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Final

Phase I Remedial Investigation Report for Groundwater at Sites 1, 3, 6, 7, 11, 17, 24, and 25

Naval Weapons Station Yorktown
Yorktown, Virginia

NAVFAC
Naval Facilities Engineering Command

Prepared for

Department of the Navy
Naval Facilities Engineering Command Mid-Atlantic

Contract No. N62470-95-D-6007
CTO-0213

September 2007

Prepared by

CH2MHILL

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Executive Summary Table

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Final Phase I Remedial Investigation Report for Groundwater at Sites 1, 3, 6, 7, 11, 17, 24, and 25

Site	Further Action	NFA	Rationale
Site 1- Dudley Road Landfill	X		Groundwater at Sites 1 & 3 is contaminated with CVOCs and metals. The aerial distribution of contaminants is undefined. Recommend delineation of extent of contamination and quanitfication of human health and ecological risks.
Site 3- Group 16 Magazine Landfill	X		
Site 6- Explosives Contaminated Wastewater Impoundment	X		Groundwater at Site 6 is contaminated with CVOCs, explosives, and inorganics. Concentrations of CVOCs in groundwater are indicative of possible DNAPL. Vertical and aerial extent of explosives and CVOC contamination has not been defined. Recommend delineation of extent of contamination and quantification of human health and ecological risks. Surface water and sediment data indicate no site impacts to Felgates Creek.
Site 7- Plant 3 Explosives Contaminated Wastewater Discharge Area	X		Explosives have been detected in groundwater at Site 7; however, concentrations detected in the area where the historical release took place have steadily declined since the 1997 contaminated soil removal action. Inorganics detected in site groundwater and sediment are not likely to be site related since upgradient concentrations are comparable to downgradient concentrations. Recommend continued LTM for groundwater only to monitor decreases in explosives concentrations. Also recommend installation of a source area well for evaluation of concentrations of metals, perchlorates, explosives, and VOCs in this area.
Site 11- Abandoned Explosives Burning Pits		X	Concentrations of iron and aluminum detected in filtered samples were above background during the Phase I Groundwater RI. Based on the HHRA included in the Round Two RI there are no acceptable risks related to these constituents in groundwater. Therefore no further action is recommended for Site 11.
Site 17- Holm Road Landfill		X	Inorganics were detected in groundwater samples greater than maximum background concentrations, but none were above MCLs. Inorganics were determined not to present an unacceptable risk during the HHRA included in the Round Two RI. Therefore no further action is recommended for Site 17
Site 24 - Aviation Field	X		Groundwater samples were not collected from Site 24 as part of this Phase I Groundwater RI. Therefore additional characterization is needed.

Executive Summary Table
Final Phase I Remedial Investigation Report for Groundwater at Sites 1, 3, 6, 7, 11, 17, 24, and 25

Site	Further Action	NFA	Rationale
Site 25 - Building 373 Rocket Plant	**X**		It is recommended that further investigation be conducted to evaluate the potential for perchlorates in groundwater

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Acronyms and Abbreviations

µg/L	microgram per Liter
amsl	above mean sea level
AST	Aboveground Storage Tank
BNA	base neutral extractable
CEC	cation exchange capacity
CLEAN	Comprehensive Long-Term Environmental Action Navy
CLP	Contract Laboratory Program
CTO	Contract Task Order
CVOC	chlorinated volatile organic compound
DCA	dichloroethane
DCE	dichloroethene
DO	dissolved oxygen
DNAPL	dense non-aqueous phase liquid
DNT	dinitrotoluene
DRMO	Defense Recycling Material Office
ft	feet
FSAP	Field Sampling and Analysis Plan
FFA	Federal Facilities Agreement
FFS	Focused Feasibility Study
FRG	Final Remediation Goal
FS	Feasibility Study
GW OU	Groundwater Operable Unit
HRSD	Hampton Roads Sanitation District
IAS	Initial Assessment Study
ID	inner diameter
IDW	investigation derived waste
IMS	Industrial Marine Services
LTM	Long Term Monitoring
LUC	land use control
MCL	maximum contaminant level
mg/kg	milligram/kilogram
mg/L	milligram/Liter
MIP	membrane interface probe
MS	matrix spike
MSD	matrix spike duplicate
NAVFAC	Naval Facilities Engineering Command
Navy	United States Department of the Navy

NEDED	Naval Explosives Development Engineering Department
NERP	Naval Environmental Restoration Program
NFESC	Naval Facilities Engineering Service Center
NEESA	Naval Energy and Environmental Support Activity
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PPLV	preliminary pollutant limit values
PRAP	Proposed Remedial Action Plan
PMT	Project Management Team
PVC	polyvinyl chloride
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RAA	Remedial Action Alternatives
RAO	Remedial Action Objective
RDX	Hexahydro-1,3,5-trinitro-1,3,5-triazine
RI	Remedial Investigation
ROD	Record of Decision
SOW	Statement of Work
SPSA	Southeastern Public Service Authority
SSA	Site Screening Area
SSP	Site Screening Process
SVOC	semi-volatile organic compound
TCA	trichloroethane
TCE	trichloroethene
TAL	Target Analyte List
TCL	Target Compound List
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TNT	Trinitrotoluene
TOC	Total Organic Carbon
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VDEQ	Virginia Department of Environmental Quality
VOC	volatile organic compound
WPNSTA	Naval Weapons Station

SECTION 1

Introduction

This report presents data, results, and conclusions of the Phase I Remedial Investigation (RI) activities conducted to support characterization of groundwater at Naval Environmental Restoration Program (NERP) Installation Restoration (IR) Sites 1, 3, 6, 7, 11, 17, 24, and 25, Naval Weapons Station (WPNSTA) Yorktown, in Yorktown, Virginia. This Phase I RI report was prepared under the United States Navy (Navy), Naval Facilities Engineering Command (NAVFAC) Atlantic, Comprehensive Long-Term Environmental Action Navy (CLEAN) II, Contract N62470-95-D-6007, Contract Task Order (CTO) 0213.

The technical approach for this Phase I RI was jointly scoped by the WPNSTA Yorktown Tier I Partnering Team, which includes representatives from the Navy, United States Environmental Protection Agency Region III (USEPA), and Virginia Department of Environmental Quality (VDEQ). The Team agreed to address groundwater at WPNSTA Yorktown using a two phased approach. During the first phase of the RI process, the Team agreed to compare site data to maximum contaminant level (MCL) screening criteria and background values to determine which sites need additional investigation. The Team agreed that the risks would be quantified during the second RI phase.

The sites included in this RI report are within the boundaries of the area formerly referred to as Groundwater Operable Unit (GW OU) I. Based on WPNSTA Yorktown Tier I Team consensus statement 07-24-06-44, groundwater at these sites is now being addressed on a site-specific basis. Therefore, the GW OU designation is not used in this document and will not be referenced in future documents for groundwater at these sites.

Phase I RI field activities were completed in September and October 2004. Field activities were conducted in accordance with the RI work plan: *Final Work Plan for the Remedial Investigation of Groundwater Operable Unit I, Naval Weapons Station Yorktown, Yorktown, Virginia* (Baker Environmental, March 2004). This RI was also conducted in accordance with the WPNSTA Yorktown Federal Facilities Agreement (FFA), the WPNSTA Yorktown Master Work Plans (Baker, 2005), and applicable federal, Commonwealth of Virginia, and local regulations and requirements.

1.1 Objectives and Approach

This RI report presents the findings of the Phase I investigation and utilizes these data in addition to existing historical data to develop recommendations for an appropriate path forward at each site. The specific objective of this RI is to assess the nature and extent of groundwater contamination at each site based on comparison of available data to MCLs and maximum background concentrations.

On the basis of this objective, the data collected during the Phase I RI (and relevant historical data, where available) were evaluated to assess the nature and extent of contamination. The results of these assessments were used to make recommendations on

which sites require additional information to be collected in order to sufficiently characterize the site and evaluate potential risks.

1.2 Report Organization

For the purpose of developing an understanding of each site, historical data in addition to data collected as part of the Phase I RI field investigation are included in this report. Section 2 of this document discusses base wide historical information and physical characteristics applicable to all eight sites. Section 3 provides information on field activities and evaluation of Phase I RI data for all of the sites. Sections 4 through 10 provide site-specific evaluations of the RI and historical data. Section 11 presents overall conclusions and recommendations for these sites, and Section 12 presents references used to create this document.

Tables and Figures are provided at the end of each respective section. Appendices are provided after Section 12.

SECTION 2

History and Physical Characteristics

2.1 WPNSTA Yorktown Description and History

WPNSTA Yorktown is a 10,624-acre installation located on the Virginia Peninsula in York and James City Counties and the City of Newport News, Virginia (Figure 2-1). WPNSTA Yorktown is bounded on the northwest by WPNSTA Yorktown Cheatham Annex and the King's Creek Commerce Center; on the northeast by the York River and the Colonial National Historic Parkway; on the southwest by Route 143 and Interstate 64; and on the southeast by Route 238 and the town of Lackey.

Originally named the U.S. Mine Depot, WPNSTA Yorktown was established in 1918 to support the laying of mines in the North Sea during World War I. For 20 years after World War I, the depot continued to receive, reclaim, store, and issue mines, depth charges, and related materials. During World War II, the facility was expanded to include three trinitrotoluene (TNT) loading plants and new torpedo overhaul facilities. A research and development laboratory for experimentation with high explosives was established in 1944. In 1947, a quality evaluation laboratory was developed to monitor special tasks assigned to the facility which included the design and development of depth charges and advanced underwater weapons. On August 7, 1959, the depot was renamed the U.S. Naval Weapons Station. Today, the primary mission of WPNSTA Yorktown is to provide ordnance, technical support, and related services to sustain the war-fighting capability of the armed forces in support of national military strategy.

The locations of Sites 1, 3, 6, 7, 11, 17, 24, and 25 are shown on Figure 2-1. Site-specific descriptions and historical information are provided in Sections 4 through 10.

2.2 Physical Characteristics

2.2.1 General Physiographic Features

WPNSTA Yorktown is situated within the Virginia Coastal Plain Physiographic Province which extends from the Atlantic Ocean westward for 75 to 90 miles where it meets the Piedmont Physiographic Province at the Fall Line, according to the *Geohydrology of the Shallow Aquifer System Report* (Brockman et al., 1997). The Virginia Coastal Plain is characterized by unconsolidated sediments of Quaternary, Tertiary, and Cretaceous ages. These sediments form a wedge of gravel, sands, silts, and clays with variable amounts of shell material overlying a weathered bedrock surface (unconformity). The Virginia Coastal Plain sediments thicken eastward from the Fall Line and are approximately 6,000 feet thick below the Eastern Shore Peninsula. This information is documented in *Hydrogeologic Framework of the Virginia Coastal Plain* (Meng and Harsh, 1988).

The topographic surface of the Virginia Coastal Plain consists of a series of broad, gently sloping terraces separated by scarps (eroded bluffs). These features were formed by

depositional and erosional processes resulting from fluctuating sea levels during the past 2-3 million years (Brockman et al., 1997). The terrace sediments were deposited during periods of high sea-level and were subsequently partially eroded during periods of low sea-level. The terraces decrease in topographic elevation in a stair-step pattern from approximately 100 feet (ft) above mean sea level (amsl) in areas close to the Fall Line to just above sea level in the proximity of Virginia's modern day coastal oceans and rivers. Scarps, predominantly oriented from north to south, delineate the eroded shoreline along the toe of each terrace.

2.2.2 WPNSTA Yorktown Geology

The *Stratigraphic Units of the Lower Cretaceous Through Miocene Series in Geologic Studies, Coastal Plain of Virginia* report indicated that in the vicinity of WPNSTA Yorktown, the sediments of the Virginia Coastal Plain have a combined thickness of approximately 1,900 ft and slope gently (about 3 ft/mile) to the southeast (Teifke, 1973). The majority of WPNSTA Yorktown lies within the Lackey Plain terrace at an elevation of 90 to 100 ft amsl. Lackey Plain is bounded on the northeast by the Camp Peary Scarp which trends approximately parallel to the York River (Brockman et al., 1997) and lies just south of the lower Croaker Flat terrace. To the south and east of WPNSTA Yorktown, Lackey Plain is bordered by the Kingsmill and Lee Hall scarps which divide Lackey Plain from the lower Huntington Flat and Grafton Plain terraces respectively (Figure 2-2).

Sites 1, 3, 6, 7, 11, 17, 24, and 25 are located entirely within the Croaker Flat terrace to the north of the Camp Peary Scarp as illustrated in Figure 2-3. Croaker Flat attains a maximum elevation of 45 ft amsl along the Camp Peary Scarp and slopes to sea level along the York River.

Ten geologic formations have been identified (Brockman et al., 1997) beneath WPNSTA Yorktown and date from the early Miocene (oldest) to late Pleistocene (youngest). These geologic units are grouped into hydrostratigraphic units which are further discussed in Section 2.2.3. Two of the geologic formations, the Yorktown and Eastover Formations, are further subdivided into four and two members, respectively (Brockman et al., 1997). Figure 2-4 illustrates the relationship between age, geologic units, and hydrostratigraphic units for the Lackey Plain and Croaker Flat terraces that occur on WPNSTA Yorktown and Figure 2-5 illustrates the extent of geologic units that occur at the surface in the vicinity of the facility.

The oldest and deepest two geologic units shown on Figure 2-4 are the Calvert and St. Mary's Formations of Miocene (23 to 5 million years ago) age (Brockman et al., 1997). The Calvert Formation is about 120 feet thick in the vicinity of WPNSTA Yorktown and consists of layers of shelly, sandy clay and diatomaceous clay strata. The St. Mary's Formation consists of silty and sandy clay and, where present beneath WPNSTA Yorktown, attains a thickness of approximately 70 ft (Brockman et al., 1997; Meng and Harsh, 1988). The unconformable contact of the Calvert Formation with the overlying St. Mary's Formation is noted on electric-resistivity logs by a series of spikes associated with thin sandy strata near the top of the Calvert Formation (Meng and Harsh, 1988). Both formations represent deposition in a marine environment during multiple oscillations of high sea levels.

The Eastover Formation, of upper Miocene age, overlies the St. Mary's Formation on an unconformity. The Eastover Formation is subdivided into two members: the Claremont

Manor Member and the Cobham Bay Member. According to *Stratigraphic Revision of Upper Miocene and Lower Pliocene Beds of the Chesapeake Group, Middle Atlantic Coastal Plain* (Ward and Blackwelder, 1980) and the *Geohydrology of the Shallow Aquifer System* (Brockman et. al., 1997) the Claremont Member consists of clayey silt and silty to sandy clay and is finer-grained than the Cobham Bay Member which consists of very fine to fine-grained sand, silty sand, silt or sandy clay.

The Yorktown Formation of Pliocene (5 to 1.6 million years ago) age overlies the Eastover Formation and is subdivided into four members, from oldest to youngest: the Sunken Meadow Member, the Rushmere Member, the Morgarts Beach Member and the Moore House Member (Ward and Blackwelder, 1980). The Sunken Meadow Member is a shelly fine to coarse grained sand and, at WPNSTA Yorktown, is lithologically the same as the shelly fine to coarse grained sand and silty sand of the Rushmere Member (Brockman et al., 1997). The Morgarts Beach Member is composed of clay, clayey silt, and sandy to silty clay. The overlying Moore House Member comprises shell hash, clayey or sandy shell hash, very fine- to medium-grained sand, or shelly clay (Brockman et al., 1997). The Yorktown Formation, deposited during transgressive and regressive phases of oscillating sea levels, is the last deposit of marine origin recognized in the Coastal Plain sedimentary strata. Due to its marine origin it contains a large percentage of glauconite that imparts an easily recognized blue-green color to the sediments and a marine fossil assemblage that distinguishes the Yorktown Formation from the overlying non-marine geologic units. Identification of the Yorktown Formation has been well established through identification of calcite-cemented shells and shell fragments, which are common characteristics of the upper portion of the formation. This type of lithology has been encountered during various WPNSTA Yorktown field investigations. Due to similar physical characteristics shared among the four members of the Formation and post-deposition erosion, it can be difficult to distinguish one member from another.

Six upper Pliocene and Pleistocene (1.6 million years ago to the present) formations overlie the Yorktown Formation on the York-James Peninsula. In order from oldest to youngest, these are the Sedley Formation, the Bacons Castle Formation, the Windsor Formation, the Chuckatuck Formation, the Shirley Formation, and the Tabb Formation. The Sedley Formation is characterized by clayey silt with very fine grained sand grading downward to fine to coarse grained sand with granules. The Bacons Castle Formation is described as a clayey silt and silty to fine-grained sand. The Windsor and Chuckatuck Formations are composed of a series of very fine to very coarse sand, pebbles, silt, and sandy clay. The Shirley and Tabb Formations consist of fining upward stream deposits with cobble beds fining to silty clay. These formations are overlain by modern alluvial, colluvial and marsh deposits.

Due to erosion during former low sea level stands, part or all of some of the geologic units represented on the York-James Peninsula are absent within WPNSTA Yorktown. Others are present on the Lackey Plain within the WPNSTA boundary but are truncated by the Camp Peary Scarp (Brockman et al., 1997) within the Sites 1, 3, 6, 7, 11, 17, 24, and 25 study areas on Croaker Flat. In general, the Rushmere Member of the Yorktown Formation and all formations underlying the Rushmere Member are present across the entire installation, but those formations overlying the Rushmere Member differ. On Croaker Flat, the Bacons Castle and Sedley Formations and the Moore House Member of the Yorktown Formation

are missing (Brockman et al., 1997) and the Shirley Formation and Holocene undifferentiated sediments occur at the surface. Over the majority of the WPNSTA, on the Lackey Plain, the Windsor and Chuckatuck Formations occur at the surface and are underlain by the Bacons Castle Formation and the four members of the Yorktown Formation (Moore House, Morgart's Beach, Rushmere and Sunken Meadow).

2.2.3 WPNSTA Yorktown Hydrogeology

The geologic units described above were grouped into hydrostratigraphic units based upon their hydrologic characteristics in *Groundwater Resources of the York-James Peninsula of Virginia, USGS Water Resources Investigation Report* (Lazniak and Meng, 1988) and the *Geohydrology of the Shallow Aquifer System* (Brockman, et. al., 1997). Based upon the hydraulic characteristics of the geologic units present, the uppermost eight (Cobham Bay Member of the Eastover Formation through the Tabb Formation) of the ten geologic formations have been identified as the York County Shallow Aquifer System (Brockman et al., 1997). As illustrated in Figure 2-4, the following five hydrogeologic units make up the York County Shallow Aquifer System at WPNSTA Yorktown:

1. Columbia aquifer (consisting of the Windsor through Tabb Formations)
2. Cornwallis Cave confining unit (consisting of the Bacons Castle Formation)
3. Cornwallis Cave aquifer (consisting of the upper Moore House Member of the Yorktown Formation and the Sedley Formation)
4. Yorktown confining unit (consisting of the upper Morgarts Beach and lower Moore House Members of the Yorktown Formation)
5. Yorktown-Eastover aquifer (consisting of the Cobham Bay through Rushmere Members of the Yorktown Formation)

Over the majority the study area where Sites 1, 3, 6, 7, 11, 17, 24, and 25 are located (Croaker Flat), the Camp Peary Scarp truncates the Columbia aquifer, the Cornwallis Cave confining unit, the Cornwallis Cave aquifer, and some to all of the Yorktown confining unit; hence, the upper units are missing and either the Yorktown aquifer or a thin portion of the Yorktown confining unit, occurs at the surface. Areas where the Yorktown aquifer is unconfined at the surface are shown on Figure 2-6. In the southern portion of the study area, the Cornwallis Cave aquifer and confining unit are absent and the Columbia aquifer overlies the Yorktown confining unit (in the vicinity of Sites 1, 11, and 17). Therefore, the Columbia aquifer, Yorktown confining unit, and Yorktown aquifer are the main shallow hydrogeologic units of interest within the study area (Sites 1, 3, 6, 7, 11, 17, 24, and 25).

Where present within the study area boundary, the Columbia aquifer ranges in thickness from 5 to 10 ft thick. Horizontal hydraulic conductivity of the unit ranges from 0.4 ft/day to 8 ft/day and vertical hydraulic conductivity ranges from 1.7×10^{-4} to 1.7×10^{-1} ft/day (Brockman et. al., 1997). A summary of aquifer hydraulic characteristics is included in Table 2-1. Within the study area, the aquifer is thickest in the vicinity of Sites 1, 11, and 17.

The Yorktown confining unit is composed of clay and silt. Typically, it is distinguishable by its dark greenish gray color and lithology. The confining unit occurs at altitudes of below sea level to 40 ft amsl and extends across all of WPNSTA Yorktown except low-lying areas

where erosion during a past low sea level removed all to most of the unit. Specifically, the Yorktown confining unit is absent north of Turkey Road between the west and south branches of Felgates Creek, along the streambeds of Felgates Creek, Indian Field Creek and their unnamed tributaries, along the ancestral York River channel and in the western portion of the Station near Ringfield Road (Brockman et al., 1997). The thickness of the unit across the Station ranges from 0 to 36 ft. Where present and of sufficient thickness, the Yorktown confining unit restricts flow to the underlying Yorktown-Eastover aquifer with a vertical hydraulic conductivity that ranges from 1.3×10^{-5} ft/day to 7.4×10^{-3} ft/day (Table 2-1).

