate Concentration Limits (ACLs) and Monitor Residual Contaminants

OR

☐ Monitor Soil and/or Groundwater Contamination That Exceeds Levels In Rule – 391-3-15-.09(3).

C. Design and Operation of Corrective Action Systems:

☒Soil ☒Groundwater ☒Free Product ☐Surface water ☐Not Applicable

D. Implementation (MUST INCLUDE THE FOLLOWING):

NOTE: If No Further Action is proposed and none of the following apply, a brief explanation must be provided with the signed Certificate of Completion.

- Milestone schedule for proposed site activities

- Inspection and preventive maintenance schedule for all specialized remediation equipment

AND / OR

Monitoring/sampling and reporting plan for measuring interim progress and project completion

- Plan to decommission equipment/wells and close site

IV. PUBLIC NOTICE:

☐ Not Applicable **The Corrective Action Objectives submitted and approved under the CAP-Part A have not changed.**

☐ Certified Letters to Adjacent, Potentially Affected Property Owners and Local Officials

☒ Legal Notice in Newspaper, as approved by EPD

☐ Other EPD-approved Method (specify) _____

V. CLAIM FOR REIMBURSEMENT (For GUST Trust Fund sites only)

☒ Not Applicable (specify) _____

_____

☐ GUST Trust Fund Application - (attach if applicable)

☐ Cost Proposal:

☐ A Total of All Costs Incurred To Date (MUST INCLUDE THE FOLLOWING):

- ▶ Invoices and Proofs-of-Payment For All Costs Incurred To Date
- ▶ Invoices itemized on the GUST-4D
- ▶ All Non-Eligible Costs Clearly Identified as such
- ▶ Incurred Costs Itemized per GUST-92 form or EPD provided form/specifications

☐ A Total of Estimated Costs To Complete Corrective Action

- ▶ Estimated Costs Itemized per GUST-92 form or EPD provided form or specifications

☐ Total Project Costs

☐ Proposed Schedule For Reimbursement

☐ Lump Sum Payment Upon Completion Of Corrective Action

OR

☐ Interim Payments With Final Payment Upon Completion

OR

☐ EPD Established Payment Schedule

2. Site Investigation Report

This Corrective Action Plan (CAP) Part-B addresses Release #3 at the Bulk Fuel Facility (BFF) at Hunter Army Airfield (HAAF), Georgia. The BFF is approximately 600 by 1,200 feet and covers an area of approximately 16.5 acres (Figure 1). Currently, the facility contains two aboveground storage tanks (ASTs) for the storage of Jet Propellant-8 with capacities of approximately 500,000 gallons each, aboveground and underground piping, and off-loader and pump stations for the distribution of fuel to and from the tanks. Previously, remediation activities have been conducted in the area to address contamination identified as Release #1 and Release #2. Release #1 consisted of contamination associated with former Underground Storage Tank (UST) 117, Facility ID #9-025113*1, which was located near Building 7002. The UST was abandoned in place on September 30, 1996. A soil gas survey was conducted in January 1999 to identify areas of significant contaminant concentrations (SAIC 1999). A CAP-Part A investigation was conducted in December 1999 and January 2000 and a CAP-Part B investigation was conducted from November 2000 to March 2001 to determine the extent of petroleum contamination at the site. Thirty-four monitoring wells, seven soil borings, and six vertical-profile borings were installed during these investigations, and surface water and sediment samples were collected from Lamar Canal. The CAP-Part B Report for Former Underground Storage Tank 117, Building 7002, Facility ID #9-025113*1, Bulk Fuel Facility (HAA-09), Hunter Army Airfield, Georgia (SAIC 2001) was submitted to Georgia Environmental Protection Division (GA EPD) UST Management Program in July 2001. The report recommended that seven monitoring wells (i.e., BF-MW-19, BF-MW-20, BF-MW-21R, BF-MW-22, BF-MW-32, BF-MW-33, and BF-MW 34) be sampled on a semiannual basis for benzene, toluene, ethylbenzene, xylenes (BTEX) and naphthalene (constituents of potential concern in groundwater).

In July 2002 and January 2003, free product was observed in well BF-MW-E5, which is located in the vicinity of AST 7009. This tank is approximately 500 feet northeast of AST 7003, where the Release #1 groundwater plume was being monitored. Free product had not been observed in this well during the CAP-Part B investigation for Release #1. During that investigation, the BTEX and polyaromatic hydrocarbon (PAH) constituents detected in the well were below the maximum contaminant level, the In-Stream Water Quality Standard (IWQS), and the alternate concentration limit (ACL) and groundwater monitoring of the area was recommended. It was apparent that there were two separate releases at the BFF. For clarification, Release #1 was associated with the groundwater plume in the vicinity of AST 7003 where the original semiannual monitoring only program was conducted. Georgia EPD granted no further action for

Release #1 in correspondence dated October 6, 2003 (Lewis, 2003). Release #2 is associated with the free product observed in well BF-MW-E5, which is in the vicinity of AST 7009 and has been assigned Facility ID #9-025113*2. Free product removal activities are currently being conducted for Release #2 in well BF-MW-E5.

UST 117 was closed in place on September 30, 1996. CAPE Environmental removed UST 117 in May 2006. No concrete pad, dispenser island, or fuel piping was found in association with UST 117 during this removal. The concrete foundations of former ASTs 7001 and 7003 were also removed by CAPE Environmental in May 2006. AST 7005 was removed in October 2007. During the removal of the concrete foundations of former ASTs 7001 and 7003 in May 2006, free product was discovered approximately 3 to 4 feet below ground surface (ft bgs) at the former location of AST 7003. This was identified as Release #3. Four 2-foot diameter sumps were installed by CAPE Environmental in the area of former AST 7003 to collect free product. A subcontractor to HAAF, Griffin Services, was contracted to measure the level of free product in the sumps and pump the free product on a routine basis from May through August 2006. In an effort to delineate free product associated with Release #3, forty-two (42) 1.625-inch diameter monitoring points (FP-1 through FP-42) were installed on approximate 50-foot centers in the area of former ASTs 7001 and 7003 in November 2006 (Figure 2).

In February 2006, 23 monitoring wells associated with Release #1 (MW-01, MW-02, MW-03, MW-06 through 14, MW-17, MW-18, MW-20, MW-21R, MW-22, MW-23, MW-28, MW-29, MW-30, MW-31, and MW-32) located throughout the BFF were abandoned (Figure 3). The abandonment was documented in the Completion Report for Former Underground Storage Tank 117, Bulk Fuel Facility (HAA-09), Facility ID #9-025113*1, Hunter Army Airfield, Georgia, dated April 2006. Six monitoring wells (MW-15, MW-16, MW-19, MW-24, MW-33, and MW-34) located around the perimeter of the site that could not be located initially were abandoned in January 2008. Monitoring wells around Tank 7009 were left for potential future use for monitoring associated with Release #2.

In December 2008, liquid levels were measured in the 42 Free Product (FP) monitoring points and 4 sumps. Measurements indicated free product in a number of points and two sumps in the area around former AST 7003 and free product in one monitoring point around former AST 7001.

2.1 Regional, Local, and Site Hydrogeology

A discussion of the regional, local, and site hydrogeology was presented in the CAP Part A, Former Underground Storage Tank 117, Building 7002, Facility Identification Number 9-025113*1, Bulk Fuel Facility (HAA-09) Hunter Army Airfield, Georgia (SAIC 2000), which addressed Release #1. The area impacted by Release #1 is predominantly the same as that impacted by Release #3 and the following hydrogeology and geological information is applicable to Release #3. The geology and hydrogeology are summarized below.

2.1.1 Groundwater Usage

According to the Groundwater Pollution Susceptibility Map of Georgia (GA EPD 1992), the impacted area is located within an average or higher groundwater pollution susceptibility area. Five public groundwater supply wells are located within a 2-mile radius of the site. Four of these wells (PWS #1, PWS #2, PWS #3, and PWS #4A) are located within the confines of HAAF. The other well (PWS #25) is located approximately 0.8 mile northwest of the site in Savannah, Georgia. All the groundwater supply wells are classified as public wells and supply water either to HAAF or the City of Savannah for drinking and non-drinking purposes. These wells range in depth from approximately 300 feet to 600 feet deep and draw groundwater from the Principal Artesian (also known as the Floridian) Aquifer. A complete discussion of the water supply wells at HAAF and those near the site is provided in Appendix D. Locations of the wells within the 2-mile radius and within a 500-foot radius are also presented in Figure D-1 in Appendix D.

2.1.2 Aquifer Description

As presented in the CAP Part A (SAIC 2000), which addressed Release #1, the hydrogeology in the vicinity of HAAF is mostly influenced by two aquifer systems. These are referred to as the principal artesian (Floridan) aquifer and the surficial aquifer (Miller 1990). The principal artesian aquifer is the lowermost hydrologic unit and is regionally extensive from South Carolina to Georgia, Alabama, and most of Florida. Known elsewhere as the Floridan, this aquifer, approximately 800 feet in total thickness, is composed primarily of Tertiary-age limestone, including the Bug Island Formation, the Ocala Group, and the Suwannee Limestone. Groundwater from the Floridan is used primarily for drinking water (Arora 1984).

The confining layer for the Floridan aquifer is the phosphatic clay of the Hawthorn Group. There are minor occurrences of aquifer material within the Hawthorn Group. However, they have limited utilization (Miller 1990). The surficial aquifer overlies the Hawthorn confining unit.

The surficial aquifer consists of widely varying amounts of sand and clay. This aquifer is primarily used for domestic lawn and agricultural irrigation. The top of the water table ranges from approximately 2 to 10 ft bgs (Miller 1990). Groundwater in the surficial aquifer system is under unconfined, or water table, conditions. Locally, however, thin clay beds create confined or semiconfined conditions. Groundwater encountered at HAAF UST/AST investigation sites is part of the surficial aquifer system.

Based on the facts that all public and non-public water supply wells draw water from the Floridan aquifer and that the Hawthorn confining unit separates the Floridan aquifer from the surficial aquifer, it is concluded that there is not likely to be hydraulic interconnection between HAA-09 sites (and associated plumes) and water supply withdrawal points.

2.1.3 Surface Water

The water resources survey conducted during the CAP-Part A Site Investigation for Release #1 is presented in Appendix D (SAIC 2000). The information was revised and updated as noted. Surface water bodies including Lamar Canal, Pond 29, and several unnamed drainage ditches are located within a 1-mile radius of the site and are shown in Appendix D. Lamar Canal is located approximately 180 feet south-southeast (downgradient) of the Release #3 area. A series of storm drains and catch basins are located along the southern border of the BFF. They were formerly used to drain the bermed area around each of the ASTs (Figure 3). One of the storm drains is located approximately 120 feet from the area of greatest soil and groundwater contamination in the vicinity of AST 7003. The invert elevation of the storm drain is unknown; however, based on shallow depth to the water table, it is assumed that the storm drain is below the water table. Therefore, the storm drain is considered as a preferential pathway. Based on the location of Lamar Canal relative to the associated plumes, the site is classified as being located less than 500 feet from a surface water body.

2.1.4 Site Stratigraphy

As determined from soil borings drilled during the UST 117 CAP-Part A and CAP-Part B Site Investigations, the lithology present within 15 feet of the surface at the site appears to correlate with the regional stratigraphic section. The lithology underlying the area consists of interbedded layers of sand with varying amounts of silt and clay concluded to be part of the Satilla Formation. Soil groups at HAAF include the Chipley, Leon, Etabelle, Kershaw, Pelham, Albany, Wahee, and Ogeechee (Wilkes et al.1974). Boring logs for wells installed as part of the Site Investigation for the June 2000 CAP – Part A and the July 2001 CAP – Part B for UST 117 and not abandoned are provided in Appendix C.

2.1.5 Direction of Groundwater Flow

Water level measurements were collected during the CAP-Part A site investigation after monitor well installation in January 2000 and during CAP-Part B site investigation groundwater sampling activities in March 2001. Water level measurements were also taken during subsequent monitoring events. Groundwater at the site was determined to flow generally to the southeast. Groundwater potentiometric surface measurements taken in January 2003 and January 2005 are presented on Figures 4a and 4b, respectively.

2.2 Horizontal and Vertical Extent of Contamination

The extent of petroleum-related contamination in the form of free product associated with Release #3 was delineated by activities performed in 2006 and 2008. A summary of the results from these activities is presented below.

2.2.1 Delineation of Soil Contamination

Forty-two (42) 1.625-inch diameter free product monitoring points (FP-1 through FP-42) were installed on approximate 50-foot centers in the area of former ASTs 7001 and 7003 in November 2006 (Figure 2). During the installation, a Photo Ionization Detector (PID) was used to obtain volatile organic compound (VOC) concentrations from the borehole. Readings ranged from less than one part per million (ppm) to 1,400 ppm. The results are presented on Figure 5. Although the method used is imprecise, the results are useful in providing an initial estimate of impacted soil area. The impacted area estimated from these data corresponds in general with the area where free product was detected.

As part of the corrective actions described in Section III, horizontal and vertical extent of soil contamination, including soil contamination at or below the water table, will be delineated to non-detect via analysis of samples taken with Direct Push Technology (DPT). The samples will be analyzed with field and laboratory methods. After the investigation with DPT is complete, horizontal and vertical components of subsurface soil contamination will be displayed on site maps and cross-sections. All analytical data will be summarized in tabular form. Detailed description of the investigation scope is presented in Section III.

Refer to the CAP–Part A (SAIC 2000) and the CAP–Part B (SAIC 2001) for UST 117, for documentation of the previous soil delineation and assessment activities associated with Release #1 in the same area.

2.2.2 Delineation of Groundwater Contamination

There has not been any groundwater sampling conducted in the area since January 2003. Because most of the monitoring wells in the area of former ASTs 7001 and 7003 were abandoned in early 2006 and the rest in 2008, there is not any groundwater contaminant concentration data subsequent to the May 2006 discovery of the contamination designated as Release #3. These monitoring wells were associated with Release #1 and were abandoned based on the granting by Georgia EPD of No Further Action (NFA) status for Release #1. The vertical and horizontal extent of groundwater contamination will be assessed with DPT in conjunction with the delineation of soil contamination. The extent will be determined for each BTEX and PAH constituent. Isoconcentration contours will be plotted on a site map. After excavation and site restoration, monitoring wells will be installed as described in Section III. Previous vertical profile borings for Release #1 (CAP-Part A) investigation indicated that contamination was limited to the upper interval of the shallow aquifer and a similar distribution is anticipated for Release #3.

Refer to the CAP-Part A (SAIC 2000) and the CAP–Part B (SAIC 2001) for UST 117 for detailed documentation of the previous groundwater delineation and assessment activities associated with Release #1.

2.2.3 Delineation of Free Product

After discovery of free product during removal of the foundation for former AST 7003 (Release #3), four 2-foot sumps were installed in the former AST 7003 area to collect free product. Griffin Services was contracted to measure the level of free product in the

sumps and to extract free product on a routine basis starting in May 2006 and continuing through August 2006. The results of these activities are in Appendix F.

In order to delineate free product associated with Release #3, 42 monitoring points (FP-01 through FP-42) were installed on approximate 50-foot centers in the area of former ASTs 7001 and 7003 in November 2006. The monitoring points were constructed with 1.625-inch diameter polyvinyl chloride (PVC) 0.010-slot screen and installed from ground surface to 4.5 ft bgs. Filter pack sand was poured around the annulus between the borehole and screen. The locations of the free product monitoring points are presented in Figure 2. Free product monitoring point construction diagrams are included in Appendix E (SAIC 2007). No liquid (water or free product) was measured in the monitoring points after installation in November 2006. Free product removal or monitoring activities were not conducted in 2007.

Liquid levels were measured in the sumps and monitoring points in December 2008. Free product was detected in monitoring points FP-04, FP-05, FP-06, FP-08, FP-13, FP-37 and FP-38. Free product was detected in Sump 1 and Sump 4 at 0.21 feet and 0.12 feet, respectively. Sheen was observed in monitoring point FP-40 and Sumps 2 and 3. The free product detections are illustrated on Figure 6. After additional data are obtained on free product distribution with DPT investigation, site figures will be created presenting the estimated horizontal and vertical extent of the free product.

2.2.4 Delineation of Surface Water and Sediment Contamination

Results from the surface water and sediment samples collected during the CAP–Part A investigation for Release #1 indicated that the surface water in Lamar Canal was not being impacted by contamination from the BFF. Therefore, additional samples were not recommended (SAIC 2000) and surface water and sediment samples have not been collected since. The need for surface water samples or sediment samples will be evaluated based on contaminant concentrations in downgradient wells and fate and transport modeling.

3. Remedial Action Plan

3.1 Corrective Action Completed or in Progress

3.1.1 Recovery/Removal of Free Product

Four 2-foot sumps were installed in the area of the removed AST 7003 foundation to collect free product in May 2006. A subcontractor to HAAF was contracted to measure the level of free product in the sumps and to pump the free product on a routine basis starting in May 2006 and continuing through August 2006. The pumping activities were documented in the Third Annual Monitoring and Free Product Removal Report (SAIC July 2007) and a table of results from that report is included as Appendix F.

Forty-two free product monitoring points were installed in November 2006. The monitoring points contained no free product or other liquids when measured in November 2006. No free product removal activities were conducted in 2007 or 2008.

3.1.2 Remediation/Treatment of Contaminated Backfill Material and Native Soil

The concrete foundations of former ASTs 7001 and 7003 and UST 117 were removed by CAPE Environmental in May 2006. During the removal of the concrete foundations, free product was discovered approximately 3 to 4 ft bgs at former location of AST 7003. Soil that was excavated to recover and remove the UST and concrete pads was temporarily staged on the site to determine approval for reuse as backfill material. Analytical results from the soil samples indicated positive detections of BTEX (estimated value) and gasoline range organics (GRO). The contaminated soil was removed as part of these activities.

3.2 Objectives of Corrective Action

3.2.1 Remove Free Product That Exceeds One-Eighth Inch at the Former AST 7001/7003 (Release #3)

In 2006, free product was detected in excess of 1/8 inch. Four 2-foot sumps were installed and free product recovery was performed from May through August 2006. In 2006, the maximum free product thickness in the sumps was 0.88 foot. Forty-two monitoring points were installed in November 2006, but liquid was not detected. Liquid levels were measured again in December 2008 and free product in excess of 1/8-inch thickness was observed in monitoring points FP-04, FP-05, FP-06, FP-08, FP-

37, FP-38, Sump 1 and Sump 4 in the area of Former AST 7003. Free product in excess of 1/8 inch was also measured in FP-13, which is in the area of Former AST 7001.

The objective of free product removal activities will be the aggressive elimination of saturated and unsaturated soil containing free product such that free product in excess of 1/8-inch thick will not be present. Free product removal activities will include excavation of soil containing free product. The excavation interval will encompass the historic smear zone. The excavation will remain open and will be monitored for free product recharge. Vacuum enhanced free product recovery actions will be initiated if free product is detected.

3.2.2 Remediate Groundwater Contamination at the Former AST 7001/7003 (Release #3)

Groundwater contamination will be remediated to In-Stream Water Quality Standards (IWQS) or ACLs. Monitoring wells in the vicinity of Former AST 7003 have been abandoned and cannot be sampled. Monitoring wells will be installed after excavation to determine the extent, if any, of groundwater contamination exceeding IWQS or ACLs. The estimated optimal monitoring well locations are shown on Figure 7. Monitoring well locations will be evaluated and adjusted after the DPT investigation and excavation are complete. ACLs will be calculated based on the sampling data from the DPT Investigation and the new monitoring wells. Based on the location of the free product associated with Release #3, the ACLs will likely be similar to values calculated for Release #1. A groundwater monitoring plan will be included in the report on DPT Investigation and Excavation.

3.2.3 Remediate Soil Contamination at the Former AST 7001/7003 (Release #3)

Soil contamination will be reduced to below Alternate Threshold Limits (ATLs). The corrective action for soil remediation will include direct push soil borings installed in the area where free product was measured in the monitoring points (Figure 8). Based on concentrations and distribution of soil contamination from this investigation, ATLs will be calculated for Release #3. As with groundwater ACLs, these values will likely be comparable to those calculated for Release #1 based on similar contaminant and receptor locations. The extent of soil contamination with concentrations exceeding the ATL will be determined from the analytical results and presented on figures included in the subsequent report.

Excavation activities will remove source material (free product) and soil with concentrations exceeding the ATLs. The estimated location of this excavation is provided on Figure 9. Additionally, an oxygen source will be applied to the bottom of the excavation to enhance biodegradation of residual contamination.

3.2.4 Provide Risk-Based Corrective Action

During the development of the CAP for Release #1, a risk-based approach was used to determine the need for further action at the site. Due to the nature of the contamination, which is similar to Release #3, the risk-based approach was limited to human health concerns. Ecological risk concerns are negligible because of the land use surrounding the site. During evaluation for Release #1, the analytical results from surface water and sediment sampling in the drainage ditch indicated that habitat potentially associated with Lamar Canal was not impacted by the former AST operations. Additional sampling of surface water/sediment will be determined based on sampling results from downgradient monitor wells that will be installed after excavation activities are complete.

The methods for assessing human health concern for the site were derived from Georgia Underground Storage Tank (GUST) CAP-Part B guidance (GA EPD 1995) and GA EPD guidance (1996). The detailed risk-based corrective action (RBCA) evaluation and calculations will be performed after additional soil and groundwater data are collected as previously described.

3.2.4.1 Potential Receptor Survey

The exposure assessment identifies any potentially complete pathways between the contaminant source and potential receptors. This involves identifying potential current and future receptors, release mechanisms through which contamination might come into contact with the receptors, and routes of exposure through which receptors might be exposed.

The Former AST 7001 and 7003 sites are located within an active military installation and within an access-controlled fence. Lamar Canal is located approximately 180 feet south-southeast (downgradient) of the site. A series of storm drains and catch basins are located along the southern border of the BFF and were used to drain the area around the former ASTs. One of these storm drains is located 120 feet from former AST 7003 location.

No connection between site contamination and current off-site receptors was identified during current or previous evaluations. Site contamination associated with Release #1 migrated to the surficial aquifer only, and Release #3 will likely behave similarly. The Hawthorne Group, which is approximately 90 feet of clay, separates the surficial aquifer from the deep drinking water aquifer, the Floridian aquifer. The Hawthorn Group, a thick and highly effective confining unit, separates the water supply wells from the surficial aquifer.

Current on-site receptors have not been identified for the site. Potential future on-site receptors might include industrial workers and military residents. Potential future on-site industrial receptors may come in direct contact with site soil contamination during construction or excavation activities. No near-term on-site receptors are likely to come into contact with groundwater unless the surficial aquifer discharges into the catch basin or Lamar Canal (SAIC 2001).

3.2.4.2 Screening for Chemicals of Potential Concern

3.2.4.2.1 Screening Methodology

The purpose of a risk evaluation screening is to identify the chemicals of potential concern (COPCs) and areas of concern at a site. Free product associated with Release #3 has been identified and remedial action will be implemented. The first step in the risk process will use screening levels that are readily obtainable and that, due to their conservative nature, can be used with a high degree of confidence to indicate site risk status.

3.2.4.2.2 Site-Specific Levels

Detections exceeding the conservative generic screening levels are considered to be COPCs. ATLs and ACLs will be developed, when appropriate, for the COPCs using site-specific information from fate and transport modeling and applicable regulatory levels.

3.2.4.2.3 Alternate Threshold Levels

The ATLS will be calculated if soil data indicate that residual soil contamination concentrations exceed the GUST Soil Threshold Levels. Benzene, ethylbenzene, toluene and xylenes were identified as COPCs for soil for Release #1. ATL calculations for Release #1 for these compounds are presented in Appendix G for

reference. These ATLs for soil at the site were determined in the previous CAP for Release #1, and ATLs calculated for Release #3 will likely be similar.

3.2.4.2.4 Alternate Concentration Limits

The ACLs will be calculated if groundwater concentrations in the monitor wells exceed IWQS values or risk-based screening criteria. The ACLs will be based on analytical data from the monitor wells installed in the "hot-spots" after excavation. For Release #1, benzene and naphthalene were identified as COPCs for groundwater at the site. Benzene and naphthalene were modeled to the potential downgradient location where a receptor may come in contact with migrating site contamination. This was determined to be a storm drain located 120 feet downgradient from the center of the source area (abandoned Monitor Well MW-22). Based on the current free product distribution, the center of the source area for Release # 3 will likely be roughly the same location. For release #1, fate and transport modeling was used to develop a site-specific dilution attenuation factor (DAF) between the source and receptor location. The modeling results estimated a DAF for benzene of 8.9 and a DAF of 126.3 for naphthalene. Compound specific regulatory levels or risk-based screening criteria were used in conjunction with site-specific DAFs identified for the potential migration of contaminants from the site to determine the ACL for each compound. The ACL calculations for Release #1 are included for reference in Appendix G.

3.2.4.2.5 Fate and Transport Model

As described above, DAFs were calculated for Release #1 and will be recalculated after DPT sampling, monitoring well sampling and excavation data for Release #3 are available. DAFs between the source and the receptor locations specific to Release #3 will be developed. Fate and transport models such as analytical transient 1,2,3-dimensional (AT123D) or other appropriate model are used as tools for developing DAFs. The application of fate and transport models at any release site must ensure that the modeling results are protective of human health and the environment. Therefore, the selection process of a predictive model at the release site will consider its performance, characteristics, and applicability to the site being considered. If the maximum soil concentration of a COPC at the site is above the water table, modeling of leaching to groundwater by percolating rainwater will be performed using seasonal soil (SESOIL) or other appropriate model in order to determine the predicted maximum concentration in the leachate at the water table interface and the soil ATLs. The potential receptor is a storm drain approximately 120 feet southwest of the site. This storm drain is part of a series of drains used to drain the bermed areas around the

ASTs at the BFF. These drains empty into Lamar Canal. This is the nearest possible location at which a receptor might encounter migrating groundwater contamination due to a possible hydraulic connection between the groundwater and the surface water in Lamar Canal (SAIC 2001). The fate and transport modeling results from the CAP-Part B for UST 117 (Release 1) are presented in Appendix H for reference.

3.2.4.2.6 Conclusions and Recommendations

The initial goal of the proposed remedial approach will be removal of free product so that no hydrocarbon layer which exceeds 1/8 inch in thickness is detected in the monitoring points, sumps or monitoring wells.

Along with free product removal, soil contamination exceeding ATLs will be also be excavated and transported off site. Groundwater concentrations will be monitored to ensure levels are less than the ACLs or IWQS and are attenuating.

4. Design and Operation of Corrective Action

Prior to any invasive site work (direct push sampling, excavation, monitor well installation), all required permits and utility clearances will be obtained.

The data available on groundwater elevations consisted of data sets from the CAP Part A Site Investigation (SAIC 2000) for Release #1 in January 2000 through water level data recorded as part of the monitor well abandonment in February 2006. The data show that depth to water in the area of former AST 7003 (based on MW-20, MW-21, MW-22, MW-23) has ranged from 1.5 to 4 ft bgs). The depth to water in the area of former AST 7001 (based on MW-17) has ranged from 1.3 to 3.1 ft bgs. The free product monitoring points installed in the area of former ASTs 7001 and 7003 were measured in November 2006 and recorded as containing no liquid. The points were installed with screen to depth of 4.5 ft bgs. Groundwater elevations from monitor wells were not available to confirm the groundwater elevations during that time. Water levels in those same points ranged from 1.5 to 3 ft bgs in December 2008. Based on the preceding information, the smear zone is estimated to be within 1 to 5 ft bgs.

4.1 Investigation

The goal of the DPT investigation is to define the limits of soil with petroleum hydrocarbon contamination that exceeds the regulatory limits. All soil within these limits will be excavated and transported off-site as described below. Therefore, there will be fewer DPT locations in areas where light non-aqueous phase liquid (LNAPL) is known to be present and more points as the investigation steps out from the known LNAPL areas. The vertical extent of the investigation will include the smear zone to evaluate all source mass. In selected “hotspot” locations, groundwater samples will be taken to establish vertical extent for subsequent monitor well installation.

Liquid levels will be measured in free product monitor points and sumps prior to starting DPT investigation. Approximately 25 DPT points will be installed in the vicinity of former ASTs 7001 and 7003 to delineate the free product and impacted soil. Groundwater samples will also be taken to evaluate vertical and horizontal impacts and to guide location and screen interval selection for monitor wells that will be installed after excavation related activities are completed. The first set of DPT points will be at the estimated limits of free product. Subsequent DPT points will be located based on the first set of screening results such that the extent of contaminated soil is defined. Approximately five DPT points will be installed in the area known to be impacted by free product to verify vertical free product distribution. DPT for soil and free product

investigation will continue until vertical and horizontal distribution of source contamination is defined. Field screening results will be used to determine extent of contamination and guide selection of locations for sample collection for laboratory analysis. Screening results will be obtained through visual inspection of soil samples, measurement of VOC headspace concentrations and other methods if necessary. For each 2-foot interval, soil grab samples will be collected in glass jars and covered with aluminum foil. After allowing at least 15 minutes for volatilization and temperature equilibration, the headspace VOC concentration will be measured with a PID with the proper lamp (11.7 eV) to quantify the VOCs.

DPT locations for contaminated soil delineation will extend to a depth of 5 to 7 ft bgs. Samples will be collected at intervals determined with field screening equipment. A second set of twinned temporary borings will be installed to collect sample tubes from the subset of initial borings that showed elevated vapors but were outside the area obviously impacted by LNAPL. When no VOCs are detected during screening, a laboratory confirmatory sample will be taken at the interval just above the water table. When VOCs are detected in one or more of the borehole intervals, samples for laboratory analysis will be selected from the most contaminated interval. Soil samples will be analyzed for United States Environmental Protection Agency (USEPA) Method 8260B and USEPA Method 8270C in accordance with GUST Guidance. Please note that because groundwater samples will be collected at the worst-case locations, soil samples will not be analyzed for USEPA Method 8015B-GRO and diesel range organics (DRO).

Two soil borings in the area with the highest VOC concentrations will be advanced into the water table to collect groundwater samples for vertical delineation. A screen-point sampler will be advanced to 15 feet to collect groundwater quality samples. The average depth for the initial collection of groundwater samples will be approximately 4 to 5 ft bgs. Samples will also be collected at 5-foot intervals to 15 ft bgs. Two locations will be selected downgradient of the source areas for collecting groundwater samples at 5-foot intervals to a total depth of 15 ft bgs. Groundwater samples will be analyzed for USEPA Method 8260B and USEPA Method 8270C. Please note that previous vertical investigations in the area for Release #1 determined that dissolved contamination was located predominantly above 15 ft bgs and that the Hawthorne Formation was encountered at approximately 40 ft bgs.

Soil samples will also be taken during the DPT Investigation for analysis of additional parameters (e.g., toxicity characteristic leaching procedure [TCLP]) as required for

transportation and disposal of contaminated soil and water in accordance with applicable regulations.

4.2 Excavation

Contaminated soil will be excavated in the areas impacted above the applicable limits as determined utilizing the DPT field and laboratory data sets. The depth of the excavation will be determined based on DPT results and historical water table fluctuations (smear zone). The initial estimate of excavation depth is 5 feet but this depth will be adjusted based on field results. Free product points and product recovery sumps in the area targeted for excavation will be removed during excavation. All excavations will be sloped to prevent collapse. The slope angle will be no greater than 2H:1V (angle of repose for sand). Dewatering pumps will be utilized to allow effective excavation of entire smear zone depth. Storage tanks will be brought to the site for containment of water extracted from the excavation.

All excavated soils that could potentially be reused will be stockpiled on polyethylene sheeting covering a perimeter of hay bales or bermed soil to prevent runoff of sediments. Because of the shallow water table and related high smear zone, reuse of soil is not anticipated. Any soil potentially returned to the excavation will be sampled for laboratory analysis by USEPA Methods 8260 and 8270. Each stockpile considered for reuse will be sampled in accordance with USEPA guidance procedures.

Based on the investigation results, the horizontal and vertical limits of soil contaminated above applicable limits will be established. Soil within that area will be excavated and directly loaded into trucks for transportation to an off-site disposal facility.

In case of transportation interruptions, contaminated soil will be placed on bermed lined storage areas or, if the quantity is small, in plastic-lined construction roll-offs. The storage areas and/or roll-offs will be staged in accordance with direction from HAAF personnel and in compliance with all applicable regulations.

Any construction debris that is encountered will be transported for disposal in a construction and demolition (C&D) waste landfill.

After excavation activities are complete, soil samples will be taken from the bottom of the excavation and from the sidewalls of the excavation for field screening. If screening results or visual examination indicate the presence of residual soil

contamination, samples will taken for analysis by USEPA Method 8260 and USEPA Method 8270. At a minimum, confirmation samples for laboratory analysis will be taken from each sidewall and the bottom of the excavation in accordance with GUST guidance. The effectiveness of bottom samples will evaluated based on relative water level.

The excavated area will be maintained open for free product evaluation. The area around the excavation will be marked with warning tape and access will be controlled. Enhanced fluid recovery (EFR) events may be performed to address any free product that is detected in the excavation. Backfilling of the excavation will commence following completion of the removal of the impacted soil and verification of free product removal. An oxygen-releasing compound will be applied to the bottom of the excavation along with approximately 1 foot of coarse sand. Although unlikely, if the excavation bottom is above the water table, the oxygen-releasing material will be hydrated. After verification of acceptable contaminant levels, uncontaminated soil, if any, will be returned to the excavation. Soil from an approved borrow source will comprise the remainder of the backfill. The remediation area will be cleaned of all sediment and debris. All areas will be graded to match existing conditions.

4.3 Installation of Monitoring Wells

At least four groundwater monitor wells will be installed after backfill and compaction activities are completed. The estimated optimal locations for the wells are shown on Figure 7. Monitor well locations and number will be evaluated and adjusted if necessary based on data from investigation and excavation. The wells will be installed by utilizing hollow-stem auger drilling techniques to a depth of approximately 15 ft bgs. The wells will be constructed with 2-inch schedule 40 PVC pipe and screened from 3 to 13 ft bgs. Monitoring wells installed in areas previously impacted by free product will be 4-inch schedule 40 PVC pipe with the same screen interval. Screen interval will also be adjusted if necessary based on investigation and excavation data. The wells will be finished with flush-mount surface completions. Each well will be developed to ensure filter packs are clear and free of fines. Well installation will be performed under the supervision of a Professional Engineer or Professional Geologist registered in Georgia. Monitor well installation will be in accordance with the Georgia Environmental Protection Division Manual for Groundwater Monitoring.

Monitor wells installed at the site will be sampled semiannually for analysis of COPCs. Sampling will continue to ensure concentrations are below either IWQS or ACLs as designated by the regulatory agency and are attenuating.

4.4 Implementation

4.4.1 Milestone Schedule

A milestone schedule for the proposed corrective action has been prepared. A Gantt chart showing milestone activities and anticipated duration is provided in Figure 10. HAAF will notify GA EPD of any significant changes to the schedule and will provide GA EPD with an updated Gantt chart, as necessary.

4.4.2 Progress Reporting

A semiannual progress report will include:

1. Project summary
2. Activities and assessment of existing conditions
3. Analytical data
4. Site ranking
5. Conclusions and recommendations on corrective action status.

4.4.3 Certificate of Completion Report

A completion report will be prepared at the conclusion of the corrective action and post-remediation monitoring work. The report will summarize the corrective actions accomplished and provide data confirming achievement of the remediation objectives set forth in Section III.B. The report will be submitted within 30 days of completing all corrective actions specified in this plan. The completion report will include the following certification:

"I hereby certify that the Corrective Action Plan–Part B, dated February 2, 2009, for Hunter Army Airfield, Former AST 7003 site (Release #3), Facility ID #9-025113*3, including any and all certified amendments/addenda thereto, has been implemented in accordance with the schedules, specifications, sampling programs, and conditions contained therein and that the plan's stated objectives have been met."

_____
Signature (Owner/Operator)

4.4.4 Inspection Schedule and Preventative Maintenance Program

The current plan does not require the installation of a permanent remediation system for HAA-09 Release #3. Thus, on-site inspection and preventative maintenance are not applicable.

4.4.5 Periodic Monitoring

Monitoring wells will be measured and sampled on a semiannual basis until groundwater contaminant concentrations are below the regulatory limit.

4.4.6 Effectiveness of Corrective Action

Monitor wells will be measured to verify effective removal of free product. Groundwater samples will be collected from each monitoring well to document groundwater contaminant concentrations. Groundwater contaminant concentrations will be evaluated for trends and progress toward remediation goals.

4.4.7 Confirmatory Soil Sampling Plan

For the former AST 7001 and 7003 site (Release #3), excavation of soil is planned in accordance with limits determined by DPT investigation. Confirmatory sampling of the excavation associated with excavation of soil will be performed with field screening and samples for laboratory analysis.

4.4.8 Stockpiled Bulk Soil Sampling

For the former AST 7001 and 7003 site (Release #3), stockpiled soil will not be generated by this corrective action. The soil will have been characterized with DPT investigation prior to excavation and will be directly loaded into trucks.

4.4.9 Monitoring Only Termination Conditions

The proposed remedial approach, which includes excavation will remove free product such that no measurable floating hydrocarbon layer (that which exceeds 1/8 inch in thickness) is detected in monitoring points. Soil contamination will be reduced to below threshold applicable limits with excavation and off-site disposal. Groundwater will be monitored to ensure contaminant concentrations are below applicable limits.

4.4.10 Post-Completion Site Restoration Activities

There will be no permanent equipment or systems located at the site as part of this remediation. The excavated area will be backfilled and properly compacted. The area will be graded to match existing.

4.5 Public Notification

The former ASTs 7001 and 7003 site is located entirely within the confines of HAAF, which is part of the Fort Stewart Military Reservation, a federal facility. The U. S. Government owns all of the property contiguous to the site. The Fort Stewart Directorate of Public Works (DPW) will comply with the public notice requirements defined by GA EPD guidance by publishing an announcement in the Savannah Morning News.

5. Claim for Reimbursement

HAAF is a federally owned facility and has funded the investigation for the former AST 7003 site (Release #3), Facility ID #9-025113*3 using U. S. Department of Defense Environmental Restoration Funds. Application for GUST Trust Fund reimbursement is not being pursued at this time.

6. References

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Tables

Table 1
Historical Groundwater Elevations
CAP-Part B
Former Aboveground Storage Tanks 7001 & 7003
Bulk Fuel Facility (HAA-09)
Hunter Army Airfield, Georgia

Well Number	Date Measured	Top of Casing Elevation (ft AMSL)	Depth of Screened Interval (ft BGS)	Depth to Free Product (ft BTOC)	Depth to Water (ft BTOC)	Product Thickness (ft)	Corrected Elevation[a] (ft AMSL)
First Semiannual Monitoring Event – July 2002							
BF-MW-01	7/11/2002	15.47	3.5 – 12.5	¾	4.04	0	11.43
BF-MW-02	7/11/2002	16.24	3.5 – 13.0	¾	3.88	0	12.36
BF-MW-03	7/11/2002	16.39	3.6 – 13.1	¾	3.88	0	12.51
BF-MW-04	7/11/2002	17.11	2.8 – 12.3	¾	4.63	0	12.48
BF-MW-05	7/11/2002	16.99	2.9 – 12.4	¾	4.40	0	12.59
BF-MW-06	7/11/2002	16.80	2.7 – 12.2	¾	4.26	0	12.54
BF-MW-07	7/11/2002	16.74	2.9 – 12.4	¾	4.44	0	12.3
BF-MW-08	7/11/2002	16.40	2.3 – 11.8	¾	4.00	0	12.4
BF-MW-09	7/11/2002	16.60	2.9 – 12.4	¾	4.62	0	11.98
BF-MW-10	7/11/2002	15.33	2.3 – 11.8	¾	3.56	0	11.77
BF-MW-11	7/11/2002	15.42	2.3 – 11.8	¾	3.52	0	11.9
BF-MW-12	7/11/2002	16.35	3.0 – 12.5	¾	4.79	0	11.56
BF-MW-13	7/11/2002	13.72	2.3 – 11.8	¾	4.84	0	8.88
BF-MW-14	7/11/2002	15.26	28 – 12.3	¾	5.04	0	10.22
BF-MW-15	7/11/2002	15.01	2.5 – 12.0	¾	3.56	0	11.45
BF-MW-16	7/11/2002	12.61	2.7 – 12.2	¾	4.74	0	7.87
BF-MW-17	7/11/2002	13.15	3.0 – 12.5	¾	3.08	0	10.07
BF-MW-18	7/11/2002	12.99	3.4 – 12.9	¾	3.80	0	9.19
BF-MW-19	7/11/2002	13.88	2.0 – 11.5	¾	3.61	0	10.27
BF-MW-20	7/11/2002	14.79	2.2 – 11.7	¾	3.38	0	11.41
BF-MW-21R	7/11/2002	14.57	4.8 – 14.8	¾	3.55	0	11.02
BF-MW-22	7/11/2002	14.60	2.4 – 11.9	¾	3.19	0	11.41
BF-MW-23	7/11/2002	14.74	2.7 – 12.2	¾	3.13	0	11.61
BF-MW-25	7/11/2002	13.60	3.6 – 13.1	¾	3.90	0	9.7
BF-MW-27	7/11/2002	14.90	2.5 – 12.0	¾	2.72	0	12.18
BF-MW-28	7/11/2002	15.49	2.0 – 11.5	¾	4.07	0	11.42
BF-MW-29	7/11/2002	14.49	2.0 – 11.5	¾	2.82	0	11.67
BF-MW-30	7/11/2002	14.19	1.9 – 11.4	¾	2.85	0	11.34
BF-MW-31	7/11/2002	14.46	1.5 – 11.0	¾	3.53	0	10.93
BF-MW-32	7/11/2002	15.74	1.4 – 11.2	¾	5.12	0	10.62
BF-MW-33	7/11/2002	13.95	1.6 – 11.4	¾	4.75	0	9.2
BF-MW-34	7/11/2002	14.87	3.1 – 13.1	¾	5.24	0	9.63
BF-MW-E1	7/11/2002	14.00	4.6 – 14.6		3.77	0	10.23
BF-MW-E2	7/11/2002	13.76	3.94 – 13.94	¾	3.91	0	9.85
BF-MW-E3	7/11/2002	13.99	4.4 – 14.4	¾	4.31	0	9.68
BF-MW-E4	7/11/2002	13.88	4.6 – 14.6	¾	4.42	0	9.46
BF-MW-E5	7/11/2002	14.00	4.8 – 14.8	4.34	4.41	0.07	9.65*a*
BF-MW-E6	7/11/2002	13.76	3.7 – 13.7	¾	3.69	0	10.07
Second Semiannual Monitoring Event – January 2003							
BF-MW-01	1/27/2003	15.47	3.5 – 12.5	¾	3.71	0	11.76
BF-MW-03	1/27/2003	16.39	3.6 – 13.1	¾	3.79	0	12.6
BF-MW-09	1/27/2003	16.60	2.9 – 12.4	¾	4.29	0	12.31
BF-MW-12	1/27/2003	16.35	3.0 – 12.5	¾	4.39	0	11.96
BF-MW-17	1/27/2003	13.15	3.0 – 12.5	¾	2.47	0	10.68
BF-MW-18	1/27/2003	12.99	3.4 – 12.9	¾	3.32	0	9.67
BF-MW-19	1/27/2003	13.88	2.0 – 11.5	¾	3.38	0	10.5
BF-MW-20	1/27/2003	14.79	2.2 – 11.7	¾	3.08	0	11.71
BF-MW-21R	1/27/2003	14.57	4.8 – 14.8	¾	3.45	0	11.12
BF-MW-22	1/27/2003	14.60	2.4 – 11.9	¾	3.05	0	11.55
BF-MW-23	1/27/2003	14.74	2.7 – 12.2	¾	3.12	0	11.62
BF-MW-25	1/27/2003	13.60	3.6 – 13.1	¾	3.72	0	9.88
BF-MW-26	1/27/2003	13.62	2.4 – 11.9	¾	2.01	0	11.61
BF-MW-28	1/27/2003	15.49	2.0 – 11.5	¾	4.02	0	11.47
BF-MW-32	1/27/2003	15.74	1.4 – 11.2	¾	4.88	0	10.86
BF-MW-33	1/27/2003	13.95	1.6 – 11.4	¾	4.54	0	9.41

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BF-MW-E1	1/27/2003	14.00	4.6 – 14.6		3.99	0	10.01
BF-MW-E2	1/27/2003	13.76	3.94 – 13.94	¾	4.02	0	9.74
BF-MW-E3	1/27/2003	13.99	4.4 – 14.4	¾	4.38	0	9.61
BF-MW-E4	1/27/2003	13.88	4.6 – 14.6	¾	4.22	0	9.66
BF-MW-E5	1/27/2003	14.00	4.8 – 14.8	4.44	4.54	0.1	9.46
BF-MW-E6	1/27/2003	13.76	3.7 – 13.7	¾	3.87	0	9.89
Third Semiannual Monitoring Event – July 2004							
BF-MW-01	7/16/2004	15.47	3.5 – 12.5	¾	4.42	0	11.05
BF-MW-02	7/16/2004	16.24	3.5 – 13.0	¾	4.06	0	12.18
BF-MW-03	7/16/2004	16.39	3.6 – 13.1	¾	4.01	0	12.38
BF-MW-04	7/16/2004	17.11	2.8 – 12.3	¾	4.72	0	12.39
BF-MW-05	7/16/2004	16.99	2.9 – 12.4	¾	4.52	0	12.47
BF-MW-06	7/16/2004	16.80	2.7 – 12.2	¾	5.42	0	11.38
BF-MW-07	7/16/2004	16.74	2.9 – 12.4	¾	4.46	0	12.28
BF-MW-08	7/16/2004	16.40	2.3 – 11.8	¾	4.18	0	12.22
BF-MW-09	7/16/2004	16.60	2.9 – 12.4	¾	4.52	0	12.08
BF-MW-10	7/16/2004	15.33	2.3 – 11.8	¾	3.53	0	11.8
BF-MW-11	7/16/2004	15.42	2.3 – 11.8	¾	3.32	0	12.1
BF-MW-12	7/16/2004	16.35	3.0 – 12.5	¾	4.77	0	11.58
BF-MW-13	7/16/2004	13.72	2.3 – 11.8	¾	5.00	0	8.72
BF-MW-14	7/16/2004	15.26	28 – 12.3	¾	5.14	0	10.12
BF-MW-15	7/16/2004	15.01	2.5 – 12.0	NM	NM	NM	NM
BF-MW-16	7/16/2004	12.61	2.7 – 12.2	NM	NM	NM	NM
BF-MW-17	7/16/2004	13.15	3.0 – 12.5	¾	3.14	0	10.01
BF-MW-18	7/16/2004	12.99	3.4 – 12.9	¾	4.02	0	8.97
BF-MW-19	7/16/2004	13.88	2.0 – 11.5	¾	3.98	0	9.9
BF-MW-20	7/16/2004	14.79	2.2 – 11.7	¾	3.27	0	11.52
BF-MW-21R	7/16/2004	14.57	4.8 – 14.8	¾	3.56	0	11.01
BF-MW-22	7/16/2004	14.60	2.4 – 11.9	¾	3.02	0	11.58
BF-MW-23	7/16/2004	14.74	2.7 – 12.2	¾	3.03	0	11.71
BF-MW-25	7/16/2004	13.60	3.6 – 13.1	NM	NM	NM	NM
BF-MW-27	7/16/2004	14.90	2.5 – 12.0	¾	2.74	0	12.16
BF-MW-28	7/16/2004	15.49	2.0 – 11.5	¾	4.02	0	11.47
BF-MW-29	7/16/2004	14.49	2.0 – 11.5	¾	2.71	0	11.78
BF-MW-30	7/16/2004	14.19	1.9 – 11.4	¾	2.84	0	11.35
BF-MW-31	7/16/2004	14.46	1.5 – 11.0	¾	3.46	0	11
BF-MW-32	7/16/2004	15.74	1.4 – 11.2	¾	5.24	0	10.5
BF-MW-33	7/16/2004	13.95	1.6 – 11.4	¾	4.88	0	9.07
BF-MW-34	7/16/2004	14.87	3.1 – 13.1	¾	4.92	0	9.95
BF-MW-35	7/16/2004	14.94	2.4 – 12.4	¾	3.91	0	11.03
BF-MW-36	7/16/2004	15.16	2.6 – 12.6	¾	5.90	0	9.26
BF-MW-37	7/16/2004	16.07	2.3 – 12.3	¾	5.07	0	11
BF-MW-E1	7/16/2004	14.00	4.6 – 14.6		3.92	0	10.08
BF-MW-E2	7/16/2004	13.76	3.94 – 13.94	¾	4.64	0	9.12
BF-MW-E3	7/16/2004	13.99	4.4 – 14.4	¾	4.64	0	9.35
BF-MW-E4	7/16/2004	13.88	4.6 – 14.6	¾	4.80	0	9.08
BF-MW-E5	7/16/2004	14.00	4.8 – 14.8	4.48	5.71	1.23	9.37*a*
BF-MW-E6	7/16/2004	13.76	3.7 – 13.7	¾	3.87	0	9.89
Fourth Semiannual Monitoring Event – January 2005							
BF-MW-01	1/12/2005	15.47	3.5 – 12.5	¾	3.90	0	11.57
BF-MW-02	1/12/2005	16.24	3.5 – 13.0	¾	3.85	0	12.39
BF-MW-03	1/12/2005	16.39	3.6 – 13.1	¾	3.80	0	12.59
BF-MW-04	1/12/2005	17.11	2.8 – 12.3	¾	4.56	0	12.55
BF-MW-05	1/12/2005	16.99	2.9 – 12.4	¾	4.51	0	12.48
BF-MW-06	1/12/2005	16.80	2.7 – 12.2	¾	3.91	0	12.89
BF-MW-07	1/12/2005	16.74	2.9 – 12.4	¾	4.43	0	12.31

Table 1
Historical Groundwater Elevations
CAP-Part B
Former Aboveground Storage Tanks 7001 & 7003
Bulk Fuel Facility (HAA-09)
Hunter Army Airfield, Georgia

Well Number	Date Measured	Top of Casing Elevation (ft AMSL)	Depth of Screened Interval (ft BGS)	Depth to Free Product (ft BTOC)	Depth to Water (ft BTOC)	Product Thickness (ft)	Corrected Elevation[a] (ft AMSL)
BF-MW-08	1/12/2005	16.40	2.3 – 11.8	¾	3.93	0	12.47
BF-MW-09	1/12/2005	16.60	2.9 – 12.4	¾	4.56	0	12.04
BF-MW-10	1/12/2005	15.33	2.3 – 11.8	¾	3.48	0	11.85
BF-MW-11	1/12/2005	15.42	2.3 – 11.8	¾	3.38	0	12.04
BF-MW-12	1/12/2005	16.35	3.0 – 12.5	¾	4.63	0	11.72
BF-MW-13	1/12/2005	13.72	2.3 – 11.8	¾	3.49	0	10.23
BF-MW-14	1/12/2005	15.26	28 – 12.3	¾	4.41	0	10.85
BF-MW-15	1/12/2005	15.01	2.5 – 12.0	NM	NM	NM	NM
BF-MW-16	1/12/2005	12.61	2.7 – 12.2	NM	NM	NM	NM
BF-MW-17	1/12/2005	13.15	3.0 – 12.5	¾	3.07	0	10.08
BF-MW-18	1/12/2005	12.99	3.4 – 12.9	¾	3.83	0	9.16
BF-MW-19	1/12/2005	13.88	2.0 – 11.5	¾	3.85	0	10.03
BF-MW-20	1/12/2005	14.79	2.2 – 11.7	¾	3.22	0	11.57
BF-MW-21R	1/12/2005	14.57	4.8 – 14.8	¾	3.55	0	11.02
BF-MW-22	1/12/2005	14.60	2.4 – 11.9	¾	3.20	0	11.4
BF-MW-23	1/12/2005	14.74	2.7 – 12.2	¾	3.19	0	11.55
BF-MW-25	1/12/2005	13.60	3.6 – 13.1	¾	4.28	0	9.32
BF-MW-27	1/12/2005	14.90	2.5 – 12.0	¾	3.27	0	11.63
BF-MW-28	1/12/2005	15.49	2.0 – 11.5	¾	4.21	0	11.28
BF-MW-29	1/12/2005	14.49	2.0 – 11.5	¾	2.78	0	11.71
BF-MW-30	1/12/2005	14.19	1.9 – 11.4	¾	2.90	0	11.29
BF-MW-31	1/12/2005	14.46	1.5 – 11.0	¾	3.39	0	11.07
BF-MW-32	1/12/2005	15.74	1.4 – 11.2	¾	5.02	0	10.72
BF-MW-33	1/12/2005	13.95	1.6 – 11.4	NM	NM	NM	NM
BF-MW-34	1/12/2005	14.87	3.1 – 13.1	¾	4.95	0	9.92
BF-MW-35	1/12/2005	14.94	2.4 – 12.4	¾	3.76	0	11.18
BF-MW-36	1/12/2005	15.16	2.6 – 12.6	¾	5.69	0	9.47
BF-MW-37	1/12/2005	16.07	2.3 – 12.3		4.87	0	11.2
BF-MW-E1	1/12/2005	14.00	4.6 – 14.6		4.09	0	9.91
BF-MW-E2	1/12/2005	13.76	3.94 – 13.94	¾	4.28	0	9.48
BF-MW-E3	1/12/2005	13.99	4.4 – 14.4	¾	4.72	0	9.27
BF-MW-E4	1/12/2005	13.88	4.6 – 14.6	¾	5.18	0	8.7
BF-MW-E5	1/12/2005	14.00	4.8 – 14.8	sheen	4.90	sheen	9.1
BF-MW-E6	1/12/2005	13.76	3.7 – 13.7	¾	3.99	0	9.77

NOTES:
[a] Corrected groundwater elevation based on a product density of 880 kg/m^3.
AMSL Above mean sea level.
BGS Below ground surface.
BTOC Below top of casing.
NM Not measured.

Table 2
Groundwater Elevations in Free Product Monitoring Points - December 2008
CAP-Part B
Former Aboveground Storage Tanks 7001 & 7003
Bulk Fuel Facility (HAA-09)
Hunter Army Airfield, Georgia

Well Number	Date Measured	Top of Casing Elevation (ft AMSL)	Depth of Screened Interval (ft BGS)	Depth to Water (ft BTOC)	Depth to Free Product (ft BTOC)	Product Thickness (ft)	Corrected Groundwater Elevation[a] (ft AMSL)
Monitoring Points around 7003							
FP-01	12/11/2008	[b]	1.3 – 4.5	2.50	--	0	[b]
FP-02	12/11/2008	[b]	1.3 – 4.5	1.58	--	0	[b]
FP-03	12/11/2008	[b]	1.3 – 4.5	1.95	--	0	[b]
FP-04**	12/11/2008	[b]	1.3 – 4.5	6.00	1.55	4.45	[b]
FP-05	12/11/2008	[b]	1.3 – 4.5	1.95	1.1	0.85	[b]
FP-06	12/11/2008	[b]	1.3 – 4.5	2.25	1.49	0.76	[b]
FP-07	12/11/2008	[b]	1.3 – 4.5	1.77	--	0	[b]
FP-08	12/11/2008	[b]	1.3 – 4.5	1.54	1.45	0.09	[b]
FP-09	12/11/2008	[b]	1.3 – 4.5	NM	NM	0	[b]
FP-15	12/11/2008	[b]	1.3 – 4.5	1.40	--	0	[b]
FP-16	12/11/2008	[b]	1.3 – 4.5	2.76	--	0	[b]
FP-17	12/11/2008	[b]	1.3 – 4.5	NM	NM	0	[b]
FP-18	12/11/2008	[b]	1.3 – 4.5	2.27	--	0	[b]
FP-19	12/11/2008	[b]	1.3 – 4.5	1.35	--	0	[b]
FP-20	12/11/2008	[b]	1.3 – 4.5	1.34	--	0	[b]
FP-21	12/11/2008	[b]	1.3 – 4.5	1.49	--	0	[b]
FP-22	12/11/2008	[b]	1.3 – 4.5	1.34	--	0	[b]
FP-23	12/11/2008	[b]	1.3 – 4.5	2.44	--	0	[b]
FP-24	12/11/2008	[b]	1.3 – 4.5	2.49	--	0	[b]
FP-37	12/11/2008	[b]	1.3 – 4.5	2.71	0.8	1.91	[b]
FP-38	12/11/2008	[b]	1.3 – 4.5	1.50	1.33	0.17	[b]
FP-39	12/11/2008	[b]	1.3 – 4.5	1.76	--	0	[b]
FP-40	12/11/2008	[b]	1.3 – 4.5	2.02	sheen	0	[b]
FP-41	12/11/2008	[b]	1.3 – 4.5	1.60	--	0	[b]
FP-42	12/11/2008	[b]	1.3 – 4.5	2.07	--	0	[b]
Sump-1	12/11/2008	[b]	1.3 – 4.5	2.49	2.28	0.21	[b]
Sump-2	12/11/2008	[b]	1.3 – 4.5	3.03	sheen	0	[b]
Sump-3	12/11/2008	[b]	1.3 – 4.5	2.54	sheen	0	[b]
Sump-4	12/11/2008	[b]	1.3 – 4.5	2.55	2.43	0.12	[b]
Monitoring Points around 7001							
FP-10	12/16/2008	[b]	1.3 – 4.5	1.3	--	0	[b]
FP-11	12/16/2008	[b]	1.3 – 4.5	1.09	--	0	[b]
FP-12	12/16/2008	[b]	1.3 – 4.5	0.95	--	0	[b]
FP-13	12/16/2008	[b]	1.3 – 4.5	1.23	1.13	0.10	[b]
FP-14	12/16/2008	[b]	1.3 – 4.5	0.91	--	0	[b]
FP-25	12/16/2008	[b]	1.3 – 4.5	1.95	--	0	[b]
FP-26	12/16/2008	[b]	1.3 – 4.5	1.00	--	0	[b]
FP-27	12/16/2008	[b]	1.3 – 4.5	1.64	--	0	[b]
FP-28	12/16/2008	[b]	1.3 – 4.5	0.9	--	0	[b]
FP-29	12/16/2008	[b]	1.3 – 4.5	0.80	--	0	[b]
FP-30	12/16/2008	[b]	1.3 – 4.5	1.53	--	0	[b]
FP-31	12/16/2008	[b]	1.3 – 4.5	1.63	--	0	[b]

Table 2
Groundwater Elevations in Free Product Monitoring Points - December 2008
CAP-Part B
Former Aboveground Storage Tanks 7001 & 7003
Bulk Fuel Facility (HAA-09)
Hunter Army Airfield, Georgia

Well Number	Date Measured	Top of Casing Elevation (ft AMSL)	Depth of Screened Interval (ft BGS)	Depth to Water (ft BTOC)	Depth to Free Product (ft BTOC)	Product Thickness (ft)	Corrected Groundwater Elevation[a] (ft AMSL)
FP-32	12/16/2008	[b]	1.3 – 4.5	1.99	--	0	[b]
FP-33	12/16/2008	[b]	1.3 – 4.5	NM	NM	0	[b]
FP-34	12/16/2008	[b]	1.3 – 4.5	2.6	--	0	[b]
FP-35	12/16/2008	[b]	1.3 – 4.5	2,34	--	0	[b]
FP-36	12/16/2008	[b]	1.3 – 4.5	1.89	--	0	[b]

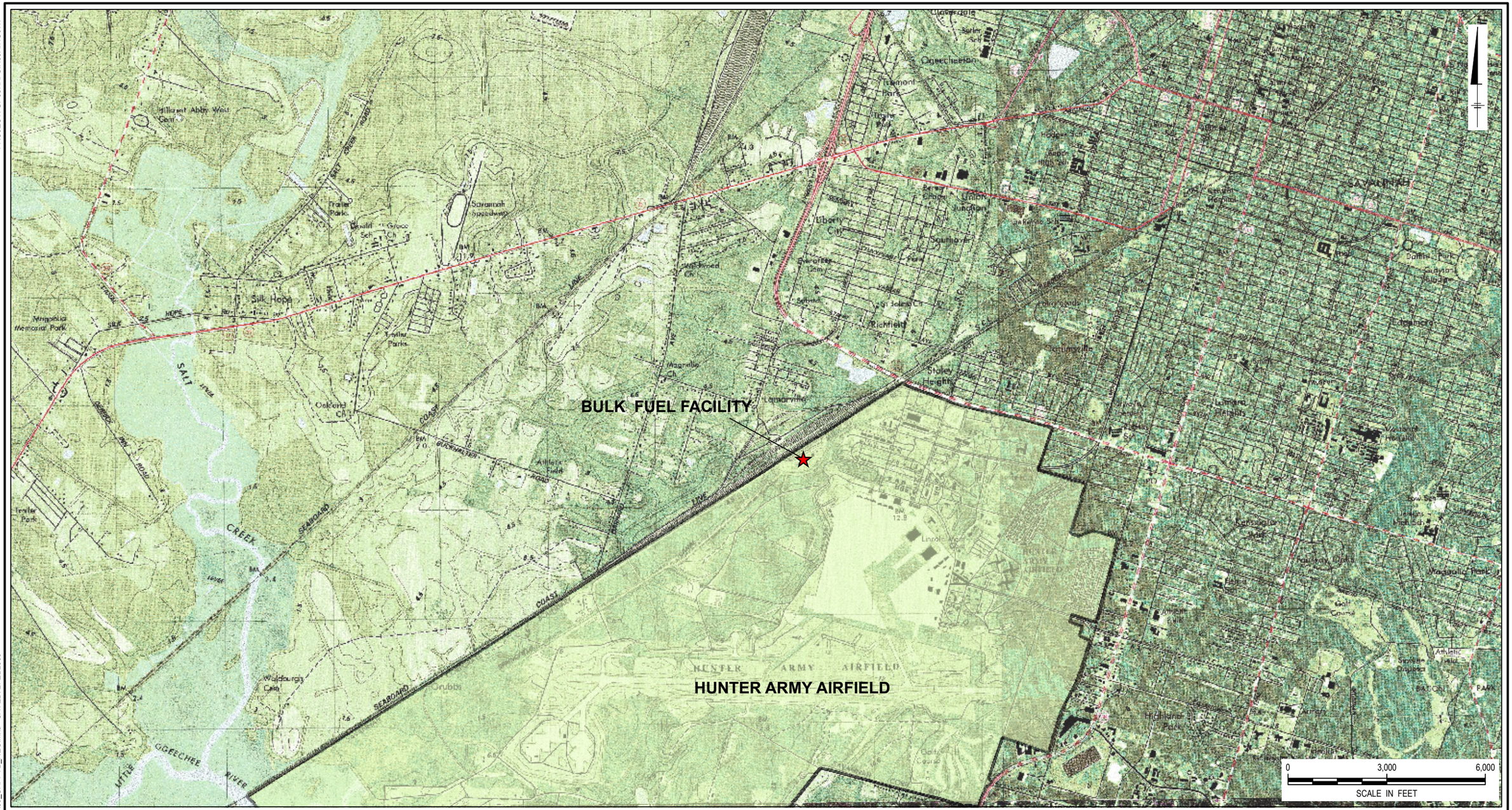
NOTES:

[b] Elevations were not surveyed.

[**] Measurement listed was verified as accurate but appears anomalous. Liquid levels will be confirmed in next gauging activity

BGS Below ground surface.
NAD North American Datum.
NAVD North American Vertical Datum.
PVC Polyvinyl chloride.
NM Not measured because well was in a low lying area covered in water

Figures



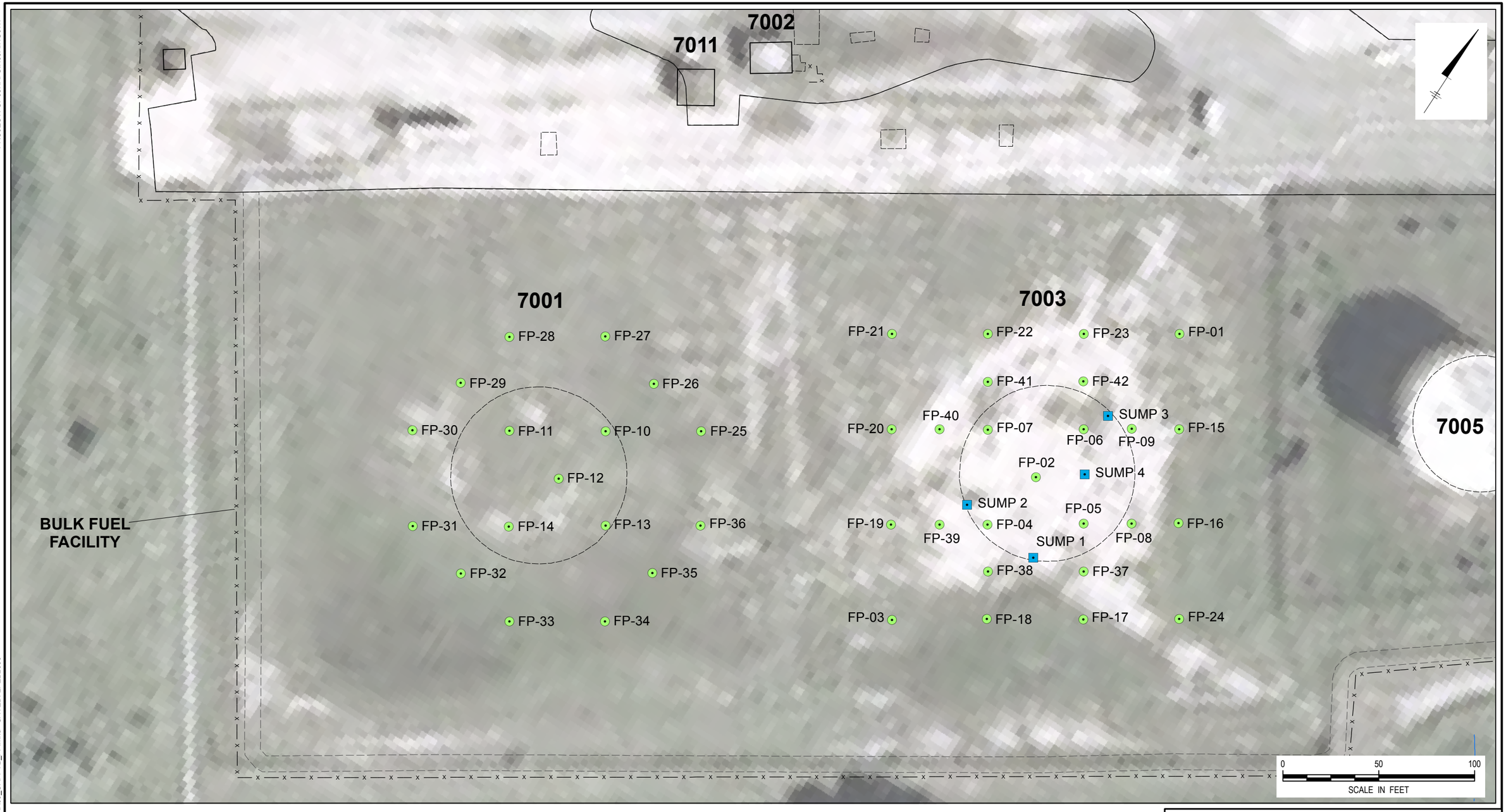
REFERENCE:
DIGITAL RASTER GRAPHIC COUNTY MOSAIC FROM NRCS,
CHATHAM COUNTY. FILE NAME: DRG_S_GA051.SID
USGS Topographic Quadrangles, Garden City and Savannah, Georgia.

HUNTER ARMY AIRFIELD, GEORGIA
FORMER ASTS 7001 AND 7003
BULK FUEL FACILITY (HAA-09 – RELEASE #3)
CORRECTIVE ACTION PLAN – PART B

Site Location Map

ARCADIS

FIGURE
1



AERIAL REFERENCE: NRCS, CHATHAM COUNTY, GEORGIA, NAIP 2007.

LEGEND:

- Sump
- Free-Product Monitoring Point

HUNTER ARMY AIRFIELD, GEORGIA
FORMER ASTS 7001 AND 7003
BULK FUEL FACILITY (HAA-09 – RELEASE #3)
CORRECTIVE ACTION PLAN – PART B

Location of Free-Product Monitoring Points

ARCADIS

FIGURE
2

MW-03
MW-04
MW-35
MW-26
MW-05
MW-27
7008
7009
MW-E6
MW-E1
AST 7009
Release #2
MW-08
MW-06
MW-E5
MW-36
MW-02
7010
MW-E4
7007
MW-E3
MW-E2
MW-07
MW-37
MW-28
MW-25
MW-09
MW-38
MW-01
7002
MW-29
7005
MW-31
MW-10
MW-23
MW-11
MW-30
7011
MW-12
MW-24
MW-22
7003
MW-15
7004
MW-14
MW-21R
MW-20
MW-32
MW-13
MW-33
7001
MW-19
MW-17
MW-34
BULK FUEL
FACILITY
Former AST 7003
Release #1 and #3
MW-16
MW-18
HUNTER ARMY AIRFIELD
HUNTER ARMY AIRFIELD BOUNDARY
LAMAR CANAL

0 150 300
SCALE IN FEET

AERIAL REFERENCE: NRCS, CHATHAM COUNTY, GEORGIA, NAIP 2007.

LEGEND:

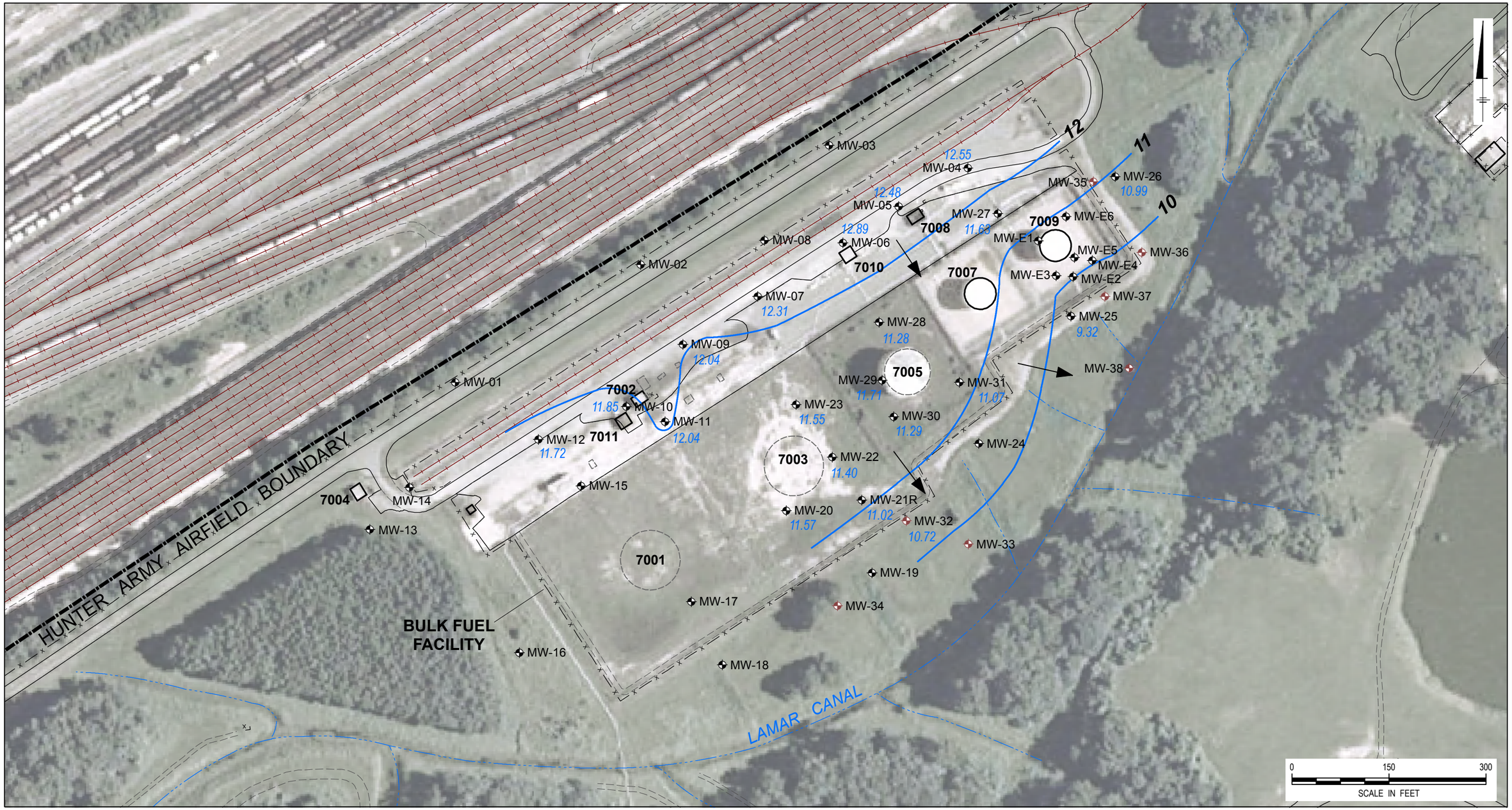
- Monitor Well (active)
- Monitor Well (abandoned)

HUNTER ARMY AIRFIELD, GEORGIA
FORMER ASTS 7001 AND 7003
BULK FUEL FACILITY (HAA-09 – RELEASE #3)
CORRECTIVE ACTION PLAN – PART B

Site Map with Monitor-Well Locations

ARCADIS

FIGURE
3



AERIAL REFERENCE: NRCS, CHATHAM COUNTY, GEORGIA, NAIP 2007.
REFERENCE: Third Annual Monitoring and Free-Product Removal Report (SAIC 2007).

LEGEND:

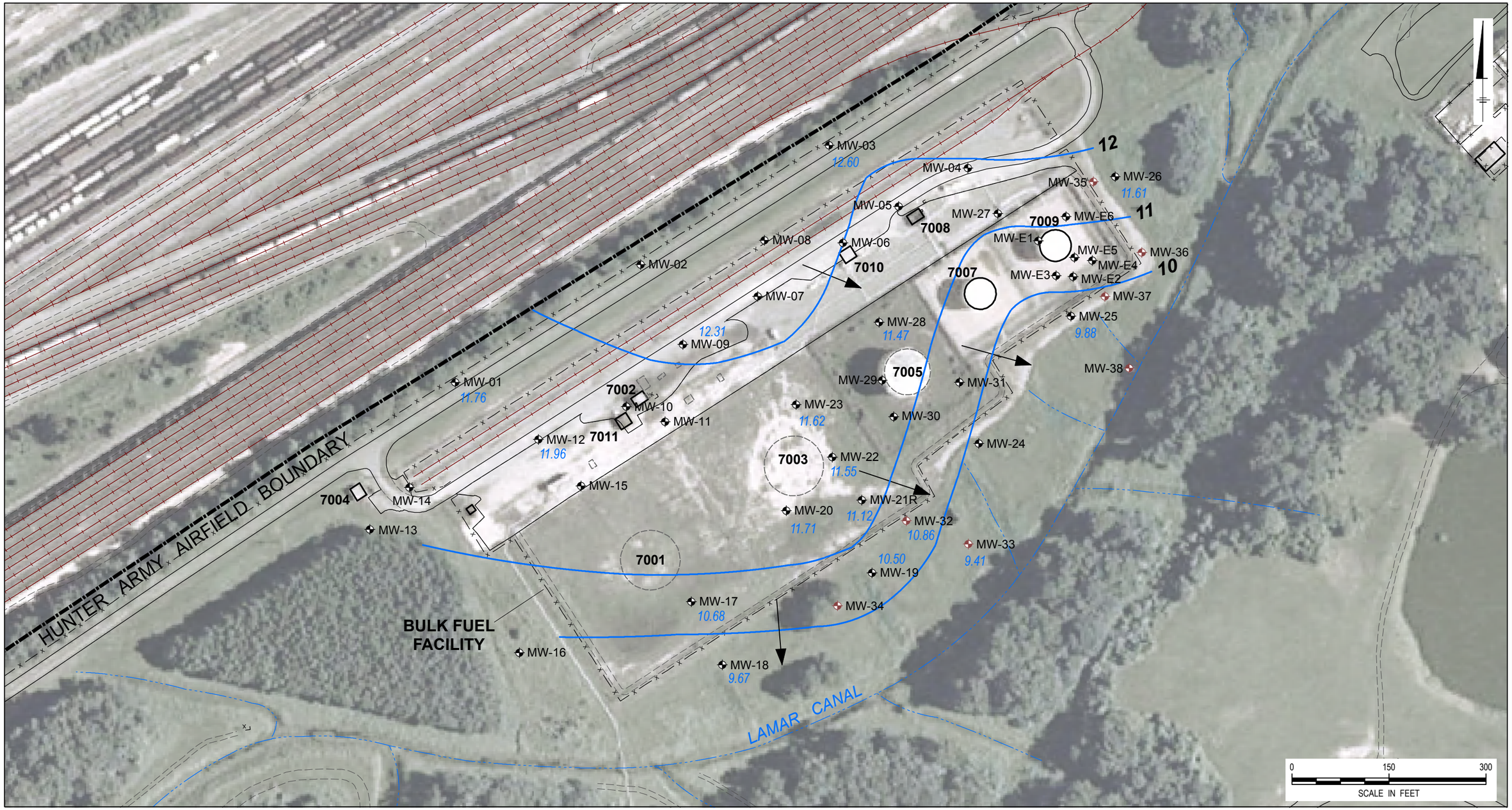
- Monitor Well (CAP - Part A)
- Monitor Well (CAP - Part B)
- Potentiometric Contour Line (ft, amsl)
- Direction of Groundwater Flow
- *11.72* Water-Level Elevation, (ft, amsl) Measured January 12, 2005

HUNTER ARMY AIRFIELD, GEORGIA
FORMER ASTS 7001 AND 7003
BULK FUEL FACILITY (HAA-09 – RELEASE #3)
CORRECTIVE ACTION PLAN – PART B

Groundwater Potentionmetric Surface Map January 2005

ARCADIS

FIGURE
4a



AERIAL REFERENCE: NRCS, CHATHAM COUNTY, GEORGIA, NAIP 2007.
REFERENCE: Third Annual Monitoring and Free-Product Removal Report (SAIC 2007).