The Yorktown-Eastover aquifer extends across all of WPNSTA Yorktown and ranges from 60 to 100 ft thick. Horizontal hydraulic conductivity ranges from 0.004 to 3 ft/day and vertical hydraulic conductivity ranges from 1.7×10^{-5} ft/day to 4.8×10^{-1} ft/day (Table 2-1). Transmissivity ranges from 0.5 to 40 ft^2/day. Groundwater flow in the Yorktown-Eastover aquifer is generally from west-to-east. A local potentiometric high of the Yorktown-Eastover aquifer occurs in the southeastern part of WPNSTA Yorktown with groundwater flowing radially from this location (to the west, northwest, and north) and adjacent areas (to the east and southeast).

The upper strata at WPNSTA discussed above are separated from the deeper strata by the Eastover-Calvert confining unit, which is approximately 140 to 166 ft thick in the vicinity of WPNSTA Yorktown. This extensive confining unit separates the York County Shallow Aquifer System from the deeper, pre-Miocene Virginia Coastal Plain aquifers. The deeper pre-Miocene sediments are excluded from evaluation in this study because previous site investigations indicate there is no potential impact by past site activities through the Eastover-Calvert confining unit to underlying strata, due to the thickness of the confining unit and its low permeability.

Site-specific hydrogeologic conditions are discussed in Sections 4 through 10.

TABLE 2-1
Summary of Aquifer Hydraulic Characteristics
Phase I Groundwater Remedial Investigation for Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Unit	Kh (ft/day)	Kv (ft/day)	Thickness (ft)	Transmissivity (ft2/day)	Altitude of Potentiometric Surface (+ft msl)
Columbia AQ	0.4 to 8	1.7×10^{-1} to1.7×10^{-4}	5 to 20	NA	20 to 80
Cornwallis CU	NA	1.4×10^{-2} to 3.1×10^{-5}	5 to 22	NA	30 to 70
Cornwallis Cave AQ	0.03 to 9	2.4×10^{-1} to 6.2×10^{-4}	5 to 60	20 to 400	20 to 60
Yorktown CU	NA	7.4×10^{-3} to 1.3×10^{-5}	5 to 36	NA	<0 to 40
Yorktown-Eastover AQ	0.004 to 3	1.3×10^{-3} to 4.0×10^{-6}	60 to >100	0.5 to 40	minus 10 to 20
Eastover-Calvert CU	NA	4.3×10^{-4} to 6.0×10^{-6}	140 to 166	NA	minus 40 to minus 80

Source: Brockman et al., 1997

Notes:
AQ - Aquifer
CU - Confining Unit
Kh - horizontal hydraulic conductivity
Kv - vertical hydraulic conductivity
ft msl - feet mean sea level

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LEGEND

- Yorktown Naval Weapons Station Base Boundary
- Magazines
- Buildings and Structures
- VA I-64
- Study Area Boundaries
- Kings Creek Commerce Center
- County Lines

N

0 2,000 4,000 Feet

Figure 2-1
WPNSTA Yorktown Location Map
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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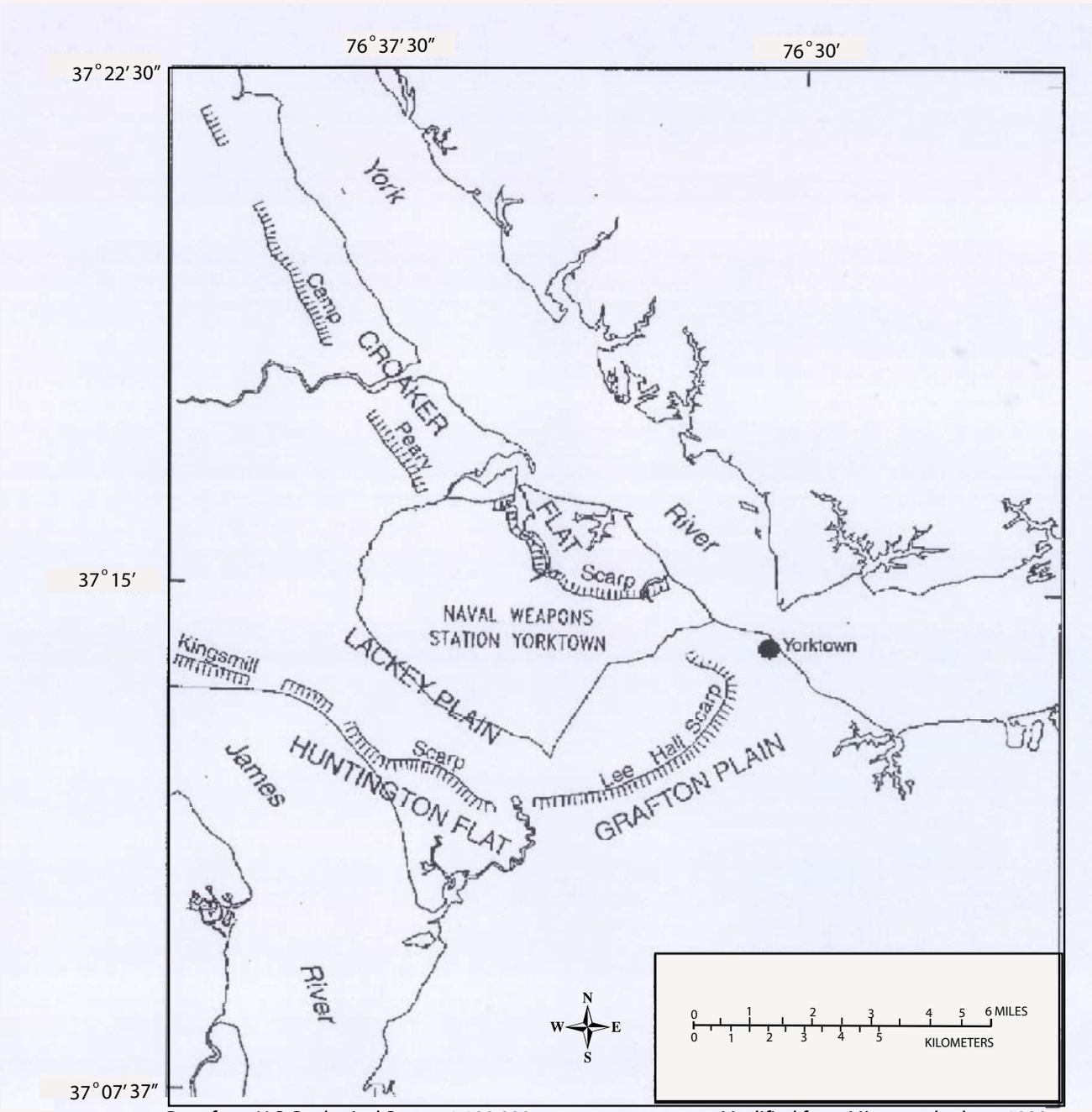

Base from U.S Geological Survey 1:100,000

Modified from Mixon and others, 1989;
Johnson and others, 1993

Baker
Baker Environmental, Inc.

Figure 2-2
Terrace and Scarp Locations in York County
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7,11,17, 24 and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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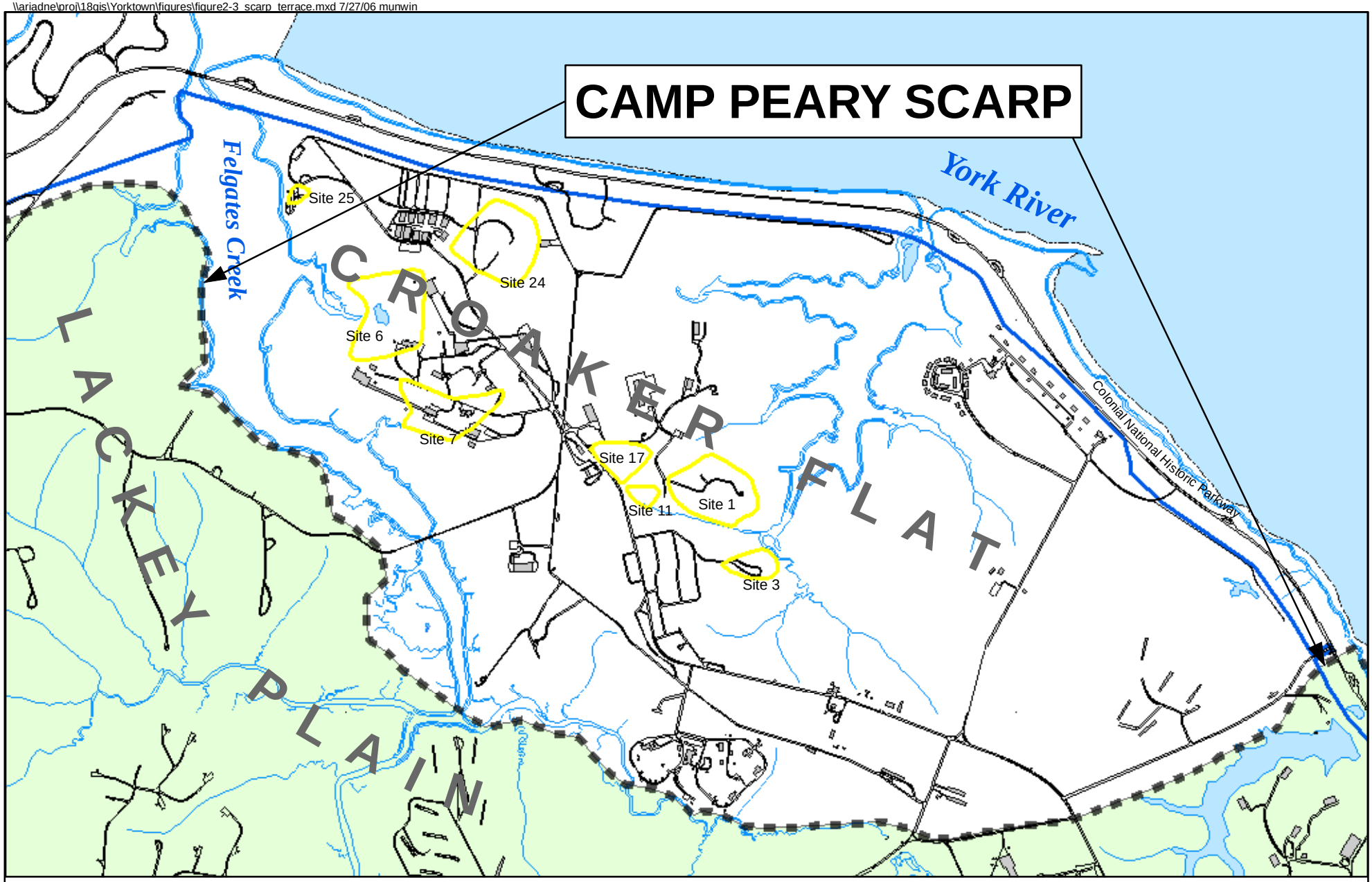

LEGEND

- Study Areas included in this Phase I RI
- Camp Peary Scarp
- Lackey Plain
- Croaker Flat

N

0 775 1,550 Feet

Figure 2-3
Scarp and Terrace Features in York County
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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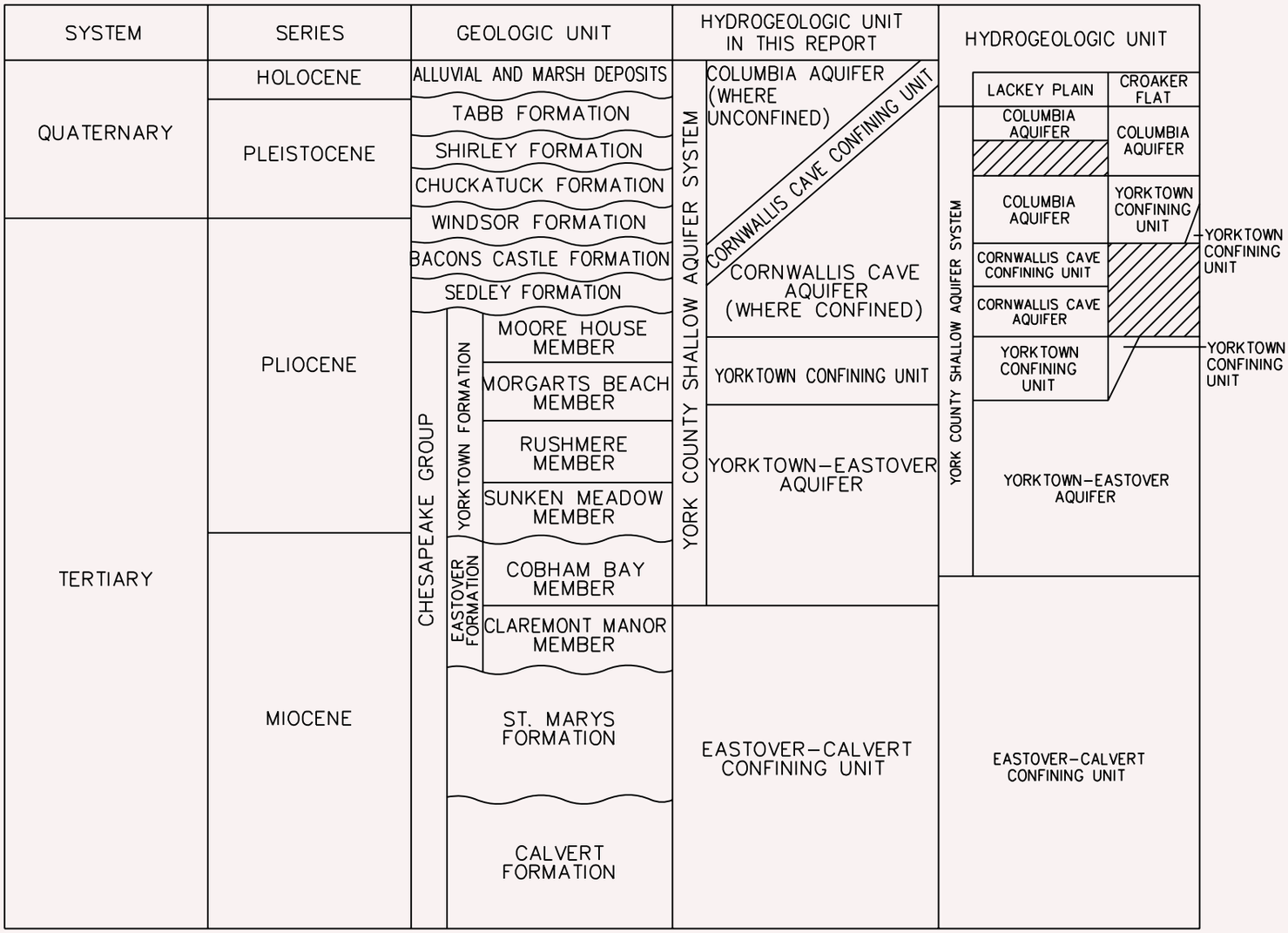

SOURCE: BROCKMAN, ET AL 1997 GEOHYDROLOGY OF THE SHALLOW AQUIFER SYSTEM, NAVAL WEAPONS STATION YOURTOWN, YORKTOWN, VIRGINIA

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Baker Environmental, Inc.

Figure 2-4
Hydrogeologic Units in York County
Phase I Remedial Investigation Report for Groundwater
at Sites 1,3,6,7,11,17,24 and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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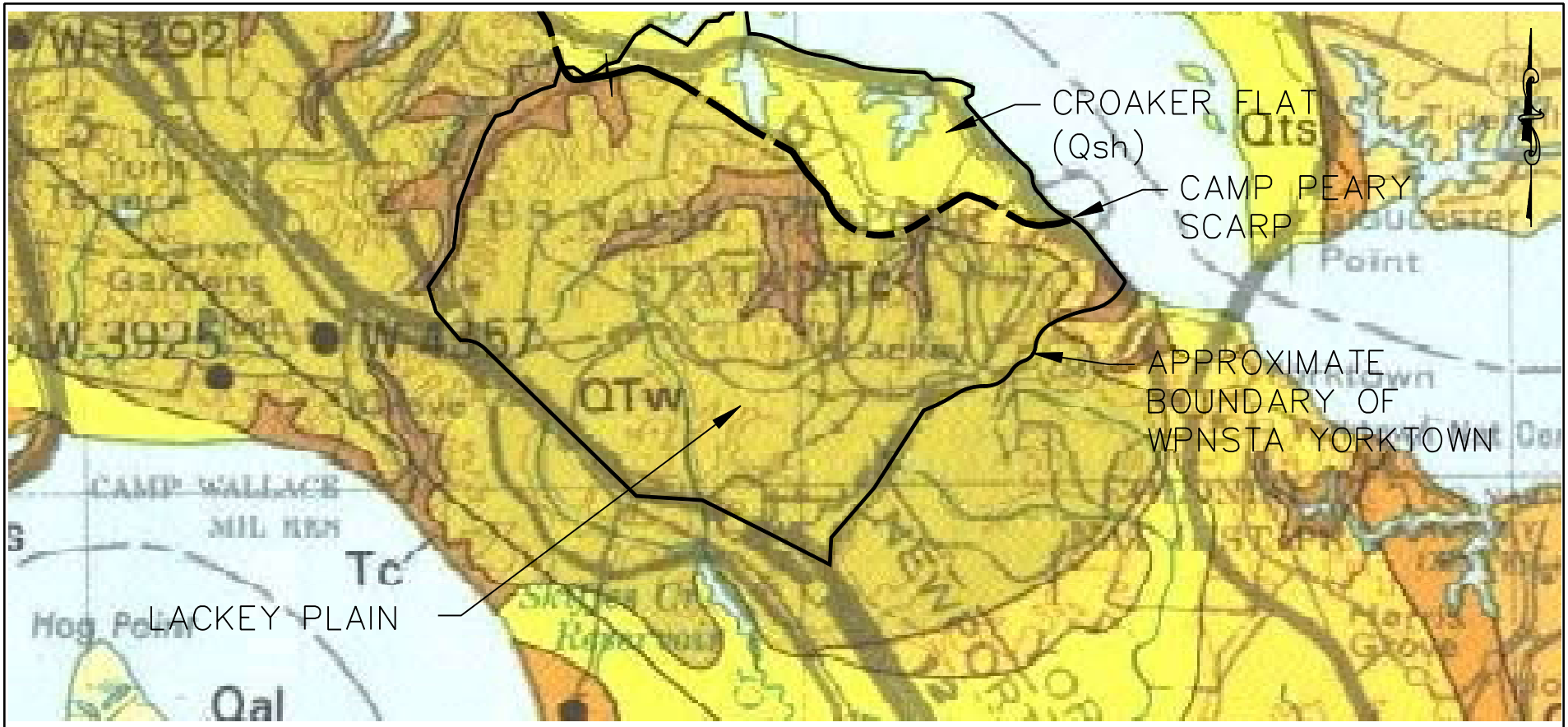

LEGEND
Qal = QUATERNARY, ALLUVIUM
Qsh = QUATERNARY, SHIRLEY FORMATION
QTw = QUATERNARY/TERTIARY, WINDSOR FORMATION
Tc = TERTIARY, CHESAPEAKE GROUP

NOT TO SCALE

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Baker Environmental, Inc.

AFTER MIXON, R.B., C.R. BERQUIST, JR., W.L. NEWELL, AND F.G. JOHNSTON. 1989. GEOLOGIC MAP AND GENERALIZED CROSS SECTIONS OF THE COASTAL PLAIN AND ADJACENT PARTS OF THE PIEDMONT, VIRGINIA. VIRGINIA DIVISION OF MINERAL RESOURCES, MISCELLANEOUS INVESTIGATIONS SERIES, MAP I-2033.