LEGEND:

- Monitor Well (CAP - Part A)
- Monitor Well (CAP - Part B)
- Potentiometric Contour Line (ft, amsl)
- Direction of Groundwater Flow
- 9.67 Water-Level Elevation, (ft, amsl) Measured January 12, 2005

HUNTER ARMY AIRFIELD, GEORGIA
FORMER ASTS 7001 AND 7003
BULK FUEL FACILITY (HAA-09 – RELEASE #3)
CORRECTIVE ACTION PLAN – PART B

Groundwater Potentionmetric Surface Map January 2003

ARCADIS

FIGURE 4b

7002

7011

7001

7003

7005

FP-28 FP-27

FP-29 FP-26

FP-30 FP-11 FP-10 FP-25

FP-12

FP-31 FP-14 FP-13 FP-36

FP-32 FP-35

FP-33 FP-34

FP-21 FP-22 FP-23 FP-01

FP-41 FP-42

FP-40 SUMP 3

FP-20 FP-07 FP-06 FP-09 FP-15

FP-02 SUMP 4

SUMP 2 FP-05

FP-19 FP-39 FP-04 FP-08 FP-16

SUMP 1

FP-38 FP-37

FP-03 FP-18 FP-17 FP-24

BULK FUEL FACILITY

0 50 100

SCALE IN FEET

AERIAL REFERENCE: NRCS, CHATHAM COUNTY, GEORGIA, NAIP 2007.
REFERENCE: Third Annual Monitoring and Free-Product Removal Report (SAIC 2007).

LEGEND:

- Sump
- Free-Product Monitoring Point

PID Readings

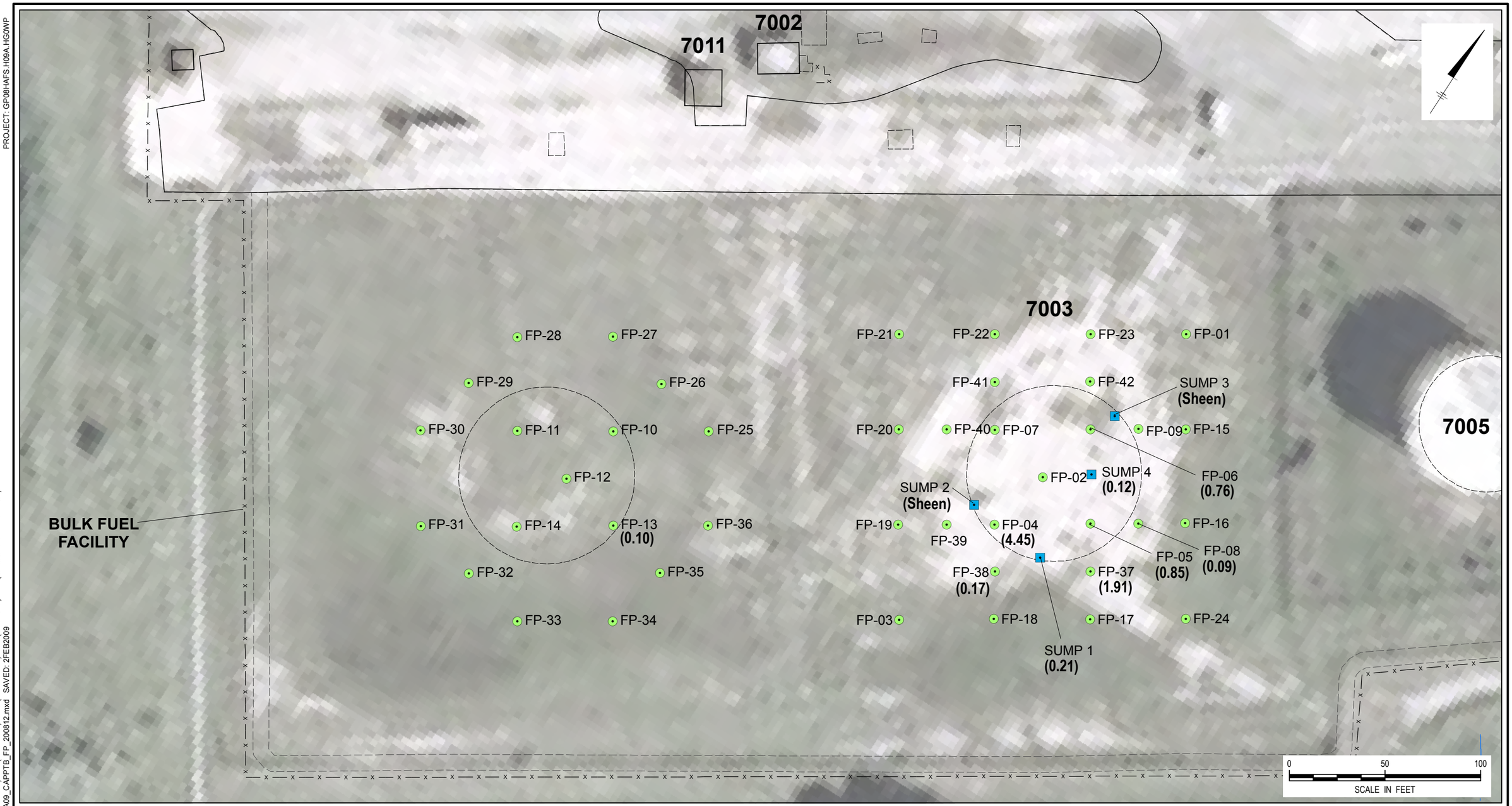
- 1-10 ppm
- >10-100 ppm
- >100 ppm

HUNTER ARMY AIRFIELD, GEORGIA
FORMER ASTS 7001 AND 7003
BULK FUEL FACILITY (HAA-09 – RELEASE #3)
CORRECTIVE ACTION PLAN – PART B

PID Results from Free-Product Monitoring Locations

ARCADIS

FIGURE
5



AERIAL REFERENCE: NRCS, CHATHAM COUNTY, GEORGIA, NAIP 2007.

LEGEND:

- Sump
- Free-Product Monitoring Point
- (0.10) Free-Product Thickness (ft)

HUNTER ARMY AIRFIELD, GEORGIA
FORMER ASTS 7001 AND 7003
BULK FUEL FACILITY (HAA-09 – RELEASE #3)
CORRECTIVE ACTION PLAN – PART B

Free-Product Thickness at Monitoring Points (December 2008)

ARCADIS

FIGURE 6

PROJECT: GP08HAFS.H09A.HG0WP
CITY:(KNOXVILLE) DIV/GROUP:(ENV) DB:(B.ALTOM) LD:(B.ALTOM) PIC:(M.FENNER) PM:(C.BERTZ) TM:(S.BOSTIAN/E.MADDOX)
G:\GIS\GP08HAFS\H09A\2009_CAP_PT\BF6 HAA09_CAPPTB_FP_200812.mxd SAVED: 2FEB2009

AERIAL REFERENCE: NRCS, CHATHAM COUNTY, GEORGIA, NAIP 2007.

LEGEND:

- Proposed Monitor Well

HUNTER ARMY AIRFIELD, GEORGIA
FORMER ASTS 7001 AND 7003
BULK FUEL FACILITY (HAA-09 – RELEASE #3)
CORRECTIVE ACTION PLAN – PART B

Proposed Monitor-Well Locations

ARCADIS

FIGURE
7

7011

7002

7003

7005

BULK FUEL FACILITY

FP-28 FP-27 FP-29 FP-26 FP-30 FP-11 FP-10 FP-25 FP-12 FP-31 FP-14 FP-13 FP-36 FP-32 FP-35 FP-33 FP-34

FP-21 FP-22 FP-23 FP-01 FP-41 FP-42 FP-40 FP-07 FP-09 FP-15 FP-20 FP-02 FP-06 FP-05 FP-16 FP-19 FP-04 FP-39 FP-08 FP-38 FP-37 FP-03 FP-18 FP-17 FP-24

SUMP 3 SUMP 4 SUMP 2 SUMP 1

0 50 100
SCALE IN FEET

AERIAL REFERENCE: NRCS, CHATHAM COUNTY, GEORGIA, NAIP 2007.

LEGEND:

- Sump
- Free-Product Monitoring Point
- Proposed Initial Geoprobe Sample Point (Subsequent points will be moved in or out based on results)
- Initial Estimate of Free-Product Extent

HUNTER ARMY AIRFIELD, GEORGIA
FORMER ASTS 7001 AND 7003
BULK FUEL FACILITY (HAA-09 – RELEASE #3)
CORRECTIVE ACTION PLAN – PART B

Proposed Direct Push Sampling Locations

ARCADIS

FIGURE
8

AERIAL REFERENCE: NRCS, CHATHAM COUNTY, GEORGIA, NAIP 2007.

LEGEND:

Estimated Extent of Excavation Area
(Areas will be adjusted based on DPT sampling results.)

HUNTER ARMY AIRFIELD, GEORGIA
FORMER ASTS 7001 AND 7003
BULK FUEL FACILITY (HAA-09 – RELEASE #3)
CORRECTIVE ACTION PLAN – PART B

Estimated Excavation Area

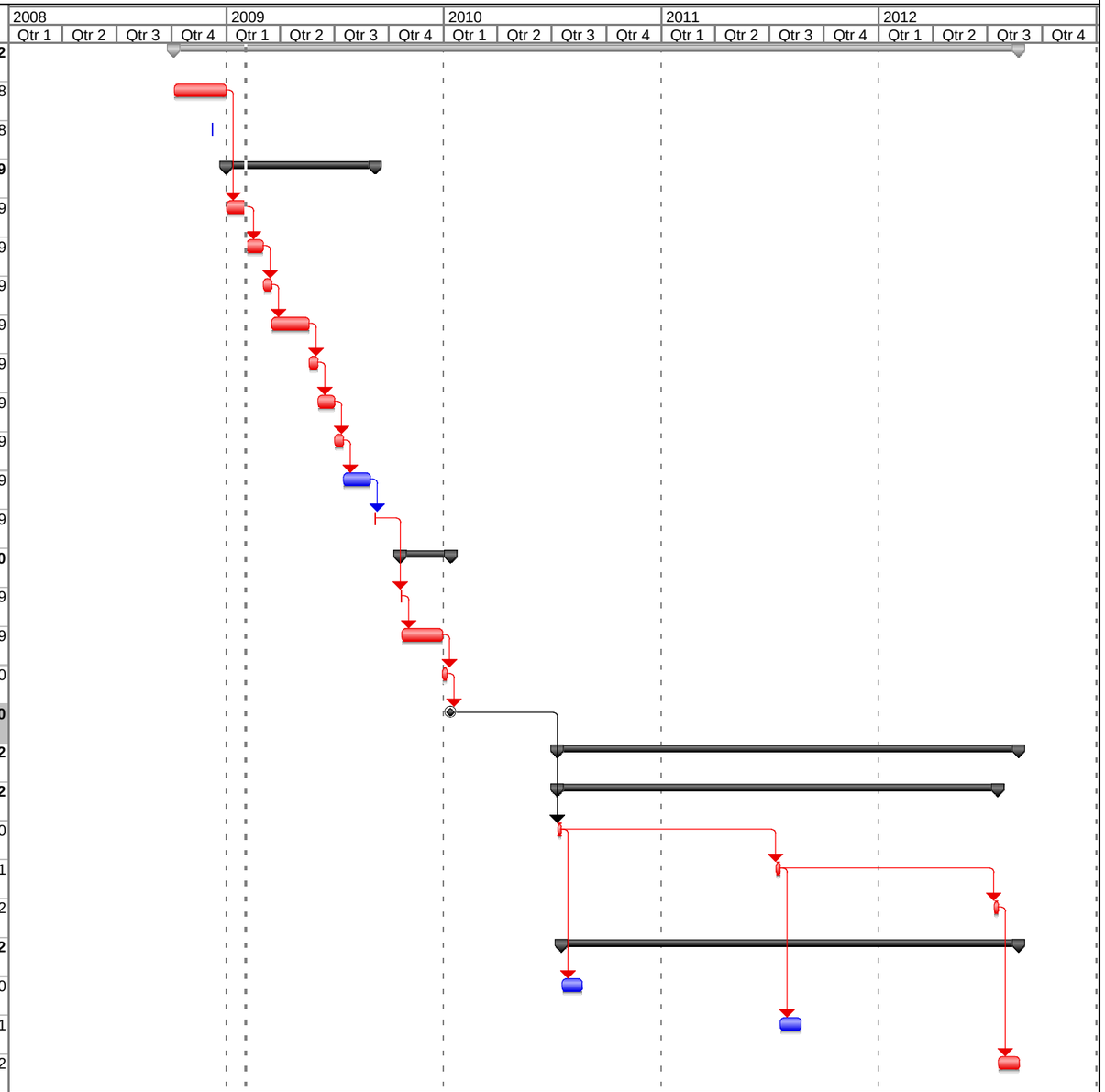
ARCADIS

FIGURE
9

HAA-09 Bulk Fuel Facility Schedule
Fort Stewart and Hunter Army Airfield

FIGURE 10

ID	WBS	Task Name	Duration	Start	Finish
0	**0**	**HAA 09: BULK FUEL FACILITY**	**987 days**	**Mon 10/6/08**	**Thu 8/23/12**
1	1	Data Evaluation	60 days	Mon 10/6/08	Wed 12/31/08
2	2	Water Level Measurements	2 days	Mon 12/8/08	Tue 12/9/08
3	**3**	**HAA 09 CAP Part B**	**175 days**	**Fri 1/2/09**	**Tue 9/8/09**
4	3.1	Prepare Draft HAA 09 CAP Part B	23 days	Fri 1/2/09	Tue 2/3/09
5	3.2	Army Review of Draft Report	20 days	Wed 2/4/09	Tue 3/3/09
6	3.3	ARCADIS Revisions	10 days	Wed 3/4/09	Tue 3/17/09
7	3.4	GAEPD Review of Draft Report	45 days	Wed 3/18/09	Tue 5/19/09
8	3.5	Prepare Final HAA 09 CAP Part B	10 days	Wed 5/20/09	Wed 6/3/09
9	3.6	Army Review of Final Report	20 days	Thu 6/4/09	Wed 7/1/09
10	3.7	ARCADIS Revisons	10 days	Thu 7/2/09	Thu 7/16/09
11	3.8	GAEPD Review of Final Report	45 edays	Thu 7/16/09	Sun 8/30/09
12	3.9	Regulatory Approval HAA 09 CAP Part B	1 day	Tue 9/8/09	Tue 9/8/09
13	**4**	**HAA 09 EXCAVATION**	**57 days**	**Wed 10/21/09**	**Wed 1/13/10**
14	4.1	Excavation Mobilization	2 days	Wed 10/21/09	Thu 10/22/09
15	4.2	Excavation Implementation	45 days	Fri 10/23/09	Tue 12/29/09
16	4.3	Restoration Completion	5 days	Wed 12/30/09	Wed 1/6/10
17	**4.4**	**Remedy In Place**	**0 days**	**Wed 1/13/10**	**Wed 1/13/10**
18	**5**	**HAA 09 Annual Monitoring and Reporting**	**540 days**	**Mon 7/12/10**	**Thu 8/23/12**
19	**5.1**	**HAA 09 Annual Monitoring**	**515 days**	**Mon 7/12/10**	**Thu 7/19/12**
20	5.1.1	HAA 09 Annual Monitoring Year 1	5 days	Mon 7/12/10	Fri 7/16/10
21	5.1.2	HAA 09 Annual Monitoring Year 2	5 days	Wed 7/13/11	Tue 7/19/11
22	5.1.3	HAA 09 Annual Monitoring Year 3	5 days	Fri 7/13/12	Thu 7/19/12
23	**5.2**	**HAA 09 Annual Reporting**	**535 days**	**Mon 7/19/10**	**Thu 8/23/12**
24	5.2.1	HAA 09 Annual Reporting Year 1	25 days	Mon 7/19/10	Fri 8/20/10
25	5.2.2	HAA 09 Annual Reporting Year 2	25 days	Wed 7/20/11	Tue 8/23/11
26	5.2.3	HAA 09 Annual Reporting Year 3	25 days	Fri 7/20/12	Thu 8/23/12



ARCADIS

Date: Mon 2/2/09

Task Duration Milestone Summary

ARCADIS

Appendix A

Historical Analytical Tables – CAP-Part A and B Results (CAP Part B Report for Release #1)

Former UST 117, Building 7002
Hunter Army Airfield
Chatham County, Facility ID: 9-025113*1

TABLE 3a: CAP-PART A GROUNDWATER ANALYTICAL RESULTS[1]
(VOLATILE ORGANIC COMPOUNDS)

Sample Location	Sample ID	Depth (ft BGS)	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Total BTEX[5] (µg/L)
MW-04	BF0412	8.5 to 12.5	12/03/99	1.0 U	0.33 J	1.0 U	3.0 U	0.33
MW-05	BF0512	8.0 to 12.0	12/03/99	1.0 U	0.51 J	1.0 U	3.0 U	0.51
MW-07	BF0712	6.5 to 10.5	12/02/99	1.0 U	1.0 U	4.4 =	2.1 J	6.5
MW-09	BF0912	8.5 to 12.5	12/03/99	1.0 UJ	0.42 J	1.4 =	3.0 U	1.82
MW-10	BF1012	6.0 to 10.0	12/02/99	4.8 =	0.53 J	9.5 =	3.8 =	18.63
MW-12	BF1212	8.0 to 12.0	12/04/99	1.0 UJ	0.36 J	1.0 UJ	3.0 UJ	0.36
MW-15	BF1512	6.0 to 10.0	12/02/99	1.0 U	1.0 U	1.0 U	1.3 J	1.3
MW-17	BF1712	3.04 to 12.50	12/08/99	0.44 J	1.0 U	2.0 =	14.2 =	16.64
MW-20	BF2012	2.2 to 11.70	12/07/99	0.60 J	1.0 U	3.1 =	21.0 =	24.70
MW-21	BF2112	3.4 to 12.9	12/07/99	**130** =	2.8 =	14.7 =	710 =	857.50
MW-22	BF2212	2.43 to 11.9	12/07/99	**553** =	0.86 J	86.7 =	352 =	992.56
MW-23	BF2312	2.73 to 12.19	12/07/99	1.1 =	1.0 U	0.48 J	1.4 J	2.98
MW-29	BF2912	5.7 to 10.7	01/11/99	1.0 UJ	0.40 J	1.0 UJ	376 J	376.4
Maximum Contaminant Level[2]				5	1,000	700	10,000	NRC
In-Stream Water Quality Standard (Chapter 391-3-6.03)[3]				71.28	200,000	28,718	NRC	NRC
Alternate Concentration Level[4]				634.4	NA	NA	NA	NRC

NOTE: [1]Only the samples with detected BTEX concentrations are listed on the table. A complete summary of the groundwater analytical data is provided on Table VIII-A, Appendix VIII.
[2]U.S. Environmental Protection Agency maximum contaminant level.
[3]Georgia Environmental Protection Division (GA EPD) In-stream Water Quality Standards (Chapter 391-3-6.03).
[4]Refer to Appendix VI for the Alternate Concentration Level (ACL) calculations.
[5]The total value reported represents the sum of all detected compounds.

BGS - Below ground surface.
BTEX - Benzene, toluene, ethylbenzene, and xylene.
NA - Not applicable; ACL not calculated.
NRC - No regulatory criteria.

Laboratory Qualifiers

U - Indicates the compound was not detected at the concentration reported.
J - Indicates the value for the compound is an estimated value.
UJ - Indicates the compound was not detected at the reported concentration and the concentration was estimated.
= - Indicates the compound was detected at the concentration reported.
Bold values exceed the applicable standard.
Italicized values exceed the ACL.

Former UST 117, Building 7002
Hunter Army Airfield
Chatham County, Facility ID: 9-025113*1

TABLE 3a: CAP-PART A GROUNDWATER ANALYTICAL RESULTS[1] (continued)
(VOLATILE ORGANIC COMPOUNDS)

Sample Location	Sample ID	Depth (ft BGS)	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Total BTEX[5] (µg/L)
VP-2	BFV212	12.0 to 17.0	12/04/99	1.0 U	0.42 J	1.0 U	3.0 U	0.42
VP-2	BFV232	22.0 to 27.0	12/04/99	1.0 U	0.30 J	1.0 U	3.0 U	0.30
VP-2	BFV242	27.0 to 32.0	12/04/99	0.22 J	0.40 J	1.0 U	3.0 U	0.62
VP-2	BFV252	32.0 to 37.0	12/04/99	1.0 U	0.36 J	1.0 U	3.0 U	0.36
VP-2	BFV262	37.0 to 42.0	12/04/99	1.0 U	0.35 J	1.0 U	3.0 U	0.35
VP-3	BFV312	12.0 to 17.0	12/05/99	1.0 U	0.33 J	1.0 U	3.0 U	0.33
VP-3	BFV322	17.0 to 22.0	12/05/99	1.0 U	0.80 J	1.0 U	3.0 U	0.80
VP-3	BFV332	22.0 to 27.0	12/05/99	1.0 U	0.31 J	1.0 U	3.0 U	0.31
VP-3	BFV342	27.0 to 32.0	12/05/99	1.0 U	0.37 J	1.0 U	3.0 U	0.37
VP-3	BFV352	32.0 to 37.0	12/05/99	1.0 UJ	0.28 J	1.0 UJ	3.0 UJ	0.28
VP-3	BFV362	37.0 to 42.0	12/05/99	1.0 UJ	0.28 J	1.0 UJ	3.0 UJ	0.28
VP-4	BFV412	13.0 to 18.0	12/04/99	**81.8** =	0.42 J	1.0 U	31.5 =	113.72
VP-4	BFV422	18.0 to 23.0	12/04/99	1.4 =	0.44 J	1.0 U	0.36 J	2.20
VP-4	BFV432	23.0 to 28.0	12/04/99	0.60 J	0.70 J	0.22 J	3.0 U	1.52
VP-4	BFV442	28.0 to 33.0	12/04/99	0.29 J	0.42 J	0.16 J	3.0 UJ	0.87
VP-4	BFV452	33.0 to 38.0	12/04/99	0.24 J	1.0 U	1.0 U	3.0 U	0.24
VP-4	BFV462	38.0 to 43.0	12/04/99	0.21 J	0.79 J	1.0 U	3.0 U	1.0
VP-5	BFV532	22.5 to 27.5	12/02/99	1.0 UJ	0.51 J	1.0 UJ	3.0 UJ	0.51
VP-5	BFV552	32.5 to 37.5	12/02/99	1.0 U	0.58 J	1.0 U	3.0 U	0.58
VP-6	BFV612	13.0 to 18.0	12/03/99	4.4 J	0.56 J	0.44 J	2.7 J	8.1
VP-6	BFV622	18.0 to 23.0	12/03/99	0.26 J	0.46 J	0.11 J	3.0 UJ	0.83
VP-6	BFV632	23.0 to 28.0	12/03/99	1.0 U	0.43 J	1.0 UJ	3.0 UJ	0.43
VP-6	BFV642	28.0 to 33.0	12/03/99	1.0 UJ	0.45 J	1.0 UJ	3.0 UJ	0.45
VP-6	BFV652	33.0 to 38.0	12/03/99	1.0 UJ	0.47 J	0.16 J	3.0 UJ	0.63
VP-6	BFV662	38.0 to 43.0	12/03/99	1.0 UJ	0.44 J	0.15 J	3.0 UJ	0.59
VP-7	BFV712	12.0 to 17.0	12/04/99	1.0 UJ	0.60 J	0.10 J	0.33 J	1.03
VP-7	BFV722	17.0 to 22.0	12/04/99	1.0 UJ	0.35 J	1.0 UJ	3.0 UJ	0.35
VP-7	BFV732	22.0 to 27.0	12/04/99	0.23 J	0.70 J	0.12 J	3.0 UJ	1.05
VP-7	BFV742	27.0 to 32.0	12/04/99	0.31 J	0.58 J	1.0 UJ	3.0 UJ	0.89
VP-7	BFV752	32.0 to 37.0	12/04/99	0.25 J	0.74 J	0.12 J	3.0 UJ	1.11
VP-7	BFV762	37.0 to 42.0	12/04/99	1.0 U	0.56 J	0.15 J	3.0 U	0.71
Maximum Contaminant Level[2]				5	1,000	700	10,000	NRC
In-Stream Water Quality Standard (Chapter 391-3-6.03)[3]				71.28	200,000	28,718	NRC	NRC
Alternate Concentration Level[4]				634.4	NA	NA	NA	NRC

NOTE: [1]Only the samples with detected BTEX concentrations are listed on the table. A complete summary of the groundwater analytical data is provided on Table VIII-A, Appendix VIII.
[2]U.S. Environmental Protection Agency maximum contaminant level.
[3]Georgia Environmental Protection Division (GA EPD) In-stream Water Quality Standards (Chapter 391-3-6.03).
[4]Refer to Appendix VI for the Alternate Concentration Level (ACL) calculations.
[5]The total value reported represents the sum of all detected compounds.

BGS - Below ground surface.
BTEX - Benzene, toluene, ethylbenzene, and xylene.
NA - Not applicable; ACL not calculated.
NRC - No regulatory criteria.

Laboratory Qualifiers
U - Indicates the compound was not detected at the concentration reported.
J - Indicates the value for the compound is an estimated value.
UJ - Indicates the compound was not detected at the reported concentration and the concentration was estimated.
= - Indicates the compound was detected at the concentration reported.
Bold values exceed the applicable standard.
Italicized values exceed the ACL.

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Chatham County, Facility ID: 9-025113*1

TABLE 3b: CAP-PART A GROUNDWATER ANALYTICAL RESULTS[1]
(POLYNUCLEAR AROMATIC HYDROCARBONS)

Sample Location	Sample ID	Depth (ft BGS)	Date Sampled	Detected PAH Compounds (µg/L)				Total PAHs[6] (µg/L)
				Naphthalene	BDL[5]	BDL[5]	BDL[5]	
MW-07	BF0712	6.5 to 10.5	12/02/99	5.8 =				5.8
MW-10	BF1012	6.0 to 10.0	12/02/99	41.20=				41.20
MW-20	BF2012	2.2 to 11.70	12/07/99	2.0 =				2.0
MW-21	BF2112	3.4 to 12.9	12/07/99	18.30 =				18.30
MW-22	BF2212	2.43 to 11.93	12/07/99	101 =				101.0
Maximum Contaminant Level[2]				NRC				NRC
In-Stream Water Quality Standard (Chapter 391-3-6.03)[3]				NRC				NRC
Alternate Concentration Level[4]				820.9				NRC

NOTE: [1]Only the samples with detected PAH concentrations are listed on the table. A complete summary of the groundwater analytical data is provided on Table VIII-A, Appendix VIII.
[2]U.S. Environmental Protection Agency maximum contaminant level.
[3]Georgia Environmental Protection Division (GA EPD) In-stream Water Quality Standards (Chapter 391-3-6.03).
[4]During the CAP-Part A investigation, the Alternate Concentration Level (ACL) for naphthalene was calculated to be 57.85. However, during the CAP-Part B investigation, the ACL was revised based on site conditions. The new calculated ACL is 820.9. Refer to Appendix VI for the ACL calculations.
[5]BDL - Below detection limit; PAH compounds were not detected above the laboratory detection limit. Refer to Appendix VIII, Table VIII-A, for complete list of PAH results.
[6]The total value reported represents the sum of all detected compounds.

BGS - Below ground surface.
NRC - No regulatory criteria.
PAHs - Polynuclear aromatic hydrocarbons.

Laboratory Qualifiers

= - Indicates the compound was detected at the concentration reported.

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Hunter Army Airfield
Chatham County, Facility ID: 9-025113*1

TABLE 2c: CAP-PART B SOIL ANALYTICAL RESULTS[1]
(VOLATILE ORGANIC COMPOUNDS)

Sample Location	Sample ID	Depth (ft BGS)	Date Sampled	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Total BTEX[4] (mg/kg)	TPH-DRO (mg/kg)	TPH-GRO (mg/kg)
SB-32	BF3211	0.0 to 2.3	11/30/00	0.0016 U	0.00043 J	0.0016 U	0.0047 U	0.00043	0.81 U	0.118 U
SB-33	BF3311	0.0 to 2.1	11/30/00	0.0018 U	0.00079 J	0.0018 U	0.0053 U	0.00079	2.5 U	0.118 U
SB-34	BF3411	0.5 to 2.2	11/30/00	0.0013 U	0.00044 J	0.0013 U	0.0039 U	0.00044	1.4 U	0.113 U
SB-35	BF3511	0.0 to 2.0	11/30/00	0.0019 U	0.00062 J	0.0019 U	0.0056 U	0.00062	41.6 =	0.0644 J
SB-36	BF3611	0.0 to 2.0	11/30/00	0.0039 =	0.0388 =	0.134 =	1.960 =	2.137	829 =	1320 =
SB-37	BF3711	0.0 to 3.5	11/30/00	0.0018 =	0.00099 J	0.0064 =	0.0362 =	0.0454	8.6 =	0.843 =
SB-37	BF3713[5]	0.0 to 3.5	11/30/00	0.0026 =	0.0012 J	0.0104 =	0.0474 =	0.0616	8.1 =	0.285 =
SB-38	BF3811	0.0 to 3.4	11/30/00	**0.0763 J**	0.185 U	**1.620 =**	4.630 =	6.3263	1660 =	3240.0 J
Soil Threshold Levels[2]				0.005	0.400	0.370	20.0	NRC	NRC	NRC
Alternate Threshold Levels[3]				0.387	12.210	61.850	74.6	NRC	NRC	NRC

NOTE: [1]Only the samples with detected BTEX concentrations are listed on the table. A complete summary of the soil analytical data is provided in Appendix V.
[2]Georgia Department of Natural Resources (GA DNR) Applicable Soil Threshold Levels (i.e., Table A, column 1).
[3]Refer to Appendix VI for the Alternate Threshold Level calculations.
[4]The total value reported represents the sum of all detected compounds. A total is not reported if all the compounds are below the laboratory detection limits.
[5]Duplicate sample.

BDL - Below detection limit; volatile organic compounds were not detected above the laboratory detection limit.
BGS - Below ground surface.
BTEX - Benzene, toluene, ethylbenzene, and xylene.
NRC - No regulatory criteria.
TPH-DRO - Total petroleum hydrocarbon-diesel-range organics.
TPH-GRO - Total petroleum hydrocarbon-gasoline-range organics.

Laboratory Qualifiers
U - Indicates the compound was not detected at the concentration reported.
J - Indicates the value for the compound is an estimated value.
UJ - Indicates the compound was not detected at the reported concentration and the concentration was estimated.
= - Indicates that the compound was detected at the concentration reported.
Bold values exceed the applicable standard.

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Hunter Army Airfield
Chatham County, Facility ID: 9-025113*1

TABLE 2d: CAP-PART B SOIL ANALYTICAL RESULTS[1]

(POLYNUCLEAR AROMATIC HYDROCARBONS)

Sample Location	Sample ID	Depth (ft BGS)	Date Sampled	Detected PAH Compounds (mg/kg)															Total PAHs[3] (mg/kg)
				Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene	
SB-36	BF3611	0.0 to 2.0	11/30/00	0.0384 U	0.0384 U	0.0384 U	0.0384 U	0.0384 U	0.0384 U	0.0384 U	0.0384 U	0.0384 U	0.0384 U	0.0384 U	0.457 =	0.0384 U	0.0384 U	0.457
SB-37	BF3711	0.0 to 3.5	11/30/00	0.0391 U	0.0391 U	0.0391 U	0.0391 U	0.0391 U	0.0391 U	0.0391 U	0.0391 U	0.0391 U	0.0391 U	0.0391 U	0.0224 J	0.0391 U	0.0391 U	0.0224
SB-37	BF3713[4]	0.0 to 3.5	11/30/00	0.0494 =	0.258 =	0.229 =	0.245 =	0.129 =	0.213 =	0.244 =	0.0505 =	0.497 =	0.0396 U	0.121 =	0.0396 U	0.0746 =	0.472 =	2.582
SB-38	BF3811	0.0 to 3.4	11/30/00	0.163 U	0.163 U	0.163 U	0.163 U	0.163 U	0.163 U	0.163 U	0.163 U	0.163 U	0.163 U	0.163 U	6.810 =	0.163 U	0.163 U	6.810
MW-32	BF321B	2.0 to 3.3	12/01/00	0.0359 U	0.0359 U	0.0359 U	0.0359 U	0.0359 U	0.0359 U	0.0359 U	0.0359 U	0.0359 U	0.0359 U	0.0359 U	0.0371 =	0.0359 U	0.0359 U	0.0371
MW-E1[5]	MW-01-01	0.0 to 2.0	01/11/00	0.086 J	0.740 J	0.0076 U	0.015 U	0.015 U	0.0076 U	0.0076 U	0.015 U	0.970 J	0.180 J	0.0076 U	0.076 U	0.490 J	0.550 J	3.016
MW-E1[5]	MW-01-02	2.0 to 4.0	01/11/00	0.290 J	2.0 J	0.0082 U	0.040 J	0.016 U	0.052 J	0.320 J	0.016 U	3.0 J	0.620 J	0.0082 U	0.300 J	1.5 J	1.8 J	9.922
MW-E1[5]	MW-01-03[5]	0.0 to 1.0	01/11/00	0.060 J	0.008 U	0.008 U	0.015 U	0.015 U	0.008 U	0.085 J	0.015 U	0.660 J	0.130 J	0.008 U	0.080 U	0.310 J	0.420 J	1.605
MW-E2[5]	MW-02-01	0.0 to 2.0	01/11/00	0.0079 U	0.0079 U	0.0079 U	0.015 U	0.017 =	0.0079 U	0.0079 U	0.015 U	0.015 U	0.0079 U	0.0082 =	0.079 U	0.0079 U	0.0079 U	0.0252
MW-E3[5]	MW-03-01	0.0 to 2.0	01/11/00	0.0083 U	0.0083 U	0.020 J	0.016 U	0.016 U	0.0083 U	0.0083 U	0.016 U	0.016 U	0.0083 U	0.030 =	0.083 U	0.0089 =	0.0083 U	0.0589
MW-E4[5]	MW-04-01	0.0 to 2.0	01/11/00	0.0084 U	0.0084 U	0.0084 U	0.025 =	0.016 U	0.096 J	0.0084 U	0.016 U	0.016 U	0.0084 U	0.0084 U	0.0084 U	0.0084 U	0.0084 U	0.121
MW-E4[5]	MW-04-02	2.0 to 4.0	01/11/01	0.0087 U	0.0087 U	0.0087 U	0.024 =	0.017 U	0.0087 U	0.0087 U	0.017 U	0.017 U	0.0087 U	0.0087 U	0.0087 U	0.0087 U	0.0087 U	0.024
MW-E5[5]	MW-05-01	0.0 to 2.0	01/11/00	0.0078 U	0.0078 U	0.0078 U	0.015 U	0.023 J	0.0078 U	0.0078 U	0.015 U	0.040 =	0.0078 U	0.0078 U	0.078 U	0.0078 U	0.092 J	0.155
MW-E5[5]	MW-05-02	2.0 to 4.0	01/11/00	0.0085 U	0.0085 U	0.0085 U	0.016 U	0.016 U	0.240 =	0.0085 U	0.016 U	0.016 U	0.0085 U	0.0085 U	0.085 U	0.0085 U	0.0085 U	0.240
Applicable Standards[2]				NA	NA	0.660	0.820	NA	1.6	0.660	1.5	NA	NA	0.660	NA	NA	NA	NRC

NOTES: [1]Only the samples with detected PAH concentrations are listed on the table. A complete summary of the soil analytical data is provided in Appendix V.
[2]Georgia Department of Natural Resources (GA DNR) Applicable Soil Threshold Levels (i.e., Table A, column 1).
[3]The total value reported represents the sum of all detected compounds.
[4]Duplicate sample.
[5]Soil boring installed by Earth Tech.

BDL - Below detection limit; PAH compounds were not detected above the laboratory detection limit.
BGS - Below ground surface.
NA - Not applicable; the health-based threshold level exceeds the expected soil concentration under free-product conditions.

NRC - No regulatory criteria.
PAHs - Polynuclear aromatic hydrocarbons.

Laboratory Qualifiers

U - Indicates the compound was not detected at the concentration reported.
J - Indicates the value for the compound is an estimated value.
UJ - Indicates the compound was not detected at the reported concentration and the concentration was estimated.
= - Indicates that the compound was detected at the concentration reported.
Bold values exceed the applicable standard.

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Chatham County, Facility ID: 9-025113*1

TABLE 3c: CAP-PART B GROUNDWATER ANALYTICAL RESULTS[1]
(VOLATILE ORGANIC COMPOUNDS)

Sample Location	Sample ID	Depth (ft BGS)	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Total BTEX[5] (µg/L)
MW-07	BF0722	2.9 to 12.4	12/02/00	1.0 U	1.0 U	0.21 J	3.0 U	0.21
MW-09	BF0922	2.9 to 12.4	12/02/00	3.8 =	0.29 J	6.9 =	3.0 U	10.99
MW-10	BF1022	2.3 to 11.8	12/02/00	2.4 =	0.4 J	10.1 =	2.9 J	15.8
MW-10	BF1024[6]	2.3 to 11.8	12/02/00	2.2 =	0.63 J	9.9 =	3 =	15.73
MW-11	BF1122	2.3 to 11.8	12/02/00	1.0 U	0.4 J	0.18 J	3.0 U	0.58
MW-16	BF1622	2.7 to 12.2	12/02/00	1.0 U	1.0 U	0.15 U	0.64 J	0.79
MW-17	BF1722	3.0 to 12.5	12/02/00	1.0 U	1.0 U	0.25 J	1.6 J	1.85
MW-20	BF2022	2.2 to 11.7	12/03/00	3.1 =	1.0 U	2.1 =	7.3 =	12.5
MW-20	BF2024[6]	2.2 to 11.7	12/03/00	2.7 =	1.0 U	2.3 =	7.7 =	12.7
MW-21	BF2122	3.4 to 12.9	12/02/00	**251** =	1.3 =	17.4 =	734 =	1003.7
MW-22	BF2222	2.4 to 11.9	12/02/00	**174** =	5.7 =	128.0 =	662 =	969.7
MW-29	BF2922	2.0 to 11.5	12/03/00	0.35 J	1.0 U	0.88 J	106 =	107.23
MW-32	BF3222	1.4 to 11.0	12/01/00	**109 J**	0.65 J	1.1 =	115 =	225.75
MW-33	BF3322	1.6 to 11.2	12/01/00	1.0 =	1.0 U	1.0 U	3.0 U	1.0
MW-33	BF3324[6]	1.6 to 11.2	12/01/00	0.94 J	1.0 U	1.0 U	3.0 U	0.94
MW-34	BF3422	3.1 to 13.3	12/01/00	1.0 U	1.0 U	1.0 U	0.36 J	0.36
MW-E1	BFE122	4.6 to 14.6	12/01/00	1.0 U	1.0 U	0.99 J	0.45 J	1.44
MW-E2	BFE222	3.94 to 13.94	12/02/00	1.0 U	0.3 J	1.0 U	3.0 U	0.30
MW-E3	BFE322	4.4 to 14.4	12/02/00	1.0 U	0.48 J	1.0 U	0.3 J	0.78
MW-E3	BFE324[6]	4.4 to 14.4	12/02/00	1.0 U	0.29 J	1.0 U	3.0 U	0.29
MW-E4	BFE433	4.6 to 14.6	12/02/00	0.29 J	0.27 J	0.28 J	0.36 J	1.2
MW-E5	BFE522	4.8 to 14.8	12/02/00	3.6 =	1.0 =	17.2 =	19.0 =	40.8
Maximum Contaminant Level[2]				5	1,000	700	10,000	NRC
In-Stream Water Quality Standard (Chapter 391-3-6.03)[3]				71.28	200,000	28,718	NRC	NRC
Alternate Concentration Level[4]				634.4	NA	NA	NA	NRC

NOTE: [1]Only the samples with detected BTEX concentrations are listed on the table. A complete summary of the groundwater analytical data is provided on Table VIII-B, Appendix VIII.
[2]U.S. Environmental Protection Agency maximum contaminant level.
[3]Georgia Environmental Protection Division (GA EPD) In-stream Water Quality Standards (Chapter 391-3-6.03).
[4]Refer to Appendix VI for the Alternate Concentration Level (ACL) calculations.
[5]The total value reported represents the sum of all detected compounds.
[6]Duplicate sample

BGS - Below ground surface.
BTEX - Benzene, toluene, ethylbenzene, and xylene.
NA - Not applicable; ACL not calculated.
NRC - No regulatory criteria.

Laboratory Qualifiers

U - Indicates the compound was not detected at the concentration reported.
J - Indicates the value for the compound is an estimated value.
UJ - Indicates the compound was not detected at the reported concentration and the concentration was estimated.
= - Indicates the compound was detected at the concentration reported.
Bold values exceed the applicable standard.

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TABLE 3d: CAP-PART B GROUNDWATER ANALYTICAL RESULTS[1]
(POLYNUCLEAR AROMATIC HYDROCARBONS)

Sample Location	Sample ID	Depth (ft BGS)	Date Sampled	Detected PAH Compounds (µg/L)				Total PAHs[6] (µg/L)
				Acenaphthene	Fluorene	Naphthalene	Phenanthrene	
MW-07	BF0722	2.9 to 12.4	12/02/00	BDL	BDL	4.8 =	BDL	4.8
MW-09	BF0922	2.9 to 12.4	12/02/00	BDL	BDL	7.1 =	BDL	7.1
MW-10	BF1022	2.3 to 11.8	12/02/00	BDL	BDL	23.4 =	BDL	23.4
MW-10	BF1024[7]	2.3 to 11.8	12/02/00	BDL	BDL	22.2 =	BDL	22.2
MW-11	BF1122	2.3 to 11.8	12/02/00	BDL	BDL	0.64 J	BDL	0.64
MW-20	BF2022	2.2 to 11.7	12/03/00	BDL	BDL	7.8 =	BDL	7.8
MW-20	BF2024[7]	2.2 to 11.7	12/03/00	BDL	BDL	7.4 =	BDL	7.4
MW-21	BF2122	3.4 to 12.9	12/02/00	BDL	BDL	22 =	BDL	22
MW-22	BF2222	2.4 to 11.9	12/02/00	BDL	BDL	528 =	BDL	528
MW-30	BF3022	1.9 to 11.4	12/03/00	BDL	BDL	0.65 J	BDL	0.65
MW-31	BF3122	1.5 to 11.0	12/03/00	BDL	BDL	0.58 J	BDL	0.58
MW-32	BF3222	1.4 to 11.0	12/01/00	BDL	BDL	2.0 =	BDL	2.0
MW-E1	BFE122	4.6 to 14.6	12/01/00	2.2 =	4 =	9.1 =	BDL	15.3
MW-E5	BFE522	4.8 to 14.8	12/02/00	0.55 J	1 =	16.6 =	0.73 J	18.88
Maximum Contaminant Level[2]				NRC	NRC	NRC	NRC	NRC
In-Stream Water Quality Standard (Chapter 391-3-6)[3]				NRC	14,000	NRC	NRC	NRC
Alternate Concentration Level[4]				NA	NA	820.9	NA	NRC

NOTE: [1]Only the samples with detected PAH concentrations are listed on the table. A complete summary of the groundwater analytical data is provided on Table VIII-A, Appendix VIII.
[2]U.S. Environmental Protection Agency maximum contaminant level.
[3]Georgia Environmental Protection Division (GA EPD) In-stream Water Quality Standards (Chapter 391-3-6.03).
[4]Refer to Appendix VI for the Alternate Concentration Level calculations.
[5]BDL - Below detection limit; PAH compounds were not detected above the laboratory detection limit. Refer to Appendix VIII, Table VIII-B, for complete list of PAH results.
[6]The total value reported represents the sum of all detected compounds.
[7]Duplicate sample.

BGS - Below ground surface.
NRC - No regulatory criteria.
PAHs - Polynuclear aromatic hydrocarbons.

Laboratory Qualifiers

= - Indicates the compound was detected at the concentration reported.
J - Indicates the value for the compound is an estimated value.

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Chatham County, Facility ID: 9-025113*1

TABLE 4: CAP-PART A/B FREE PRODUCT REMOVAL

Monitoring Well Number: MW-22[1]				
Date of Measurement	Groundwater Elev. (ft MSL)	Product Thickness (ft)	Corrected Water Elev. (ft MSL)	Product Removed (gal)
12/01/00	10.61	0.58[1]	10.03	0.066
02/01/01	11.30	0	11.30	0
03/12/01	11.40	0	11.40	0
			TOTAL	0.066

NOTE: MSL - Mean sea level.
[1]Free product was found in MW-22 only on December 1, 2000. On this date, all product was pumped from the well resulting in the recovery of approximately 0.066 gal. Free product has not been detected in any of the other wells located at this site.

TABLE 8: SOIL DATA RISK-BASED SCREENING RESULTS (continued)

Location / Sample ID / Date Collected / Depth (ft BGS)	Applicable Standards[1]	Risk-based Screening Level[a]	Leaching to Groundwater[b]	SB-34 BF3411 11/30/00 0.5 to 2.2	SB-35 BF3511 11/30/00 0.0 to 2.0	SB-36 BF3611 11/30/00 0.0 to 2.0	SB-37 BF3711 11/30/00 0.0 to 3.5	SB-37 BF3713[4] 11/30/00 0.0 to 3.5	SB-38 BF3811 11/30/00 0.0 to 3.4	MW-32 BF321B 12/01/00 2.0 to 3.3	MW-33 BF331B 12/01/00 4.0 to 6.2	MW-34 BF341B 12/01/00 8.0 to 9.0
VOCs	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Benzene	0.005	104.1	0.0018	0.0013 U	0.0019 U	0.0039 =	0.0018 =	0.0026 =	0.0763 J	0.0021 U	0.0012 U	0.0015 U
Toluene	0.400	408,800	8.79	0.00044 J	0.00062 J	0.0388 =	0.00099 J	0.0012 J	0.185 U	0.0018 J	0.0012 U	0.0015 U
Ethylbenzene	0.370	204,400	14.98	0.0013 U	0.0019 U	0.134 =	0.0064 =	0.0104 =	1.620 =	0.0021U	0.0012 U	0.0015 U
Xylenes	20.0	408,800	170.20	0.0039 U	0.0056 U	1.960 =	0.0362 =	0.0474 =	4.630 =	0.0062U	0.0037 U	0.0044 U
TPH-DRO	NRC	--	--	1.4 U	41.6 =	829 =	8.6 =	8.1 =	1660 =	0.61 U	2.2 U	1.5 U
TPH-GRO	NRC	--	--	0.113 U	0.0644 J	1320.0=	0.843 =	0.285 =	3240.0 J	0.190 =	0.124 U	0.118 U
PAHs	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
2-Chloronaphthalene[c]	N/A[2]	40,880	0.15	0.0377 U	0.0360 U	0.0384 U	0.0391 U	0.0396 U	0.163 U	0.0359 U	0.0415 U	0.0392 U
Acenaphthene	N/A[2]	122,640	104.83	0.0377 U	0.0360 U	0.0384 U	0.0391 U	0.0396 U	0.163 U	0.0359 U	0.0415 U	0.0392 U
Acenaphthylene	N/A[2]	61,320	682.00	0.0377 U	0.0360 U	0.0384 U	0.0391 U	0.0396 U	0.163 U	0.0359 U	0.0415 U	0.0392 U
Anthracene	N/A[2]	613,200	465.60	0.0377 U	0.0360 U	0.0384 U	0.0391 U	0.0494 =	0.163 U	0.0359 U	0.0415 U	0.0392 U
Benzo(a)anthracene	N/A[2]	7.8	1.46	0.0377 U	0.0360 U	0.0384 U	0.0391 U	0.258 =	0.163 U	0.0359 U	0.0415 U	0.0392 U
Benzo(a)pyrene	0.660	0.78	0.37	0.0377 U	0.0360 U	0.0384 U	0.0391 U	0.229 =	0.163 U	0.0359 U	0.0415 U	0.0392 U
Benzo(b)fluoranthene	0.820	7.8	4.51	0.0377 U	0.0360 U	0.0384 U	0.0391 U	0.245 =	0.163 U	0.0359 U	0.0415 U	0.0392 U
Benzo(g,h,i)perylene	N/A[2]	--	--	0.0377 U	0.0360 U	0.0384 U	0.0391 U	0.129 =	0.163 U	0.0359 U	0.0415 U	0.0392 U
Benzo(k)fluoranthene	1.6	78.4	45.14	0.0377 U	0.0360 U	0.0384 U	0.0391 U	0.213 =	0.163 U	0.0359 U	0.0415 U	0.0392 U
Chrysene	0.660	784	146.09	0.0377 U	0.0360 U	0.0384 U	0.0391 U	0.244 =	0.163 U	0.0359 U	0.0415 U	0.0392 U
Dibenzo(a,h)anthracene	1.5	0.78	1.39	0.0377 U	0.0360 U	0.0384 U	0.0391 U	0.0505 =	0.163 U	0.0359 U	0.0415 U	0.0392 U
Fluoranthene	N/A[2]	81,760	6254.6	0.0377 U	0.0360 U	0.0384 U	0.0391 U	0.497 =	0.163 U	0.0359 U	0.0415 U	0.0392 U
Fluorene	N/A[2]	81,760	135.29	0.0377 U	0.0360 U	0.0384 U	0.0391 U	0.0396 U	0.163 U	0.0359 U	0.0415 U	0.0392 U
Indeno(1,2,3-cd)pyrene	0.660	7.8	12.73	0.0377 U	0.0360 U	0.0384 U	0.0391 U	0.121 =	0.163 U	0.0359 U	0.0415 U	0.0392 U
Naphthalene	N/A[2]	40,880	0.15	0.0377 U	0.0360 U	0.457 =	0.0224 J	0.0396 U	6.810 =	0.0371 =	0.0415 U	0.0392U
Phenanthrene[d]	N/A[2]	61,320	682.00	0.0377 U	0.0360 U	0.0384 U	0.0391 U	0.0746 =	0.163 U	0.0359 U	0.0415 U	0.0392 U
Pyrene	N/A[2]	61,320	682.00	0.0377 U	0.0360 U	0.0384 U	0.0391 U	0.472 =	0.163 U	0.0359 U	0.0415 U	0.0392 U

NOTE: [1]Georgia Department of Natural Resources (GA DNR) Applicable Soil Threshold Levels (i.e., Table A, column I).
[2]Not applicable; the health-based threshold level exceeds the expected soil concentration under free-product conditions.
[3]Volatile reporting levels were not achieved in the sample due to the inherently high concentrations of petroleum products (TPH-DRO/TPH-GRO) in the sample. Therefore, the concentrations are reported as less than the elevated detection limits.
[4]Duplicate sample.
[a]Protective of soil exposure during industrial land use.
[b]Protective of groundwater ingestion. Used a dilution attenuation factor of 20.
BGS - Below ground surface.
NRC - No regulatory criteria.
PAHs - Polynuclear aromatic hydrocarbons.
Bold values exceed soil threshold levels.
[c]Values based on naphthalene as a surrogate chemical.
[d]Values based on pyrene as a surrogate chemical.
TPH-DRO - Total petroleum hydrocarbon-diesel-range organics.
TPH-GRO - Total petroleum hydrocarbon-gasoline-range organics.
VOCs - Volatile organic compounds.
Underlined values indicate results exceeding leaching to groundwater screening levels.

Laboratory Qualifiers
U - Indicates the compound was not detected at the concentration reported.
J - Indicates the value for the compound is an estimated value.
UJ - Indicates the compound was not detected at the reported concentration and the concentration was estimated.
= - Indicates the compound was detected at the concentration reported.

TABLE 9: GROUNDWATER DATA RISK-BASED SCREENING LEVELS (continued)

Location Sample ID Date Collected Depth (ft BGS)	Federal SDWA MCL[1]	IWQS[2]	Risk-based[4]	MW-20 BF2012 12/ 7/99 2.2 to 11.7	MW-20 BF2014[3] 12/7/99 2.2 to 11.7	MW-21 BF2112 12/07/99 3.4 to 12.9	MW-22 BF2212 12/07/99 2.4 to 11.9	MW-23 BF2312 12/07/99 2.7 to 12.2	MW-24 BF2412 12/ 02/99 7.5 to 12.5	MW-25 BF2512 12/02/99 7.6 to 12.6	MW-26 BF2612 12/02/99 7.2 to 12.2	MW-27 BF2712 01/11/99 7.0 to 12.0	MW-28 BF2812 01/11/99 7.5 to 12.5
VOCs	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Benzene	5	71.28	0.36	0.60 J	0.59 J	**130 =**	**553 =**	1.1 =	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U
Toluene	1,000	200,000	750	1.0 U	1.0 U	2.8 =	0.86 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U
Ethylbenzene	700	28,718	1,300	3.1 =	3.0 =	14.7 =	86.7 =	0.48 J	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U
Xylenes	10,000	NRC	12,000	21.0 =	20.4 =	710 =	352 =	1.4 J	3.0 U	3.0 U	3.0 U	3.0 UJ	3.0 U
PAHs	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
2-Chloronaphthalene[6]	NRC	NRC	6.5	1.1 U	0.95 U	0.95 U	1.0 U	1.0 U	9.9 UJ	9.8 UJ	10.0 U	1.1 U	1.0 UJ
Acenaphthene	NRC	NRC	365	1.1 U	0.95 U	0.95 U	1.0 U	1.0 U	0.99 UJ	0.98 UJ	1.0 U	1.1 U	1.0 UJ
Acenaphthylene	NRC	NRC	182.5	1.1 U	0.95 U	0.95 U	1.0 U	1.0 U	0.99 UJ	0.98 UJ	1.0 U	1.1 U	1.0 UJ
Anthracene	NRC	110,000	182.5	1.1 U	0.95 U	0.95 U	1.0 U	1.0 U	0.99 UJ	0.98 UJ	1.0 U	1.1 U	1.0 UJ
Benzo(a)anthracene	NRC	0.0311	0.092	**1.1 U**	**0.95 U**	**0.95 U**	**1.0 U**	**1.0 U**	**0.99 UJ**	**0.98 UJ**	**1.0 U**	**1.1 U**	**1.0 UJ**
Benzo(a)pyrene	0.2	0.0311	0.00092	**1.1 U**	**0.95 U**	**0.95 U**	**1.0 U**	**1.0 U**	**0.99 UJ**	**0.98 UJ**	**1.0 U**	**1.1 U**	**1.0 UJ**
Benzo(b)fluoranthene	NRC	NRC	0.0092	1.1 U	0.95 U	0.95 U	1.0 U	1.0 U	0.99 UJ	0.98 UJ	1.0 U	1.1 U	1.0 UJ
Benzo(g,h,i)perylene	NRC	NRC	--	1.1 U	0.95 U	0.95 U	1.0 U	1.0 U	0.99 UJ	0.98 UJ	1.0 U	1.1 U	1.0 UJ
Benzo(k)fluoranthene	NRC	0.0311	0.92	**1.1 U**	**0.95 U**	**0.95 U**	**1.0 U**	**1.0 U**	**0.99 UJ**	**0.98 UJ**	**1.0 U**	**1.1 U**	**1.0 UJ**
Chrysene	NRC	0.0311	9.2	1.1 U	0.95 U	0.95 U	1.0 U	1.0 U	0.99 UJ	0.98 UJ	1.0 U	1.1 U	1.0 UJ
Dibenzo(a,h)anthracene	NRC	0.0311	0.0092	**1.1 U**	**0.95 U**	**0.95 U**	**1.0 U**	**1.0 U**	**0.99 UJ**	**0.98 UJ**	**1.0 U**	**1.1 U**	**1.0 UJ**
Fluoranthene	NRC	370	1,460	1.1 U	0.95 U	0.95 U	1.0 U	1.0 U	0.99 UJ	0.98 UJ	1.0 U	1.1 U	1.0 UJ
Fluorene	NRC	14,000	243	1.1 U	0.95 U	0.95 U	1.0 U	1.0 U	0.99 UJ	0.98 UJ	1.0 U	1.1 U	1.0 UJ
Indeno(1,2,3-cd)pyrene	NRC[7]	0.0311	0.092	**1.1 U**	**0.95 U**	**0.95 U**	**1.0 U**	**1.0 U**	**0.99 UJ**	**0.98 UJ**	**1.0 U**	**1.1 U**	**1.0 UJ**
Naphthalene	NRC	NRC	6.5	2.0 =	2.6 =	**18.3 =**	**101 =**	1.0 U	0.99 UJ	0.98 UJ	1.0 U	1.1 U	1.0 UJ
Phenanthrene[5]	NRC	NRC	182.5	1.1 U	0.95 U	0.95 U	1.0 U	1.0 U	0.99 UJ	0.98 UJ	1.0 U	1.1 U	1.0 UJ
Pyrene	NRC	11,000	182.5	1.1 U	0.95 U	0.95 U	1.0 U	1.0 U	0.99 UJ	0.98 UJ	1.0 U	1.1 U	1.0 UJ

NOTE:
[1]U.S. Environmental Protection Agency Safe Drinking Water Act (SDWA) maximum contaminant level.
[2]Georgia Environmental Protection Division (GA EPD) In-stream Water Quality Standards (Chapter 391-3-6.03).
[3]Duplicate sample.
[4]Protective of tap water ingestion by a resident.
[5]Values based on naphthalene as a surrogate chemical.
[6]Values based on pyrene as a surrogate chemical.
BGS - Below ground surface.
MW - Monitoring well.
NRC - No regulatory criteria.
Bold values indicate results exceeding Georgia IWQS.
PAHs - Polynuclear aromatic hydrocarbons.
VOCs - Volatile organic compounds.
VP - Vertical profile.
Underlined values indicate results exceeding risk-based screening levels.
Laboratory Qualifiers
U - Indicates the compound was not detected at the concentration reported.
UJ - Indicates the compound was not detected at the reported concentration and the concentration was estimated.
J - Indicates the value for the compound is an estimated value.
= - Indicates the compound was detected at the concentration reported.

TABLE 9: GROUNDWATER DATA RISK-BASED SCREENING LEVELS (continued)

Location Sample ID Date Collected Depth (ft BGS)	Federal SDWA MCL[1]	IWQS[2]	Risk-based[a]	MW-29 BF2912 01/11/99 5.7 to 10.7	MW-30 BF3012 01/11/99 5.9 to10.9	MW-30 BF3014[3] 01/11/99 5.9 to 10.9	MW-31 BF3112 01/ 10/99 5.7 to 10.7	VP-2 BFV212 12/04/99 12.0 to 17.0	VP-2 BFV222 12/04/99 17.0 to 22.0	VP-2 BFV232 12/ 04/99 22.0 to 27.0	VP-2 BFV242 12/04/99 27.0 to 32.0	VP-2 BFV244[3] 12/04/99 27.0 to 32.0	VP-2 BFV252 12/04/99 32.0 to 37.0
VOCs	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Benzene	5	71.28	0.36	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.22 J	0.24 J	1.0 U
Toluene	1,000	200,000	750	0.40 J	1.0 U	1.0 U	1.0 U	0.42 J	1.0 U	0.30 J	0.40 J	0.27 J	0.36 J
Ethylbenzene	700	28,718	1,300	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes	10,000	NRC	12,000	376 J	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
PAHs	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
2-Chloronaphthalene[b]	NRC	NRC	6.5	1.0 UJ	1.0 U	1.0 UJ	1.1 UJ	1.0 U	1.0 U	1.0 U	1.0 U	0.99 U	1.0 U
Acenaphthene	NRC	NRC	365	1.0 UJ	1.0 U	1.0 UJ	1.1 UJ	1.0 U	1.0 U	1.0 U	1.0 U	0.99 U	1.0 U
Acenaphthylene	NRC	NRC	182.5	1.0 UJ	1.0 U	1.0 UJ	1.1 UJ	1.0 U	1.0 U	1.0 U	1.0 U	0.99 U	1.0 U
Anthracene	NRC	110,000	182.5	1.0 UJ	1.0 U	1.0 UJ	1.1 UJ	1.0 U	1.0 U	1.0 U	1.0 U	0.99 U	1.0 U
Benzo(a)anthracene	NRC	0.0311	0.092	1.0 UJ	1.0 U	1.0 UJ	1.1 UJ	1.0 U	1.0 U	1.0 U	1.0 U	0.99 U	1.0 U
Benzo(a)pyrene	0.2	0.0311	0.00092	1.0 UJ	1.0 U	1.0 UJ	1.1 UJ	1.0 U	1.0 U	1.0 U	1.0 U	0.99 U	1.0 U
Benzo(b)fluoranthene	NRC	NRC	0.0092	1.0 UJ	1.0 U	1.0 UJ	1.1 UJ	1.0 U	1.0 U	1.0 U	1.0 U	0.99 U	1.0 U
Benzo(g,h,i)perylene	NRC	NRC	--	1.0 UJ	1.0 U	1.0 UJ	1.1 UJ	1.0 U	1.0 U	1.0 U	1.0 U	0.99 U	1.0 U
Benzo(k)fluoranthene	NRC	0.0311	0.92	1.0 UJ	1.0 U	1.0 UJ	1.1 UJ	1.0 U	1.0 U	1.0 U	1.0 U	0.99 U	1.0 U
Chrysene	NRC	0.0311	9.2	1.0 UJ	1.0 U	1.0 UJ	1.1 UJ	1.0 U	1.0 U	1.0 U	1.0 U	0.99 U	1.0 U
Dibenzo(a,h)anthracene	NRC	0.0311	0.0092	1.0 UJ	1.0 U	1.0 UJ	1.1 UJ	1.0 U	1.0 U	1.0 U	1.0 U	0.99 U	1.0 U
Fluoranthene	NRC	370	1,460	1.0 UJ	1.0 U	1.0 UJ	1.1 UJ	1.0 U	1.0 U	1.0 U	1.0 U	0.99 U	1.0 U
Fluorene	NRC	14,000	243	1.0 UJ	1.0 U	1.0 UJ	1.1 UJ	1.0 U	1.0 U	1.0 U	1.0 U	0.99 U	1.0 U
Indeno(1,2,3-cd)pyrene	NRC	0.0311	0.092	1.0 UJ	1.0 U	1.0 UJ	1.1 UJ	1.0 U	1.0 U	1.0 U	1.0 U	0.99 U	1.0 U
Naphthalene	NRC	NRC	6.5	1.0 UJ	1.0 U	1.0 UJ	1.1 UJ	1.0 U	1.0 U	1.0 U	1.0 U	0.99 U	1.0 U
Phenanthrene[c]	NRC	NRC	182.5	1.0 UJ	1.0 U	1.0 UJ	1.1 UJ	1.0 U	1.0 U	1.0 U	1.0 U	0.99 U	1.0 U
Pyrene	NRC	11,000	182.5	1.0 UJ	1.0 U	1.0 UJ	1.1 UJ	1.0 U	1.0 U	1.0 U	1.0 U	0.99 U	1.0 U

NOTE:
[1]U.S. Environmental Protection Agency Safe Drinking Water Act (SDWA) maximum contaminant level.
[2]Georgia Environmental Protection Division (GA EPD) In-stream Water Quality Standards (Chapter 391-3-6.03).
[3]Duplicate sample.
[a]Protective of tap water ingestion by a resident.
[b]Values based on naphthalene as a surrogate chemical.
[c]Values based on pyrene as a surrogate chemical.
BGS - Below ground surface.
MW - Monitoring well.
NRC - No regulatory criteria.
Bold values indicate results exceeding Georgia IWQS.
Laboratory Qualifiers
U - Indicates the compound was not detected at the concentration reported.
J - Indicates the value for the compound is an estimated value.
PAHs - Polynuclear aromatic hydrocarbons.
VOCs - Volatile organic compounds.
VP - Vertical profile.
Underlined values indicate results exceeding risk-based screening levels.
UJ - Indicates the compound was not detected at the reported concentration and the concentration was estimated.
= - Indicates the compound was detected at the concentration reported.

Former UST 117, Building 7002
Hunter Army Airfield
Chatham County, Facility ID: 9-025113*1

TABLE 9: GROUNDWATER DATA RISK-BASED SCREENING LEVELS (continued)

Location Sample ID Date Collected Depth (ft BGS)	Federal SDWA MCL[1]	IWQS[2]	Risk-based[4]	MW-17 BF1722 12/02/00 3.0 to 12.5	MW-18 BF1822 12/02/00 3.4 to 12.9	MW-19 BF1922 12/02/00 2.0 to 11.5	MW-20 BF2022 12/03/00 2.2 to 11.7	MW-20 BF2024[3] 12/03/00 2.2 to 11.7	MW-21 BF2122 12/02/00 3.4 to 12.9	MW-22 BF2222 12/02/00 2.4 to 11.9	MW-23 BF2322 12/02/00 2.7 to 12.2	MW-24 BF2422 12/02/00 7.5 to 12.5	MW-25 BF2522 12/02/00 3.6 to 13.1
VOCs	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Benzene	5	71.28	0.36	1.0 U	1.0 U	1.0 U	3.1 =	2.7 =	251 =	174 =	1.0 U	1.0 U	1.0 U
Toluene	1,000	200,000	750	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.3 =	5.7 =	1.0 U	1.0 U	1.0 U
Ethylbenzene	700	28,718	1.300	0.25 J	1.0 U	1.0 U	2.1 =	2.3 =	17.4 =	128 =	1.0 U	1.0 U	1.0 U
Xylenes	10,000	NRC	12,000	1.6 J	3.0 U	3.0 U	7.3 =	7.7 =	734 =	662 =	3.0 U	3.0 U	3.0 U
PAHs	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
2-Chloronaphthalene[5]	NRC	NRC	6.5	1.0 U	1.0 U	0.98 U	0.99 U	1.0 U	1.0 U	19.0 U	0.95 U	0.96 U	0.98 U
Acenaphthene	NRC	NRC	365	1.0 U	1.0 U	0.98 U	0.99 U	1.0 U	1.0 U	19.0 U	0.95 U	0.96 U	0.98 U
Acenaphthylene	NRC	NRC	182.5	1.0 U	1.0 U	0.98 U	0.99 U	1.0 U	1.0 U	19.0 U	0.95 U	0.96 U	0.98 U
Anthracene	NRC	110,000	182.5	1.0 U	1.0 U	0.98 U	0.99 U	1.0 U	1.0 U	19.0 U	0.95 U	0.96 U	0.98 U
Benzo(a)anthracene	NRC	0.0311	0.092	1.0 U	1.0 U	0.98 U	0.99 U	1.0 U	1.0 U	19.0 U	0.95 U	0.96 U	0.98 U
Benzo(a)pyrene	0.2	0.0311	0.00092	1.0 U	1.0 U	0.98 U	0.99 U	1.0 U	1.0 U	19.0 U	0.95 U	0.96 U	0.98 U
Benzo(b)fluoranthene	NRC	NRC	0.0092	1.0 U	1.0 U	0.98 U	0.99 U	1.0 U	1.0 U	19.0 U	0.95 U	0.96 U	0.98 U
Benzo(g,h,i)perylene	NRC	NRC	--	1.0 U	1.0 U	0.98 U	0.99 U	1.0 U	1.0 U	19.0 U	0.95 U	0.96 U	0.98 U
Benzo(k)fluoranthene	NRC	0.0311	0.92	1.0 U	1.0 U	0.98 U	0.99 U	1.0 U	1.0 U	19.0 U	0.95 U	0.96 U	0.98 U
Chrysene	NRC	0.0311	9.2	1.0 U	1.0 U	0.98 U	0.99 U	1.0 U	1.0 U	19.0 U	0.95 U	0.96 U	0.98 U
Dibenzo(a,h)anthracene	NRC	0.0311	0.0092	1.0 U	1.0 U	0.98 U	0.99 U	1.0 U	1.0 U	19.0 U	0.95 U	0.96 U	0.98 U
Fluoranthene	NRC	370	1.460	1.0 U	1.0 U	0.98 U	0.99 U	1.0 U	1.0 U	19.0 U	0.95 U	0.96 U	0.98 U
Fluorene	NRC	14,000	243	1.0 U	1.0 U	0.98 U	0.99 U	1.0 U	1.0 U	19.0 U	0.95 U	0.96 U	0.98 U
Indeno(1,2,3-cd)pyrene	NRC	0.0311	0.092	1.0 U	1.0 U	0.98 U	0.99 U	1.0 U	1.0 U	19.0 U	0.95 U	0.96 U	0.98 U
Naphthalene	NRC	NRC	6.5	1.0 U	1.0 U	0.98 U	7.8 =	7.4 =	22 =	528 =	0.95 U	0.96 U	0.98 U
Phenanthrene[6]	NRC	NRC	182.5	1.0 U	1.0 U	0.98 U	0.99 U	1.0 U	1.0 U	19.0 U	0.95 U	0.96 U	0.98 U
Pyrene	NRC	11,000	182.5	1.0 U	1.0 U	0.98 U	0.99 U	1.0 U	1.0 U	19.0 U	0.95 U	0.96 U	0.98 U

NOTE:
[1]U.S. Environmental Protection Agency Safe Drinking Water Act (SDWA) maximum contaminant level.
[2]Georgia Environmental Protection Division (GA EPD) In-stream Water Quality Standards (Chapter 391-3-6.03).
[3]Duplicate sample.
[4]Protective of tap water ingestion by a resident.
[5]Values based on naphthalene as a surrogate chemical.
[6]Values based on pyrene as a surrogate chemical.
BGS - Below ground surface.
MW - Monitoring well.
NRC - No regulatory criteria.
Bold values indicate results exceeding Georgia IWQS.
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Underlined values indicate results exceeding risk-based screening levels.
UJ - Indicates the compound was not detected at the reported concentration and the concentration was estimated.
= - Indicates the compound was detected at the concentration reported.

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Appendix B

Documented Calculations of Aquifer Characteristics (CAP Part A Report for Release #1)

1.0 OTHER GEOLOGIC AND HYDROGEOLOGIC DATA

The following information is presented to provide supplemental information to Appendix X (Site Ranking Form) of the Corrective Action Plan (CAP)-Part A form and provides detailed information relating to the geologic and hydrogeologic conditions at Hunter Army Airfield (HAAF) to support determinations of groundwater flow pathway(s) or direction(s) and contaminant transport.

1.1 REGIONAL GEOLOGY

Southeast Georgia is located within the Coastal Plain Physiographic Province of the Southeast United States (Clark and Zisa 1976). In this region, the thickness of southeastward dipping, subsurface strata ranges from 0 feet at the fall line, located approximately 350 miles inland from the Atlantic coast, to approximately 4,200 feet below land surface (BLS) at the coast. Herrick (1961) provides detailed lithologic descriptions of the stratigraphic units encountered during the installation of water and petroleum exploration wells in Chatham County. The well log of GGS Well 125, located on White Bluff Road, 700 feet west and 0.3 miles north of Buckhalter Road, Savannah, provides one of the more complete lithologic descriptions of upper Eocene, Miocene, and Pliocene to Recent sedimentary strata in Chatham County.

The upper Eocene (Ocala Limestone) section of GGS Well 125 is approximately 225 feet thick and dominated by light-gray to white, fossiliferous limestone. The Miocene section is approximately 250 feet thick and consists of limestone with a 160-feet-thick cap of dark green phosphatic clay. This clay is regionally extensive and is known to occupy the Coosawatchie Formation of the Hawthorn Group (Furlow 1969; Arora 1984; Huddlestun 1988). The interval from approximately 80 feet to the surface is Pliocene to Recent in age and composed primarily of sand interbedded with clay and silt. This section is occupied by the Satilla and Cypresshead Formations (Huddlestun 1988).

1.2 LOCAL GEOLOGY

HAAF is located within the Barrier Island Sequence District of the Coastal Plain Physiographic Province of the Southeast United States (Clark and Zisa 1976). The Barrier Island Sequence District in Chatham and Bryan Counties is characterized by the existence of several marine terraces (step-like topographic surfaces that decrease in elevation toward the coast). These marine terraces, and their associated deposits, are the results of sea level fluctuations that occurred during the Pleistocene Epoch. The surficial (Quaternary) deposits in Chatham and Bryan Counties, in decreasing elevation and age, are part of the Okefenokee, Wicomico, Penholoway, Pamlico, and Silver Bluff terrace complexes (Wilkes et al. 1974; GA DNR 1976; Huddlestun 1988).

HAAF, as well as most of Chatham County, is underlain by the Pleistocene Pamlico Terrace. The Pleistocene Satilla Formation (formerly known as the Pamlico Formation) consists of deposits of the Pamlico Terrace complex and other terrace complexes in the region (Huddlestun 1988). The Satilla Formation is a lithologically heterogeneous unit that consists of variably bedded to non-bedded sand and variably bedded silty to sandy clay. During the Pleistocene, these sand and clay deposits were formed in offshore and inner continental shelf, barrier island, and marsh/lagoonal-type environments (Huddlestun 1988). According to the Geologic Map of Georgia (GA DNR 1976), clay beds of marsh origin, which were deposited on the northwest side of the former Pamlico Barrier Island complex, exist in the western quarter of HAAF. Very fine- to

coarse-grained sand deposits of barrier island origin are more common throughout the remaining areas of HAAF.

Based on the coring and sampling of unconsolidated strata at HAAF during the CAP-Part A investigations, it is concluded that all former underground storage tanks (USTs) were buried within the Satilla Formation, which is overlain by various soil types. Soil groups at HAAF include the Chipley, Leon, Ellabelle, Kershaw, Pelham, Albany, Wahee, and Ogeechee (Wilkes et al. 1974).

1.3 REGIONAL AND LOCAL HYDROGEOLOGY

The hydrogeology in the vicinity of HAAF is mostly influenced by two aquifer systems. These are referred to as the Principal (Floridan) Aquifer and the Surficial Aquifer (Miller 1990). The Principal Aquifer is the lowermost hydrologic unit and is regionally extensive from South Carolina through Georgia, Alabama, and most of Florida. Known elsewhere as the Floridan, this aquifer, approximately 800 feet in total thickness, is composed primarily of Tertiary-age limestone including the Bug Island Formation, the Ocala Group, and the Suwannee Limestone. Groundwater from the Floridan is used primarily for drinking water (Arora 1984). According to Miller (1990), one of the largest cones of depression produced in the Upper Floridan Aquifer exists directly beneath Savannah, Georgia. Net water-level decline in the Floridan system, between the predevelopment period and 1980, exceeded 80 feet beneath Savannah. In addition, according to 1980 estimates, more than 500 million gallons of water per day were withdrawn from the Floridan for public and industrial use in southeast Georgia, more than any other region.

The confining layer for the Principal (Floridan) Aquifer is the phosphatic clay of the Hawthorn Group. There are minor occurrences of aquifer material within the Hawthorn Group; however, they have limited utilization (Miller 1990). The Surficial Aquifer overlies the Hawthorn confining unit.

The Surficial Aquifer consists of widely varying amounts of sand and clay, ranging from 55 to 150 feet in thickness, and is composed primarily of the Satilla and Cypresshead Formations in the Savannah vicinity (Arora 1984). This aquifer is primarily used for domestic lawn and agricultural irrigation. The top of the water table ranges from approximately 2 to 10 feet below ground level (Miller 1990). Groundwater in the Surficial Aquifer system is under unconfined, or water table, conditions. However, locally, thin clay beds create confined or semiconfined conditions, as is the case at HAAF where thin, surficial clay beds are present in the west quadrant (GA DNR 1976).

Groundwater encountered at all the UST investigation sites is part of the Surficial Aquifer system. Based on the fact that all public and non-public water supply wells draw water from the Principal (Floridan) Aquifer, and that the Hawthorn confining unit separates the Principal Aquifer from the Surficial Aquifer, it is concluded that there is no hydraulic interconnection between UST sites (and associated plumes, if applicable) and water supply withdrawal points (Figure X-A).

1.4 GEOLOGIC AND HYDROGEOLOGIC CONDITIONS AT THE FORMER UST 117, BUILDING 7002, SITE

According to Wilkes et al. (1974), the soil common at the Bulk Fuel Facility consists of the Chipley-Urban land complex (Cuc). This complex contains 40 to 70 percent Chipley soils and 20 to 40 percent Urban Land soils. The surface layer of this complex is very dark grayish brown to gray, with the underlying layer being olive brown to light yellowish brown mottled with gray.

A seasonal high water table is 15 to 36 inches below the surface. In places, the soil profile has been altered due to the cutting, filing, and grading activities resulting from urban development (Wilkes et al. 1974).

During direct-push sampling events at the Former UST 117 site, three major unconsolidated sediment types were encountered (Figures 4b and 4c, Appendix I). These include: (1) poorly graded sand with silt; (2) clay with silt and sand; and (3) moderately to well graded, clean quartz sand.

Groundwater encountered at the site is part of the Surficial Aquifer System. Based on the fact that all public and non-public water supply wells draw water from the Principal (Floridan) Aquifer, and that the Hawthorn confining unit separates the Principal Aquifer from the Surficial Aquifer, it is concluded that there is no hydraulic interconnection between the Surficial Aquifer (and associated groundwater plumes) located beneath the Former UST 117 site and identified water supply withdrawal points.