Figure 2-5
Surficial Geologic Map of York County
Phase I Remedial Investigation Report for Groundwater
at Sites 1,3,6,7,11,17,24 and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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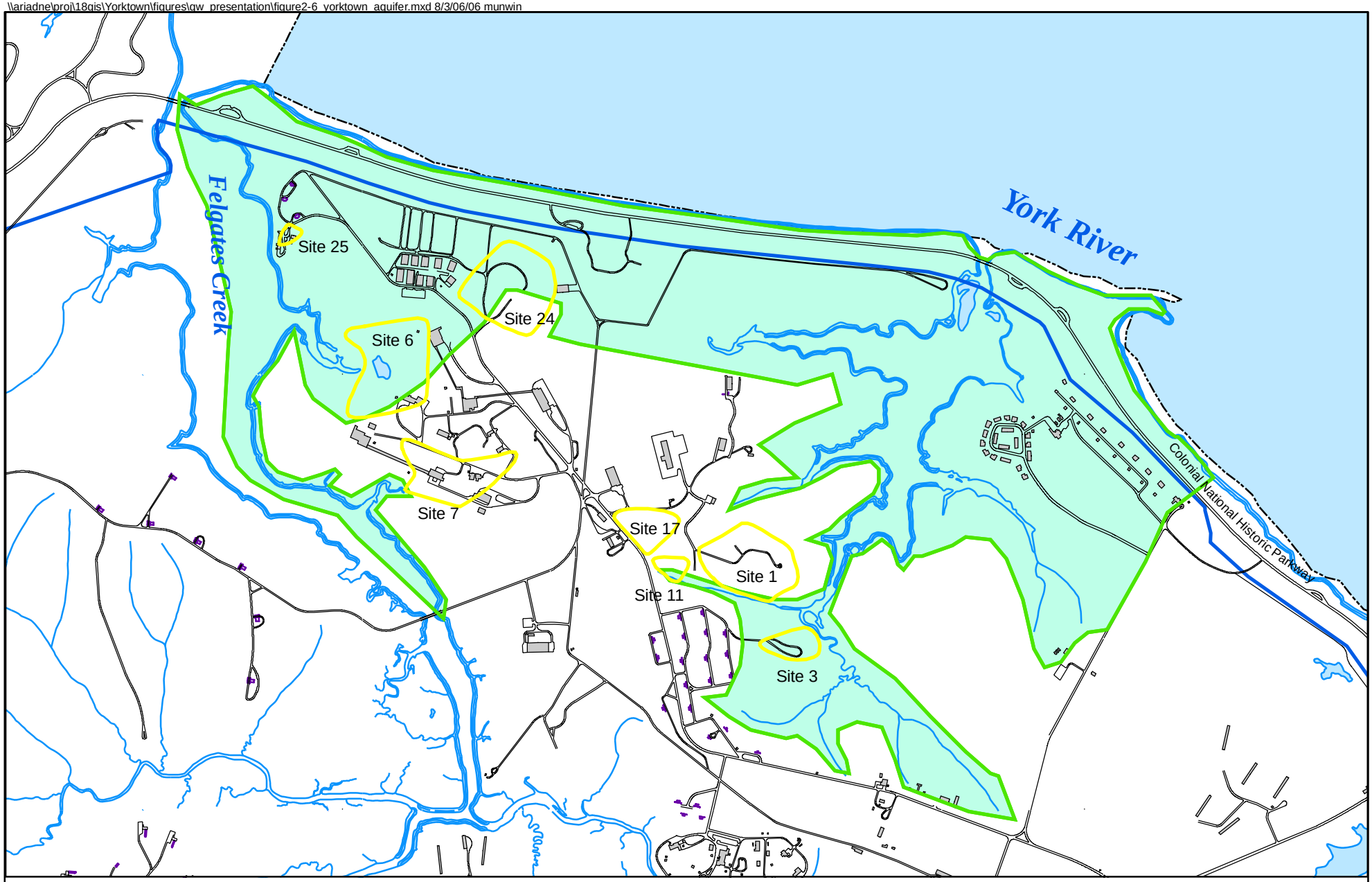

LEGEND

Study Areas included in this Phase I RI

Yorktown-Eastover Aquifer, Approximate Area of Unconfined Conditions

N

0 700 1,400 Feet

Figure 2-6
Yorktown-Eastover Aquifer-Approximate Area of Unconfined Conditions
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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SECTION 3

Field Investigation Activities and Data Evaluation

Initial Phase I RI field activities were completed in October 2004. Follow-up work was completed in March 2005. Field activities included monitoring well installation, monitoring well abandonment, a water level survey of each site, and sampling of site monitoring wells. Details of the field efforts are provided in the subsections below.

3.1 Field Investigation Activities

3.1.1 Monitoring Well Installation

Three new monitoring wells were installed at Site 3 and nine new monitoring wells were installed at Site 6 to support Phase I RI activities at the sites. The locations of the new wells are provided in figures included in Sections 4 and 5 of this document. Construction for all wells with the exception of one Site 6 well (6GW08) was completed using traditional hollow stem auger drilling. Well construction methodology for 6GW08 was modified because it was installed within a wetland area. Methodologies are described below.

Non-Wetland Area Well Installation

At eight of the nine new well locations, borings were advanced using hollow stem augers. Boreholes were sampled for lithology during installation using 2-foot split spoon samplers driven at 5-foot intervals. An on-site geologist examined each lithologic sample and recorded grain size information, color, moisture content and other relevant information such as evidence of contamination. Once borings were advanced to the desired depth, 10-foot 0.01-inch slotted screens were set at the base of the borehole. Wells were constructed of 2-inch inner diameter (ID) Schedule 40 polyvinyl chloride (PVC) screen and riser. A volume of No. 1 silica sand was placed within the annular space to a depth of 2 ft above the top of the screen. A seal composed of 2 to 3 ft of hydrated bentonite chips was constructed above the sand pack. The remaining annular space was grouted to the surface with a mixture of bentonite and cement grout. Monitoring well installation was completed in accordance with the procedures described in the Master Field Sampling and Analysis Plan (FSAP) of the *Final Master Project Plans for Naval Weapons Station Yorktown*, Section 3.9.1 (Baker, 2005).

Wetland Area Well Installation

Wetland area well 6GW08 was installed using a 4-inch stainless steel casing with an expendable endpoint. The casing was driven to depth using a tri-pod portable tower equipped with a 5-horse power gas-driven cathead and 140 lb hammer. When the casing had been advanced to 18 ft below ground surface (bgs), it was grouted in place and allowed to sit overnight prior to boring continuation to 36 ft bgs. The well itself was constructed with 1.5-inch ID schedule 40 PVC, which consisted of a 5-foot pre-packed (with sand) 0.01-inch slot screen and 35-foot riser; the remainder of the well construction was consistent with

2 ft of sand above the screen, 2 ft of bentonite on top of the sand, then grouted to ground surface.

Well construction details for the new monitoring wells in addition to existing wells are tabulated in Sections 4 through 11. Well locations are illustrated in Section 4 through 11 figures. Appendix A presents the test boring and well construction records for the new and existing monitoring wells. In addition, Section 3.8 of the Master FSAP describes the procedures for soil boring advancement in detail (Baker, 2005).

3.1.2 Monitoring Well Development

All nine newly installed monitoring wells were developed prior to sampling. Monitoring well development was performed after the grout used to construct the new monitoring wells had been allowed to adequately set (at least 24 hours or more) to prevent grout contamination of the screened interval. Submersible pumps were used to evacuate a minimum of five well volumes of water from each new well thereby removing silt and particulates from the well screen and surrounding filter pack. Development continued until five successive measurements of pH, specific conductivity, and temperature were stable (i.e. the readings for each measurement were within 10 percent of each other). Monitoring well development was completed in accordance with Section 3.10 of the Master FSAP (Baker, 2005). Development information, comprising water clarity (turbidity), pH, specific conductivity, and temperature, is presented in the field notes in Appendix B.

3.1.3 Groundwater Sampling

New and existing monitoring wells were sampled for analytes shown in tables included in Sections 4 through 10. Monitoring wells were purged prior to sample collection using low flow sampling methodology. Groundwater was pumped through disposable polyethylene tubing using a Grundfos® Redi-flow submersible pump or a peristaltic pump, depending on the depth to water, as a peristaltic pump cannot pull water from greater than 30 ft bgs. Field water quality parameters were collected using a YSI 556 multimeter and flow through cell. To ensure collection of groundwater representative of the aquifer, purging continued until three well volumes were collected and successive measurements of pH, specific conductivity, and temperature stabilized to within 10% of the previous reading. Purge time was also adjusted to minimize the turbidity of the samples. Field measurements collected during well purging are presented on tables included in Sections 4 through 10. Once the well had stabilized and three well volumes were purged, the flow through cell was disconnected and the groundwater was collected into pre-preserved laboratory prepared sample bottles. Monitoring well purging and groundwater sampling procedures were conducted in accordance with Section 3.13 of the Master FSAP (Baker, 2005), except a submersible or peristaltic pump was used in place of a bladder pump.

Sample bottles were packed on ice and shipped overnight to Compuchem Analytical Services, Cary, North Carolina. The Chain of Custody (COC) forms that accompanied the samples to the laboratory are contained in Appendix C. Sample handling and document custody procedures were followed as described in Section 4.0 of the Master Quality Assurance Project Plan (QAPP) of the *Final Master Project Plans for Naval Weapons Station Yorktown* (Baker, 2005).

In the volatile organic compound (VOC) results for monitoring well 6GW08, there was a trichloroethene (TCE) detection of 36,000 micrograms/Liter (µg/L). This result was significantly higher than any other TCE result from the monitoring wells sampled around the Site 6 impoundment area. Therefore, to verify that this was a repeatable result and representative of groundwater conditions, well 6GW08 was redeveloped and re-sampled (for the same analytic parameters as in the fall 2004) in March 2005. This new set of data was collected using the same Level IV Quality Assurance/Quality Control (QA/QC) as the original sample, which included duplicate, rinsate, and field blanks.

3.1.4 Quality Assurance/Quality Control Sample Collection

Samples collected for this field investigation were analyzed using Contract Laboratory Program (CLP) methods with Level IV QA/QC. These analytical methods, their contract required detection limits or practical quantitation limits, and QA/QC procedures are described in the Master QAPP, Section 6.0 (Baker, 2005). USEPA Level IV deliverables were submitted to Baker in accordance with the CLP Statement of Work (SOW) for organic and inorganic analyses.

Field QA/QC samples were collected during the sampling program. These samples were obtained to: (1) ensure that disposal sampling equipment was free of contaminants, (2) evaluate field methodology, (3) establish field background conditions, and (4) evaluate whether cross-contamination occurred during sampling and/or shipping.

Several types of field QA/QC samples were collected and analyzed and are defined below:

- Equipment Rinsate Blank: These samples are obtained by running laboratory grade deionized water over/through sample collection equipment after the piece of equipment was decontaminated (for reusable equipment) or prior to the equipment's use (for disposable equipment). These samples are used to determine if decontamination procedures for reusable equipment are adequate and/or if disposable, one-time use equipment is contaminant free prior to use. Since the sampling for Sites 1, 3, 6, 7, 11, and 17 was conducted using disposable equipment, only one rinsate blank was necessary from the pump tubing.

- Duplicate Sample: Duplicate samples are collected at the same time and under identical conditions as their associated sample. These samples are collected to evaluate reproducibility of sample results. One duplicate sample was collected for every ten environmental samples collected (or ten percent).

- Field Blank: Field blanks are generally collected to evaluate potential impacts to samples due to ambient air conditions in the field. Samples are typically collected using laboratory grade deionized water which is poured into sample bottles in the field under the same conditions under which environmental samples are collected. However, during this Phase I Groundwater RI, field blanks were obtained from each water source used during the field investigation. The water sources used during this field program included: laboratory-grade deionized water used to collect rinsate blanks, store-bought distilled water used for decontamination of the submersible pump, and non-potable water from the water supply tank on the drill rig (used during the monitoring well installation process). One sample from each of these water sources was collected for a total of three field blank samples.

- Trip Blank: Trip blanks are prepared at the laboratory, shipped with the sample containers, and stored on-site near the empty sample containers. Any time VOC samples are packed and shipped to the laboratory, a trip blank sample accompanies them to the laboratory inside their shipping cooler. The trip blanks are analyzed for VOCs, along with the other VOC samples. At no time after their preparation are the trip blank sample containers opened before they reached the laboratory. Trip blanks are used to evaluate whether or not cross-contamination may have occurred during sampling and/or shipping. For this sampling field effort, five trip blanks were necessary.

In addition to samples collected to monitor field quality control, samples are used to monitor quality within the laboratory. These include the following:

- Matrix Spike (MS): An aliquot of a matrix, either soil or water, is spiked with known quantities of specific compounds and subjected to the entire analytical procedure. By measuring recovery, the appropriateness of the method for the matrix can be determined.
- Matrix Spike Duplicate (MSD): A second aliquot of the same matrix as the matrix spike to determine the precision of the method.

One MS sample and one MSD sample were collected for every twenty environmental samples collected (or five percent).

A complete discussion of the QA/QC procedures can be found in Section 8.0 of the Master QAPP (Baker, 2005).

3.1.5 Decontamination Procedures

Decontamination procedures for heavy equipment (e.g., drilling augers), sampling equipment, and personnel were followed as per Section 3.23 of the Master FSAP (Baker, 2005). An industrial grade steam cleaner was used to decontaminate heavy equipment. Distilled water and Liquinox® were used to decontaminate the submersible pump motor lead between well development and well sampling of individual wells.

3.1.6 Monitoring Well Abandonment

The integrity of monitoring well 3GW08 was compromised during the 1998 Site 3 remedial action. The well appeared to be obstructed with dirt/debris, indicating that the well was disturbed during earth moving activities associated with the remedial action. An attempt to rehabilitate the well (i.e. clean out the PVC by flushing it with water) failed. Therefore, the well was abandoned, and well 3GW08B was installed to replace it. Monitoring well abandonment was completed in accordance with the procedures described in Section 3.11 of the Master FSAP (Baker, 2005), which included removing the well pad, protective casing, and the PVC riser and screen, then grouting the hole closed using a tremie pipe.

3.1.7 Surveying Activities

Miller-Stephenson & Associates (a Virginia-licensed and registered surveyor) conducted a survey of the new monitoring wells from February 8-11, 2005. Each of the monitoring wells was surveyed for vertical and horizontal control to an accuracy of 0.01 ft and 0.1 ft,

respectively. Monitoring wells were surveyed at the top of the PVC casing and at the ground surface. The vertical elevations were referenced to National Geodetic Vertical Datum 29 to remain consistent with the existing WPNSTA Yorktown vertical datum. Horizontal coordinates conformed to North American Datum 83 (Latest Adjustment) with ties to the Virginia State Plane Coordinate System.

3.1.8 Investigation Derived Waste Management

The investigation derived waste (IDW) generated during the field investigation included: twenty two 55-gallon drums of soil generated from drilling the soil borings and eight 55-gallon drums of liquid IDW generated from auger and rod and submersible pump decontamination and development and purge water from the monitoring wells. The drums were staged in front of the loading dock at Building 109, which is located southeast of the Site 6 impoundment area. Each drum was sealed with a bolted top, placed on a wooden pallet, and properly labeled with the site number from which the IDW was generated, source of the material (well/boring number), date collected, and CTO number. Once all sampling was complete, one soil and one liquid composite sample were collected from the drums and sent for Full Toxicity Characteristic Leachate Procedure (TCLP) [VOC, semi-volatile organic compound (SVOC), Pesticide, and Metals] and ignitability, corrosivity, and reactivity analysis. After receipt of analyses, the IDW was determined to be non-hazardous and was removed from the site by Industrial Marine Service (IMS) on November 15, 2004. IMS disposed of the liquid IDW at their permitted facility. The soil was sent to Soilex Corp. for disposal at the Southeastern Public Service Authority (SPSA) Regional landfill. The IDW disposal documentation is contained in Appendix D.

Health and safety expendables, such as sampling gloves, paper towels, polyethylene sheeting and other materials that came into contact with potential contamination were contained in large plastic bags and placed in municipal waste containers for disposal.

3.1.9 Data Validation

Data validation was performed by Environmental Data Management and Chemistry Consulting Services (e*data, inc.) of Marmora, New Jersey. The procedures for validation followed the appropriate Level IV Guidelines listed in the Naval Facilities Engineering Service Center (NFESC) guidance document entitled *Navy Installation Restoration Laboratory Quality Assurance Guide, Interim Document* (NFESC, 1996), which supercedes the Naval Energy and Environmental Support Activity (NEESA) guidance document *Sampling and Chemical Analysis Quality Assurance Requirements for the Navy Installation Restoration Program* (NEESA, 1988)

The data validation qualifiers, or flags, used for the Phase I Groundwater RI data for Sites 1, 3, 6, 7, 11, 17, 24, and 25 include the following:

- A “B” flag by the data validator indicates that the analytes have also been detected in a field, equipment, or trip blank, or in a laboratory QA/QC sample. The concentration of a “B”-qualified result is less than 5 or 10 times the concentration of the constituent for an associated QA/QC result. If the sample concentration is less than 5 or 10 times the associated blank concentration, the conclusion is that the analyte is not present in the sample.

- A "J" flag indicates that the analyte is present but the value is estimated.
- An "L" flag indicates that the analyte is present, but the reported value may be biased low and the actual value is expected to be higher.
- An "R" flag indicates an unusable result. The analyte may or may not have been present and the result was rejected.
- A "U" flag indicates that the analyte was not detected and the associated value indicates the approximate sample concentration necessary to be quantified.
- A "UJ" flag indicates that the analyte was not detected and the quantitation limit may be inaccurate or imprecise.
- A "UL" flag indicates that the analyte was not detected and the quantitation limit is probably higher.

3.1.10 Potential Non-Site Related Analytical Results

Some of the constituents detected in soil and/or groundwater from Sites 1, 3, 6, 7, 11, 17, 24, and 25 may be attributed to non-site-related conditions or sources such as laboratory contaminants, anthropogenic non-site release sources, and naturally occurring (background) concentrations of constituents.

3.1.10.1 Laboratory and Sample Blank Contamination

In some instances, chemicals detected in samples may have been introduced during field sampling, transportation to the analytical laboratory, or during laboratory procedures. Blank samples were analyzed and used in the QA process to determine which of the constituents may or may not be attributable to the field sample.

Typically, a field blank is collected to account for ambient conditions during sample collection. An equipment or rinsate blank is collected to determine if the equipment used to collect the samples (e.g., augers, bailers, and sample containers) was adequately clean. Additionally, the laboratory analyzes a method blank in each batch of 20 samples to verify instrument cleanliness and function. Common phthalate compounds can be introduced during the analytical process and are often considered laboratory contaminants.

When blank samples are found to contain common laboratory contaminants, each of the aqueous field samples associated with that blank that contain up to 10 times the concentrations in the blanks are qualified during data validation with a "B" for that compound. A "B" qualifier means that the compound may not be attributed to the site at that sample location. When a sampling or laboratory blank contains contaminants other than the common laboratory contaminants, each of the aqueous field samples associated with that blank that contain up to 5 times the concentrations is qualified during data validation with a "B" for that compound.

For this sampling event, a field blank was collected on non-potable drilling water. This sample was used for data validation. Consequently there are numerous B flagged values in the data set that may actually indicate detections.

SECTION 4

Sites 1 and 3 Summary and Investigation Results

Based on the close proximity of Sites 1 and 3 and their similar historical uses, these sites will be discussed together.

4.1 Sites 1 and 3 Background and Physical Characteristics

4.1.1 Site 1 History and Physical Setting

Site 1, Dudley Road Landfill, is located in the northern portion of WPNSTA Yorktown west of Indian Field Creek and north of an unnamed tributary to the creek. The site consists of a former landfill and the surrounding area (Figure 4-1).

Site 1 was originally used for sand mining and consisted of two borrow pits. Between 1965 and 1979, the site was operated as a landfill under a Conditional Permit (No. 287) issued by VDEQ, and the borrow pits were filled with solid waste materials. Waste disposed of included asbestos from insulation on steam piping; empty oil, grease, paint, and solvent containers; nitramine-contaminated carbon; household appliances; scrap metal banding; construction debris; tree limbs; lumber, packaging wastes; electrical wires; waste oil; and plastic lens grinding waste. These wastes were estimated at quantities of 17 tons/year for approximately 15 years. On January 12, 1979, VDEQ performed an inspection of the site. The landfill did not meet the Virginia Department of Health requirements governing the disposal of solid waste. The deficiencies were corrected and the landfill received approved waste until 1985 when the facility was closed. Another inspection of the closed disposal facility conducted by VDEQ on August 29, 1995 found deficiencies (subsidence and ponding water) within the landfill cover. These deficiencies were corrected during the 1999 Remedial Action as documented in the *Final Report, Remedial Action, Sites 1 and 3, and SSA 22* (OHM Remediation Services Corp., 2001a). The northern boundary of the main disposal area estimated from the 1994 geophysical survey is shown on Figure 4-1. The southern boundary was not included in the geophysical survey scope and no additional geophysical work was conducted to estimate this boundary.

The general topography at Site 1 is level (near the landfill) with slopes to the east and south toward Indian Field Creek and the unnamed tributary to Indian Field Creek. Thus, the majority of surface water at the site drains toward these surface water bodies. The majority of the area is cleared, but is surrounded by woods, which acts as a riparian buffer for the adjacent Indian Field Creek. A dirt road runs through the site and a dirt mound is located in the northern portion of the landfill.

4.1.2 Site 3 History and Physical Setting

Site 3, the Group 16 Magazines Landfill, is located just south of and across an unnamed tributary from Site 1, along the headwaters of Indian Field Creek (Figure 4-2). The landfill is

named for its proximity to the Group 16 Magazines, however, the history of this landfill is unrelated to operations at the magazines.