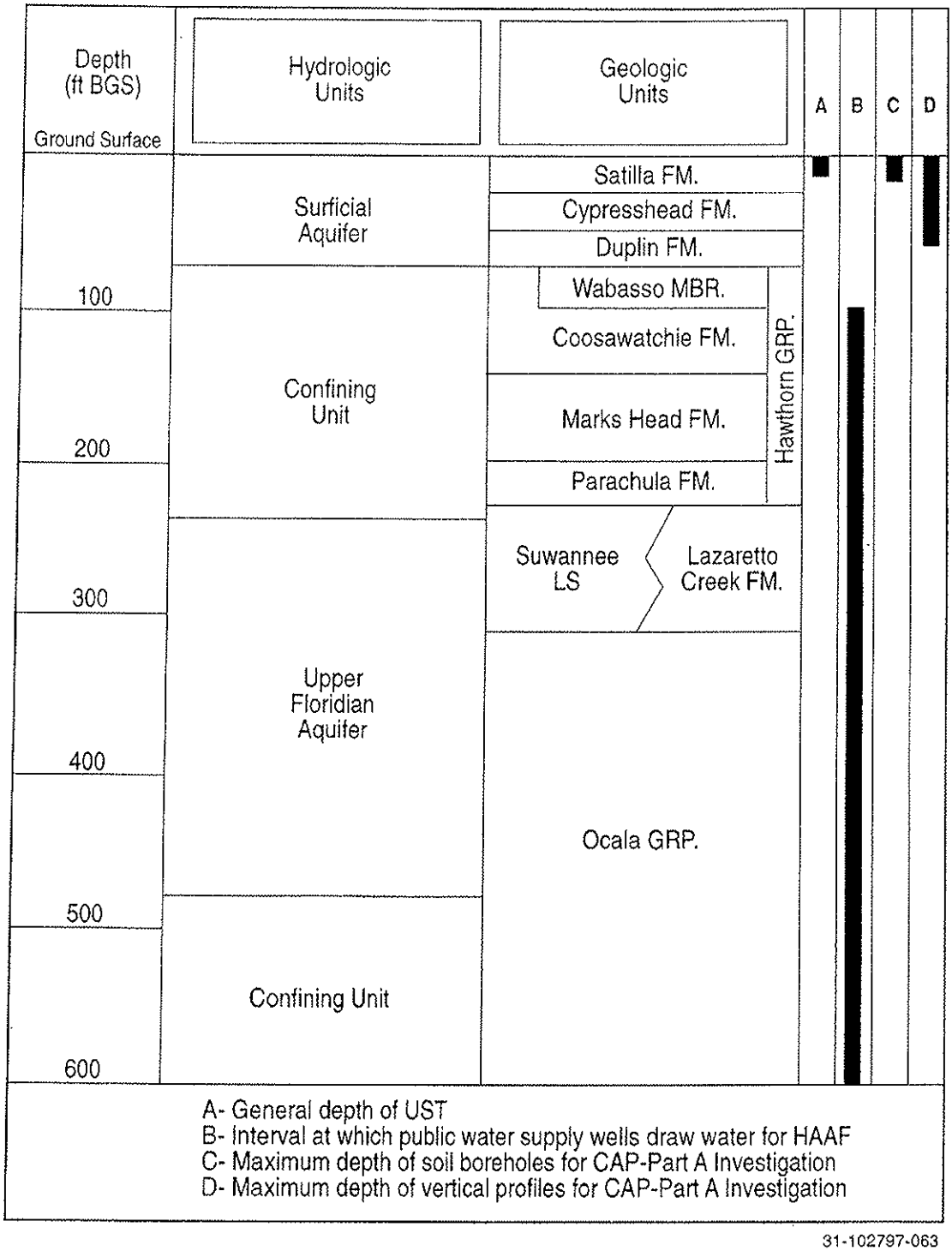

Figure X-A. Generalized Stratigraphy of Chatham County, Georgia

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Appendix C

Soil Boring Logs/Well Construction Diagram MW Installation (CAP Part A for Release #1)

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HTRW DRILLING LOG	DISTRICT Savannah Corp's	HOLE NUMBER SB-4
1. COMPANY NAME SAIC	2. DRILL SUBCONTRACTOR SAIC Middletown	SHEET 1 OF 3 SHEETS

3. PROJECT HAAF Bulk Fuel Facility	4. LOCATION Bulk Fuel Facility in Rd
5. NAME OF DRILLER John Haselhoff	6. MANUFACTURER'S DESIGNATION OF DRILL Geoprobe 540Ø
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4' x 2¼" Macrocore barrels w/ Acetate liners 2½" well slotting rods. Sch. 40 PVC	8. HOLE LOCATION See map
	9. SURFACE ELEVATION 17.3 ft AMSL
	10. DATE STARTED 12/3/99 — 11. DATE COMPLETED 12/3/99
12. OVERBURDEN THICKNESS greater than T.D.	15. DEPTH GROUNDWATER ENCOUNTERED Top of Saturated zone @ 9.1' BGS.
13. DEPTH DRILLED INTO ROCK NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED after we pierced clay zone @ 9.1 - WL up to 5.5' BGS
14. TOTAL DEPTH OF HOLE 13.Ø' BGS	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

18. GEOTECHNICAL SAMPLES	DISTURBED X	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	~~METALS~~	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	BTEX	TPH-GRO/Mois.	PAH, TPH DRO	PAH	—	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
		—		Robert Bonnett

LOCATION SKETCH/COMMENTS — SCALE:

See page 47 - Key to log

PROJECT	HOLE NO
AAAF BFF HAA-Ø9	SB-4

ENG FORM 5056-R, AUG 94 (Proponent CECW-EG)

DRILLING LOG

PROJECT HAAF - BFF | INSPECTOR Heather L Smith | HOLE NUMBER SB-4 | SHEET 2 of 3

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
		Concrete core.	overcore			START 1255 FINISH 1300 RUN 4.0 REC 2.8 LOSS 1.3 .7 from concrete in Rd
	1.0	(SC) Clayey Sand fine gr. sand slightly moist firm to hard, nonplastic 10YR 3/1 Very dk. grey	0			
	2.0	(SC) clayey Sand beginning to be mottled w/ (color change) 10YR4/6 dk yellowish brn.	0			
	3.0	(SC) clayey Sand (color change) as above but now predominantly 10YR4/6 dk yellowish brown	0			headspace 0.7-3.5' BGS = 0.6 ppm
	4.0	Loss				
		(SC) clayey Sand (color change) nonplastic fine gr sand soft to firm slightly moist 5Y 4/4 olive	0			START 1300 FINISH 1305 RUN 4.0 REC 4.0 LOSS 0 (WL after hole to 12.0' BGS.)
	5.0	(CL) Lean Clay firm to hard, dense high plasticity, moist trace fine gr Sand 5Y3/1 Very dk grey mottled w/ 2.5Y4/4 olive brown (<10% mottling)	0			
	6.0		0			headspace 4-6' BGS @0.1 ppm
	7.0	dashed line	0			headspace 6'-8' BGS @0.1 ppm
		(CL) Lean Clay (w/ trace Sand) mottled color 10YR4/1 grey w/ 10YR4/6 dk yellowish brown (<30% mottling)	0			
	8.0	(SC) Clayey Sand fine gr sand, firm to hard. Slightly moist low plasticity	0	HS 12-3-99	B.0-9.1 Analytical Sample #BF0411 @1310	START FINISH RUN 4.0 REC 3.0 LOSS 1.0
	9.0	10YR 3/1 Very dark grey			8.5 Water Sampling 8.5->12.5	
		(SM) Silty Sand - med. gr Sand SATURATED ZONE, soft, nonplastic 10YR6/1 grey	0	HS 12-3-99	HBF0412 @1320	headspace 8-10' BGS 1.2 ppm
	10.0	(SC) Clayey Sand fine gr sand, firm moist -> slightly moist 10YR4/6 dk yellowish brown	0			

PROJECT HAAF - BFF | HOLE NO SB-04

DRILLING LOG

PROJECT: HAAF - BFF | INSPECTOR: Heather L Smith | HOLE NUMBER: SB-4 | SHEET: 3 of 3

99

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
		(Sm) Silty Sand. W/ TRACE Clay fine → med gr. QTZ sand (Wet) 5Y8/1 white		Geotech Sample 1ϕ-11' BGS #BFϕ411	Water Sampling Screened 8½-12½ #BFϕ412	
	11.ϕ	Loss				
	12.ϕ	Bottom of coring. Did not collect core		#S 12-3-99	#S 12-3-99	Bottom of Run 3
	13.ϕ					B.O.B. 13.ϕ' BGS
	14.ϕ					

Heather L Smith 12/ϕ3/99

PROJECT: HAAF - Bulk Fuel Facility | HOLE NO: SB-4

HTRW DRILLING LOG

1. COMPANY NAME: SAIC	2. DISTRICT: Savannah Corps	HOLE NUMBER: SB-05
	2. DRILL SUBCONTRACTOR: SAIC - Middletown	SHEET 1 OF 3 SHEETS

3. PROJECT: HAAF - BFF

4. LOCATION: Bulk Fuel Facility

5. NAME OF DRILLER: John Haselhoff

6. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe 5400

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4' x 2¼" Macrocores w/ Acetate liner (core); 2¼" Well setting Rods; Sch 40 PVC - Well Screen/Casing

8. HOLE LOCATION: See map

9. SURFACE ELEVATION:

10. DATE STARTED: 12-3-99

11. DATE COMPLETED: 12-3-99

12. OVERBURDEN THICKNESS: greater than total depth.

13. DEPTH GROUNDWATER ENCOUNTERED: 1st Saturated Core @ 7.5' BGS.

14. DEPTH DRILLED INTO ROCK: NA

15. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 4.6' BGS immed. after well inst.

16. TOTAL DEPTH OF HOLE: 13.0' BGS

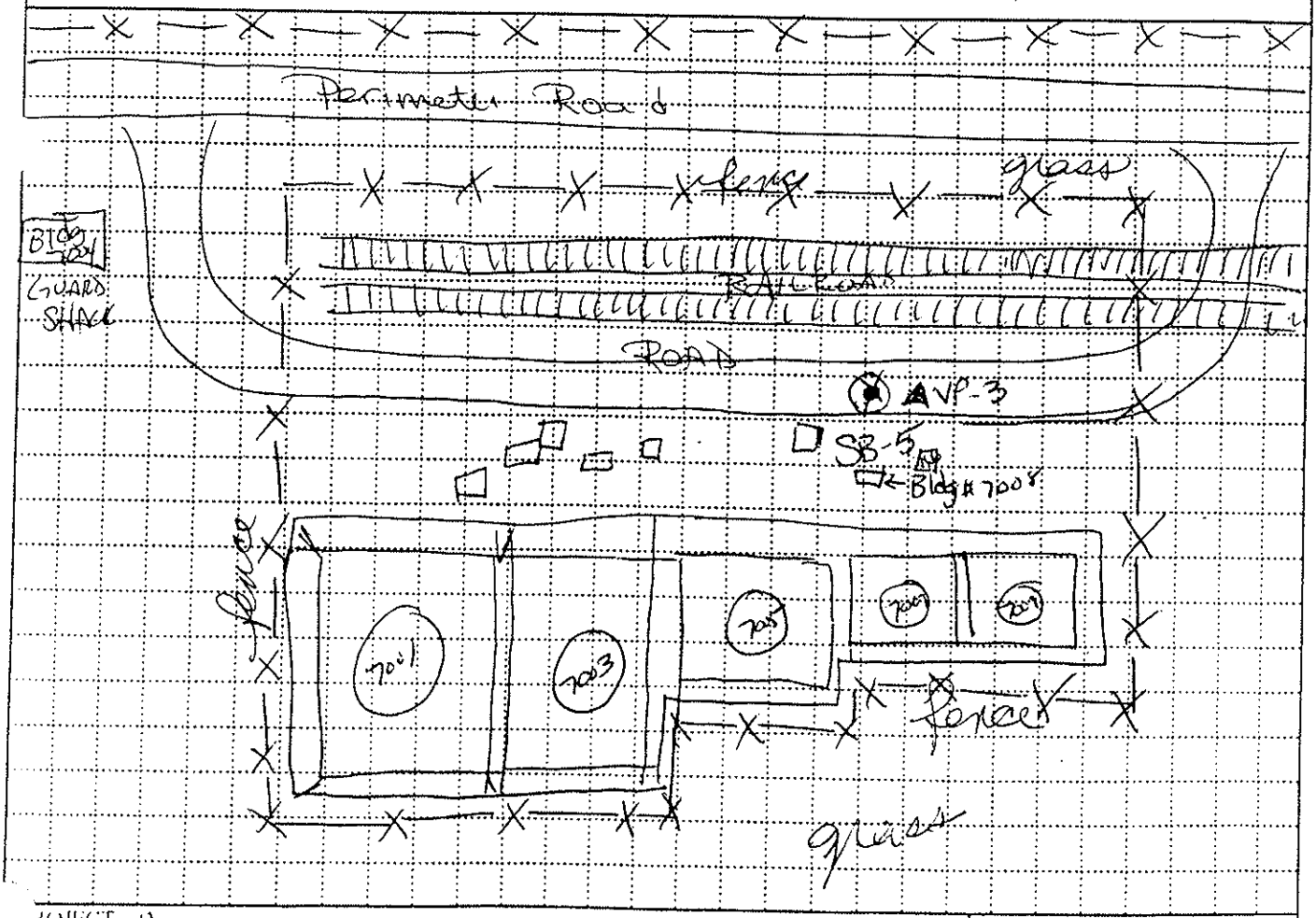
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
#BF05-11	X		NA

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	~~METALS~~	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
#BF05-11 & #BF05-12	BTEX	PAH	TPH-GRO-Moisture		PAH, TPH-DRO	NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	—	X	—	Heather L. Smith

LOCATION SKETCH/COMMENTS — SCALE: NONE



PROJECT: HAAF, Bulk Fuel Facility

HOLE NO: SB-05

ENG FORM 5056-R, AUG 94 (Proponent CECW-EG)

DRILLING LOG

PROJECT	INSPECTOR	HOLE NUMBER	SHEET
HAAF - BFF	Heather L Smith	SB-05	2 of 3

9

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
		Concrete	overcore Øppm			START : 1440 FINISH : 1445 RUN : 4.0 REC : 3.4 LOSS : Ø.6 Ø.6 - Concrete Core
	1.Ø	(SC) - Clayey Sand (<20% Sand) med → fine gr sand, firm → hard, moist nonplastic 2.5Y3/3 dk. olive brown	Øppm			1.Ø
	2.Ø	(SC) - Clayey Sand ~~Med~~ fine gr sand w/ lean clay mtrl Firm → HARD - slightly moist	Øppm			HEADSPACE Ø-2' BGS = Ø.7 ppm; 2.Ø
	3.Ø	2.5Y 3/2 very dk. greyish brown	Øppm			HEADSPACE 2'-4' BGS = Ø.2 ppm; 3.Ø
	4.Ø	(CL) - Lean Clay Soft, moist Dense, high plasticity trace amt of fine gr. Sand	Øppm			4.Ø
	5.Ø	Color is predominantly 5Y 3/1 Very dk grey w/ <10% Streaking w/ 2.5YR4/4 olive brown	Øppm		5.5	1445 : START 1450 : FINISH (start w/ after well ...) 4.0 : RUN 4.0 : REC Ø : LOSS; 5.Ø
	6.Ø	until you get to ~7.1' BGS Where 2.5YR4/4 staining increases to ~5Ø%	Øppm	Geotech Sample ID #BFØ511 collected from 5.5-7.5' BGS	Sample ID # BFØ511 @1450	HEADSPACE 4'-6' BGS = 1.Ø ppm; 6.Ø
	7.Ø		Øppm		7.5	HEADSPACE 6'-8' BGS Ø.9 = ~~1.5~~ ppm 12-3-96; 7.Ø
		(SM) - Silty Sand, Soft, nonplastic fine → med gr. Sand. WET Sm. amt of silt (<20%) 5GY4/1 GREENISH GREY	Øppm			TOP of Saturated Core
	8.Ø	Bottom of CORING			8.Ø	8.Ø
	9.Ø	DID NOT CORE HERE			Water Sample #BFØ512 @1500 Screen 8-12' BGS	START FINISH RUN REC LOSS — DID NOT COLLECT CORE; 9.Ø
	10.Ø					10.Ø

PROJECT: HAAF Bulk Fuel Facility

HOLE NO: SB-05

DRILLING LOG

PROJECT: HAAF, Bulk Fuel Facility | INSPECTOR: Heather L Smith | HOLE NUMBER: SB-05 | SHEET: 3 of 3 | ID

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	11.0	DID NOT COLLECT CORE HERE			water sampling from 8-12' bgs	
	12.0	DIRECT PUSH TO 13' & INSTALL WELL			12.0	
	13.0					B.O.B. 13.0' bgs
	14.0					

HTRW DRILLING LOG

1. COMPANY NAME: SAIC	2. DISTRICT: Savannah	HOLE NUMBER: SB25/MW-25 (47)
	3. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 3 SHEETS

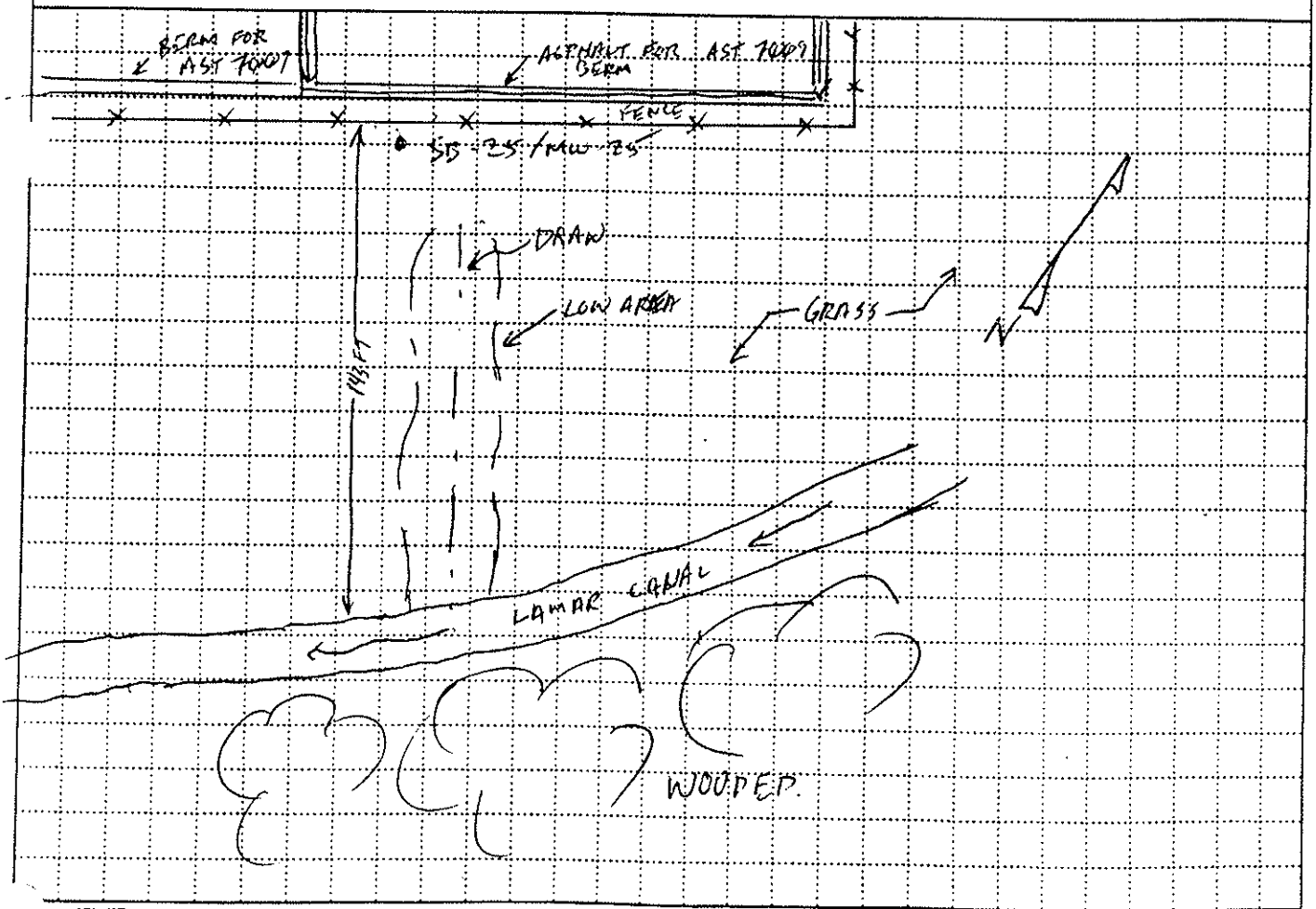
5. PROJECT: CAD. Part A, BFF HHA-09, HHAF	4. LOCATION: Bulk Fuel Facility, Hunter AAF
7. NAME OF DRILLER: Al Root	6. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe 5400
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 2 INCH O.D. SAC 4.0 FT LENGTH MACRCORE; 3.5 FT LENGTH, 1 INCH O.D STEEL SCREEN; 2.25 INCH O.D., 4 FT LENGTH STEEL CASING FOR WELL INSTALLATION	8. HOLE LOCATION: SB-25
	9. SURFACE ELEVATION: TBD by Surveyor
	10. DATE STARTED: 12/02/99 — 11. DATE COMPLETED: 12/02/99
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: 7.6 FT BGS TO SATURATED ZONE
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED (DEPTH USED TO CALCULATE IN SAME WELL): 5.3 FT BGS AFTER WATER SAMPLE COLLECTION
14. TOTAL DEPTH OF HOLE: 13.5 FT BGS.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): 4.6 FT BGS AFTER WELL INSTALLATION.

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
BF25 11	BF25@1	N/A	N/A

20. SAMPLES FOR CHEMICAL ANALYSIS: SOIL / WATER	STEEL	PLASTIC	OTHER (SPECIFY): TPT-GLD	OTHER (SPECIFY): PART/WATER	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
BF25 11 / BF25 12	1 / 1	1 / 0	1 / 0	0 / 1		90%

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Monitoring Well		MW-25		M. H. Hall

LOCATION SKETCH/COMMENTS — SCALE:



PROJECT: BFF, CAP-4, Hunter Army Airfield — HOLE NO: SB-25/MW-25

ENG FORM 5056-R, AUG 94 (Proponent CECW-EG)

DRILLING LOG

PROJECT: CAPH, BFF HHH-09 HHHF | INSPECTOR: [illegible] | HOLE NUMBER: SB-25/MW-25 | SHEET: 2 of 3

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	0	Q - CH, MOIST SOFT ROOTS AND GRASS, DARK BRN	BZ: 0.0 FS: 0.0 HS: 0.0	N/A	N/A	START: 0758 STOP: 0800 RUN: 4.0. RECOV. 3.2 FT
	1	CH - FIRM TO HARD, MOIST, FAT CLAY WITH SAND, MODERATE PLASTICITY 10YR2/1 black to 10YR 3/3 dark brown ORGANIC RICH				
	2		FS: 0.0 HS: 0.0	N/A	N/A	
	3	NO RECOVERY				
	4	SAME AS ABOVE	BZ: 0.0 FS: 0.0 HS: 0.4	BF2511 GEOTECH SAMPLE 3.6 - 5.6 @825	N/A	START: 0803 STOP 0805 RUN: 4.0 FT RECOV.: 4.0 FT
	5	- - - - - GRADATIONAL CONTACT CH - FIRM, MOIST, FAT CLAY WITH SAND, HIGH PLASTICITY MOTTLED COLOR 10YR 3/3 DARK BROWN & 10YR 5/1 GRAY - - - GRAD. CONT.			BF2511 5.6 - 7.6 FT BGS @816 SOIL SAMPLE	
	6		FS: 0.0 HS: 0.5	N/A		
	7	CH - SOFT, VERY MOIST, FAT CLAY WITH INCREASING SAND (20% fine grained)				
	8	- - - - - SATURATED ZONE 7.6 FT BGS SP. SM: Poorly sorted sand with silt, wet 7.5YR 5/0 GREY	BZ: 0.0	N/A	BF2512 7.6 - 12.6 FT BGS WATER SAMPLE @836	START: 0815 STOP: 0826 PUSHING STEEL SCREEN FOR WATER SAMPLE COLLECTION TO 12.0 FT BGS
	9	SOIL NOT COLLECTED FOR DESCRIPTION.				
	10					

PROJECT: CAP A, BFF HAA-09, HAAF | HOLE NO: SB-25/MW-25

DRILLING LOG

PROJECT: CAP-A BFF HHA-09, HHAF | INSPECTOR: [signature] | HOLE NUMBER: SB-25/MW-25 | SHEET: 3 of 3

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ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	10.0	SOIL NOT COLLECTED FOR DESCRIPTION	N/A	N/A	BF2512 CONT'D	SEE PREVIOUS PAGE
	11					
	12		N/A	N/A		TIME / WATER TAG @0900 5.3 FT BGS
	13		BZ=0.0	N/A		START: 0905 STOP: 0910 PUSH 2.25 INCH STEEL CASING TO 13.5 FEET BGS
	13.5	TD: 13.5				
	14					

10.0 — 11.0 — 12.0 — 13.0 — 14.0

MAH 12/02/99

PROJECT: CAP. PART A, BFF HHA-09, HAAF | HOLE NO: SB-25/MW-25

HTRW DRILLING LOG

1. COMPANY NAME: SAIC	2. DISTRICT: USACE - Savannah	3. HOLE NUMBER: SB-26/MW-26 (57)
4. DRILL SUBCONTRACTOR: SAIC		5. SHEET 1 OF 3

6. PROJECT: CAP - PART A, BFF HAA-09

7. LOCATION: BULK FUEL FACILITY HAA-09, HAAF

8. NAME OF DRILLER: Al Root

9. MANUFACTURERS DESIGNATION OF DRILL: GEOPROBE 5400

10. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 3.5 LENGTH, 1.0 IN O.D STEEL SLOTTED SCREEN FOR WATER SAMPLE COLLECTION; 4.0 FT LENGTH; 2 -INCH DIAMETER SOIL MACRORER

11. HOLE LOCATION: SB-26

12. SURFACE ELEVATION: TBD by Surveyor

13. DATE STARTED: 12/02/99

14. DATE COMPLETED: 12/02/99

15. OVERBURDEN THICKNESS: N/A

16. DEPTH GROUNDWATER ENCOUNTERED: 7.1 feet BGS to saturated zone

17. DEPTH DRILLED INTO ROCK: N/A

18. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 4.3 FT BGS, 35 minutes

19. TOTAL DEPTH OF HOLE: 12.5 feet

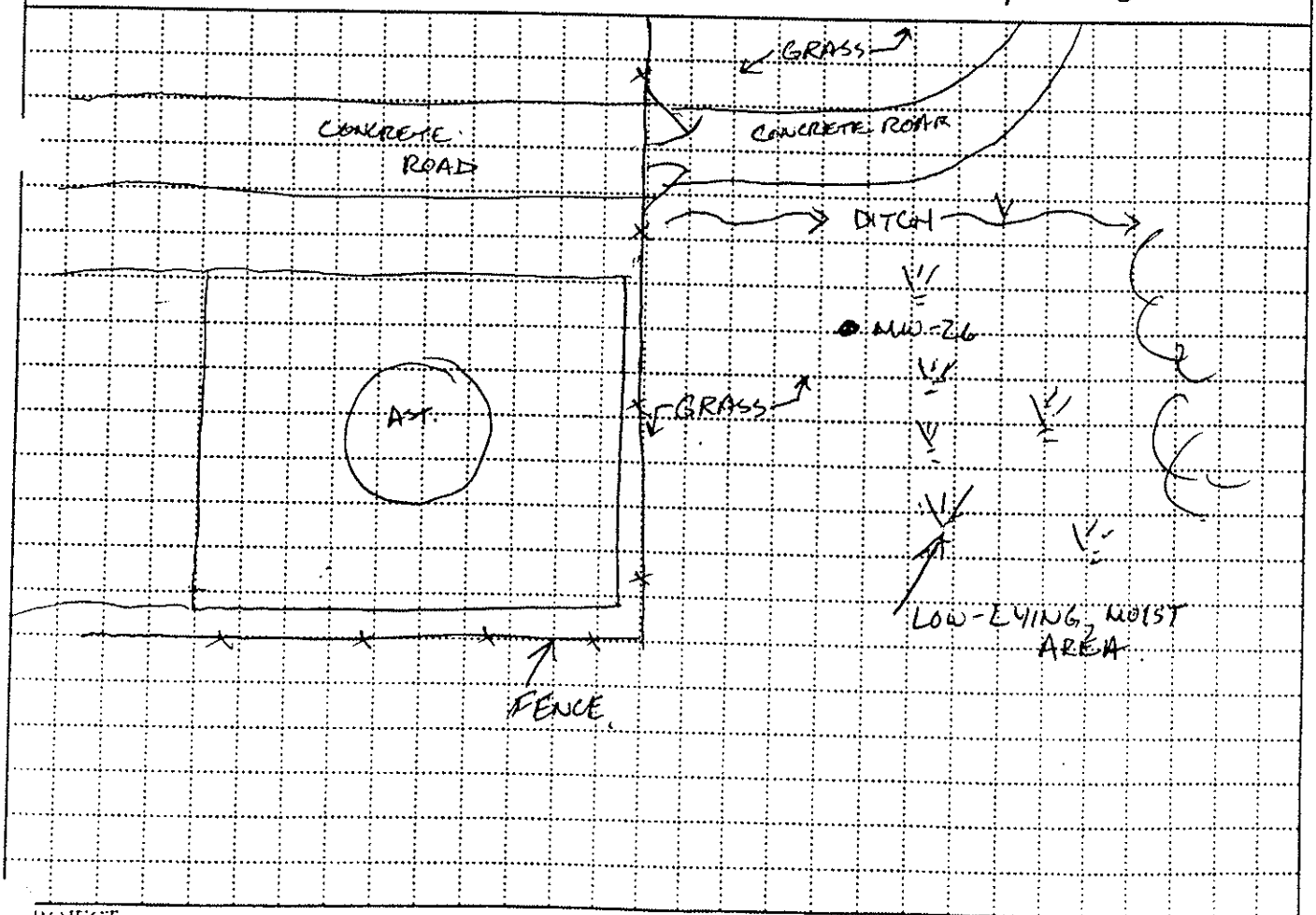
20. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): —

21. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	22. TOTAL NUMBER OF CORE BOXES
BF2611	✓	NA	NA

23. SAMPLES FOR CHEMICAL ANALYSIS	VOC BTEX	METALS Pb	OTHER (SPECIFY) TPH-DRO	OTHER (SPECIFY) TPH-GRO	OTHER (SPECIFY)	24. TOTAL CORE RECOVERY
BF2611 / BF2612	1 / 1	1 / 1	1 / 0	1 / 0	NA	90 %

25. DISPOSITION OF HOLE				26. SIGNATURE OF INSPECTOR
	BACKFILLED	MONITORING WELL MW-26	OTHER (SPECIFY)	Richard Hall

LOCATION SKETCH/COMMENTS: ● MW-26 SCALE: 1" = ~80'



PROJECT: CAP - PART A, BFF HAA-09, HUNTER AAF

HOLE NO: SB-26

ENG FORM 5056-R, AUG 94

(Proponent CECW-EG)

DRILLING LOG

PROJECT: CAPA, BFF HAA-09, HAAF | INSPECTOR: Mitchell Hall | HOLE NUMBER: SB-26/MW-26 | SHEET: 2 of 3

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D) (ppm)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	0	OL/OH - ORGANIC RICH TOP SOIL, MOIST SOFT	BZ = 0.0 FS = 0.0 HS = 0.0	N/A	N/A	START: 1242 STOP: 1244 RUN: 4.0 FT RECOVERY: 3.2 FT
	1	- - - GRADATIONAL CONTACT CH - FIRM, MOIST FAT CLAY W/ SAND (FINE GRAINE) ORGANIC RICH				
	2		FS = 0.0 HS = 0.8	N/A	BFZ611 1.2-3.2 SOIL SAMPLE 1248	
	3	- - - - - GRADATIONAL CONT MH - ELASTIC SILT; SEE DESCRIPTION BELOW				
		No RECOVERY	N/A		NA	
	4	MH - Elastic Silt w/ sand and clay, very soft, plastic MOIST 10YR 2/2 VERY DARK BROWN	BZ = 0.0 FS = 0.0 HS = 0.0	BFZ611 4.0-6.0 GEOTECH SAMPLE 1255		START: 1245 STOP: 1247 RUN: 4.0 FT RECOVERY: 4.0 FT
	5	- - - GRADATIONAL CONT - SP-SM POORLY SAND W/ SILT AND GRAVEL MOIST, (Medium to coarse grained sand. 10YR 4/6 Dark yellowish brown.				
	6		FS = 0.0 HS = 0.0	NA	N/A	
		SHARP CONT.				
	7	SW/SP FINE GRAINED WELL SORTED SAND INTERBEDDED SATURATED ZONE ▽ WITH POORLY SORTED SAND (Fine to medium grained) 10YR 7/2 LIGHT GREY			BFZ612 7.2-12.2 WATER SAMPLE 1315	
		- - - GRADATIONAL CONT. -				
	8	SP-SM & CLAY POORLY SORTED FINE SAND SILT INTERBEDDED WITH CLAY LAMINATIONS LIGHT GRAY AND DARK GREEN, WET	BZ = 0.0	NA		START: 1255 STOP: 1305 PUSHED STEEL SCREEN TO 12.2 FT BGS AND PULLED UP 1.5 FEET FOR GROUNDWATER SAMPLE COLLECTION
	9	SOIL NOT COLLECTED FOR DESCRIPTION				
	10					

PROJECT: CAP - PART A, BFF - HAA-09, HAAF | HOLE NO: SB-26, MW-26

DRILLING LOG

PROJECT: CAP A, BFF HAA-09, HAAF | INSPECTOR: Richard Hall | BOH NUMBER: SB-26 / MW-26 | SHEET: 3 of 3

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D) (ppm)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	10	SOIL NOT COLLECTED FOR DESCRIPTION	BZ: 0.0	N/A	BFF26124 CONT'D	See previous page
	11					
				NA		TIME / WATER TAGGED 1330 / 4.85 1340 4.3
	12					
		TD=			NA	START: 1330 WELL STOP: 1350 INSTALLED
	13					

MTH 12/02/99

PROJECT: CAP A, BFF HAA-09, HAAF | HOLE NO: SB-26 / MW-26

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HTRW DRILLING LOG

1. COMPANY NAME: SAIC	DISTRICT: Savannah	HOLE NUMBER: SB-27
2. DRILL SUBCONTRACTOR: SAIC		SHEET 1 OF 3 SHEETS

3. PROJECT: CAP - Part A

4. LOCATION: BFF HAA-09, HAAF

5. NAME OF DRILLER: Al Root

6. MANUFACTURERS DESIGNATION OF DRILL: Geoprobe 5400

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 1-IN OD/3.5 LENGTH STEEL SCREEN, 2.25 O.D STEEL CASING FOR WELL PLACEMENT; 4-FT LENGTH 2-IN OD MACROCORE

8. HOLE LOCATION: SB-27 OUTSIDE OF BERM AT AST 7009

9. SURFACE ELEVATION: TBD by Surveyor

10. DATE STARTED: 1/11/00

11. DATE COMPLETED: 1/11/00

12. OVERBURDEN THICKNESS: NA

13. DEPTH DRILLED INTO ROCK: NA

14. TOTAL DEPTH OF HOLE: 12.5 Ft

15. DEPTH GROUNDWATER ENCOUNTERED: 7.0 FT TO SATURATED ZONE

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: N/A

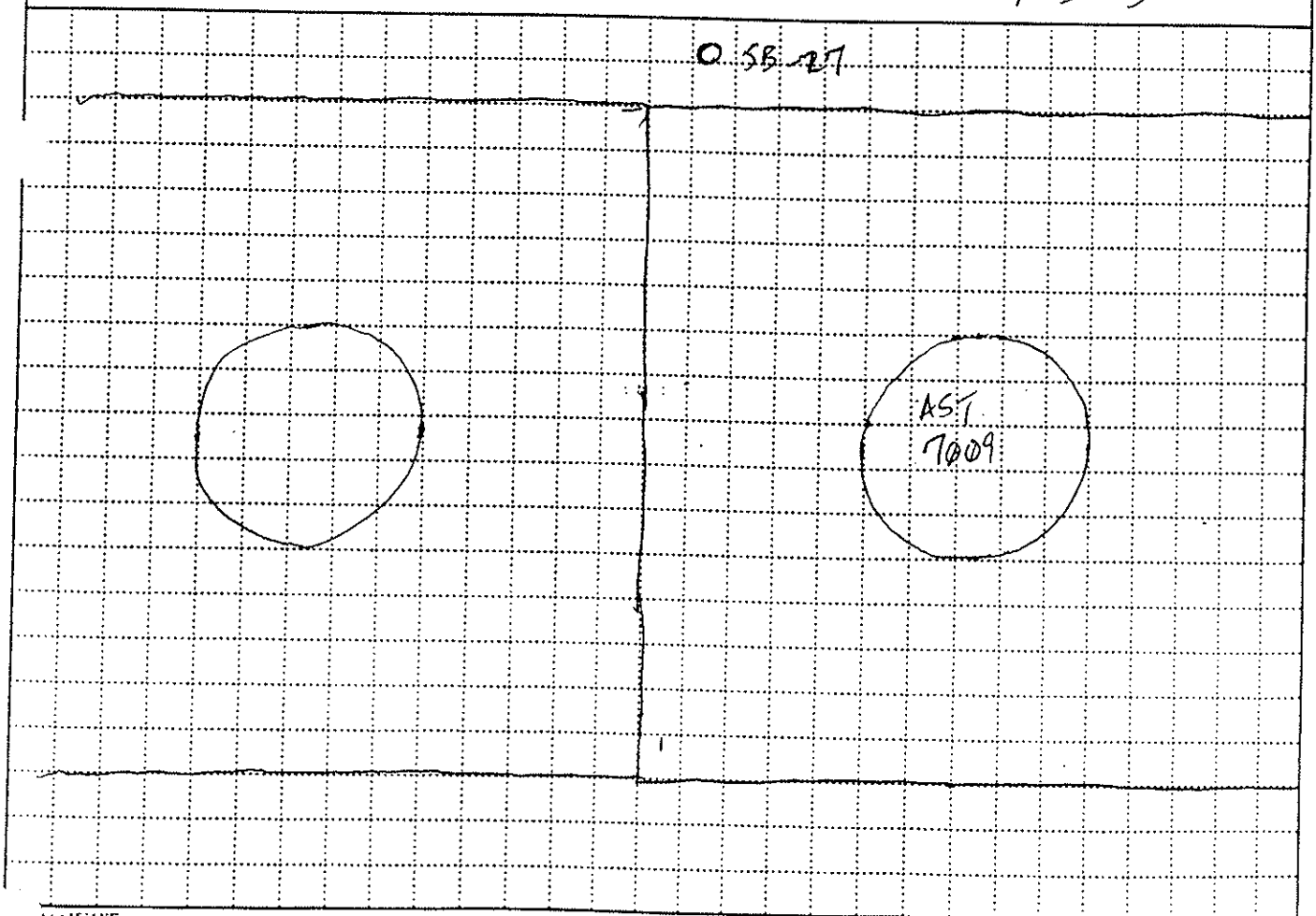
17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): N/A

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
BF2711	✓	NA	NA

20. SAMPLES FOR CHEMICAL ANALYSIS	BTEX	METALS	OTHER (SPECIFY) TPH-DRO	OTHER (SPECIFY) TPH-GRO	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
BF2711 / BF2712	1 / 2	1 / 2	1 / 0	1 / 0	NA	66

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
MW-27		✓		Richard Hall

LOCATION SKETCH/COMMENTS: ● BORING LOCATION — SCALE: 1" = ~32'



PROJECT	HOLE NO
CAP-PART A, BFF HAA-09, HAAF	SB-27

ENG FORM 5056-R, AUG 94

(Proponent CECW-EG)

DRILLING LOG

PROJECT: CAP: PART A, BFF HAA-09 HAAF | INSPECTOR: Mitch Hall | HOLE NUMBER: SB-27 | SHEET: 2 of

ELEV (ft)	DEPTH (ft)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D) (ppm)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	0	NO RECOVERY	BZ: 0.0	NA	NA	START: 1416 STOP: 1417 RUN: 4.0 FT RECOVERY: 0 FT
	2			NA	NA	NO RECOVERY.
	4	CH - SP - SANDY FAT CLAY 10YR2/2 very dark brown and 10YR3/4 dark yellowish brown moist	BZ: 0.0 FS: 0.0 HS: 0.0	NA	NA	START: 1418 STOP: 1420 RUN: 4.0 FT RECOV: 4.0 FT
	6	gradational contact. CH - FAT CLAY, MOIST, GRADING INTO SANDY ~~AT~~ CLAY AT 6.5 FT. GLEY 4/1	FS: 0.0 HS: 0.0	BF2711 1425 5.0-7.0 ~~SOIL~~ GEOTECH SAMPLE	BF2711 1425 5.0-7.0 SOIL SAMPLE	
	7	▽ SW-SP/CH INTERBEDDED WELL GRADED SAND WITH POORLY GRADED SAND AND SILT, WET. 10YR7/1 (Light gray) for well graded sand. and gray for poorly graded sand, some glauconitic layers present (green).		NA	BF2712 1455 7.0-12.0 FT WATER SAMPLE	
	8		BZ: 0.0			START: 1425 SOIL CORE 8-12 STOP: 1428 RUN: 4.0 FT RECOVER: 4.0 FT
	9			NA		START: 1445 STEEL STOP: 1455 SCREEN PUSHED TO 12 FEET FOR WATER SAMPLE
	10					

PROJECT: CAP - PART A, BFF HAA-09, HAAF | HOLE NO: SB-27

DRILLING LOG

PROJECT: CAP-A, BFF HAA-09, HAAF | INSPECTOR: Mitch Hall | HOLE NUMBER: SB-27 | SHEET: 3 of 3

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ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	11	SAME AS ABOVE WITH WOOD FRAGMENT	BZ: 0.0	NA	BFF12 CONT'D	SEE PREVIOUS PAGE
	12	CH- FAT CLAY, WET GREY GLEY 4/1	BZ: 0.0		NA	START: 1525 STOP: 1540 WELL INSTALLED.
		TD = 12.5 ft.				

AWH 1/11/00

PROJECT: CAP-PART A, BFF HAA-09, HAAF | HOLE NO: SB-27

HTRW DRILLING LOG

1. COMPANY NAME: SAIC	DISTRICT: Savannah	HOLE NUMBER: SB-35
	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 1

3. PROJECT:	4. LOCATION: HAAF
5. NAME OF DRILLER: M. Bock	6. MANUFACTURERS DESIGNATION OF DRILL: GeoProbe 54DD
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 2" Macro Core Sampler, Acetate Liner	8. HOLE LOCATION: BFF
	9. SURFACE ELEVATION:
	10. DATE STARTED: 11-30-00 / 11. DATE COMPLETED: 11-30-00
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: 4.0'
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:
14. TOTAL DEPTH OF HOLE: 8.0'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES: NA	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: NA			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	BTEX					
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR: Kenneth Jordan		
	Bentonite					

LOCATION SKETCH/COMMENTS: See Page 3

SCALE:

NOTE TYPE OF MONITORING (i.e., borehole cuttings, monitoring well atmosphere, soil core, breathing zone, venting compressor air, etc.)

QA CHECK BY: Anthony Moore 12/19/00

HTRW DRILLING LOG

HOLE NUMBER SB-35 | 13

PROJECT: | INSPECTOR JKL | SHEET 1 OF 1

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		Gravel				
	1	SILTY SAND (SM), 20% silt, fine grained, dry, subrounded, very soft, Gray, 10YR-5/1	7.3 ppm			
	2	Clayey SAND (SC), 15% clay, fine grained, moist, low plasticity, soft, Brown, (10YR-4/3), mottled with Brownish Yellow, 10YR-6/8				
	3	SILTY SAND (SM) 20% silt, fine grained, soft, dry, Yellowish Brown, 10YR-5/4				
	4	No Recovery				▽ WT = 4.0
	5	FAT CLAY (CH), soft, Wet, Olive Gray, 5Y-4/2 mottled with Yellow, 10YR-7/8				
	6					
	7	Grading to SANDY FAT CLAY, (CH), fine grained, 25% sand, Firm, wet, Medium plasticity, Light Olive Gray, 5Y-6/2				
	8	No Recovery				Bottom of Hole = 8.0'
	9					
	10					

3

HTRW DRILLING LOG

HTRW DRILLING LOG	DISTRICT: Savannah	HOLE NUMBER SB-36
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 1

3. PROJECT:	4. LOCATION: HAAF
5. NAME OF DRILLER: M. Bock	6. MANUFACTURERS DESIGNATION OF DRILL: Portable GeoProbe
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 2" MacroCore Sampler, Acetate Liner	8. HOLE LOCATION: BFF
	9. SURFACE ELEVATION:
	10. DATE STARTED: 11-30-00 / 11. DATE COMPLETED: 11-30-00
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: 3.6'
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:
14. TOTAL DEPTH OF HOLE: 6.0'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA			NA

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	BTEX		PAH	TPH-DRO	TPH-GRO	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	Bentonite			[signature]

LOCATION SKETCH/COMMENTS See Page 21 SCALE:

well atmosphere, soil core, breathing zone, venting compress air, etc.)

(Signature and Date)

HTRW DRILLING LOG

HOLE NUMBER SB-36

PROJECT:

INSPECTOR JKL

SHEET 1 OF

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0	Gravel & Coarse Sand	1210 ppm		BF3611	
	1	CLAY with SAND (CH), 30% fine sand, low plasticity, firm, dry, Dark Brown, 10YR-3/3				
	2		752 ppm			
	3	No Recovery				
		Same as above				
	4	CLAY (CH), high plasticity, firm, wet, Dark Gray, 10YR-4/1				▽ WL = 3.6'
	5					
	6	No Recovery				
						Bottom of hole = 6.0'
	7					
	8					
	9					
	10					

HTRW DRILLING LOG

DISTRICT: Savannah

HOLE NUMBER: SB-37

1. COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: SAIC

SHEET 1 OF 1

3. PROJECT:

4. LOCATION: HAAF Portable

5. NAME OF DRILLER: M. Back

6. MANUFACTURERS DESIGNATION OF DRILL: Geo Probe 5400

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 2" MacroCore Sampler, Acetate liner

8. HOLE LOCATION: BFF

9. SURFACE ELEVATION:

10. DATE STARTED: 11-30-00

11. DATE COMPLETED: 11-30-00

12. OVERBURDEN THICKNESS: NA

15. DEPTH GROUNDWATER ENCOUNTERED: 3.5'

13. DEPTH DRILLED INTO ROCK: NA

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:

14. TOTAL DEPTH OF HOLE: 6.0'

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES: NA — DISTURBED — UNDISTURBED

19. TOTAL NUMBER OF CORE BOXES: NA

20. SAMPLES FOR CHEMICAL ANALYSIS: VOC: BTEX; METALS: ; OTHER (SPECIFY): PAH; OTHER (SPECIFY): TPH-GRO; OTHER (SPECIFY): TPH-DRO

21. TOTAL CORE RECOVERY %

22. DISPOSITION OF HOLE: BACKFILLED: Bentonite; MONITORING WELL: ; OTHER (SPECIFY):

23. SIGNATURE OF INSPECTOR: Kenneth Southerland

LOCATION SKETCH/COMMENTS: See Page 21

SCALE:

(Signature and Date)

HTRW DRILLING LOG

PROJECT: | INSPECTOR JKL | SHEET / OF

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	GRAVEL with Coarse Sand	15.4 ppm		BF3711	
		SILTY SAND (SM), 15% silt, fine grained, soft, dry, Dark Brown, 10YR-3/3 HC odor				
	2	No Recovery				
	3	SANDY CLAY (CH), 35% fine sand low plasticity, Firm, moist, Dark Brown, 10YR-3/3				▽ WL = 3.5'
	4	Grading to CLAY (CH) high plasticity, firm, ~~moist~~ wet, Dark Gray, 10YR-4/1, HC odor				
	5					
	6					Bottom of hole = 6.0'
	7					
	8					
	9					
	10					

HTRW DRILLING LOG

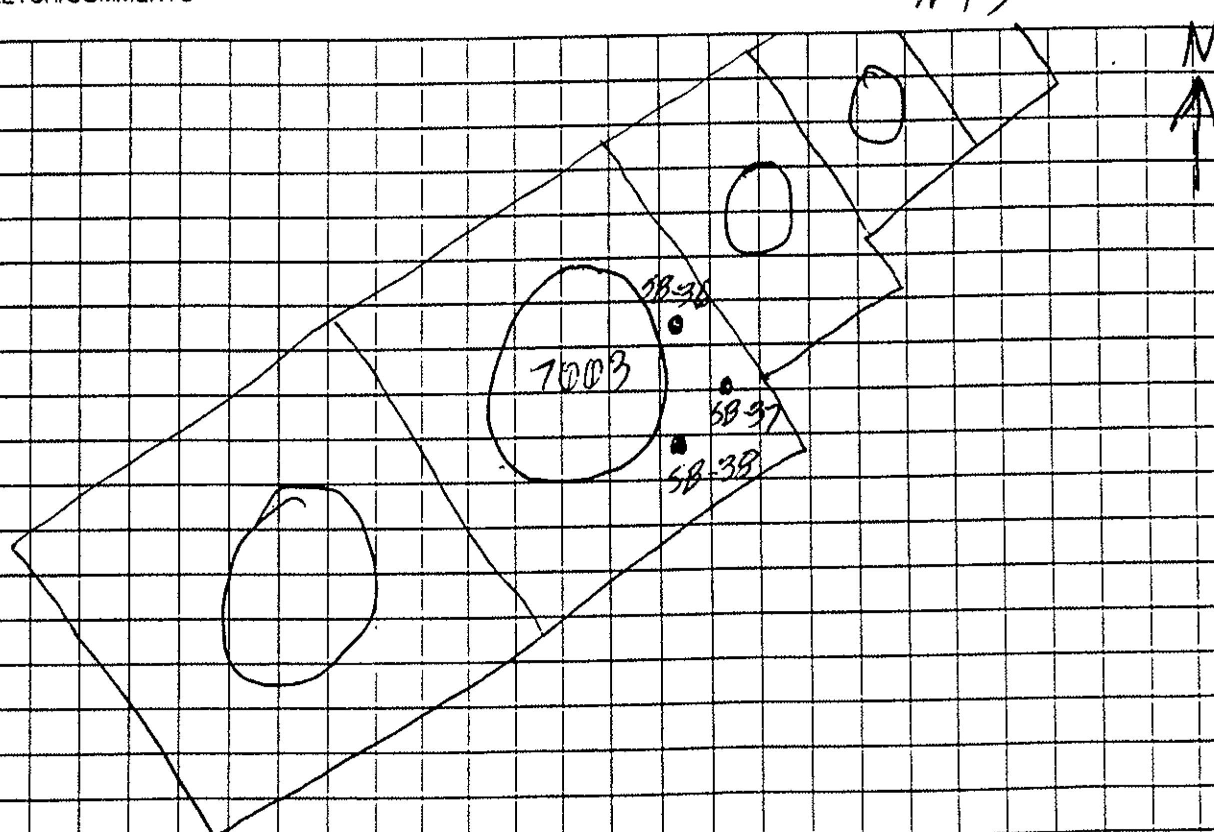
HTRW DRILLING LOG	DISTRICT: Savannah	HOLE NUMBER: SB-38
COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 1

3. PROJECT:	4. LOCATION: HAAF
5. NAME OF DRILLER: M. Back	6. MANUFACTURERS DESIGNATION OF DRILL: Portable GeoProbe
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 2" MacroCore Sampler; Acetate Liner	8. HOLE LOCATION: BFF
	9. SURFACE ELEVATION:
	10. DATE STARTED: 11-30-00 / 11. DATE COMPLETED: 11-30-00
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: 3.4'
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:
14. TOTAL DEPTH OF HOLE: 6.0'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES: NA	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: NA		
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)
	BTEX		PAH	TPH-DRO	TPH-GRO
21. TOTAL CORE RECOVERY %					
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR	
	Bentonite			[signature]	

LOCATION SKETCH/COMMENTS

SCALE: NTS



HTRW DRILLING LOG

HOLE NUMBER SB-38

PROJECT:

INSPECTOR JKL

SHEET 1 OF 1

22

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0	SANDY CLAY (CH), 50% fine grained sand, low plasticity, dry, soft, Reddish Brown, 5YR-4/3	2020 ppm		BF3811	
	1	CLAY with SAND (CH) 15% fine sand, medium plasticity, moist, firm, Dark Olive Gray, 5Y-3/2, HC odor				
	2					
	3	No Recovery				
		Same as above				▽ WT = 3.4'
	4	SILTY SAND (SM), 20% silt, fine grained, soft, wet, Yellowish Brown, 10YR-5/4				
	5	CLAY (CH), high plasticity, Firm, wet, Dark Greenish Gray, 10GY-3/1, strong HC odor.				
	6	No Recovery				Bottom of hole = 6.0'
	7					
	8					
	9					
	10					

The Earth Technology Corporation

Borehole Log

Project Name: HAAF Bulk Fuel		Project Number: Earth Tech Wells	
Borehole Location: Bulk Fuel Storage Area	Borehole No. MW-1 (EV)	Sheet 1 of	
Drilling Agency: Alliance Environmental	Driller: Richard Mooney		
Drilling Equipment: Mdl. B-59	Date Started: 1/11/00	Total Depth (feet):	
Drilling Method: HSA/SS	Date Finished: 1/11/00	Depth to Bedrock (feet): N/A	
Drilling Fluid: N/A	Number of Samples: 2	Depth to Water (feet): 4'	
Completion Information:	Borehole Diameter (in): 6½"	Elevation and Datum:	
	Logged by: K.E. Owens		
	Checked by:	Date:	

Depth (feet)	Sample Number	Sample Interval	Sample Blow Count	Sample Recovery	Sample Time	Field Analysis FID (ppm) S/B*	Field Analysis PID (ppm) S/B*	LOG Graphic	LOG USCS or Rock Type	Lithologic Description	Remarks
0	1	0-2	4 3 3 6	12			521.0			FINE SAND, SILT, BROWN 7.5YR 5/3 DAMP	
	2	2-4	6 8 13 12	24			24.0			FINE SAND, TRACE SILT, LT. GRAY 7.5YR N7 WET	
4											WATER
5											STOP SS, AUGER TO 14'
10											
15											
20											
25											
30											

Key * S/B = Sample reading / background reading; NA = not analyzed

Form F-

The Earth Technology Corporation

Borehole Log

Project Name: HAAF Bulk Fuel		Project Number: EarthTech wells
Borehole Location: Bulk Fuel Storage Area	Borehole No. MW-E/2	Sheet 1 of
Drilling Agency: Alliance Environmental	Driller: Richard Mooney	
Drilling Equipment: Mobile B-59	Date Started: 1/11/00	Total Depth (feet):
Drilling Method: HSA/SS	Date Finished: 1/11/00	Depth to Bedrock (feet): N/A
Drilling Fluid: N/A	Number of Samples: 2	Depth to Water (feet): 4
Completion Information:	Borehole Diameter (in): 6½"	Elevation and Datum:
	Logged by: K.E. Owens	
	Checked by:	Date:

Depth (feet)	Sample Number	Sample Interval	Sample Blow Count	Sample Recovery	Sample Time	Field Analysis FID (ppm) S/B*	Field Analysis PID (ppm) S/B*	LOG Graphic	LOG USCS or Rock Type	Lithologic Description	Remarks
0	1	0-2	3 4 4	8"			3.1			V. FINE SAND, SILTY, DK. BROWN 7.5YR 3/2 WET	BOREHOLE IN PUDDLE
	2	2-4	6 6 5	24			5.0			V. FINE SAND, SILTY, PINKISH GRAY 7.5YR N7 WET	
5			2 3 4	18"			2.6			V. FINE SAND, SILTY, GRAY 7.5YR 5/2 WET	WATER
											STOP SS, AUGER TO 14'
10											
15											
20											
25											
30											

Key * S/B = Sample reading / background reading; NA = not analyzed

Form I

The Earth Technology Corporation

Borehole Log

Project Name: HAAF BULK FUEL		Project Number: EarthTech Wells	
Borehole Location: BULK FUEL STORAGE AREA	Borehole No. MW-3E	Sheet 1 of 1	
Drilling Agency: ALLIANCE ENVIRONMENTAL	Driller: RICHARD MOONEY		
Drilling Equipment: Mobile B-59	Date Started: 1/11/00	Total Depth (feet):	
Drilling Method: HSA/SS	Date Finished: 1/11/00	Depth to Bedrock (feet): N/A	
Drilling Fluid: N/A	Number of Samples: 2	Depth to Water (feet): 6'	
Completion Information:	Borehole Diameter (in): 6½"	Elevation and Datum:	
	Logged by: K.E. OWENS		
	Checked by:	Date:	

Depth (feet)	Sample: Number	Sample: Interval	Sample: Blow Count	Sample: Recovery	Sample: Time	Field Analysis: FID (ppm) S/B*	Field Analysis: PID (ppm) S/B*	LOG: Graphic	LOG: USCS or Rock Type	Lithologic Description	Remarks
0	1	0-2	4 4 5	8"			11.6			SILTY SAND, SOME GRAVEL, V. DARK GRAY 7.5YR N3 MOIST	
										7.5	
	2	2-4	12 9 6	2"			43.4			FINE SAND, SILTY, LT GRAY 7.5YR N7 DAMP	
5			3 4 5	12"			0.5			FINE SAND, SOME SILT, GRAY 7.5YR N6 WET	WATER STOP SS, AUGER TO 14'
10											
											TD 14'
15											
20											
25											
30											

Key * S/B = Sample reading / background reading; NA = not analyzed

Form F-

The Earth Technology Corporation

Borehole Log

Project Name: HAAF Bulk Fuel		Project Number: Earth Tech Wells	
Borehole Location: Bulk Fuel Storage Area	Borehole No. MW-14E	Sheet 1 of 1	
Drilling Agency: Alliance Environmental	Driller: Richard Mooney		
Drilling Equipment: Mobile B-59	Date Started: 1/11/00	Total Depth (feet): 14	
Drilling Method: HSA/SS	Date Finished: 1/11/00	Depth to Bedrock (feet): N/A	
Drilling Fluid: N/A	Number of Samples: 2	Depth to Water (feet): 6' BGS	
Completion Information:	Borehole Diameter (in): 6 1/2"	Elevation and Datum:	
	Logged by: K. L. Owens		
	Checked by:	Date:	

Depth (feet)	Sample: Number	Sample: Interval	Sample: Blow Count	Sample: Recovery	Sample: Time	Field Analysis: FID (ppm) S/B*	Field Analysis: PID (ppm) S/B*	LOG: Graphic	LOG: USCS or Rock Type	Lithologic Description	Remarks
0	1	0-2	6 5 5	12"			2.4			FINE SAND, SILT, DK. REDDISH BROWN, DAMP, 5YR 3/4	
	2	2-4	7 5 5	18"			2.6			SILTY CLAY, DK REDDISH BROWN 5YR 3/4 MOIST	
5			7 12 12	12"			0.0			SANDY CLAY, SOME SILT, GRAY 5YR 6/1 DAMP	
			17	14"			0.0			FINE SAND, SOME SILT, GRAY 5YR 5/1 WET	WATER
											STOP SS, AUGER TO 14'
10											
											TD 14'
15											
20											
25											
30											

Key * S/B = Sample reading / background reading; NA = not analyzed

Form F-

The Earth Technology Corporation

Borehole Log

Project Name: HAAF BULK FUEL		Project Number: EarthTech Wells	
Borehole Location: BULK FUEL STORAGE AREA	Borehole No. MW-E	Sheet 1 of 1	
Drilling Agency: ALLIANCE ENVIRONMENTAL	Driller: RICHARD MOONEY		
Drilling Equipment: Mobile B-59	Date Started: 1/11/00	Total Depth (feet):	
Drilling Method: HSA/SS	Date Finished: 1/11/00	Depth to Bedrock (feet): N/A	
Drilling Fluid N/A	Number of Samples: 2	Depth to Water (feet): 4'	
Completion Information:	Borehole Diameter (in): 6½"	Elevation and Datum:	
	Logged by: K.E. OWENS		
	Checked by:	Date:	

Depth (feet)	Sample: Number	Sample: Interval	Sample: Blow Count	Sample: Recovery	Sample: Time	Field Analysis: FID (ppm) S/B*	Field Analysis: PID (ppm) S/B*	LOG: Graphic	LOG: USCS or Rock Type	Lithologic Description	Remarks
0	1	0-2	3-4-2-2	18"			1.8			FINE SAND, SOME SILT, LT. GRAY 5YR7/1 DAMP	
	2	2-4	2-2-3-3	20"			2.4			FINE SAND, SOME SILT, LT. GRAY 5YR7/1 WET	
											WATER STOP SS, AUGER TO 14'
5											
10											
											TD 14'
15											
20											
25											
30											

Key * S/B = Sample reading / background reading; NA = not analyzed

Form F-5

The Earth Technology Corporation

Borehole Log

Project Name: HAAF Bulk Fuel		Project Number: EarthTech Wells	
Borehole Location: Bulk Fuel Storage Area	Borehole No. MW-6E	Sheet 1 of	
Drilling Agency: Alliance Environmental	Driller: Richard Mooney		
Drilling Equipment: Mobile B-59	Date Started: 1/11/00	Total Depth (feet):	
Drilling Method: HSA/SS	Date Finished: 1/11/00	Depth to Bedrock (feet): N/A	
Drilling Fluid: N/A	Number of Samples: 2	Depth to Water (feet): 6	
Completion Information:	Borehole Diameter (in): 6½"	Elevation and Datum:	
	Logged by: K.E. Owens		
	Checked by:	Date:	

Depth (feet)	Sample: Number	Sample: Interval	Sample: Blow Count	Sample: Recovery	Sample: Time	Field Analysis: FID (ppm) S/B*	Field Analysis: PID (ppm) S/B*	LOG: Graphic	LOG: USCS or Rock Type	Lithologic Description	Remarks
0	1	0-2	3 4 3	12			8.7			V. FINE SAND, SILT, BROWN 7.5YR 4/3 DAMP	
	2	2-4	8 13 14	24			3.8			V. FINE SAND, SILT, DK BROWN 7.5YR 4/12 DAMP	
5			4 5 8	14			1.0			FINE SAND, TRACE SILT, PINKISH GRAY 7.5YR N7 WET	WATER STOPPED AUGER TO 14'
10											
15											TD 14'
20											
25											
30											

Key * S/B = Sample reading / background reading; NA = not analyzed

Form F-9

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Appendix D

Water Resources Survey
Documentation

Appendix D

Water Resources Survey Documentation

1.0 Local Water Resources

As required by the Georgia Department of Natural Resources (GA DNR) Underground Storage Tank (UST) Corrective Action Plan Guidance (GA DNR 1998), a water resource survey documenting information for public and non-public water supply wells, surface water bodies, underground utilities, and potential receptors was conducted at the Bulk Fuel Facility in 1998 for the CAP Part-A for the Former UST 117, Building 7002. The information presented in this section provides and update the supporting documentation from the previous report.

1.1 Water Supply Well Survey

The water supply well survey was conducted using the following requirements:

- Determine if HAAF is located in an area of average or higher groundwater pollution susceptibility (GA DNR 1976).
- Locate all public supply wells, which exist within a 2 mile radius of the sites being investigated.
- Locate all non-public supply wells that exist within 0.5 miles of the sites being investigated.
- Locate all supply wells nearest and downgradient of the sites being investigated.

To update the previous water supply well survey, the following agencies were contacted: Fort Stewart Directorate of Public Works (FS DPW), the City of Savannah Bureau of Water Operations, and conducting a U.S. Geological Survey (USGS) database search to determine if any water supply wells exist within a 2-mile radius of the Bulk Fuel Facility at HAAF (Figure IV-1). An updated summary is provided below.

1.1.1 Fort Stewart Directorate of Public Works Survey Summary

According to the current FS DPW, nine water supply wells are located within the confines of the HAAF area (Figure IV-1). The pump rate of these well have the potential to provide up to 3,890 gallons per minute (gpm) of water to occupants of the HAAF installation. The FS DPW did not have any information on the company that installed the well, driller's log showing as-built information and subsurface geologic data. The FS DPW provided well locations, pump rates, treatment methods, casing depths, and total depths for eight of the nine wells at HAAF (Table IV-1).

Wells #1 and #2, both public water supply wells located in the cantonment area of HAAF, which is the main water supply system at the HAAF installation. Well 1, located at Building 711 on the corner of Moore Road and Douglass Street, is a 12-inch diameter well with 100-hp turbine pump serving a 100,000-gallon elevated storage tank (Tank 1) through 10-inch lines. Well #2, located at Building 1205

on the corner of Neal Street and Strachan Road, is a 12-inch diameter well with a 100-hp turbine pump serving a 200,000-gallon elevated tank (Tank #2) through 10-inch lines. Water from Well #2 is also injected with 500,000 gallon elevated storage tank (Tank #3) located on Middleground Road behind noncommissioned officer (NCO) family housing. This tank provides potable water to 694 service connections, which are used by an average of at least 5,000 individuals on a yearly basis (SAIC 2001).

Wells #3, #4a, #7 are public supply wells located outside the cantonment area of HAAF. Well #3, is located at Building 8455, is a 4.0-inch diameter well with 1.0-hp turbine pump serving a 1,000-gallon hydropneumatic storage tank through 1.5-inch galvanized steel lines. Water from Well #3 is treated with calcium hypochlorite solution and is consumed by approximately 25 people during daytime on a yearly basis. Well #4A located at Building 8581 at the 117th Air National Guard Facility, is a 4.0-inch diameter well. Pumpage is accomplished with a 0.75-hp turbine pump with 80gpm capacity. Well #4A provides water for approximately 50 people per day on a yearly basis. Well #7 is located at Building 8703 on the Forest River, west of Rio Road. Well #7 is a 4.0-inch well with a 3.0-hp submersible pump serving a 5,000-gallon hydropneumatic tank through 2.0-inch galvanized steel lines. Well #7 serves approximately 500 people, on a part-time basis. Sanitary protection for Wells #3, #4A, and #7 is provided by a pump motor block, concrete slab, sealed well head, and screened casing vent (SAIC 2001).

Based on GA DR criteria Wells #5, #8, #9 are classified as a non-public supply well because it serves potable water to less than 25 occupants per day and it has less than 15 service connections. Well #10 is a non-potable water source that is used to clean the military equipment at the wash-rack facility, see Table IV-1 for well construction details.

1.1.2 City of Savannah Bureau of Water operations Survey Summary

Based on the information provided by the City of Savannah, only water supply well # 25 exists in a 2-mile radius of the Bulk Fuel Facility. The City of Savannah did not have the drillers log, but well construction details are provided on Figure IV-2.

1.1.3 U.S. Geological Survey Summary

A review of the U.S. Geological (USGS) records was performed for wells identified within the search radius to identify well use and well construction information (Table IV-3). A total of 10 water supply wells are located within the 2-mile radius of the Bulk Fuel Facility, three wells are reported as public wastewater treatment facilities.

2.0 Surface Water Bodies

Surface water(s) in the State of Georgia, as defined by *Rules and Regulations for Water Quality Control, Chapter 391-3-6* (GA DNR 1998), shall mean any and all river, streams, creeks, branches, lakes, reservoirs, ponds, drainage systems, springs producing 100,000 gallons per day, and all other bodies of surface water, natural or artificial, lying within or forming a part of the boundaries of the State which are not entirely confined and retained completely upon the property of a single individual, partnership, or corporation.

Surface water at HAAF include Hallstrom Lake, Lamar Canal, Buckhalter Canal, Springfield Canal, Pond 29, and an unnamed pond located at the southeast boundary of the HAAF installation (Figure 1). Several unnamed drainage ditches exist throughout HAAF. Most of the ditches drain southwest into the little Ogeechee River, which is part of the Lower Ogeechee watershed. The remaining drainage ditches located on the east side of the HAAF installation and flow east and eventually drain into the Vernon River, which is located on the southeast of the HAAF installation (SAIC 2001).

Surface water bodies at HAAF and adjacent areas are not used as public water supplies. The ponds and lakes are perennial, whereas most of the drainage ditches are intermittent. Most of the drainage canals and ditches are at least partially enclosed in culverts.

Table IV-3
Water Supply Well Information Provided by USGS
CAP-Part B
Former Aboveground Storage Tanks 7001 & 7003
Bulk Fuel Facility (HAA-09)
Hunter Army Airfield, Georgia

Agency	Site Number	Site Name	Site Type	Well depth	Hole depth	Year Drilled	Public or Non-Public Supply
USGS	3.20002E+14	36Q287	Well	370	370	1951	Unk
USGS	3.20003E+14	36Q292	Well	375	Unk	Unk	Unk
USGS	3.20017E+14	36Q291	Well	180	Unk	Unk	Unk
USGS	3.20019E+14	36Q284	Well	623	625	1959	Unk
USGS	3.20058E+14	36Q290	Well	300	300	1926	Unk
USGS	3.20103E+14	36Q289	Well	360	360	1958	Unk
USGS	3.20115E+14	36Q286	Well	555	555	1942	Unk
USGS	3.20119E+14	36Q112	Well	508	508	1925	Unk
USGS	3.20145E+14	36Q285	Well	504	504	1940	Unk
USGS	3.2015E+14	36Q164	Well	375	375	1958	Unk
USGS	3.20227E+14	36Q302	Well	540	540	1973	Unk
USGS	3.20243E+14	37Q096	Well	346	346	1936	Unk
USGS	3.20258E+14	37Q033	Well	568	568	1947	Unk
USGS	3.20308E+14	36Q125	Well	341	341	1938	Unk
USGS	3.20314E+14	36Q017	Well	448	476	1953	Unk
USGS	3.20317E+14	37Q175	Well	561	613	1957	Unk

Notes:
USGS - U.S. Geological Survey
Unk - Unknown

Table IV-1
Water Supply Well Information Provided by the Fort Stewart/HAAF DPW
CAP-Part B
Former Aboveground Storage Tanks 7001 & 7003
Bulk Fuel Facility (HAA-09)
Hunter Army Airfield, Georgia

Building	Well ID	Year Drilled	Bore Depth	Casing Depth	Pump Rate (gpm)	Number of Service Connections	Population	Public or Non-Public Supply
711	1	1941	550	250	1,300	525	1951	Public
1205	2	1941	600	250	1,300	525	Unk	Public
8455	3	1951	360	40	30	2	Unk	Public
8581	4A	Unk	300	92	80	10	1959	Public
8641	5	1955	380	85	30	Unk	1926	Non-public
8703	7	1980	450	330	70	8	1958	Public
8632	8	1956	370	255	80	5	1942	Non-public
8654	9	Unk	600	255	1,000	Unk	1925	Non-public
8464	10	Unk	Unk	Unk	Unk	N/A	1940	Non-public

Notes:
USGS - U.S. Geologic
Unk - Unknown
N/A - Not Applicable
gpm - gallons per minute
HAAF - Hunter Army Airfield

Table IV-2
Water Supply Well Information Provided by the City of Savannah Bureau of Water Operations
CAP-Part B
Former Aboveground Storage Tanks 7001 & 7003
Bulk Fuel Facility (HAA-09)
Hunter Army Airfield, Georgia

Well ID	Year Drilled	Bore Depth	Casing Depth	Pump Rate (gpm)	Number of Service Connections	Population[1]	Public or Non-Public Supply[1]
1	Unk	1006	300	1,362	Unk	Unk	Public
6	Unk	750	240	1,500	Unk	Unk	Public
9	Unk	710	267	2700	Unk	Unk	Public
13	Unk	1000	270	2200	Unk	Unk	Public
14	Unk	800	338	571	Unk	Unk	Public
15	Unk	414	252	1000	Unk	Unk	Public
23	Unk	639	320	1056	Unk	Unk	Public
25	Unk	540	287	1,120	Unk	Unk	Public
27	Unk	550	321	1468	Unk	Unk	Public
42	Unk	550	260	2100	Unk	Unk	Public

Notes:
Unk - Unknown
gpm - gallons per minute
[1]All wells are part of the same public water supply system serving the population of the City of Savannah

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Appendix E

Free Product Monitoring Points
Construction Diagrams (SAIC 2006)

4

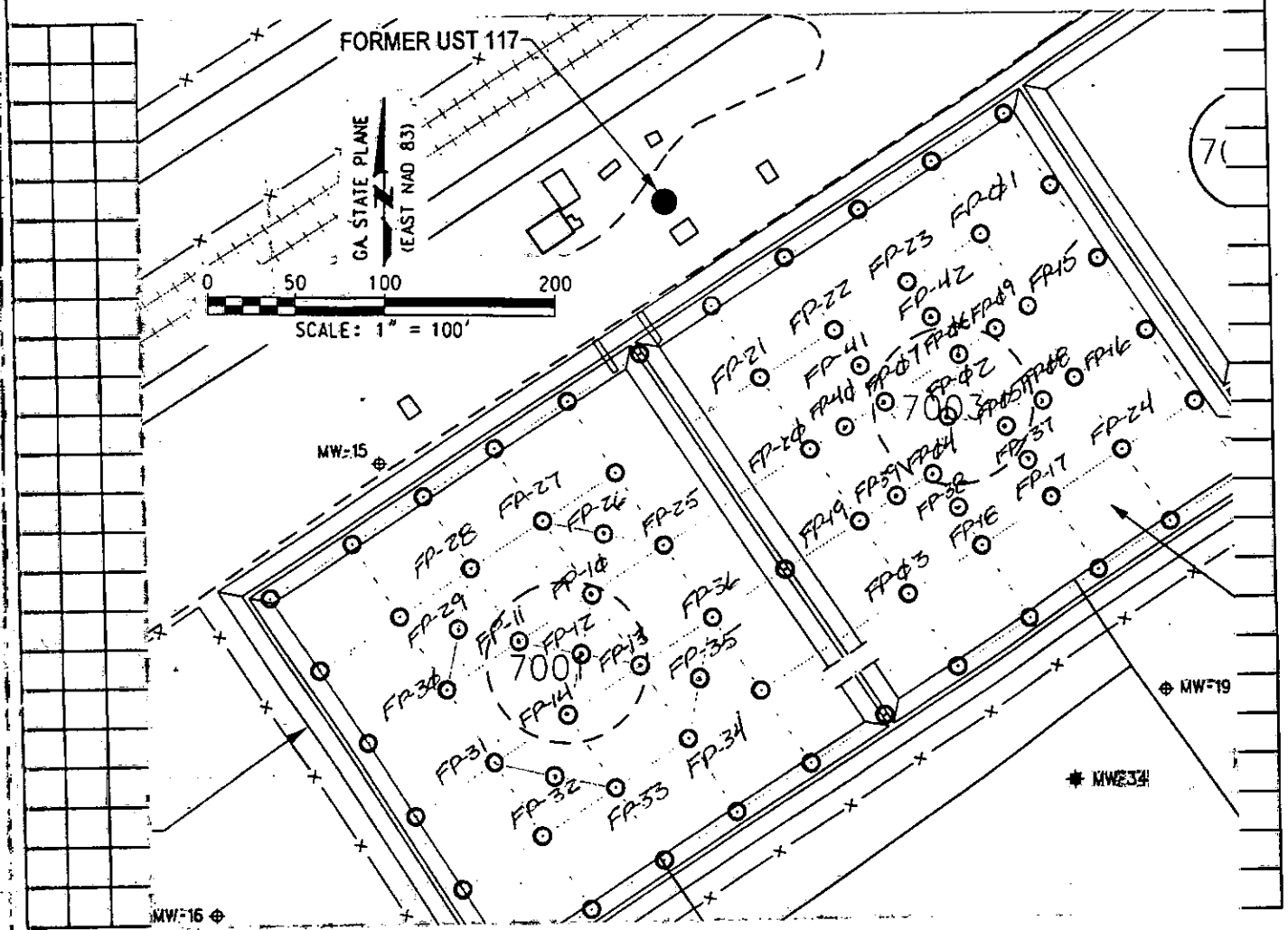
HTRW DRILLING LOG

DISTRICT: Savannah		HOLE NUMBER FP-01
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 2

3. PROJECT: Bulk Fuels Product Delineation	4. LOCATION: HAAF/Bulk Fuels Facility
5. NAME OF DRILLER: W. Parker/R. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 21Φ Hole Digger
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 21Φ Hole Digger with 2-in. diam. solid-stem auger.	8. HOLE LOCATION: Tank 7003 Site.
	9. SURFACE ELEVATION:
	10. DATE STARTED: 11/10/06 — 11. DATE COMPLETED: 11/12/06
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED:
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:
14. TOTAL DEPTH OF HOLE: 6.0 Ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES	DISTURBED: N/A	UNDISTURBED: N/A	19. TOTAL NUMBER OF CORE BOXES: N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	N/A	N/A	N/A			
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR		
			Fuel Point.			

LOCATION SKETCH/COMMENTS — SCALE:



HTRW DRILLING LOG

PROJECT: Bulk Fuels Product Del.	INSPECTOR [signature]	HOLE NUMBER FP-01
		SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0–1	0-1.5 Poorly graded sand with clay (SP-SC) Trace gravel, loose moist medium grained subangular	↓		↓	
	1–2	yellowish brown				
	2–3	1.5-5.0 ~~Poorly graded sand~~ Clayey sand (SC)				
	3–4	fine grained, subangular firm moist, gray ≈ 40% fines				
	4–5		↓		↓	
	5	TD = 5.0 BLS				
	6					
	7					
	8					
	9					
	10					

HTRW DRILLING LOG

DISTRICT: Savannah

HOLE NUMBER: FP-07

1. COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: SAIC

SHEET 1 OF 2

3. PROJECT: Bulk Fuels Product Delineation

4. LOCATION: HAAF / Bulk Fuels Facility

6. NAME OF DRILLER: W. Parker/R. Ledbetter

6. MANUFACTURERS DESIGNATION OF DRILL: General 210 Hole Digger

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 210 Hole Digger with 2-in. diam. solid-stem auger.