Similarly to Site 1, this landfill originally was used for sand mining and consisted of one borrow pit. Between 1940 and 1970, the site was operated as a landfill, and the borrow pit was filled with solid waste material. Wastes disposed of in the borrow pit include solvents, sludge from boiler cleaning operations, grease trap wastes, Imhoff tank skimmings containing oil and grease, and animal carcasses. The Site 3 landfill received approximately 90 tons of wastes during the time in which it was in use. The southern extent of the larger disposal area estimated from the 1993 geophysical survey is shown on Figure 4-2. The remainder of the boundary was not included in the geophysical survey as documented in the *Geophysical Investigation Report for Sites 1,2,3,4,12,16, 17, and 21* (Baker and Weston, 1993a). Upon cessation of disposal activities, the site was covered with approximately 2 ft of soil.

The general topography at Site 3 can be described as uneven with topographic highs at the northern and southwestern boundaries of the site and topographic lows (excluding the areas adjacent to Indian Field Creek) within the landfill. Surface water across the site flows northeast towards Indian Field Creek. The area adjacent to Indian Field Creek is covered by woods, which may act as a riparian buffer for surface water runoff.

4.1.3 Sites 1 and 3 Geology and Hydrogeology

Sites 1 and 3 are located on the Croaker Flat Terrace within the Virginia Coastal Plain Physiographic Province. Descriptions of the lithologic units present at Sites 1 and 3 are provided in Section 2.2.

Several monitoring wells have been installed at Sites 1 and 3. Construction details for site wells are summarized in Table 4-1. Based on boring logs for these wells (Appendix A), the surficial geology at Site 1 consists of the unconfined Columbia aquifer, which lies above the Yorktown confining unit. The thickness of the Columbia aquifer at Site 1 ranges from 10 to 18 ft. Hydraulic conductivity in the Columbia aquifer at Site 1 is estimated to be between 0.51 ft/day and 8.8 ft/day, and that of the Yorktown aquifer is estimated to be 9.60×10^{-2} ft/day (Table 4-2). Consistent with the 1997 USGS study, the Yorktown confining unit is truncated in the eastern portion of Site 1 close to Indian Field Creek (Figure 2-6). Consequently, the overlying Columbia aquifer is hydraulically connected to the underlying Yorktown aquifer in this area. Based on the 1997 USGS report, the Yorktown-Eastover aquifer is approximately 100 feet thick in the vicinity of Site 1 (Brockman et. al., 1997).

The surficial geology at Site 3 consists of an unsaturated clay layer lithologically consistent with the Yorktown confining unit. Since the water table is below the clay layer, the Yorktown-Eastover aquifer behaves as an unconfined aquifer. These findings are consistent with the results of the 1997 USGS study (Figure 2-6). The Yorktown-Eastover aquifer is approximately 80 feet thick in the vicinity of Site 3. The hydraulic conductivity of the shallow Yorktown-Eastover aquifer at Site 3 is estimated to be between 1.7 ft/day and 16 ft/day. The hydraulic conductivity in the deeper portion of the aquifer is estimated to be 4.2×10^{-1} ft/day (Table 4-2).

According to base wide geology described in Section 2.2, the Eastover-Calvert confining unit lies beneath the Yorktown-Eastover aquifer at both sites. Cross-sections of Site 1 and 3 are provided as Appendix E of this document.

Groundwater elevations collected at Site 1 as part of this Phase I Groundwater RI (Table 4-3) indicate that Columbia aquifer groundwater flow is primarily east and south toward Indian Field Creek and its tributary (Figure 4-3). Yorktown-Eastover groundwater flow is east/ southeast at Site 1 and north/northeast at Site 3 toward Indian Field Creek (Figure 4-4).

4.2 Previous Investigations

4.2.1 Initial Assessment Study (1984)

This effort was documented in the *Initial Assessment Study (IAS) of Naval Weapons Station Yorktown, Virginia (NEESA, 1984).* The IAS was conducted to identify and assess sites posing a potential threat to human health and the environment because of prior waste management activities. Sites 1 and 3 were identified for further evaluation. Activity records relating to waste generation, handling, and disposal were reviewed; physical conditions at the site were characterized; and migration pathways and potential receptors were identified. The results of the data evaluation were used to develop recommendations concerning the need for a confirmation study at Sites 1 and 3. The IAS concluded that because migration pathways to groundwater and surface water are present at Sites 1 and 3, sampling would be required to verify the presence of contamination and determine the need for further characterization and/or remediation.

4.2.2 Confirmation Study Round I (1986)

In 1986, groundwater, surface water, and sediment sampling was conducted at Sites 1 and 3. The purpose of the study was to verify the presence and/or absence of contamination at the sites recommended for further investigation in the IAS. Sites 1 and 3 were examined in conjunction with WPNSTA Sites 11 and 17 due to their close proximity to one another. This effort was documented in the *Confirmation Study Step IA (Verification), Round One*, (Dames & Moore, 1986).

During the Confirmation Study Round I, monitoring wells 1GW04, 1GW05, 3GW06, 3GW07, and 3GW08 were installed and sampled at Sites 1 and 3 (Figures 4-5 and 4-6). Samples were analyzed for VOCs, pesticides/ polychlorinated biphenyls (PCBs), metals, and explosives. Two surface water samples (1SW01 and 1SW02) and two sediment samples (1SD01 and 1SD02) also were collected and analyzed for the same constituents. Site 1 sample locations are shown on Figure 4-5. Site 3 sample locations are shown on Figure 4-6. Metals were detected in groundwater at both Site 1 (antimony, arsenic, barium, lead, nickel, and zinc) and Site 3 (arsenic, barium, and zinc). The compound, 1,2-dichloroethene (1,2-DCE), was detected in one sample from monitoring well 1GW04 (2 µg/L), which is below the MCL of 5 µg/L. Also, TCE was detected above the corresponding MCL (5 µg/L) at Site 3 in monitoring wells 3GW07 (17 µg/L) and 3GW08 (37 µg/L), which was destroyed during subsequent removal actions and replaced by 3GW08B.

Two sediment samples were collected within Indian Field Creek to assess potential impacts to sediment from both Site 1 and Site 3. 1SD01 was collected downgradient of both sites and

1SD02 was collected upgradient of both sites. In these samples, several inorganics (arsenic, barium, chromium, copper, nickel, and zinc) and the explosive, hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), were detected. Overall concentrations of constituents detected in these samples were comparable at locations 1SD01 and 1SD02. Maximum detections of nickel (5.30 mg/kg), zinc (34.6 mg/kg), and RDX (1,080 mg/kg) were detected in the upgradient sediment sample (1SD01). Maximum detections of arsenic (8.2 mg/kg), barium (14.9 mg/kg), chromium (14.3 mg/kg), and copper (6.00 mg/kg) were detected in the downgradient sediment sample (1SD02).

In the surface water samples collected at the same locations as the sediment samples, antimony, barium, chromium, lead, mercury, selenium, silver, thallium, and zinc were detected. Overall concentrations of these constituents were comparable at both sample locations. Maximum concentrations of antimony (95.4 µg/L), chromium (14.0 µg/L), lead (82.0 µg/L), mercury (0.26 µg/L), selenium (15.9 µg/L), and thallium (192.4 µg/L) were detected at downgradient surface water location (1SW02). Maximum concentrations of barium (20.0 µg/L), silver (11.01 µg/L), and zinc (31.0 µg/L) were detected at up gradient surface water location (1SW01).

There were no CVOCs detected in the surface water and sediment samples. Round I of the Confirmation Study (Dames & Moore, 1986) recommended that a second round of sampling be completed at Sites 1 and 3, and 11.

4.2.3 Confirmation Study Round II (1988)

Consistent with the recommendations of the Confirmation Study Round I, the groundwater monitoring wells and surface water and sediment sampling stations sampled during the Round I study at Sites 1 and 3 were sampled and analyzed for VOCs, pesticides/PCBs, metals, and explosives. This effort was documented in the *Confirmation Study Step IA (Verification), Round Two*, (Dames & Moore, 1988) as part of a Confirmation Study Round II. Two new up gradient surface water/sediment locations (1SW/SD03 and 1SW/SD04) were sampled during this study. Sample locations are shown on Figures 4-5 and 4-6.

At Site 1, inorganics comprising arsenic, barium, nickel, selenium, and zinc were detected in groundwater at maximum concentrations of 7.5 µg/L (1GW04), 24 µg/L (1GW05), 13 µg/L (1GW05), 2.4µg/L (1GW05), and 37 µg/L (1GW05), respectively. These concentrations do not represent exceedances of corresponding MCLs. Both 1GW04 and 1GW05 are located in the southeast portion of Site 1.

Barium, selenium, and zinc were detected in Site 3 monitoring wells. The highest concentrations of these constituents were 33 µg/L, 2.4 µg/L, and 5.9 µg/L, respectively, in the sample from 3GW07. Barium and selenium concentrations were below the corresponding MCLs of 2,000 µg/L and 50 µg/L, respectively. No MCL exists for zinc. The volatile organic, TCE, was detected in exceedance of the corresponding MCL (5 µg/L) in samples from Site 3 monitoring wells 3GW07 (30 µg/L) and 3GW08 (30 µg/L).

Several metals were detected in upgradient and down gradient sediment samples. Maximum concentrations detected in upgradient samples were: arsenic (11.5 mg/kg at 1SD01), barium (56 mg/kg at 1SD01), chromium (53 mg/kg at 1SD04), copper (23 mg/kg (1SD04), lead (10.2 mg/kg at 1SD01), nickel (13 mg/kg at 1SD01), silver (0.3 mg/kg at 1SD01 and 1SD04), and zinc (112 mg/kg at 1SD02). The highest concentrations of barium

(58 mg/kg), chromium (58 mg/kg), copper (28 mg/kg), lead (10.7 mg/kg), nickel (17 mg/kg), silver (0.33 mg/kg), and zinc (132 mg/kg) were detected in the downgradient sediment sample (1SD02). Overall, the concentrations of metals downgradient of Sites 1 and 3 were comparable to the upgradient concentrations.

Several metals were detected in upgradient surface water samples. Maximum concentrations detected in upgradient samples were: barium (18 µg/L at 1SW03), lead (7.5 µg/L at 1SW01), silver (7.3 µg/L at 1SW03), and zinc (11 µg/L at 1SW04). Detected concentrations in the downgradient sample (1SW02) were: arsenic (3.7 µg/L), barium (19 µg/L), lead (14.5 µg/L), silver (11.7 µg/L), and zinc (18 µg/L). Downgradient surface water sample concentrations of metals generally were higher than those concentrations detected upgradient.

No recommendations for further site investigation were made in the final Round II report (Dames & Moore, 1988).

4.2.4 Remedial Investigation Interim Report (1991)

The *RI Interim Report* (Versar, 1991) was drafted by Dames & Moore in 1989 and revised by Versar in 1991 to incorporate comments from the Technical Review Committee (TRC). The purpose of this report was to facilitate movement of the sites into the RI process. The report summarized available data from the Confirmation Studies for those sites recommended for further investigation in the IAS and, based on these data, provided recommendations for additional efforts to be conducted to complete the RI. The Interim RI recommended a risk assessment and additional sampling be conducted at Sites 1 and 3. Recommended investigation activities included groundwater, surface water and sediment sampling, as well as a hydrogeologic investigation and site boundary survey.

4.2.5 Remedial Investigation – Round One (1993)

Round One RI activities took place during the spring/summer 1992. Field activities included the collection of geophysical data, aquifer testing, installation of groundwater monitoring wells (1GW12, 1GW13, 1GW14, 1GW17, 3GW15, and 3GW18) and sampling of previously and newly installed monitoring wells, surface and subsurface soil sampling, surface water and sediment sampling, groundwater elevation surveys, and a soil cover survey utilizing Shelby tubes. Sample locations are shown on Figures 4-5 and 4-6. This information is documented in the *Final Round One RI for Sites 1-9, 11, 12, 16-19, and 21* (Baker and Weston, 1993a). Groundwater analytical results from 1992 are included in Tables 4-4 and 4-5, together with the results of the samples collected during the Phase I Groundwater RI conducted in 2004/2005.

Site 1 groundwater analytical results from the Round One RI indicated detections of chlorinated VOCs (CVOCs) comprising tetrachlorothene (PCE), TCE, and 1,2-DCE. The highest concentrations of CVOCs were detected in groundwater from 1GW12, a Columbia aquifer monitoring well in the southwest portion of the study area. Concentrations of TCE and 1,2-DCE were 18,000 µg/L and 1,000 µg/L, respectively, in the sample from this well. At Site 3, TCE was detected in samples from four monitoring wells, comprising 3GW06 (3 J µg/L), 3GW07 (9 J µg/L), 3GW08 (16 µg/L), and 3GW15 (86 µg/L). The compound, 1,2-

DCE, a daughter product of TCE, also was detected in the sample from 3GW15 at a concentration of 61 µg/L.

Several inorganics including aluminum, arsenic, cadmium, iron, lead, manganese, nickel, and zinc were detected in multiple Site 1 and 3 wells at concentrations above base wide maximum background concentrations for groundwater. At Site 3, barium, beryllium, and chromium were also detected above base wide background concentrations.

Sediment samples were collected from depth intervals of 0-6 inches and 6-12 inches bgs at eight locations associated with Site 1 (1SD05 through 1SD12) and two sediment sampling locations associated with Site 3 (3SD01 and 3SD02). Four of the sampling locations were located within the tidal channel of Indian Field Creek (1SD05 through 1SD08), three were located within the tidally affected drainages to Indian Creek, and five were collected in drainages not influenced by tide.

There were no detections of pesticides/PCBs or explosives in sediment samples associated with Sites 1 and 3. Concentrations of 4-methylphenol, pentachlorophenol, and phenol were detected in sediment samples from the Indian Field Creek channel (1SD05 through 1SD08), but were not detected in samples in the drainage channels adjacent to the site (1SD09 through 1SD12). With the exception of common laboratory contaminants that were likely not site-related, there were no other organic constituents detected in sediment samples.

Inorganics were detected in sediment samples from Sites 1 and 3 (Tables 4-6 and 4-7). Aluminum, antimony, arsenic, barium, beryllium, chromium, cobalt, copper, iron, lead, manganese, nickel, selenium, vanadium, and zinc were detected in one or more samples (Figures 4-6 and 4-7).

Six surface water samples were collected within Indian Field Creek. Four samples (1SW05, 1SW06, 1SW07, 1SW08) were collected downgradient of Sites 1 and 3 and one sample (1SW02) was collected upgradient (Table 4-8 and 4-9). Surface water sample 3SW01 was up gradient of Site 1 and downgradient of Site 3. Additionally one sample was collected from within the drainage channel that runs south of Site 1 to Indian Field Creek (1SW09), and one north of the landfill area (1SW10). The highest concentrations of metals detected most often (arsenic, barium, cadmium, chromium, copper, iron, lead, nickel, and zinc) were either from downgradient sample locations within the Indian Field Creek channel (1SW05 through 1SW08) or from the sample location north of the main Site 1 landfill area (1SW10). Total and dissolved metal concentrations were comparable in all sample locations. Lower concentrations of metals were detected in sample locations upgradient of Sites 1 and/or 3. Aluminum (50.4 µg/L at 3SW01), manganese (134 µg/L at 3SW02), and vanadium (14 µg/L at 3SW01) were the only metals detected at maximum concentrations in up gradient locations of Sites 1 and/or 3.

The Round One RI recommended that further investigation be conducted at Site 1 in order to delineate the extent of chlorinated solvent contamination and identify a potential source area. Another round of groundwater sampling was recommended at Site 3 to evaluate seasonal variation of TCE concentrations. It was also recommended that both sites undergo further geophysical investigation to define the boundaries of waste disposal.

4.2.6 Remedial Investigation – Round Two (1998)

Consistent with the recommendations made in the Round One RI, additional investigation activities took place at Sites 1 and 3 in January/February 1996 as part of a Round Two RI. Efforts from this field event are documented in the *Final Round Two RI Report, Site 1 and* 3 (Baker, 1997a). Field investigation activities included the installation of Columbia and Yorktown-Eastover groundwater monitoring wells, excavation of test pits, and the collection of surface soil, subsurface soil, sediment, surface water, and groundwater samples. Sample locations are shown on Figures 4-5 and 4-6.

Polycyclic aromatic hydrocarbons (PAHs) and pesticides were detected in both surface and subsurface soils at Site 1; however these concentrations did not exceed base-wide background concentrations. Potential risks to human health were identified based on exposure to arsenic, beryllium, and iron in surface and subsurface soil at Site 1. The highest metals concentrations were detected in the vicinity of monitoring well 1GW12A. The maximum arsenic concentration of 126 milligrams/kilogram (mg/kg) was detected in subsurface soil sample 1SB12A collected in the location of 1GW12A (Figure 4-5). Potential risks to human health were identified due to elevated concentrations of PAHs in surface and subsurface soils at Site 3. Elevated concentrations of PAHs were detected in soil sample 3SS10 (Figure 4-6).

Chlorinated solvents were detected in groundwater at Sites 1 and 3. TCE and cis 1,2-DCE were detected in Site 1 groundwater. The highest concentrations of TCE (190 µg/L) and cis 1,2-DCE (52 µg/L) in Columbia aquifer groundwater were detected in monitoring well 1GW20 located in the southwest portion of the study area. TCE was also detected in Yorktown-Eastover aquifer groundwater at well locations 1GW12A/B and 1GW21. The highest concentration of TCE was detected in 1GW12B (360 µg/L) within the shallow portions of the Yorktown-Eastover aquifer (30 to 50 ft bgs) just below the confining unit.

1,1-DCE, TCE, total 1,2-DCE, and vinyl chloride were detected in one or more of five monitoring wells at Site 3 (3GW07, 3GW08, 3GW15, 3GW15A, 3GW19, and 3GW19A). Maximum concentrations of total 1,1-DCE (4 J µg/L), TCE (860 µg/L), total 1,2-DCE (570 µg/L), and vinyl chloride (48 µg/L) were detected at 3GW19. These constituents exceeded one or more of their respective MCLs, with the exception of total 1,1-DCE, at all monitoring well locations except for 3GW07.

Several inorganics including aluminum, barium, cadmium, chromium, cobalt, copper, iron, lead, manganese, nickel, vanadium, and zinc were detected in groundwater at Sites 1 and 3 above base-wide background concentrations. Cadmium exceeded the MCL (5 µg/L) in Site 1 Columbia aquifer groundwater at 1GW12 (8.6 µg/L) and chromium exceeded the MCL (100 µg/L) in Yorktown-Eastover aquifer groundwater at 1GW13A (154 µg/L). Chromium also exceeded the MCL at Site 3 in the sample from monitoring well 3GW19 (177 µg/L). Non-carcinogenic and carcinogenic risks for the future adult and child residents were identified based on exposure to CVOC contamination in Columbia and Yorktown-Eastover aquifer groundwater at Sites 1 and 3.

Several metals (aluminum, arsenic, barium, cadmium, chromium, cobalt, copper, iron, lead, manganese, nickel, vanadium, and zinc) were detected in one or more sediment sample locations in the vicinity of Site 1 and 3 during the Round Two RI. While most of the maximum concentrations were located in the upgradient sample location (1SD17),

comparable concentrations were detected in the downgradient sample (1SD16) and in the headwaters of the unnamed tributary west of Indian Field Creek (1SD13, 1SD14, and 1SD15).

Several metals (aluminum, barium, cadmium, cobalt, copper, iron, lead, magnesium, manganese, vanadium, and zinc) were detected in one or more surface water samples (1SW15, 1SW16, 1SW17) in the vicinity of Sites 1 and 3. While the highest concentrations of most metals were detected in the upgradient sample location (1SW17) comparable concentrations were detected in all sample locations (Table 4-8).

The Round Two RI recommended removal of the surface soil SVOC "hot spot" at Site 3. It was recommended that Land Use Controls (LUCs) be implemented to restrict the use of Columbia and Yorktown aquifer groundwater as a potable source.

4.2.7 Hot Spot Delineation (1997)

Following the Round Two RI, "hot spot" delineation sampling was conducted at Sites 1 and 3 to address the risks identified in the RI and aid in removal action design. Sampling locations are shown on Figures 4-5 and 4-6.

Site 1 "hot spot" delineation was conducted in August and September 1997. Eighteen additional surface soil samples were collected near monitoring wells 1GW12A and 1GW12B in order to further evaluate elevated concentrations of arsenic detected in soil during the Round Two RI. Arsenic concentrations ranged from non-detect to 141 mg/kg.

Site 3 "hot spot" delineation sampling was conducted in August 1996 and September 1997. In August 1996, five surface soil and one subsurface soil sample were collected around sample location 3SS10, where elevated levels of PAHs had been previously detected. Total PAH concentrations in surface soil ranged from 2.2 mg/kg to 358.4 mg/kg. The subsurface soil concentration was 4.7 mg/kg. In September 1997, an additional six surface soil and subsurface soil samples were collected. The samples were field screened using PAH test kits and indicated PAH detections between 1 mg/kg and 10 mg/kg.

The results of the hot spot delineations sampling were used to support the *Final Focused Feasibility Study (FFS) for Sites 1 and* 3 (Baker, 1997b).

4.2.8 Final Focused Feasibility Study (1997)

The purpose of the *Final FFS for Sites 1 and 3* (Baker, 1997b) was to identify remedial action alternatives (RAAs) to address surface soil contamination at the sites. The FFS involved the development, screening, and detailed analysis of RAAs.

The remedial action objective developed for Site 1 in the FFS was to mitigate the potential for direct contact of arsenic in soils exceeding the final remediation goal (FRG) (63 mg/kg) by human receptors. The FFS examined three RAAs to address Site 1 arsenic: 1) no further action, 2) soil cover and surface debris removal, and 3) soil cover, surface debris removal and excavation with off-site disposal. Alternative 3 was identified as the preferred alternative.

The remedial action objective (RAO) developed for Site 3 was to mitigate the potential for direct contact with PAHs in soils exceeding the FRG (10 mg/kg) by human receptors, and to

prevent ecological effects to terrestrial receptors and eliminate the potential migration of these contaminants to other environmental media. The FFS examined four RAAs to address Site 3 PAHs: 1) no further action, 2) no further action with institutional controls and debris removal, 3) soil excavation with on-site treatment and debris removal, and 4) soil excavation with off-site disposal and debris removal. Alternative 4 was identified as the preferred alternative.

4.2.9 Proposed Plan/Record of Decision (1998-1999)

The *Final v2 Proposed Remedial Action Plan (PRAP) for Sites 1 and 3* (Baker, 1998a) was released to the public in May 1998 presenting the preferred alternatives identified in the FFS. The *Final Record of Decision (ROD) for Sites 1 and 3 (Baker, 1999a)* was signed in June 1999. The ROD documents the selected remedial actions to reduce the risk posed by soil at Sites 1 and 3.

4.2.10 Remedial Action (1999)

The remedial actions at Sites 1 and 3 began in July 1999 and were completed in April 2000. The effort at Site 1 included the removal of metal debris and transporting it to the Defense Recycling Material Office (DRMO); placing additional soil over the landfill area; removing the arsenic contaminated waste and disposing it off-site; placing borrow soil in the excavated area; grading the landfill area and excavated/backfilled area to provide graded slopes; and restoring the site with upland grasses. Eighteen inches of cover, followed by 6 inches of topsoil were placed on the landfill for a total of 2 ft of soil cover.

The Site 3 effort consisted of the removal and disposal of PAH-contaminated soil per the design plan, backfilling the excavation, and restoring the area. During the removal action, additional wastes (i.e., unidentified drums, galley waste, and batteries) were discovered and disposed off-site (OHM, 2001a). The remedial action for Site 3 resulted in residual soil concentrations at or below residential criteria, instead of the industrial criteria presented in the ROD.

4.2.11 Long-Term Monitoring (2000)

Long-term monitoring (LTM) at Sites 1 and 3 was initiated in May 2000, and included installation of additional wells, and groundwater, surface water, and sediment sampling for Target Compound List (TCL) VOCs to monitor the migration of contaminants to surface water bodies. Five rounds of LTM sampling were completed. Monitoring well sample results are comparable to those collected as part of the Groundwater RI (discussed below). Chlorinated solvents were detected in Indian Field Creek surface water and sediment. Concentrations of 1,2-DCE and TCE were detected in surface water from Indian Field Creek and its tributaries at maximum concentrations of 3 µg/L and 1 µg/L respectively. 1,2-DCE was detected in sediment just downgradient of Site 3 during the May 2005 round of LTM at a concentration of 180 µg/kg, but no CVOCs were detected during the August 2005 round of LTM.

4.3 Sites 1 and 3 Phase I Groundwater RI Field Activities

In order to provide additional data to evaluate the nature and extent of chlorinated solvents in groundwater, three additional monitoring wells were installed (Section 3.1.1), and groundwater samples were collected from three Site 1 Columbia aquifer monitoring wells (1GW04, 1GW05, and 1GW12) and three Yorktown-Eastover aquifer monitoring wells (1GW04A, 1GW05A, and 1GW12B) as part of this Phase I Groundwater RI. The groundwater samples collected were analyzed for TCL VOCs, SVOCs, pesticides/PCBs, Target Analyte List (TAL) total and dissolved metals, and cyanide. In addition, VOC data from Columbia aquifer well 1GW20, which was sampled for only VOCs as part of the Site 1 LTM in 2004, are summarized in this report for the purpose of providing a more complete site data set.

Two Site 3 Yorktown-Eastover aquifer monitoring wells were sampled as part of this Phase I Groundwater RI (3GW19 and 3GW19A) and analyzed for TCL VOCs and total and dissolved metals. VOC data were from wells 3GW08A, 3GW08B, 3GW20, and 3GW20A, which were sampled for only VOCs as part of the Site 3 LTM Program in 2004 are included in the evaluation herein.

Table 4-10 presents the samples collected, comprising associated QA/QC samples, and the analytical parameters for these samples, and Figures 4-1 and 4-2 show the location of the Sites 1 and 3 monitoring wells, respectively. Geo-chemical parameters (specific conductance, pH, turbidity, and temperature) for each well are listed on 4-11.

4.4 Site 1 Analytical Results

Tables 4-4, 4-6, and 4-8 present the analytical results of the Site 1 Phase I Groundwater RI sampling event along with results from the Round One and Round Two RIs and LTM sampling events. Appendix F presents complete analytical results for this Phase I Groundwater RI sampling event only. Figures 4-7, 4-8, 4-9, and 4-10 depict concentrations of organic and inorganic constituents exceeding MCL and maximum background concentrations at any Site 1 well during this Phase I Groundwater RI. No pesticides/PCBs were detected in Site 1 groundwater. Only one SVOC (phenol) was detected in one Site 1 groundwater sample from Yorktown-Eastover aquifer; it was detected in monitoring well 1GW12B (21 µg/L) at a concentration above the corresponding maximum background concentration.

4.4.1 VOC Analytical Results

Of the 48 VOCs analyzed, five were detected in site monitoring wells: 1,1-DCE, carbon disulfide, cis 1,2-DCE, TCE, and vinyl chloride. 1,1-DCE and carbon disulfide were detected in one Yorktown-Eastover aquifer well (1GW12B), at concentrations of 4 µg/L and 30 µg/L, respectively. TCE, cis-1,2-DCE, and vinyl chloride were detected in groundwater samples from both the Columbia aquifer and Yorktown-Eastover aquifer. TCE was detected in two Columbia aquifer wells, at concentrations of 90 µg/L (1GW12) and 3 µg/L (1GW20). Cis-1,2-DCE was detected in two Columbia aquifer wells, at concentrations of 20 µg/L (1GW04) and 130 µg/L (1GW12). Vinyl chloride was detected in only one Columbia aquifer well (1GW12), at a concentration of 14 µg/L. TCE, cis-1,2-DCE, and vinyl chloride were also

detected in deep Yorktown-Eastover aquifer well 1GW12B at concentrations of 760 µg/L, 160 µg/L, and 7 µg/L, respectively.

Concentrations of TCE, cis 1,2-DCE and vinyl chloride exceeded the corresponding MCL values of in 5 µg/L, 70 µg/L, and 2 µg/L respectively in one or more Site 1 samples. The highest concentrations of VOCs in groundwater were detected in samples from the 1GW12/1GW12B well pair in the southwestern portion of the site. There were no VOCs detected in the background data set.

4.4.2 Total and Dissolved Metals Analytical Results

Of the 23 inorganics analyzed, ten total (aluminum, cadmium, calcium, iron, magnesium, manganese, nickel, potassium, sodium, and zinc) and eleven dissolved metals (aluminum, cadmium, calcium, iron, magnesium, manganese, nickel, potassium, selenium, sodium, and zinc) were detected in Site 1 groundwater during the Phase I Groundwater RI.

The iron concentration in the total (unfiltered) sample from 1GW05 (22,800 µg/L) exceeded the Columbia aquifer maximum background concentration (11,600 µg/L). Total manganese was detected above the Columbia aquifer background concentration (105 µg/L) in groundwater from 1GW04 (93.4 µg/L), 1GW05 (97.6 µg/L), and 1GW12 (2,480 µg/L). Total nickel was detected in groundwater above the Columbia aquifer maximum background concentration (<5.2 µg/L) in groundwater from 1GW05 (6.3J µg/L) and 1GW12 (12.4J µg/L). Dissolved iron, manganese, and nickel were also detected above maximum background concentrations (17.7 µg/L, 50.4 µg/L, and <5.2 µg/L, respectively) in groundwater at Columbia aquifer monitoring wells 1GW05 and 1GW12. The total (2,350 µg/L) and dissolved (2,420 µg/L) concentrations of zinc from 1GW12 were also above the corresponding Columbia aquifer maximum background concentration of 15.6 J µg/L. Cadmium was detected above the Columbia aquifer maximum background concentration (<2.3 µg/L) and MCL standard (5 µg/L) in groundwater from monitoring well 1GW12 at a concentrations of 6.7 µg/L and 5.3 µg/L in unfiltered and filtered samples. Total (388 µg/L) and dissolved (270 µg/L) aluminum were detected in groundwater at Columbia aquifer monitoring well 1GW05 above maximum background concentrations of 20.9 µg/L). Selenium (2.5 J µg/L) was detected in groundwater at Columbia aquifer monitoring well 1GW05 above maximum background concentrations of <2.6 µg/L.

Total aluminum was detected above the corresponding maximum Yorktown-Eastover aquifer background value of 1160 µg/L in the sample collected from monitoring well 1GW12B (1,420 µg/L). Dissolved aluminum was detected above the corresponding maximum background concentration of 146 J µg/L in groundwater at Yorktown-Eastover aquifer monitoring well 1GW12B (2,670 µg/L).Total manganese was detected in groundwater at monitoring well 1GW05A above the corresponding maximum background concentration of 105 µg/L at a concentration of 38µg/L. Dissolved manganese was detected in the Yorktown-Eastover aquifer at monitoring well locations 1GW04A (95.9 µg/L) and 1GW05A (41.5 µg/L) above the maximum background concentration of 12.2 µg/L. The sample collected from monitoring well 1GW04A also showed a detection of dissolved iron (1,180 µg/L) above the maximum background concentration (5.8 µg/L).

It should be noted that several inorganics comprising arsenic, barium, beryllium, cobalt, copper, lead, and vanadium were actually detected in Site 1 total and dissolved metals

samples, but were flagged with B qualifiers during validation and are thus considered as non-detects. This may have been due to detections of these constituents in the field blank collected on the non-potable drilling water. Consequently these non-detect results may not be reflective of actual concentrations in aquifer water.

4.5 Site 3 Analytical Results

Figures 4-11 and 4-12 present analytical exceedances of background maximum and MCL values for Site 3 samples collected during the Phase I Groundwater RI field activities.

4.5.1 VOC Analytical Results

Of the 48 VOCs analyzed, five were detected in Site 3 monitoring wells: 1,1-DCE, bromodichloromethane, cis 1,2-DCE, TCE, and vinyl chloride. 1,1 DCE and bromodichloromethane were detected in groundwater at well location 3GW19 at concentrations of 2 µg/L and 1 µg/L respectively. TCE was detected in three wells at concentrations of 5 µg/L (3GW08B), 120 µg/L (3GW19), and 6 µg/L (3GW19A). Cis 1,2 DCE was detected in groundwater at three well locations: 3GW19A (6J µg/L), 3GW20 (5J µg/L) and 3GW19 (320 µg/L). Vinyl chloride was detected in samples from two wells at concentrations of 42 µg/L (3GW19) and 4J µg/L (3GW20).

All detections of TCE and vinyl chloride were at or above the corresponding tap water MCLs for these compounds of 5 µg/L and 2 µg/L respectively. The concentration of cis 1,2-DCE in the sample from 3GW19 was also above the corresponding MCL of 70 µg/L. The highest concentrations of VOCs in groundwater were detected in the sample from 3GW19 on the northeast side of the landfill.

4.5.2 Total and Dissolved Metal Analytical Results

Of the 23 inorganics analyzed, 8 total metals (aluminum, barium, calcium, iron, magnesium, manganese, potassium, and sodium) and 6 dissolved metals (barium, calcium, magnesium, manganese, potassium, and sodium) were detected in Site 3 groundwater samples from the 3GW19/3GW19A well pair. Total and dissolved manganese was detected above the maximum background concentrations for total (18.4 µg/L) and dissolved metals (12.2 µg/L) in samples from both 3GW19 and 3GW19A (Table 4-5). Total and dissolved manganese were detected at concentrations of 53.8 µg/L and 53.5 µg/L respectively, in monitoring well 3GW19. In monitoring well 3G19A, total and dissolved manganese were detected at concentrations of 55.3 µg/L and 57.6 µg/L, respectively. Manganese was the only concentration exceeding the maximum background concentration in any sample.

It should be noted that several total (arsenic, chromium, cobalt, copper, nickel vanadium, and zinc) and dissolved metals (aluminum, arsenic, iron, and zinc) were detected in Site 3 samples, but were flagged with B qualifiers during validation and are thus considered non-detects. This may have been due to detections of these constituents in the field blank collected on the non-potable drilling water. Consequently these non-detect results may not be reflective of actual concentrations in aquifer water.

4.6 Sites 1 and 3 Nature and Extent of Contamination

At Site 1, elevated concentrations of TCE, 1, cis 1,2-DCE, and vinyl chloride were detected in the vicinities of 1GW12/1GW12B, 1GW20 and 1GW04. Although the extent of the volatile organic contamination cannot be sufficiently delineated based on the existing well depths and locations, it is likely that the contamination originates in the previous waste disposal area (Figure 4-1) and extends south-southeast consistent with the direction of groundwater flow towards Indian Field Creek (Figures 4-3 and 4-4). The CVOCs are present within the Yorktown confining unit to a depth of at least 28.0-38.0 bgs at 1GW12B. During previous rounds of sampling VOCs were not detected in the deeper companion well for this well (1GW12A) which is screened from 49.5 to 64.5 ft bgs. Groundwater from Sites 1 and 3 is discharging to Indian Field Creek and its tributaries. Concentrations of CVOCs (TCE and cis-1,2 DCE) were detected in surface water and sediment samples from Indian Field Creek during LTM sampling, indicating that groundwater from the sites is impacting surface water and sediment.

Based on existing data, the aerial extent of CVOC contamination at Site 3 appears to be limited to the northeast portion of the site just upgradient of Indian Field Creek in the vicinity of 3GW19/3GW19A, and 3GW08B. It is likely that the source of the contamination is south of this area within the estimated boundary of the waste material delineated during the geophysical survey (Figure 4-2).

Concentrations of inorganics in groundwater at Sites 1 and 3 do not indicate a contiguous plume. At Site 1, the concentrations of iron, manganese, nickel and zinc in samples from 1GW12 and 1GW12B are notably higher than background concentrations and concentrations detected in samples from other site wells. The concentration of cadmium in 1GW12 (6.7 µg/L) exceeded the MCL during this and previous rounds of sampling. The concentrations of arsenic and lead exceeded the corresponding MCLs in the sample collected during the 1996 RI. No additional inorganic samples have been collected at this station. These concentrations appear sporadic based on existing data points. At Site 3, concentrations of inorganics were not notably over background maximum concentrations.

4.7 Sites 1 and 3 Fate and Transport

4.7.1 Fate and Transport of CVOCs

The CVOCs at Sites 1 and 3 are considered to be extremely to very mobile and will migrate as a dissolved phase with groundwater flow. Based on existing data, the current primary migration pathways of TCE and its daughter products at Sites 1 and 3 are based on flow by advection within the groundwater. Advective flow is directed toward Indian Field Creek and its unnamed tributary at Sites 1 and 3.

Fate and transport mechanisms for flow though porous media that are also likely to be influencing TCE migration include hydrodynamic dispersion and retardation. Hydrodynamic dispersion describes the tendency of contaminants to spread out from the path that they would be expected to follow based on advective hydraulics alone. Hydrodynamic dispersion occurs due to mechanical mixing during fluid advection and molecular diffusion due to the thermal-kinetic energy of the solute particles. Retardation results from the transfer by adsorption or other chemical processes of contaminant mass

from the flowing pore water to surrounding soil particles resulting in slower transport of the contaminant mass.

TCE is denser than water and has a tendency to migrate downward due to gravity. In the vicinity of 1GW12/1GW12B, concentrations of TCE are higher in the upper portion of the partially confined Yorktown aquifer than they are in the shallow Columbia aquifer. Since it is unlikely that the contaminants are migrating through the intact Yorktown confining unit which is approximately 15 to 20 feet thick in this area, it is believed that the contaminants are migrating downward east of this well where the confining unit is absent.

Based on analytical results containing TCE's daughter products (DCE and vinyl chloride), some of the TCE released at Sites 1 and 3 has been degraded via biological reductive dechlorination. Biological reductive dechlorination is a naturally-occurring, microbially mediated, anaerobic process in which chlorine atoms on a parent CVOC molecule are sequentially replaced with hydrogen. In the reductive dechlorination process, electrons are transferred from an electron donor source to the CVOC compound, which functions as the electron acceptor. Anaerobic (reducing) conditions are required for effective reductive dechlorination.

The principal anaerobic biodegradation pathway for reductive dechlorination of chlorinated ethenes is:

TCE → DCE → vinyl chloride → ethene

The transformation rate for each step varies but tends to become slower with progress along the breakdown sequence, often resulting in accumulation of 1,2-DCE and VC. These degradation products have been detected in groundwater at Sites 1 and 3, indicating that biodegradation may be occurring. Expected results of natural attenuation are decreases in TCE concentrations along with simultaneous increases in daughter products. This pattern is not evident at Sites 1 and 3. This may indicate either than natural attenuation is not occurring or that ethene is being generated at the same rate that TCE and its daughter products are being degraded.

4.7.2 Fate and Transport of Inorganics

Elevated concentrations of metals comprising barium, cadmium, chromium, iron, lead, and manganese are present in groundwater at Sites 1 and 3. These constituents are generally much less mobile than CVOCs and consequently usually do not migrate far from their source areas. The existing distribution of inorganics at Sites 1 and 3 is sporadic, consistent with multiple source areas of constituents with limited mobility.

4.8 Sites 1 and 3 Conclusions and Recommendations

The primary contaminants at Sites 1 and 3 are TCE and its daughter products. These contaminants are likely migrating downward via gravity and towards Indian Field Creek via advection. The contaminants likely migrate along the top of the confining unit (where present) and down into the Yorktown aquifer where the confining unit is absent. However, the extent of CVOC contamination at these sites cannot be fully defined based on existing data.

1. Therefore, it is recommended that a real-time technology such as a membrane interface probe (MIP) be used to vertically and horizontally delineate the extent of the CVOCs and select well locations based on source areas and identified upgradient and downgradient areas.
2. It is recommended that additional sampling be conducted at the groundwater/surface water interface in order to further evaluate the interaction between groundwater and surface water. Based on the results of the MIP investigation, this sampling may include surface water, sediment, and pore water sampling.
3. It is recommended that further investigation be conducted to determine the extent of the Yorktown-Eastover confining unit at Site 1 to facilitate understanding of the interaction between the two aquifers at the site.
4. It is also recommended that one additional well be installed on the parcel of land east of Indian Field Creek to ensure that migration under the creek is not occurring.
5. New and existing wells should be sampled for metals, VOCs, and natural attenuation parameters [methane, ethane, ethene, nitrate, nitrite, sulfide, sulfate, chloride, dissolved oxygen (DO), oxidation-reduction potential (ORP), alkalinity, total organic carbon (TOC) and *Dehalococcoides*].
6. Following this additional investigation, it is recommended that risks due to groundwater contamination at these sites be quantified in revisions to the HHRA and ERA completed during the Round Two RI.
7. If data from this Phase I Groundwater RI is used for risk assessment purposes, it is recommended that the inorganic data be revalidated without using the field blank, which was collected on non-potable drilling water.