8. HOLE LOCATION: Tank 7003 Site.

9. SURFACE ELEVATION:

10. DATE STARTED: 11/10/06

11. DATE COMPLETED: 11/10/06

12. OVERBURDEN THICKNESS: N/A

15. DEPTH GROUNDWATER ENCOUNTERED:

13. DEPTH DRILLED INTO ROCK: N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:

14. TOTAL DEPTH OF HOLE: 5.0 Ft

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES: ~~DISTURBED~~ ~~UNDISTURBED~~

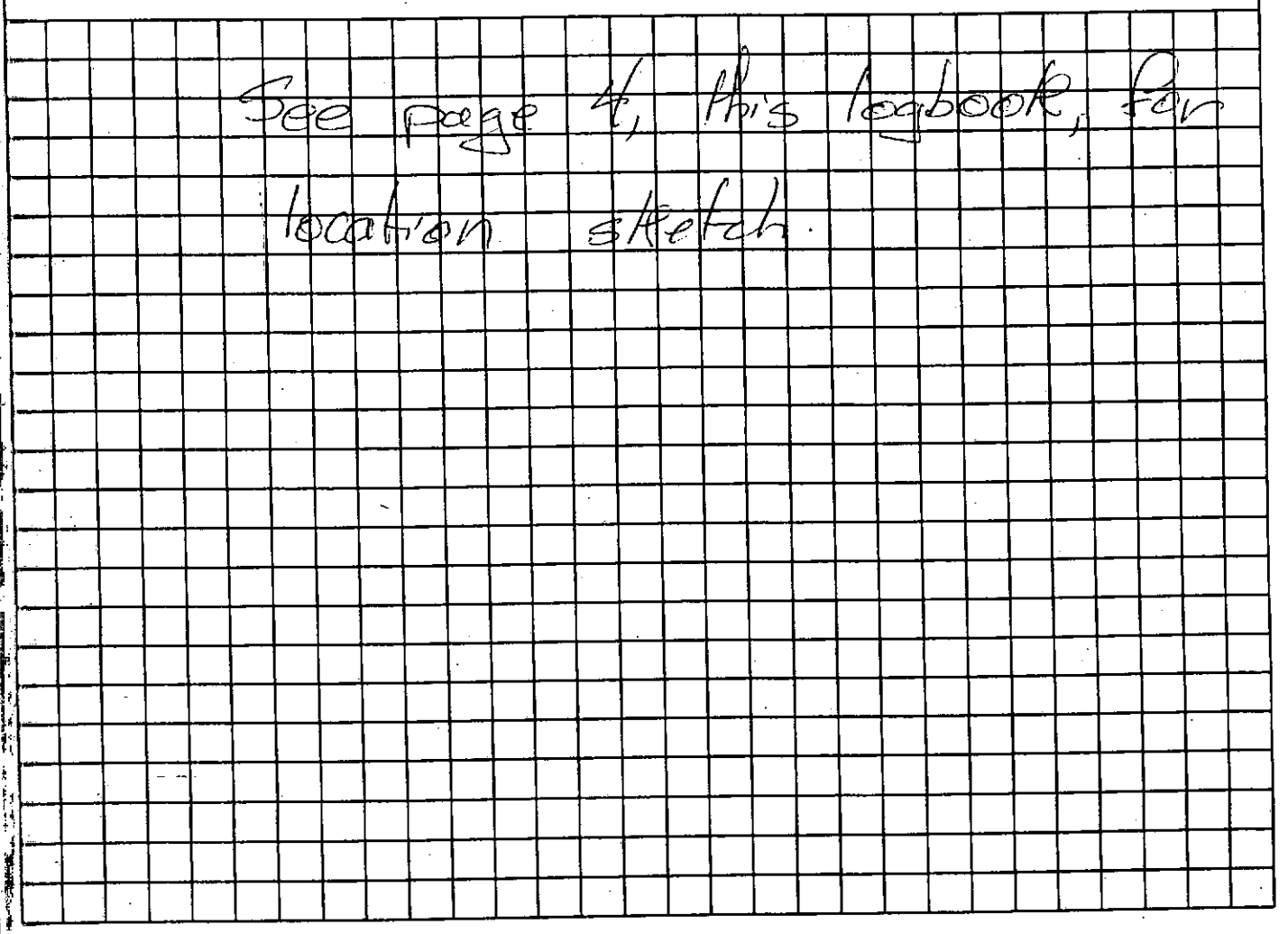
19. TOTAL NUMBER OF CORE BOXES: N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	N/A	~~N/A~~	N/A			

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
			Fuel Point	

LOCATION SKETCH/COMMENTS

SCALE:



HTRW DRILLING LOG

HOLE NUMBER FP-02

PROJECT: Bulk Fuels Product Del. | INSPECTOR Wayne H. Rue | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	0.0 - 0.5 Poorly graded sand with clay (SP-SC) Trace gravel, fine grained, subangular loose, moist to dry 0.5 - 5.0 Clayey sand (SC) ≈ 35-45% fines subangular, firm moist, light brown				
	2					
	3					
	4					
	5					
	6	TD = 5.0 BLS				
	7	WHR 11/10/06				
	8					
	9					
	10					

HTRW DRILLING LOG

DISTRICT: ~~Mobile~~ Savanah		HOLE NUMBER FP-03
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 2
3. PROJECT: Bulk Fuels Product Delineation.	4. LOCATION: HAAF	
5. NAME OF DRILLER: W. Parker / K. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 210	Hole Digger
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 210 Hole Digger with 2-in. diam. solid-stem auger.	8. HOLE LOCATION: Tank 7003 Site	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 11/11/06	11. DATE COMPLETED: 11/11/06
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 3 days	
14. TOTAL DEPTH OF HOLE: 5.0 Ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

18. GEOTECHNICAL SAMPLES: N/A	~~DISTURBED~~	~~UNDISTURBED~~	19. TOTAL NUMBER OF CORE BOXES: N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: N/A	METALS: N/A	OTHER (SPECIFY): N/A	OTHER (SPECIFY):	OTHER (SPECIFY):	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY): Fuel Point	23. SIGNATURE OF INSPECTOR: [signature]		

LOCATION SKETCH/COMMENTS

SCALE:

See page 11, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-03

PROJECT: Bulk Fuels Product Del. | INSPECTOR Timothy Coffey | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Yellowish-brown (10YR 5/8) silty sand; dry, rel. loose, F- to M-grnd.				Auger screwed into ground, stuck first attempt.
	2	Black (10YR 2/1) silty sand, massive/ uniform, sl. packed, "dirty", F-grnd.	N/A	N/A	N/A	
	3					
	4	Greenish-gray (5G 5/1) Sandy clay; moist to wet, sl. to med. plast., rel. soft, mass.				
	5	End of Boring		TD = 5 Ft		
	6					
	7					
	8					
	9					
	10					

HTRW DRILLING LOG

	DISTRICT: Mobile Savannah	HOLE NUMBER FP-04
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 2
3. PROJECT: Bulk Fuels Product Delineation.	4. LOCATION: HAAF/Bulk Fuels Fac.	
5. NAME OF DRILLER: W. Parker/K. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 210	Hole Digger
7. TYPES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 210 Hole Digger with 2-in. diam. solid-stem auger.	8. HOLE LOCATION: Tank 7003 Site	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 11/11/06	11. DATE COMPLETED: 11/11/06
13. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry/3 days	
14. TOTAL DEPTH OF HOLE: 5.0 Ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

18. GEOTECHNICAL SAMPLES	~~DISTURBED~~	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	N/A	N/A	N/A			
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR		
			Fuel Point	Timothy Coffey		

LOCATION SKETCH/COMMENTS

SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-04

PROJECT: Bulk Fuels Product Del. INSPECTOR Timothy Colley SHEET 2 OF 2

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ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Very dark gray (10YR 3/1) silty sand: moist, sl. packed, F- to M-grnd.				
	2			N/A	N/A	
	3		PID reading at B/H collar = 953 ppm.			
	4	Greenish-gray (10BG 5/1) sandy clay: moist, rel. soft, med. plast.; sand ≤ 20%.				Very moist.
	5	Moisture content incr. ↓				
	6	End of Boring.		TD = 5 Ø Ft		
	7					
	8					
	9					
	10					

HTRW DRILLING LOG

DISTRICT: Mobile Savannah

HOLE NUMBER: FP-05

1. COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: SAIC

SHEET 1 OF 2

3. PROJECT: Bulk Fuels Product Delineation.

4. LOCATION: HAAF / Bulk Fuels Fac.

5. NAME OF DRILLER: W. Parker / K. Ledbetter

6. MANUFACTURERS DESIGNATION OF DRILL: General 210 Hole Digger

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 210 Hole Digger with 2-in. diam. solid-stem auger.

8. HOLE LOCATION: Tank 7003 Site

9. SURFACE ELEVATION:

10. DATE STARTED: 11/11/06

11. DATE COMPLETED: 11/11/06

12. OVERBURDEN THICKNESS: N/A

15. DEPTH GROUNDWATER ENCOUNTERED: N/A

13. DEPTH DRILLED INTO ROCK: N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 3 days.

14. TOTAL DEPTH OF HOLE: 5.0 Ft

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES	DISTURBED: N/A	UNDISTURBED: N/A	19. TOTAL NUMBER OF CORE BOXES: N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: N/A	METALS: N/A	OTHER (SPECIFY): N/A	OTHER (SPECIFY):	OTHER (SPECIFY):	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY): Fuel Point	23. SIGNATURE OF INSPECTOR: [signature]		

LOCATION SKETCH/COMMENTS

SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-05

PROJECT: Bulk Fuels Product Del.

INSPECTOR Timothy Coffey

SHEET 2 OF 2

25

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Very dark gray (10YR 3/1) silty sand: dry rel. loose, F- to M-grnd.				
	2			N/A	N/A	
	3	Dark yellowish-brown (10YR 4/6) silty sand: moist, sl. packed, F- to M-grnd.	PID reading at B/H collar = 427 ppm.			
	4					
	5					
	6	End of Boring.		TD = 5.0 Ft.		
	7					
	8					
	9					
	10					

29

HTRW DRILLING LOG

DISTRICT: Savannah

HOLE NUMBER: FP-06

1. COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: SAIC

SHEET 1 OF 2

3. PROJECT: Bulk Fuels Product Delineation

4. LOCATION: HAAF / Bulk Fuels Fac.

5. NAME OF DRILLER: W. Parker / K. Ledbetter

6. MANUFACTURERS DESIGNATION OF DRILL: General 210 Hole Digger

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 210 Hole Digger, with 2-in. diam. solid-stem auger.

8. HOLE LOCATION: Tank 7003 Site

9. SURFACE ELEVATION:

10. DATE STARTED: 11/11/06

11. DATE COMPLETED: 11/11/06

12. OVERBURDEN THICKNESS: N/A

15. DEPTH GROUNDWATER ENCOUNTERED: N/A

13. DEPTH DRILLED INTO ROCK: N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 3 days.

14. TOTAL DEPTH OF HOLE: 5.0 ft

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES	~~DISTURBED~~	~~UNDISTURBED~~	19. TOTAL NUMBER OF CORE BOXES: N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: N/A	METALS: N/A	OTHER (SPECIFY): N/A	OTHER (SPECIFY):	OTHER (SPECIFY):	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY): Fuel Point	23. SIGNATURE OF INSPECTOR:		

LOCATION SKETCH/COMMENTS

SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-4C 30

PROJECT: Product Delineation. INSPECTOR Timothy Coffey SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Black (10YR 2/1) silty sand: dry, rel. loose, massive.				
	2					
	3	Yellow-brown (10YR 5/8) sand: moist to wet, rel. loose, m-grnd.	N/A	N/A	N/A	Strong Fuel odor.
	4					
	5	Very dark gray (10YR 3/1) sandy clay: moist, sl. plastic.				
	6	End of Boring.		TD =	5.0	ft
	7					
	8					
	9					
	10					

HTRW DRILLING LOG

DISTRICT: Savannah

HOLE NUMBER: FP-Φ7

SHEET 1 OF 2

1. COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: SAIC

3. PROJECT: Bulk Fuels Product Delineation

4. LOCATION: HAAF / Bulk Fuels Fac.

5. NAME OF DRILLER: W. Parker / R. Ledbetter

6. MANUFACTURERS DESIGNATION OF DRILL: General 21Φ Hole Digger

7. TYPES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 21Φ Hole Digger with 2-in. diam. Solid-stem auger.

8. HOLE LOCATION: Tank 7Φ03 Site,

9. SURFACE ELEVATION:

10. DATE STARTED: 11/11/Φ6

11. DATE COMPLETED: 11/11/Φ6

12. OVERBURDEN THICKNESS: N/A

13. DEPTH DRILLED INTO ROCK: N/A

14. TOTAL DEPTH OF HOLE: 5.Φ ft

15. DEPTH GROUNDWATER ENCOUNTERED: N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry 3 days.

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES: DISTURBED N/A | UNDISTURBED N/A

19. TOTAL NUMBER OF CORE BOXES: N/A

20. SAMPLES FOR CHEMICAL ANALYSIS: VOC N/A | METALS N/A | OTHER (SPECIFY) N/A | OTHER (SPECIFY) | OTHER (SPECIFY)

21. TOTAL CORE RECOVERY %

22. DISPOSITION OF HOLE: BACKFILLED | MONITORING WELL | OTHER (SPECIFY) Fuel Point

23. SIGNATURE OF INSPECTOR:

LOCATION SKETCH/COMMENTS

SCALE:

See Page 41 this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-07

PROJECT: Bulk Fuels Product Del. | INSPECTOR Timothy Coffey | SHEET 2 OF 2

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ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Very dark gray (10YR 3/1) silty sand; dry, rel. loose, F- to M-grnd, mnr organics.				Gravelly
	2	Moisture content increases with depth.		N/A	N/A	
	3		PID reading at B/H collar = 1300 ppm.			
	4					
	5	Greenish-gray (5G 5/1) sandy clay; moist to wet, med. plast.		TD = 5.0 Ft.		
		End of Boring				
	6					
	7					
	8					
	9					
	10					

HTRW DRILLING LOG

DISTRICT: Savannah

HOLE NUMBER: FP-08

1. COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: SAIC

SHEET 1 OF 2

3. PROJECT: Bulk Fuels Product Delineation

4. LOCATION: HAAF / Bulk Fuels Fac.

5. NAME OF DRILLER: W. Parker / K. Ledbetter

6. MANUFACTURERS DESIGNATION OF DRILL: General 210 Hole Digger

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 210 Hole Digger with 2-in. diam. solid-stem auger.

8. HOLE LOCATION: Tank 7003 Site.

9. SURFACE ELEVATION:

10. DATE STARTED: 11/11/06

11. DATE COMPLETED: 11/11/06

12. OVERBURDEN THICKNESS: N/A

15. DEPTH GROUNDWATER ENCOUNTERED: N/A

13. DEPTH DRILLED INTO ROCK: N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 3 days.

14. TOTAL DEPTH OF HOLE: 5.0 Ft

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	N/A	N/A	N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	N/A	N/A	N/A			

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
			Fuel Point	

LOCATION SKETCH/COMMENTS

SCALE:

See page 41 this logbook for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-08

PROJECT: Bulk Fuels Product Del. INSPECTOR Timothy Coffey SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Very dark gray (10YR 3/1) silty sand: dry to moist, F-to-M grnd, rel. loose, gravelly.				Gravelly
		Black silty sand				
	2	Very dark gray sand (As Above)		N/A	N/A	
	3		PID reading at B/H collar = 1070 ppm.			
	4					Strong product odor.
	5	Green-gray (5G 5/1) clay: moist, med. plast				
		End of Boring.		TD = 5.0 Ft.		
	6					
	7					
	8					
	9					
	10					

HTRW DRILLING LOG

DISTRICT: Savannah		HOLE NUMBER: FP-09
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 2
3. PROJECT: Bulk Fuels Product Delineation.	4. LOCATION: HAAF / Bulk Fuels Fac.	
5. NAME OF DRILLER: W. Parker / K. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 210	Hole Digger
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 210 Hole Digger with 2-in. diam. solid-stem auger.	8. HOLE LOCATION: Tank 7003 Site.	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 11/11/06	11. DATE COMPLETED: 11/11/06
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 3 days	
14. TOTAL DEPTH OF HOLE: 6.0 Ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

18. GEOTECHNICAL SAMPLES	~~DISTURBED~~	~~UNDISTURBED~~	19. TOTAL NUMBER OF CORE BOXES: N/A				
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: N/A	METALS: N/A	OTHER (SPECIFY): N/A	OTHER (SPECIFY):	OTHER (SPECIFY):	21. TOTAL CORE RECOVERY %	
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY): Foot Point	23. SIGNATURE OF INSPECTOR: [signature]			

LOCATION SKETCH/COMMENTS — SCALE:

See Page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-09

PROJECT: Bulk Foods Product Del. | INSPECTOR Timothy Coffey | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Very dark gray (10YR 3/1) silty sand: dry, rel. loose, F- to M-grnd.				gravelly
	2	Black (10YR 2/1) silty sand: moist, F-grnd, sl. packed, "dirty".		N/A	N/A	
	3		PID reading at B/H collar = 275 ppm			
	4					
	5	Very dark gray (10YR 3/1) sandy clay: moist, sl. plastic.				
	6	End of Boring.		TD =	5.0	Ft.
	7					
	8					
	9					
	10					

HTRW DRILLING LOG

DISTRICT: Savannah		HOLE NUMBER: FP-10
1. COMPANY NAME: SAIC.	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 2
3. PROJECT: Bulk Fuels Product Delineations.	4. LOCATION: HAAF / Bulk Fuels Fac.	
5. NAME OF DRILLER: W. Parker / K. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL:	
7. TYPES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 21/4 Hole Digger with 2-in. diam. Solid-stem auger.	8. HOLE LOCATION: Tank 7001 Site.	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 11/11/06	11. DATE COMPLETED: 11/11/06
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 3 days.	
14. TOTAL DEPTH OF HOLE: 5.0 ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

18. GEOTECHNICAL SAMPLES	~~UNDISTURBED~~ N/A	~~UNDISTURBED~~ N/A	19. TOTAL NUMBER OF CORE BOXES: N/A				
SAMPLES FOR CHEMICAL ANALYSIS	VOC: N/A	METALS: N/A	OTHER (SPECIFY): N/A	OTHER (SPECIFY):	OTHER (SPECIFY):	21. TOTAL CORE RECOVERY %	
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY): Fuel Point	23. SIGNATURE OF INSPECTOR: [signature]			

LOCATION SKETCH/COMMENTS — SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

PROJECT: Bulk Fuels Product Del. | INSPECTOR Timothy Coffay | HOLE NUMBER FP-14 | SHEET 2 OF 2

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ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Brownish-yellow (10YR 6/6) sand; dry, rel. loose, F- to mt-grnd.				
	2	Very dark gray (10YR 3/1) silty sand: dry to moist, loose, F-grnd.				Esp. loose sand (caving)
	3		PID reading at B/H collar = 17 ppm.	N/A	N/A	
	4	Black (10YR 2/1) silty sand: moist to wet, sl. packed, F-grnd, "dirty".				
	5	Very dark gray clay to sandy clay.				
	6	End of Boring		TD =	5.0 ft	
	7					
	8					
	9					
	10					

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ITRW DRILLING LOG

DISTRICT: Savannah		HOLE NUMBER FP-11
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 2
3. PROJECT: Bulk Fuels Product Delineation.	4. LOCATION: HAAF/Bulk Fuels Fac.	
5. NAME OF DRILLER: W. Parker/K. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 21¢	Hole Digger.
7. TYPES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 21¢ Hole Digger with 2-in. diam. & solid-stem auger.	8. HOLE LOCATION: Tank 7¢01 Site.	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 11/11/¢6	11. DATE COMPLETED: 11/11/¢6
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 3days	
14. TOTAL DEPTH OF HOLE: 5.¢ Ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

18. GEOTECHNICAL SAMPLES	DISTURBED N/A	UNDISTURBED N/A	19. TOTAL NUMBER OF CORE BOXES N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC N/A	METALS N/A	OTHER (SPECIFY) N/A	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY) Fuel Point	23. SIGNATURE OF INSPECTOR		

LOCATION SKETCH/COMMENTS SCALE:

See page 4, this logbook, for location sketch.

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HTRW DRILLING LOG

HOLE NUMBER FP-11

PROJECT: Bulk Fuels Product Del. INSPECTOR Timothy Coffey SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Brownish-yellow (10YR 6/6) sand: dry, rel. loose, F- to M-grnd, gravelly.				
	2			N/A	N/A	
	3		PID reading at B/H collar = 20 ppm			
	4	Black (10YR 2/1) silty sand: moist to wet, F-grnd, sl. packed, "dirty", massive/uniform				
	5					
	6	End of Boring.		TD = 5.0 Ft		
	7					
	8					
	9					
	10					

HTRW DRILLING LOG

1. COMPANY NAME: SAIC	DISTRICT: Savannah	HOLE NUMBER FP-12
	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 2

3. PROJECT: Bulk Fuels Product Delineation.	4. LOCATION: HAAF / Bulk Fuels Fac.
5. NAME OF DRILLER: W. Parker / K. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 210
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 210 Hole Digger with 2-in. diam. solid-stem auger.	8. HOLE LOCATION: Tank 7001 Site.
	9. SURFACE ELEVATION:
	10. DATE STARTED: 11/11/06 — 11. DATE COMPLETED: 11/11/06
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 3 days.
14. TOTAL DEPTH OF HOLE: 5.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES	~~DISTURBED~~ N/A	~~UNDISTURBED~~ N/A	19. TOTAL NUMBER OF CORE BOXES: N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: N/A	METALS: N/A	OTHER (SPECIFY): N/A	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY): Fuel Point	23. SIGNATURE OF INSPECTOR: [signature]		

LOCATION SKETCH/COMMENTS — SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-12

PROJECT: Bulk Fuels Product Del. | INSPECTOR Timothy Coffey | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Brownish-yellow (10YR 6/6) sand: dry, F- to M-grnd, rel. loose, gravelly.				
	2	Yellow (10YR 7/8) sand: dry, mass/unif.		N/A	N/A	
	3	Black (10YR 2/1) silty sand: moist, to wet, F-grnd, sl. packed, "dirty".	PID reading at B/H collar = 92 ppm			
	4					
	5					
	6	End of Boring.		TD=	5.0	Ft.
	7					
	8					
	9					
	10					

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HTRW DRILLING LOG

DISTRICT: Savannah		HOLE NUMBER: FP-13
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 2
3. PROJECT: Bulk Fuels Product Delineation	4. LOCATION: HAAF / Bulk Fuels Fac.	
5. NAME OF DRILLER: W. Parker / K. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 21¢	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 21¢ Hole Digger with 2-in. diam. solid-stem auger.	8. HOLE LOCATION: Tank 7¢¢1 Site.	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 11/11/¢6	11. DATE COMPLETED: 11/11/¢6
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 3 days.	
14. TOTAL DEPTH OF HOLE: 5.¢ Ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

Hole Digger

18. GEOTECHNICAL SAMPLES	DISTURBED: N/A	UNDISTURBED: N/A	19. TOTAL NUMBER OF CORE BOXES: N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: N/A	METALS: N/A	OTHER (SPECIFY): N/A	OTHER (SPECIFY):	OTHER (SPECIFY):	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY): Fuel Point	23. SIGNATURE OF INSPECTOR: [signature]		

LOCATION SKETCH/COMMENTS

SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-13

PROJECT: Bulk Fuels Product Del. | INSPECTOR Timothy Coffey | SHEET 2 OF 2

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ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Brownish-yellow (10YR 6/6) sand: dry, rel. loose, F- to m-grnd, gravelly, mnr organics.				Gravel lens/ layer
	2			N/A	N/A	
	3	Black (10YR 2/1) silty sand: moist, massive/uniform, sl. packed, F-grnd, "dirty".	PID reading at B/H Collar = 1340 ppm			
	4					
	5					Strong product odor.
	6	End of Boring		TD=	5.0 Ft.	
	7					
	8					
	9					
	10					

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HTRW DRILLING LOG

DISTRICT: Savannah

HOLE NUMBER: FP-14

1. COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: SAIC

SHEET 1 OF 2

3. PROJECT: Bulk Fuels Product Delineation.

4. LOCATION: HAAF / Bulk Fuels Fac.

5. NAME OF DRILLER: W. Parker / K. Ledbetter

6. MANUFACTURERS DESIGNATION OF DRILL: General 210 Hole Digger

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 210 Hole Digger with 2-in. diam. solid-stem auger.

8. HOLE LOCATION: Tank 7001 Site.

9. SURFACE ELEVATION:

10. DATE STARTED: 11/11/06

11. DATE COMPLETED: 11/11/06

12. OVERBURDEN THICKNESS: N/A

15. DEPTH GROUNDWATER ENCOUNTERED: N/A

13. DEPTH DRILLED INTO ROCK: N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 3 days.

14. TOTAL DEPTH OF HOLE: 5.0 Ft.

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES: ~~DISTURBED~~ N/A ~~UNDISTURBED~~ N/A

19. TOTAL NUMBER OF CORE BOXES: N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	N/A	N/A	N/A			

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
			Fuel Point	

LOCATION SKETCH/COMMENTS

SCALE:

See page 4 this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-14 9Φ

PROJECT: Bulk Fuels Product Del. INSPECTOR Timothy Coffey SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Brownish-yellow (10YR 6/6) sand: dry, rel. loose, F- to M-grnd, gravelly, mnr organics.		↑	↑	
	2					
				N/A	N/A	
	3	Black (10YR 2/1), silty sand: moist, massive/uniform, F-grnd, sl. packed, "dirty".	PID reading at B/H collar = 32 ppm	↓	↓	
	4					
	5					
	6	End of Boring		TD =	5.0	Rt.
	7					
	8					
	9					
	10					

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HTRW DRILLING LOG

1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: SAIC	DISTRICT: Savannah / HOLE NUMBER: FP-15 / SHEET 1 OF 2
3. PROJECT: Bulk Fuels Product Delineation	4. LOCATION: HAAF / Bulk Fuels Fac.	
5. NAME OF DRILLER: W. Parker / K. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 210	Hole Digger
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 210 Hole Digger with 2-in. diam. solid-stem auger.	8. HOLE LOCATION: Tank 7003 Site.	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 11/11/06	11. DATE COMPLETED: 11/11/06
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 3 days.	
14. TOTAL DEPTH OF HOLE: 5.0 Ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

18. GEOTECHNICAL SAMPLES	DISTURBED: N/A	UNDISTURBED: N/A	19. TOTAL NUMBER OF CORE BOXES: N/A				
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: N/A	METALS: N/A	OTHER (SPECIFY): N/A	OTHER (SPECIFY):	OTHER (SPECIFY):	21. TOTAL CORE RECOVERY %	
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY): Fuel Point	23. SIGNATURE OF INSPECTOR: [signature]			

LOCATION SKETCH/COMMENTS — SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-15

PROJECT: Bulk Fuels Product Del. INSPECTOR Timothy Coffey SHEET 2 OF 2

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ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Yellowish-brown (10YR 5/6) sand: dry, F- to M-grnd, rel. loose; mnr organics.				
	2	Black (10YR 2/1) silty sand: moist, sl. packed, massive/ uniform, "dirty".		N/A	N/A	
	3		PID reading at B/H collar = 7 ppm			
	4					
	5	Very dark gray (10YR 3/1) sandy clay: moist, sl. plastic.				
	6	End of Boring.		TD =	5.0 Ft	
	7					
	8					
	9					
	10					

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HTRW DRILLING LOG

DISTRICT: Savannah

HOLE NUMBER: FP-16

SHEET 1 OF 2

1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: SAIC
3. PROJECT: Bulk Fuels Product Delineation.	4. LOCATION: HAAF / Bulk Fuels Fac.
5. NAME OF DRILLER: W. Parker / K. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 21Φ
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 21Φ Hole Digger with 2-in. diameter solid-stem auger.	8. HOLE LOCATION: Tank 7003 Site.
	9. SURFACE ELEVATION:
	10. DATE STARTED: 11/11/06 — 11. DATE COMPLETED: 11/11/06
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 3 days.
14. TOTAL DEPTH OF HOLE: 5.0 Ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

Hole Digge

18. GEOTECHNICAL SAMPLES	~~DISTURBED~~ N/A	~~UNDISTURBED~~ N/A	19. TOTAL NUMBER OF CORE BOXES: N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: N/A	METALS: N/A	OTHER (SPECIFY): N/A	OTHER (SPECIFY):	OTHER (SPECIFY):	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY): Fuel Point	23. SIGNATURE OF INSPECTOR: [signature]		

LOCATION SKETCH/COMMENTS — SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-16

PROJECT: Bulk Fuels Product Del. | INSPECTOR Timothy Coffey | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Very dark gray (10YR 3/1) silty sand: dry, rel. loose, gravelly.				Very hard/packed gravel layer
	2	Black (10YR 2/1) silty sand: dry to moist, massive.				
	3	Very dark gray (10YR 3/1) sandy clay: moist to wet, sl. plastic.	PID reading at B/H collar = 65 ppm.			
	4					
	5	Greenish-gray (5G 5/1) clay: moist to wet, med. plast.				
	6	End of Boring.		TD =	5.0 Ft.	
	7					
	8					
	9					
	10					

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HTRW DRILLING LOG

DISTRICT: Savannah

HOLE NUMBER: FP-17

1. COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: SAIC

SHEET 1 OF 2

3. PROJECT: Bulk Fuels Product Delineation.

4. LOCATION: HAAF/Bulk Fuels Fac.

5. NAME OF DRILLER: W. Parker/K. Ledbetter

6. MANUFACTURERS DESIGNATION OF DRILL: General 214 Hole Digger

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 214 Hole Digger with 2-in. diam. solid-stem auger

8. HOLE LOCATION: Tank 7003 Site.

9. SURFACE ELEVATION:

10. DATE STARTED: 11/11/06

11. DATE COMPLETED: 11/11/06

12. OVERBURDEN THICKNESS: N/A

15. DEPTH GROUNDWATER ENCOUNTERED: N/A

13. DEPTH DRILLED INTO ROCK: N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry/ 3 days.

14. TOTAL DEPTH OF HOLE: 5.0 ft.

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES	DISTURBED: N/A	UNDISTURBED: N/A	19. TOTAL NUMBER OF CORE BOXES: N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: N/A	METALS: N/A	OTHER (SPECIFY): N/A	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY): Fuel Point	23. SIGNATURE OF INSPECTOR: Timothy Colby		

LOCATION SKETCH/COMMENTS

SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-17

PROJECT: Bulk Fuels Product Del. INSPECTOR Timothy Coffey

SHEET 2 OF 2

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ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0	Yellowish-brown (10YR 6/4) sand: dry, loose, F- to M-grnd.				
	1	Black (10YR 2/1) silty sand: dry to moist, massive/unif, F-grnd, "dirty".				
	2			N/A	N/A	
	3		PID reading at B/H collar = 907 ppm.			
	4	Very dark gray (10YR 3/1) sandy clay: moist to wet, sl. plastic.				
	5					
	6	End of Boring.		TD = 5.0 ft.		
	7					
	8					
	9					
	10					

HTRW DRILLING LOG

	DISTRICT: Savannah	HOLE NUMBER FP-18
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 2
3. PROJECT: Bulk Fuels Product Delineation	4. LOCATION: HAAF / Bulk Fuels Fac.	
5. NAME OF DRILLER: W. Parker / K. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 210	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 210 Hole Digger with 2-in. solid stem auger	8. HOLE LOCATION: Tank 7003 Site.	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 11/11/06	11. DATE COMPLETED: 11/11/06
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 3days.	
14. TOTAL DEPTH OF HOLE: 5.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	N/A	N/A	N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	N/A	N/A	N/A			

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
			Fuel Point	

LOCATION SKETCH/COMMENTS — SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-18

PROJECT: Bulk Fuels Product Del. INSPECTOR Timothy Coffey SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Yellowish brown (10YR 5/8) silty sand: dry, rel. loose, F- to M- grnd; organics.				
	2	Black (10YR 2/1) silty sand: moist, sl. packed, "dirty", massive/uniform, F- grnd, "dirty".		N/A	N/A	
	3		PID reading at B/H collar = 91 ppm			
	4	Very dark gray (5G 3/1) Sandy clay: moist to wet, med. plast., soft, massive.				
	5					
	6	End of Boring.		TD =	5.0	ft.
	7					
	8					
	9					
	10					

HTRW DRILLING LOG

DISTRICT: Savanna

HOLE NUMBER: FP-19

1. COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: SAIC

SHEET 1 OF 2

3. PROJECT: Bulk Fuels Product Delineations

4. LOCATION: HAAF / Bulk Fuels Fac

5. NAME OF DRILLER: W. Parker / K. Ledbetter

6. MANUFACTURERS DESIGNATION OF DRILL: General 216 (Hole Digger)

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 216 Hole Digger with 2-in. diam. solid-stem auger.

8. HOLE LOCATION: Tank 7003 Site.

9. SURFACE ELEVATION:

10. DATE STARTED: 11/11/06

11. DATE COMPLETED: 11/11/06

12. OVERBURDEN THICKNESS: N/A

15. DEPTH GROUNDWATER ENCOUNTERED: N/A

13. DEPTH DRILLED INTO ROCK: N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 3 days

14. TOTAL DEPTH OF HOLE: 5.0 Ft

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES: ~~DISTURBED~~ ~~UNDISTURBED~~

19. TOTAL NUMBER OF CORE BOXES: N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	N/A	N/A	N/A			

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
			Fuel Point	

LOCATION SKETCH/COMMENTS

SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-19

PROJECT: Bulk Fuels Prod. Delineation INSPECTOR Timothy Coffey

SHEET 2 OF 2

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ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Yellowish-brown (10YR 5/8) sand: dry; F- to M-grnd, rel. loose, mnr organics				
	2	grades to: Very dark gray (10YR 3/1) silty sand, sl. packed, moist, F- to m-grnd.		N/A	N/A	
	3	Black (10YR 2/1) silty sand.	PID reading at B/H collar = 35ppm			
	4	Gray (10YR 5/1) clay sand: moist to wet.				
	5	Very dark gray (10YR 3/1) silty sandy clay: moist to wet, sl. plast.				
	6	End of Boring.		TD = 5.0 Ft.		
	7					
	8					
	9					
	10					

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HTRW DRILLING LOG

DISTRICT: Savannah

HOLE NUMBER: FP-24

1. COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: SAIC

SHEET 1 OF 2

3. PROJECT: Bulk Fuels Product Delineation.

4. LOCATION: HAAF / Bulk Fuels Fac.

5. NAME OF DRILLER: W. Parker / K. Ledbetter

6. MANUFACTURERS DESIGNATION OF DRILL: General 24 Hole Digger

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 24 Hole Digger with 2-in. diam. solid-stem auger.

8. HOLE LOCATION: Tank 7003 Site.

9. SURFACE ELEVATION:

10. DATE STARTED: 11/11/06

11. DATE COMPLETED: 11/11/06

12. OVERBURDEN THICKNESS: N/A

15. DEPTH GROUNDWATER ENCOUNTERED: N/A

13. DEPTH DRILLED INTO ROCK: N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 3 days.

14. TOTAL DEPTH OF HOLE: 5.0 ft

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES	DISTURBED: N/A	UNDISTURBED: N/A	19. TOTAL NUMBER OF CORE BOXES: N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: N/A	METALS: N/A	OTHER (SPECIFY): N/A	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY): Fuel Point	23. SIGNATURE OF INSPECTOR		

LOCATION SKETCH/COMMENTS

SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP26

PROJECT: Bulk Fuels Product Del. | INSPECTOR Timothy Coffey | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Very dark gray (10YR 3/1) silty sand: dry, F- to M-grnd, rel. loose, mnr organics.				
	2					
	3	Lt. brownish-gray (10YR 6/2) sand: dry, loose, massive, M-grnd.		N/A	N/A	
	4	Very dark gray silty sand (As Above).	PID reading at B/H collar = 118 ppm			
	5	Greenish-gray (5G5/1) clay to sandy clay.				
	6	End of Boring.		TD = 5.0 Ft		
	7					
	8					
	9					
	10					

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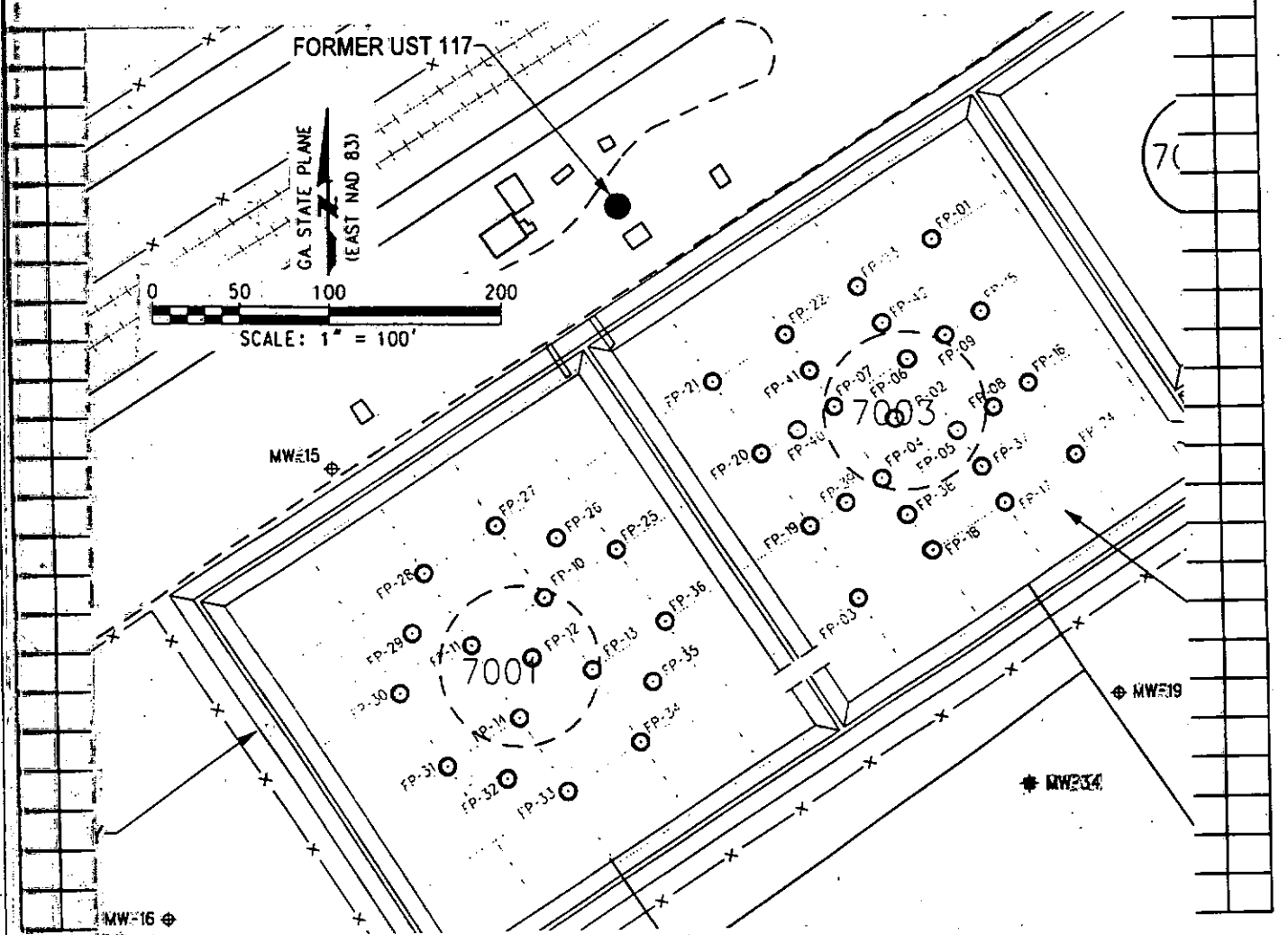
HTRW DRILLING LOG

DISTRICT: Savannah		HOLE NUMBER: FP-21
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 2
3. PROJECT: Bulk Fuels Product Delineation	4. LOCATION: HAAF / Bulk Fuels Fac.	
5. NAME OF DRILLER: W. Parker / K. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 210	Hole Digger
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 210 Hole Digger with 2-in. dia. Solid Stem auger.	8. HOLE LOCATION: Tank 7003 Site	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 11/11/06	11. DATE COMPLETED: 11/11/06
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 3 days	
14. TOTAL DEPTH OF HOLE: 5.0 Ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	
18. GEOTECHNICAL SAMPLES: ~~DISTURBED~~ N/A	~~UNDISTURBED~~ N/A	19. TOTAL NUMBER OF CORE BOXES: N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	N/A	N/A	N/A			
22. DISPOSITION OF HOLE	**BACKFILLED**	**MONITORING WELL**	**OTHER (SPECIFY)**	**23. SIGNATURE OF INSPECTOR**		
			Fuel Point			

LOCATION SKETCH/COMMENTS

SCALE:



HTRW DRILLING LOG

HOLE NUMBER FP-21

PROJECT: Bulk Fuels Product Del. | INSPECTOR - Timothy Coffey | SHEET 2 OF 2

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ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Black (10YR 2/1) silty sand: dry, F-grnd, rel. loose, mnr organics.				
	2	Very dark gray (10YR 3/1) silty sand (As Above)		N/A	N/A	
	3	Brownish-yellow (10YR 6/8) to gray (10YR 5/1) sand to clay sand: dry to moist, non- to sl. plastic, F- to M-grnd.	PID reading at B/H collar = 7 ppm			
	5	Brown-yellow sandy clay: moist to wet, mottled				
		End of Boring.		TD = 5.0 Ft.		
	6					
	7					
	8					
	9					
	10					

HTRW DRILLING LOG

DISTRICT: Savannah

HOLE NUMBER: FP-22

1. COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: SAIC

SHEET 1 OF 2

3. PROJECT: Bulk Fuels Product Delineation

4. LOCATION: HAAF / Bulk Fuels Fac.

5. NAME OF DRILLER: W. Parker / K. Ledbetter

6. MANUFACTURERS DESIGNATION OF DRILL: General 210 Hole Digger

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 210 Hole Digger with 2-in. Diam. solid stem auger.

8. HOLE LOCATION: Tank 7003 Site.

9. SURFACE ELEVATION:

10. DATE STARTED: 11/11/06

11. DATE COMPLETED: 11/11/06

12. OVERBURDEN THICKNESS: N/A

15. DEPTH GROUNDWATER ENCOUNTERED: N/A

13. DEPTH DRILLED INTO ROCK: N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 3 days.

14. TOTAL DEPTH OF HOLE: 5.0 Ft

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES: ~~DISTURBED~~ N/A | ~~UNDISTURBED~~ N/A

19. TOTAL NUMBER OF CORE BOXES: N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	N/A	N/A	N/A			

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
			Fuel Point	[signature]

LOCATION SKETCH/COMMENTS

SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-22

PROJECT: Bulk Fuels Product Del. | INSPECTOR Timothy Coffey | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0–2	Very dark gray (10YR 3/1) silty sand; dry, F- to M-grnd, rel. loose, mnr organics.				
	2–4	Black (10YR 2/1) silty sand: dry to moist, rel. packed, V. F-grnd.	PID reading at B/H collar = 3 ppm	N/A	N/A	
	4–5	Dark brown-gray (10YR 4/2) clay sand: moist to wet, soft, non-plast.				
	5	End of Boring.		TD = 5.0 ft		

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HTRW DRILLING LOG

DISTRICT: Savannah

HOLE NUMBER: FP-23

1. COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: SAIC

SHEET 1 OF 2

3. PROJECT: Bulk Fuels Product Delineation.

4. LOCATION: HAAF/Bulk Fuels Fac.

5. NAME OF DRILLER: W. Parker/K. Ledbetter

6. MANUFACTURERS DESIGNATION OF DRILL: General 210

Hole Digger

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 210 Hole Digger with 2-in. and 3-in. diam. solid-stem augers.

8. HOLE LOCATION: Tank 7003 Site.

9. SURFACE ELEVATION:

10. DATE STARTED: 11/11/06

11. DATE COMPLETED: 11/11/06

12. OVERBURDEN THICKNESS: N/A

15. DEPTH GROUNDWATER ENCOUNTERED: N/A

13. DEPTH DRILLED INTO ROCK: N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry/3 days.

14. TOTAL DEPTH OF HOLE: 5.0 ft

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES: ~~DISTURBED~~ N/A | ~~UNDISTURBED~~ N/A

19. TOTAL NUMBER OF CORE BOXES: N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	N/A	N/A	N/A			

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
			Fuel Point	

LOCATION SKETCH/COMMENTS

SCALE:

See page 14, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-23

PROJECT: Bulk Fuels Product Del. | INSPECTOR Timothy Coffey | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Very dark gray (10YR 3/1) silty sand: dry, F- to M-grnd, rel. loose, mnr organics.				
	2	Gravel layer		N/A	N/A	Hard-packed gravel.
	3	Gray (10YR 6/1) sand: dry, M-grnd, massive/uniform, loose/friable.	PID reading at B/H collar = 0.0ppm			
	4					
	5	Gray (10YR 6/1) and brown-yellow (10YR 6/8) mottled sandy clay: moist, plastic.				
	6	End of Boring.		TD =	5.0	ft.
	7					
	8					
	9					
	10					

HTRW DRILLING LOG

DISTRICT: Savannah

HOLE NUMBER: FP-Z4

1. COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: SAIC

SHEET 1 OF 2

3. PROJECT: Bulk Fuels Product Delineation.

4. LOCATION: HAAF/Bulk Fuels Fac.

5. NAME OF DRILLER: W. Parker/K. Ledbetter

6. MANUFACTURERS DESIGNATION OF DRILL: General 216 Hole Digger

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 216 Hole Digger with 2-in. and 3-in. diam. solid-stem augers.

8. HOLE LOCATION: Tank 7003 Site,

9. SURFACE ELEVATION:

10. DATE STARTED: 11/12/06

11. DATE COMPLETED: 11/12/06

12. OVERBURDEN THICKNESS: N/A

15. DEPTH GROUNDWATER ENCOUNTERED: N/A

13. DEPTH DRILLED INTO ROCK: N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry/2 days.

14. TOTAL DEPTH OF HOLE: 5.0 Ft

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES	DISTURBED: N/A	UNDISTURBED: N/A	19. TOTAL NUMBER OF CORE BOXES: N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: N/A	METALS: N/A	OTHER (SPECIFY): N/A	OTHER (SPECIFY):	OTHER (SPECIFY):	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY): Fuel Point	23. SIGNATURE OF INSPECTOR: [signature]		

LOCATION SKETCH/COMMENTS

SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-24 2 of 2

PROJECT: Bulk Fuels Product Del. INSPECTOR Timothy Coffey SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Dark yellow-brown (10YR 4/6) sand: dry, rel. loose, F- to M-grnd.				
	2	Black (10YR 2/1) silty sand: dry to moist, v. F-grnd, rel. packed, "dirty".		N/A	N/A	
	3		PID reading at B/H collar = <1ppm.			
	4					
	5	Dark bluish-gray (10B 4/1) clay: moist to wet, sticky, plastic, <20% sand.				
		End of Boring.		TD =	5.0 ft.	
	6					
	7					
	8					
	9					
	10					

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HTRW DRILLING LOG

1. COMPANY NAME: SAIC	DISTRICT: Savannah	HOLE NUMBER: HP-25
	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 2
3. PROJECT: Bulk Fuels Product Delineation.	4. LOCATION: HAAF/Bulk Fuels Fac.	
5. NAME OF DRILLER: W. Parker/K. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 210	Hole Digger.
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 210 Hole Digger with 2-in. diam. solid-stem auger.	8. HOLE LOCATION: Tank 7003 Site.	
	9. SURFACE ELEVATION: 7001	
	10. DATE STARTED: 11/12/06	11. DATE COMPLETED: 11/12/06
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 2 days.	
14. TOTAL DEPTH OF HOLE: 5.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

18. GEOTECHNICAL SAMPLES	~~DISTURBED~~	~~UNDISTURBED~~	19. TOTAL NUMBER OF CORE BOXES: N/A				
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: N/A	METALS: N/A	OTHER (SPECIFY): N/A	OTHER (SPECIFY):	OTHER (SPECIFY):	21. TOTAL CORE RECOVERY %	
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY): Fuel Point	23. SIGNATURE OF INSPECTOR: [signature]			

LOCATION SKETCH/COMMENTS

SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-25

PROJECT: Bulk Fuels Product Del. | INSPECTOR Timothy Coffey | SHEET 2 OF 2

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ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Dark yellow-brown (10YR 4/6) sand: dry, F- to M-grnd, silty, rel. loose; mnr gravel.				
	2	Black (10YR 2/1) silty sand: dry to moist, massive, sl. packed, "dirty".		N/A	N/A	Gravel layer
	3		PID reading at B/H collar = <1 ppm.			
	4	Very dark gray (10YR 3/1) clay/sandy clay: moist, med. plast, rel. soft; ≈30% sand.				
	5					
	6	End of Boring.		TD = 5.0 Ft.		
	7					
	8					
	9					
	10					

HTRW DRILLING LOG

1. COMPANY NAME: SAIC	DISTRICT: Savannah	HOLE NUMBER: FP-26
	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 2
3. PROJECT: Bulk Fuels Product Delineation.	4. LOCATION: HAAF / Bulk Fuels Fac.	
5. NAME OF DRILLER: W. Parker / K. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 210	Hole Digga-
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 210 Hole Digger with 2-in. diam. solid-stem auger.	8. HOLE LOCATION: Tank 7001 Site.	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 11/12/06	11. DATE COMPLETED: 11/12/06
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 2 days.	
14. TOTAL DEPTH OF HOLE: 5.0 ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

18. GEOTECHNICAL SAMPLES	~~DISTURBED~~ N/A	~~UNDISTURBED~~ N/A	19. TOTAL NUMBER OF CORE BOXES: N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: N/A	METALS: N/A	OTHER (SPECIFY): N/A	OTHER (SPECIFY):	OTHER (SPECIFY):	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY): Fuel Point	23. SIGNATURE OF INSPECTOR: [signature]		

LOCATION SKETCH/COMMENTS

SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-ZA

PROJECT: Bulk Fuels Product Del. | INSPECTOR Timothy Coffay | SHEET 2 OF 2

SURV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0–3	Very dark gray (10YR 3/1) silty sand: dry, rel. loose, F- to M-grnd; gravelly.		N/A	N/A	
	3–5	Dark gray (10YR 4/1) sandy clay: moist, med. plast, rel. soft.	PID reading at B/H collar = <1 ppm			
	5	End of Boring.		TD = 5.0 Ft		

HTRW DRILLING LOG

DISTRICT: Savannah

HOLE NUMBER: FP-27

1. COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: SAIC

SHEET 1 OF 2

3. PROJECT: Bulk Fuels Product Delineations

4. LOCATION: HAAF/Bulk Fuels Fac,

5. NAME OF DRILLER: W. Parker/K. Ledbetter

6. MANUFACTURERS DESIGNATION OF DRILL: General 210

Hole Digger

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 210 Hole Digger with 2-in. diam. solid-stem auger.

8. HOLE LOCATION: Tank 7001 Site.

9. SURFACE ELEVATION:

10. DATE STARTED: 11/12/06

11. DATE COMPLETED: 11/12/06

12. OVERBURDEN THICKNESS: N/A

15. DEPTH GROUNDWATER ENCOUNTERED: N/A

13. DEPTH DRILLED INTO ROCK: N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 2 days.

14. TOTAL DEPTH OF HOLE: 5.0 ft

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES: ~~N/A~~ DISTURBED ~~N/A~~ UNDISTURBED

19. TOTAL NUMBER OF CORE BOXES: N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	N/A	N/A	N/A			

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
			Fuel Point	

LOCATION SKETCH/COMMENTS

SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-27 35

PROJECT: Bulk Fuels Product Del. | INSPECTOR Timothy Coffey | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0	Dark yellow-brown (10YR 4/6) sand: dry, loose.				
	1	Very dark gray (10YR 3/1) silty sand: dry to moist, rel. loose, F-to M-grnd.				
	2			N/A	N/A	
	3		PID reading at B/H collar = < 1 ppm			
	4	Dark gray (10YR 4/1) sandy clay: moist, plastic.				
	5					
	6	End of Boring.		TD = 5.0 Ft.		
	7					
	8					
	9					
	10					

HTRW DRILLING LOG

DISTRICT: Savannah		HOLE NUMBER FP-28
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 2
3. PROJECT: Bulk Fuels Product Delineation	4. LOCATION: HAAF/Bulk Fuels Fac.	
5. NAME OF DRILLER: W. Parker/K. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 210	Hole Digger
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 210 Hole Digger with 2-in. diam. solid-stem auger.	8. HOLE LOCATION: Tank 7001 Site.	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 11/12/06	11. DATE COMPLETED: 11/12/06
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 2 days.	
14. TOTAL DEPTH OF HOLE: 5.0 ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

18. GEOTECHNICAL SAMPLES	DISTURBED N/A	UNDISTURBED N/A	19. TOTAL NUMBER OF CORE BOXES N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC N/A	METALS N/A	OTHER (SPECIFY) N/A	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY) Fuel Point	23. SIGNATURE OF INSPECTOR		

LOCATION SKETCH/COMMENTS SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-28

PROJECT: Bulk Fuels Product Del. INSPECTOR Timothy Coffey

SHEET 2 OF 2

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ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Very dark gray (10YR 3/1) silty sand; dry to moist, F- to M-grnd, rel. loose				
	2			N/A	N/A	
	3		PID reading at B/H collar = 1 ppm.			
	4	Dark gray (10YR 4/1) sandy clay; moist, plastic.				
	5					
	6	End of Boring		TD = 5.0 ft.		
	7					
	8					
	9					
	10					

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TRW DRILLING LOG

DISTRICT: Savannah		HOLE NUMBER FP-29
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 2
3. PROJECT: Bulk Fuels Product Delineation	4. LOCATION: HAAF/Bulk Fuels Fac.	
5. NAME OF DRILLER: W. Parker/K. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 21Φ	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 21Φ Hole Digger with 2-in. diam. solid-stem auger.	8. HOLE LOCATION: Tank 7001 Site.	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 11/12/06	11. DATE COMPLETED: 11/12/06
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry/2 days.	
14. TOTAL DEPTH OF HOLE: 5.0 Ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

Hole Digger

18. GEOTECHNICAL SAMPLES	~~DISTURBED~~	~~UNDISTURBED~~	19. TOTAL NUMBER OF CORE BOXES: N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: N/A	METALS: N/A	OTHER (SPECIFY): N/A	OTHER (SPECIFY):	OTHER (SPECIFY):	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY): Fuel Point	23. SIGNATURE OF INSPECTOR: [signature]		

LOCATION SKETCH/COMMENTS

SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-29

PROJECT: Bulk Fuels Product Del. | INSPECTOR Timothy Coffey | SHEET 2 OF 2

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ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0	Dark gray (10YR 4/1) clay sand: moist.				
	1	Very dark gray (10YR 3/1) silty sand: dry to moist, F- to M-grnd, rd. loose.				
	2			N/A	N/A	
	3	Dark gray (10YR 4/1) sandy clay: moist, plastic.	PID reading at B/H collar = <1 ppm			
	4	Greenish-gray (5G 5/1) clay / sandy clay: moist, soft, plastic.				
	5	End of Boring.		TD = 5.0 ft		
	6					
	7					
	8					
	9					
	10					

USACE/TRW DRILLING LOG

1. COMPANY NAME: SAIC	DISTRICT: Savannah	HOLE NUMBER FP-30
2. DRILL SUBCONTRACTOR: SAIC		SHEET 1 OF 2
3. PROJECT: Bulk Fuels Product Delineation	4. LOCATION: HAAF / Bulk Fuels Fac.	
5. NAME OF DRILLER: W. Parker / K. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 216	Hole Digger.
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 216 Hole Digger with 2-in. diam. solid-stem auger.	8. HOLE LOCATION: Tank 7001 Site.	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 11/12/06	11. DATE COMPLETED: 11/12/06
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 2 days.	
14. TOTAL DEPTH OF HOLE: 5.0 ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

18. GEOTECHNICAL SAMPLES	DISTURBED N/A	UNDISTURBED N/A	19. TOTAL NUMBER OF CORE BOXES N/A				
SAMPLES FOR CHEMICAL ANALYSIS	VOC N/A	METALS N/A	OTHER (SPECIFY) N/A	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %	
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY) Fuel Point	23. SIGNATURE OF INSPECTOR [signature]			

LOCATION SKETCH/COMMENTS — SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-30

PROJECT: Bulk Fuels Product Del. INSPECTOR Timothy Coffey

SHEET 2 OF 2

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ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Very dark gray (10YR 3/1) silty sand: dry to moist, F- to M- grnd, rel. loose.				Gravel layer
	2			N/A	N/A	
	3	Dark gray (10YR 4/1) sandy clay: moist,	PID reading at B/H collar = <1 ppm			
	4	Lt. olive brown (2.5Y 5/6) clay: moist, rel. stiff, plastic, mottled, sand <20%.				
	5					
	6	End of Boring.		TD = 5.0 Ft		
	7					
	8					
	9					
	10					

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TRW DRILLING LOG

COMPANY NAME: SAIC	DISTRICT: Savannah	HOLE NUMBER FP-31
	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 2
3. PROJECT: Bulk Fuels Product Delineation.	4. LOCATION: HAAF/ Bulk Fuels Fac.	
5. NAME OF DRILLER: W. Parker/K. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 210	Hole Digger
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 210 Hole Digger with 2-in. diam. solid-stem auger.	8. HOLE LOCATION: Tank 7001 Site	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 11/12/96	11. DATE COMPLETED: 11/12/96
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry/ 2 days.	
14. TOTAL DEPTH OF HOLE: 5.0 ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

18. GEOTECHNICAL SAMPLES	DISTURBED N/A	UNDISTURBED N/A	19. TOTAL NUMBER OF CORE BOXES N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC N/A	METALS N/A	OTHER (SPECIFY) N/A	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY) Fuel Point	23. SIGNATURE OF INSPECTOR Timothy Jeffay		

LOCATION SKETCH/COMMENTS

SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-31

PROJECT: Bulk Fuels Product Del. | INSPECTOR Timothy Coffey | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Dark yellow-brown (10YR 4/6) silty sand.				
		Black (10YR 2/1) silty sand.				
	2	Dark gray (10YR 4/1) silty sand: dry to moist, F. to M-grnd, rel. loose.		N/A	N/A	
	3		PID reading at B/H collar = 2 ppm.			
	4	Dark gray (10YR 4/1) sandy clay: moist, rel. stiff, plastic.				
	5					
	6	End of Boring		TD =	5.0 Ft.	
	7					
	8					
	9					
	10					

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HTRW DRILLING LOG

DISTRICT: Savannah		HOLE NUMBER FP-32
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 2
3. PROJECT: Bulk Fuels Product Delineation.	4. LOCATION: HAAF/Bulk Fuels Fac.	
5. NAME OF DRILLER: W. Parker/K. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 210	Hole Digger
7. TYPE AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 210 Hole Digger with 2-in. diam. solid-stem auger.	8. HOLE LOCATION: Tank 7001 Site.	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 11/12/06	11. DATE COMPLETED: 11/12/06
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 2 days.	
14. TOTAL DEPTH OF HOLE: 5.0 Ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

18. GEOTECHNICAL SAMPLES	DISTURBED: N/A	UNDISTURBED: N/A	19. TOTAL NUMBER OF CORE BOXES: N/A				
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: N/A	METALS: N/A	OTHER (SPECIFY): N/A	OTHER (SPECIFY):	OTHER (SPECIFY):	21. TOTAL CORE RECOVERY: %	
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY): Fuel Point	23. SIGNATURE OF INSPECTOR: [signature]			

LOCATION SKETCH/COMMENTS — SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-32

PROJECT: Bulk Fuels Product Del. | INSPECTOR Timothy Coffey | SHEET 2 OF 2

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ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Very dark gray (10YR 3/1) silty clay sand: moist, massive, F- to M-grnd, non-plastic, sl. packed.				
	2			N/A	N/A	
	3		PID reading at B/H collar = 89 ppm			
	4	Bluish-gray (10B 5/1) clay: moist, soft, plastic, sand ≤ 10%.				
	5					
	6	End of Boring.		TD = 5.0 Ft.		
	7					
	8					
	9					
	10					

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HTRW DRILLING LOG

DISTRICT: Savannah		HOLE NUMBER FD-33
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 2

3. PROJECT: Bulk Fuels Product Delineation.	4. LOCATION: HAAF/Bulk Fuels Fac.
5. NAME OF DRILLER: W. Parker/K. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 21Φ
7. SIZES AND TYPES OF DRILLING OR SAMPLING EQUIPMENT: General 21Φ Hole Digger with 2-in. diam. Solid-stem auger.	8. HOLE LOCATION: Tank 7Φ01 Site,
	9. SURFACE ELEVATION:
	10. DATE STARTED: 11/12/06 — 11. DATE COMPLETED: 11/12/06
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 2 days
14. TOTAL DEPTH OF HOLE: 5.Φ Ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

Hole Digger

18. GEOTECHNICAL SAMPLES	~~DISTURBED~~ N/A		~~UNDISTURBED~~ N/A		19. TOTAL NUMBER OF CORE BOXES N/A		
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC N/A	METALS N/A	OTHER (SPECIFY) N/A	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %	
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY) Fuel Point	23. SIGNATURE OF INSPECTOR			

LOCATION SKETCH/COMMENTS — SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-33

PROJECT: Bulk Fuels Product Del. | INSPECTOR Timothy Coffey | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Very dark grey-brown (10YR 3/2) silty clay sand: dry to moist, F. to M-grnd, rel loose, mnr organics.				
	2			N/A	N/A	
	3	Dark bluish-gray (10B 4/1) clay: moist, plastic, sand ≤ 10%	PID reading at B/H collar = 2 ppm.			
	4	Dark green-gray (10G 4/1) clay/sandy clay: moist, plastic, sand ≤ 25%.				
	5	End of Boring.		TD =	5.0 Ft.	
	6					
	7					
	8					
	9					
	10					

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HTRW DRILLING LOG

DISTRICT: Savannah		HOLE NUMBER: FP-34
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 2
3. PROJECT: Bulk Fuels Product Delineations	4. LOCATION: HAAF/Bulk Fuels Fac.	
5. NAME OF DRILLER: W. Parker/K. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 21Φ	Hole Diggen.
7. SIZES AND TYPES OF DRILLING OR SAMPLING EQUIPMENT: General 21Φ Hole Digger with 2-in. diam. solid-stem auger.	8. HOLE LOCATION: Tank 7001 Site	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 11/12/06	11. DATE COMPLETED: 11/12/06
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 2 days.	
14. TOTAL DEPTH OF HOLE: 5.0 Ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

18. GEOTECHNICAL SAMPLES	DISTURBED: ~~N/A~~	UNDISTURBED: ~~N/A~~	19. TOTAL NUMBER OF CORE BOXES: N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: N/A	METALS: N/A	OTHER (SPECIFY): N/A	OTHER (SPECIFY):	OTHER (SPECIFY):	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY): Fuel Point	23. SIGNATURE OF INSPECTOR: [signature]		

LOCATION SKETCH/COMMENTS — SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-34

PROJECT: Bulk Fuels Product Del. | INSPECTOR Timothy Coffey | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Very dark grey-brn (10YR 3/2) silty clay sand: moist, non-plastic, F- to M-grnd, sl. packed.				
	2	grades to: sandy clay: moist to wet, sl. plastic.		N/A	N/A	
	3	Dark bluish-grey (10B 4/1) clay: moist, plastic, ≤10% sand,	PID reading at B/H color = 3ppm			
	4	Dark green-grey (10Y 4/1) sandy clay: moist, plastic, ≤20% sand.				
	5					
	6	End of Boring.		TD = 5.0 ft.		
	7					
	8					
	9					
	10					

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HTRW DRILLING LOG	DISTRICT: Savannah	HOLE NUMBER FP-35
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 2

3. PROJECT: Bulk Fuels Product Delineation.	4. LOCATION: HAAF / Bulk Fuels Fac.
5. NAME OF DRILLER: W. Parker / K. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 210
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 210 Hole Digger with 2-in. diam. solid-stem auger.	8. HOLE LOCATION: Tank 7001 Site
	9. SURFACE ELEVATION:
	10. DATE STARTED: 11/12/06 — 11. DATE COMPLETED: 11/12/06
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 2 days.
14. TOTAL DEPTH OF HOLE: 5.0 ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

Hole Digger.

18. GEOTECHNICAL SAMPLES	DISTURBED: N/A	UNDISTURBED: N/A	19. TOTAL NUMBER OF CORE BOXES: N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: N/A	METALS: N/A	OTHER (SPECIFY): N/A	OTHER (SPECIFY):	OTHER (SPECIFY):	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY): Fuel Points	23. SIGNATURE OF INSPECTOR		

LOCATION SKETCH/COMMENTS — SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-35

PROJECT: Bulk Fuels Product Del. INSPECTOR Timothy Coffey

SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Very dark gray-brown (10YR 3/2) silty clay sand; moist, non-plastic, F- to M-grnd, sl. packed.				
	2			N/A	N/A	
	3	Dark bluish-gray (10B 4/1) clay; moist, plastic,	PID reading at B/H collar = <1 ppm			
	4	Dark green-gray (10Y 4/1) and brown-yellow (10YR 6/8) mottled sandy clay.				
	5	End of Boring.		TD = 5.0 Ft.		
	6					
	7					
	8					
	9					
	10					

HTRW DRILLING LOG

DISTRICT: Savannah

HOLE NUMBER: FP-36

1. COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: SAIC

SHEET 1 OF 3

3. PROJECT: Bulk Feds Product Delineation

4. LOCATION: HAAF/Bulk Feds Fac.

5. NAME OF DRILLER: W. Parker/K. Ledbetter

6. MANUFACTURERS DESIGNATION OF DRILL: General 216

Hdr Digger

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 216 Hole Digger with 2-in. diam. solid-stem auger.

8. HOLE LOCATION: Tank 7001 Site

9. SURFACE ELEVATION:

10. DATE STARTED: 11/12/96

11. DATE COMPLETED: 11/12/96

12. OVERBURDEN THICKNESS: N/A

15. DEPTH GROUNDWATER ENCOUNTERED: N/A

13. DEPTH DRILLED INTO ROCK: N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry/2 days.

14. TOTAL DEPTH OF HOLE: 5.0 Ft

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES: ~~DISTURBED~~ N/A ~~UNDISTURBED~~ N/A

19. TOTAL NUMBER OF CORE BOXES: N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	N/A	N/A	N/A			

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
			Fuel Point	

LOCATION SKETCH/COMMENTS

SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-36

PROJECT: Bulk Fuels Product Del. INSPECTOR Timothy Coffey

SHEET 2 OF 2

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ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Dark yellow-brown (10YR 4/6) sand: dry, F- to M-grnd, rel. loose; gravelly.				Gravelly
	2	Brown-yellow (10YR 6/8) sand: dry, F-to M-grnd, rel. loose.		N/A	N/A	
	3	Very dark gray (10YR 3/1) silty sand: moist, F- to M-grn, sl. packed.	PID reading at B/H collar = <1 ppm			
	4	Dark gray (10YR 4/1) to v. dark gray (10YR 3/1) clay: rel. stiff, moist, sticky, plastic.				Very tough drilling.
	5					
	6	End of Boring.		TD = 5.0 ft.		
	7					
	8					
	9					
	10					

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HTRW DRILLING LOG

DISTRICT: Savannah		HOLE NUMBER FP-37
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 2

3. PROJECT: Bulk Fuels Product Delineation	4. LOCATION: HAAF/Bulk Fuels Facility
5. NAME OF DRILLER: W. Parker/R. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 21Φ
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 21Φ Hole Digger with 2-in. diam. solid-stem auger.	8. HOLE LOCATION: Tank 7003 Site.
	9. SURFACE ELEVATION:
	10. DATE STARTED: 11/12/06 — 11. DATE COMPLETED: 11/12/06
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry/ 2days
14. TOTAL DEPTH OF HOLE: 5.0 Ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES	DISTURBED N/A	UNDISTURBED N/A	19. TOTAL NUMBER OF CORE BOXES N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC N/A	METALS N/A	OTHER (SPECIFY) N/A	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY) Fuel Paint	23. SIGNATURE OF INSPECTOR		

Hole Digger

LOCATION SKETCH/COMMENTS — SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-37

PROJECT: Bulk Fuels Product Del. | INSPECTOR Timothy Coffey | SHEET 2 OF 2

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ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Dark yellowish-brown (10YR 4/6) sand: dry, F- to M-grnd, rel. loose.				
	2	Very dark gray (10YR 3/1) sand; moist, F- to M-grnd, sl. packed.				
	3	Dark yellowish-brown (10YR 4/6) sand/silty sand: moist, sl. packed, F- to M-grnd.	PID reading at B/H collar = 1220 ppm.	N/A	N/A	strong product odor.
	4					
	5					
	6	End of Boring.		TD =	5.0 Ft.	
	7					
	8					
	9					
	10					

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HTRW DRILLING LOG

DISTRICT: Savannah

HOLE NUMBER: FP-38

1. COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: SAIC

SHEET 1 OF 2

3. PROJECT: Bulk Fuels Product Delineation

4. LOCATION: HAAF / Bulk Fuels Facility

5. NAME OF DRILLER: W. Parker / K. Ledbetter

6. MANUFACTURERS DESIGNATION OF DRILL: General 21Φ

Hole Digger

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 21Φ Hole Digger with 2-in. diam. solid-stem auger.

8. HOLE LOCATION: Tank 7003 Site.

9. SURFACE ELEVATION:

10. DATE STARTED: 11/12/06

11. DATE COMPLETED: 11/12/06

12. OVERBURDEN THICKNESS: N/A

15. DEPTH GROUNDWATER ENCOUNTERED: N/A

13. DEPTH DRILLED INTO ROCK: N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 2 days.

14. TOTAL DEPTH OF HOLE: 5.0 Ft.

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES	~~DISTURBED~~	~~UNDISTURBED~~	19. TOTAL NUMBER OF CORE BOXES: N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: N/A	METALS: N/A	OTHER (SPECIFY): N/A	OTHER (SPECIFY):	OTHER (SPECIFY):	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY): Fuel Point	23. SIGNATURE OF INSPECTOR: Timothy Jeffrey		

LOCATION SKETCH/COMMENTS

SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-38

PROJECT: Bulk Fuels Product Del. | INSPECTOR Timothy Coffey | SHEET 2 OF 2

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ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Dark yellow-brown (10YR 4/6) sand: dry, rel. loose, F- to M-grnd.				
	2	Very dark gray (10YR 3/1) sand: sl. packed, F- to M-grnd.				
	3	Black (10YR 2/1) silty sand: dry to moist, F- grnd, sl. packed.		N/A	N/A	
	4	Very dark gray (10YR 3/1) sand: moist to wet, sl. packed, F- to M-grnd.	PID reading at B/H collar = 1400 ppm			Very strong product odor.
	5					
	6	End of Boring.		TD = 5.0 Ft.		
	7					
	8					
	9					
	10					

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HTRW DRILLING LOG

DISTRICT: Savannah

HOLE NUMBER: FP-39

1. COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: SAIC

SHEET 1 OF 2

3. PROJECT: Bulk Fuels Product Delineations.

4. LOCATION: HAAF/Bulk Fuels Facility.

5. NAME OF DRILLER: W. Parker/K. Ledbetter

6. MANUFACTURERS DESIGNATION OF DRILL: General 21Φ Hole Digger

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 21Φ Hole Digger with 2-in. diam. solid-stem auger.

8. HOLE LOCATION: Tank 7003 Site.

9. SURFACE ELEVATION:

10. DATE STARTED: 11/12/06

11. DATE COMPLETED: 11/12/06

12. OVERBURDEN THICKNESS: N/A

15. DEPTH GROUNDWATER ENCOUNTERED: N/A

13. DEPTH DRILLED INTO ROCK: N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry/2 days

14. TOTAL DEPTH OF HOLE: 6.0 Ft

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	N/A	N/A	N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	N/A	N/A	N/A			

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
			Fuel Point	

LOCATION SKETCH/COMMENTS

SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-39

PROJECT: Bulk Fuels Product Del. INSPECTOR Timothy Coffey

SHEET 2 OF 2

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ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Very dark gray (10YR 3/1) silty sand: moist, sl. packed, F- to M-grnd.				
	2			N/A	N/A	
	3					
	4	Greenish-gray (10 BG 5/1) sandy clay: moist, rel. soft, med. plast.	PID reading at B/H collar = 144 ppm			strong product odor.
	5					
	6	End of Boring.		TD = 5.0 ft.		
	7					
	8					
	9					
	10					

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HTRW DRILLING LOG

DISTRICT: Savannah

HOLE NUMBER: FP-40

1. COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: SAIC

SHEET 1 OF 2

3. PROJECT: Bulk Fuels Product Delineation

4. LOCATION: HAAF/Bulk Fuels Fac.

5. NAME OF DRILLER: W. Parker/K. Ledbetter

6. MANUFACTURERS DESIGNATION OF DRILL: General 210 Hole Digger

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 210 Hole Digger with 2-in. diam. solid-stem auger.

8. HOLE LOCATION: Tank 7003 Site

9. SURFACE ELEVATION:

10. DATE STARTED: 11/12/06

11. DATE COMPLETED: 11/12/06

12. OVERBURDEN THICKNESS: N/A

15. DEPTH GROUNDWATER ENCOUNTERED: N/A

13. DEPTH DRILLED INTO ROCK: N/A

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry/ 2 days.

14. TOTAL DEPTH OF HOLE: 5.0 ft

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES: DISTURBED N/A; UNDISTURBED N/A

19. TOTAL NUMBER OF CORE BOXES: N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	N/A	N/A	N/A			

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
			Fuel Point	Timothy Coffey

LOCATION SKETCH/COMMENTS

SCALE:

See page 41, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-40

PROJECT: Bulk Fuels Product Del. INSPECTOR Timothy Coffey SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	~~Very~~ dark yell-brn (10YR 4/6) sand: dry, F- to M-grnd, rel. loose.				
	2	Very pale brown (10YR 7/4) sand; dry, v. loose, massive, M-grnd.		N/A	N/A	
	3	Olive brown (2.5Y 4/3) sand: moist, sl. packed, F. to M-grnd.	PID reading at B/H collar = 140 ppm			
	4					
	5	olive brown sandy clay: moist, med. plast.				
	6	End of Boring.		TD = 5.0 ft.		
	7					
	8					
	9					
	10					

HTRW DRILLING LOG

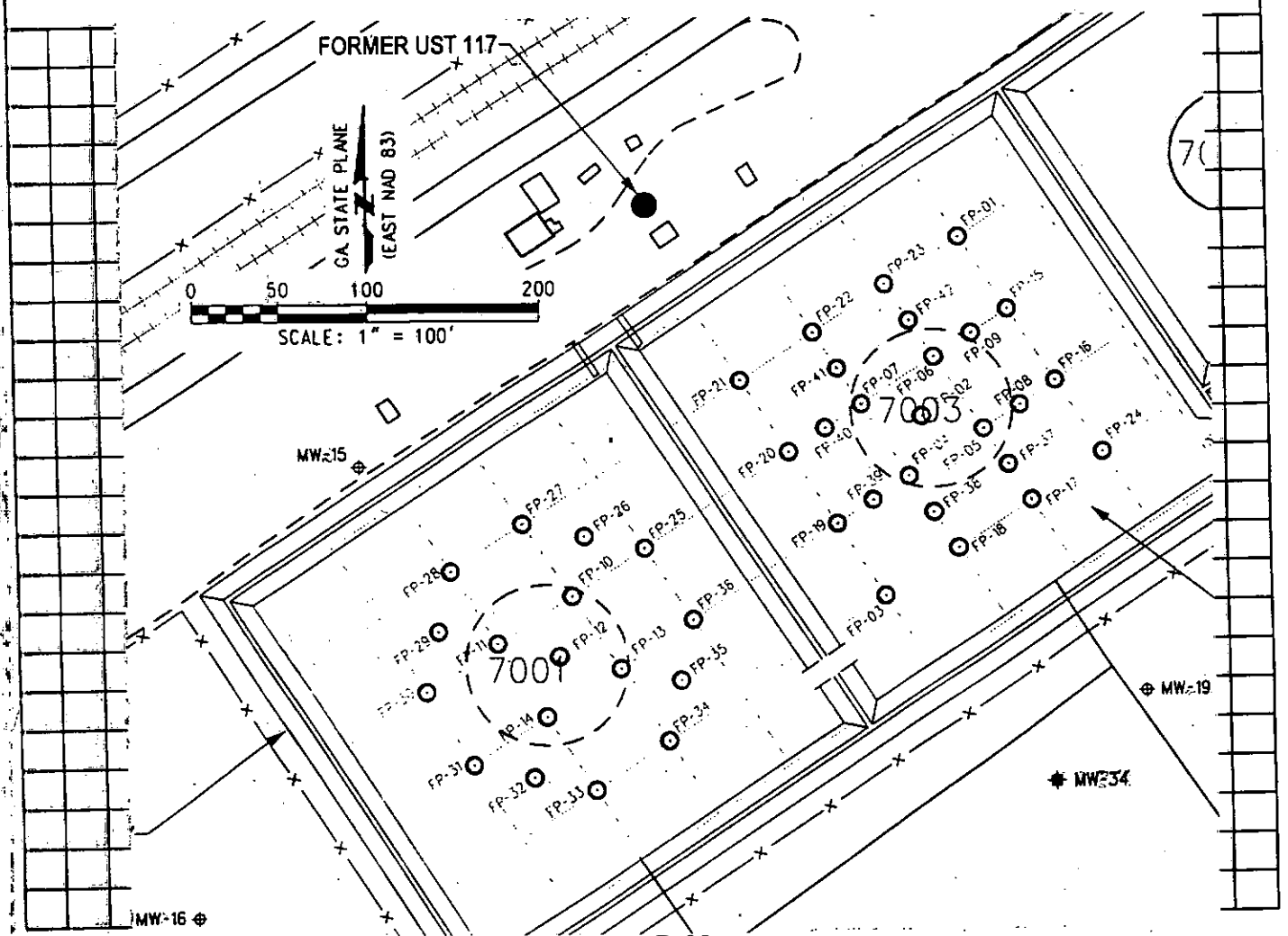
	DISTRICT: Savannah	HOLE NUMBER FP-41
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 2

3. PROJECT: Bulk Fuels Product Delineation	4. LOCATION: HAAF / Bulk Fuels Fac.
5. NAME OF DRILLER: W. Parker / K. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 21Φ Hole Digger
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 21Φ Hole Digger with 2-in. diam. solid-stem auger.	8. HOLE LOCATION: Tank 7003 Site.
	9. SURFACE ELEVATION:
	10. DATE STARTED: 11/12/06 — 11. DATE COMPLETED: 11/12/06
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 2 days.
14. TOTAL DEPTH OF HOLE: 5.0 Ft.	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES	DISTURBED: N/A	UNDISTURBED: N/A	19. TOTAL NUMBER OF CORE BOXES: N/A			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: N/A	METALS: N/A	OTHER (SPECIFY): N/A	OTHER (SPECIFY):	OTHER (SPECIFY):	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY): Fuel Point	23. SIGNATURE OF INSPECTOR: Timothy Coffey		

LOCATION SKETCH/COMMENTS

SCALE:



HTRW DRILLING LOG

HOLE NUMBER FP-47

PROJECT: Bulk Fuels Product Del. | INSPECTOR Timothy Coffey | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0	Dark yellow-brn (10YR 4/6) sand: dry, rel. loose, F- to M-grnd.				
	1	Very dark gray (10YR 3/1) silty sand: dry to moist, F- to M-grnd, sl. packed.				
	2			N/A	N/A	
	3		PID reading at B/H collar = 6 ppm			
	4	Olive brown (2.5Y 4/3) sandy clay: moist, sl. soft, sl. plast, mottled.				
	5	End of Boring.		TD = 5.0 Ft		
	6					
	7					
	8					
	9					
	10					

HTRW DRILLING LOG

DISTRICT: Savannah		HOLE NUMBER FP-42
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: SAIC	SHEET 1 OF 2
3. PROJECT: Bulk Fuels Product Delineation	4. LOCATION: HAAF / Bulk Fuels Fac.	
5. NAME OF DRILLER: W. Parker / K. Ledbetter	6. MANUFACTURERS DESIGNATION OF DRILL: General 210	Hole Digger
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: General 210 Hole Digger with 2-in. diam. solid-stem auger.	8. HOLE LOCATION: Tank 7003 Site.	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 11/12/06	11. DATE COMPLETED: 11/12/06
12. OVERBURDEN THICKNESS: N/A	15. DEPTH GROUNDWATER ENCOUNTERED: N/A	
13. DEPTH DRILLED INTO ROCK: N/A	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: Dry / 2 days.	
14. TOTAL DEPTH OF HOLE: 5.0 Ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

18. GEOTECHNICAL SAMPLES: ~~DISTURBED~~ N/A		UNDISTURBED N/A		19. TOTAL NUMBER OF CORE BOXES: N/A		
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	N/A	N/A	N/A			
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY) Fuel Point	23. SIGNATURE OF INSPECTOR: Matthew Coffey		

LOCATION SKETCH/COMMENTS

SCALE:

See page 4, this logbook, for location sketch.

HTRW DRILLING LOG

HOLE NUMBER FP-42

PROJECT: Bulk Fuels Product Del. | INSPECTOR Timothy Coffey | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Dark yellow-brown (10YR 4/6) sand: dry; rel. loose, F- to m-grnd.				
	2	Very dark gray (10YR 3/1) silty sand: dry to moist, F- to m-grnd.				
	3	Black (10YR 2/1) silty sand: moist, F-grnd, sl. packed, massive. becoming: clayey: moist; sl. plastic.	PID reading at B/H collar = 5 ppm	N/A	N/A	
	4	Bluish-gray (10B 5/1) clay: moist, plastic, rel. soft, sand ≤ 10%				
	5	End of Boring.		TD = 5.0 Ft.		
	6					
	7					
	8					
	9					
	10					

MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-Φ1

INSTALLATION START: DATE: 11/10/06 TIME: 1200

INSTALLATION FINISH: DATE: 11/10/06 TIME: 1330

ANNULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: W.G. #1 QUANTITY: 5 lbs

BENTONITE SEAL: TYPE: DSI Easy Seal QUANTITY: 1-2 lbs

GROUT: TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): Φ.Φ1 SLOT CONFIGURATION: Horizontal

TOTAL OPEN AREA PER FOOT OF SCREEN: N/A

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations

DESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing

JOINT DESIGN AND COMPOSITION: Flush-threaded / slip-cap on bottom

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

NOMINAL INSIDE DIAMETER: 6-in. COMPOSITION: Steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [✓] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [✓] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [✓] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: NONE

RECORDED BY: Wyatt Tam 11/27/06 (Signature & Date) **QA CHECK BY:** (Signature & Date)

3

MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-01

BEGIN: 11/10/06

END: 11/10/06

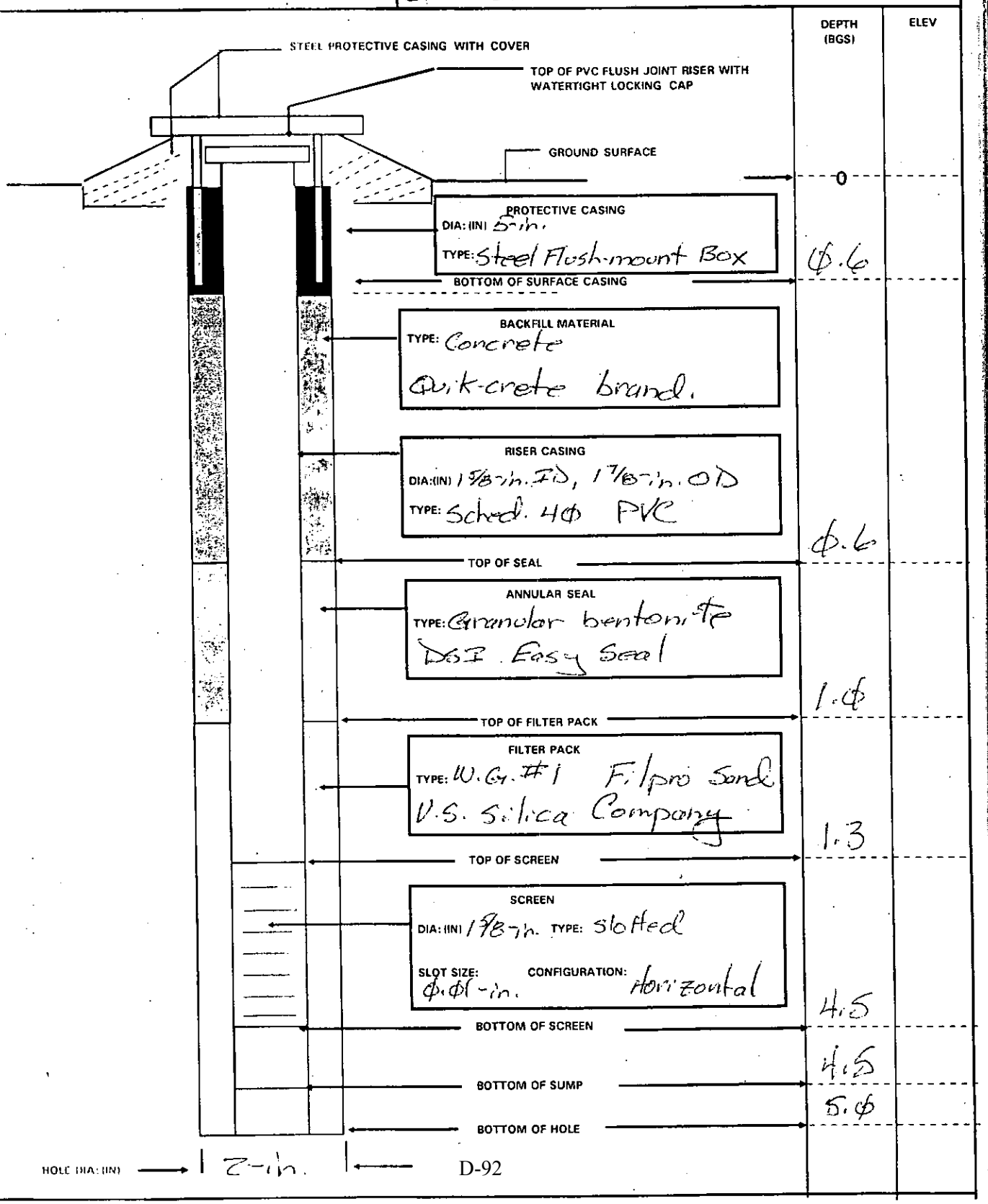
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface.

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-02

INSTALLATION START: DATE: 11/10/06 TIME: 1400

INSTALLATION FINISH: DATE: 11/10/06 TIME: 1545

ANNULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: W.G. #1 QUANTITY: 5 lbs

BENTONITE SEAL: TYPE: DSI Easy Seal QUANTITY: 1-2 lbs

GROUT: TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): 0.01 SLOT CONFIGURATION: Horizontal

TOTAL OPEN AREA PER FOOT OF SCREEN: N/A

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

NOMINAL INSIDE DIAMETER: 5-in. COMPOSITION: steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [✓] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [✓] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [✓] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: NONE

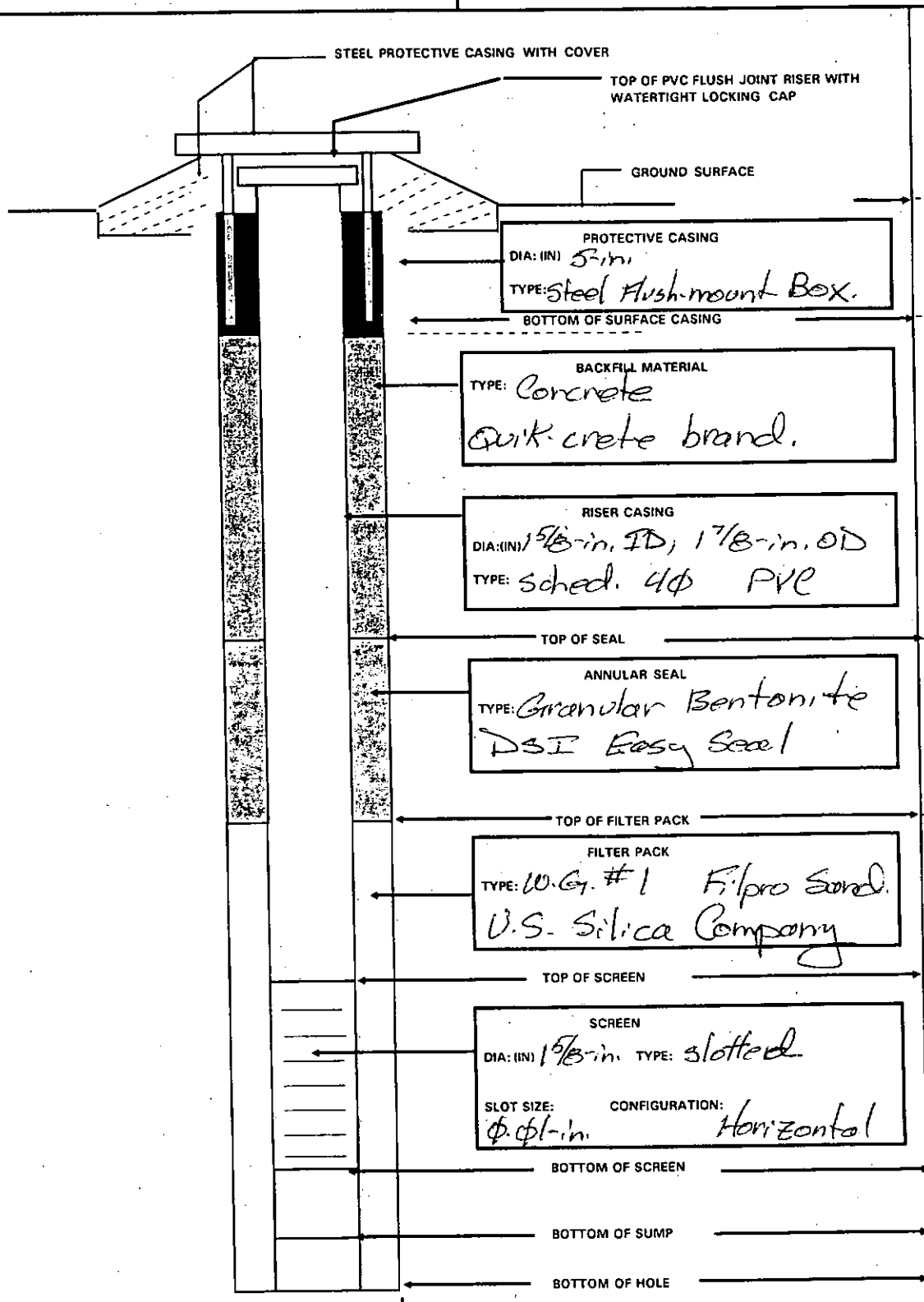
RECORDED BY: [signature] 11/27/06 (Signature & Date) **QA CHECK BY:** _____ (Signature & Date)

8

MONITORING WELL

PROJECT: Bulk Fuel Facility
DELIVERY ORDER NO: 0066

WELL NUMBER: FP-02
BEGIN: 11/10/06
END: 11/10/06
COORDINATES: N:
E:
DATUM/UNITS:
REFERENCE POINT: Ground Surface. **ELEVATION:** **DATUM/UNITS:**



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MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-03

INSTALLATION START: DATE: 11/11/06 TIME: 0745

INSTALLATION FINISH: DATE: 11/11/06 TIME: 0809

ANNULAR SPACE MATERIALS INVENTORY:

- **GRANULAR FILTER PACK:** TYPE: W.G. #1 QUANTITY: 5 lbs
- **BENTONITE SEAL:** TYPE: DSI Easy Seal QUANTITY: 1-2 lbs
- **GROUT:** TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- **SLOT SIZE (inches):** 0.01 **SLOT CONFIGURATION:** Horizontal
- **TOTAL OPEN AREA PER FOOT OF SCREEN:** N/A
- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: _____

DESCRIPTION OF WELL CASING:

- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- **NOMINAL INSIDE DIAMETER:** 5-in. **COMPOSITION:** Steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None

RECORDED BY: [signature] 11/12/06 (Signature & Date) **QA CHECK BY:** Wayne H. Palm 11/27/06 (Signature & Date)

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MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-03

BEGIN: 11/11/96

END: 11/11/96

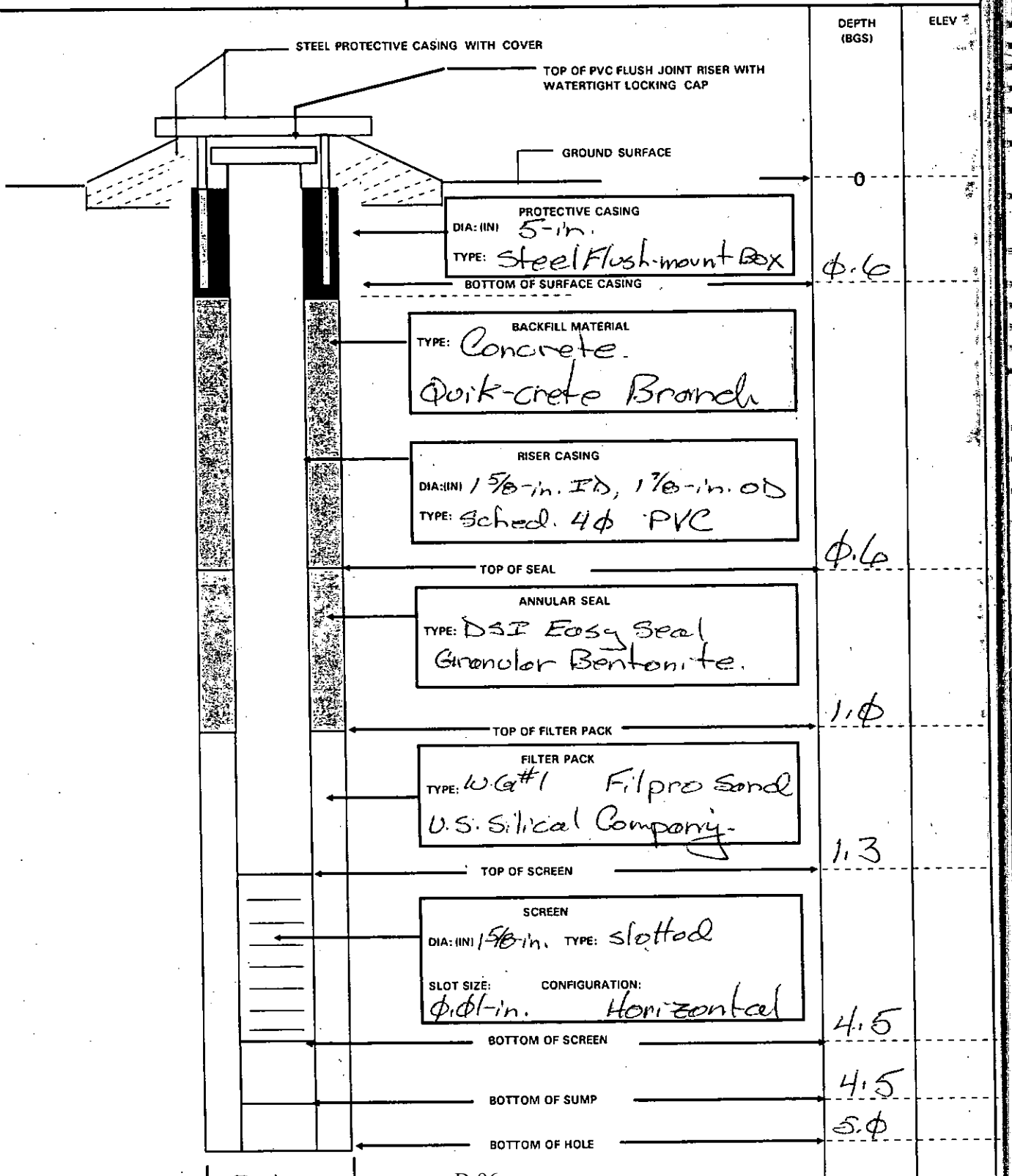
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility DELIVERY ORDER: 0066

MONITORING WELL ID: FP-04

INSTALLATION START: DATE: 11/11/06 TIME: 0820

INSTALLATION FINISH: DATE: 11/11/06 TIME: 0828

ANNULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: #1 W.G. QUANTITY: 5 lbs.

BENTONITE SEAL: TYPE: DSI EasySeal QUANTITY: 1-2 lbs.

GROUT: TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): 0.01 SLOT CONFIGURATION: Horizontal

TOTAL OPEN AREA PER FOOT OF SCREEN: N/A

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native formations.

DESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip-cap on bottom

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

NOMINAL INSIDE DIAMETER: 5-in. COMPOSITION: steel

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/12/06 (Signature & Date)

QA CHECK BY: Wayne H. Parker 11/27/06 (Signature & Date)

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MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-04

BEGIN: 11/11/06

END: 11/11/06

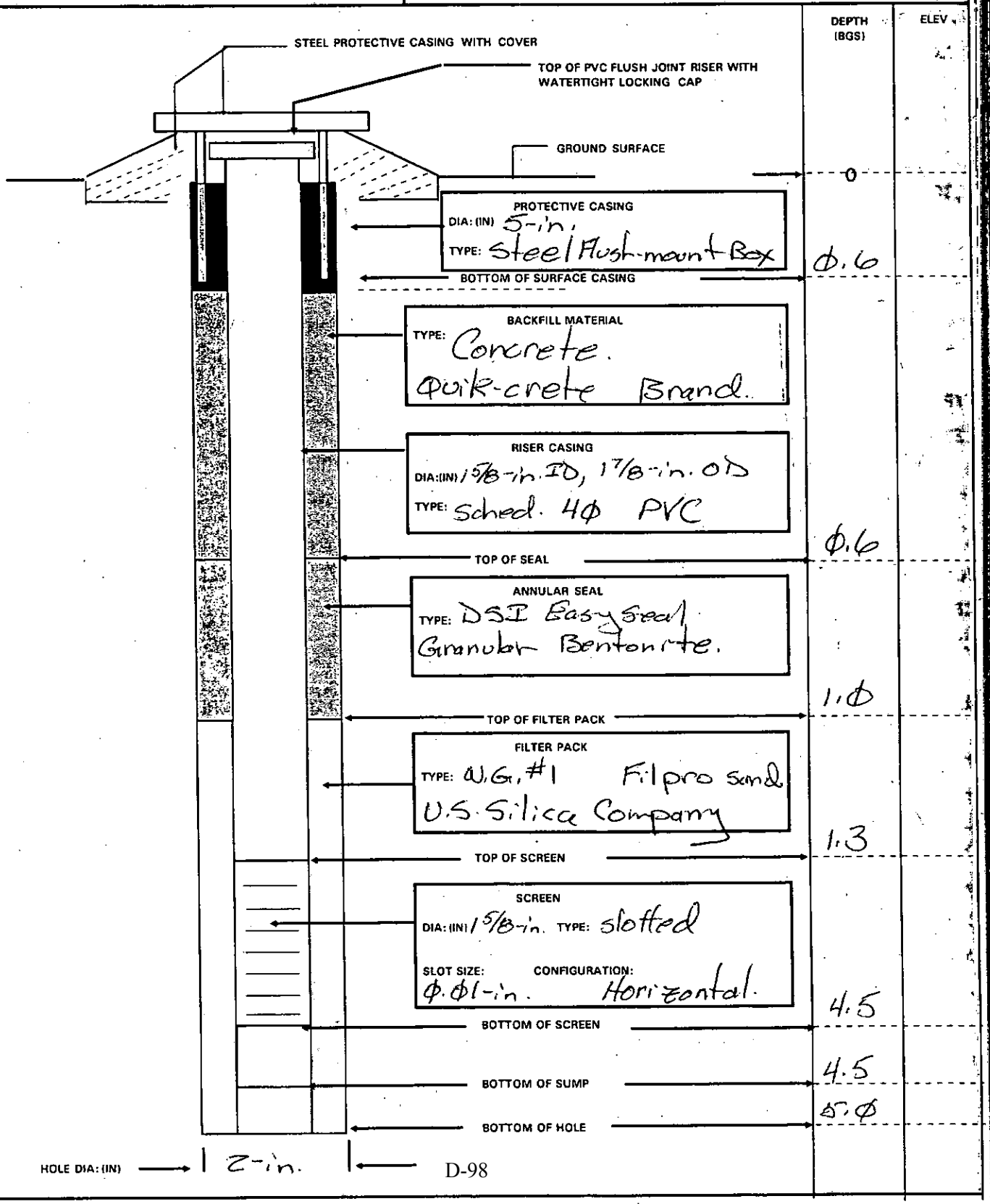
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-05

INSTALLATION START: DATE: 11/11/06 TIME: 0837

INSTALLATION FINISH: DATE: 11/11/06 TIME: ~~0854~~ 0839 TSC 11/12/06

ANNULAR SPACE MATERIALS INVENTORY:

- GRANULAR FILTER PACK: TYPE: QG. #1 QUANTITY: 5 lbs.
- BENTONITE SEAL: TYPE: DSI Easy Seal QUANTITY: 1-2 lbs
- GROUT: TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- SLOT SIZE (inches): 0.01 SLOT CONFIGURATION: Horizontal
- TOTAL OPEN AREA PER FOOT OF SCREEN: N/A
- OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.
- SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC
- MANUFACTURER: ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

- OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.
- SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC
- MANUFACTURER: ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip-cap on bottom

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- NOMINAL INSIDE DIAMETER: 5-in. COMPOSITION: Steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/12/06 (Signature & Date) **QA CHECK BY:** Wayne A. Parker 11/22/06 (Signature & Date)

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MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-05

BEGIN: 11/11/06

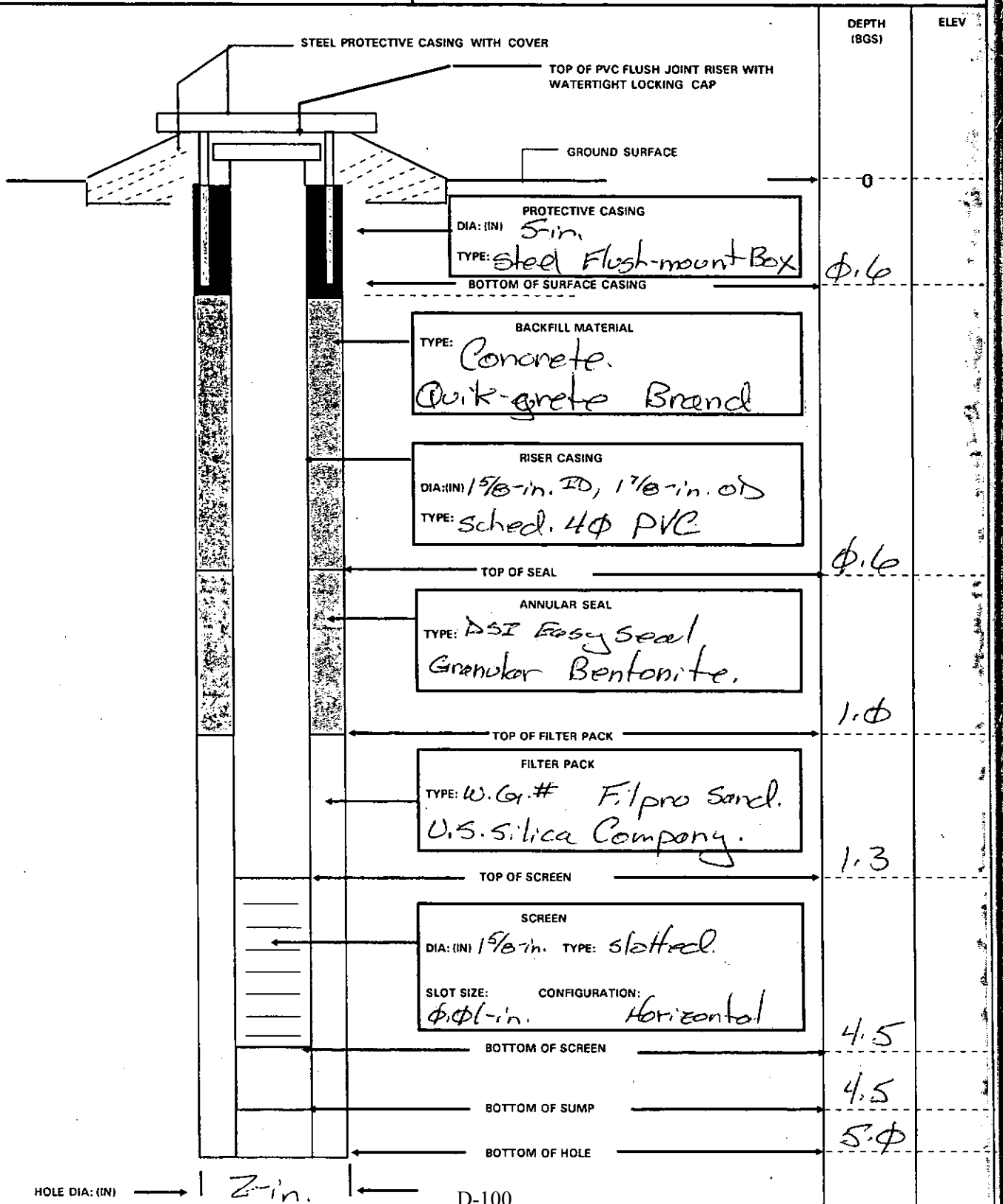
END: 11/11/06

COORDINATES: N:

E:

DATUM/UNITS:

REFERENCE POINT: ELEVATION: DATUM/UNITS: Ground Surface.



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-06

INSTALLATION START: DATE: 11/11/06 TIME: 0849

INSTALLATION FINISH: DATE: 11/11/06 TIME: 0854

ANNULAR SPACE MATERIALS INVENTORY:

- **GRANULAR FILTER PACK:** TYPE: W.G. #1 QUANTITY: 5 lbs
- **BENTONITE SEAL:** TYPE: DSI Easy Seal QUANTITY: 1-2 lbs
- **GROUT:** TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- **SLOT SIZE (inches):** 0.01 **SLOT CONFIGURATION:** Horizontal
- **TOTAL OPEN AREA PER FOOT OF SCREEN:** N/A
- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations

DESCRIPTION OF WELL CASING:

- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip-cap on bottom

CENTRALIZERS DESIGN AND COMPOSITION: None

DESCRIPTION OF PROTECTIVE CASING:

- **NOMINAL INSIDE DIAMETER:** 5-in. **COMPOSITION:** Steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None

RECORDED BY: [signature] 11/13/06 (Signature & Date)

QA CHECK BY: [signature] 11/27/06 (Signature & Date)

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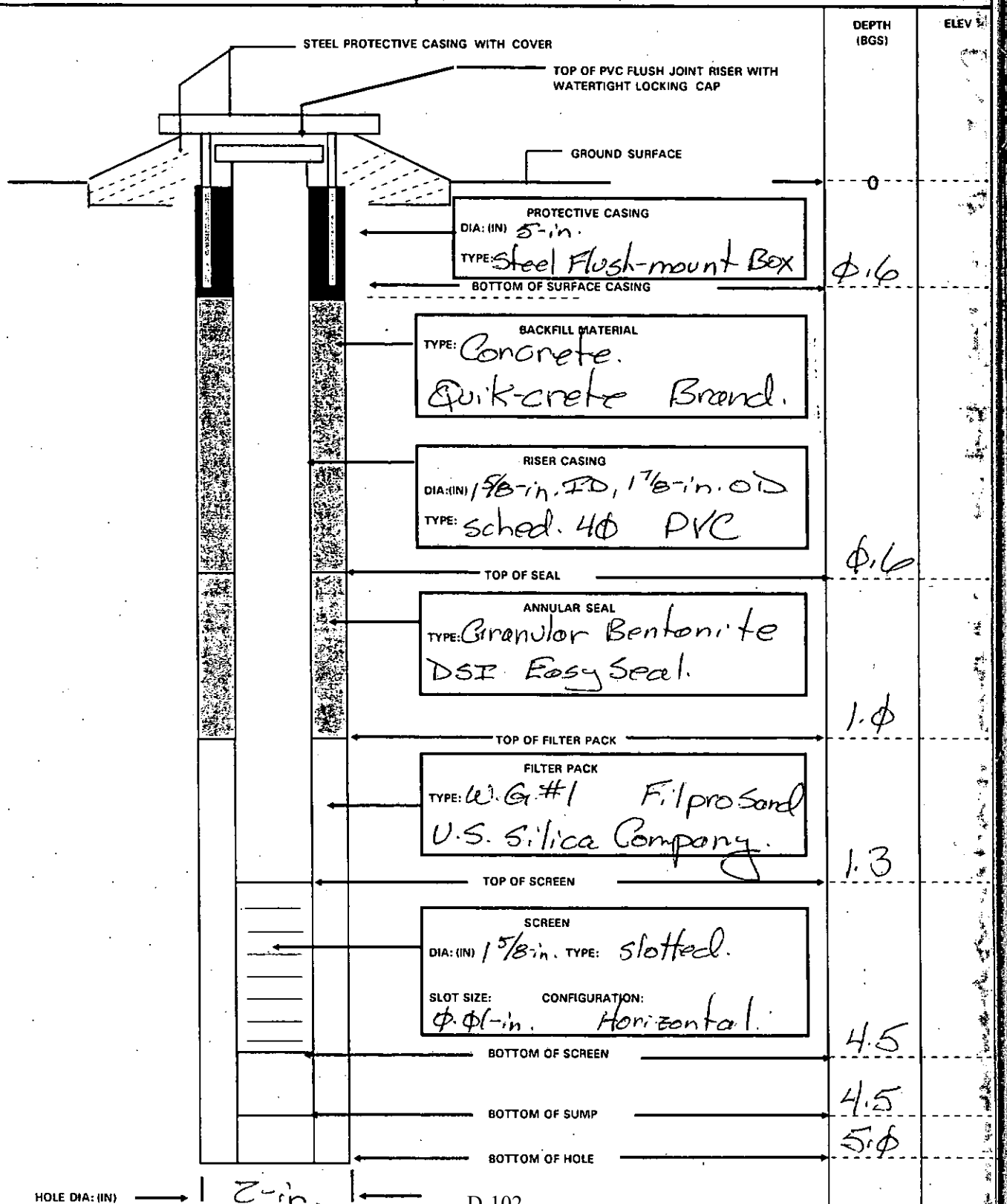
MONITORING WELL

PROJECT: Bulk Fuel Facility
DELIVERY ORDER NO: 0066

WELL NUMBER: FP-06
BEGIN: 11/11/06 **END:** 11/11/06
COORDINATES: N:
E:
DATUM/UNITS:
REFERENCE POINT: Ground Surface. **ELEVATION:** **DATUM/UNITS:**



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-07

INSTALLATION START: DATE: 11/11/06 TIME: 0901

INSTALLATION FINISH: DATE: 11/11/06 TIME: 0909

ANNULAR SPACE MATERIALS INVENTORY:

- **GRANULAR FILTER PACK:** TYPE: W.G. #1 QUANTITY: 5 lbs.
- **BENTONITE SEAL:** TYPE: DSI Easy Seal QUANTITY: 1-2 lbs.
- **GROUT:** TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- **SLOT SIZE (inches):** 0.01 **SLOT CONFIGURATION:** Horizontal
- **TOTAL OPEN AREA PER FOOT OF SCREEN:** N/A
- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip-cap on bottom

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- **NOMINAL INSIDE DIAMETER:** 6-in. **COMPOSITION:** Steel

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK EMPLACEMENT: None

RECORDED BY: [signature] 11/13/06 (Signature & Date) **QA CHECK BY:** Wayne M. Pash 11/27/06 (Signature & Date)

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MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-07

BEGIN: 11/11/96

END: 11/11/96

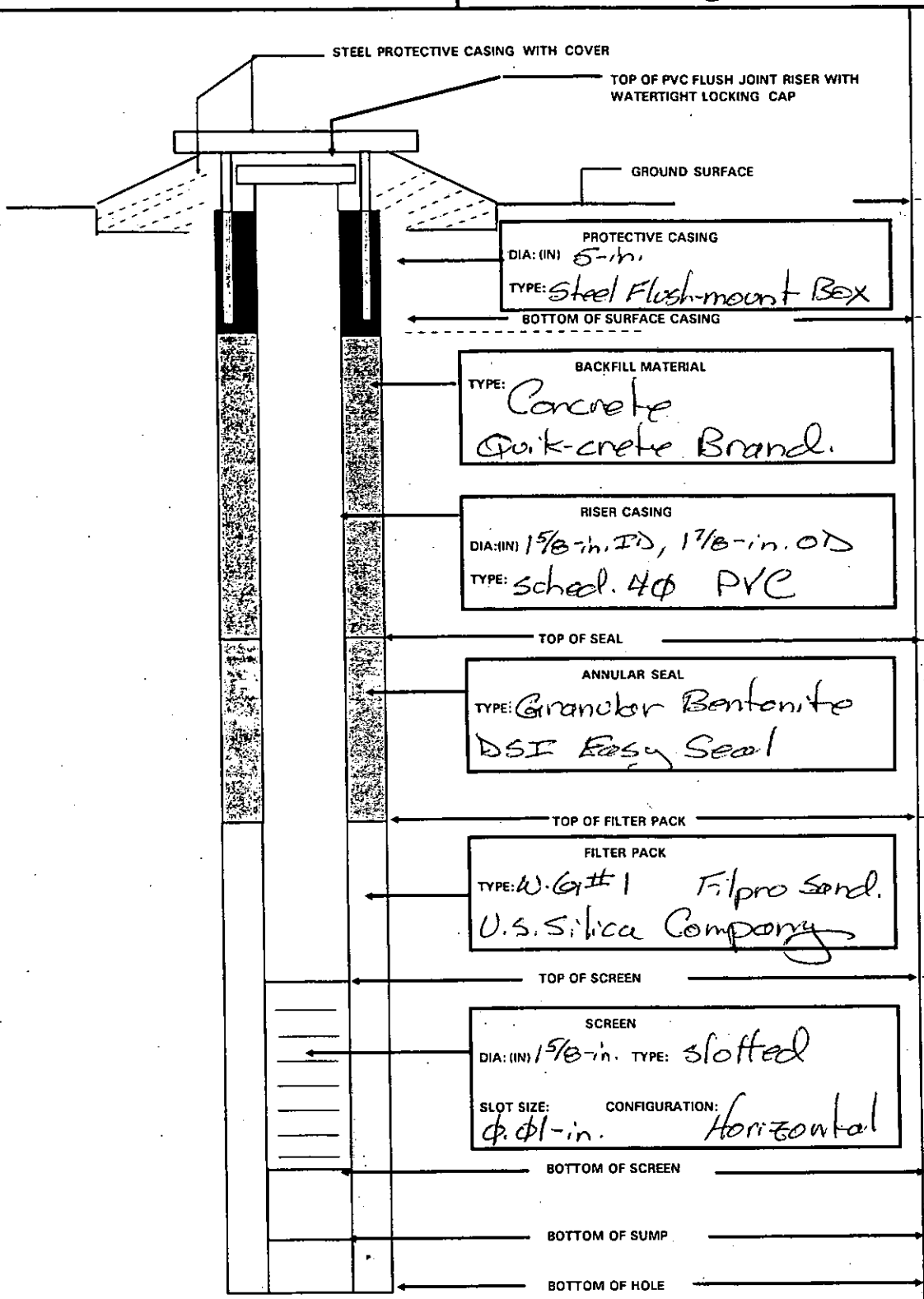
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface.

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility DELIVERY ORDER: 0066

MONITORING WELL ID: FP-06

INSTALLATION START: DATE: 11/11/06 TIME: 0920

INSTALLATION FINISH: DATE: 11/11/06 TIME: 0924

ANNULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: W.G. #1 QUANTITY: 5 lbs

BENTONITE SEAL: TYPE: DSI Easy Seal QUANTITY: 1-2 lbs

GROUT: TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): 0.01 SLOT CONFIGURATION: Horizontal

TOTAL OPEN AREA PER FOOT OF SCREEN: N/A

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip-cap on bottom

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

NOMINAL INSIDE DIAMETER: 5-in. COMPOSITION: Steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/13/06 (Signature & Date) QA CHECK BY: [signature] 11/27/06 (Signature & Date)

38

MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-08

BEGIN: 11/11/06

END: 11/11/06

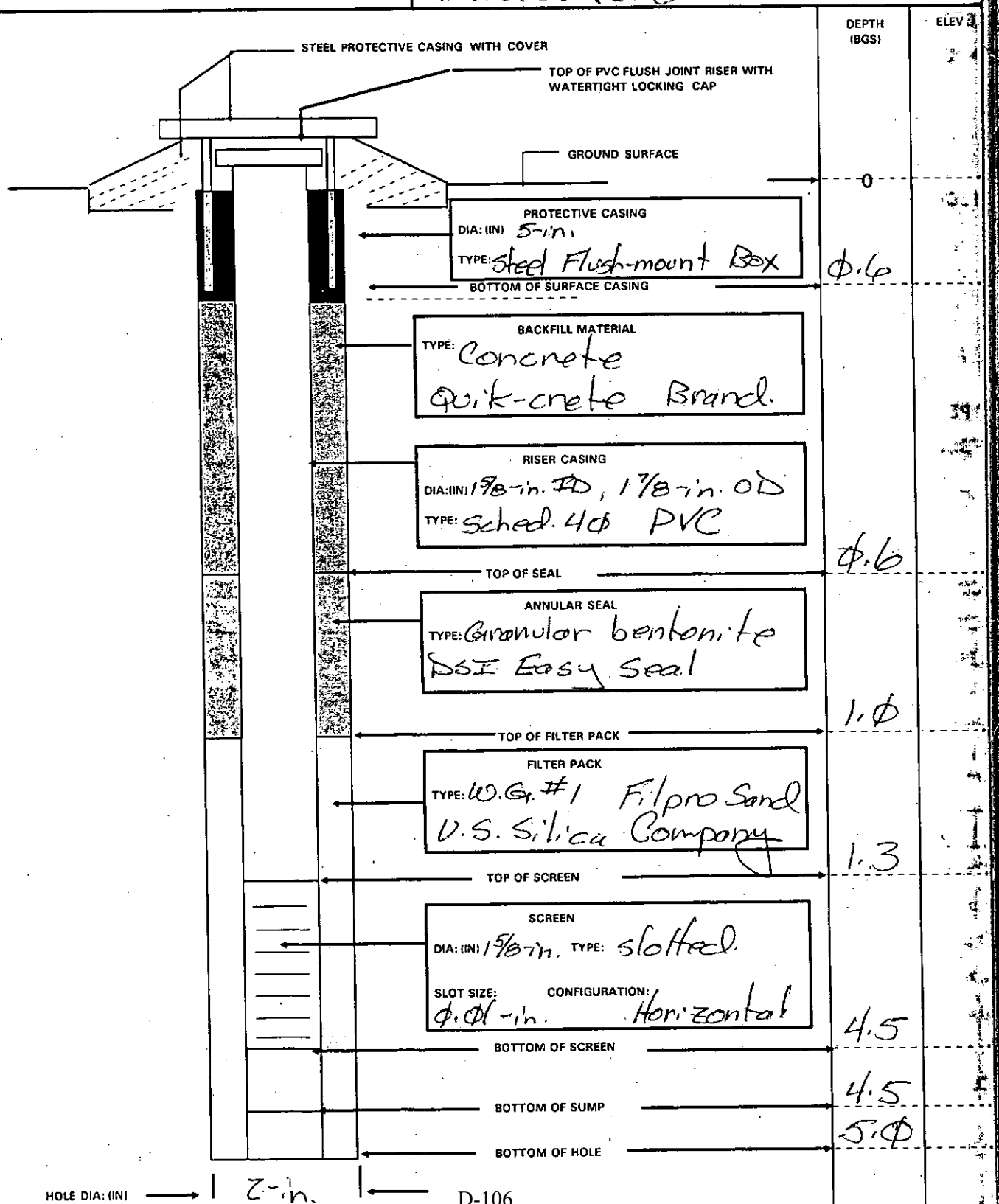
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-09

INSTALLATION START: DATE: 11/11/06 TIME: 0933

INSTALLATION FINISH: DATE: 11/11/06 TIME: 0944

ANNULAR SPACE MATERIALS INVENTORY:

- **GRANULAR FILTER PACK:** TYPE: W.G. #1 QUANTITY: 5 lbs.
- **BENTONITE SEAL:** TYPE: DSI Easy Seal QUANTITY: 1-2 lbs.
- **GROUT:** TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- **SLOT SIZE (inches):** 0.01 **SLOT CONFIGURATION:** Horizontal
- **TOTAL OPEN AREA PER FOOT OF SCREEN:** N/A
- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations

DESCRIPTION OF WELL CASING:

- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-Threaded/slip-cap on bottom

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- **NOMINAL INSIDE DIAMETER:** 6-in. **COMPOSITION:** Steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Was deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None

RECORDED BY: [signature] 11/13/06 (Signature & Date) **QA CHECK BY:** [signature] 11/27/06 (Signature & Date)

4.5

MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FR-09

BEGIN: 11/11/96

END: 11/11/96

COORDINATES: N:

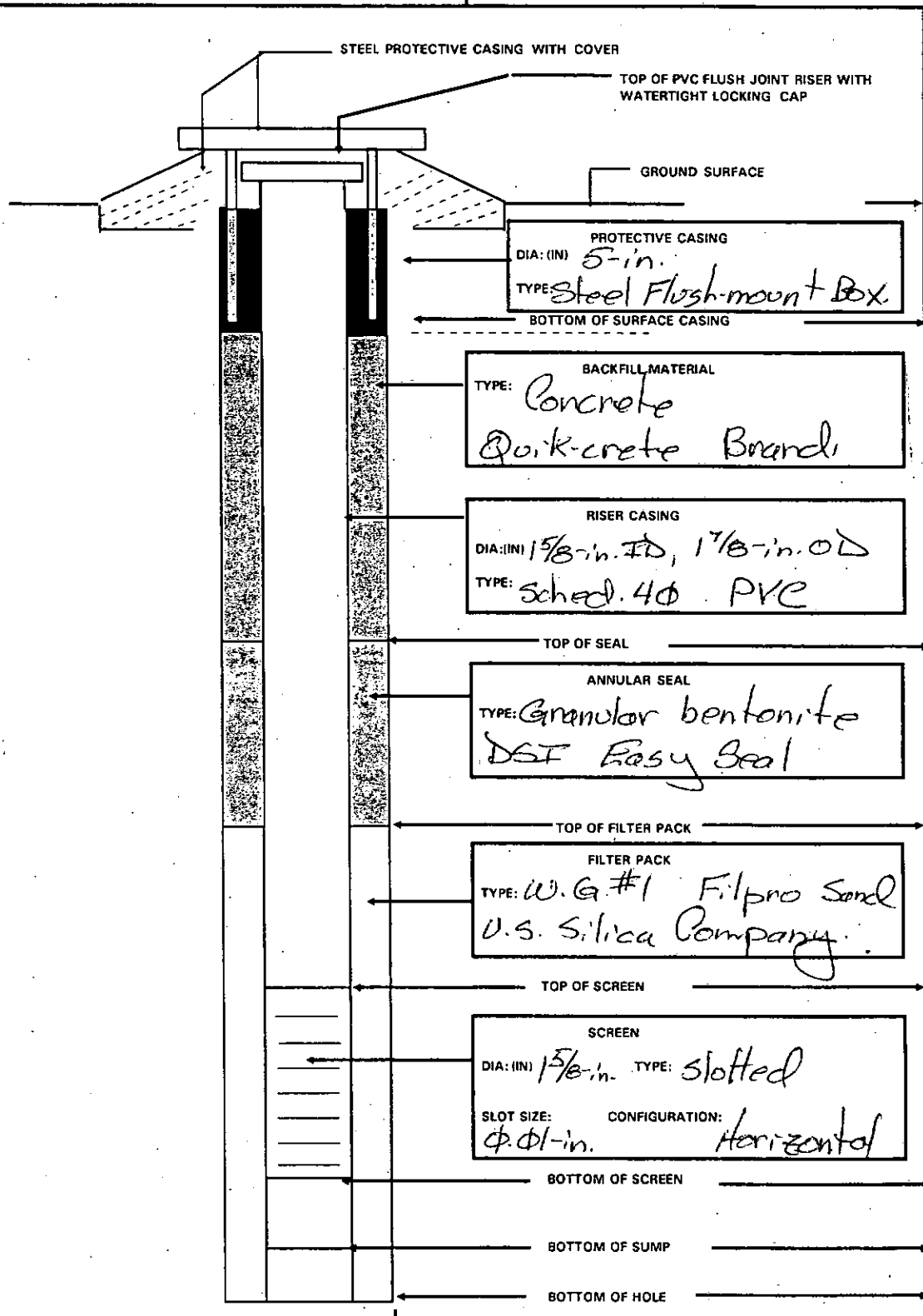
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-1Φ

INSTALLATION START: DATE: 11/11/Φ6 TIME: 1ΦΦ6

INSTALLATION FINISH: DATE: 11/11/Φ6 TIME: 1Φ12

ANNULAR SPACE MATERIALS INVENTORY:

- GRANULAR FILTER PACK: TYPE: W.G. #1 QUANTITY: 5 lbs.
- BENTONITE SEAL: TYPE: DSI Easy Seal QUANTITY: 1-2 lbs.
- GROUT: TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- SLOT SIZE (inches): Φ.Φ1 SLOT CONFIGURATION: Horizontal
- TOTAL OPEN AREA PER FOOT OF SCREEN: N/A
- OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.
- SCHEDULE/THICKNESS: Sched. 4Φ COMPOSITION: PVC
- MANUFACTURER: ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

- OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.
- SCHEDULE/THICKNESS: Sched. 4Φ COMPOSITION: PVC
- MANUFACTURER: ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- NOMINAL INSIDE DIAMETER: 6-in. COMPOSITION: Steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None

RECORDED BY: [signature] 11/13/Φ6 (Signature & Date)

QA CHECK BY: Wayne H. Yates 11/27/06 (Signature & Date)

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MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-10

BEGIN: 11/11/06

END: 11/11/06

COORDINATES: N:

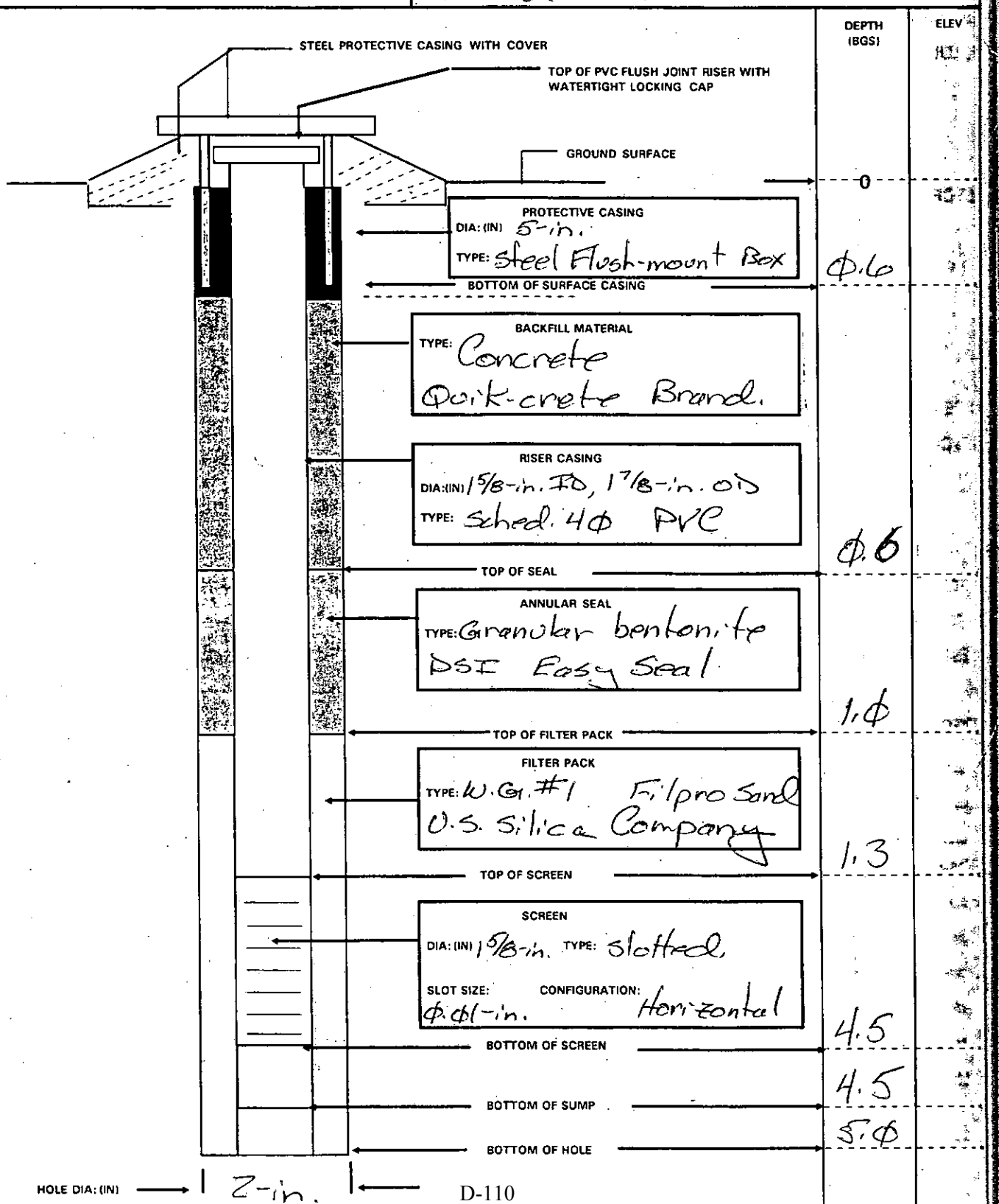
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface.

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-11

INSTALLATION START: DATE: 11/11/06 TIME: 1018

INSTALLATION FINISH: DATE: 11/11/06 TIME: 1023

ANNULAR SPACE MATERIALS INVENTORY:

- **GRANULAR FILTER PACK:** TYPE: W.G. #1 QUANTITY: 5 lbs.
- **BENTONITE SEAL:** TYPE: DSI Easy Seal QUANTITY: 1-2 lbs.
- **GROUT:** TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- **SLOT SIZE (inches):** 0.01 **SLOT CONFIGURATION:** Horizontal
- **TOTAL OPEN AREA PER FOOT OF SCREEN:** N/A
- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded / slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A.

DESCRIPTION OF PROTECTIVE CASING:

- **NOMINAL INSIDE DIAMETER:** 6-in. **COMPOSITION:** Steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/13/06 (Signature & Date) **QA CHECK BY:** Wayne H. Paw 11/27/06 (Signature & Date)

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MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-11

BEGIN: 11/11/06

END: 11/11/06

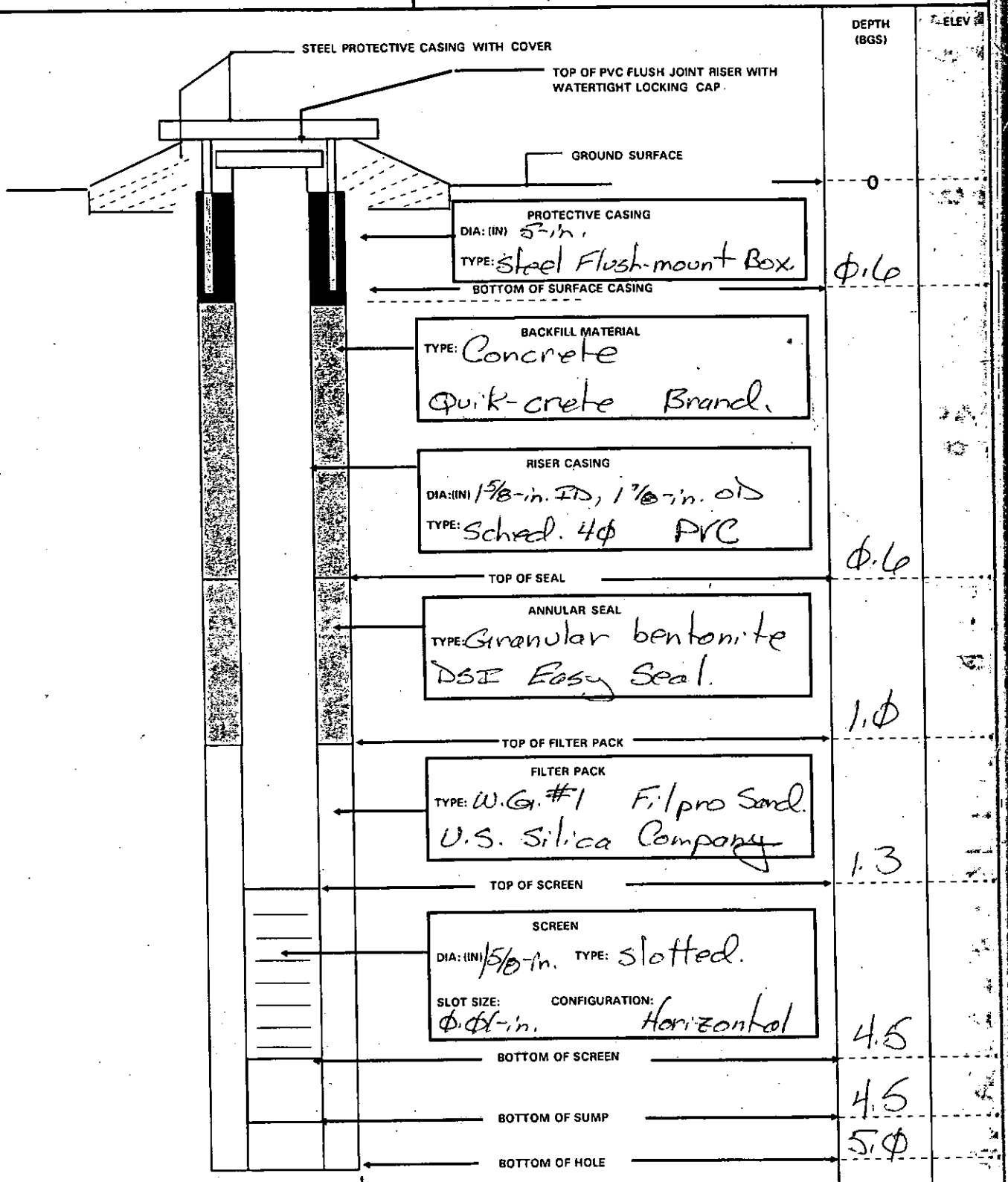
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface.

ELEVATION:

DATUM/UNITS:



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MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility DELIVERY ORDER: 0066

MONITORING WELL ID: FP-1Z

INSTALLATION START: DATE: 11/11/06 TIME: 1031

INSTALLATION FINISH: DATE: 11/11/06 TIME: 1046

ANNULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: W.G. #1 QUANTITY: 5lbs

BENTONITE SEAL: TYPE: DSI Easy Seal QUANTITY: 1-2 lbs.

GROUT: TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): .01 SLOT CONFIGURATION: Horizontal

TOTAL OPEN AREA PER FOOT OF SCREEN: N/A

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-Threaded/slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

NOMINAL INSIDE DIAMETER: 5-in. COMPOSITION: Steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/13/06 QA CHECK BY: _____

(Signature & Date) (Signature & Date)

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MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-12

BEGIN: 11/11/96

END: 11/11/96

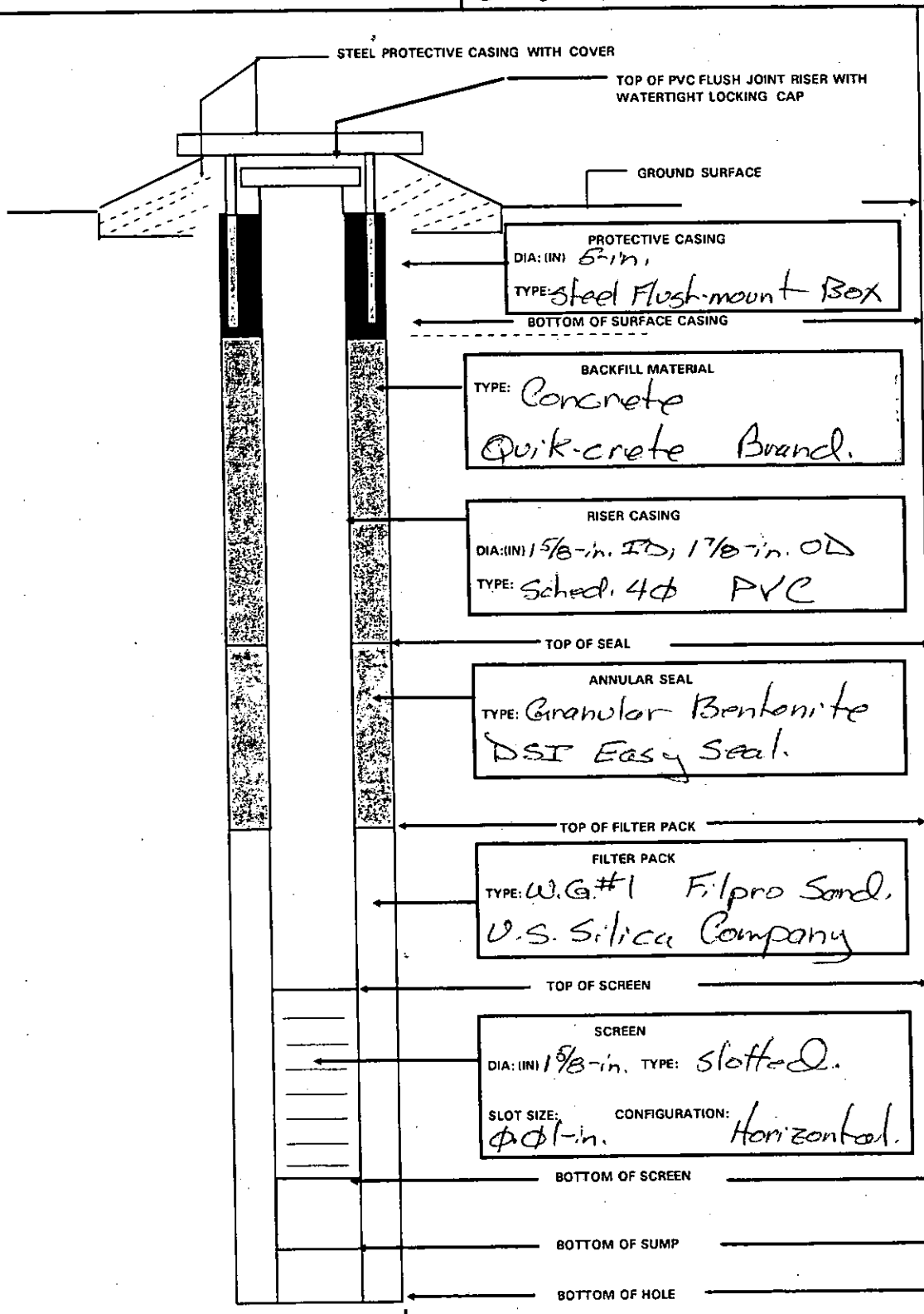
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface.

ELEVATION:

DATUM/UNITS:



DEPTH (BGS)	ELEV
0	
0.6	
0.6	
1.0	
1.3	
4.5	
4.5	
5.0	

MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-13

INSTALLATION START: DATE: 11/11/06 TIME: 1055

INSTALLATION FINISH: DATE: 11/11/06 TIME: 1059

ANNULAR SPACE MATERIALS INVENTORY:

- **GRANULAR FILTER PACK:** TYPE: W.G. #1 QUANTITY: 5 lbs
- **BENTONITE SEAL:** TYPE: DSI Easy Seal QUANTITY: 1-2 lbs
- **GROUT:** TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- **SLOT SIZE (inches):** 0.01 **SLOT CONFIGURATION:** Horizontal
- **TOTAL OPEN AREA PER FOOT OF SCREEN:** N/A
- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A.

DESCRIPTION OF PROTECTIVE CASING:

- **NOMINAL INSIDE DIAMETER:** 5-in. **COMPOSITION:** Steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/13/06 (Signature & Date)

QA CHECK BY: [signature] 11/27/06 (Signature & Date)

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MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-13

BEGIN: 11/11/06

END: 11/11/06

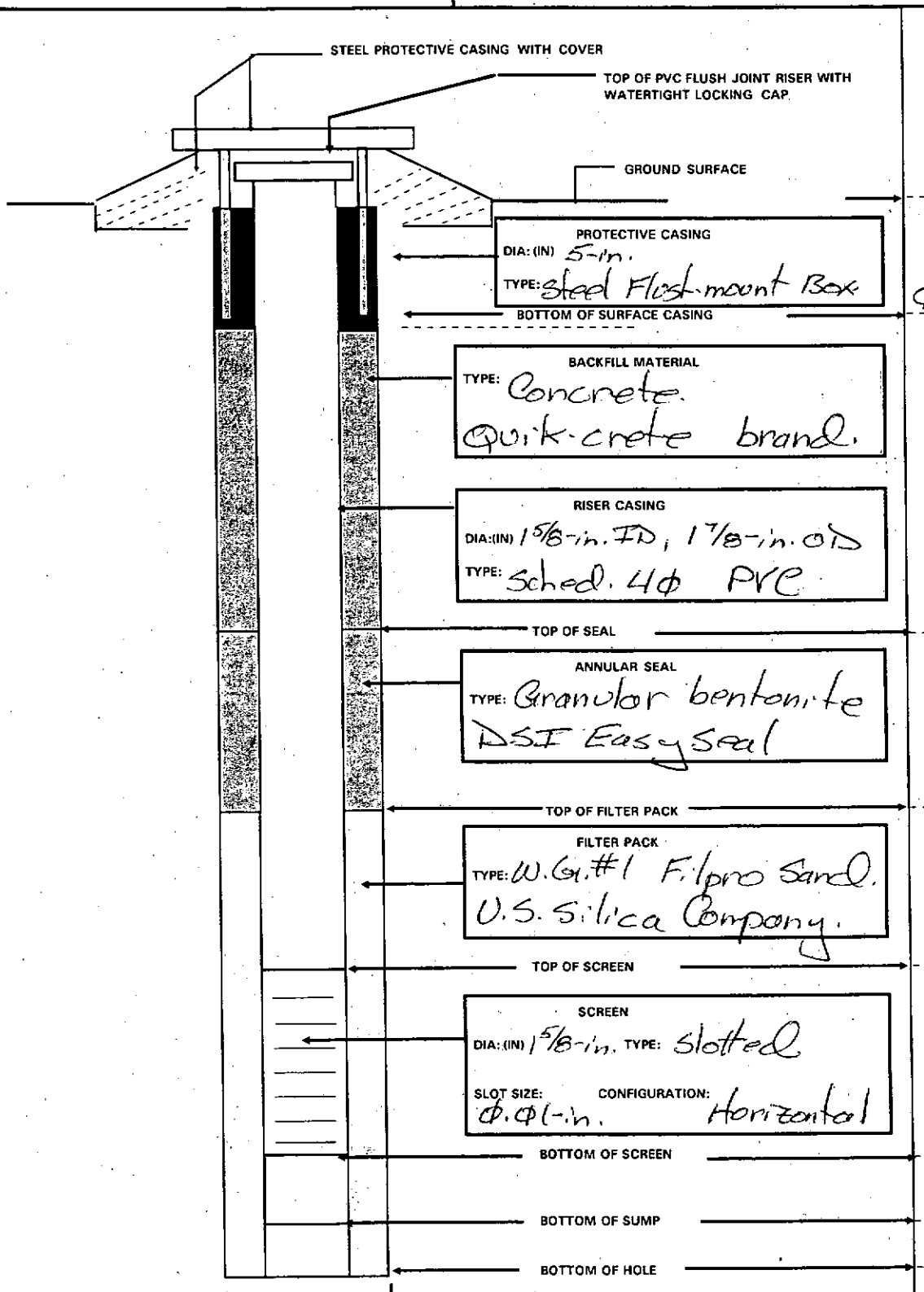
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface.

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-14

INSTALLATION START: DATE: 11/11/06 TIME: 1106

INSTALLATION FINISH: DATE: 11/11/06 TIME: 1115

ANNULAR SPACE MATERIALS INVENTORY:

- **GRANULAR FILTER PACK:** TYPE: W.G. #1 QUANTITY: 5 lbs.
- **BENTONITE SEAL:** TYPE: DSI Easy Seal QUANTITY: 1-2 lbs.
- **GROUT:** TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- **SLOT SIZE (inches):** .01 **SLOT CONFIGURATION:** Horizontal
- **TOTAL OPEN AREA PER FOOT OF SCREEN:** N/A
- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- **NOMINAL INSIDE DIAMETER:** 5-in. **COMPOSITION:** steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/13/06 (Signature & Date) **QA CHECK BY:** [signature] 11/27/06 (Signature & Date)

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MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-14

BEGIN: 11/11/06

END: 11/11/06

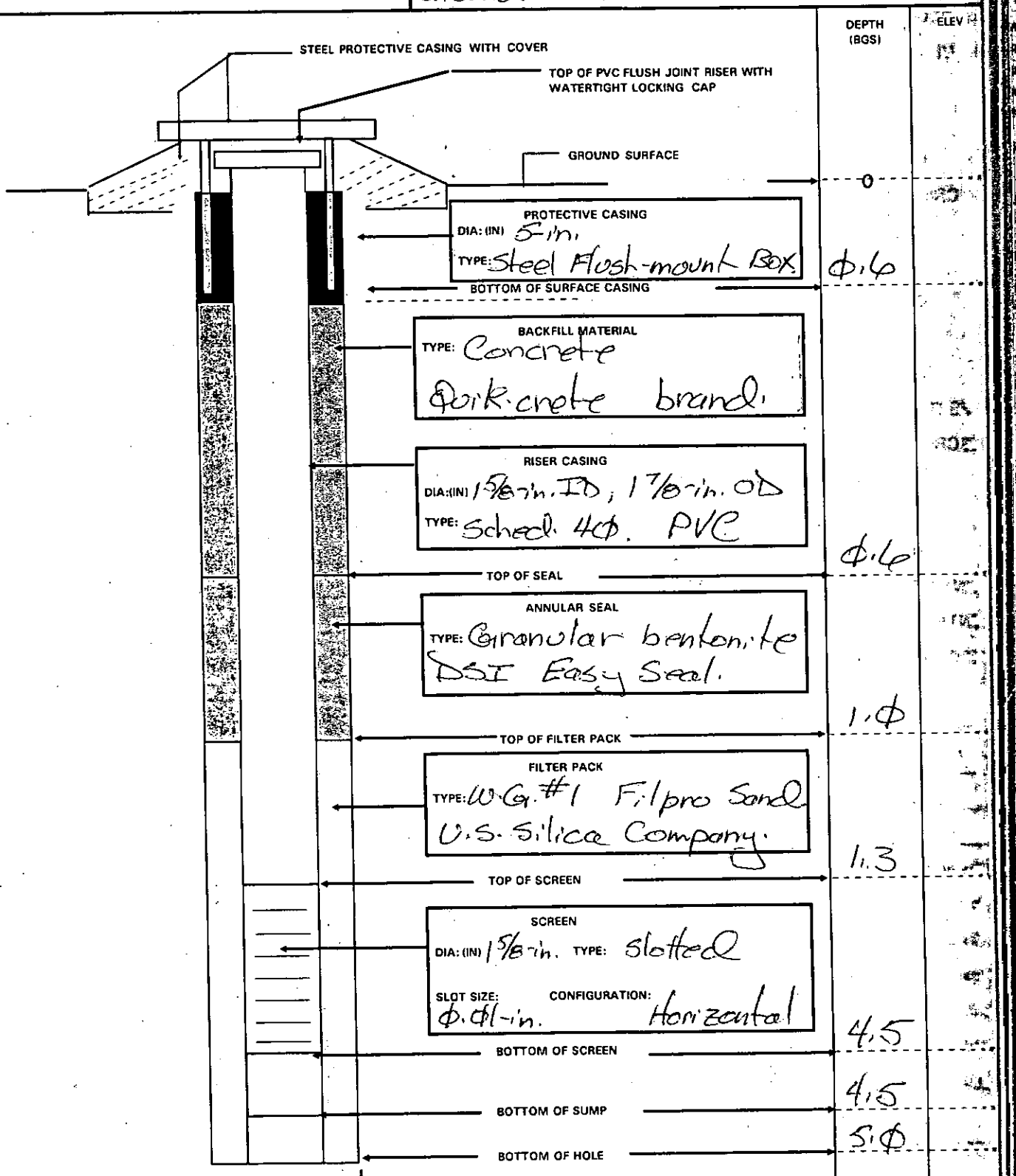
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface.

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-15

INSTALLATION START: DATE: 11/11/06 TIME: 1258

INSTALLATION FINISH: DATE: 11/11/06 TIME: 1307

ANNULAR SPACE MATERIALS INVENTORY:

- **GRANULAR FILTER PACK:** TYPE: W.G. #1 QUANTITY: 5 lbs
- **BENTONITE SEAL:** TYPE: DSI Easy Seal QUANTITY: 1-2 lbs.
- **GROUT:** TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- **SLOT SIZE (inches):** .01 **SLOT CONFIGURATION:** Horizontal
- **TOTAL OPEN AREA PER FOOT OF SCREEN:** N/A
- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations

DESCRIPTION OF WELL CASING:

- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC.
- **MANUFACTURER:** ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- **NOMINAL INSIDE DIAMETER:** 5-in. **COMPOSITION:** Steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:
Very hard/packed gravel layer: move drilling location.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None

RECORDED BY: [signature] 11/13/06 **QA CHECK BY:** Wayne A. Parker
(~~Signature~~ & Date) (Signature & Date)

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MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-15

BEGIN: 11/11/06

END: 11/11/06

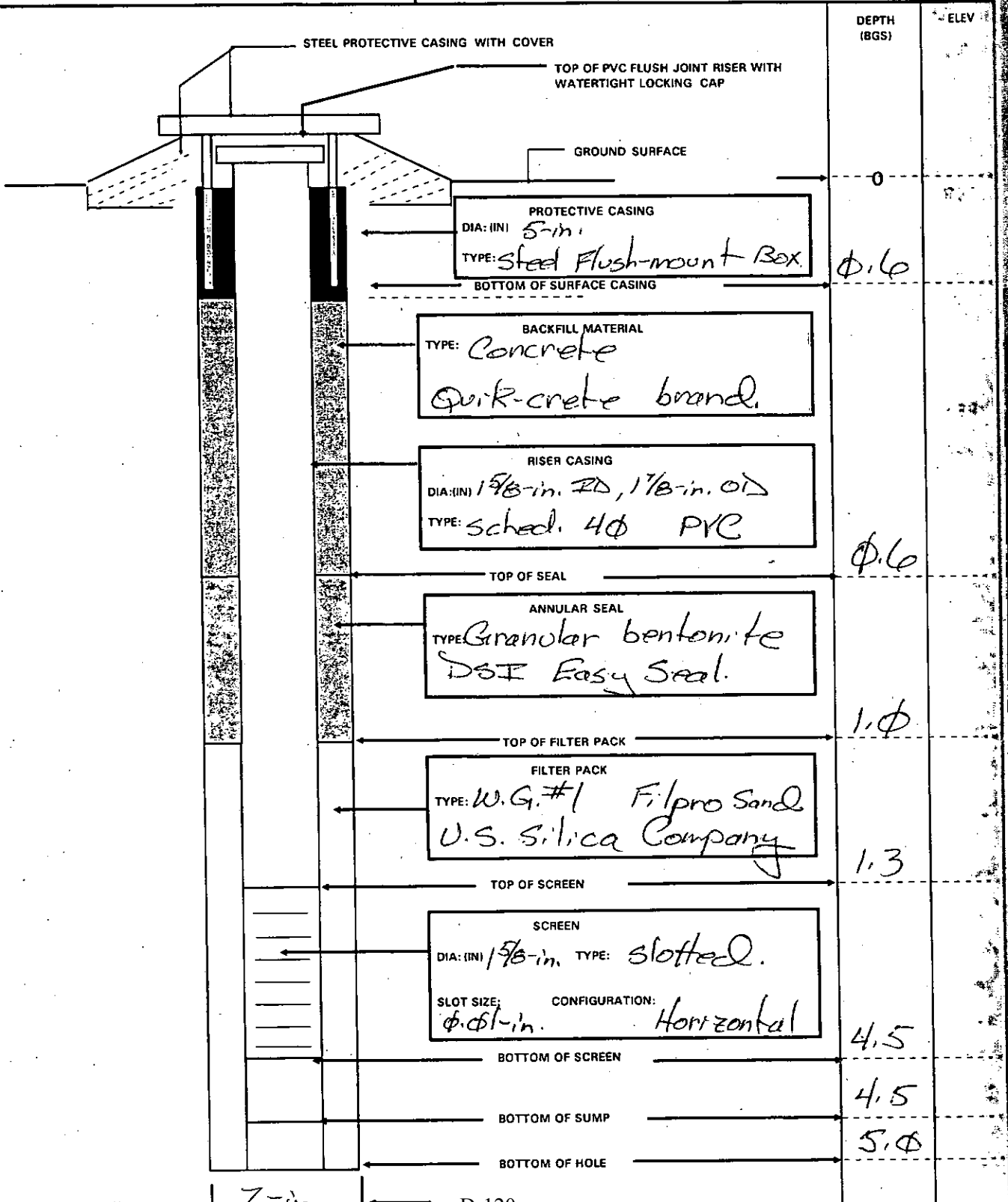
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface.

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-16

INSTALLATION START: DATE: 11/11/06 TIME: 1323

INSTALLATION FINISH: DATE: 11/11/06 TIME: 1330

ANNULAR SPACE MATERIALS INVENTORY:

- GRANULAR FILTER PACK: TYPE: W.G. #1 QUANTITY: 5 lbs.
- BENTONITE SEAL: TYPE: DSI Easy Seal QUANTITY: 1-2 lbs.
- GROUT: TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- SLOT SIZE (inches): 0.01 SLOT CONFIGURATION: Horizontal
- TOTAL OPEN AREA PER FOOT OF SCREEN: N/A
- OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.
- SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC
- MANUFACTURER: ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations,

DESCRIPTION OF WELL CASING:

- OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.
- SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC
- MANUFACTURER: ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-Threaded/slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A.

DESCRIPTION OF PROTECTIVE CASING:

- NOMINAL INSIDE DIAMETER: 5-in. COMPOSITION: Steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:
Encounter hard/packed gravel layer: break up rocks using hammer and bor.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/13/06 (Signature & Date) **QA CHECK BY:** [signature] 11/27/06 (Signature & Date)

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MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-16

BEGIN: 11/11/96

END: 11/11/96

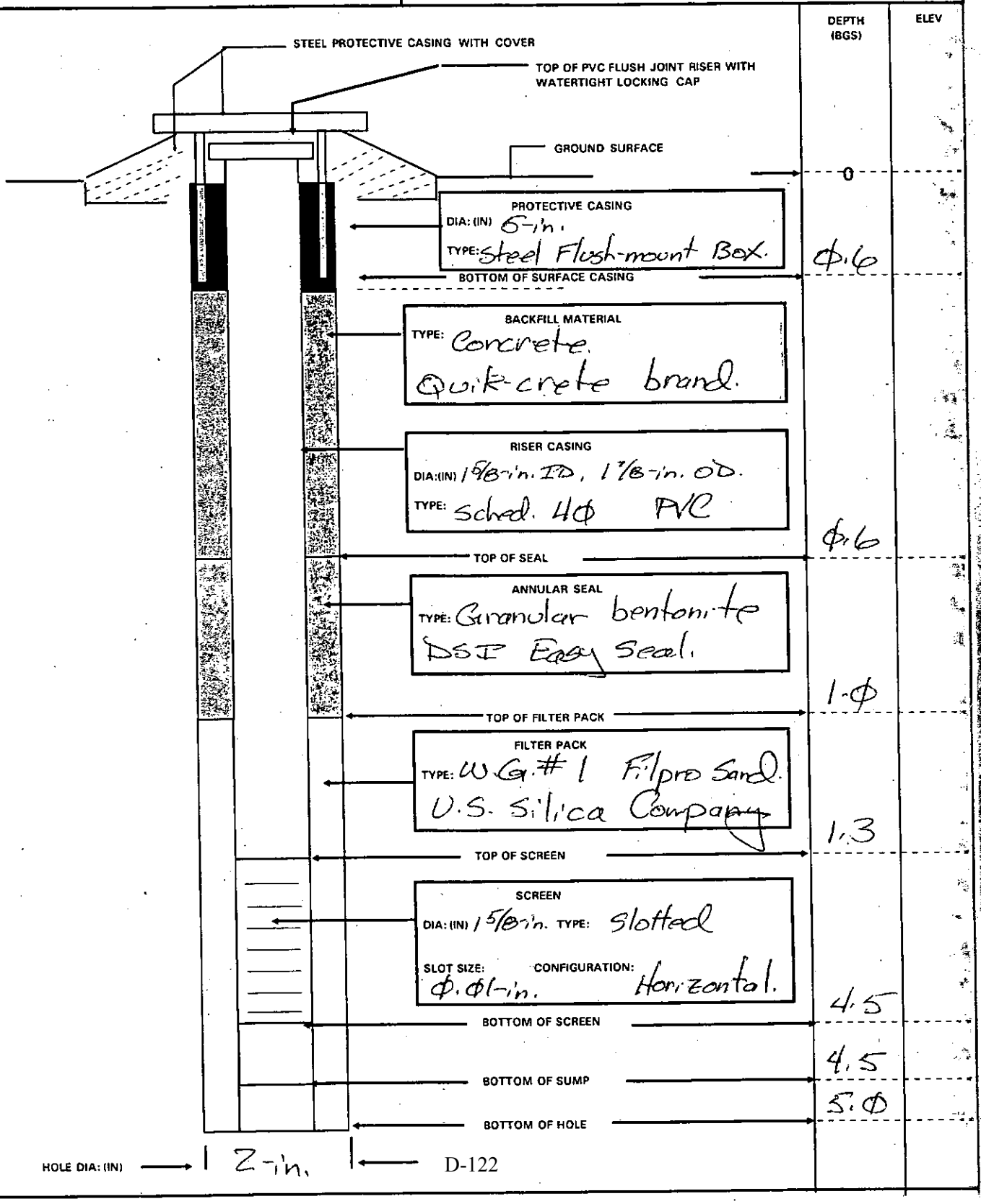
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility DELIVERY ORDER: 0066

MONITORING WELL ID: FP-17

INSTALLATION START: DATE: 11/11/06 TIME: 1338

INSTALLATION FINISH: DATE: 11/11/06 TIME: 1344

ANNULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: W.G. #1 QUANTITY: 5 lbs.

BENTONITE SEAL: TYPE: DSI Easy Seal QUANTITY: 1-2 lbs.