TABLE 4-1
Groundwater Monitoring Well Construction Details at Sites 1, 3
Phase I Groundwater Remedial Investigations for Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Well Number	Aquifer	Date Installed	Top of PVC Casing Elevation (ft msl)	Ground Surface Elevation (ft msl)	Boring Total Depth (ft bgs)	Elevation Bottom of Boring (ft msl)	Well Diameter	Total Well Depth (ft bgs)	Bottom Well Elevation (ft msl)	Outer Casing Interval (ft bgs)	Depth to Screen Interval (ft bgs)	Top of Screen Interval Elevation (ft msl)	Bottom of Screen Interval Elevation (ft msl)	Depth to Top of Sand Pack (ft bgs)	Depth to Top of Bentonite (ft bgs)
1GW04	Columbia	01/07/1986	9.52	6.40	16.5	-10.10	4	16.5	-10.10	--	1.5 - 16.5	4.9	-10.1	1	0
1GW04A	Yorktown-Eastover	05/11/2000	9.36	7.57	42	-34.43	2	42	-34.43	0 - 14	32 - 42	-24.4	-34.4	30	28
1GW05 (1)	Columbia	12/11/1985	36.74	35.10	15.5	19.60	4	15.5	19.60	--	0.5 - 15.5	34.6	19.6	0.5	1
1GW05A	Yorktown-Eastover	05/11/2000	37.83	36.17	70	-33.83	2	70	-33.83	0 - 14	60 - 70	-23.8	-33.8	58	56
1GW12	Columbia	06/10/1992	45.28	42.50	14	28.50	4	14	28.50	--	4 - 14	38.5	28.5	2	1
1GW12A	Yorktown-Eastover	01/26/1996	43.34	41.40	65	-23.60	2	64.5	-23.10	0 - 13	49.5 - 64.5	-8.1	-23.1	46	43
1GW12B	Yorktown-Eastover	01/29/1996	43.52	40.70	38	2.70	2	38	2.70	0 - 13	28 - 38	12.7	2.7	25	23
1GW13	Columbia	06/10/1992	43.54	40.80	14	26.80	4	14	26.80	--	4 - 14	36.8	26.8	3	2
1GW13A	Yorktown-Eastover	01/28/1996	42.27	40.30	75	-34.70	2	75	-34.70	0 - 13	60 - 75	-19.7	-34.7	57	55
1GW14	Columbia	06/09/1992	47.98	44.80	15	29.80	4	15	29.80	--	5 - 15	39.8	29.8	3	1
1GW17	Columbia	06/10/1992	41.49	38.90	12	26.90	4	12	26.90	--	2 - 12	36.9	26.9	1	0
1GW18	Columbia	01/24/1996	49.31	47.10	19	28.10	2	18	29.10	--	8 - 18	39.1	29.1	2	1
1GW19	Columbia	01/23/1996	45.96	43.56	15	28.56	2	13	30.56	--	3 - 13	40.6	30.6	2	1
1GW20	Columbia	01/23/1996	27.29	24.90	13	11.90	2	10	14.90	--	3 - 10	21.9	14.9	3	1
1GW21	Columbia	01/24/1996	34.15	32.20	41	-8.80	2	40	-7.80	--	25 - 40	7.2	-7.8	22	20
1ST01(3)	Columbia	09/23/2005	5.88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3GW06	Yorktown-Eastover	2/13/1986	45.41	43.10	51	-7.90	2	50	-6.90	--	35 - 50	8.1	-6.9	17	16
3GW07	Yorktown-Eastover	1/6/1986	27.69	24.30	31	-6.70	2	31	-6.70	--	16 - 31	8.3	-6.7	13	12
3GW08A	Yorktown-Eastover	2/8/1996	27.99	25.90	75	-49.10	2	75	-49.10	--	60 - 75	-34.1	-49.1	57	53
3GW08B	Yorktown-Eastover	9/20/2004	28.03	25.98	35	-9.02	2	35	-9.02	--	25 - 35	1.0	-9.0	23	21
3GW15	Yorktown-Eastover	06/05/1992	31.96	29.50	37	-7.50	4	35	-5.50	--	20 - 35	9.5	-5.5	17	15
3GW15A	Yorktown-Eastover	01/30/1996	31.75	29.70	70	-40.30	2	70	-40.30	--	55 - 70	-25.3	-5.3	52	49
3GW18	Yorktown-Eastover	06/03/1992	48.39	46.20	51	-4.80	4	50	-3.80	--	35 - 50	11.2	-3.8	33	31
3GW19	Yorktown-Eastover	02/07/1996	39.51	37.10	45	-7.90	2	45	-7.90	--	30 - 45	7.1	-7.9	27	23
3GW19A	Yorktown-Eastover	02/05/1996	39.62	37.30	84	-46.70	2	81	-43.70	--	66 - 81	-28.7	-43.7	63	60
3GW20	Yorktown-Eastover	9/20/2004	31.18	29.48	50	-20.52	2	50	-20.52	--	40 - 50	-10.5	-20.5	38	36
3GW20A	Yorktown-Eastover	9/20/2004	31.31	29.07	80	-50.93	2	80	-50.93	--	70 - 80	-40.9	-50.9	67	65
3ST01(3)	Yorktown-Eastover	9/23/2004	4.63	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NOTES:
msl - mean sea level (in feet)
bgs - Below Ground Surface (in feet)
-- NA
(1) Modified well construction due to shallow groundwater table
(2) Drive point, no sand pack
(3) Staff gauge

TABLE 4-2
Summary of Hydraulic Conductivity Values at Sites 1, 3
Phase I Groundwater Remedial Investigation for Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Site	Monitoring Well	Hydraulic Conductivity (ft/day)	Aquifer
1	1GW04	5.50E+00	Columbia
	1GW05	5.10E-01	Columbia
	1GW12	2.10E+00	Columbia
	1GW12A	9.60E-02	Yorktown-Eastover
	1GW13	1.10E+00	Columbia
	1GW14	1.70E+00	Columbia
	1GW17	8.80E+00	Columbia
	1GW18	8.35E+00	Columbia
	1GW19	5.33E+00	Columbia
3	3GW06	5.50E+00	Yorktown-Eastover
	3GW07	1.70E+00	Yorktown-Eastover
	3GW08	1.00E+01	Yorktown-Eastover
	3GW18	1.60E+01	Yorktown-Eastover
	3GW19A	7.46E-01	Yorktown-Eastover

TABLE 4-3
Summary of Groundwater Elevation Data at Sites 1, 3
Phase I Groundwater Remedial Investigation for Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Monitoring Well	Aquifer	Depth to Water (ft) October 12, 2004	Top of Casing (ft above msl)	Groundwater Elevation (ft above msl) October 12, 2004
1GW04	Columbia	5.73	9.45	3.72
1GW04A	Yorktown-Eastover	3.35	9.36	6.01
1GW05	Columbia	3.95	36.59	32.64
1GW05A	Yorktown-Eastover	32.25	37.83	5.58
1GW12	Columbia	9.08	45.24	36.16
1GW12A	Yorktown-Eastover	30.68	43.34	12.66
1GW12B	Yorktown-Eastover	28.68	41.48	12.80
1GW13	Columbia	8.69	43.52	34.83
1GW13A	Yorktown-Eastover	35.74	42.27	6.53
1GW14	Columbia	9.60	47.98	38.38
1GW17	Columbia	5.82	38.9	33.08
1GW18	Columbia	11.52	49.31	37.79
1GW19	Columbia	8.09	45.96	37.87
1GW20	Columbia	11.23	27.29	16.06
1GW21	Columbia	20.20	34.15	13.95
3GW06	Yorktown-Eastover	35.09	45.52	10.43
3GW07	Yorktown-Eastover	21.90	27.56	5.66
3GW08A	Yorktown-Eastover	22.36	27.99	5.63
3GW08B	Yorktown-Eastover	22.47	28.03	5.56
3GW15	Yorktown-Eastover	23.40	31.92	8.52
3GW15A	Yorktown-Eastover	23.46	31.75	8.29
3GW18	Yorktown-Eastover	35.34	48.33	12.99
3GW19	Yorktown-Eastover	33.74	39.51	5.77
3GW19A	Yorktown-Eastover	33.61	39.62	6.01
3GW20	Yorktown-Eastover	26.23	31.18	4.95
3GW20A	Yorktown-Eastover	26.27	31.31	5.04

Note:
msl - mean sea level

TABLE 4-4
Groundwater Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Columbia Aquifer**	**Maximum Background - Yorktown-Eastover Aquifer**	Columbia							Yorktown-Eastover			
Station ID				YS01-GW004							YS01-GW004A			
Sample ID				YS01-MW004-0792	YS01-MW004-0296	YS01-MW004P-0296	YS01-MW004-0904	YS01-MW004-0205	YS01-MW004-0505	YS01-MW004-0805	YS01-MW004A-0600	YS01-MW004A-0904	YS01-MW004A-0205	YS01-MW004A-0505
Sample Date				07/20/92	02/10/96	02/10/96	09/21/04	02/10/05	05/04/05	08/04/05	06/16/00	09/21/04	02/10/05	05/04/05
Investigation				Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	GW RI Data	LTM Data	LTM Data
Chemical Name														
Volatile Organic Compounds (UG/L)														
1,1,2-Trichloroethane	5	1 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	7	1 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	70	NA	NA	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	No MCL	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	No MCL	1 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U
Chloroform	80	6	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	5	2 U	2 U	10 U	10 U	10 U	10 U	10 U	37	10 U	2 B	10 U	10 U	42
Tetrachloroethene	5	1 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	1,000	1 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	5	1 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	2	1 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	70	1 U	1 U	NA	NA	NA	20	23	22	22	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	100	1 U	1 U	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Semi-volatile Organic Compounds (UG/L)														
Di-n-octylphthalate	No MCL	10 U	10 U	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Diethylphthalate	No MCL	10 U	10 U	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Nitrobenzene	No MCL	10 U	10 U	NA	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Phenanthrene	No MCL	10 U	10 U	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Phenol	No MCL	10 U	1 J	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Pyrene	No MCL	10 U	10 U	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Explosives (UG/L)														
Nitrobenzene	No MCL	0.98 U	0.73 U	0.31 U	0.35 U	0.32 U	NA	NA	NA	NA	NA	NA	NA	NA
Total Metals (UG/L)														
Aluminum	No MCL	3170	1160	6,430 J	716	1,080	80.7 U	NA	NA	NA	NA	80.7 U	NA	NA
Arsenic	10	5.2 L	3.5 J	5.5 J	1.7 L	2.1 L	6 B	NA	NA	NA	NA	2.1 U	NA	NA
Barium	2,000	53 J	43.6 J	78.4	39.8	39.9	45.1 B	NA	NA	NA	NA	7.9 B	NA	NA
Beryllium	4	0.38 K	0.2 U	1 U	0.8 U	0.8 U	0.1 U	NA	NA	NA	NA	0.1 U	NA	NA
Cadmium	5	2.3 U	2.3 U	4 U	2.2 U	2.2 U	0.2 U	NA	NA	NA	NA	0.2 U	NA	NA
Calcium	No MCL	155000	67100	80,600	103,000	99,800	105,000	NA	NA	NA	NA	25,300	NA	NA
Chromium	100	12.8 L	4.7 L	16.4	2.4 U	2.4 U	0.9 U	NA	NA	NA	NA	0.9 U	NA	NA
Cobalt	No MCL	5 J	2.1 U	6 U	3 U	3 U	0.5 U	NA	NA	NA	NA	0.5 U	NA	NA
Copper	1,300	4.7 J	4.5 J	5.4	2 U	2 U	0.6 U	NA	NA	NA	NA	0.6 U	NA	NA
Iron	No MCL	11600	2350	17,900 J	1,600	1,990	1,330	NA	NA	NA	NA	72.8 B	NA	NA
Lead	15	2.5 L	1.5 U	8.5 J	1.5	0.8 U	1.1 U	NA	NA	NA	NA	1.1 U	NA	NA
Magnesium	No MCL	3400 J	3350 J	3,480 J	5,540	5,390	3,020 J	NA	NA	NA	NA	379 J	NA	NA
Manganese	No MCL	105	18.4	114	29	27.4	93.4	NA	NA	NA	NA	21.7	NA	NA
Nickel	No MCL	5.2 U	5.2 U	18 U	11.3 U	11.3 U	0.6 U	NA	NA	NA	NA	0.6 U	NA	NA
Potassium	No MCL	1710 J	5510	1,910	2,540 L	2,550 L	1,230 J	NA	NA	NA	NA	898 J	NA	NA
Selenium	50	2.4 U	2.9 J	2 UJ	1.3 U	1.3 U	2.4 U	NA	NA	NA	NA	2.4 U	NA	NA
Sodium	No MCL	7110	8300	7,750 J	10,900	10,600	7,670	NA	NA	NA	NA	5,640	NA	NA
Vanadium	No MCL	16 J	7.5 J	22.2	3.4	4.1	0.6 U	NA	NA	NA	NA	0.6 U	NA	NA
Zinc	No MCL	30.2 J	14.9 J	42.8	3.6 UL	5.4 L	4.1 U	NA	NA	NA	NA	4.1 U	NA	NA
Dissolved Metals (UG/L)														
Aluminum	No MCL	20.9 J	146 J	35 U	23.3 U	23.3 U	80.7 U	NA	NA	NA	NA	80.7 U	NA	NA
Arsenic	10	2.6 U	2.6 UL	4.3 J	0.9 UL	1.2 L	2.1 U	NA	NA	NA	NA	3.1 B	NA	NA
Barium	2,000	37.2 J	30.9 J	29.3	34.4	35	7.4 B	NA	NA	NA	NA	44.5 B	NA	NA
Beryllium	4	0.2 U	0.2 U	1 U	0.8 U	0.8 U	0.12 B	NA	NA	NA	NA	0.12 B	NA	NA
Cadmium	5	2.3 U	2.3 U	4 U	2.2 U	2.2 U	0.2 U	NA	NA	NA	NA	0.2 U	NA	NA
Calcium	No MCL	129000	69800	70,900	94,700	96,600	24,000	NA	NA	NA	NA	104,000	NA	NA
Cobalt	No MCL	4.6 J	2.1 UL	6 U	3 U	3 U	4.3 B	NA	NA	NA	NA	0.5 U	NA	NA
Copper	1,300	2.3 J	4 J	5 U	2 U	2 U	0.6 U	NA	NA	NA	NA	0.6 U	NA	NA
Iron	No MCL	17.7 J	5.8 J	474 J	108	101	54.9 B	NA	NA	NA	NA	1,180	NA	NA

TABLE 4-4
Groundwater Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Columbia Aquifer**	**Maximum Background - Yorktown-Eastover Aquifer**	Columbia							Yorktown-Eastover			
Station ID				YS01-GW004							YS01-GW004A			
Sample ID				YS01-MW004-0792	YS01-MW004-0296	YS01-MW004P-0296	YS01-MW004-0904	YS01-MW004-0205	YS01-MW004-0505	YS01-MW004-0805	YS01-MW004A-0600	YS01-MW004A-0904	YS01-MW004A-0205	YS01-MW004A-0505
Sample Date				07/20/92	02/10/96	02/10/96	09/21/04	02/10/05	05/04/05	08/04/05	06/16/00	09/21/04	02/10/05	05/04/05
Investigation				Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	GW RI Data	LTM Data	LTM Data
Chemical Name														
Lead	15	1.5 UL	1.5 U	2 UJ	0.8 U	1.1	1.1 U	NA	NA	NA	NA	1.1 U	NA	NA
Magnesium	No MCL	2520 J	3410 J	3,850 J	4,880	5,050	366 J	NA	NA	NA	NA	3,040 J	NA	NA
Manganese	No MCL	50.4	12.2 J	68.2	24.6	23.6	25.2	NA	NA	NA	NA	95.9	NA	NA
Nickel	No MCL	5.2 U	5.2 U	18 U	11.3 U	11.3 U	0.72 J	NA	NA	NA	NA	0.6 U	NA	NA
Potassium	No MCL	1270 J	5680	1,720	1,390 L	1,780 L	888 J	NA	NA	NA	NA	1,300 J	NA	NA
Selenium	50	2.6 U	3.9 K	2 UJ	1.3 U	1.3 U	2.4 U	NA	NA	NA	NA	2.4 U	NA	NA
Sodium	No MCL	6720	8570	7,530 J	10,100	10,400	5,720	NA	NA	NA	NA	8,220	NA	NA
Vanadium	No MCL	2.7 J	6.3 J	8.9	2.4 UL	2.4 U	0.6 U	NA	NA	NA	NA	0.6 U	NA	NA
Zinc	No MCL	15.6 J	5.9 J	8.1 U	3.6 U	3.6 UL	4.1 U	NA	NA	NA	NA	4.1 U	NA	NA
Wet Chemistry (MG/L)														
Nitrate	10	NA	NA	0.1 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Shaded values indicate the analyte was detected
LTM = Long Term Monitoring
RI = Remedial Investigation
MCL = Federal Maximum Contaminant Level
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 4-4
Groundwater Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Columbia Aquifer**	**Maximum Background - Yorktown-Eastover Aquifer**	Yorktown-Eastover		Columbia							Yorktown-Eastover	
Station ID				YS01-GW004A		YS01-GW005							YS01-GW005A	
Sample ID				YS01-MW004AP-0505	YS01-MW004A-0805	YS01-MW005-0792	YS01-MW005-0296	YS01-MW005-0904	YS01-MW005P-0904	YS01-MW005-0205	YS01-MW005-0505	YS01-MW005-0805	YS01-MW005A-0600	YS01-MW005A-0904
Sample Date				05/04/05	08/04/05	07/20/92	02/10/96	09/19/04	09/19/04	02/10/05	05/04/05	08/04/05	06/15/00	09/23/04
Investigation				LTM Data	LTM Data	Historical Data	Historical Data	GW RI Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	GW RI Data
Chemical Name														
Volatile Organic Compounds (UG/L)														
1,1,2-Trichloroethane	5	1 U	1 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	7	1 U	1 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	70	NA	NA	NA	NA	10 U	10 U	NA	NA	NA	NA	NA	NA	NA
Acetone	No MCL	NA	NA	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 B	2 B	10 U
Carbon disulfide	No MCL	1 U	1 U	10 U	10 U	10 U	10 U	10 U	NA	10 UJ	10 U	10 U	10 UJ	10 U
Chloroform	80	6	1 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Methylene chloride	5	2 U	2 U	45	10 U	10 U	10 U	10 U	NA	10 U	63	10 U	2 B	10 U
Tetrachloroethene	5	1 U	1 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Toluene	1,000	1 U	1 U	10 U	10 U	10 U	10 U	10 U	NA	3 B	10 U	10 U	10 U	10 U
Trichloroethene	5	1 U	1 U	10 U	10 U	10 U	10 U	10 U	NA	1 J	10 U	10 U	10 U	10 U
Vinyl chloride	2	1 U	1 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	70	1 U	1 U	10 U	10 U	NA	NA	10 U	NA	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	100	1 U	1 U	10 U	10 U	NA	NA	10 U	NA	10 U	10 U	10 U	10 U	10 U
Semi-volatile Organic Compounds (UG/L)														
Di-n-octylphthalate	No MCL	10 U	10 U	NA	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U
Diethylphthalate	No MCL	10 U	10 U	NA	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U
Nitrobenzene	No MCL	10 U	10 U	NA	NA	NA	10 U	10 U	10 U	NA	NA	NA	NA	10 U
Phenanthrene	No MCL	10 U	10 U	NA	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U
Phenol	No MCL	10 U	1 J	NA	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U
Pyrene	No MCL	10 U	10 U	NA	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U
Explosives (UG/L)														
Nitrobenzene	No MCL	0.98 U	0.73 U	NA	NA	0.31 U	0.36 U	NA	NA	NA	NA	NA	NA	NA
Total Metals (UG/L)														
Aluminum	No MCL	3170	1160	NA	NA	10,500 J	652	388	321	NA	NA	NA	NA	80.7 U
Arsenic	10	5.2 L	3.5 J	NA	NA	6.7 J	1.3 L	12.1 B	12 B	NA	NA	NA	NA	2.1 U
Barium	2,000	53 J	43.6 J	NA	NA	52.7	14.2	26.6 B	26.9 B	NA	NA	NA	NA	9.7 B
Beryllium	4	0.38 K	0.2 U	NA	NA	2	0.8 U	0.42 B	0.39 B	NA	NA	NA	NA	0.1 U
Cadmium	5	2.3 U	2.3 U	NA	NA	4 U	2.2 U	0.2 U	0.2 U	NA	NA	NA	NA	0.2 U
Calcium	No MCL	155000	67100	NA	NA	41,400	24,200	32,300	32,800	NA	NA	NA	NA	34,500
Chromium	100	12.8 L	4.7 L	NA	NA	20	2.4 U	0.9 U	0.9 U	NA	NA	NA	NA	0.9 U
Cobalt	No MCL	5 J	2.1 U	NA	NA	34	9.3	14.5 B	14.5 B	NA	NA	NA	NA	0.5 U
Copper	1,300	4.7 J	4.5 J	NA	NA	7.8	2 U	0.6 U	0.6 U	NA	NA	NA	NA	0.6 U
Iron	No MCL	11600	2350	NA	NA	29,100 J	5,060	22,500	22,800	NA	NA	NA	NA	92.7 B
Lead	15	2.5 L	1.5 U	NA	NA	5.1 J	1.6	1.1 U	1.1 U	NA	NA	NA	NA	1.1 U
Magnesium	No MCL	3400 J	3350 J	NA	NA	29,400 J	13,500	15,600	15,800	NA	NA	NA	NA	565 J
Manganese	No MCL	105	18.4	NA	NA	355	99.5	96.6	97.6	NA	NA	NA	NA	38
Nickel	No MCL	5.2 U	5.2 U	NA	NA	26.6	11.3 U	6.3 J	6.3 J	NA	NA	NA	NA	0.6 U
Potassium	No MCL	1710 J	5510	NA	NA	3,720	1,420 L	1,140 J	1,140 J	NA	NA	NA	NA	571 J
Selenium	50	2.4 U	2.9 J	NA	NA	2 U	1.3 U	2.4 U	2.4 U	NA	NA	NA	NA	2.4 U
Sodium	No MCL	7110	8300	NA	NA	19,600 J	7,940	14,500	14,500	NA	NA	NA	NA	4,120 J
Vanadium	No MCL	16 J	7.5 J	NA	NA	22.1	3.3	2.7 B	2.7 B	NA	NA	NA	NA	0.6 U
Zinc	No MCL	30.2 J	14.9 J	NA	NA	72.9	3.6 UL	10.5 B	10.8 B	NA	NA	NA	NA	7.5 B
Dissolved Metals (UG/L)														
Aluminum	No MCL	20.9 J	146 J	NA	NA	834 J	432	270	254	NA	NA	NA	NA	4.4 U
Arsenic	10	2.6 U	2.6 UL	NA	NA	2 UJ	1.8 L	11.3 B	11.2 B	NA	NA	NA	NA	1.8 U
Barium	2,000	37.2 J	30.9 J	NA	NA	30	12.3	25.1 B	23.8 B	NA	NA	NA	NA	10.6 B
Beryllium	4	0.2 U	0.2 U	NA	NA	1.4	0.8 U	0.37 B	0.39 B	NA	NA	NA	NA	0.1 U
Cadmium	5	2.3 U	2.3 U	NA	NA	4 U	2.2 U	0.2 U	0.2 U	NA	NA	NA	NA	0.2 U
Calcium	No MCL	129000	69800	NA	NA	42,300	24,100	32,300	30,000	NA	NA	NA	NA	39,600
Cobalt	No MCL	4.6 J	2.1 UL	NA	NA	27.9	9	13.8 B	12.7 B	NA	NA	NA	NA	1.1 B
Copper	1,300	2.3 J	4 J	NA	NA	5 U	2 U	0.6 U	0.6 U	NA	NA	NA	NA	0.5 U
Iron	No MCL	17.7 J	5.8 J	NA	NA	1,770 J	4,760	21,400	20,200	NA	NA	NA	NA	12.6 B