GROUT: TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): .01 SLOT CONFIGURATION: Horizontal

TOTAL OPEN AREA PER FOOT OF SCREEN: N/A

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations

DESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

NOMINAL INSIDE DIAMETER: 5-in. COMPOSITION: Steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/13/06 (Signature & Date)

QA CHECK BY: [signature] 11/27/06 (Signature & Date)

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MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-17

BEGIN: 11/11/96

END: 11/11/96

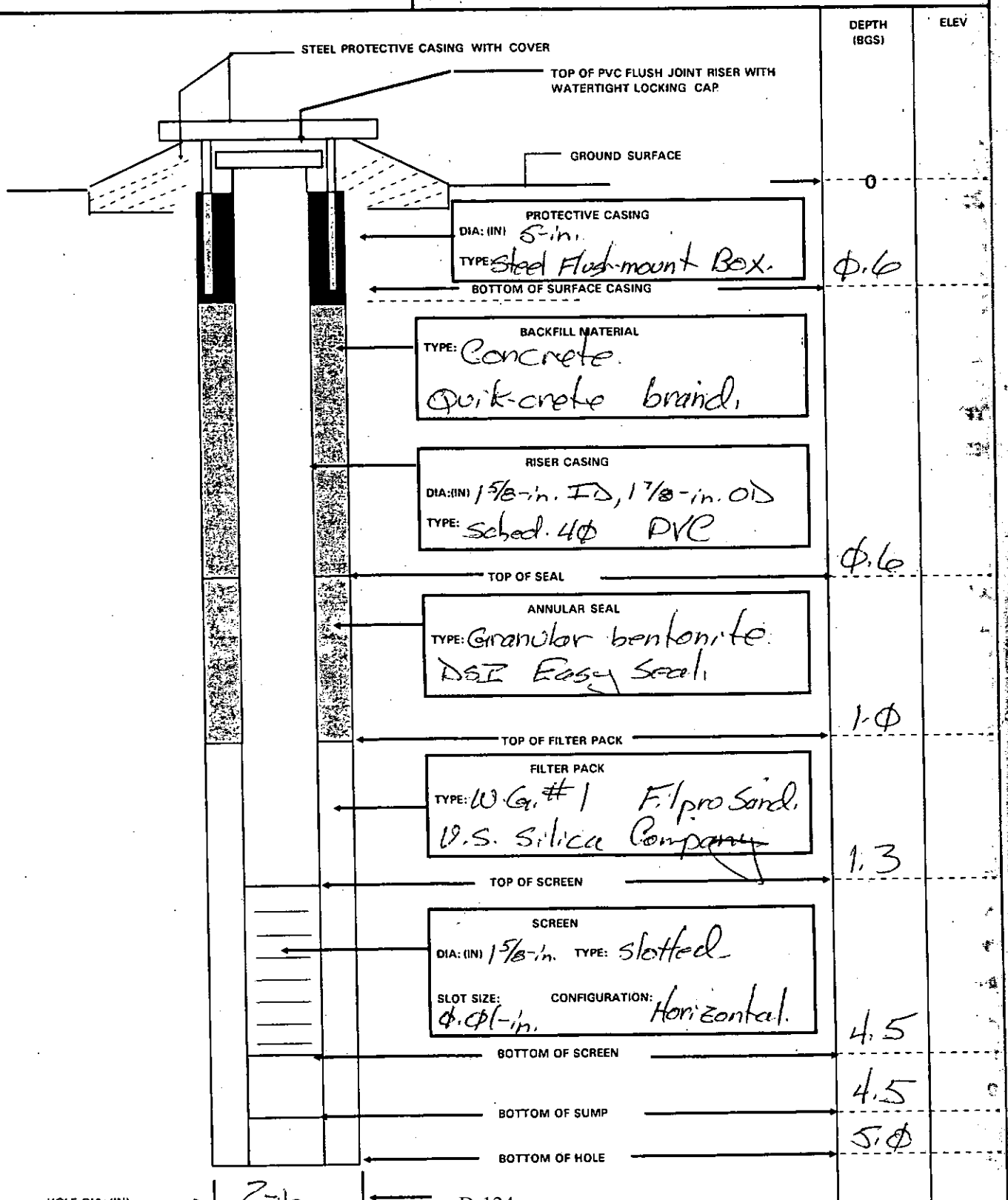
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground surface.

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-18

INSTALLATION START: DATE: 11/11/06 TIME: 1357

INSTALLATION FINISH: DATE: 11/11/06 TIME: 1403

ANNULAR SPACE MATERIALS INVENTORY:

- GRANULAR FILTER PACK: TYPE: W.G. #1 QUANTITY: 5 lbs
- BENTONITE SEAL: TYPE: DSI Easy Seal QUANTITY: 1-2 lbs
- GROUT: TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- SLOT SIZE (inches): 0.01 SLOT CONFIGURATION: Horizontal
- TOTAL OPEN AREA PER FOOT OF SCREEN: N/A
- OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.
- SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC
- MANUFACTURER: ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations

DESCRIPTION OF WELL CASING:

- OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.
- SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC
- MANUFACTURER: ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-Threaded/slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- NOMINAL INSIDE DIAMETER: 5-in. COMPOSITION: Steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/14/06 (Signature & Date) **QA CHECK BY:** Wayd H. Patton 11/27/06 (Signature & Date)

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MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-18

BEGIN: 11/11/96

END: 11/11/96

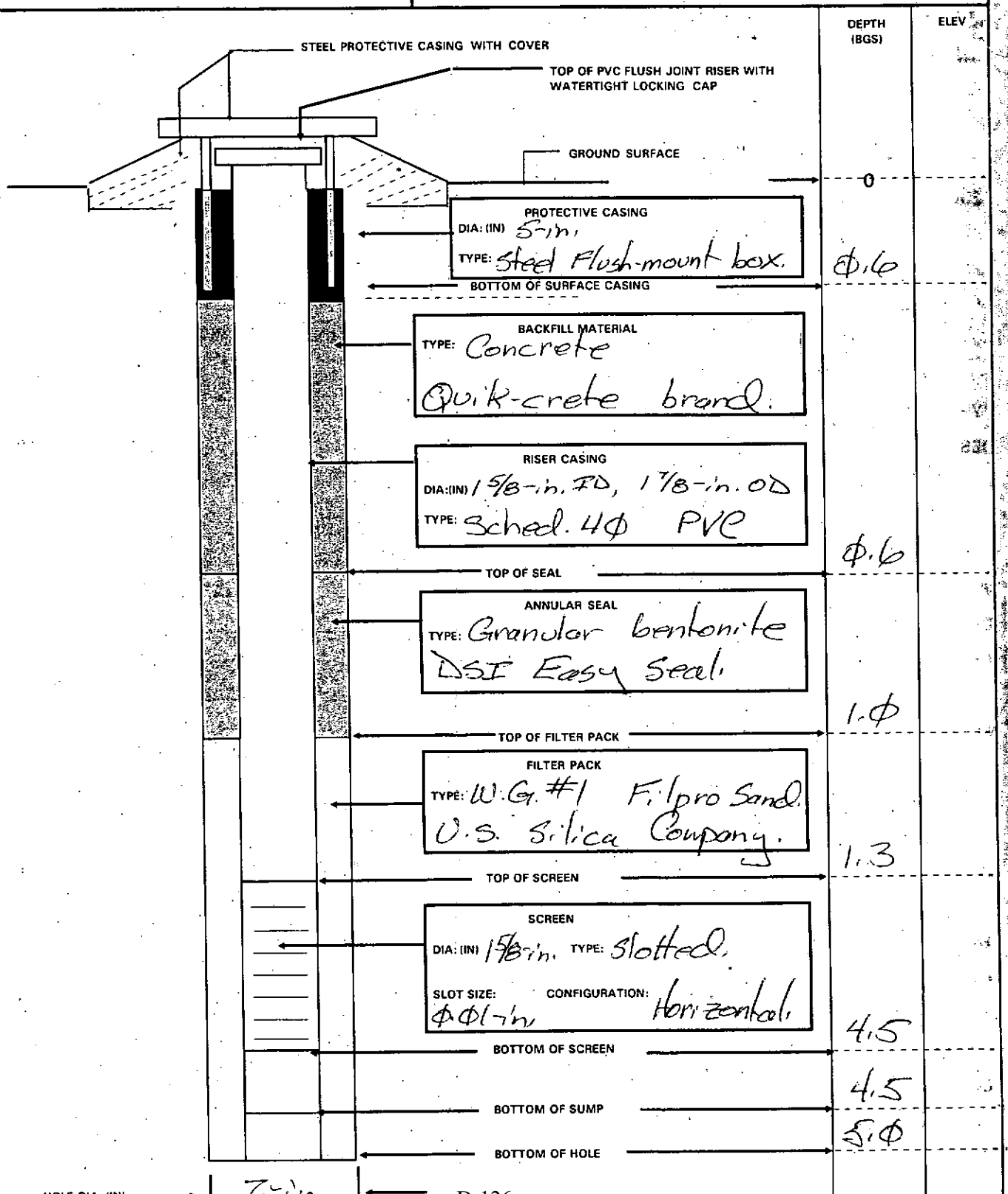
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-19

INSTALLATION START: DATE: 11/11/06 TIME: 1437

INSTALLATION FINISH: DATE: 11/11/06 TIME: 1440

ANNULAR SPACE MATERIALS INVENTORY:

- GRANULAR FILTER PACK: TYPE: W.G. #1 QUANTITY: 5 lbs
- BENTONITE SEAL: TYPE: DSI Easy Seal QUANTITY: 1-2 lbs
- GROUT: TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- SLOT SIZE (inches): 0.01 SLOT CONFIGURATION: Horizontal
- TOTAL OPEN AREA PER FOOT OF SCREEN: N/A
- OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.
- SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC
- MANUFACTURER: ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations

DESCRIPTION OF WELL CASING:

- OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.
- SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC
- MANUFACTURER: ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush - threaded / slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- NOMINAL INSIDE DIAMETER: 5-in. COMPOSITION: Steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/14/06 (Signature & Date) **QA CHECK BY:** [signature] 11/27/06 (Signature & Date)

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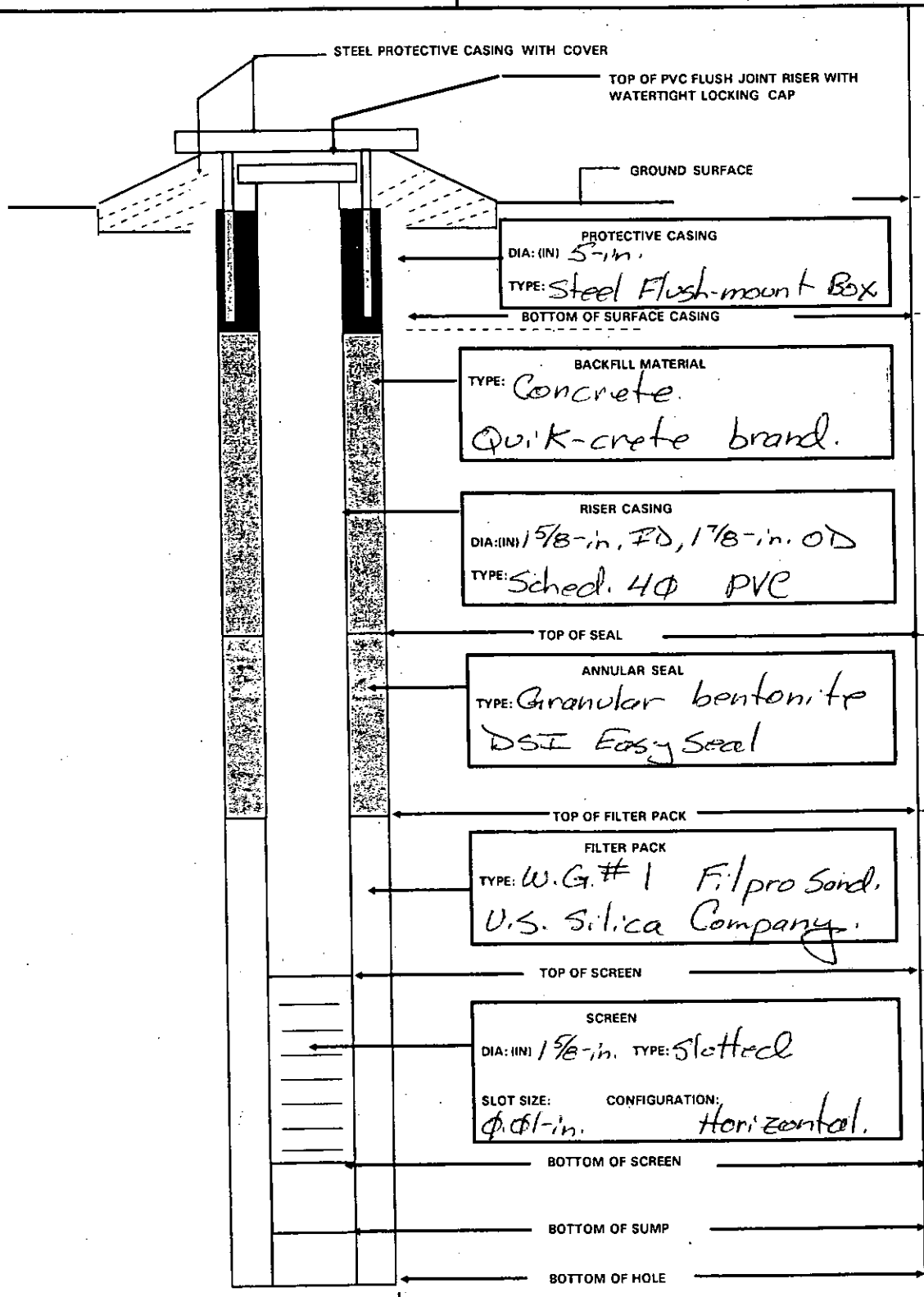
MONITORING WELL –
PROJECT: Bulk Fuel Facility
DELIVERY ORDER NO: 0066

WELL NUMBER: FP-19
BEGIN: 11/11/06
END: 11/11/06
COORDINATES: N:
E:
DATUM/UNITS:
REFERENCE POINT: Ground Surface,
ELEVATION:
DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-20

INSTALLATION START: DATE: 11/11/06 TIME: 1502

INSTALLATION FINISH: DATE: 11/11/06 TIME: 1516

ANNULAR SPACE MATERIALS INVENTORY:

- **GRANULAR FILTER PACK:** TYPE: W.G. #1 QUANTITY: 5 lbs
- **BENTONITE SEAL:** TYPE: DSI Easy Seal QUANTITY: 1-2 lbs
- **GROUT:** TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- **SLOT SIZE (inches):** 0.01 **SLOT CONFIGURATION:** Horizontal
- **TOTAL OPEN AREA PER FOOT OF SCREEN:** N/A
- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A.

DESCRIPTION OF PROTECTIVE CASING:

- **NOMINAL INSIDE DIAMETER:** 5-in. **COMPOSITION:** Steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None

RECORDED BY: [signature] 11/14/06 (Signature & Date)

QA CHECK BY: [signature] 11/27/06 (Signature & Date)

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MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-20

BEGIN: 11/11/96

END: 11/11/96

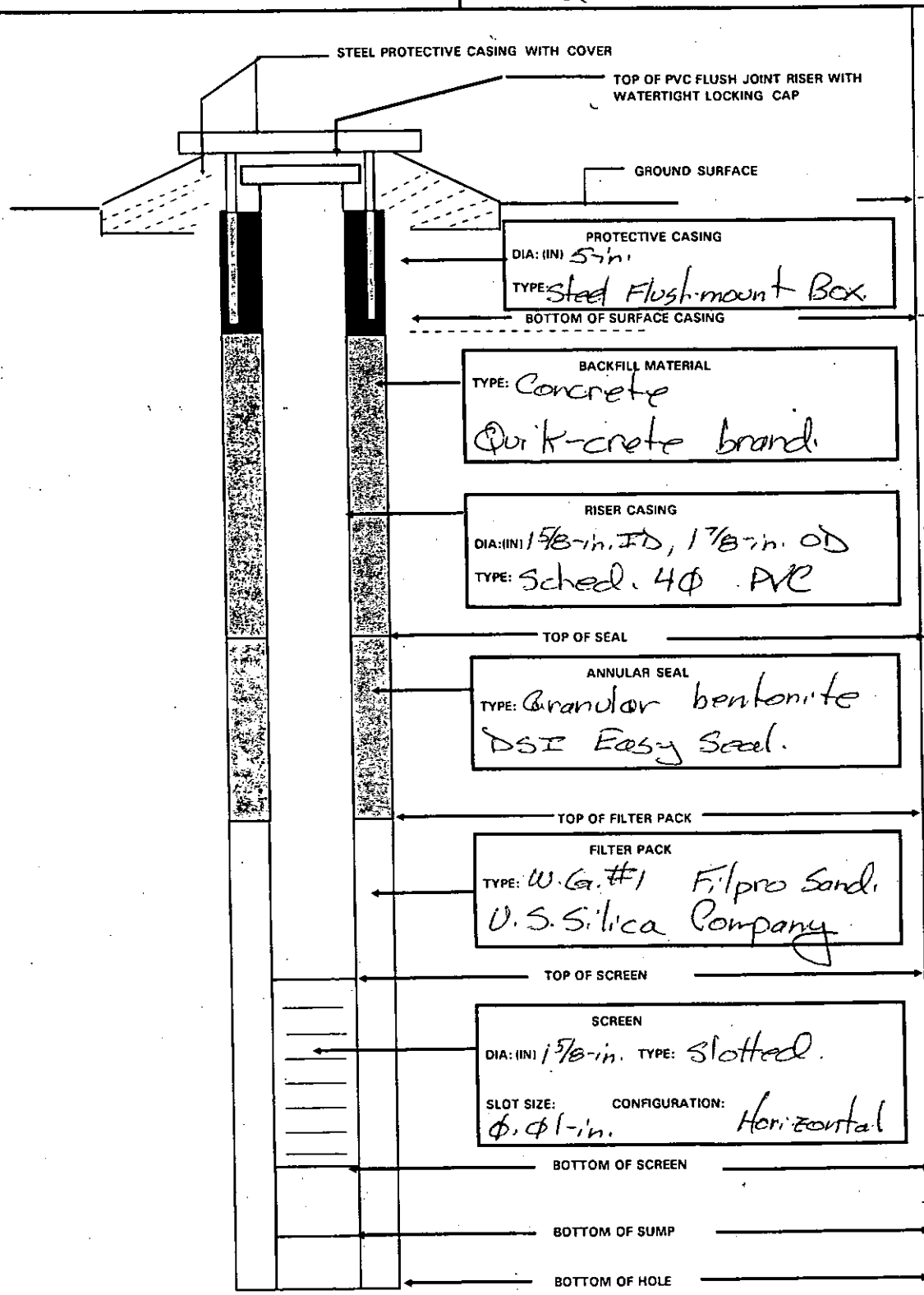
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface.

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-21

INSTALLATION START: DATE: 11/11/06 TIME: 1540

INSTALLATION FINISH: DATE: 11/11/06 TIME: 1545

ANNULAR SPACE MATERIALS INVENTORY:

- **GRANULAR FILTER PACK:** TYPE: W.G. #1 QUANTITY: 5 lbs.
- **BENTONITE SEAL:** TYPE: DSI Easy Seal QUANTITY: 1-2 lbs
- **GROUT:** TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- **SLOT SIZE (inches):** 0.01 **SLOT CONFIGURATION:** Horizontal
- **TOTAL OPEN AREA PER FOOT OF SCREEN:** N/A
- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: _____

DESCRIPTION OF WELL CASING:

- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing

JOINT DESIGN AND COMPOSITION: Flush. threaded.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- **NOMINAL INSIDE DIAMETER:** 6-in. **COMPOSITION:** Steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/14/06 (Signature & Date) **QA CHECK BY:** Wayne H. Parker 11/27/06 (Signature & Date)

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MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-21

BEGIN: 11/11/96

END: 11/11/96

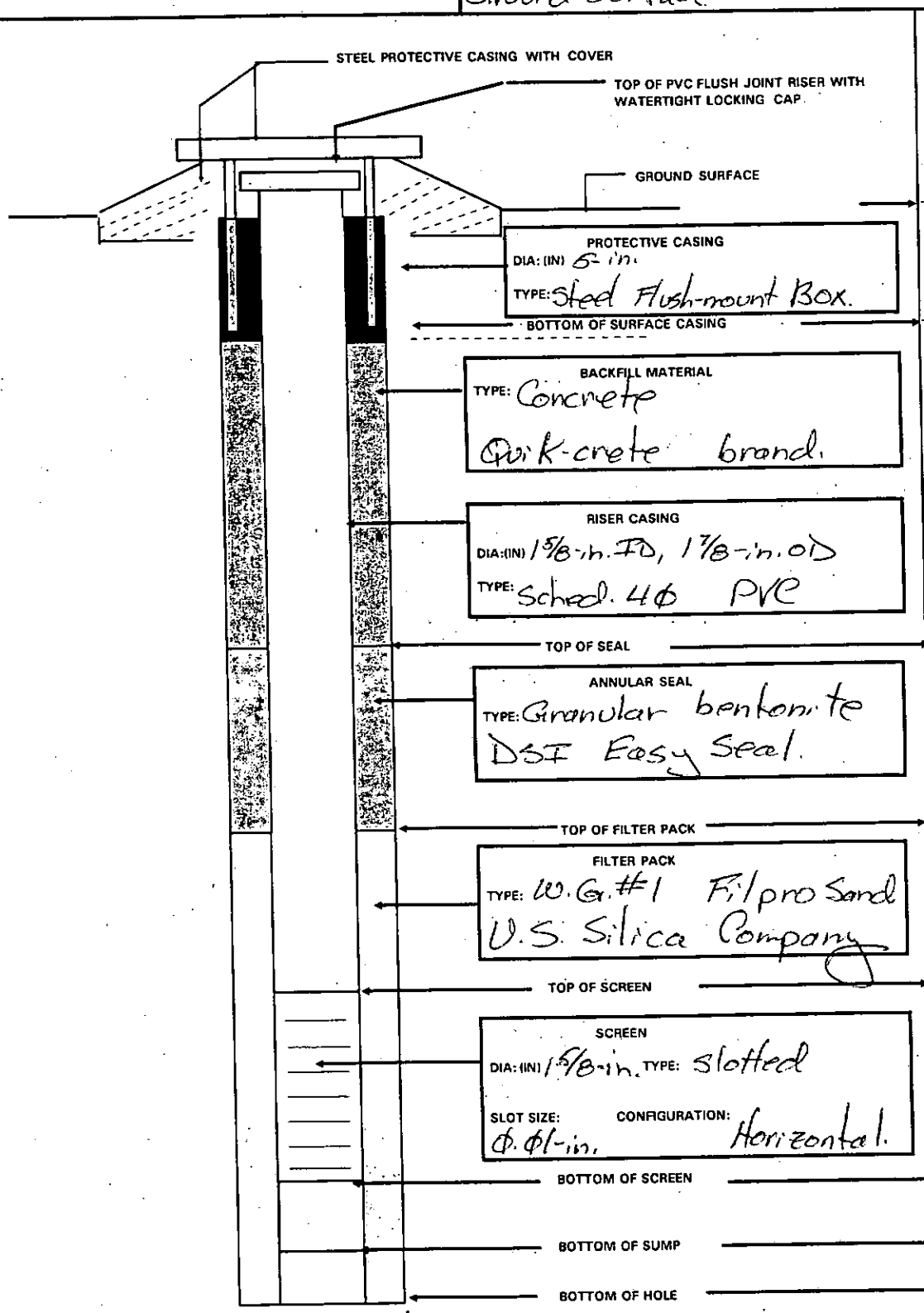
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: PP-22

INSTALLATION START: DATE: 11/11/06 TIME: 1554

INSTALLATION FINISH: DATE: 11/11/06 TIME: 1558

ANNULAR SPACE MATERIALS INVENTORY:

- **GRANULAR FILTER PACK:** TYPE: W.G. #1 QUANTITY: 5 lbs
- **BENTONITE SEAL:** TYPE: DSI Easy Seal QUANTITY: 1-2 lbs
- **GROUT:** TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- **SLOT SIZE (inches):** .01 **SLOT CONFIGURATION:** Horizontal
- **TOTAL OPEN AREA PER FOOT OF SCREEN:** N/A
- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-Threaded/slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- **NOMINAL INSIDE DIAMETER:** 5-in. **COMPOSITION:** Steel

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None

RECORDED BY: [signature] 11/14/06 (Signature & Date)

QA CHECK BY: Wayne H. Parker 11/27/06 (Signature & Date)

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MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-22

BEGIN: 11/11/06

END: 11/11/06

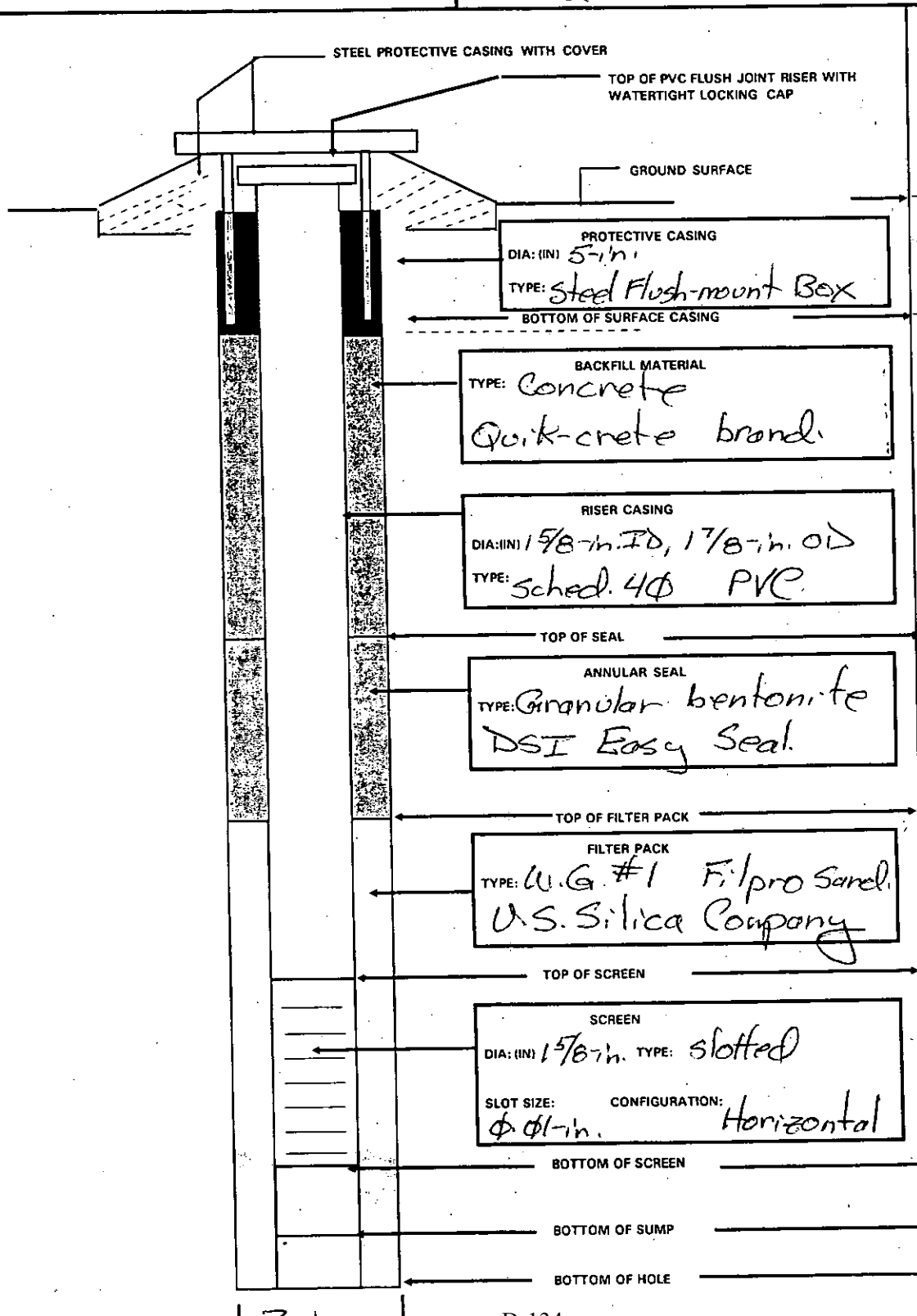
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-23

INSTALLATION START: DATE: 11/11/06 TIME: 1639

INSTALLATION FINISH: DATE: 11/11/06 TIME: 1645

ANNULAR SPACE MATERIALS INVENTORY:

- **GRANULAR FILTER PACK:** TYPE: W.G. #1 QUANTITY: 30 lbs.
- **BENTONITE SEAL:** TYPE: DSI Easy Seal QUANTITY: 4-5 lbs.
- **GROUT:** TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- **SLOT SIZE (inches):** 0.01 **SLOT CONFIGURATION:** Horizontal
- **TOTAL OPEN AREA PER FOOT OF SCREEN:** N/A
- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-Threaded/slip cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- **NOMINAL INSIDE DIAMETER:** 5-in. **COMPOSITION:** steel

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:
Encounter hard/packed gravel layer, or large rocks; use 3-in. diam. auger.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/14/06 (Signature & Date)

QA CHECK BY: [signature] 11/27/06 (Signature & Date)

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MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-23

BEGIN: 11/11/06

END: 11/11/06

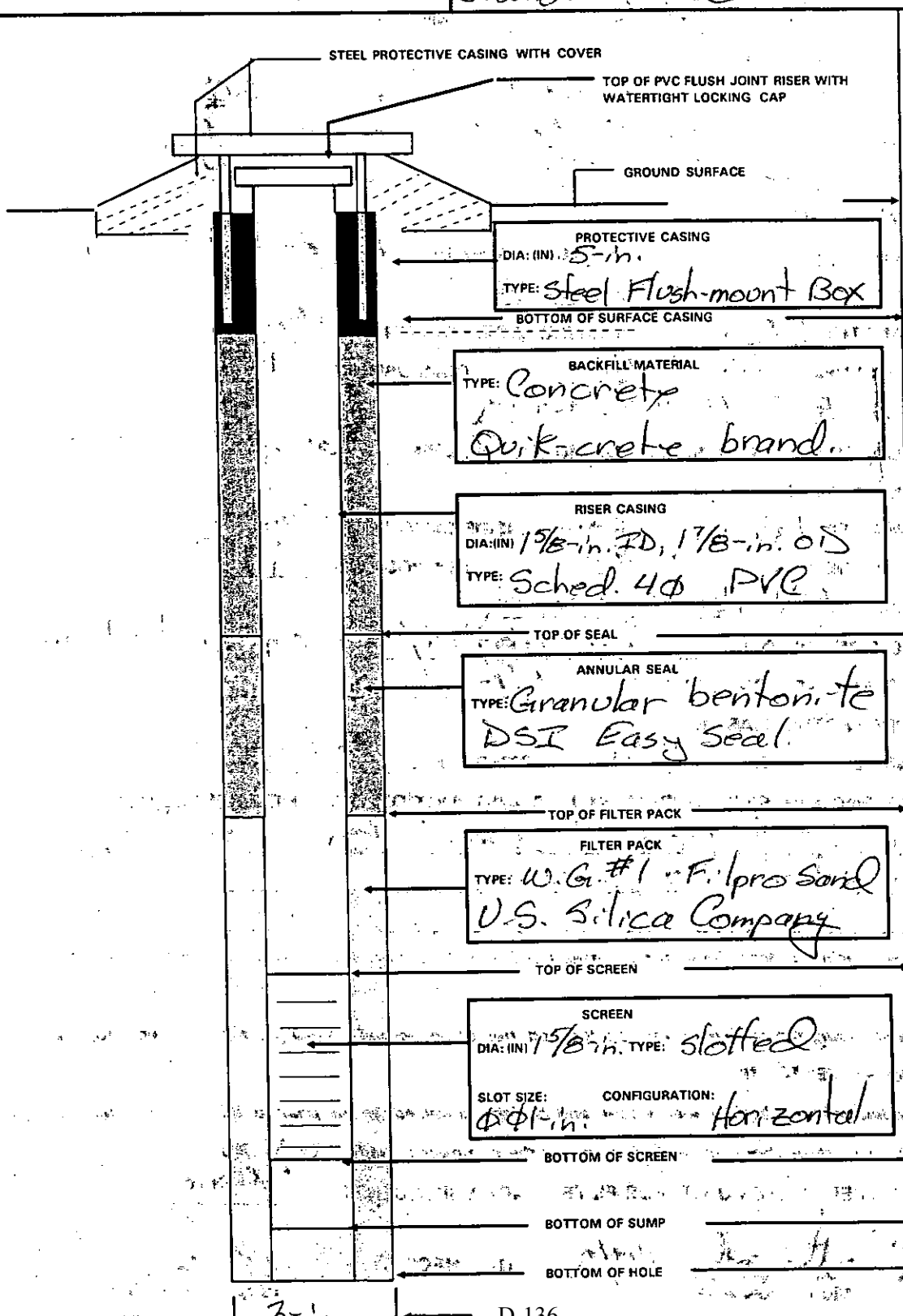
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-24

INSTALLATION START: DATE: 11/12/06 TIME: 0745

INSTALLATION FINISH: DATE: 11/12/06 TIME: 0754

ANNULAR SPACE MATERIALS INVENTORY:

- **GRANULAR FILTER PACK:** TYPE: W.G. #1 QUANTITY: 30 lbs.
- **BENTONITE SEAL:** TYPE: DSI Easy Seal QUANTITY: 4-5 lbs
- **GROUT:** TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- **SLOT SIZE (inches):** 0.01 **SLOT CONFIGURATION:** Horizontal
- **TOTAL OPEN AREA PER FOOT OF SCREEN:** N/A
- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- **NOMINAL INSIDE DIAMETER:** 5-in. **COMPOSITION:** Steel

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

Encounter hard/packed gravel layer; Use 3-in. diam. auger.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/14/06 (Signature & Date)

QA CHECK BY: [signature] 11/27/06 (Signature & Date)

18

MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-24

BEGIN: 11/12/06

END: 11/12/06

COORDINATES: N:

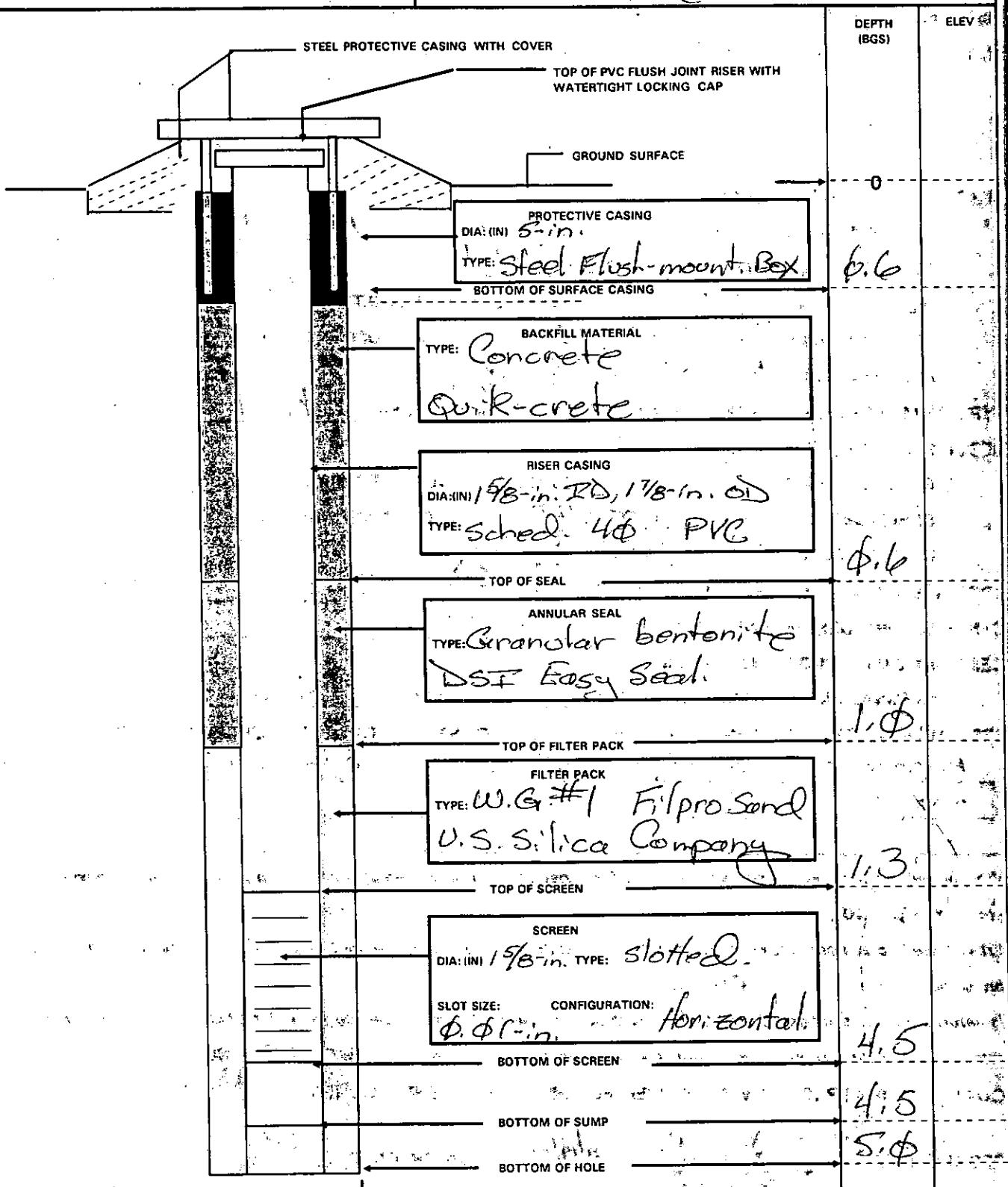
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-25

INSTALLATION START: DATE: 11/12/06 TIME: 0845

INSTALLATION FINISH: DATE: 11/12/06 TIME: 0850

ANNULAR SPACE MATERIALS INVENTORY:

- **GRANULAR FILTER PACK:** TYPE: W. Gr. #1 QUANTITY: 5 lbs.
- **BENTONITE SEAL:** TYPE: DSI Easy Seal. QUANTITY: 1-2 lbs.
- **GROUT:** TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- **SLOT SIZE (inches):** 0.01 **SLOT CONFIGURATION:** Horizontal
- **TOTAL OPEN AREA PER FOOT OF SCREEN:** N/A
- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded / slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- **NOMINAL INSIDE DIAMETER:** 6-in. **COMPOSITION:** steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/14/06 (Signature & Date) **QA CHECK BY:** Wayne H. Park 11/27/06 (Signature & Date)

23

MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-25

BEGIN: 11/12/06

END: 11/12/06

COORDINATES: N:

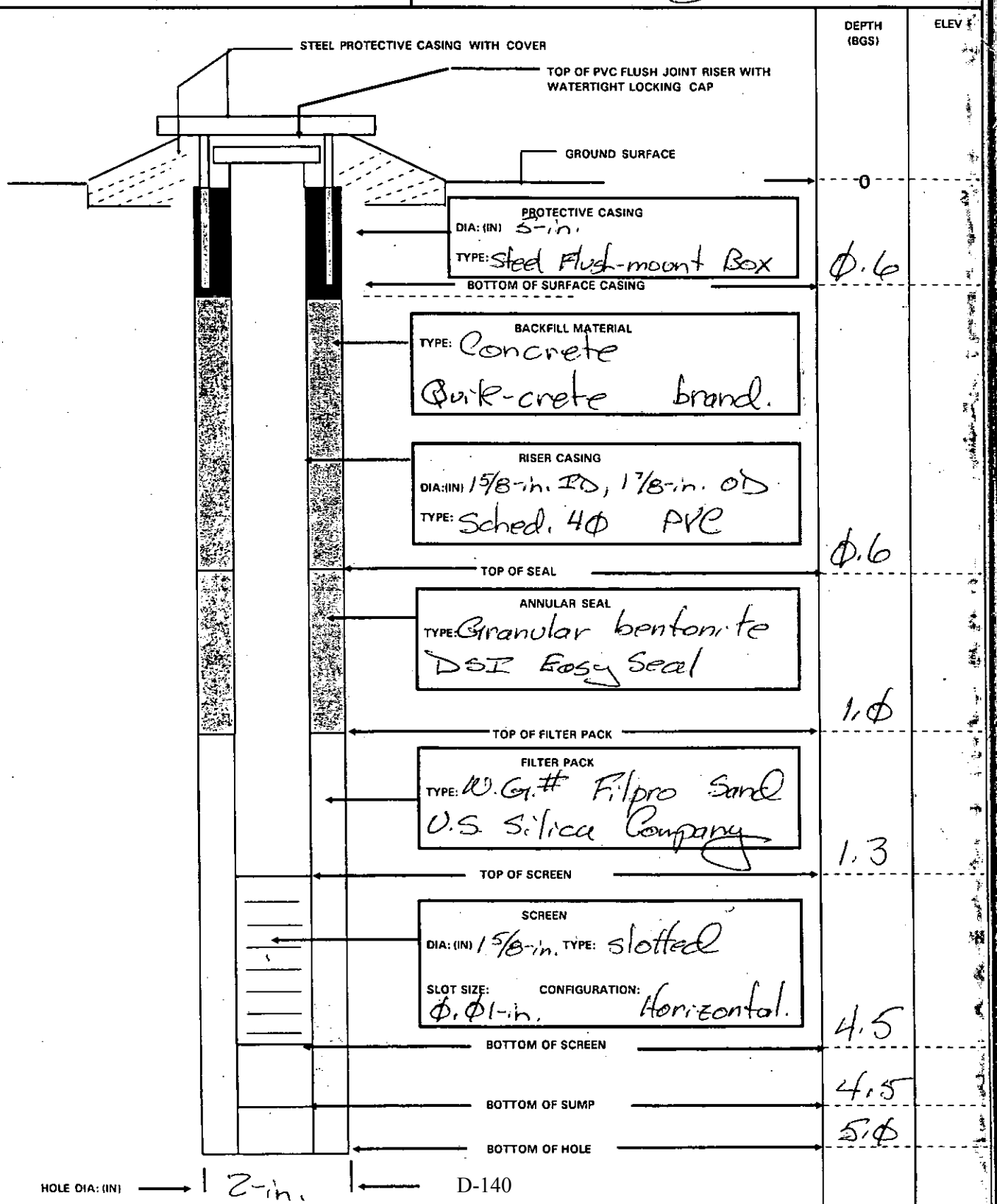
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-26

INSTALLATION START: DATE: 11/12/06 TIME: 0901

INSTALLATION FINISH: DATE: 11/12/06 TIME: 0906

ANNULAR SPACE MATERIALS INVENTORY:

- GRANULAR FILTER PACK: TYPE: W.G #1 QUANTITY: 5 lbs.
- BENTONITE SEAL: TYPE: DSI Easy Seal QUANTITY: 1-2 lbs.
- GROUT: TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- SLOT SIZE (inches): 0.01 SLOT CONFIGURATION: Horizontal
- TOTAL OPEN AREA PER FOOT OF SCREEN: N/A
- OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.
- SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC
- MANUFACTURER: ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

- OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.
- SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC
- MANUFACTURER: ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded / slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- NOMINAL INSIDE DIAMETER: 6-in. COMPOSITION: Steel

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None

RECORDED BY: [signature] 11/14/06 (Signature & Date) **QA CHECK BY:** [signature] 11/22/06 (Signature & Date)

28

MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-26

BEGIN: 11/12/96

END: 11/12/96

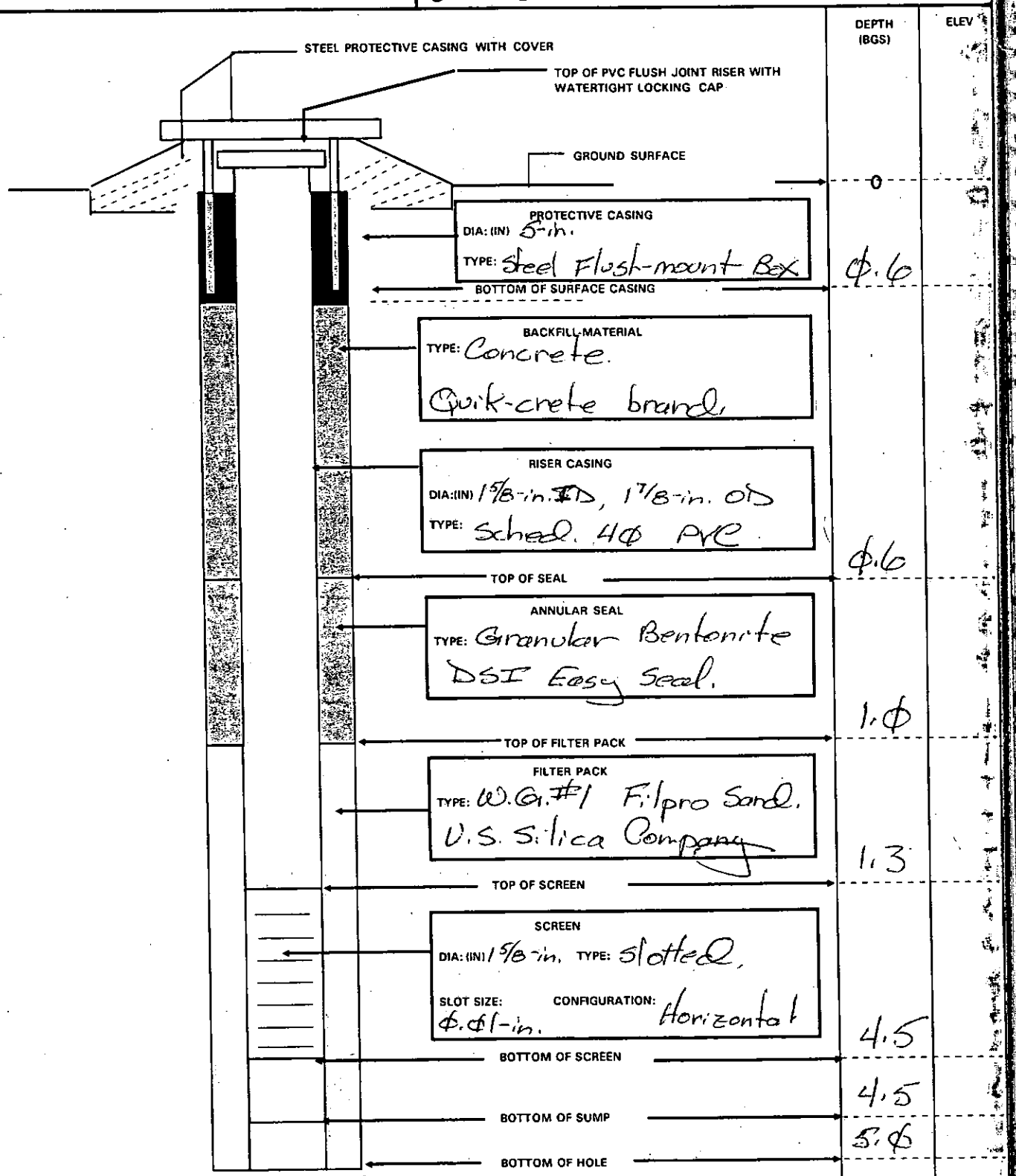
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface.

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility DELIVERY ORDER: 0066

MONITORING WELL ID: RP-27

INSTALLATION START: DATE: 11/12/06 TIME: 0914

INSTALLATION FINISH: DATE: 11/12/06 TIME: 0919

ANNULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: W.G.#1 QUANTITY: 5 lbs.

BENTONITE SEAL: TYPE: DSI Easy Seal QUANTITY: 1-2 lbs.

GROUT: TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): 0.01 SLOT CONFIGURATION: Horizontal

TOTAL OPEN AREA PER FOOT OF SCREEN: N/A

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION:

DESCRIPTION OF PROTECTIVE CASING:

NOMINAL INSIDE DIAMETER: 5-in. COMPOSITION: Steel

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/14/06 (Signature & Date)

QA CHECK BY: [signature] 11/27/06 (Signature & Date)

93

MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-27

BEGIN: 11/12/96

END: 11/12/96

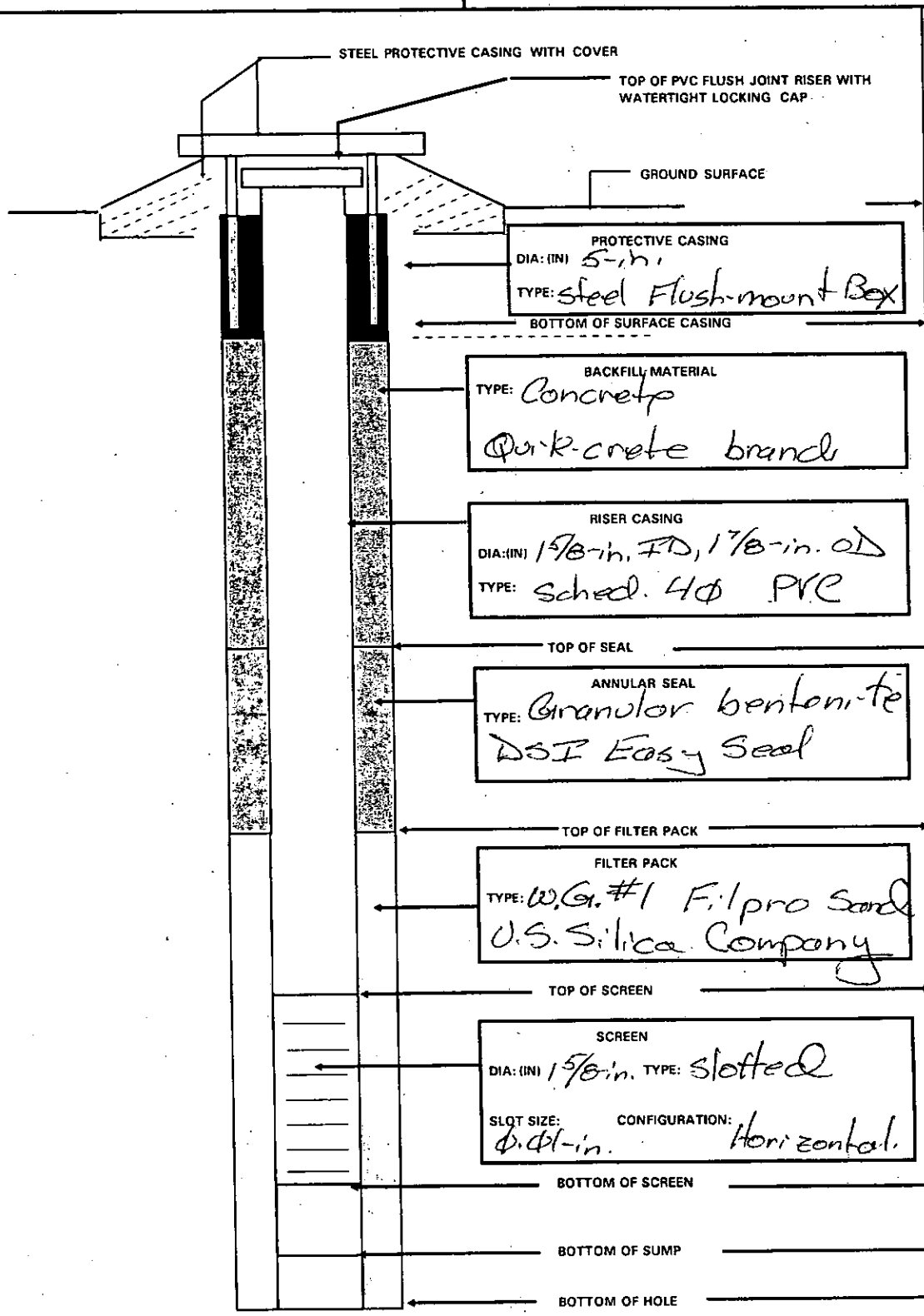
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface

ELEVATION:

DATUM/UNITS:



DEPTH (BGS)	ELEV
0	
0.6	
0.6	
1.0	
1.3	
4.5	
4.5	
5.0	

MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-28

INSTALLATION START: DATE: 11/12/06 TIME: 0926

INSTALLATION FINISH: DATE: 11/12/06 TIME: 0930

ANNULAR SPACE MATERIALS INVENTORY:

- GRANULAR FILTER PACK: TYPE: W.G. #1 QUANTITY: 5 lbs.
- BENTONITE SEAL: TYPE: DSI Easy Seal QUANTITY: 1-2 lbs
- GROUT: TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- SLOT SIZE (inches): 0.01 SLOT CONFIGURATION: Horizontal
- TOTAL OPEN AREA PER FOOT OF SCREEN: N/A
- OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.
- SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC
- MANUFACTURER: ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

- OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.
- SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC.
- MANUFACTURER: ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- NOMINAL INSIDE DIAMETER: 5-in. COMPOSITION: steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/14/06 (Signature & Date) **QA CHECK BY:** [signature] 11/27/06 (Signature & Date)

38

MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-28

BEGIN: 11/12/96

END: 11/12/96

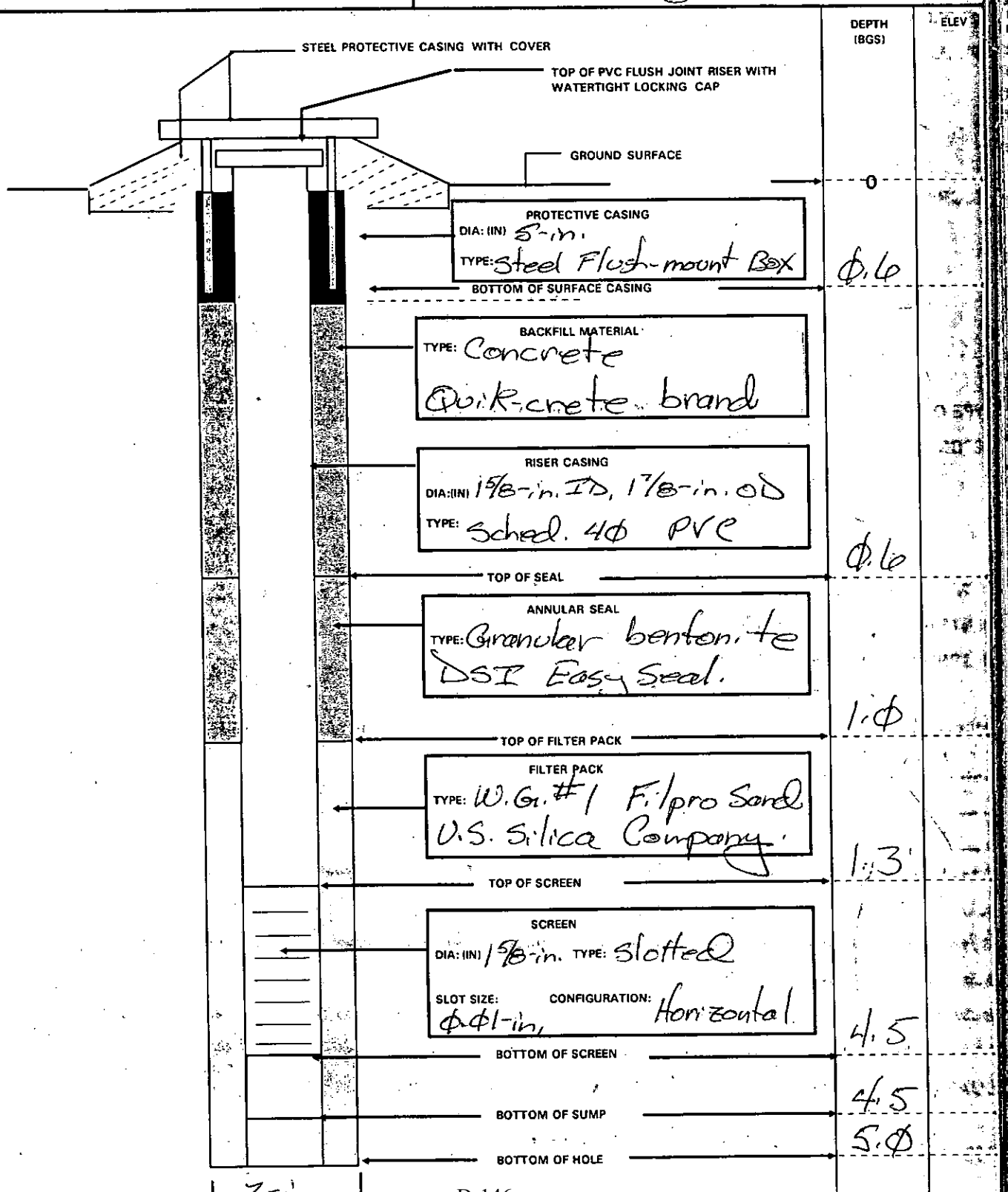
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility DELIVERY ORDER: 0066

MONITORING WELL ID: FP-29

INSTALLATION START: DATE: 11/12/06 TIME: 0939

INSTALLATION FINISH: DATE: 11/12/06 TIME: 0943

ANNULAR SPACE MATERIALS INVENTORY:

- GRANULAR FILTER PACK: TYPE: W.G.#1 QUANTITY: 5 lbs.
- BENTONITE SEAL: TYPE: DSI Easy Seal QUANTITY: 1-2 lbs.
- GROUT: TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- SLOT SIZE (inches): 0.01 SLOT CONFIGURATION: Horizontal
- TOTAL OPEN AREA PER FOOT OF SCREEN: N/A
- OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.
- SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC
- MANUFACTURER: ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

- OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.
- SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC
- MANUFACTURER: ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded / slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- NOMINAL INSIDE DIAMETER: 5-in. COMPOSITION: Steel

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None

RECORDED BY: [signature] 11/14/06 (Signature & Date)

QA CHECK BY: [signature] 11/17/06 (Signature & Date)

43

MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-29

BEGIN: 11/12/06

END: 11/12/06

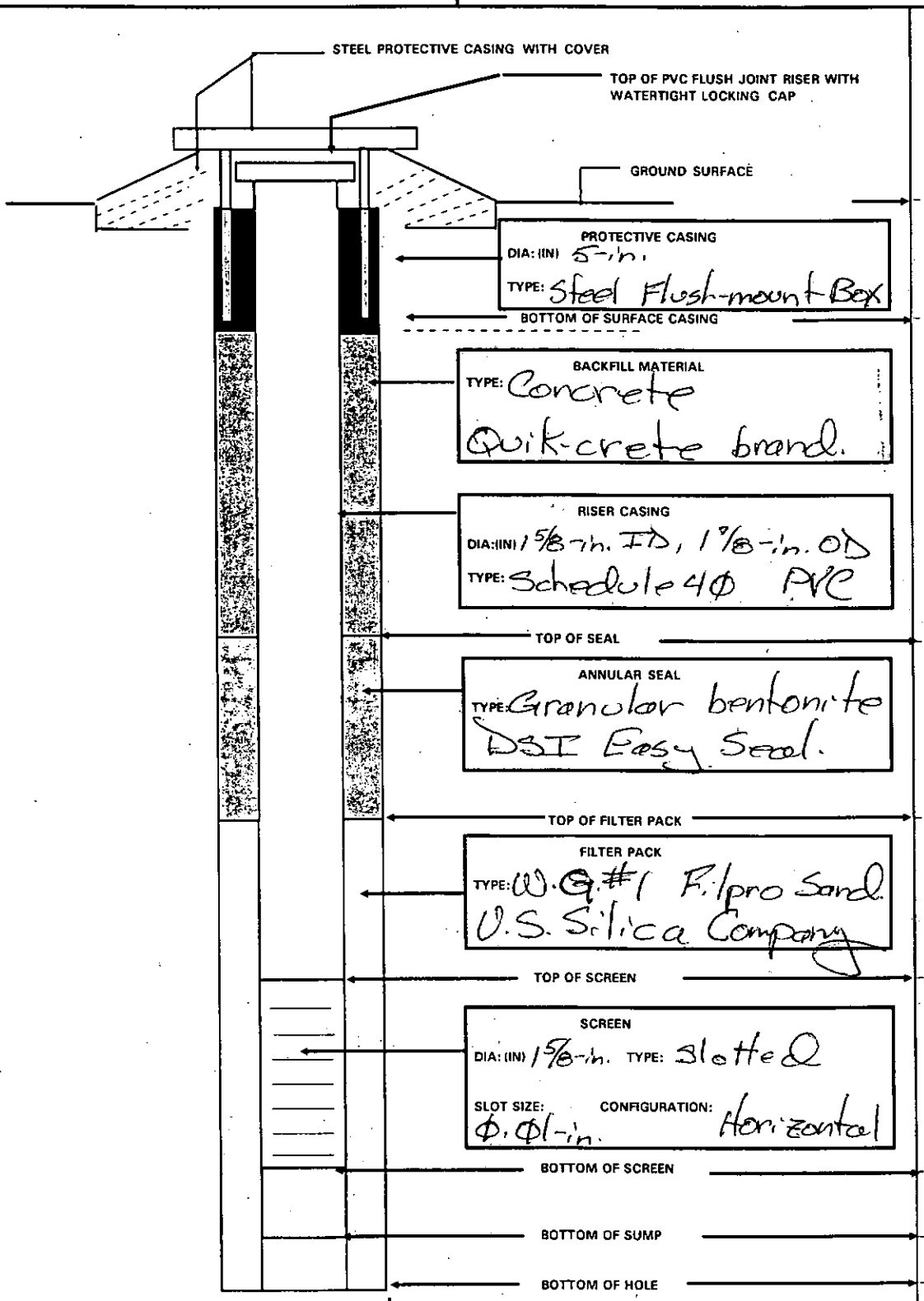
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-3Φ

INSTALLATION START: DATE: 11/12/Φ6 TIME: Φ955

INSTALLATION FINISH: DATE: 11/12/Φ6 TIME: Φ958

ANNULAR SPACE MATERIALS INVENTORY:

- GRANULAR FILTER PACK: TYPE: W.G.#1 QUANTITY: 5 lbs.
- BENTONITE SEAL: TYPE: DSI Easy Seal QUANTITY: 1-2 lbs.
- GROUT: TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- SLOT SIZE (inches): Φ.Φ1 SLOT CONFIGURATION: Horizontal
- TOTAL OPEN AREA PER FOOT OF SCREEN: N/A
- OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.
- SCHEDULE/THICKNESS: Sched. 4Φ COMPOSITION: PVC
- MANUFACTURER: ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

- OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.
- SCHEDULE/THICKNESS: Sched. 4Φ COMPOSITION: PVC
- MANUFACTURER: ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded / slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- NOMINAL INSIDE DIAMETER: 5-in. COMPOSITION: steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:
Stick the auger: use pipe wrench to unthread. Continue augering.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/14/06 (Signature & Date) **QA CHECK BY:** [signature] 11/27/06 (Signature & Date)

48

MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-3Φ

BEGIN: 11/12/Φ6

END: 11/12/Φ6

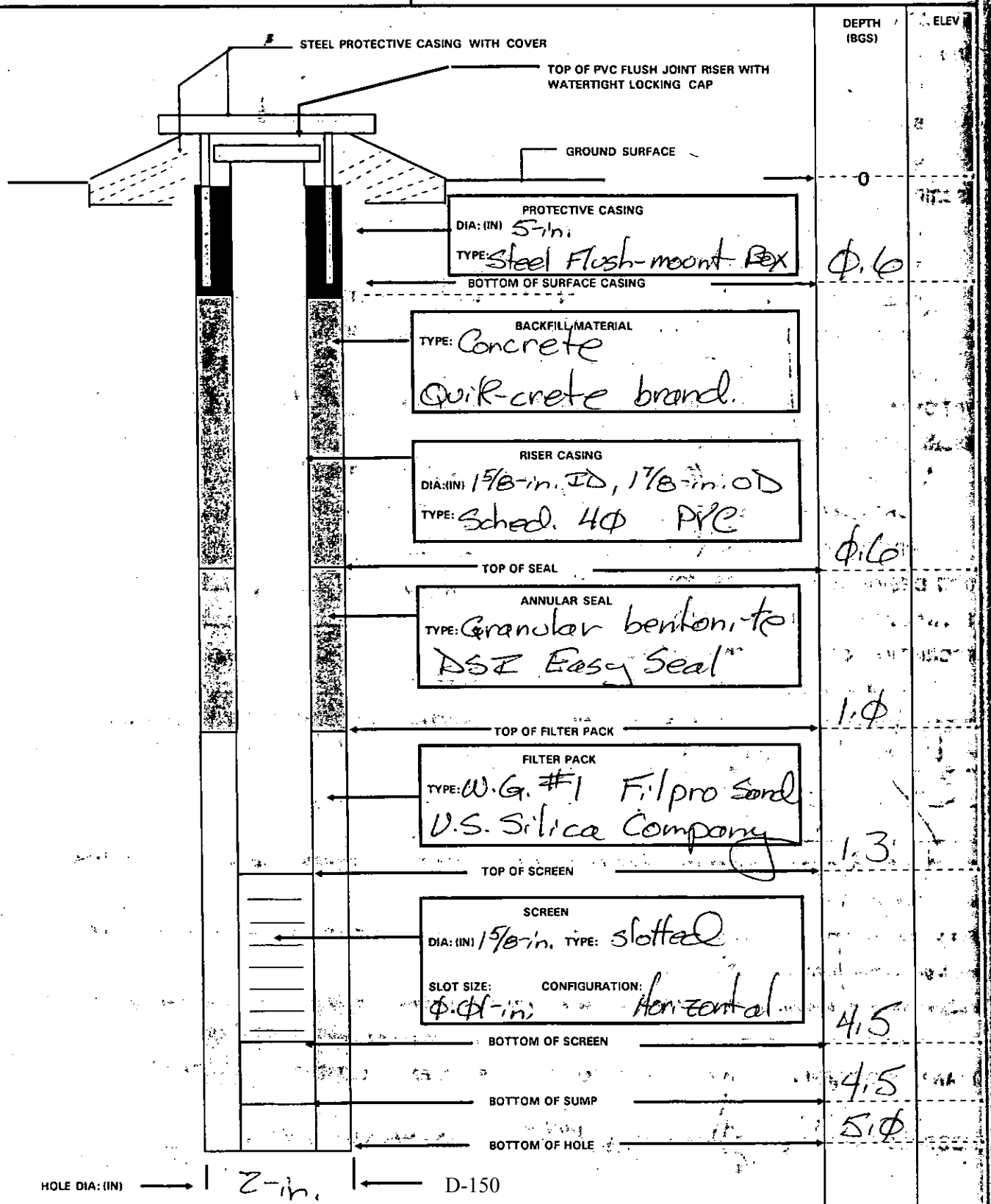
COORDINATES: N:

E:

DATUM/UNITS:

REFERENCE POINT: ELEVATION: DATUM/UNITS:

Ground Surface.



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility DELIVERY ORDER: 0066

MONITORING WELL ID: FP-31

INSTALLATION START: DATE: 11/12/06 TIME: 1013

INSTALLATION FINISH: DATE: 11/12/06 TIME: 1016

ANNULAR SPACE MATERIALS INVENTORY:

- GRANULAR FILTER PACK: TYPE: W.G #1 QUANTITY: 5 lbs
- BENTONITE SEAL: TYPE: DSI Easy Seal QUANTITY: 1-2 lbs.
- GROUT: TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- SLOT SIZE (inches): 0.01 SLOT CONFIGURATION: horizontal
- TOTAL OPEN AREA PER FOOT OF SCREEN: N/A
- OUTSIDE DIAMETER: 1⅞-in. NOMINAL INSIDE DIAMETER: 1⅝-in.
- SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC
- MANUFACTURER: ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

- OUTSIDE DIAMETER: 1⅞-in. NOMINAL INSIDE DIAMETER: 1⅝-in.
- SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC
- MANUFACTURER: ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- NOMINAL INSIDE DIAMETER: 5-in. COMPOSITION: Steel

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/15/06 (Signature & Date)

QA CHECK BY: [signature] 11/27/06 (Signature & Date)

53

MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-31

BEGIN: 11/12/06

END: 11/12/06

COORDINATES: N:

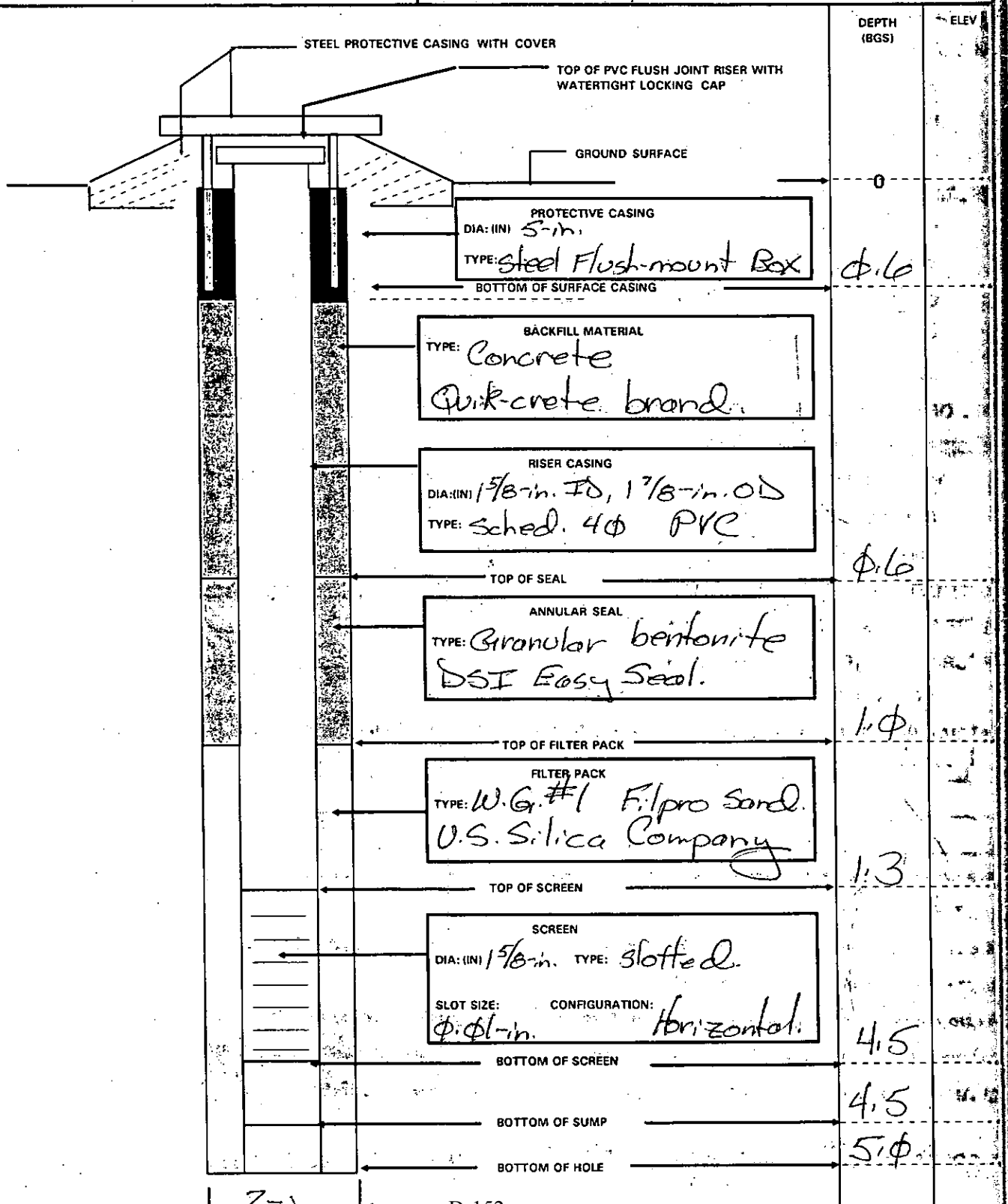
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface.

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-3Z

INSTALLATION START: DATE: 11/12/06 TIME: 1043

INSTALLATION FINISH: DATE: 11/12/06 TIME: 1047

ANNULAR SPACE MATERIALS INVENTORY:

- GRANULAR FILTER PACK: TYPE: W.G. #1 QUANTITY: 5 lbs.
- BENTONITE SEAL: TYPE: DSI Easy Seal QUANTITY: 1-2 lbs.
- GROUT: TYPE: N/A QUANTITY: N/A.

DESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): 0.01 SLOT CONFIGURATION: Horizontal

TOTAL OPEN AREA PER FOOT OF SCREEN: N/A

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-Threaded/Slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

NOMINAL INSIDE DIAMETER: 5-in. COMPOSITION: Steel

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/15/06 (Signature & Date)

QA CHECK BY: [signature] 11/22/06 (Signature & Date)

58

MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-3C

BEGIN: 11/12/06

END: 11/12/06

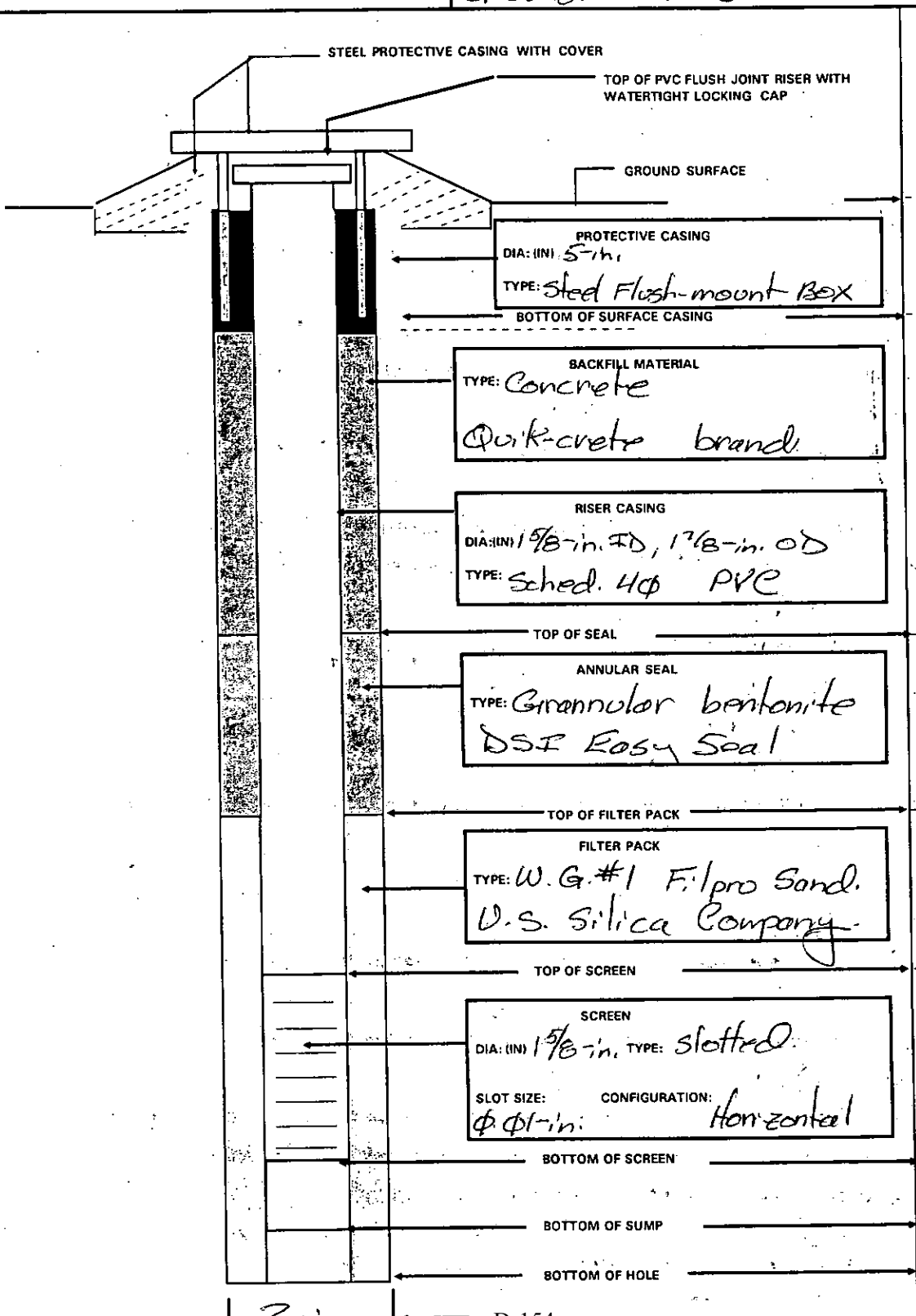
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility DELIVERY ORDER: 0066

MONITORING WELL ID: FP-33

INSTALLATION START: DATE: 11/12/06 TIME: 1058

INSTALLATION FINISH: DATE: 11/12/06 TIME: 1103

ANNULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: W.G. #1 QUANTITY: 5 lbs.

BENTONITE SEAL: TYPE: DSI Easy Seal QUANTITY: 1-2 lbs.

GROUT: TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): 0.01 SLOT CONFIGURATION: Horizontal

TOTAL OPEN AREA PER FOOT OF SCREEN: N/A

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations,

DESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip-cap on bottom,

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

NOMINAL INSIDE DIAMETER: 5-in. COMPOSITION: Steel

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/15/06 (Signature & Date)

QA CHECK BY: [signature] 11/27/06 (Signature & Date)

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MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-33

BEGIN: 11/12/06

END: 11/12/06

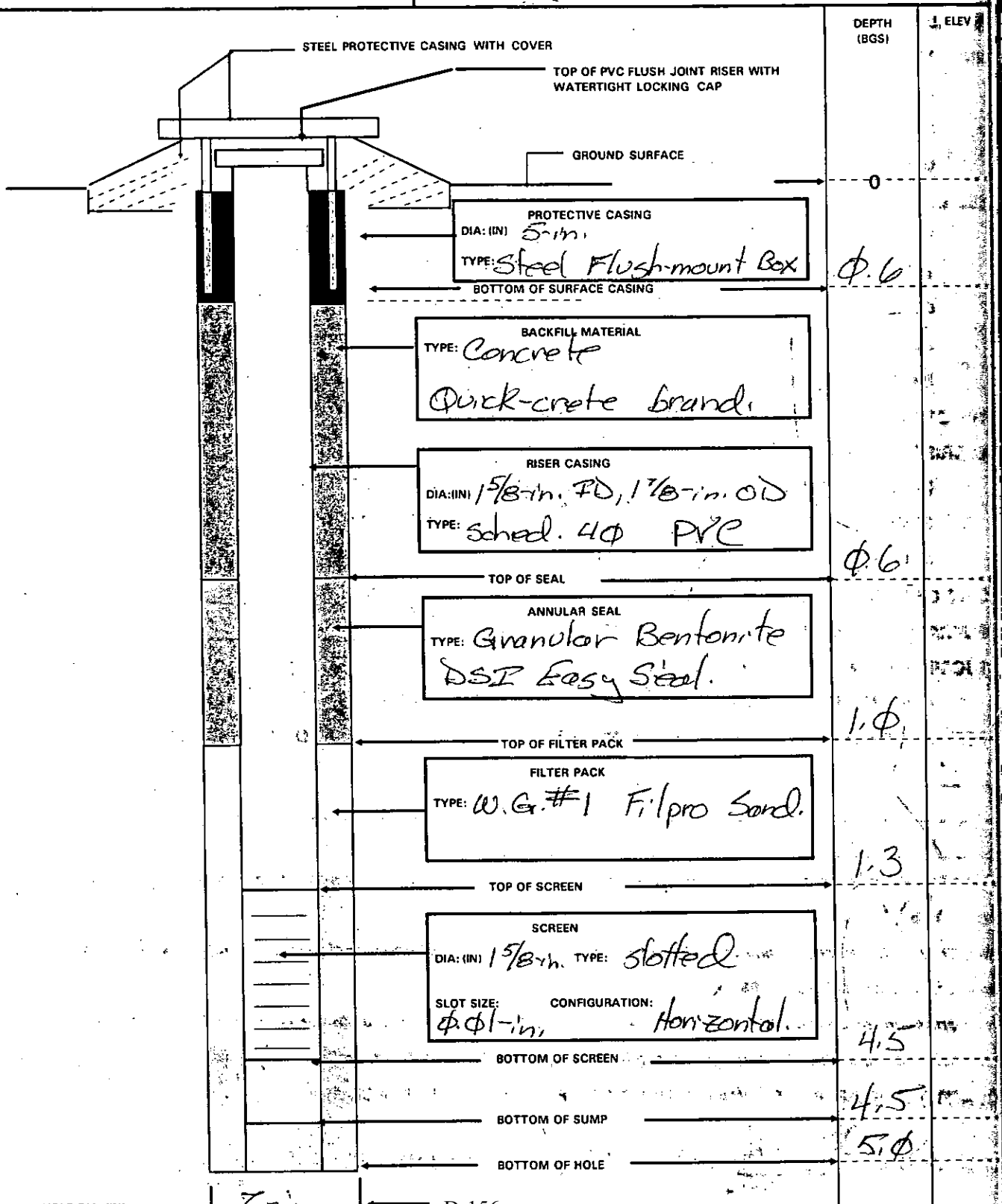
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility DELIVERY ORDER: 0066

MONITORING WELL ID: FP-34

INSTALLATION START: DATE: 11/12/06 TIME: 1112

INSTALLATION FINISH: DATE: 11/12/06 TIME: 1118

ANNULAR SPACE MATERIALS INVENTORY:

- GRANULAR FILTER PACK: TYPE: W.G. #1 QUANTITY: 5 lbs.
- BENTONITE SEAL: TYPE: DSI Easy Seal QUANTITY: 1-2 lbs.
- GROUT: TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): 0.01 SLOT CONFIGURATION: Horizontal

TOTAL OPEN AREA PER FOOT OF SCREEN: N/A

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations,

DESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A.