TABLE 4-4
Groundwater Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Columbia Aquifer**	**Maximum Background - Yorktown-Eastover Aquifer**	Yorktown-Eastover		Columbia							Yorktown-Eastover	
Station ID				YS01-GW004A		YS01-GW005							YS01-GW005A	
Sample ID				YS01-MW004AP-0505	YS01-MW004A-0805	YS01-MW005-0792	YS01-MW005-0296	YS01-MW005-0904	YS01-MW005P-0904	YS01-MW005-0205	YS01-MW005-0505	YS01-MW005-0805	YS01-MW005A-0600	YS01-MW005A-0904
Sample Date				05/04/05	08/04/05	07/20/92	02/10/96	09/19/04	09/19/04	02/10/05	05/04/05	08/04/05	06/15/00	09/23/04
Investigation				LTM Data	LTM Data	Historical Data	Historical Data	GW RI Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	GW RI Data
Chemical Name														
Lead	15	1.5 UL	1.5 U	NA	NA	20 UJ	0.8 U	1.1 U	1.1 U	NA	NA	NA	NA	0.9 U
Magnesium	No MCL	2520 J	3410 J	NA	NA	28,600 J	13,500	15,200	14,200	NA	NA	NA	NA	644 J
Manganese	No MCL	50.4	12.2 J	NA	NA	254	102	94.4	88.7	NA	NA	NA	NA	41.5
Nickel	No MCL	5.2 U	5.2 U	NA	NA	18 U	12.2	7.3 J	6.9 J	NA	NA	NA	NA	0.82 J
Potassium	No MCL	1270 J	5680	NA	NA	2,840	932 L	1,210 J	1,120 J	NA	NA	NA	NA	624 J
Selenium	50	2.6 U	3.9 K	NA	NA	2 UJ	1.3 U	2.4 U	2.5 J	NA	NA	NA	NA	2.6 U
Sodium	No MCL	6720	8570	NA	NA	20,000 J	7,930	14,600	13,600	NA	NA	NA	NA	5,530
Vanadium	No MCL	2.7 J	6.3 J	NA	NA	8.3	2.4 U	2.4 B	2.3 B	NA	NA	NA	NA	0.4 U
Zinc	No MCL	15.6 J	5.9 J	NA	NA	70.6	4.4 L	20.7 B	12.7 B	NA	NA	NA	NA	9 B
Wet Chemistry (MG/L)														
Nitrate	10	NA	NA	NA	NA	0.1 UJ	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Shaded values indicate the analyte was detected
LTM = Long Term Monitoring
RI = Remedial Investigation
MCL = Federal Maximum Contaminant Level
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 4-4
Groundwater Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	MCL-Groundwater	Maximum Background - Columbia Aquifer	Maximum Background - Yorktown-Eastover Aquifer	Yorktown-Eastover			Columbia								Yorktown-Eastover
Station ID				YS01-GW005A			YS01-GW012								YS01-GW012A
Sample ID				YS01-MW005A-0205	YS01-MW005A-0505	YS01-MW005A-0805	YS01-MW012-0792	YS01-MW012-0296	YS01-MW012-0600	YS01-MW012-0904	YS01-MW012-0205	YS01-MW012-0505	YS01-MW012P-0505	YS01-MW012-0805	YS01-MW012A-0296
Sample Date				02/10/05	05/04/05	08/04/05	07/20/92	02/09/96	06/16/00	09/21/04	02/09/05	05/03/05	05/03/05	08/03/05	02/10/96
Investigation				LTM Data	LTM Data	LTM Data	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	LTM Data	Historical Data
Chemical Name															
Volatile Organic Compounds (UG/L)															
1,1,2-Trichloroethane	5	1 U	1 U	10 U	10 U	10 U	28	10 U	1 J	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	7	1 U	1 U	10 U	10 U	10 U	10 U	10 U	1 J	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	70	NA	NA	NA	NA	NA	1,000 J	40 B	NA	NA	NA	NA	NA	NA	5 B
Acetone	No MCL	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	No MCL	1 U	1 U	10 UJ	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	80	6	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	5	2 U	2 U	10 U	66	10 U	10 U	10 U	1 B	10 U	10 U	63	14 B	10 U	10 U
Tetrachloroethene	5	1 U	1 U	10 U	10 U	10 U	7 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	1,000	1 U	1 U	10 U	10 U	10 U	1 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	5	1 U	1 U	10 U	10 U	10 U	18,000	64 B	880	90	100	98	100	17	46 B
Vinyl chloride	2	1 U	1 U	10 U	10 U	10 U	10 U	10 U	2 J	14	8 J	6 J	6 J	10 U	10 U
cis-1,2-Dichloroethene	70	1 U	1 U	10 U	10 U	10 U	NA	NA	580	130	130	83	88	21	NA
trans-1,2-Dichloroethene	100	1 U	1 U	10 U	10 U	10 U	NA	NA	1 J	10 U	10 U	10 U	10 U	10 U	NA
Semi-volatile Organic Compounds (UG/L)															
Di-n-octylphthalate	No MCL	10 U	10 U	NA	NA	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U
Diethylphthalate	No MCL	10 U	10 U	NA	NA	NA	1 J	10 U	NA	10 U	NA	NA	NA	NA	10 U
Nitrobenzene	No MCL	10 U	10 U	NA	NA	NA	NA	10 U	NA	10 U	NA	NA	NA	NA	10 U
Phenanthrene	No MCL	10 U	10 U	NA	NA	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U
Phenol	No MCL	10 U	1 J	NA	NA	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U
Pyrene	No MCL	10 U	10 U	NA	NA	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U
Explosives (UG/L)															
Nitrobenzene	No MCL	0.98 U	0.73 U	NA	NA	NA	0.31 U	0.27 U	NA	NA	NA	NA	NA	NA	0.27 U
Total Metals (UG/L)															
Aluminum	No MCL	3170	1160	NA	NA	NA	389 J	47.8	NA	80.7 U	NA	NA	NA	NA	165
Arsenic	10	5.2 L	3.5 J	NA	NA	NA	2 UJ	1.1 L	NA	2.6 B	NA	NA	NA	NA	1.6 L
Barium	2,000	53 J	43.6 J	NA	NA	NA	67.4	98.8	NA	112 B	NA	NA	NA	NA	25.2
Beryllium	4	0.38 K	0.2 U	NA	NA	NA	1 U	0.8 U	NA	0.1 U	NA	NA	NA	NA	0.8 U
Cadmium	5	2.3 U	2.3 U	NA	NA	NA	5.9	8.6	NA	6.7	NA	NA	NA	NA	2.2 U
Calcium	No MCL	155000	67100	NA	NA	NA	28,300	81,500	NA	74,800	NA	NA	NA	NA	39,900
Chromium	100	12.8 L	4.7 L	NA	NA	NA	8 U	2.4 U	NA	0.9 U	NA	NA	NA	NA	2.4 U
Cobalt	No MCL	5 J	2.1 U	NA	NA	NA	6 U	3 U	NA	2 B	NA	NA	NA	NA	3 U
Copper	1,300	4.7 J	4.5 J	NA	NA	NA	5 U	8.6	NA	5.2 B	NA	NA	NA	NA	2 U
Iron	No MCL	11600	2350	NA	NA	NA	1,390 J	909	NA	3,520	NA	NA	NA	NA	625
Lead	15	2.5 L	1.5 U	NA	NA	NA	3.8 J	4.7	NA	1.1 B	NA	NA	NA	NA	0.8 U
Magnesium	No MCL	3400 J	3350 J	NA	NA	NA	4,970 J	6,920	NA	5,200	NA	NA	NA	NA	535
Manganese	No MCL	105	18.4	NA	NA	NA	127	821	NA	2,480	NA	NA	NA	NA	8.1
Nickel	No MCL	5.2 U	5.2 U	NA	NA	NA	18 U	11.3 U	NA	12.4 J	NA	NA	NA	NA	11.3 U
Potassium	No MCL	1710 J	5510	NA	NA	NA	3,590	2,960 L	NA	3,660 J	NA	NA	NA	NA	4,570
Selenium	50	2.4 U	2.9 J	NA	NA	NA	2 U	1.3 U	NA	2.4 U	NA	NA	NA	NA	1.3 U
Sodium	No MCL	7110	8300	NA	NA	NA	2,480 J	3,270	NA	2,790 J	NA	NA	NA	NA	8,900
Vanadium	No MCL	16 J	7.5 J	NA	NA	NA	6 U	2.4 U	NA	0.6 U	NA	NA	NA	NA	2.4 U
Zinc	No MCL	30.2 J	14.9 J	NA	NA	NA	1,650	2,960	NA	2,350	NA	NA	NA	NA	3.6 UL
Dissolved Metals (UG/L)															
Aluminum	No MCL	20.9 J	146 J	NA	NA	NA	61.4 J	23.3 U	NA	20.4 B	NA	NA	NA	NA	23.3 U
Arsenic	10	2.6 U	2.6 UL	NA	NA	NA	2 UJ	0.9 UL	NA	2.4 B	NA	NA	NA	NA	0.9 UL
Barium	2,000	37.2 J	30.9 J	NA	NA	NA	68.8	94.1	NA	130 B	NA	NA	NA	NA	22.4
Beryllium	4	0.2 U	0.2 U	NA	NA	NA	1 U	0.8 U	NA	0.1 U	NA	NA	NA	NA	0.8 U
Cadmium	5	2.3 U	2.3 U	NA	NA	NA	4 U	9	NA	5.3	NA	NA	NA	NA	2.2 U
Calcium	No MCL	129000	69800	NA	NA	NA	29,100	79,000	NA	83,000	NA	NA	NA	NA	37,600
Cobalt	No MCL	4.6 J	2.1 UL	NA	NA	NA	7.5	3 U	NA	4.3 B	NA	NA	NA	NA	3 U
Copper	1,300	2.3 J	4 J	NA	NA	NA	5 U	4.6	NA	0.5 U	NA	NA	NA	NA	3.5
Iron	No MCL	17.7 J	5.8 J	NA	NA	NA	504 J	23.9	NA	7,500	NA	NA	NA	NA	23.1

TABLE 4-4
Groundwater Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Columbia Aquifer**	**Maximum Background - Yorktown-Eastover Aquifer**	Yorktown-Eastover			Columbia								Yorktown-Eastover
Station ID				YS01-GW005A			YS01-GW012								YS01-GW012A
Sample ID				YS01-MW005A-0205	YS01-MW005A-0505	YS01-MW005A-0805	YS01-MW012-0792	YS01-MW012-0296	YS01-MW012-0600	YS01-MW012-0904	YS01-MW012-0205	YS01-MW012-0505	YS01-MW012P-0505	YS01-MW012-0805	YS01-MW012A-0296
Sample Date				02/10/05	05/04/05	08/04/05	07/20/92	02/09/96	06/16/00	09/21/04	02/09/05	05/03/05	05/03/05	08/03/05	02/10/96
Investigation				LTM Data	LTM Data	LTM Data	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	LTM Data	Historical Data
Chemical Name															
Lead	15	1.5 UL	1.5 U	NA	NA	NA	2 UJ	0.8 U	NA	1.2 B	NA	NA	NA	NA	0.8 U
Magnesium	No MCL	2520 J	3410 J	NA	NA	NA	5,220 J	6,660	NA	5,690	NA	NA	NA	NA	475
Manganese	No MCL	50.4	12.2 J	NA	NA	NA	141	803	NA	2,930	NA	NA	NA	NA	7
Nickel	No MCL	5.2 U	5.2 U	NA	NA	NA	18 U	11.3 U	NA	13.1 J	NA	NA	NA	NA	11.3 U
Potassium	No MCL	1270 J	5680	NA	NA	NA	3,450	2,710 L	NA	3,720 J	NA	NA	NA	NA	4,520
Selenium	50	2.6 U	3.9 K	NA	NA	NA	2 UJ	1.3 U	NA	2.6 U	NA	NA	NA	NA	1.3 U
Sodium	No MCL	6720	8570	NA	NA	NA	2,500 J	3,110	NA	3,220 J	NA	NA	NA	NA	8,620
Vanadium	No MCL	2.7 J	6.3 J	NA	NA	NA	6 U	2.4 U	NA	0.4 U	NA	NA	NA	NA	2.4 U
Zinc	No MCL	15.6 J	5.9 J	NA	NA	NA	1,080	2,850	NA	2,420	NA	NA	NA	NA	3.6 UL
Wet Chemistry (MG/L)															
Nitrate	10	NA	NA	NA	NA	NA	2.4 J	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Shaded values indicate the analyte was detected
LTM = Long Term Monitoring
RI = Remedial Investigation
MCL = Federal Maximum Contaminant Level
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 4-4
Groundwater Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Columbia Aquifer**	**Maximum Background - Yorktown-Eastover Aquifer**	Yorktown-Eastover					Columbia		Yorktown-Eastover		Columbia
Station ID				YS01-GW012B					YS01-GW013		YS01-GW013A		YS01-GW014
Sample ID				YS01-MW012B-0296	YS01-MW012B-0600	YS01-MW012B-0904	YS01-MW012B-0205	YS01-MW012B-0505	YS01-MW013-0792	YS01-MW013-0296	YS01-MW013A-0296	YS01-MW013AP-0296	YS01-MW014-0792
Sample Date				02/10/96	06/22/00	09/22/04	02/10/05	05/04/05	07/20/92	02/10/96	02/10/96	02/10/96	07/20/92
Investigation				Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	HIstorical Data	Historical Data	Historical Data	Historical Data	Historical Data
Chemical Name													
Volatile Organic Compounds (UG/L)													
1,1,2-Trichloroethane	5	1 U	1 U	10 U	17 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	7	1 U	1 U	10 U	17 U	4 J	4 J	5 J	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	70	NA	NA	32 B	NA	NA	NA	NA	10 U	10 U	10 U	10 U	10 U
Acetone	No MCL	NA	NA	18	8 B	10 U	17	6 J	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	No MCL	1 U	1 U	10 U	17 U	30 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	80	6	1 U	10 U	17 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	5	2 U	2 U	10 U	5 B	10 U	10 U	63	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	5	1 U	1 U	10 U	17 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	1,000	1 U	1 U	10 U	17 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	5	1 U	1 U	360	220	760	710	850 D	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	2	1 U	1 U	10 U	2 J	7 J	9 J	9 J	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	70	1 U	1 U	NA	39	160	160	160	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1 U	1 U	NA	17 U	10 U	10 U	10 U	NA	NA	NA	NA	NA
Semi-volatile Organic Compounds (UG/L)													
Di-n-octylphthalate	No MCL	10 U	10 U	10 U	NA	10 U	NA	NA	11 U	10 U	4 J	10 U	11 U
Diethylphthalate	No MCL	10 U	10 U	10 U	NA	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U
Nitrobenzene	No MCL	10 U	10 U	10 U	NA	10 U	NA	NA	NA	10 U	10 U	10 U	NA
Phenanthrene	No MCL	10 U	10 U	10 U	NA	10 U	NA	NA	11 U	10 U	2 J	2 J	11 U
Phenol	No MCL	10 U	1 J	130	NA	21	NA	NA	11 U	10 U	10 U	10 U	11 U
Pyrene	No MCL	10 U	10 U	10 U	NA	10 U	NA	NA	11 U	10 U	2 J	10 U	11 U
Explosives (UG/L)													
Nitrobenzene	No MCL	0.98 U	0.73 U	0.28 U	NA	NA	NA	NA	0.31 U	0.24 U	0.16 U	0.22 U	0.31 U
Total Metals (UG/L)													
Aluminum	No MCL	3170	1160	10,200	NA	1,420	NA	NA	377 J	449	25,900	18,100	401 J
Arsenic	10	5.2 L	3.5 J	4.2 L	NA	2.1 U	NA	NA	2 UJ	0.9 UL	24 L	18.1 L	2 U
Barium	2,000	53 J	43.6 J	66.8	NA	25.2 B	NA	NA	61.6	40.7	105	81	38.8
Beryllium	4	0.38 K	0.2 U	0.99	NA	0.1 B	NA	NA	1 U	0.8 U	1.1	2.1	1 U
Cadmium	5	2.3 U	2.3 U	2.2 U	NA	0.2 U	NA	NA	4 U	2.2 U	3.3	2.4	4 U
Calcium	No MCL	155000	67100	116,000	NA	53,600	NA	NA	9,540	4,280	138,000	109,000	5,490
Chromium	100	12.8 L	4.7 L	27.8	NA	0.9 U	NA	NA	8 U	2.4 U	154	112	8 U
Cobalt	No MCL	5 J	2.1 U	3.4	NA	0.5 U	NA	NA	6 U	3 U	12.6	9.6	17.9
Copper	1,300	4.7 J	4.5 J	9.9	NA	8 B	NA	NA	5 U	6.3	44.2	32.6	5 U
Iron	No MCL	11600	2350	24,200	NA	79.4 B	NA	NA	652 J	2,520	73,400	53,600	906 J
Lead	15	2.5 L	1.5 U	7.6 K	NA	1.1 U	NA	NA	4.3 J	3.1	26.7	20.3	5.1 J
Magnesium	No MCL	3400 J	3350 J	3,900	NA	453 J	NA	NA	3,680 J	1,540	11,600	8,480	1,090 J
Manganese	No MCL	105	18.4	117	NA	0.35 B	NA	NA	84.7	73.9	334	253	30.7
Nickel	No MCL	5.2 U	5.2 U	16.3	NA	0.6 U	NA	NA	18 U	11.3 U	41.3	41.6	18 U
Potassium	No MCL	1710 J	5510	26,300	NA	6,540	NA	NA	1,470	1,260 L	12,800	10,100	970 U
Selenium	50	2.4 U	2.9 J	1.3 U	NA	2.4 U	NA	NA	2 U	1.3 U	2.7	2.1	2 U
Sodium	No MCL	7110	8300	38,300	NA	8,190	NA	NA	2,550 J	2,070	5,650	5,810	2,610 J
Vanadium	No MCL	16 J	7.5 J	28.2	NA	2 B	NA	NA	6 U	2.4 U	104	75	6 U
Zinc	No MCL	30.2 J	14.9 J	44.4 L	NA	4.6 B	NA	NA	22.6	3.6 UL	156	117	28.2
Dissolved Metals (UG/L)													
Aluminum	No MCL	20.9 J	146 J	1,920	NA	2,670	NA	NA	67.2 J	53.6	68.8	23.3 U	111 J
Arsenic	10	2.6 U	2.6 UL	1.5 L	NA	1.8 U	NA	NA	2 UJ	0.9 UL	1.4 L	1.1 L	2 UJ
Barium	2,000	37.2 J	30.9 J	3.7	NA	33.5 B	NA	NA	63.2	39.1	18.6	19.8	35.3
Beryllium	4	0.2 U	0.2 U	0.8 U	NA	0.1 U	NA	NA	1 U	0.8 U	0.8 U	0.8 U	1 U
Cadmium	5	2.3 U	2.3 U	2.2 U	NA	0.2 U	NA	NA	4 U	2.2 U	2.2 U	2.2 U	4 U
Calcium	No MCL	129000	69800	11,100	NA	113,000	NA	NA	10,100	4,150	31,400	31,300	5,010
Cobalt	No MCL	4.6 J	2.1 UL	3 U	NA	0.3 U	NA	NA	6 U	3 U	3 U	3 U	16.4
Copper	1,300	2.3 J	4 J	2 U	NA	1.1 B	NA	NA	5 U	2 U	2 U	2 U	5 U
Iron	No MCL	17.7 J	5.8 J	60.2	NA	10.7 U	NA	NA	19 U	853	178	74.5	443 J