DESCRIPTION OF PROTECTIVE CASING:

NOMINAL INSIDE DIAMETER: 6.0-in. COMPOSITION: Steel,

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None,

RECORDED BY: [signature] 11/15/06 (Signature & Date)

QA CHECK BY: [signature] 11/27/06 (Signature & Date)

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MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-34

BEGIN: 11/12/06

END: 11/12/06

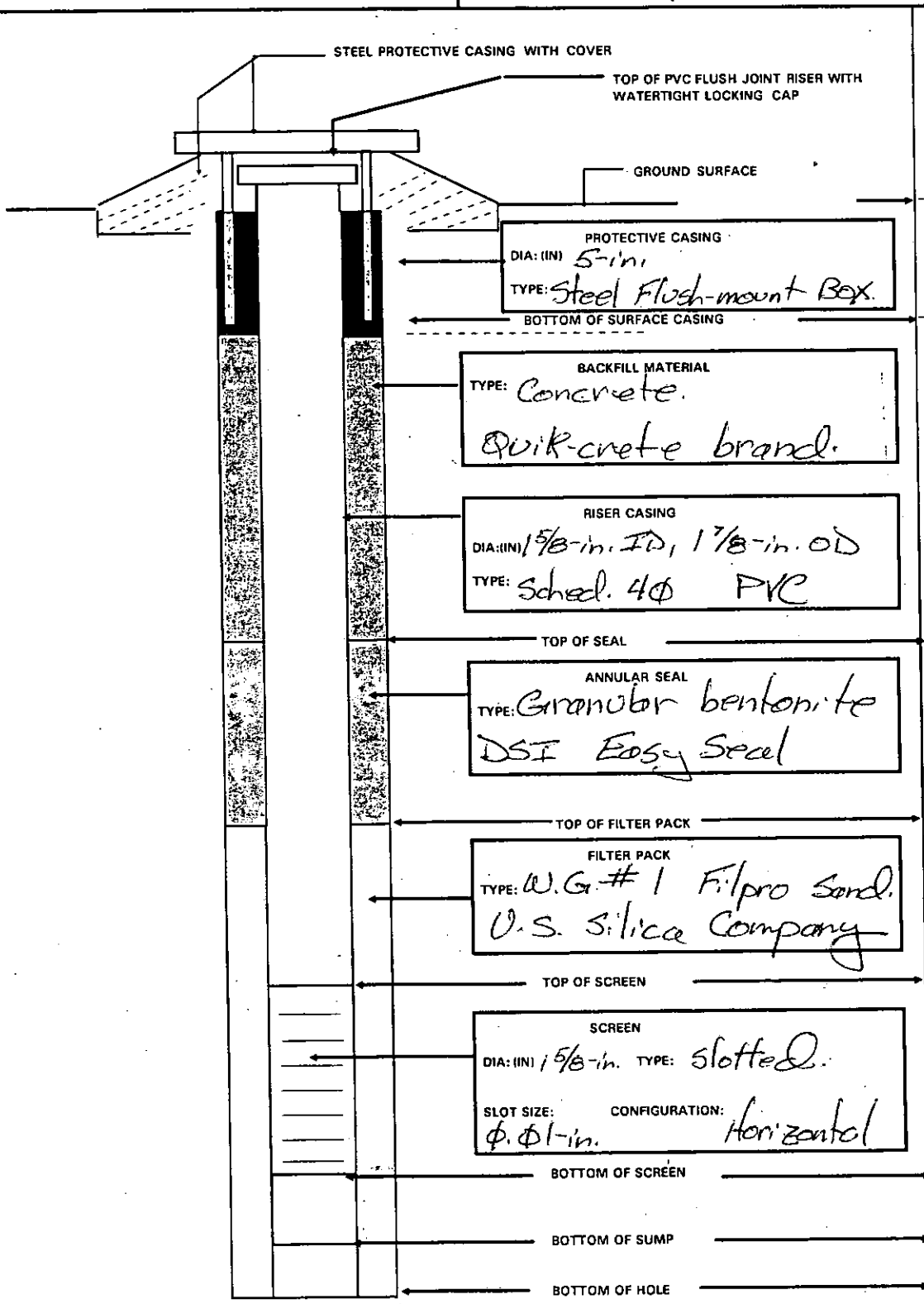
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface.

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-35

INSTALLATION START: DATE: 11/12/06 TIME: 1142

INSTALLATION FINISH: DATE: 11/12/06 TIME: 1152

ANNULAR SPACE MATERIALS INVENTORY:

- **GRANULAR FILTER PACK:** TYPE: W.G. #1 QUANTITY: 5 lbs
- **BENTONITE SEAL:** TYPE: DSI Easy Seal QUANTITY: 1-2 lbs.
- **GROUT:** TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- **SLOT SIZE (inches):** .01 **SLOT CONFIGURATION:** Horizontal
- **TOTAL OPEN AREA PER FOOT OF SCREEN:** N/A
- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded / slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- **NOMINAL INSIDE DIAMETER:** 5-in. **COMPOSITION:** steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:
Auger gets stuck: loosen by unthreading using a pipe wrench. Continue.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/15/06 (Signature & Date) **QA CHECK BY:** [signature] 11/22/06 (Signature & Date)

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MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-35

BEGIN: 11/12/96

END: 11/12/96

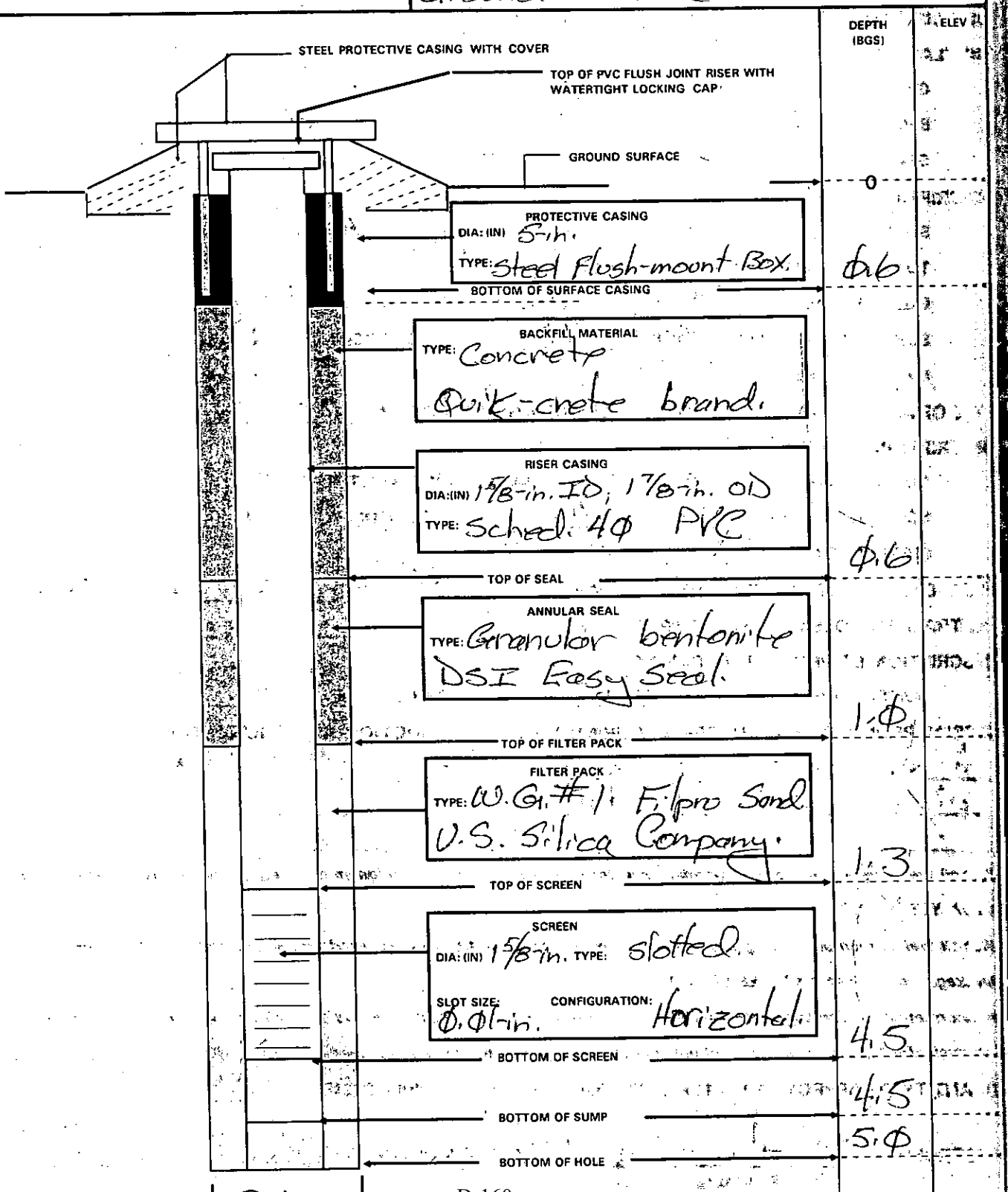
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-36

INSTALLATION START: DATE: 11/12/06 TIME: 1326

INSTALLATION FINISH: DATE: 11/12/06 TIME: ~~1344~~ 1331
TDC 11/24/06

ANNULAR SPACE MATERIALS INVENTORY:

- GRANULAR FILTER PACK: TYPE: W.G#1 QUANTITY: 5 lbs
- BENTONITE SEAL: TYPE: DSI Easy Seal QUANTITY: 1-2 lbs
- GROUT: TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): .01 SLOT CONFIGURATION: Horizontal

TOTAL OPEN AREA PER FOOT OF SCREEN: N/A

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations

DESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-Threaded / Slip-cap on bottom

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

NOMINAL INSIDE DIAMETER: 6-in. COMPOSITION: Steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

Auger got stuck; loosen using pipewrench, and continue.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/24/06
(Signature & Date)

QA CHECK BY: [signature] 11/27/06
(Signature & Date)

MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-36

BEGIN: 11/12/06

END: 11/12/06

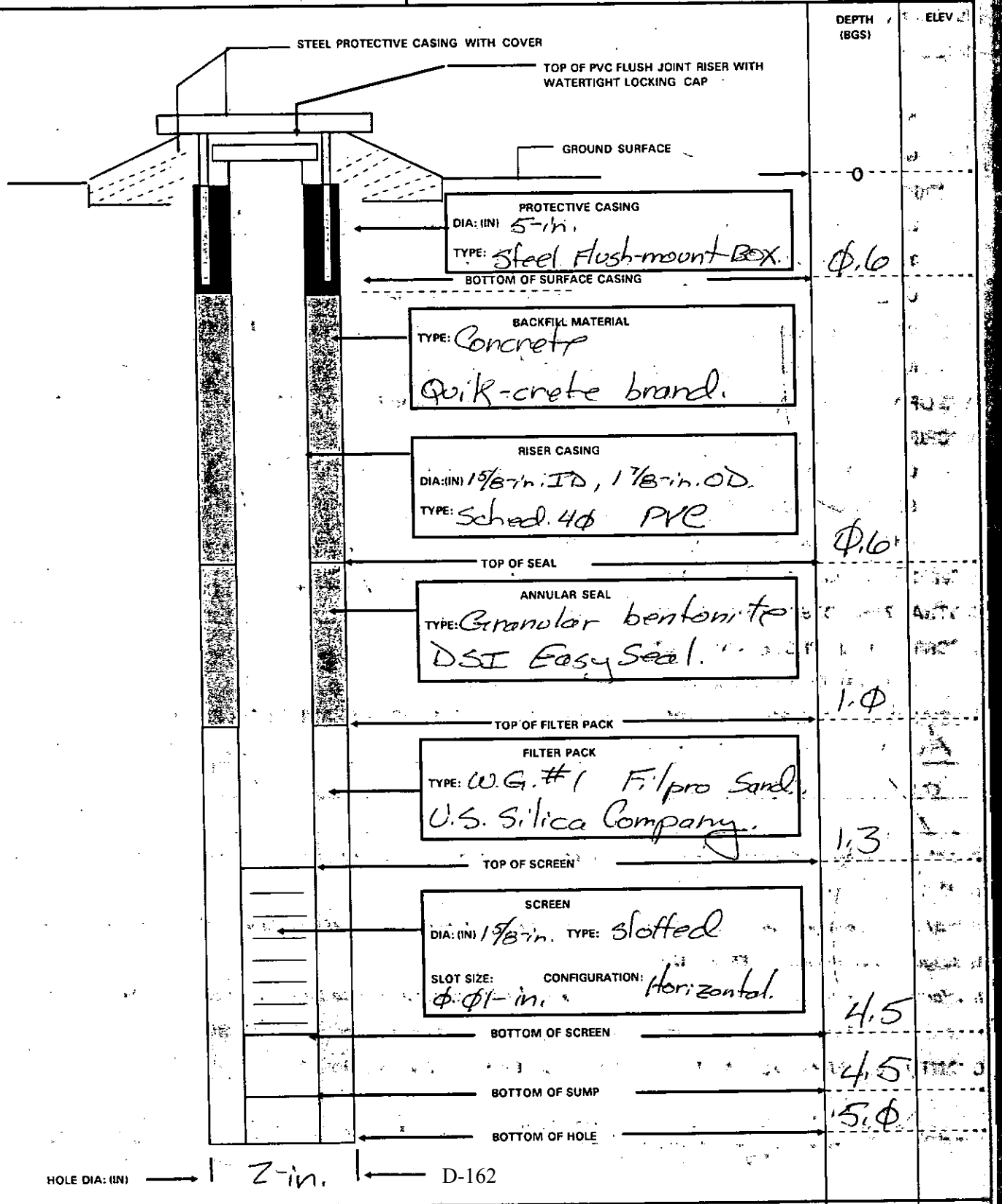
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface.

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-37

INSTALLATION START: DATE: 11/12/06 TIME: 1353

INSTALLATION FINISH: DATE: 11/12/06 TIME: 1356

ANNULAR SPACE MATERIALS INVENTORY:

- **GRANULAR FILTER PACK:** TYPE: W.G. #1 QUANTITY: 5 lbs.
- **BENTONITE SEAL:** TYPE: DSI Easy Seal QUANTITY: 1-2 lbs.
- **GROUT:** TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- **SLOT SIZE (inches):** 0.01 **SLOT CONFIGURATION:** Horizontal
- **TOTAL OPEN AREA PER FOOT OF SCREEN:** N/A
- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations

DESCRIPTION OF WELL CASING:

- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- **NOMINAL INSIDE DIAMETER:** 5-in. **COMPOSITION:** Steel

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None

RECORDED BY: [signature] 11/24/06 (Signature & Date) **QA CHECK BY:** [signature] 11/27/06 (Signature & Date)

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MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-37

BEGIN: 11/12/06

END: 11/12/06

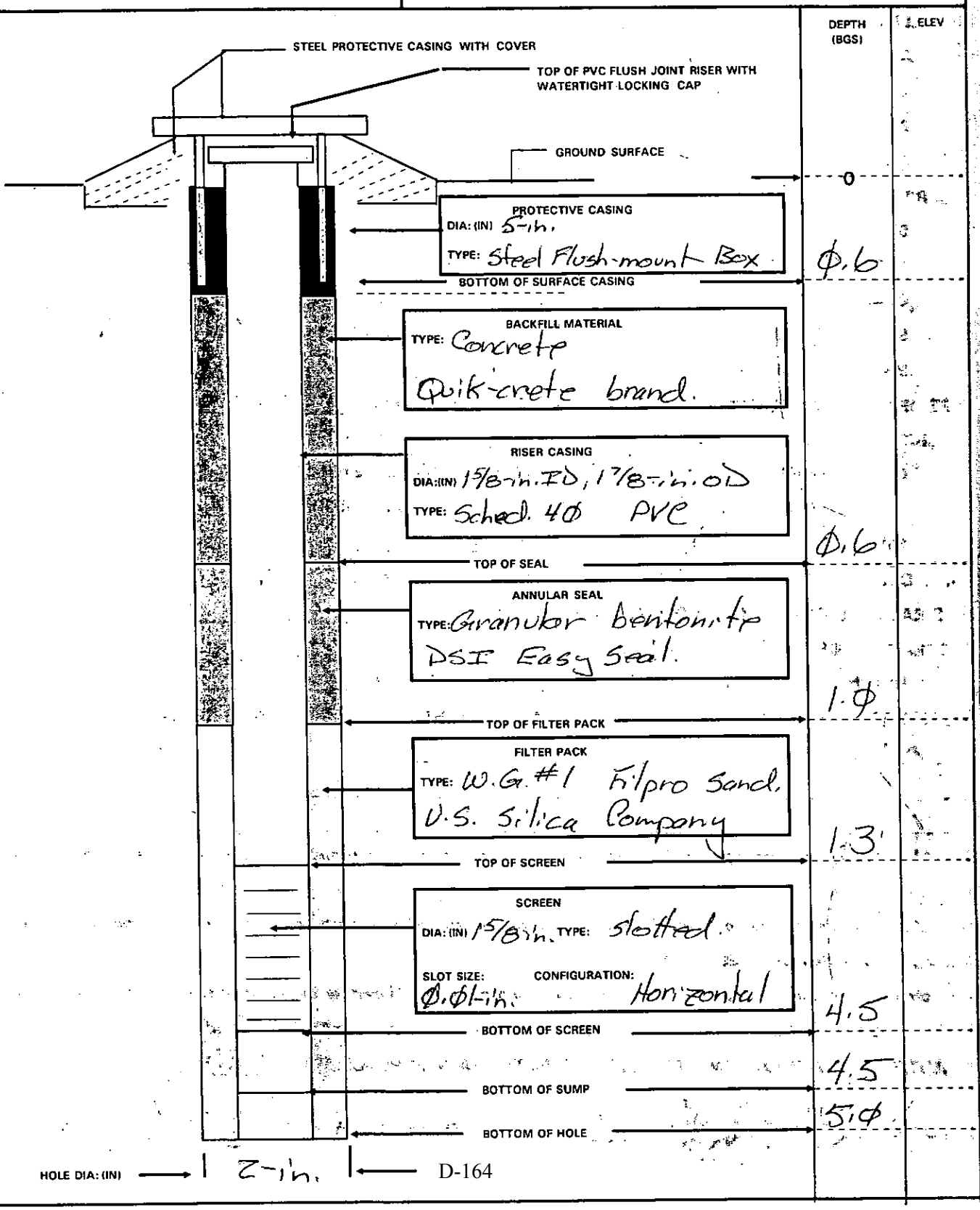
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface.

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-38

INSTALLATION START: DATE: 11/12/06 TIME: 1403

INSTALLATION FINISH: DATE: 11/12/06 TIME: 1407

ANNULAR SPACE MATERIALS INVENTORY:

- **GRANULAR FILTER PACK:** TYPE: W.G. #1 QUANTITY: 5 lbs.
- **BENTONITE SEAL:** TYPE: DSI EasySeal QUANTITY: 1-2 lbs.
- **GROUT:** TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- **SLOT SIZE (inches):** .01 **SLOT CONFIGURATION:** Horizontal
- **TOTAL OPEN AREA PER FOOT OF SCREEN:** N/A
- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations

DESCRIPTION OF WELL CASING:

- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing

JOINT DESIGN AND COMPOSITION: Flush-threaded / slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- **NOMINAL INSIDE DIAMETER:** 5-in. **COMPOSITION:** Steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/14/06 (Signature & Date) **QA CHECK BY:** [signature] 11/27/06 (Signature & Date)

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MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-38

BEGIN: 11/12/96

END: 11/12/96

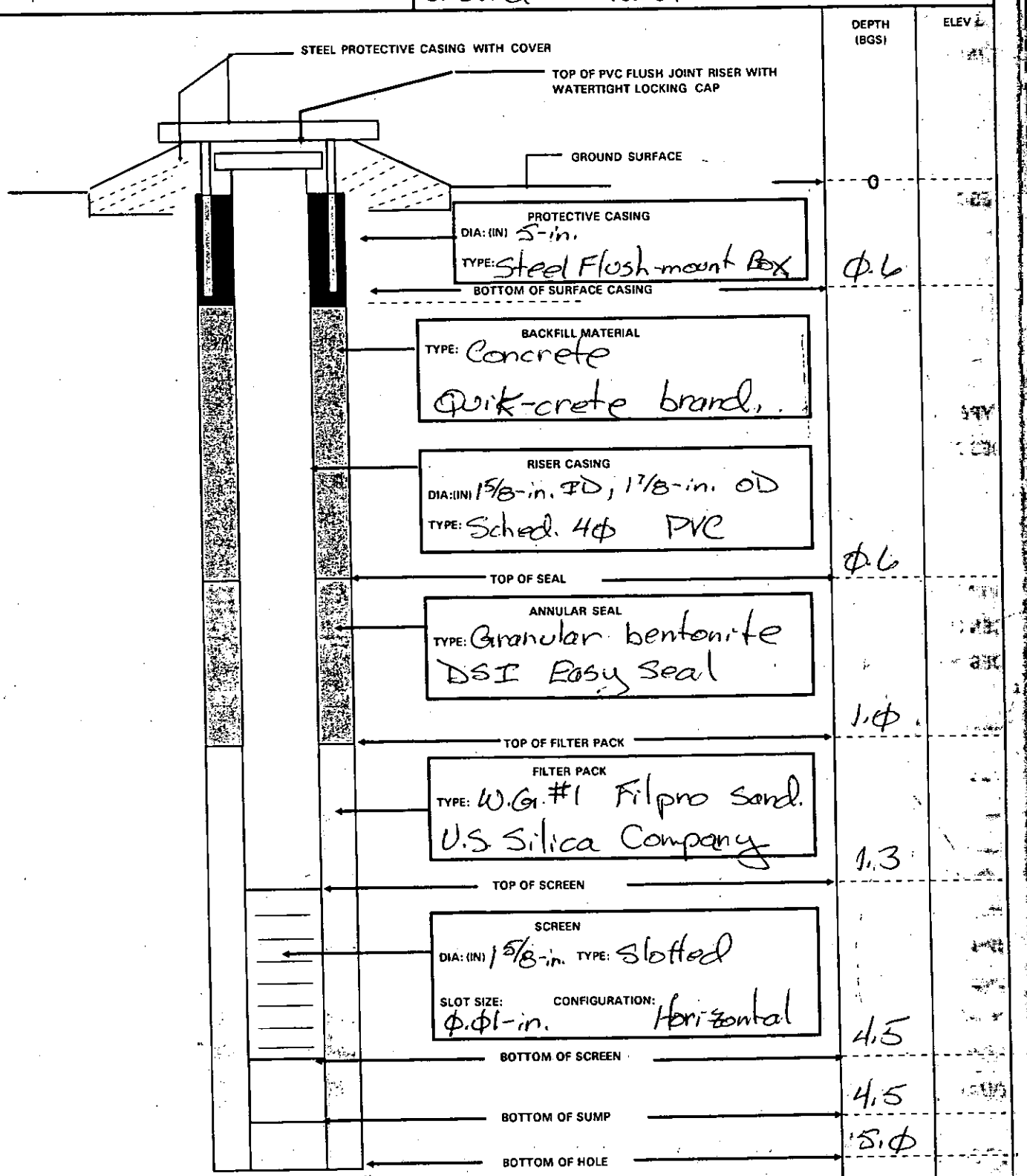
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface.

ELEVATION:

DATUM/UNITS:



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MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-39

INSTALLATION START: DATE: 11/12/06 TIME: 1414

INSTALLATION FINISH: DATE: 11/12/06 TIME: 1418

ANNULAR SPACE MATERIALS INVENTORY:

- GRANULAR FILTER PACK: TYPE: W.G.#1 QUANTITY: 5 lbs.
- BENTONITE SEAL: TYPE: DSI Easy Seal QUANTITY: 1-2 lbs.
- GROUT: TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- SLOT SIZE (inches): .01 SLOT CONFIGURATION: Horizontal
- TOTAL OPEN AREA PER FOOT OF SCREEN: N/A
- OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.
- SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC
- MANUFACTURER: ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

- OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.
- SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC
- MANUFACTURER: ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- NOMINAL INSIDE DIAMETER: 5-in. COMPOSITION: Steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/20/06 (Signature & Date) **QA CHECK BY:** [signature] 11/27/06 (Signature & Date)

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MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-39

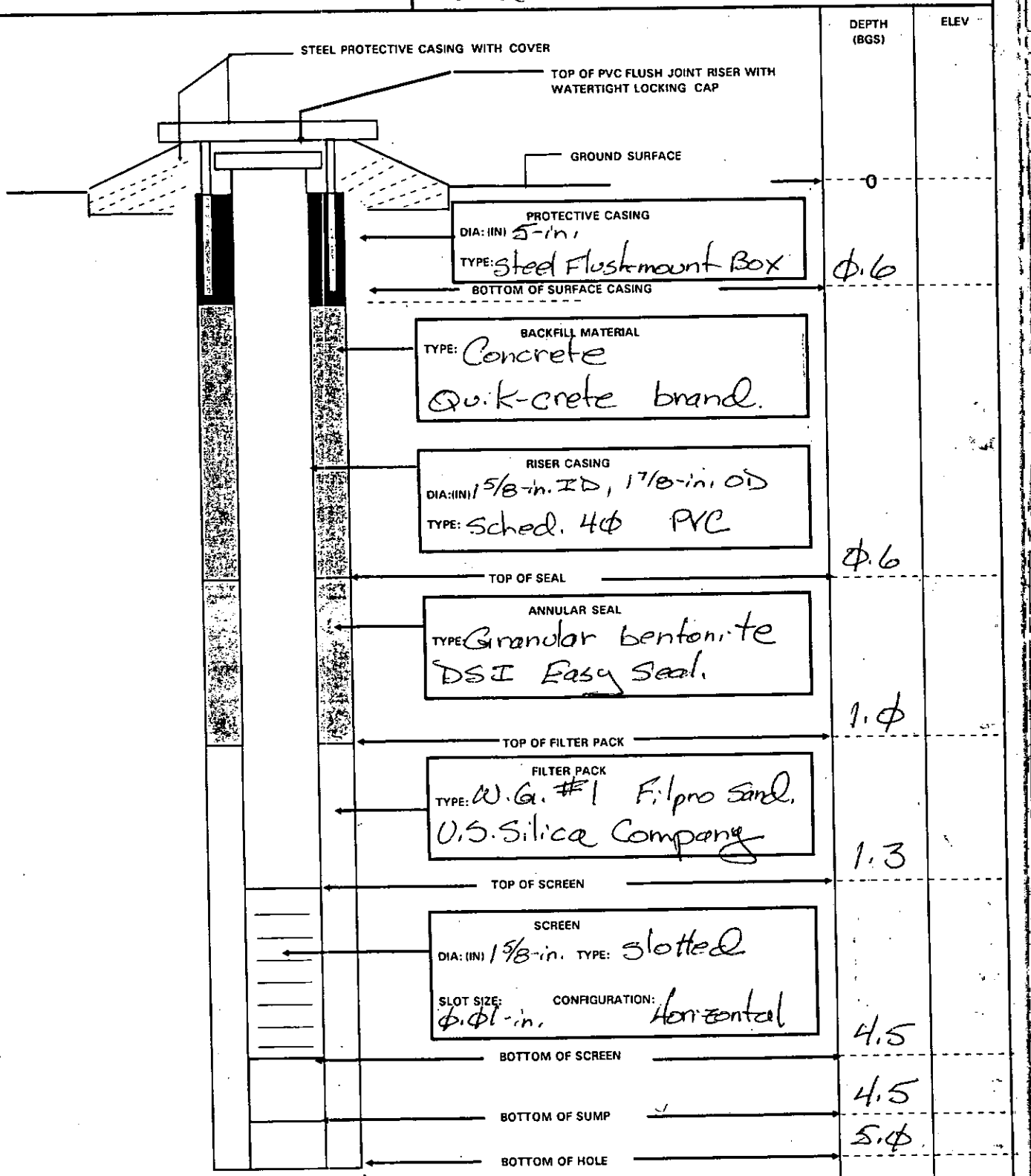
BEGIN: 11/12/06

END: 11/12/06

COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: ELEVATION: DATUM/UNITS:
Ground Surface,



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility DELIVERY ORDER: 0066

MONITORING WELL ID: FP-40

INSTALLATION START: DATE: 11/12/06 TIME: 1425

INSTALLATION FINISH: DATE: 11/12/06 TIME: 1430

ANNULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: W.G.#1 QUANTITY: 5 lbs.

BENTONITE SEAL: TYPE: DSI Easy Seal QUANTITY: 1-2 lbs.

GROUT: TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): 0.01 SLOT CONFIGURATION: Horizontal

TOTAL OPEN AREA PER FOOT OF SCREEN: N/A

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.

SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC

MANUFACTURER: ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

NOMINAL INSIDE DIAMETER: 5-in. COMPOSITION: Steel

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/20/06
(Signature & Date)

QA CHECK BY: _____
(Signature & Date)

98

MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-4Φ

BEGIN: 11/12/Φ6

END: 11/12/Φ6

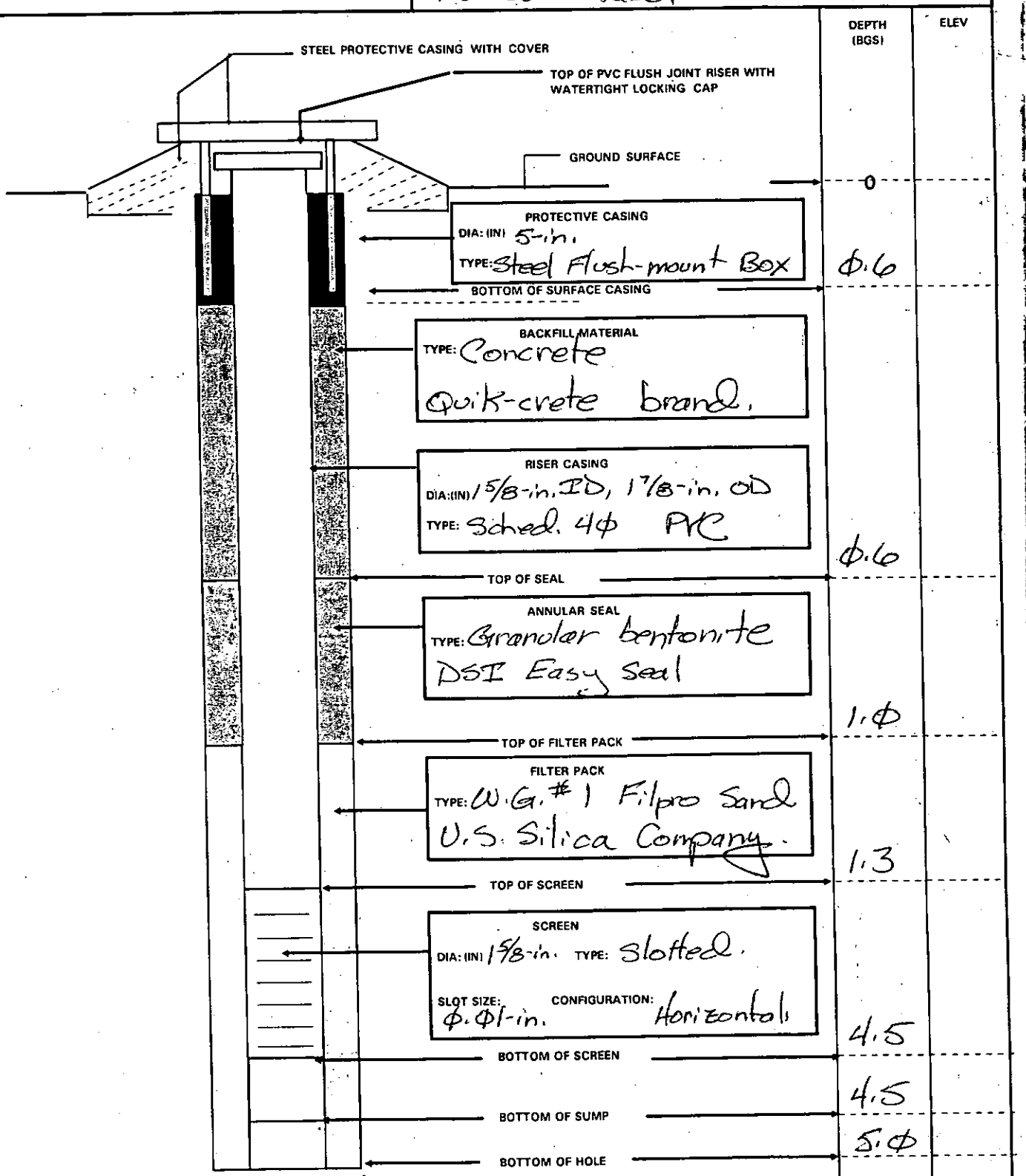
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface,

ELEVATION:

DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-41

INSTALLATION START: DATE: 11/12/06 TIME: 1452

INSTALLATION FINISH: DATE: 11/12/06 TIME: 1458

ANNULAR SPACE MATERIALS INVENTORY:

- **GRANULAR FILTER PACK:** TYPE: W.G.#1 QUANTITY: 5 lbs
- **BENTONITE SEAL:** TYPE: DSI Easy Seal QUANTITY: 1-2 lbs
- **GROUT:** TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- **SLOT SIZE (inches):** .01 **SLOT CONFIGURATION:** Horizontal.
- **TOTAL OPEN AREA PER FOOT OF SCREEN:** N/A
- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

- **OUTSIDE DIAMETER:** 1 7/8-in. **NOMINAL INSIDE DIAMETER:** 1 5/8-in.
- **SCHEDULE/THICKNESS:** Sched. 40 **COMPOSITION:** PVC
- **MANUFACTURER:** ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- **NOMINAL INSIDE DIAMETER:** 5-in. **COMPOSITION:** Steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None

RECORDED BY: [signature] 11/20/06 (Signature & Date) **QA CHECK BY:** [signature] 11/27/06 (Signature & Date)

3

MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-41

BEGIN: 11/12/96

END: 11/12/96

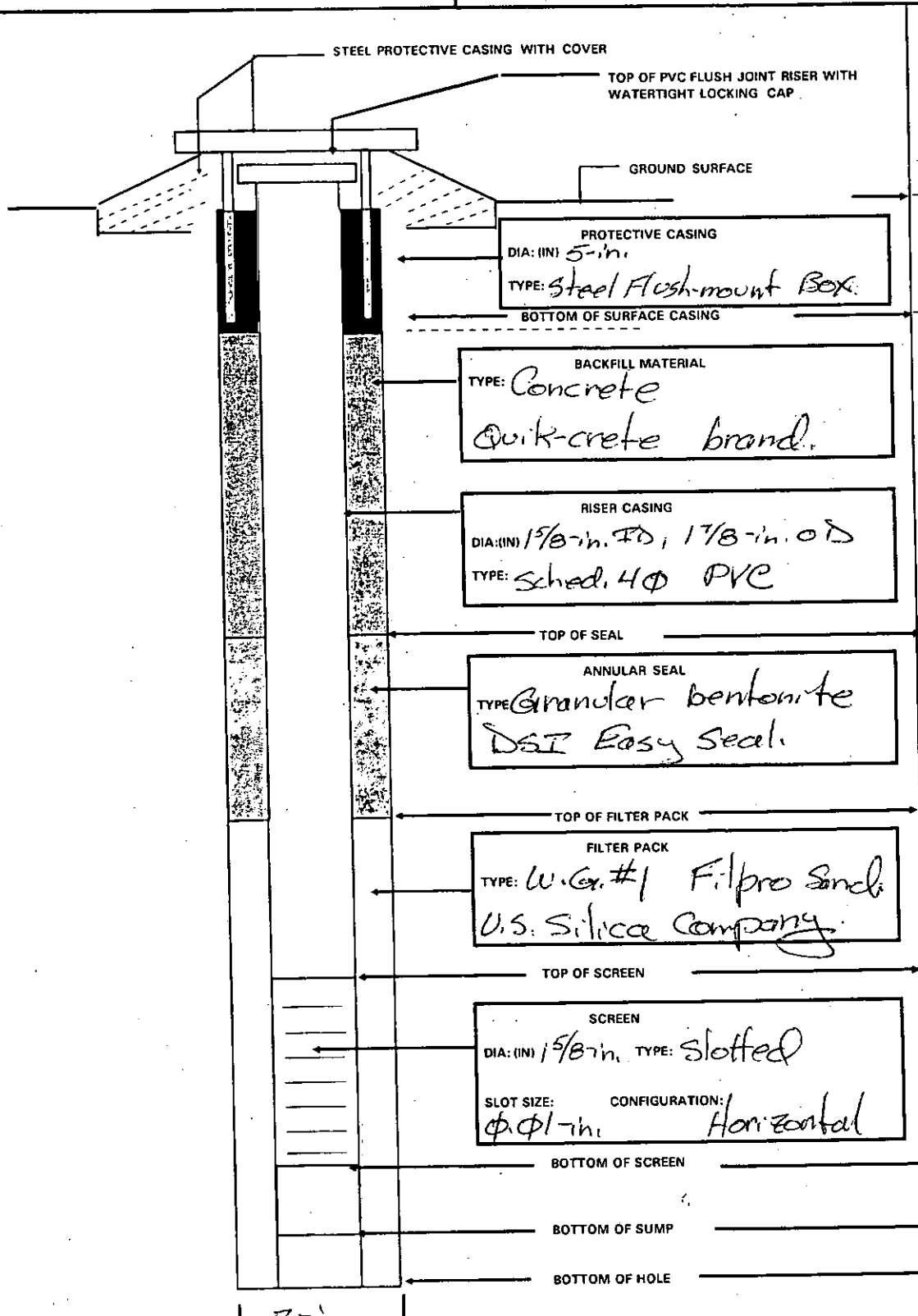
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface

ELEVATION:

DATUM/UNITS:



DEPTH (BGS)	ELEV
0	
0.6	
0.6	
1.0	
1.3	
4.5	
4.5	
5.0	

MONITORING WELL INSTALLATION LOG

PROJECT: Bulk Fuel Facility **DELIVERY ORDER:** 0066

MONITORING WELL ID: FP-4Z

INSTALLATION START: DATE: 11/12/06 TIME: 1507

INSTALLATION FINISH: DATE: 11/12/06 TIME: 1520

ANNULAR SPACE MATERIALS INVENTORY:

- GRANULAR FILTER PACK: TYPE: WG. #1 QUANTITY: 5 lbs
- BENTONITE SEAL: TYPE: DSI Easy Seal QUANTITY: 1-2 lbs.
- GROUT: TYPE: N/A QUANTITY: N/A

DESCRIPTION OF WELL SCREEN:

- SLOT SIZE (inches): 0.01 SLOT CONFIGURATION: Horizontal
- TOTAL OPEN AREA PER FOOT OF SCREEN: N/A
- OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.
- SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC
- MANUFACTURER: ECT Manufacturing.

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Native Formations.

DESCRIPTION OF WELL CASING:

- OUTSIDE DIAMETER: 1 7/8-in. NOMINAL INSIDE DIAMETER: 1 5/8-in.
- SCHEDULE/THICKNESS: Sched. 40 COMPOSITION: PVC
- MANUFACTURER: ECT Manufacturing.

JOINT DESIGN AND COMPOSITION: Flush-threaded/slip-cap on bottom.

CENTRALIZERS DESIGN AND COMPOSITION: N/A

DESCRIPTION OF PROTECTIVE CASING:

- NOMINAL INSIDE DIAMETER: 5-in. COMPOSITION: Steel.

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, etc.)? YES [X] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [X] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [X] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: None.

RECORDED BY: [signature] 11/20/06 (Signature & Date) **QA CHECK BY:** _____ (Signature & Date)

8

MONITORING WELL

PROJECT: Bulk Fuel Facility

DELIVERY ORDER NO: 0066

WELL NUMBER: FP-42

BEGIN: 11/12/96

END: 11/14/96

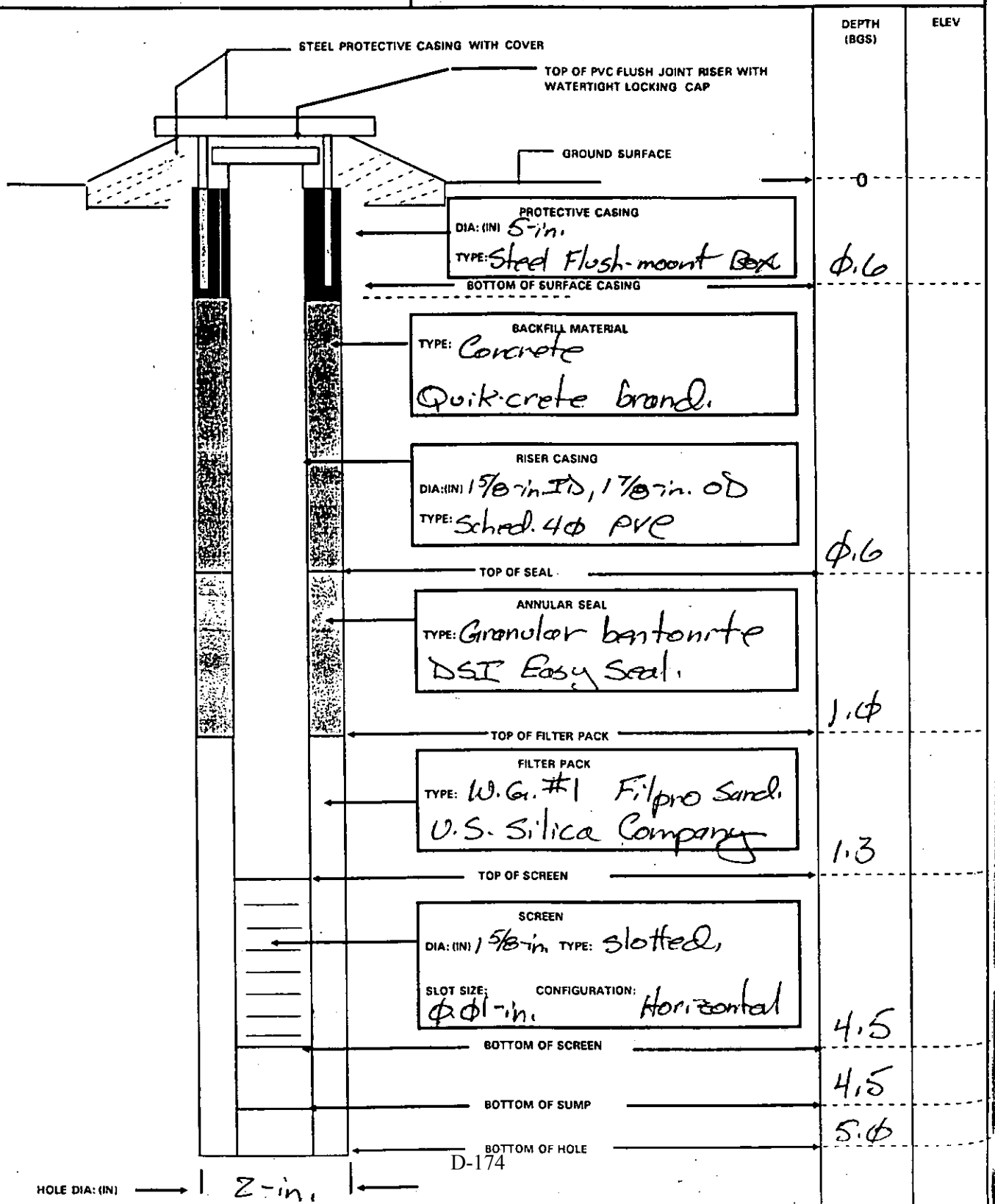
COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: Ground Surface

ELEVATION:

DATUM/UNITS:



ARCADIS

Appendix F

Free Product Pumping Activities
Previously Submitted (SAIC 2006)

Table 4b. Free Product Removal Activities for Sumps

August 2006 Measurements							
Date	**Position**	**Free Product**	**Water**	**Fuel**	**ft**	**cft Fuel**	**Gallons**
8/2/06 8:00	1	19.5	10	9.5	0.79	2.49	18.58
	2	19	18	1	0.08	0.26	1.96
	3	27.5	26.5	1	0.08	0.26	1.96
	4	5.5	0	5.5	0.46	1.44	10.76
							33.25
8/2/06 11:30	1	13.5	6	7.5	0.63	1.96	14.67
	2	17.5	17.5	0	0.00	0.00	0.00
	3	26	26	0	0.00	0.00	0.00
	4	4.5	0	4.5	0.38	1.18	8.80
							23.47
8/2/06 15:00	1	19	10	9	0.75	2.36	17.60
	2	18	18	0	0.00	0.00	0.00
	3	27	26.5	0.5	0.04	0.13	0.98
	4	5.5	0	5.5	0.46	1.44	10.76
							29.34
8/3/2006 8:00	1	20	10	10	0.83	2.62	19.56
	2	18.5	17.5	1	0.08	0.26	1.96
	3	27	26	1	0.08	0.26	1.96
	4	5.5	0	5.5	0.46	1.44	10.76
							34.22
8/3/2006 11:30	1	17	7	10	0.83	2.62	19.56
	2	17	17	0	0.00	0.00	0.00
	3	26	26	0	0.00	0.00	0.00
	4	4.5	0	4.5	0.38	1.18	8.80
							28.36
8/3/2006 15:00	1	18	9.5	8.5	0.71	2.23	16.62
	2	18	18	0	0.00	0.00	0.00
	3	26.5	26	0.5	0.04	0.13	0.98
	4	5	0	5	0.42	1.31	9.78
							27.38
8/4/2006 8:00	1	19.5	9.5	10	0.83	2.62	19.56
	2	18.5	17.5	1	0.08	0.26	1.96
	3	27	26	1	0.08	0.26	1.96
	4	5.5	0	5.5	0.46	1.44	10.76
							34.22

Table 4b. Free Product Removal Activities for Sumps (continued)

August 2006 Measurements							
Date	**Position**	**Free Product**	**Water**	**Fuel**	**ft**	**cft Fuel**	**Gallons**
8/4/2006 11:30	1	14	7	7	0.58	1.83	13.69
	2	17.5	17.5	0	0.00	0.00	0.00
	3	25	25	0	0.00	0.00	0.00
	4	4.5	0	4.5	0.38	1.18	8.80
							22.49
8/4/2006 11:30	1	19	10	9	0.75	2.36	17.60
	2	18	17.5	0.5	0.04	0.13	0.98
	3	26	25.5	0.5	0.04	0.13	0.98
	4	5	0	5	0.42	1.31	9.78
							29.34
8/7/2006 8:00	1	20	10	10	0.83	2.62	19.56
	2	16.5	16	0.5	0.04	0.13	0.98
	3	25.5	25	0.5	0.04	0.13	0.98
	4	6	0	6	0.50	1.57	11.73
							33.25
8/7/2006 11:30	1	20.5	10	10.5	0.88	2.75	20.53
	2	16.5	16	0.5	0.04	0.13	0.98
	3	25.5	25	0.5	0.04	0.13	0.98
	4	6	0	6	0.50	1.57	11.73
							34.22
8/7/2006 11:30	1	12.5	6	6.5	0.54	1.70	12.71
	2	16	15.5	0.5	0.04	0.13	0.98
	3	26	26	0	0.00	0.00	0.00
	4	4	0	4	0.33	1.05	7.82
							21.51
8/8/2006 8:00	1	20	10	10	0.83	2.62	19.56
	2	17	16.5	0.5	0.04	0.13	0.98
	3	25	24.5	0.5	0.04	0.13	0.98
	4	5.5	0	5.5	0.46	1.44	10.76
							32.27
8/8/2006 11:30	1	20	9.5	10.5	0.88	2.75	20.53
	2	17	16.5	0.5	0.04	0.13	0.98
	3	25.5	25	0.5	0.04	0.13	0.98
	4	6	0	6	0.50	1.57	11.73
							34.22
8/8/2006 3:00	1	8	5	3	0.25	0.79	5.87
	2	15	15	0	0.00	0.00	0.00
	3	25	25	0	0.00	0.00	0.00
	4	3.5	0	3.5	0.29	0.92	6.84
							12.71

Table 4b. Free Product Removal Activities for Sumps (continued)

August 2006 Measurements							
Date	**Position**	**Free Product**	**Water**	**Fuel**	**ft**	**cft Fuel**	**Gallons**
8/9/2006 8:00	1	20.5	10.5	10	0.83	2.62	19.56
	2	17.5	17	0.5	0.04	0.13	0.98
	3	24	23.5	0.5	0.04	0.13	0.98
	4	5.5	0.5	5	0.42	1.31	9.78
							31.29
8/9/2006 11:30	1	20.5	10.5	10	0.83	2.62	19.56
	2	17.5	17	0.5	0.04	0.13	0.98
	3	24	23.5	0.5	0.04	0.13	0.98
	4	6	1	5	0.42	1.31	9.78
							31.29
8/9/2006 3:00	1	10	9.5	0.5	0.04	0.13	0.98
	2	15	15	0	0.00	0.00	0.00
	3	22	22	0	0.00	0.00	0.00
	4	4	0	4	0.33	1.05	7.82
							8.80
8/10/2006 8:00	1	19	10	9	0.75	2.36	17.60
	2	17.5	17	0.5	0.04	0.13	0.98
	3	25	24.5	0.5	0.04	0.13	0.98
	4	6	1	5	0.42	1.31	9.78
							29.34
8/10/2006 11:30	1	19	9	10	0.83	2.62	19.56
	2	17.5	17	0.5	0.04	0.13	0.98
	3	25	24.5	0.5	0.04	0.13	0.98
	4	6	1	5	0.42	1.31	9.78
							31.29
8/10/2006 3:00	1	9	4.5	4.5	0.38	1.18	8.80
	2	14.5	14.5	0	0.00	0.00	0.00
	3	23	23	0	0.00	0.00	0.00
	4	4	0	4	0.33	1.05	7.82
							16.62
8/11/2006 8:00	1	19	10	9	0.75	2.36	17.60
	2	17.5	17	0.5	0.04	0.13	0.98
	3	25	24.5	0.5	0.04	0.13	0.98
	4	6	1.5	4.5	0.38	1.18	8.80
							28.36
8/11/2006 11:30	1	19	9.5	9.5	0.79	2.49	18.58
	2	18	17.5	0.5	0.04	0.13	0.98
	3	26	25.5	0.5	0.04	0.13	0.98
	4	6	1.5	4.5	0.38	1.18	8.80
							29.34

Table 4b. Free Product Removal Activities for Sumps (continued)

August 2006 Measurements							
Date	**Position**	**Free Product**	**Water**	**Fuel**	**ft**	**cft Fuel**	**Gallons**
8/11/2006 3:00	1	11	5.5	5.5	0.46	1.44	10.76
	2	17	17	0	0.00	0.00	0.00
	3	25	25	0	0.00	0.00	0.00
	4	4	0	4	0.33	1.05	7.82
							18.58
8/14/2006 8:00	1	21.5	11.5	10	0.83	2.62	19.56
	2	17.5	17	0.5	0.04	0.13	0.98
	3	24.5	24	0.5	0.04	0.13	0.98
	4	6	1	5	0.42	1.31	9.78
							31.29
8/14/2006 11:30	1	17.5	9	8.5	0.71	2.23	16.62
	2	16.5	16.5	0	0.00	0.00	0.00
	3	23.5	23.5	0	0.00	0.00	0.00
	4	4.5	0	4.5	0.38	1.18	8.80
							25.42
8/14/2006 3:00	1	20.5	10.5	10	0.83	2.62	19.56
	2	17	16.5	0.5	0.04	0.13	0.98
	3	26	25.5	0.5	0.04	0.13	0.98
	4	5.5	0.5	5	0.42	1.31	9.78
							31.29
8/28/2006 3:00	1	21	11	10	0.83	2.62	19.56
	2	16	15.75	0.25	0.02	0.07	0.49
	3	23.5	23	0.5	0.04	0.13	0.98
	4	5.25	0.25	5	0.42	1.31	9.78
							30.80

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Appendix G

Alternate Concentration Limit and Alternate Threshold Level Calculations (CAP Part B for Release #1)

1.0 ALTERNATE CONCENTRATION LIMITS

Benzene and naphthalene were selected as contaminants of potential concern (COPCs) in groundwater for the site. The maximum benzene concentration in groundwater was 553 (µg/L) in December 1999 during the Corrective Action Plan (CAP)–Part A investigation. The maximum naphthalene concentration in groundwater was 528 (µg/L) in December 2000 during the CAP–Part B investigation. The modeling results estimated a dilution attenuation factor (DAF) of 8.9 for the lateral migration of benzene in groundwater from the area of the highest contamination (MW-22) to the closest potential receptor (storm drain) located 120 feet away from the center of the source area (Attachment A). The modeling results estimated a DAF of 126.3 for the lateral migration of naphthalene from the area of highest contamination (MW-22) to the storm drain (Attachment A).

Compound-specific regulatory levels or risk-based screening criteria were used in conjunction with the site-specific DAFs identified for the potential migration of contamination from the site to determine the alternate concentration limit (ACL) for each compound. The ACLs are presented in Table VI-A along with the maximum observed concentration for each constituent. The maximum detected concentrations for benzene and naphthalene do not exceed their respective ACLs.

Table VI-A. Alternate Concentration Limits for Contaminants in Groundwater

Constituent	Regulatory Level (µg/L)	DAF[a]	Calculated ACL (µg/L)	Maximum Observed Concentration (µg/L)	
				CAP–Part A	CAP–Part B
Benzene	71.28[c]	8.9	634.4[b]	553	251
Naphthalene	6.5[d]	126.3	820.9	101	558

CAP - Corrective Action Plan.
DAF - Dilution attenuation factor.
[a]DAF = Maximum observed concentration ÷ predicted concentration at the receptor.
= 553 ÷ 62.1 ≈ 8.9 for benzene at the storm drain.
= 558 ÷ 4.19 ≈ 126.3 for naphthalene at the storm drain.
[b]ACL = Regulatory level × DAF.
[c]In-stream Water Quality Standard.
[d]Risk-based screening criteria.
Bold value exceeds the calculated ACL.

2.0 ALTERNATE THRESHOLD LEVELS

Benzene, toluene, ethylbenzene, and xylenes (BTEX) were selected as COPCs for soil at the site. In addition, toluene was selected as a COPC for the sediment at the site. The closest receptor (storm drain) is located approximately 120 feet from the area of highest soil and groundwater contamination (SB/MW-22) in the vicinity of former aboveground storage tank (AST) 7003. Therefore, a DAF for lateral migration from the source to the nearest receptor was used in the ALT calculation. To be conservative, the benzene DAF of 8.9 was used in calculating the alternate threshold levels (ATLs) for each of the COPCs (Table VI-B). The maximum soil contamination levels at the site were detected in the soil sample collected above the water table [0.0 to 2.0 feet below ground surface (BGS), MW-22]; therefore, leaching to groundwater by percolating rainwater was used. The DAF for migration of leachate to the water table is calculated based on the SESOIL modeling results. SESOIL is used to simulate the vertical transport of contaminants from the source areas down through the vadose zone to the shallow

groundwater (water table). (SESOIL is an acronym for Seasonal Soil compartment model and is a one-dimensional, vertical transport code for the unsaturated soil zone.)

The ATLs for soil are presented in Table VI-C along with the maximum observed concentrations. The maximum detected benzene concentration in the soil (1.130 mg/kg) at location SB-22/MW-22 was the only compound found to exceed its ATL.

The ATLs were calculated using the following equation:

$$ATL = K_{oc} * f_{cs} * C_{std} * DAF_L * DAF_W ,$$

where

K_{oc} = organic carbon partitioning coefficient [Georgia Underground Storage Tank (GA UST) CAP–Part A Guidance, Appendix I, Table 1],
f_{cs} = fractional organic carbon content,
C_{std} = applicable water quality standard,
DAF_W = dilution attenuation factor for the lateral migration of groundwater,
DAF_L = dilution attenuation factor for the vertical migration of leachate.

Table VI-B. Values Used in ATL Calculation

Constituent	K_{oc} (mL/g)	f_{cs}	C_{std} (mg/L)[1]	DAF_L	DAF_W	Calculated ATL (mg/kg)
Benzene	81	0.0036	0.005	29.8	8.9	0.3867
Toluene	133	0.0036	1	25.5	8.9	12.210
Ethylbenzene	176	0.0036	0.7	15.7	8.9	61.85
Xylenes	639	0.0036	10	3.2	8.9	74.6

[1]U.S. Environmental Protection Agency Safe Drinking Water Act (SDWA) maximum contaminant level.
ATL - Alternate threshold level.
DAF - Dilution attenuation factor.

Table VI-C. Alternate Threshold Levels for Contaminated Soil/Sediment

Constituent	Regulatory Level (mg/kg)[a]	Calculated ATL (mg/kg)	Maximum Observed Concentration (mg/kg)	
			CAP–Part A	CAP–Part B
Benzene	0.005	0.3867	**1.130**	0.0763
Toluene	0.400	12.210	0.404 (Soil)	0.0388 (Soil)
			2.810 (Sediment)	ND (Sediment)
Ethylbenzene	0.370	61.85	13.6	4.5
Xylenes	20.0	74.6	74.6	17.0

[a]Georgia Underground Storage Tank Soil Threshold Levels (i.e., Table A, Column 1).
CAP - Corrective Action Plan.
ND - Not detected.
Bold value exceeds the calculated ATL.

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Appendix H

Summary of Fate and Transport Model (CAP Part B for Release #1)

Table A-1. CAP–Part A Natural Attenuation Modeling Results (Benzene Concentration vs. Distance) for the Former UST 117 Site

Distance to Receptor (ft)	Distance to Receptor (m)	Predicted Maximum Benzene Concentration in Groundwater (µg/L)
0.0	0.0	553
32.8	10.0	435
39.4	12.0	365
49.2	15.0	273
59.1	18.0	209
65.6	20.0	178
78.7	24.0	130
98.4	30.0	90.8
120.1	36.6	62.1
131.2	40.0	51.8
164.0	50.0	31.4
196.9	60.0	20
229.7	70.0	13.1
262.5	80.0	8.74
295.3	90.0	5.95
341.2	104.0	3.6
393.7	120.0	2
492.1	150.0	0.8
656.2	200.0	0.2

Table A-2. CAP–Part B Natural Attenuation Modeling Results (Naphthalene Concentration vs. Distance) for the Former UST 117 Site

Distance to Receptor (ft)	Distance to Receptor (m)	Predicted Maximum Naphthalene Concentration in Groundwater (µg/L)
0.0	0.0	529
6.6	2.0	536
9.8	3.0	533
13.1	4.0	526
16.4	5.0	512
23.0	7.0	458
29.5	9.0	366
32.8	10.0	312
39.4	12.0	214
49.2	15.0	120
59.1	18.0	71
65.6	20.0	51
78.7	24.0	25.3
98.4	30.0	10.9
120.1	36.6	4.19
196.9	60.0	0.174
341.2	104.0	6.70 E-04
393.7	120.0	0
492.1	150.0	0
656.2	200.0	0

Table A-3. CAP–Part B Natural Attenuation Modeling Results (Benzene Concentration vs. Time) for the Former UST 117 Site

Time (year)	Predicted Maximum Benzene Concentration in Groundwater (µg/L)	
	MW-22	MW-32
0.0 (12/00)	174.0	109.0
0.5 (06/01)	114.0	89.1
1.0 (12/01)	75.9	84.3
1.5 (06/02)	51.6	74.2
2.0 (12/02)	31.6	62.3

Note: Time 0.0 is equal to December 2000, which was the last groundwater sampling event conducted at the site. Monitoring wells MW-22 and MW-32 will be sampled semiannually for 1 year as part of the monitoring only program to validate the fate and transport modeling results. As predicted by the model, benzene concentrations in both wells should be below the In-stream Water Quality Standard (IWQS) of 71.28 µg/L by the end of year 2 (i.e., December 2002).

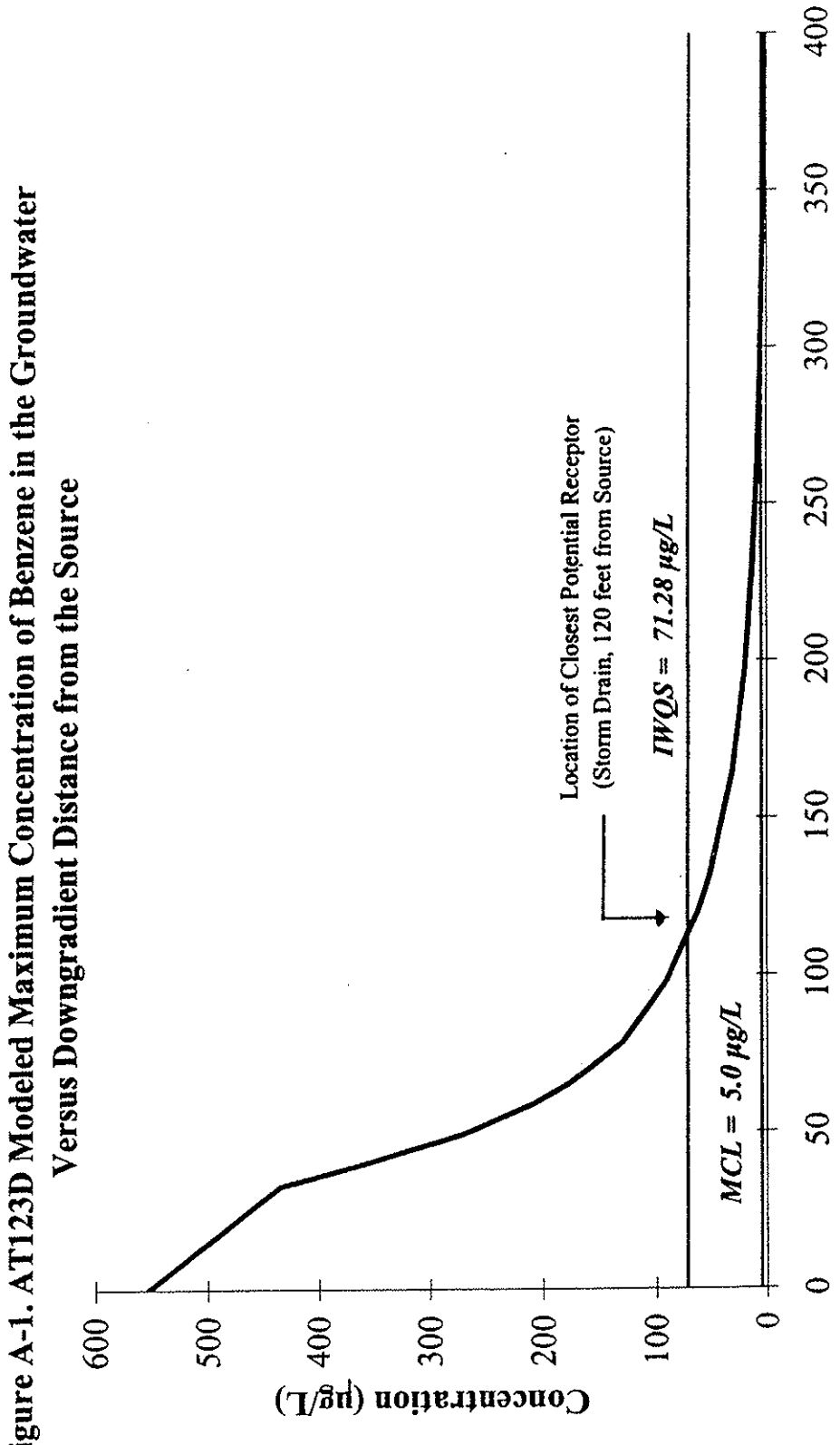


Figure A-1. AT123D Modeled Maximum Concentration of Benzene in the Groundwater Versus Downgradient Distance from the Source

Figure A-2. AT123D Modeled Maximum Concentration of Naphthalene in the Groundwater Versus Downgradient Distance from the Source

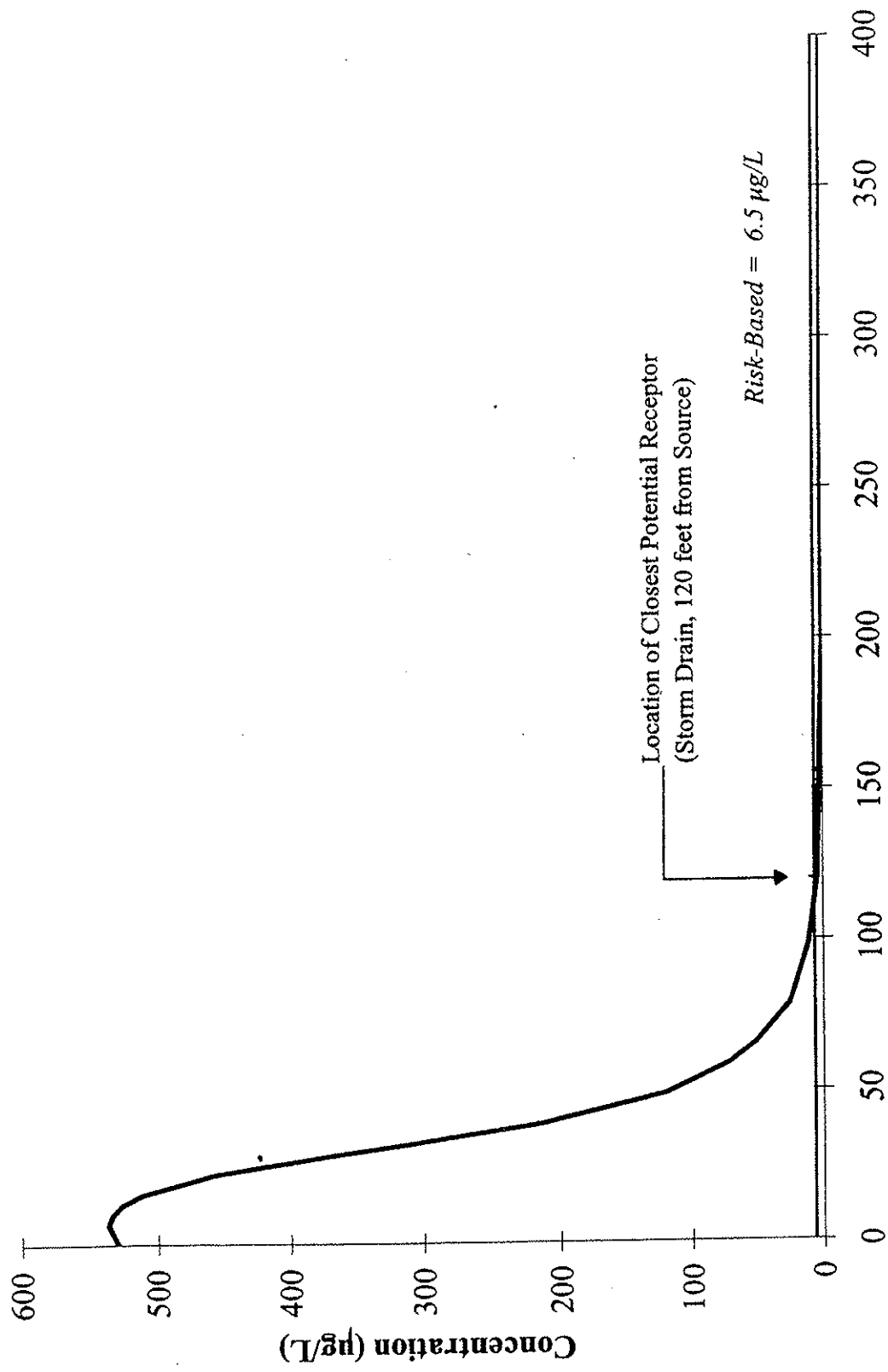
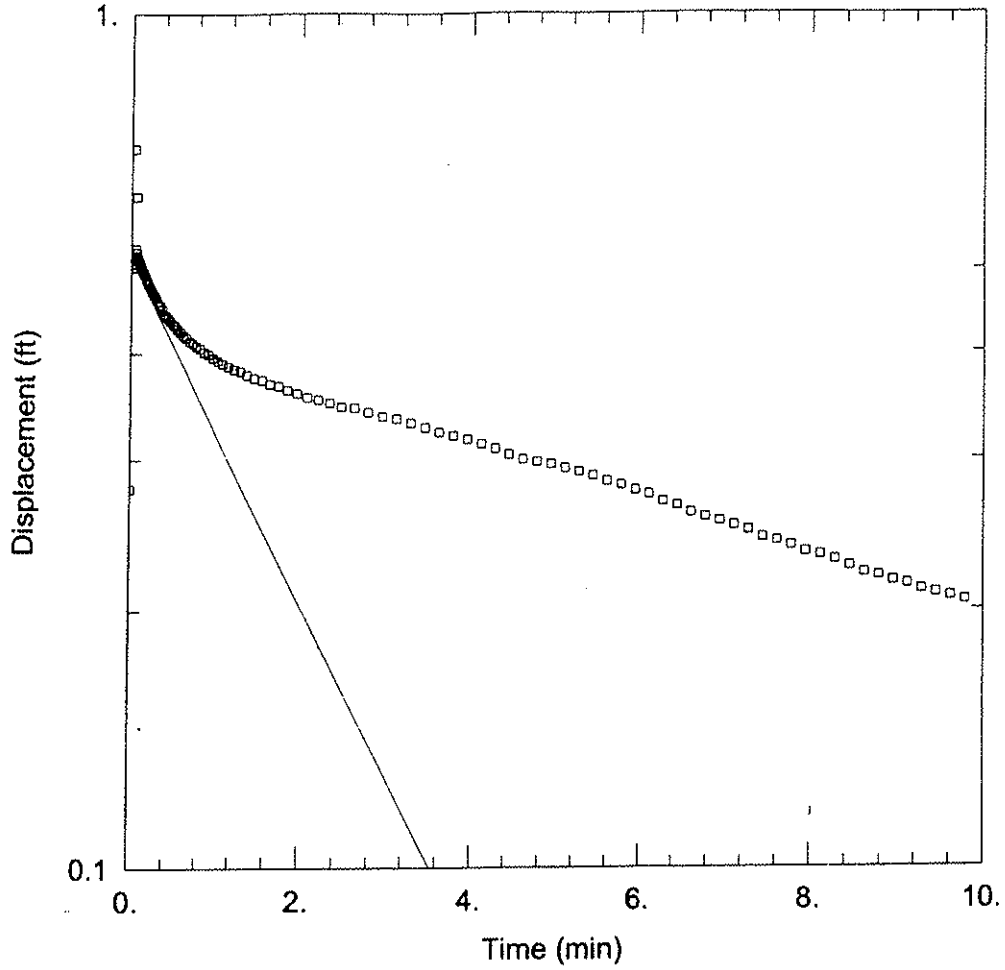


Figure A-2. AT123D Modeled Maximum Concentration of Naphthalene in the Groundwater Versus Downgradient Distance from the Source



WELL TEST ANALYSIS

Data Set: C:\WINDOWS\DESKTOP\BF-MW-E4.AQT
Date: 01/22/01 Time: 10:09:30

PROJECT INFORMATION

Company: SAIC
Client: USACE-Savannah
Test Location: Hunter Army Airfield
Test Date: 12-04-00

AQUIFER DATA

Saturated Thickness: 10.72 ft
Anisotropy Ratio (Kz/Kr): 1.

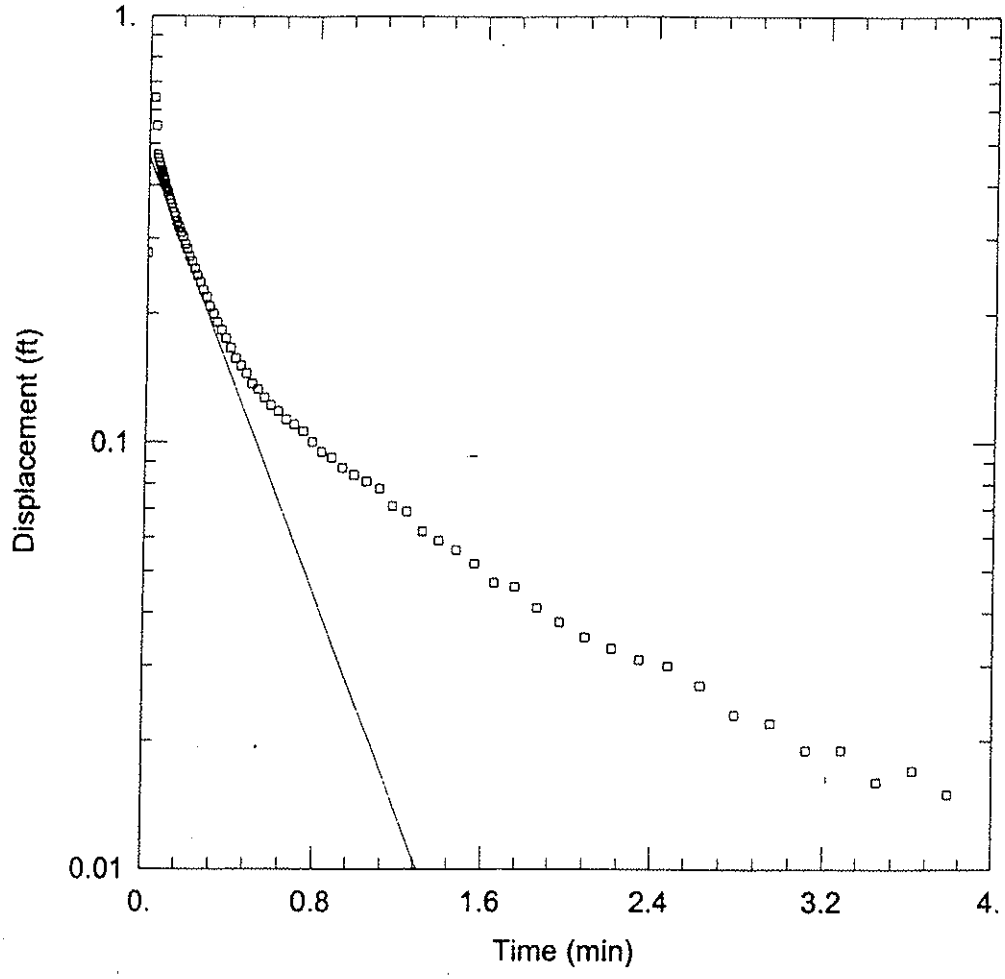
WELL DATA

Initial Displacement: 0.278 ft
Casing Radius: 0.008 ft
Screen Length: 10. ft
Water Column Height: 10.72 ft
Wellbore Radius: 0.33 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.001994 ft/min
y0 = 0.5165 ft

Figure A-3. Slug Test Analysis for MW-E4 at the Former UST 117, Building 7002 Site



WELL TEST ANALYSIS

Data Set: C:\WINDOWS\DESKTOP\BF-MW-E5.AQT
Date: 01/22/01 Time: 10:10:44

PROJECT INFORMATION

Company: SAIC
Client: USACE-Savannah
Test Location: Hunter Army Airfield
Test Date: 12-04-00

AQUIFER DATA

Saturated Thickness: 10.7 ft Anisotropy Ratio (Kz/Kr): 1.

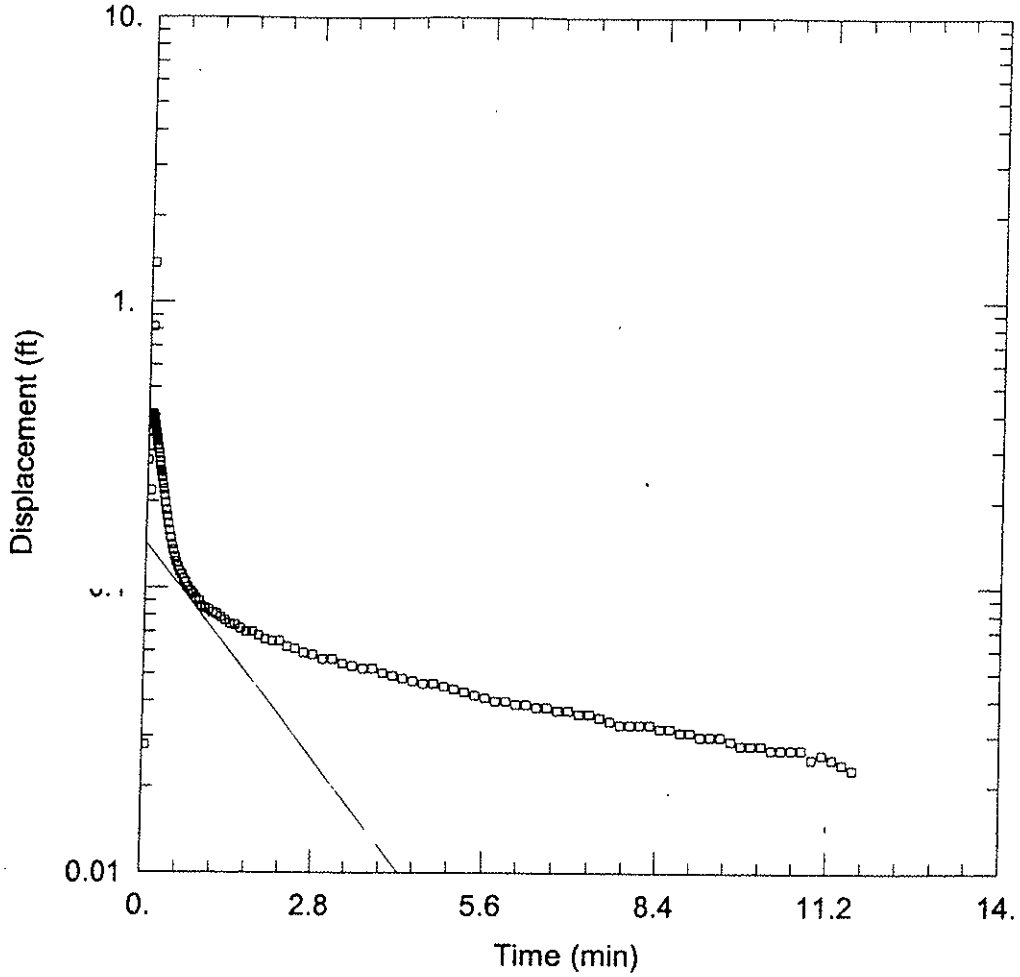
WELL DATA

Initial Displacement: 0.278 ft Water Column Height: 10.7 ft
Casing Radius: 0.008 ft Wellbore Radius: 0.33 ft
Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 0.01269 ft/min
Solution Method: Bouwer-Rice y0 = 0.4673 ft

Figure A-4. Slug Test Analysis for MW-E5 at the Former UST 117, Building 7002 Site



WELL TEST ANALYSIS

Data Set: C:\WINDOWS\DESKTOP\BF-MW-E6.AQT
Date: 01/22/01 Time: 10:10:07

PROJECT INFORMATION

Company: SAIC
Client: USACE-Savannah
Test Location: Hunter Army Airfield
Test Date: 12-04-00

AQUIFER DATA

Saturated Thickness: 9.76 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 0.278 ft
Casing Radius: 0.008 ft
Screen Length: 10. ft
Water Column Height: 9.76 ft
Wellbore Radius: 0.33 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.002624 ft/min
y0 = 0.1433 ft

Figure A-5. Slug Test Analysis for MW-E6 at the Former UST 117, Building 7002 Site

TABLE A-4. AT123D FATE AND TRANSPORT MODEL INPUT AND OUTPUT VALUES FOR BENZENE AT THE FORMER UST 117, BUILDING 7002 SITE

NO. OF POINTS IN X-DIRECTION	14
NO. OF POINTS IN Y-DIRECTION	2
NO. OF POINTS IN Z-DIRECTION	1
NO. OF ROOTS: NO. OF SERIES TERMS	400
NO. OF BEGINNING TIME STEP	13
NO. OF ENDING TIME STEP	241
NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION	12
INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE	1
SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE	0
INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT	1
CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD	2
AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS)	0.1524E+02
AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS)	0.0000E+00
BEGIN POINT OF X-SOURCE LOCATION (METERS)	-0.9100E+01
END POINT OF X-SOURCE LOCATION (METERS)	0.9100E+01
BEGIN POINT OF Y-SOURCE LOCATION (METERS)	-0.6100E+01
END POINT OF Y-SOURCE LOCATION (METERS)	0.6100E+01
BEGIN POINT OF Z-SOURCE LOCATION (METERS)	0.0000E+00
END POINT OF Z-SOURCE LOCATION (METERS)	0.0000E+00
POROSITY	0.1800E+00
HYDRAULIC CONDUCTIVITY (METER/HOUR)	0.9000E-01
HYDRAULIC GRADIENT	0.3500E-02
LONGITUDINAL DISPERSIVITY (METER)	0.1000E+02
LATERAL DISPERSIVITY (METER)	0.3000E+01
VERTICAL DISPERSIVITY (METER)	0.1000E+01
DISTRIBUTION COEFFICIENT, KD (M**3/KG)	0.7900E-04
HEAT EXCHANGE COEFFICIENT (KCAL/HR-M**2-DEGREE C)	0.0000E+00
MOLECULAR DIFFUSION MULTIPLY BY POROSITY (M**2/HR)	0.3530E-05
DECAY CONSTANT (PER HOUR)	0.4000E-04
BULK DENSITY OF THE SOIL (KG/M**3)	0.1320E+04
ACCURACY TOLERANCE FOR REACHING STEADY STATE	0.1000E-02
DENSITY OF WATER (KG/M**3)	0.1000E+04
TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (HR)	0.7300E+03
DISCHARGE TIME (HR)	0.8760E+06
WASTE RELEASE RATE (KCAL/HR), (KG/HR), OR (CI/HR)	0.2210E-04
RETARDATION FACTOR	0.1579E+01
RETARDED DARCY VELOCITY (M/HR)	0.1108E-02
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/HR)	0.1109E-01
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/HR)	0.3337E-02
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/HR)	0.1120E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.0000E+00 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-24.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-24.	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8760E+04 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.159E-02	0.296E-02	0.494E+00	0.489E+00	0.354E+00	0.282E+00	0.188E+00	0.124E+00	0.947E-01	0.516E-01
-24.	0.902E-05	0.149E-04	0.415E-03	0.477E-03	0.479E-03	0.462E-03	0.422E-03	0.367E-03	0.326E-03	0.234E-03

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.225E-01	0.758E-02	0.451E-04	0.000E+00
-24.	0.133E-03	0.567E-04	0.518E-06	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1752E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X: -31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.376E-02	0.608E-02	0.537E+00	0.540E+00	0.410E+00	0.339E+00	0.245E+00	0.179E+00	0.147E+00	0.977E-01
-24.	0.125E-03	0.178E-03	0.241E-02	0.289E-02	0.316E-02	0.320E-02	0.319E-02	0.308E-02	0.297E-02	0.262E-02

CONTINUE

Y	X: 30.	37.	60.	104.
0.	0.582E-01	0.310E-01	0.216E-02	0.948E-06
-24.	0.207E-02	0.141E-02	0.154E-03	0.881E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2628E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X: -31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.476E-02	0.738E-02	0.548E+00	0.553E+00	0.425E+00	0.355E+00	0.262E+00	0.197E+00	0.166E+00	0.116E+00
-24.	0.280E-03	0.379E-03	0.406E-02	0.492E-02	0.556E-02	0.572E-02	0.586E-02	0.588E-02	0.581E-02	0.551E-02

CONTINUE

Y	X: 30.	37.	60.	104.
0.	0.761E-01	0.467E-01	0.719E-02	0.485E-04
-24.	0.485E-02	0.387E-02	0.984E-03	0.888E-05

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.3504E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.519E-02	0.792E-02	0.552E+00	0.558E+00	0.431E+00	0.361E+00	0.269E+00	0.204E+00	0.173E+00	0.124E+00
-24.	0.390E-03	0.518E-03	0.500E-02	0.609E-02	0.696E-02	0.722E-02	0.749E-02	0.763E-02	0.764E-02	0.746E-02

CONTINUE

Y \ X	30.	37.	60.	104.
0.	0.840E-01	0.546E-01	0.120E-01	0.306E-03
-24.	0.690E-02	0.593E-02	0.225E-02	0.792E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.4380E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.538E-02	0.815E-02	0.553E+00	0.560E+00	0.433E+00	0.363E+00	0.271E+00	0.207E+00	0.176E+00	0.127E+00
-24.	0.455E-03	0.597E-03	0.548E-02	0.669E-02	0.769E-02	0.801E-02	0.836E-02	0.858E-02	0.865E-02	0.858E-02

CONTINUE

Y \ X	30.	37.	60.	104.
0.	0.876E-01	0.585E-01	0.153E-01	0.825E-03
-24.	0.814E-02	0.725E-02	0.341E-02	0.263E-03

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.5256E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.546E-02	0.825E-02	0.554E+00	0.560E+00	0.434E+00	0.364E+00	0.272E+00	0.208E+00	0.177E+00	0.129E+00
-24.	0.491E-03	0.640E-03	0.572E-02	0.700E-02	0.807E-02	0.841E-02	0.882E-02	0.908E-02	0.918E-02	0.918E-02

CONTINUE

Y \ X	30.	37.	60.	104.
0.	0.893E-01	0.603E-01	0.174E-01	0.147E-02
-24.	0.882E-02	0.803E-02	0.426E-02	0.535E-03

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.6132E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.550E-02	0.830E-02	0.554E+00	0.561E+00	0.434E+00	0.364E+00	0.273E+00	0.209E+00	0.178E+00	0.129E+00
-24.	0.510E-03	0.663E-03	0.584E-02	0.715E-02	0.826E-02	0.862E-02	0.905E-02	0.934E-02	0.945E-02	0.950E-02

CONTINUE

Y \ X	30.	37.	60.	104.
0.	0.900E-01	0.612E-01	0.185E-01	0.208E-02
-24.	0.919E-02	0.846E-02	0.482E-02	0.828E-03

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7008E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.552E-02	0.832E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.520E-03	0.675E-03	0.590E-02	0.723E-02	0.836E-02	0.872E-02	0.917E-02	0.947E-02	0.960E-02	0.966E-02

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.904E-01	0.617E-01	0.192E-01	0.258E-02
-24.	0.939E-02	0.869E-02	0.516E-02	0.109E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7884E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.553E-02	0.833E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.525E-03	0.681E-03	0.593E-02	0.727E-02	0.841E-02	0.878E-02	0.923E-02	0.954E-02	0.967E-02	0.975E-02

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.906E-01	0.619E-01	0.195E-01	0.294E-02
-24.	0.950E-02	0.882E-02	0.537E-02	0.129E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8760E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.554E-02	0.834E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.528E-03	0.685E-03	0.595E-02	0.729E-02	0.843E-02	0.881E-02	0.926E-02	0.958E-02	0.971E-02	0.980E-02

CONTINUE

Y \ X	30.	37.	60.	104.
0.	0.907E-01	0.620E-01	0.197E-01	0.319E-02
-24.	0.955E-02	0.889E-02	0.549E-02	0.144E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.9636E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.554E-02	0.834E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.530E-03	0.686E-03	0.596E-02	0.730E-02	0.845E-02	0.882E-02	0.928E-02	0.960E-02	0.973E-02	0.982E-02

CONTINUE

Y \ X	30.	37.	60.	104.
0.	0.907E-01	0.621E-01	0.199E-01	0.335E-02
-24.	0.958E-02	0.893E-02	0.555E-02	0.155E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1051E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	-31.	-28.	0.	5.	X 10.	12.	15.	18.	20.	24.
0.	0.554E-02	0.834E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.530E-03	0.687E-03	0.596E-02	0.730E-02	0.845E-02	0.883E-02	0.929E-02	0.961E-02	0.974E-02	0.984E-02

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.908E-01	0.621E-01	0.199E-01	0.345E-02
-24.	0.960E-02	0.894E-02	0.559E-02	0.161E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1139E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	-31.	-28.	0.	5.	X 10.	12.	15.	18.	20.	24.
0.	0.554E-02	0.834E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.531E-03	0.688E-03	0.596E-02	0.731E-02	0.846E-02	0.883E-02	0.929E-02	0.961E-02	0.975E-02	0.984E-02

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.908E-01	0.621E-01	0.199E-01	0.352E-02
-24.	0.961E-02	0.896E-02	0.561E-02	0.166E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1226E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	-31.	-28.	0.	5.	X 10.	12.	15.	18.	20.	24.
0.	0.554E-02	0.834E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.531E-03	0.688E-03	0.597E-02	0.731E-02	0.846E-02	0.884E-02	0.929E-02	0.961E-02	0.975E-02	0.985E-02

CONTINUE

Y	30.	37.	60.	104. (X)
0.	0.908E-01	0.621E-01	0.200E-01	0.356E-02
-24.	0.961E-02	0.896E-02	0.563E-02	0.168E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1314E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	-31.	-28.	0.	5.	X 10.	12.	15.	18.	20.	24.
0.	0.554E-02	0.834E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.531E-03	0.688E-03	0.597E-02	0.731E-02	0.846E-02	0.884E-02	0.929E-02	0.962E-02	0.975E-02	0.985E-02

CONTINUE

Y	30.	37.	60.	104. (X)
0.	0.908E-01	0.621E-01	0.200E-01	0.358E-02
-24.	0.961E-02	0.896E-02	0.563E-02	0.170E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1402E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	-31.	-28.	0.	5.	X 10.	12.	15.	18.	20.	24.
0.	0.554E-02	0.834E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.531E-03	0.688E-03	0.597E-02	0.731E-02	0.846E-02	0.884E-02	0.930E-02	0.962E-02	0.975E-02	0.985E-02

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.908E-01	0.621E-01	0.200E-01	0.359E-02
-24.	0.961E-02	0.897E-02	0.564E-02	0.171E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1489E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	-31.	-28.	0.	5.	X 10.	12.	15.	18.	20.	24.
0.	0.554E-02	0.834E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.531E-03	0.688E-03	0.597E-02	0.731E-02	0.846E-02	0.884E-02	0.930E-02	0.962E-02	0.975E-02	0.985E-02

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.908E-01	0.621E-01	0.200E-01	0.360E-02
-24.	0.962E-02	0.897E-02	0.564E-02	0.172E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1577E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.554E-02	0.834E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.531E-03	0.688E-03	0.597E-02	0.731E-02	0.846E-02	0.884E-02	0.930E-02	0.962E-02	0.975E-02	0.985E-02

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.908E-01	0.621E-01	0.200E-01	0.360E-02
-24.	0.962E-02	0.897E-02	0.564E-02	0.172E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1664E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.554E-02	0.834E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.531E-03	0.688E-03	0.597E-02	0.731E-02	0.846E-02	0.884E-02	0.930E-02	0.962E-02	0.975E-02	0.985E-02

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.908E-01	0.621E-01	0.200E-01	0.361E-02
-24.	0.962E-02	0.897E-02	0.564E-02	0.172E-02

STEADY STATE SOLUTION HAS BEEN OBTAINED BEFORE FINAL SIMULATING TIME

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1752E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

					X					
Y	175200.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.554E-02	0.834E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.531E-03	0.688E-03	0.597E-02	0.731E-02	0.846E-02	0.884E-02	0.930E-02	0.962E-02	0.975E-02	0.985E-02

CONTINUE

					X
Y	30.	37.	60.	104.	
0.	0.908E-01	0.621E-01	0.200E-01	0.361E-02	
-24.	0.962E-02	0.897E-02	0.564E-02	0.172E-02	

TABLE A-5. AT123D FATE AND TRANSPORT MODEL INPUT AND OUTPUT VALUES FOR NAPHTHALENE AT THE FORMER UST 117, BUILDING 7002 SITE

NO. OF POINTS IN X-DIRECTION 14
NO. OF POINTS IN Y-DIRECTION 2
NO. OF POINTS IN Z-DIRECTION 1
NO. OF ROOTS: NO. OF SERIES TERMS 400
NO. OF BEGINNING TIME STEP 13
NO. OF ENDING TIME STEP 241
NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION 12
INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE 1
SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE 0
INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT 1
CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD 2

AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS) ... 0.1524E+02
AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS) ... 0.0000E+00
BEGIN POINT OF X-SOURCE LOCATION (METERS) ..... -0.9100E+01
END POINT OF X-SOURCE LOCATION (METERS) ..... 0.9100E+01
BEGIN POINT OF Y-SOURCE LOCATION (METERS) ..... -0.6100E+01
END POINT OF Y-SOURCE LOCATION (METERS) ..... 0.6100E+01
BEGIN POINT OF Z-SOURCE LOCATION (METERS) ..... 0.0000E+00
END POINT OF Z-SOURCE LOCATION (METERS) ..... 0.0000E+00

POROSITY ..... 0.1800E+00
HYDRAULIC CONDUCTIVITY (METER/HOUR) 0.9000E-01
HYDRAULIC GRADIENT 0.8900E-02
LONGITUDINAL DISPERSIVITY (METER) ..... 0.1000E+02
LATERAL DISPERSIVITY (METER) ..... 0.3000E+01
VERTICAL DISPERSIVITY (METER) ..... 0.1000E+01
DISTRIBUTION COEFFICIENT, KD (M**3/KG) 0.1190E-02
HEAT EXCHANGE COEFFICIENT (KCAL/HR-M**2-DEGREE C).. 0.0000E+00

MOLECULAR DIFFUSION MULTIPLY BY POROSITY (M**2/HR) 0.2700E-05
DECAY CONSTANT (PER HOUR) 0.1110E-03
BULK DENSITY OF THE SOIL (KG/M**3) ..... 0.1350E+04
ACCURACY TOLERANCE FOR REACHING STEADY STATE 0.1000E-02
DENSITY OF WATER (KG/M**3) ..... 0.1000E+04
TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (HR) .. 0.7300E+03
DISCHARGE TIME (HR) ..... 0.8760E+06
WASTE RELEASE RATE (KCAL/HR), (KG/HR), OR (CI/HR) . 0.7677E-04

RETARDATION FACTOR ..... 0.9925E+01
RETARDED DARCY VELOCITY (M/HR) 0.4484E-03
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/HR) .. 0.4485E-02
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/HR) . 0.1347E-02
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/HR). 0.4499E-03

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.0000E+00 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-24.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-24.	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8760E+04 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.891E-04	0.257E-03	0.480E+00	0.458E+00	0.261E+00	0.166E+00	0.784E-01	0.372E-01	0.223E-01	0.660E-02
-24.	0.410E-08	0.102E-07	0.183E-05	0.192E-05	0.158E-05	0.137E-05	0.102E-05	0.690E-06	0.504E-06	0.215E-06

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.114E-02	0.102E-03	0.119E-09	0.000E+00
-24.	0.528E-07	0.629E-08	0.172E-13	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1752E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.443E-03	0.935E-03	0.520E+00	0.502E+00	0.302E+00	0.203E+00	0.110E+00	0.616E-01	0.422E-01	0.183E-01
-24.	0.859E-06	0.154E-05	0.631E-04	0.710E-04	0.681E-04	0.640E-04	0.558E-04	0.459E-04	0.391E-04	0.252E-04

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.602E-02	0.146E-02	0.225E-05	0.000E+00
-24.	0.122E-04	0.407E-05	0.110E-07	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2628E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.643E-03	0.125E-02	0.527E+00	0.510E+00	0.310E+00	0.212E+00	0.117E+00	0.685E-01	0.485E-01	0.231E-01
-24.	0.408E-05	0.653E-05	0.163E-03	0.188E-03	0.191E-03	0.186E-03	0.171E-03	0.151E-03	0.136E-03	0.101E-03

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.908E-02	0.295E-02	0.280E-04	0.662E-11
-24.	0.618E-04	0.292E-04	0.540E-06	0.206E-12

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.3504E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.716E-03	0.136E-02	0.528E+00	0.511E+00	0.312E+00	0.213E+00	0.119E+00	0.703E-01	0.503E-01	0.247E-01
-24.	0.739E-05	0.113E-04	0.226E-03	0.264E-03	0.275E-03	0.271E-03	0.257E-03	0.234E-03	0.216E-03	0.172E-03

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.103E-01	0.371E-02	0.782E-04	0.327E-08
-24.	0.116E-03	0.646E-04	0.300E-05	0.187E-09

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.4380E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.740E-03	0.139E-02	0.528E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.708E-01	0.508E-01	0.251E-01
-24.	0.940E-05	0.140E-04	0.255E-03	0.299E-03	0.315E-03	0.312E-03	0.299E-03	0.277E-03	0.258E-03	0.212E-03

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.107E-01	0.402E-02	0.123E-03	0.327E-07
-24.	0.151E-03	0.907E-04	0.691E-05	0.296E-08

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.5256E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.747E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.509E-01	0.253E-01
-24.	0.104E-04	0.153E-04	0.266E-03	0.313E-03	0.331E-03	0.329E-03	0.317E-03	0.295E-03	0.277E-03	0.230E-03

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.108E-01	0.413E-02	0.150E-03	0.120E-06
-24.	0.168E-03	0.105E-03	0.105E-04	0.148E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.6132E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.749E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.107E-04	0.158E-04	0.270E-03	0.318E-03	0.337E-03	0.335E-03	0.323E-03	0.302E-03	0.284E-03	0.237E-03

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.109E-01	0.417E-02	0.164E-03	0.257E-06
-24.	0.175E-03	0.111E-03	0.128E-04	0.390E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7008E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.750E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.109E-04	0.160E-04	0.271E-03	0.319E-03	0.339E-03	0.337E-03	0.326E-03	0.305E-03	0.286E-03	0.240E-03

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.109E-01	0.418E-02	0.170E-03	0.399E-06
-24.	0.178E-03	0.114E-03	0.141E-04	0.700E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7884E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.750E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.110E-04	0.161E-04	0.272E-03	0.320E-03	0.339E-03	0.338E-03	0.326E-03	0.305E-03	0.287E-03	0.241E-03

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.109E-01	0.419E-02	0.172E-03	0.512E-06
-24.	0.179E-03	0.115E-03	0.147E-04	0.990E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8760E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.750E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.110E-04	0.161E-04	0.272E-03	0.320E-03	0.340E-03	0.338E-03	0.327E-03	0.306E-03	0.288E-03	0.241E-03

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.109E-01	0.419E-02	0.173E-03	0.586E-06
-24.	0.179E-03	0.116E-03	0.150E-04	0.121E-06

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.9636E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01.* DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.750E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.110E-04	0.161E-04	0.272E-03	0.320E-03	0.340E-03	0.338E-03	0.327E-03	0.306E-03	0.288E-03	0.241E-03

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.109E-01	0.419E-02	0.174E-03	0.629E-06
-24.	0.179E-03	0.116E-03	0.151E-04	0.135E-06

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1051E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

			X							
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.750E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.110E-04	0.161E-04	0.272E-03	0.320E-03	0.340E-03	0.338E-03	0.327E-03	0.306E-03	0.288E-03	0.241E-03

CONTINUE

			X	
Y	30.	37.	60.	104.
0.	0.109E-01	0.419E-02	0.174E-03	0.651E-06
-24.	0.179E-03	0.116E-03	0.152E-04	0.143E-06

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1139E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

			X							
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.750E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.110E-04	0.161E-04	0.272E-03	0.320E-03	0.340E-03	0.338E-03	0.327E-03	0.306E-03	0.288E-03	0.241E-03

CONTINUE

			X	
Y	30.	37.	60.	104.
0.	0.109E-01	0.419E-02	0.174E-03	0.662E-06
-24.	0.179E-03	0.116E-03	0.152E-04	0.147E-06

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1226E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

			X							
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.750E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.110E-04	0.161E-04	0.272E-03	0.320E-03	0.340E-03	0.338E-03	0.327E-03	0.306E-03	0.288E-03	0.241E-03

CONTINUE

			X	
Y	30.	37.	60.	104.
0.	0.109E-01	0.419E-02	0.174E-03	0.667E-06
-24.	0.179E-03	0.116E-03	0.152E-04	0.149E-06

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1314E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.750E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.110E-04	0.161E-04	0.272E-03	0.320E-03	0.340E-03	0.338E-03	0.327E-03	0.306E-03	0.288E-03	0.241E-03

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.109E-01	0.419E-02	0.174E-03	0.669E-06
-24.	0.179E-03	0.116E-03	0.152E-04	0.150E-06

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1402E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.750E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.110E-04	0.161E-04	0.272E-03	0.320E-03	0.340E-03	0.338E-03	0.327E-03	0.306E-03	0.288E-03	0.241E-03

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.109E-01	0.419E-02	0.174E-03	0.670E-06
-24.	0.179E-03	0.116E-03	0.152E-04	0.151E-06

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1489E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.750E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.110E-04	0.161E-04	0.272E-03	0.320E-03	0.340E-03	0.338E-03	0.327E-03	0.306E-03	0.288E-03	0.241E-03

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.109E-01	0.419E-02	0.174E-03	0.670E-06
-24.	0.179E-03	0.116E-03	0.152E-04	0.151E-06

STEADY STATE SOLUTION HAS BEEN OBTAINED BEFORE FINAL SIMULATING TIME.

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1577E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.750E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.110E-04	0.161E-04	0.272E-03	0.320E-03	0.340E-03	0.338E-03	0.327E-03	0.306E-03	0.288E-03	0.241E-03

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.109E-01	0.419E-02	0.174E-03	0.670E-06
-24.	0.179E-03	0.116E-03	0.152E-04	0.151E-06

Table A-6. AT123D Fate and Transport Model Input and Output Values for Benzene (Concentration vs. Time) at the Former UST 117, Building 7002 Site

NO. OF POINTS IN X-DIRECTION 2
NO. OF POINTS IN Y-DIRECTION 1
NO. OF POINTS IN Z-DIRECTION 1
NO. OF ROOTS: NO. OF SERIES TERMS 400
NO. OF BEGINNING TIME STEP 61
NO. OF ENDING TIME STEP 175
NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION 6
INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE 1
SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE 0
INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT 1
CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD 2

AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS) ... 0.1524E+02
AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS) ... 0.0000E+00
BEGIN POINT OF X-SOURCE LOCATION (METERS) ..... -0.9100E+01
END POINT OF X-SOURCE LOCATION (METERS) ..... 0.9100E+01
BEGIN POINT OF Y-SOURCE LOCATION (METERS) ..... -0.6100E+01
END POINT OF Y-SOURCE LOCATION (METERS) ..... 0.6100E+01
BEGIN POINT OF Z-SOURCE LOCATION (METERS) ..... 0.0000E+00
END POINT OF Z-SOURCE LOCATION (METERS) ..... 0.0000E+00

POROSITY ..... 0.1800E+00
HYDRAULIC CONDUCTIVITY (METER/HOUR) 0.9000E-01
HYDRAULIC GRADIENT 0.3500E-02
LONGITUDINAL DISPERSIVITY (METER) ..... 0.1000E+02
LATERAL DISPERSIVITY (METER) ..... 0.3000E+01
VERTICAL DISPERSIVITY (METER) ..... 0.1000E+01
DISTRIBUTION COEFFICIENT, KD (M**3/KG) 0.7900E-04
HEAT EXCHANGE COEFFICIENT (KCAL/HR-M**2-DEGREE C).. 0.0000E+00

MOLECULAR DIFFUSION MULTIPLY BY POROSITY (M**2/HR) 0.3530E-05
DECAY CONSTANT (PER HOUR) 0.4000E-04
BULK DENSITY OF THE SOIL (KG/M**3) ..... 0.1320E+04
ACCURACY TOLERANCE FOR REACHING STEADY STATE 0.1000E-02
DENSITY OF WATER (KG/M**3) ..... 0.1000E+04
TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (HR) .. 0.7300E+03
DISCHARGE TIME (HR) ..... 0.4380E+05
WASTE RELEASE RATE (KCAL/HR), (KG/HR), OR (CI/HR) . 0.2210E-04

RETARDATION FACTOR ..... 0.1579E+01
RETARDED DARCY VELOCITY (M/HR) 0.1108E-02
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/HR) .. 0.1109E-01
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/HR) . 0.3337E-02
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/HR). 0.1120E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.0000E+00 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

	Z = 0.00	
		X
Y	0.	46.
0.	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.4380E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

	Z = 0.00	
		X
Y	0.	46.
0.	0.553E+00	0.345E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.4818E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

	Z = 0.00	
		X
Y	0.	46.
0.	0.289E+00	0.468E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.5256E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

	Z = 0.00	
		X
Y	0.	46.
0.	0.176E+00	0.672E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.5694E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

	Z = 0.00	
		X
Y	0.	46.
0.	0.114E+00	0.840E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.6132E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	0.	X
0.	0.759E-01	46. 0.891E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.6570E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	0.	X
0.	0.516E-01	46. 0.843E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7008E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	0.	X
0.	0.356E-01	46. 0.742E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7446E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	0.	X
0.	0.248E-01	46. 0.623E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7884E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	0.	X
0.	0.174E-01	46. 0.506E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8322E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

		X
Y	0.	46.
0.	0.123E-01	0.402E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8760E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

		X
Y	0.	46.
0.	0.875E-02	0.315E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.9198E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

		X
Y	0.	46.
0.	0.624E-02	0.243E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.9636E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

		X
Y	0.	46.
0.	0.446E-02	0.187E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1007E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

		X
Y	0.	46.
0.	0.320E-02	0.142E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1051E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

	Z = 0.00	
		X
Y	0.	46.
0.	0.230E-02	0.108E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1095E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

	Z = 0.00	
		X
Y	0.	46.
0.	0.166E-02	0.811E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1139E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

	Z = 0.00	
		X
Y	0.	46.
0.	0.120E-02	0.609E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1183E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

	Z = 0.00	
		X
Y	0.	46.
0.	0.864E-03	0.456E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1226E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

	Z = 0.00	
		X
Y	0.	46.
0.	0.626E-03	0.341E-02

STEADY STATE SOLUTION HAS NOT BEEN REACHED BEFORE FINAL SIMULATING TIME.

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1270E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

	Z = 0.00	
		X
Y	0.	46.
0.	0.454E-03	0.255E-02

TABLE A-7. GEOTECHNICAL PARAMETERS FOR THE FORMER UST 117, BUILDING 7002 SITE

Building ID	Tank ID	Facility ID	Sample ID	Sample Depth	Classification	Moisture Content (%)	Total Organic Carbon (%)	Specific Gravity	Porosity, n	Permeability (cm/s)
7002	117	9-025113*1	BFGT11	2.0 to 4.0	CH	28.9	0.1	2.65	0.49	1.42E-08

NOTE: CH = Sandy, fat clay.
UST = Underground storage tank.

ARCADIS

Appendix I

Site Ranking Form

Table A-1. CAP–Part A Natural Attenuation Modeling Results (Benzene Concentration vs. Distance) for the Former UST 117 Site

Distance to Receptor (ft)	Distance to Receptor (m)	Predicted Maximum Benzene Concentration in Groundwater (µg/L)
0.0	0.0	553
32.8	10.0	435
39.4	12.0	365
49.2	15.0	273
59.1	18.0	209
65.6	20.0	178
78.7	24.0	130
98.4	30.0	90.8
120.1	36.6	62.1
131.2	40.0	51.8
164.0	50.0	31.4
196.9	60.0	20
229.7	70.0	13.1
262.5	80.0	8.74
295.3	90.0	5.95
341.2	104.0	3.6
393.7	120.0	2
492.1	150.0	0.8
656.2	200.0	0.2

Table A-2. CAP–Part B Natural Attenuation Modeling Results (Naphthalene Concentration vs. Distance) for the Former UST 117 Site

Distance to Receptor (ft)	Distance to Receptor (m)	Predicted Maximum Naphthalene Concentration in Groundwater (µg/L)
0.0	0.0	529
6.6	2.0	536
9.8	3.0	533
13.1	4.0	526
16.4	5.0	512
23.0	7.0	458
29.5	9.0	366
32.8	10.0	312
39.4	12.0	214
49.2	15.0	120
59.1	18.0	71
65.6	20.0	51
78.7	24.0	25.3
98.4	30.0	10.9
120.1	36.6	4.19
196.9	60.0	0.174
341.2	104.0	6.70 E-04
393.7	120.0	0
492.1	150.0	0
656.2	200.0	0

Table A-3. CAP–Part B Natural Attenuation Modeling Results (Benzene Concentration vs. Time) for the Former UST 117 Site

Time (year)	Predicted Maximum Benzene Concentration in Groundwater (µg/L)	
	MW-22	MW-32
0.0 (12/00)	174.0	109.0
0.5 (06/01)	114.0	89.1
1.0 (12/01)	75.9	84.3
1.5 (06/02)	51.6	74.2
2.0 (12/02)	31.6	62.3

Note: Time 0.0 is equal to December 2000, which was the last groundwater sampling event conducted at the site. Monitoring wells MW-22 and MW-32 will be sampled semiannually for 1 year as part of the monitoring only program to validate the fate and transport modeling results. As predicted by the model, benzene concentrations in both wells should be below the In-stream Water Quality Standard (IWQS) of 71.28 µg/L by the end of year 2 (i.e., December 2002).

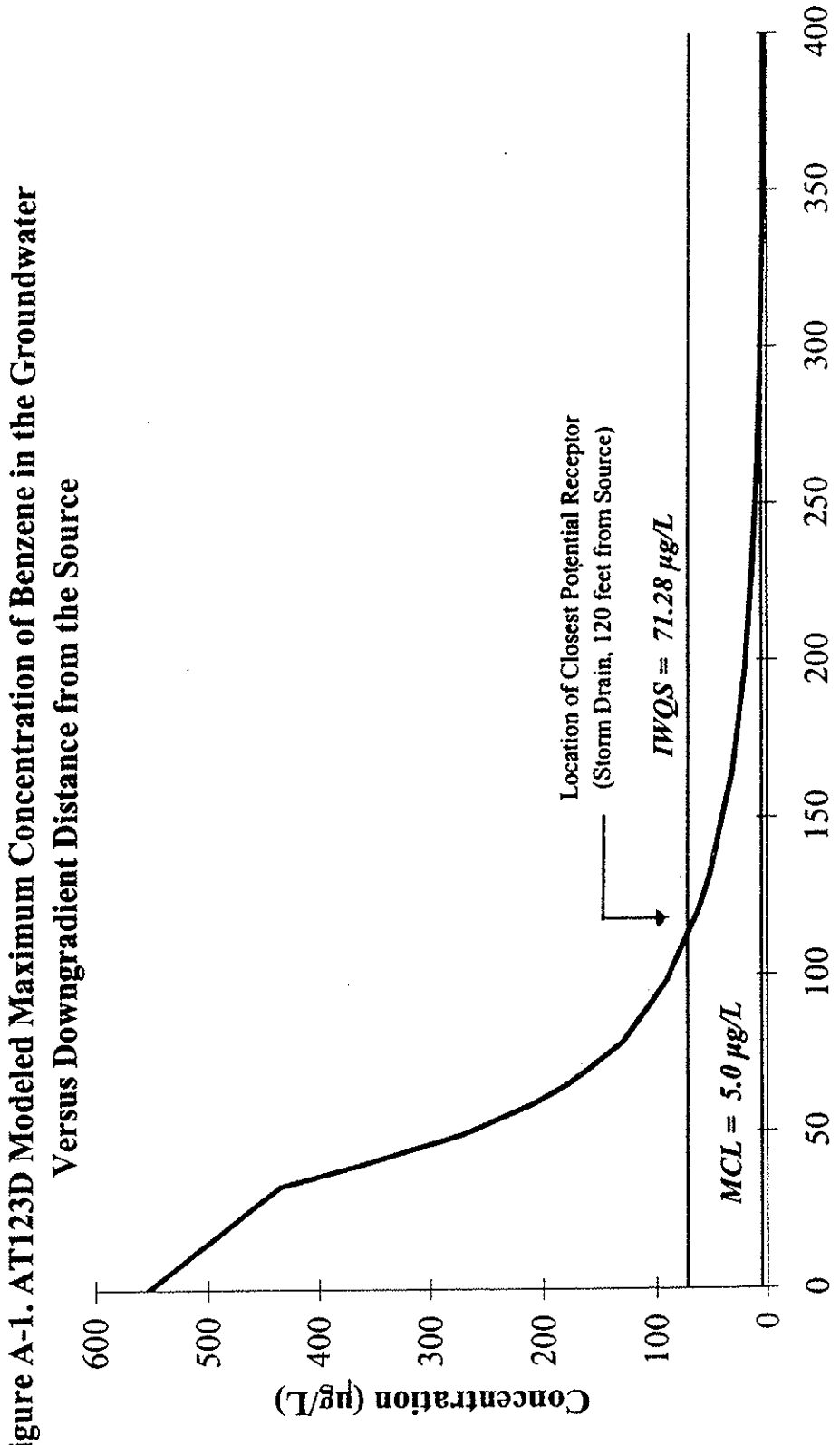


Figure A-1. AT123D Modeled Maximum Concentration of Benzene in the Groundwater Versus Downgradient Distance from the Source

Figure A-2. AT123D Modeled Maximum Concentration of Naphthalene in the Groundwater Versus Downgradient Distance from the Source

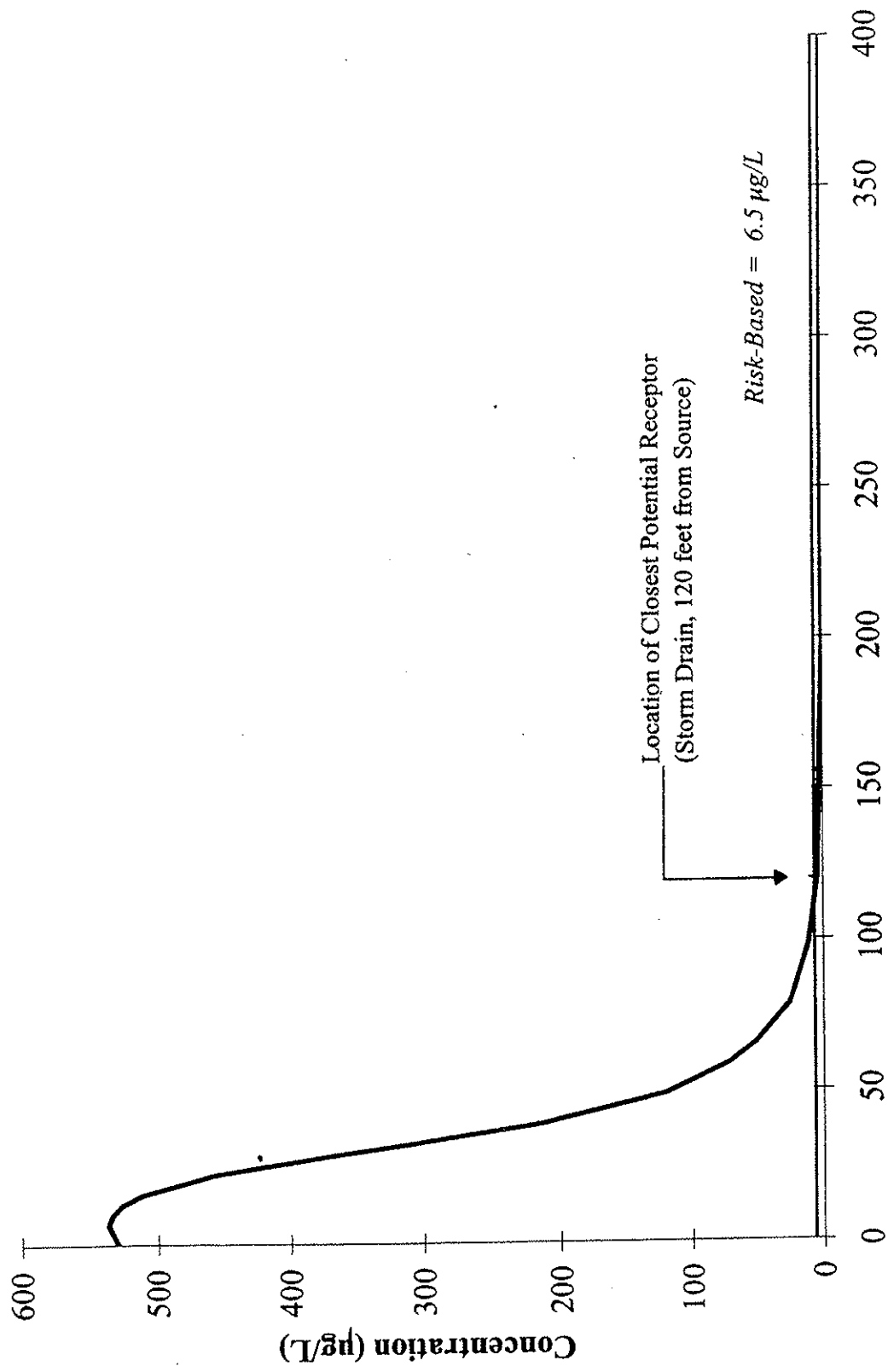
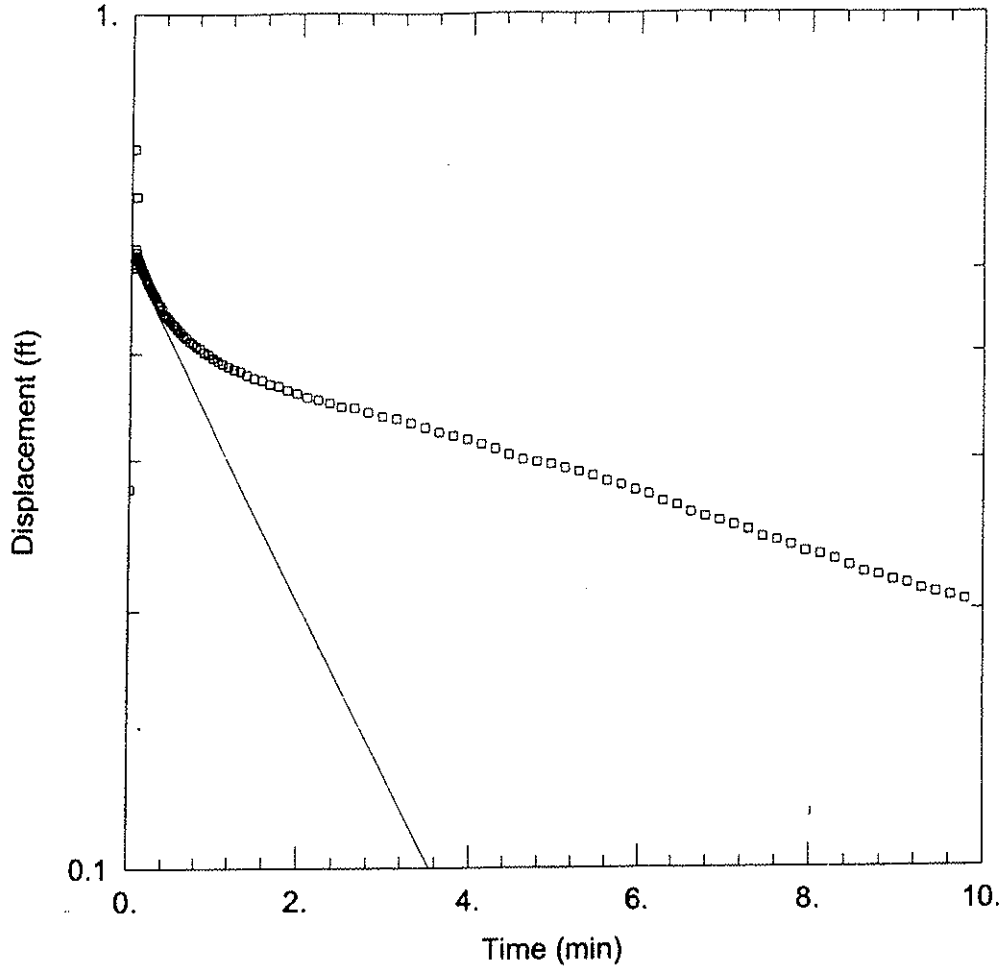


Figure A-2. AT123D Modeled Maximum Concentration of Naphthalene in the Groundwater Versus Downgradient Distance from the Source



WELL TEST ANALYSIS

Data Set: C:\WINDOWS\DESKTOP\BF-MW-E4.AQT
Date: 01/22/01 Time: 10:09:30

PROJECT INFORMATION

Company: SAIC
Client: USACE-Savannah
Test Location: Hunter Army Airfield
Test Date: 12-04-00

AQUIFER DATA

Saturated Thickness: 10.72 ft
Anisotropy Ratio (Kz/Kr): 1.

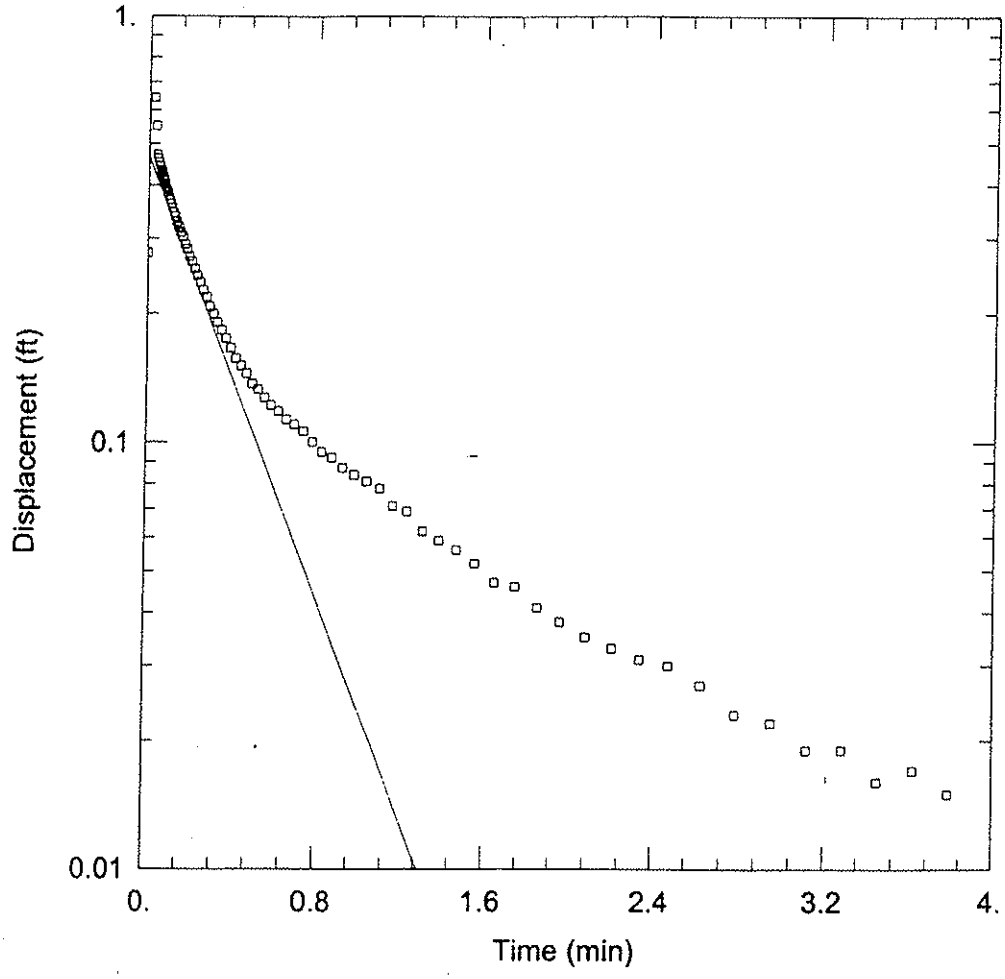
WELL DATA

Initial Displacement: 0.278 ft
Casing Radius: 0.008 ft
Screen Length: 10. ft
Water Column Height: 10.72 ft
Wellbore Radius: 0.33 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.001994 ft/min
y0 = 0.5165 ft

Figure A-3. Slug Test Analysis for MW-E4 at the Former UST 117, Building 7002 Site



WELL TEST ANALYSIS

Data Set: C:\WINDOWS\DESKTOP\BF-MW-E5.AQT
Date: 01/22/01 Time: 10:10:44

PROJECT INFORMATION

Company: SAIC
Client: USACE-Savannah
Test Location: Hunter Army Airfield
Test Date: 12-04-00

AQUIFER DATA

Saturated Thickness: 10.7 ft Anisotropy Ratio (Kz/Kr): 1.

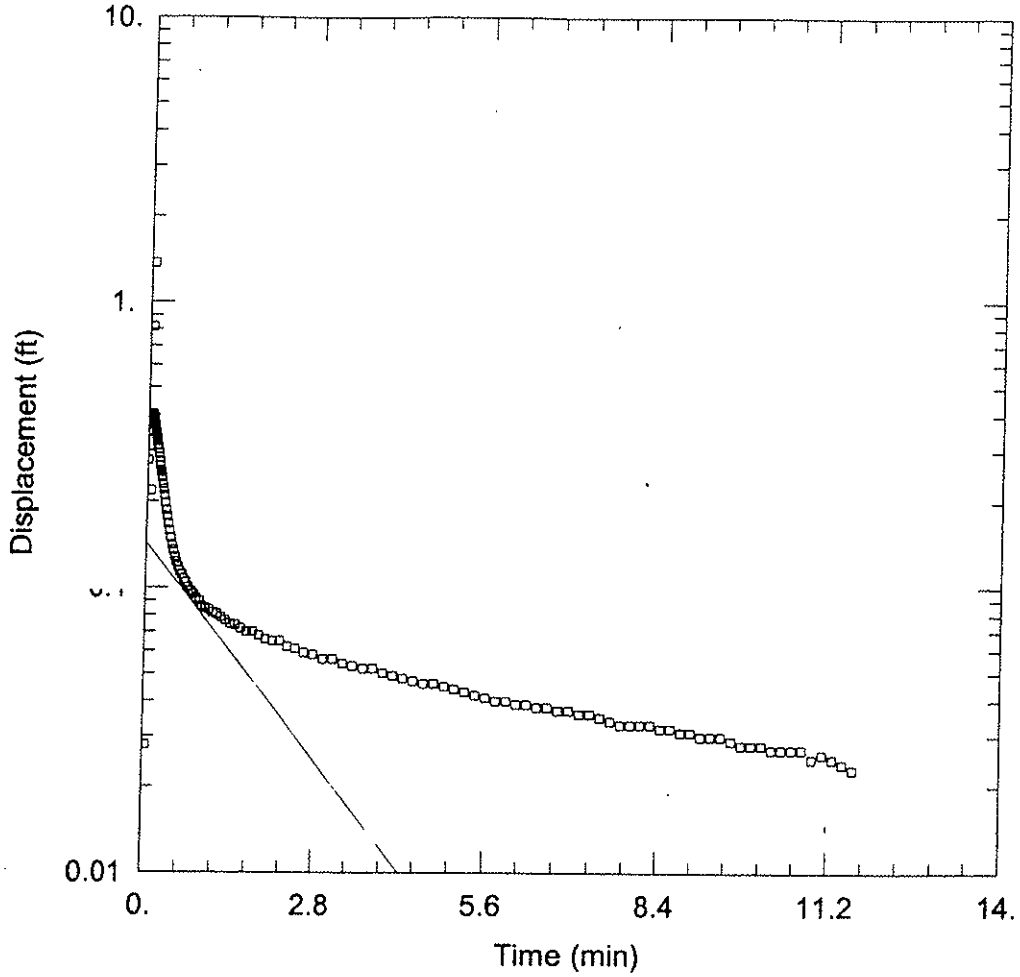
WELL DATA

Initial Displacement: 0.278 ft Water Column Height: 10.7 ft
Casing Radius: 0.008 ft Wellbore Radius: 0.33 ft
Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 0.01269 ft/min
Solution Method: Bouwer-Rice y0 = 0.4673 ft

Figure A-4. Slug Test Analysis for MW-E5 at the Former UST 117, Building 7002 Site



WELL TEST ANALYSIS

Data Set: C:\WINDOWS\DESKTOP\BF-MW-E6.AQT
Date: 01/22/01 Time: 10:10:07

PROJECT INFORMATION

Company: SAIC
Client: USACE-Savannah
Test Location: Hunter Army Airfield
Test Date: 12-04-00

AQUIFER DATA

Saturated Thickness: 9.76 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 0.278 ft
Casing Radius: 0.008 ft
Screen Length: 10. ft
Water Column Height: 9.76 ft
Wellbore Radius: 0.33 ft
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.002624 ft/min
y0 = 0.1433 ft

Figure A-5. Slug Test Analysis for MW-E6 at the Former UST 117, Building 7002 Site

TABLE A-4. AT123D FATE AND TRANSPORT MODEL INPUT AND OUTPUT VALUES FOR BENZENE AT THE FORMER UST 117, BUILDING 7002 SITE

NO. OF POINTS IN X-DIRECTION	14
NO. OF POINTS IN Y-DIRECTION	2
NO. OF POINTS IN Z-DIRECTION	1
NO. OF ROOTS: NO. OF SERIES TERMS	400
NO. OF BEGINNING TIME STEP	13
NO. OF ENDING TIME STEP	241
NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION	12
INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE	1
SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE	0
INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT	1
CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD	2
AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS)	0.1524E+02
AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS)	0.0000E+00
BEGIN POINT OF X-SOURCE LOCATION (METERS)	-0.9100E+01
END POINT OF X-SOURCE LOCATION (METERS)	0.9100E+01
BEGIN POINT OF Y-SOURCE LOCATION (METERS)	-0.6100E+01
END POINT OF Y-SOURCE LOCATION (METERS)	0.6100E+01
BEGIN POINT OF Z-SOURCE LOCATION (METERS)	0.0000E+00
END POINT OF Z-SOURCE LOCATION (METERS)	0.0000E+00
POROSITY	0.1800E+00
HYDRAULIC CONDUCTIVITY (METER/HOUR)	0.9000E-01
HYDRAULIC GRADIENT	0.3500E-02
LONGITUDINAL DISPERSIVITY (METER)	0.1000E+02
LATERAL DISPERSIVITY (METER)	0.3000E+01
VERTICAL DISPERSIVITY (METER)	0.1000E+01
DISTRIBUTION COEFFICIENT, KD (M**3/KG)	0.7900E-04
HEAT EXCHANGE COEFFICIENT (KCAL/HR-M**2-DEGREE C)	0.0000E+00
MOLECULAR DIFFUSION MULTIPLY BY POROSITY (M**2/HR)	0.3530E-05
DECAY CONSTANT (PER HOUR)	0.4000E-04
BULK DENSITY OF THE SOIL (KG/M**3)	0.1320E+04
ACCURACY TOLERANCE FOR REACHING STEADY STATE	0.1000E-02
DENSITY OF WATER (KG/M**3)	0.1000E+04
TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (HR)	0.7300E+03
DISCHARGE TIME (HR)	0.8760E+06
WASTE RELEASE RATE (KCAL/HR), (KG/HR), OR (CI/HR)	0.2210E-04
RETARDATION FACTOR	0.1579E+01
RETARDED DARCY VELOCITY (M/HR)	0.1108E-02
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/HR)	0.1109E-01
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/HR)	0.3337E-02
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/HR)	0.1120E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.0000E+00 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-24.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-24.	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8760E+04 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.159E-02	0.296E-02	0.494E+00	0.489E+00	0.354E+00	0.282E+00	0.188E+00	0.124E+00	0.947E-01	0.516E-01
-24.	0.902E-05	0.149E-04	0.415E-03	0.477E-03	0.479E-03	0.462E-03	0.422E-03	0.367E-03	0.326E-03	0.234E-03

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.225E-01	0.758E-02	0.451E-04	0.000E+00
-24.	0.133E-03	0.567E-04	0.518E-06	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1752E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X: -31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.376E-02	0.608E-02	0.537E+00	0.540E+00	0.410E+00	0.339E+00	0.245E+00	0.179E+00	0.147E+00	0.977E-01
-24.	0.125E-03	0.178E-03	0.241E-02	0.289E-02	0.316E-02	0.320E-02	0.319E-02	0.308E-02	0.297E-02	0.262E-02

CONTINUE

Y	X: 30.	37.	60.	104.
0.	0.582E-01	0.310E-01	0.216E-02	0.948E-06
-24.	0.207E-02	0.141E-02	0.154E-03	0.881E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2628E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X: -31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.476E-02	0.738E-02	0.548E+00	0.553E+00	0.425E+00	0.355E+00	0.262E+00	0.197E+00	0.166E+00	0.116E+00
-24.	0.280E-03	0.379E-03	0.406E-02	0.492E-02	0.556E-02	0.572E-02	0.586E-02	0.588E-02	0.581E-02	0.551E-02

CONTINUE

Y	X: 30.	37.	60.	104.
0.	0.761E-01	0.467E-01	0.719E-02	0.485E-04
-24.	0.485E-02	0.387E-02	0.984E-03	0.888E-05

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.3504E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.519E-02	0.792E-02	0.552E+00	0.558E+00	0.431E+00	0.361E+00	0.269E+00	0.204E+00	0.173E+00	0.124E+00
-24.	0.390E-03	0.518E-03	0.500E-02	0.609E-02	0.696E-02	0.722E-02	0.749E-02	0.763E-02	0.764E-02	0.746E-02

CONTINUE

Y \ X	30.	37.	60.	104.
0.	0.840E-01	0.546E-01	0.120E-01	0.306E-03
-24.	0.690E-02	0.593E-02	0.225E-02	0.792E-04

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.4380E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.538E-02	0.815E-02	0.553E+00	0.560E+00	0.433E+00	0.363E+00	0.271E+00	0.207E+00	0.176E+00	0.127E+00
-24.	0.455E-03	0.597E-03	0.548E-02	0.669E-02	0.769E-02	0.801E-02	0.836E-02	0.858E-02	0.865E-02	0.858E-02

CONTINUE

Y \ X	30.	37.	60.	104.
0.	0.876E-01	0.585E-01	0.153E-01	0.825E-03
-24.	0.814E-02	0.725E-02	0.341E-02	0.263E-03

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.5256E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.546E-02	0.825E-02	0.554E+00	0.560E+00	0.434E+00	0.364E+00	0.272E+00	0.208E+00	0.177E+00	0.129E+00
-24.	0.491E-03	0.640E-03	0.572E-02	0.700E-02	0.807E-02	0.841E-02	0.882E-02	0.908E-02	0.918E-02	0.918E-02

CONTINUE

Y \ X	30.	37.	60.	104.
0.	0.893E-01	0.603E-01	0.174E-01	0.147E-02
-24.	0.882E-02	0.803E-02	0.426E-02	0.535E-03

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.6132E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.550E-02	0.830E-02	0.554E+00	0.561E+00	0.434E+00	0.364E+00	0.273E+00	0.209E+00	0.178E+00	0.129E+00
-24.	0.510E-03	0.663E-03	0.584E-02	0.715E-02	0.826E-02	0.862E-02	0.905E-02	0.934E-02	0.945E-02	0.950E-02

CONTINUE

Y \ X	30.	37.	60.	104.
0.	0.900E-01	0.612E-01	0.185E-01	0.208E-02
-24.	0.919E-02	0.846E-02	0.482E-02	0.828E-03

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7008E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.552E-02	0.832E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.520E-03	0.675E-03	0.590E-02	0.723E-02	0.836E-02	0.872E-02	0.917E-02	0.947E-02	0.960E-02	0.966E-02

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.904E-01	0.617E-01	0.192E-01	0.258E-02
-24.	0.939E-02	0.869E-02	0.516E-02	0.109E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7884E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.553E-02	0.833E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.525E-03	0.681E-03	0.593E-02	0.727E-02	0.841E-02	0.878E-02	0.923E-02	0.954E-02	0.967E-02	0.975E-02

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.906E-01	0.619E-01	0.195E-01	0.294E-02
-24.	0.950E-02	0.882E-02	0.537E-02	0.129E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8760E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.554E-02	0.834E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.528E-03	0.685E-03	0.595E-02	0.729E-02	0.843E-02	0.881E-02	0.926E-02	0.958E-02	0.971E-02	0.980E-02

CONTINUE

Y \ X	30.	37.	60.	104.
0.	0.907E-01	0.620E-01	0.197E-01	0.319E-02
-24.	0.955E-02	0.889E-02	0.549E-02	0.144E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.9636E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y \ X	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.554E-02	0.834E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.530E-03	0.686E-03	0.596E-02	0.730E-02	0.845E-02	0.882E-02	0.928E-02	0.960E-02	0.973E-02	0.982E-02

CONTINUE

Y \ X	30.	37.	60.	104.
0.	0.907E-01	0.621E-01	0.199E-01	0.335E-02
-24.	0.958E-02	0.893E-02	0.555E-02	0.155E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1051E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	-31.	-28.	0.	5.	X 10.	12.	15.	18.	20.	24.
0.	0.554E-02	0.834E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.530E-03	0.687E-03	0.596E-02	0.730E-02	0.845E-02	0.883E-02	0.929E-02	0.961E-02	0.974E-02	0.984E-02

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.908E-01	0.621E-01	0.199E-01	0.345E-02
-24.	0.960E-02	0.894E-02	0.559E-02	0.161E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1139E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	-31.	-28.	0.	5.	X 10.	12.	15.	18.	20.	24.
0.	0.554E-02	0.834E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.531E-03	0.688E-03	0.596E-02	0.731E-02	0.846E-02	0.883E-02	0.929E-02	0.961E-02	0.975E-02	0.984E-02

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.908E-01	0.621E-01	0.199E-01	0.352E-02
-24.	0.961E-02	0.896E-02	0.561E-02	0.166E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1226E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	-31.	-28.	0.	5.	X 10.	12.	15.	18.	20.	24.
0.	0.554E-02	0.834E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.531E-03	0.688E-03	0.597E-02	0.731E-02	0.846E-02	0.884E-02	0.929E-02	0.961E-02	0.975E-02	0.985E-02

CONTINUE

Y	30.	37.	60.	104. (X)
0.	0.908E-01	0.621E-01	0.200E-01	0.356E-02
-24.	0.961E-02	0.896E-02	0.563E-02	0.168E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1314E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	-31.	-28.	0.	5.	X 10.	12.	15.	18.	20.	24.
0.	0.554E-02	0.834E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.531E-03	0.688E-03	0.597E-02	0.731E-02	0.846E-02	0.884E-02	0.929E-02	0.962E-02	0.975E-02	0.985E-02

CONTINUE

Y	30.	37.	60.	104. (X)
0.	0.908E-01	0.621E-01	0.200E-01	0.358E-02
-24.	0.961E-02	0.896E-02	0.563E-02	0.170E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1402E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	-31.	-28.	0.	5.	X 10.	12.	15.	18.	20.	24.
0.	0.554E-02	0.834E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.531E-03	0.688E-03	0.597E-02	0.731E-02	0.846E-02	0.884E-02	0.930E-02	0.962E-02	0.975E-02	0.985E-02

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.908E-01	0.621E-01	0.200E-01	0.359E-02
-24.	0.961E-02	0.897E-02	0.564E-02	0.171E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1489E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	-31.	-28.	0.	5.	X 10.	12.	15.	18.	20.	24.
0.	0.554E-02	0.834E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.531E-03	0.688E-03	0.597E-02	0.731E-02	0.846E-02	0.884E-02	0.930E-02	0.962E-02	0.975E-02	0.985E-02

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.908E-01	0.621E-01	0.200E-01	0.360E-02
-24.	0.962E-02	0.897E-02	0.564E-02	0.172E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1577E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.554E-02	0.834E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.531E-03	0.688E-03	0.597E-02	0.731E-02	0.846E-02	0.884E-02	0.930E-02	0.962E-02	0.975E-02	0.985E-02

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.908E-01	0.621E-01	0.200E-01	0.360E-02
-24.	0.962E-02	0.897E-02	0.564E-02	0.172E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1664E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.554E-02	0.834E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.531E-03	0.688E-03	0.597E-02	0.731E-02	0.846E-02	0.884E-02	0.930E-02	0.962E-02	0.975E-02	0.985E-02

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.908E-01	0.621E-01	0.200E-01	0.361E-02
-24.	0.962E-02	0.897E-02	0.564E-02	0.172E-02

STEADY STATE SOLUTION HAS BEEN OBTAINED BEFORE FINAL SIMULATING TIME

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1752E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

					X					
Y	175200.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.554E-02	0.834E-02	0.554E+00	0.561E+00	0.435E+00	0.365E+00	0.273E+00	0.209E+00	0.178E+00	0.130E+00
-24.	0.531E-03	0.688E-03	0.597E-02	0.731E-02	0.846E-02	0.884E-02	0.930E-02	0.962E-02	0.975E-02	0.985E-02

CONTINUE

					X
Y	30.	37.	60.	104.	
0.	0.908E-01	0.621E-01	0.200E-01	0.361E-02	
-24.	0.962E-02	0.897E-02	0.564E-02	0.172E-02	

TABLE A-5. AT123D FATE AND TRANSPORT MODEL INPUT AND OUTPUT VALUES FOR NAPHTHALENE AT THE FORMER UST 117, BUILDING 7002 SITE

NO. OF POINTS IN X-DIRECTION 14
NO. OF POINTS IN Y-DIRECTION 2
NO. OF POINTS IN Z-DIRECTION 1
NO. OF ROOTS: NO. OF SERIES TERMS 400
NO. OF BEGINNING TIME STEP 13
NO. OF ENDING TIME STEP 241
NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION 12
INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE 1
SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE 0
INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT 1
CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD 2

AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS) ... 0.1524E+02
AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS) ... 0.0000E+00
BEGIN POINT OF X-SOURCE LOCATION (METERS) ..... -0.9100E+01
END POINT OF X-SOURCE LOCATION (METERS) ..... 0.9100E+01
BEGIN POINT OF Y-SOURCE LOCATION (METERS) ..... -0.6100E+01
END POINT OF Y-SOURCE LOCATION (METERS) ..... 0.6100E+01
BEGIN POINT OF Z-SOURCE LOCATION (METERS) ..... 0.0000E+00
END POINT OF Z-SOURCE LOCATION (METERS) ..... 0.0000E+00

POROSITY ..... 0.1800E+00
HYDRAULIC CONDUCTIVITY (METER/HOUR) 0.9000E-01
HYDRAULIC GRADIENT 0.8900E-02
LONGITUDINAL DISPERSIVITY (METER) ..... 0.1000E+02
LATERAL DISPERSIVITY (METER) ..... 0.3000E+01
VERTICAL DISPERSIVITY (METER) ..... 0.1000E+01
DISTRIBUTION COEFFICIENT, KD (M**3/KG) 0.1190E-02
HEAT EXCHANGE COEFFICIENT (KCAL/HR-M**2-DEGREE C).. 0.0000E+00

MOLECULAR DIFFUSION MULTIPLY BY POROSITY (M**2/HR) 0.2700E-05
DECAY CONSTANT (PER HOUR) 0.1110E-03
BULK DENSITY OF THE SOIL (KG/M**3) ..... 0.1350E+04
ACCURACY TOLERANCE FOR REACHING STEADY STATE 0.1000E-02
DENSITY OF WATER (KG/M**3) ..... 0.1000E+04
TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (HR) .. 0.7300E+03
DISCHARGE TIME (HR) ..... 0.8760E+06
WASTE RELEASE RATE (KCAL/HR), (KG/HR), OR (CI/HR) . 0.7677E-04

RETARDATION FACTOR ..... 0.9925E+01
RETARDED DARCY VELOCITY (M/HR) 0.4484E-03
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/HR) .. 0.4485E-02
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/HR) . 0.1347E-02
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/HR). 0.4499E-03

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.0000E+00 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-24.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-24.	0.000E+00	0.000E+00	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8760E+04 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.891E-04	0.257E-03	0.480E+00	0.458E+00	0.261E+00	0.166E+00	0.784E-01	0.372E-01	0.223E-01	0.660E-02
-24.	0.410E-08	0.102E-07	0.183E-05	0.192E-05	0.158E-05	0.137E-05	0.102E-05	0.690E-06	0.504E-06	0.215E-06

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.114E-02	0.102E-03	0.119E-09	0.000E+00
-24.	0.528E-07	0.629E-08	0.172E-13	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1752E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.443E-03	0.935E-03	0.520E+00	0.502E+00	0.302E+00	0.203E+00	0.110E+00	0.616E-01	0.422E-01	0.183E-01
-24.	0.859E-06	0.154E-05	0.631E-04	0.710E-04	0.681E-04	0.640E-04	0.558E-04	0.459E-04	0.391E-04	0.252E-04

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.602E-02	0.146E-02	0.225E-05	0.000E+00
-24.	0.122E-04	0.407E-05	0.110E-07	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.2628E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.643E-03	0.125E-02	0.527E+00	0.510E+00	0.310E+00	0.212E+00	0.117E+00	0.685E-01	0.485E-01	0.231E-01
-24.	0.408E-05	0.653E-05	0.163E-03	0.188E-03	0.191E-03	0.186E-03	0.171E-03	0.151E-03	0.136E-03	0.101E-03

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.908E-02	0.295E-02	0.280E-04	0.662E-11
-24.	0.618E-04	0.292E-04	0.540E-06	0.206E-12

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.3504E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.716E-03	0.136E-02	0.528E+00	0.511E+00	0.312E+00	0.213E+00	0.119E+00	0.703E-01	0.503E-01	0.247E-01
-24.	0.739E-05	0.113E-04	0.226E-03	0.264E-03	0.275E-03	0.271E-03	0.257E-03	0.234E-03	0.216E-03	0.172E-03

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.103E-01	0.371E-02	0.782E-04	0.327E-08
-24.	0.116E-03	0.646E-04	0.300E-05	0.187E-09

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.4380E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.740E-03	0.139E-02	0.528E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.708E-01	0.508E-01	0.251E-01
-24.	0.940E-05	0.140E-04	0.255E-03	0.299E-03	0.315E-03	0.312E-03	0.299E-03	0.277E-03	0.258E-03	0.212E-03

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.107E-01	0.402E-02	0.123E-03	0.327E-07
-24.	0.151E-03	0.907E-04	0.691E-05	0.296E-08

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.5256E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.747E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.509E-01	0.253E-01
-24.	0.104E-04	0.153E-04	0.266E-03	0.313E-03	0.331E-03	0.329E-03	0.317E-03	0.295E-03	0.277E-03	0.230E-03

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.108E-01	0.413E-02	0.150E-03	0.120E-06
-24.	0.168E-03	0.105E-03	0.105E-04	0.148E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.6132E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.749E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.107E-04	0.158E-04	0.270E-03	0.318E-03	0.337E-03	0.335E-03	0.323E-03	0.302E-03	0.284E-03	0.237E-03

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.109E-01	0.417E-02	0.164E-03	0.257E-06
-24.	0.175E-03	0.111E-03	0.128E-04	0.390E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7008E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.750E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.109E-04	0.160E-04	0.271E-03	0.319E-03	0.339E-03	0.337E-03	0.326E-03	0.305E-03	0.286E-03	0.240E-03

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.109E-01	0.418E-02	0.170E-03	0.399E-06
-24.	0.178E-03	0.114E-03	0.141E-04	0.700E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7884E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.750E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.110E-04	0.161E-04	0.272E-03	0.320E-03	0.339E-03	0.338E-03	0.326E-03	0.305E-03	0.287E-03	0.241E-03

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.109E-01	0.419E-02	0.172E-03	0.512E-06
-24.	0.179E-03	0.115E-03	0.147E-04	0.990E-07

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8760E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.750E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.110E-04	0.161E-04	0.272E-03	0.320E-03	0.340E-03	0.338E-03	0.327E-03	0.306E-03	0.288E-03	0.241E-03

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.109E-01	0.419E-02	0.173E-03	0.586E-06
-24.	0.179E-03	0.116E-03	0.150E-04	0.121E-06

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.9636E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01.* DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.750E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.110E-04	0.161E-04	0.272E-03	0.320E-03	0.340E-03	0.338E-03	0.327E-03	0.306E-03	0.288E-03	0.241E-03

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.109E-01	0.419E-02	0.174E-03	0.629E-06
-24.	0.179E-03	0.116E-03	0.151E-04	0.135E-06

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1051E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

			X							
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.750E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.110E-04	0.161E-04	0.272E-03	0.320E-03	0.340E-03	0.338E-03	0.327E-03	0.306E-03	0.288E-03	0.241E-03

CONTINUE

			X	
Y	30.	37.	60.	104.
0.	0.109E-01	0.419E-02	0.174E-03	0.651E-06
-24.	0.179E-03	0.116E-03	0.152E-04	0.143E-06

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1139E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

			X							
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.750E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.110E-04	0.161E-04	0.272E-03	0.320E-03	0.340E-03	0.338E-03	0.327E-03	0.306E-03	0.288E-03	0.241E-03

CONTINUE

			X	
Y	30.	37.	60.	104.
0.	0.109E-01	0.419E-02	0.174E-03	0.662E-06
-24.	0.179E-03	0.116E-03	0.152E-04	0.147E-06

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1226E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

			X							
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.750E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.110E-04	0.161E-04	0.272E-03	0.320E-03	0.340E-03	0.338E-03	0.327E-03	0.306E-03	0.288E-03	0.241E-03

CONTINUE

			X	
Y	30.	37.	60.	104.
0.	0.109E-01	0.419E-02	0.174E-03	0.667E-06
-24.	0.179E-03	0.116E-03	0.152E-04	0.149E-06

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1314E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.750E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.110E-04	0.161E-04	0.272E-03	0.320E-03	0.340E-03	0.338E-03	0.327E-03	0.306E-03	0.288E-03	0.241E-03

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.109E-01	0.419E-02	0.174E-03	0.669E-06
-24.	0.179E-03	0.116E-03	0.152E-04	0.150E-06

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1402E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.750E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.110E-04	0.161E-04	0.272E-03	0.320E-03	0.340E-03	0.338E-03	0.327E-03	0.306E-03	0.288E-03	0.241E-03

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.109E-01	0.419E-02	0.174E-03	0.670E-06
-24.	0.179E-03	0.116E-03	0.152E-04	0.151E-06

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1489E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

	X									
Y	-31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.750E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.110E-04	0.161E-04	0.272E-03	0.320E-03	0.340E-03	0.338E-03	0.327E-03	0.306E-03	0.288E-03	0.241E-03

CONTINUE

	X			
Y	30.	37.	60.	104.
0.	0.109E-01	0.419E-02	0.174E-03	0.670E-06
-24.	0.179E-03	0.116E-03	0.152E-04	0.151E-06

STEADY STATE SOLUTION HAS BEEN OBTAINED BEFORE FINAL SIMULATING TIME.

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1577E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.1190E+01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	X -31.	-28.	0.	5.	10.	12.	15.	18.	20.	24.
0.	0.750E-03	0.140E-02	0.529E+00	0.512E+00	0.312E+00	0.214E+00	0.120E+00	0.710E-01	0.510E-01	0.253E-01
-24.	0.110E-04	0.161E-04	0.272E-03	0.320E-03	0.340E-03	0.338E-03	0.327E-03	0.306E-03	0.288E-03	0.241E-03

CONTINUE

Y	X 30.	37.	60.	104.
0.	0.109E-01	0.419E-02	0.174E-03	0.670E-06
-24.	0.179E-03	0.116E-03	0.152E-04	0.151E-06

Table A-6. AT123D Fate and Transport Model Input and Output Values for Benzene (Concentration vs. Time) at the Former UST 117, Building 7002 Site

NO. OF POINTS IN X-DIRECTION 2
NO. OF POINTS IN Y-DIRECTION 1
NO. OF POINTS IN Z-DIRECTION 1
NO. OF ROOTS: NO. OF SERIES TERMS 400
NO. OF BEGINNING TIME STEP 61
NO. OF ENDING TIME STEP 175
NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION 6
INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE 1
SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE 0
INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT 1
CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD 2

AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS) ... 0.1524E+02
AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS) ... 0.0000E+00
BEGIN POINT OF X-SOURCE LOCATION (METERS) ..... -0.9100E+01
END POINT OF X-SOURCE LOCATION (METERS) ..... 0.9100E+01
BEGIN POINT OF Y-SOURCE LOCATION (METERS) ..... -0.6100E+01
END POINT OF Y-SOURCE LOCATION (METERS) ..... 0.6100E+01
BEGIN POINT OF Z-SOURCE LOCATION (METERS) ..... 0.0000E+00
END POINT OF Z-SOURCE LOCATION (METERS) ..... 0.0000E+00

POROSITY ..... 0.1800E+00
HYDRAULIC CONDUCTIVITY (METER/HOUR) 0.9000E-01
HYDRAULIC GRADIENT 0.3500E-02
LONGITUDINAL DISPERSIVITY (METER) ..... 0.1000E+02
LATERAL DISPERSIVITY (METER) ..... 0.3000E+01
VERTICAL DISPERSIVITY (METER) ..... 0.1000E+01
DISTRIBUTION COEFFICIENT, KD (M**3/KG) 0.7900E-04
HEAT EXCHANGE COEFFICIENT (KCAL/HR-M**2-DEGREE C).. 0.0000E+00

MOLECULAR DIFFUSION MULTIPLY BY POROSITY (M**2/HR) 0.3530E-05
DECAY CONSTANT (PER HOUR) 0.4000E-04
BULK DENSITY OF THE SOIL (KG/M**3) ..... 0.1320E+04
ACCURACY TOLERANCE FOR REACHING STEADY STATE 0.1000E-02
DENSITY OF WATER (KG/M**3) ..... 0.1000E+04
TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (HR) .. 0.7300E+03
DISCHARGE TIME (HR) ..... 0.4380E+05
WASTE RELEASE RATE (KCAL/HR), (KG/HR), OR (CI/HR) . 0.2210E-04

RETARDATION FACTOR ..... 0.1579E+01
RETARDED DARCY VELOCITY (M/HR) 0.1108E-02
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/HR) .. 0.1109E-01
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/HR) . 0.3337E-02
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/HR). 0.1120E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.0000E+00 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

	Z = 0.00	
		X
Y	0.	46.
0.	0.000E+00	0.000E+00

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.4380E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

	Z = 0.00	
		X
Y	0.	46.
0.	0.553E+00	0.345E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.4818E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

	Z = 0.00	
		X
Y	0.	46.
0.	0.289E+00	0.468E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.5256E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

	Z = 0.00	
		X
Y	0.	46.
0.	0.176E+00	0.672E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.5694E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

	Z = 0.00	
		X
Y	0.	46.
0.	0.114E+00	0.840E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.6132E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	0.	X
0.	0.759E-01	46. 0.891E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.6570E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	0.	X
0.	0.516E-01	46. 0.843E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7008E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	0.	X
0.	0.356E-01	46. 0.742E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7446E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	0.	X
0.	0.248E-01	46. 0.623E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.7884E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

Y	0.	X
0.	0.174E-01	46. 0.506E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8322E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

		X
Y	0.	46.
0.	0.123E-01	0.402E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.8760E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

		X
Y	0.	46.
0.	0.875E-02	0.315E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.9198E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

		X
Y	0.	46.
0.	0.624E-02	0.243E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.9636E+05 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

		X
Y	0.	46.
0.	0.446E-02	0.187E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1007E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

Z = 0.00

		X
Y	0.	46.
0.	0.320E-02	0.142E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1051E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

	Z = 0.00	
		X
Y	0.	46.
0.	0.230E-02	0.108E-01

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1095E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

	Z = 0.00	
		X
Y	0.	46.
0.	0.166E-02	0.811E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1139E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

	Z = 0.00	
		X
Y	0.	46.
0.	0.120E-02	0.609E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1183E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

	Z = 0.00	
		X
Y	0.	46.
0.	0.864E-03	0.456E-02

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1226E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

	Z = 0.00	
		X
Y	0.	46.
0.	0.626E-03	0.341E-02

STEADY STATE SOLUTION HAS NOT BEEN REACHED BEFORE FINAL SIMULATING TIME.

DISTRIBUTION OF DISSOLVED CHEMICALS IN PPM AT 0.1270E+06 HRS
(ADSORBED CHEMICAL CONC. = 0.7900E-01 * DISSOLVED CHEMICAL CONC.)

	Z = 0.00	
		X
Y	0.	46.
0.	0.454E-03	0.255E-02

TABLE A-7. GEOTECHNICAL PARAMETERS FOR THE FORMER UST 117, BUILDING 7002 SITE

Building ID	Tank ID	Facility ID	Sample ID	Sample Depth	Classification	Moisture Content (%)	Total Organic Carbon (%)	Specific Gravity	Porosity, n	Permeability (cm/s)
7002	117	9-025113*1	BFGT11	2.0 to 4.0	CH	28.9	0.1	2.65	0.49	1.42E-08

NOTE: CH = Sandy, fat clay.
UST = Underground storage tank.