TABLE 4-4
Groundwater Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Columbia Aquifer**	**Maximum Background - Yorktown-Eastover Aquifer**	Yorktown-Eastover					Columbia		Yorktown-Eastover		Columbia
Station ID				YS01-GW012B					YS01-GW013		YS01-GW013A		YS01-GW014
Sample ID				YS01-MW012B-0296	YS01-MW012B-0600	YS01-MW012B-0904	YS01-MW012B-0205	YS01-MW012B-0505	YS01-MW013-0792	YS01-MW013-0296	YS01-MW013A-0296	YS01-MW013AP-0296	YS01-MW014-0792
Sample Date				02/10/96	06/22/00	09/22/04	02/10/05	05/04/05	07/20/92	02/10/96	02/10/96	02/10/96	07/20/92
Investigation				Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	HIstorical Data	Historical Data	Historical Data	Historical Data	Historical Data
Chemical Name													
Lead	15	1.5 UL	1.5 U	0.8 U	NA	0.9 U	NA	NA	2 UJ	0.93	0.8 U	0.8 U	2 U
Magnesium	No MCL	2520 J	3410 J	598	NA	19.5 B	NA	NA	4,240 J	1,500	744	697	1,120 UJ
Manganese	No MCL	50.4	12.2 J	1.6 U	NA	0.1 U	NA	NA	69.2	71.3	15.9	16.1	23.7
Nickel	No MCL	5.2 U	5.2 U	11.3 U	NA	0.5 U	NA	NA	18 U	11.3 U	11.3 U	11.3 U	18 U
Potassium	No MCL	1270 J	5680	24,300	NA	3,370 J	NA	NA	1,800	1,260 L	2,210 L	2,060 L	970 U
Selenium	50	2.6 U	3.9 K	1.3 U	NA	2.6 U	NA	NA	2 UJ	1.3 U	1.3 U	1.3 U	2 UJ
Sodium	No MCL	6720	8570	37,300	NA	10,700	NA	NA	2,730 J	2,130	4,480	4,400	2,480 J
Vanadium	No MCL	2.7 J	6.3 J	2.8	NA	1.8 B	NA	NA	6 U	2.4 U	2.4 U	2.4 U	6 U
Zinc	No MCL	15.6 J	5.9 J	3.6 UL	NA	2.8 B	NA	NA	9.3 U	3.6 UL	3.6 UL	3.6 UL	39.4
Wet Chemistry (MG/L)													
Nitrate	10	NA	NA	NA	NA	NA	NA	NA	3.4 J	NA	NA	NA	0.15 J

Notes:

Shaded values indicate the analyte was detected
LTM = Long Term Monitoring
RI = Remedial Investigation
MCL = Federal Maximum Contaminant Level
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 4-4
Groundwater Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Columbia Aquifer**	**Maximum Background - Yorktown-Eastover Aquifer**	Columbia	Columbia			Columbia	Columbia	Columbia					Columbia
Station ID				YS01-GW014	YS01-GW017			YS01-GW018	YS01-GW019	YS01-GW020					YS01-GW021
Sample ID				YS01-MW014-0296	YS01-MW017-0792	YS01-MW017P-0792	YS01-MW017-0296	YS01-MW018-0296	YS01-MW019-0296	YS01-MW020-0296	YS01-MW020-0904	YS01-MW020-0205	YS01-MW020-0505	YS01-MW020-0805	YS01-MW021-0296
Sample Date				02/08/96	07/20/92	07/20/92	02/08/96	02/09/96	02/09/96	02/10/96	09/22/04	02/10/05	05/04/05	08/04/05	02/10/96
Investigation				Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data
Chemical Name															
Volatile Organic Compounds (UG/L)															
1,1,2-Trichloroethane	5	1 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	7	1 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	70	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	52	NA	NA	NA	NA	10 U
Acetone	No MCL	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	5 J	10 U	6 B	10 U
Carbon disulfide	No MCL	1 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	80	6	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	3 J
Methylene chloride	5	2 U	2 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	67	10 U	10 U
Tetrachloroethene	5	1 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	1,000	1 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	5	1 U	1 U	10 U	10 U	10 U	10 U	10 U	4 J	190	3 J	3 J	1 J	10 U	2 J
Vinyl chloride	2	1 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	70	1 U	1 U	NA	NA	NA	NA	NA	NA	NA	10 U	2 J	10 U	10 U	NA
trans-1,2-Dichloroethene	100	1 U	1 U	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U	NA
Semi-volatile Organic Compounds (UG/L)															
Di-n-octylphthalate	No MCL	10 U	10 U	10 U	10 U	10 U	10 U	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Diethylphthalate	No MCL	10 U	10 U	10 U	10 U	10 U	10 U	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Nitrobenzene	No MCL	10 U	10 U	3 J	NA	NA	1 J	2 J	10 U	9 U	NA	NA	NA	NA	10 U
Phenanthrene	No MCL	10 U	10 U	10 U	10 U	10 U	10 U	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Phenol	No MCL	10 U	1 J	10 U	10 U	10 U	10 U	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Pyrene	No MCL	10 U	10 U	10 U	10 U	10 U	10 U	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Explosives (UG/L)															
Nitrobenzene	No MCL	0.98 U	0.73 U	1.4	0.31 U	0.31 U	0.7	1.3	0.22 U	0.16 U	NA	NA	NA	NA	0.32 U
Total Metals (UG/L)															
Aluminum	No MCL	3170	1160	1,310	1,400 J	1,140 J	968	23.3 U	2,200	217 B	NA	NA	NA	NA	323
Arsenic	10	5.2 L	3.5 J	0.9 U	2 U	2 U	0.9 U	3.5	3.9	0.9 U	NA	NA	NA	NA	0.9 U
Barium	2,000	53 J	43.6 J	67.5	25.2	28.1	16.2	97.1	52.7	25.4	NA	NA	NA	NA	15.9
Beryllium	4	0.38 K	0.2 U	0.9 B	1 U	1 U	0.8 U	0.8 U	0.8 U	0.8 U	NA	NA	NA	NA	0.8 U
Cadmium	5	2.3 U	2.3 U	2.2 U	4 U	4 U	2.2 U	2.2 U	2.2 U	2.2 U	NA	NA	NA	NA	2.2 U
Calcium	No MCL	155000	67100	2,150	9,470	9,000	14,200	23,000	94,400	23,200	NA	NA	NA	NA	87,900
Chromium	100	12.8 L	4.7 L	2.4 U	8 U	8 U	2.4 U	2.4 U	6.4	2.4 U	NA	NA	NA	NA	2.4 U
Cobalt	No MCL	5 J	2.1 U	11.2	6 U	6 U	3 U	3 U	3.4	3.3	NA	NA	NA	NA	4.1
Copper	1,300	4.7 J	4.5 J	2 U	5 U	5 U	2 U	2 U	2.8	2.6	NA	NA	NA	NA	2 U
Iron	No MCL	11600	2350	407	2,460 J	1,920 J	1,210	55,300	3,840	304	NA	NA	NA	NA	730
Lead	15	2.5 L	1.5 U	3.6	2.3 J	2.2 J	1	1.1	2.3	0.86	NA	NA	NA	NA	0.95
Magnesium	No MCL	3400 J	3350 J	1,030	4,410 J	4,320 J	4,220	3,580	5,350	4,620	NA	NA	NA	NA	2,520
Manganese	No MCL	105	18.4	47.9	164	163	90.6	1,500	71.8	6.6 B	NA	NA	NA	NA	30.7
Nickel	No MCL	5.2 U	5.2 U	11.3 U	18 U	18 U	11.3 U	11.3 U	11.3 U	11.3 U	NA	NA	NA	NA	11.3 U
Potassium	No MCL	1710 J	5510	828 U	2,930	2,380	1,250	1,370 L	3,010	2,910	NA	NA	NA	NA	1,120
Selenium	50	2.4 U	2.9 J	1.3 U	2 UJ	2 U	1.3 U	1.5	1.3 U	1.3 U	NA	NA	NA	NA	1.3 U
Sodium	No MCL	7110	8300	3,530	1,880 J	1,810 J	3,470	2,240	2,480	4,430	NA	NA	NA	NA	6,890
Vanadium	No MCL	16 J	7.5 J	2.7	6 U	6 U	4.3	2.4 U	7.8	3.7	NA	NA	NA	NA	3.9
Zinc	No MCL	30.2 J	14.9 J	11.9	20.1 U	16.6 U	3.6 U	6.1 L	30.1	10.1	NA	NA	NA	NA	3.6 U
Dissolved Metals (UG/L)															
Aluminum	No MCL	20.9 J	146 J	966	345 J	296 J	255 B	383	29.4 B	51.6 B	NA	NA	NA	NA	23.3 U
Arsenic	10	2.6 U	2.6 UL	0.9 U	2 UJ	2 UJ	0.9 U	4.4 L	1.7	0.9 U	NA	NA	NA	NA	0.9 U
Barium	2,000	37.2 J	30.9 J	66.1	21.2	21	13.4	101	47.7	30.2	NA	NA	NA	NA	14.4
Beryllium	4	0.2 U	0.2 U	0.96 B	1 U	1 U	0.8 U	0.8 U	0.9 B	0.8 U	NA	NA	NA	NA	0.8 U
Cadmium	5	2.3 U	2.3 U	2.2 U	4 U	4 U	2.2 U	2.2 U	2.2 U	2.2 U	NA	NA	NA	NA	2.2 U
Calcium	No MCL	129000	69800	2,190	9,190	9,490	13,600	23,700	94,400	20,800	NA	NA	NA	NA	85,600
Cobalt	No MCL	4.6 J	2.1 UL	14.2	6 U	6 U	4.7	5.7	4.1	3.6	NA	NA	NA	NA	3 U
Copper	1,300	2.3 J	4 J	2 U	5 U	5 U	2 U	2 U	2.4	27.6	NA	NA	NA	NA	2 U
Iron	No MCL	17.7 J	5.8 J	31.6 B	43.5 J	39.4 J	95.9 B	54,900	1,970	54.8 B	NA	NA	NA	NA	22 B

TABLE 4-4
Groundwater Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Columbia Aquifer**	**Maximum Background - Yorktown-Eastover Aquifer**	Columbia	Columbia			Columbia	Columbia	Columbia					Columbia
Station ID				YS01-GW014	YS01-GW017			YS01-GW018	YS01-GW019	YS01-GW020					YS01-GW021
Sample ID				YS01-MW014-0296	YS01-MW017-0792	YS01-MW017P-0792	YS01-MW017-0296	YS01-MW018-0296	YS01-MW019-0296	YS01-MW020-0296	YS01-MW020-0904	YS01-MW020-0205	YS01-MW020-0505	YS01-MW020-0805	YS01-MW021-0296
Sample Date				02/08/96	07/20/92	07/20/92	02/08/96	02/09/96	02/09/96	02/10/96	09/22/04	02/10/05	05/04/05	08/04/05	02/10/96
Investigation				Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data
Chemical Name															
Lead	15	1.5 UL	1.5 U	1.6	2 UJ	2 UJ	0.8 U	1.7 K	0.8 U	1.5 U	NA	NA	NA	NA	2.4
Magnesium	No MCL	2520 J	3410 J	1,000	4,370 J	4,430 J	4,060	3,680	5,220	4,650	NA	NA	NA	NA	2,440
Manganese	No MCL	50.4	12.2 J	48.1	140	138	84.3	1,530	64.8	10.3 B	NA	NA	NA	NA	29.4
Nickel	No MCL	5.2 U	5.2 U	11.3 U	18 U	18 U	11.3 U	11.3 U	11.3 U	11.3 U	NA	NA	NA	NA	11.3 U
Potassium	No MCL	1270 J	5680	847	3,140	3,120 J	1,020	2,000	2,490	2,390	NA	NA	NA	NA	1,300
Selenium	50	2.6 U	3.9 K	1.3 U	2 UJ	2 UJ	1.3 U	1.3 U	1.3 U	1.3 U	NA	NA	NA	NA	1.3 U
Sodium	No MCL	6720	8570	3,570	1,650 J	1,630 J	3,380	2,270	2,430	4,410	NA	NA	NA	NA	6,950
Vanadium	No MCL	2.7 J	6.3 J	2.4 U	6 U	6 U	2.4 U	2.4 U	2.4 U	2.4	NA	NA	NA	NA	2.4 U
Zinc	No MCL	15.6 J	5.9 J	11.9	9.2 U	10.6 U	3.6 U	14.8	28.3	31.8	NA	NA	NA	NA	3.6 U
Wet Chemistry (MG/L)															
Nitrate	10	NA	NA	NA	6.4 J	8.2 J	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Shaded values indicate the analyte was detected
LTM = Long Term Monitoring
RI = Remedial Investigation
MCL = Federal Maximum Contaminant Level
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 4-5
Groundwater Analytical Detections at Site 3
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Yorktown-Eastover Aquifer**	Yorktown-Eastover			Yorktown-Eastover		Yorktown-Eastover		Yorktown-Eastover			
Station ID			YS03-GW006			YS03-GW007		YS03-GW008		YS03-GW008A			
Sample ID			YS03-MW006-0792	YS03-MW006-0296	YS03-MW006P-0296	YS03-MW007-0792	YS03-MW007-0296	YS03-MW008-0792	YS03-MW008-0296	YS03-MW008A-0296	YS03-MW008A-0600	YS03-MW008A-0904	YS03-MW008AP-0904
Sample Date			07/21/92	02/11/96	02/11/96	07/21/92	02/11/96	07/21/92	02/11/96	02/12/96	06/12/00	09/19/04	09/19/04
Investigation			Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	GW RI Data	GW RI Data
Chemical Name													
Volatile Organic Compounds (UG/L)													
1,1-Dichloroethene	7	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	70	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA
Bromodichloromethane	80	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	80	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	5	2 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	2 B	10 U	10 U
Toluene	1,000	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	5	1 U	3 J	3 J	10 U	9 J	3 J	16	10	10 U	10 U	10 U	10 U
Vinyl chloride	2	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	70	1 U	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U
trans-1,2-Dichloroethene	100	1 U	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U
Semi-volatile Organic Compounds (UG/L)													
Di-n-octylphthalate	No MCL	10 U	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA
Phenanthrene	No MCL	10 U	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA
Total Metals (UG/L)													
Aluminum	No MCL	1160	10,600 J	4,410 K	11,200 K	6,970 J	3,290 K	34,900 J	3,210 K	498 K	NA	NA	NA
Arsenic	10	3.5 J	20.4 J	13.6	24.6	13.6 J	11.3	17.8 J	9.8	0.9 U	NA	NA	NA
Barium	2,000	43.6 J	88.5	39.9	61	69	47.8	163	39.4	25.8	NA	NA	NA
Beryllium	4	0.2 U	1.6	0.8 U	0.8 U	1.1	0.8 U	4.7	0.8 U	0.8 U	NA	NA	NA
Cadmium	5	2.3 U	4 U	2.2 UL	2.2 UL	4 U	2.2 U	8.4	2.2 U	2.2 UL	NA	NA	NA
Calcium	No MCL	67100	140,000	105,000	130,000	171,000	138,000	370,000	131,000	88,900	NA	NA	NA
Chromium	100	4.7 L	54.3	19.9	46.9	38.2	18.7	188	14.3	2.4 U	NA	NA	NA
Cobalt	No MCL	2.1 U	10.1	3 U	3.7	6 U	4.2	29.4	3 U	3 U	NA	NA	NA
Copper	1,300	4.5 J	14.6	4.8	13.3	9.9	3.5	38.3	2.7	2 U	NA	NA	NA
Iron	No MCL	2350	44,600 J	12,200	28,000	22,900 J	8,830	107,000 J	6,520	1,740	NA	NA	NA
Lead	15	1.5 U	15.2	3.4	9.8	10.3 U	2.6 K	118	1.8 K	0.8 U	NA	NA	NA
Magnesium	No MCL	3350 J	7,130	3,190	5,460	5,480	3,680	15,900	3,890	1,720	NA	NA	NA
Manganese	No MCL	18.4	207	60.5	118	110	35	492	22.6	91.3	NA	NA	NA
Mercury	2	0.2 UL	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NA	NA	NA
Nickel	No MCL	5.2 U	21.3	11.3 U	11.3 U	18 U	11.3 U	84.1	11.3 U	11.3 U	NA	NA	NA
Potassium	No MCL	5510	4,960	2,600	4,540	3,950	2,470 L	12,100	1,730 L	1,230	NA	NA	NA
Selenium	50	2.9 J	2 UJ	1.4 L	1.7	2 UJ	1.3 U	20 UJ	1.3 U	1.3 U	NA	NA	NA
Silver	No MCL	1.7 U	6 U	3.1 U	3.1 U	6 U	3.1 U	7.3	3.1 U	3.1 U	NA	NA	NA
Sodium	No MCL	8300	6,680	6,050	6,480	10,900	10,400	11,200	9,630	8,530	NA	NA	NA
Vanadium	No MCL	7.5 J	49	26.2	54.1	56.5	23.5	204	19.1	5.9	NA	NA	NA
Zinc	No MCL	14.9 J	82.1 J	21.7	49	49.2 J	18	218 J	15.3	3.6	NA	NA	NA
Dissolved Metals (UG/L)													
Aluminum	No MCL	146 J	35 U	23.3 U	23.3 U	35 U	30 K	35 U	23.9 K	23.3 U	NA	NA	NA
Arsenic	10	2.6 UL	2 UJ	1	1.2	2 UJ	0.9 U	2 UJ	1.4	0.9 U	NA	NA	NA
Barium	2,000	30.9 J	25.3	20.6	20.9	34.8	34.1	28.8	27.6	23.9	NA	NA	NA
Cadmium	5	2.3 U	4 U	2.2 UL	2.2 UL	4 U	2.2 U	4 U	2.9 K	2.2 UL	NA	NA	NA
Calcium	No MCL	69800	90,500	77,500	80,200	132,000	119,000	138,000	118,000	83,800	NA	NA	NA
Chromium	100	1.5 U	8 U	2.4 U	2.4 U	8 U	2.4 U	8 U	2.4 U	7.3	NA	NA	NA
Copper	1,300	4 J	5 U	2 U	2 U	5 U	2 U	5 U	2 U	2 U	NA	NA	NA
Iron	No MCL	5.8 J	139 J	52.9	47.4	19 UJ	42.2	25.4 J	28.9	238	NA	NA	NA
Lead	15	1.5 U	16.8	0.8 U	0.8 U	2 U	0.8 U	2 U	0.8 U	0.8 U	NA	NA	NA
Magnesium	No MCL	3410 J	2,220	1,650	1,820	2,990	2,590	3,410	2,930	1,560	NA	NA	NA
Manganese	No MCL	12.2 J	22.2	14.4	14.8	2 U	1.6 U	6.3	2.1	88.3	NA	NA	NA

TABLE 4-5
Groundwater Analytical Detections at Site 3
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Yorktown-Eastover Aquifer**	Yorktown-Eastover			Yorktown-Eastover		Yorktown-Eastover		Yorktown-Eastover			
Station ID			YS03-GW006			YS03-GW007		YS03-GW008		YS03-GW008A			
Sample ID			YS03-MW006-0792	YS03-MW006-0296	YS03-MW006P-0296	YS03-MW007-0792	YS03-MW007-0296	YS03-MW008-0792	YS03-MW008-0296	YS03-MW008A-0296	YS03-MW008A-0600	YS03-MW008A-0904	YS03-MW008AP-0904
Sample Date			07/21/92	02/11/96	02/11/96	07/21/92	02/11/96	07/21/92	02/11/96	02/12/96	06/12/00	09/19/04	09/19/04
Investigation			Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	GW RI Data	GW RI Data
Chemical Name													
Potassium	No MCL	5680	1,160	828 U	1,390	970 U	948 L	970 U	828 UL	1,190	NA	NA	NA
Sodium	No MCL	8570	6,540	5,950	6,100	10,700	9,990	11,400	9,970	8,640	NA	NA	NA
Vanadium	No MCL	6.3 J	11.6	2.4 U	2.7	15.2	2.4 U	16.8	2.4 U	5	NA	NA	NA
Zinc	No MCL	5.9 J	59.8 J	3.6 U	3.6 U	134 J	3.6 U	35.4 J	3.6 U	3.6 U	NA	NA	NA
Wet Chemistry (MG/L)													
Nitrate	10	NA	0.1 U	NA	NA	0.17	NA	0.1 U	NA	NA	NA	NA	NA

Notes:
Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
MCL = Federal Maximum Contaminant Level
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 4-5
Groundwater Analytical Detections at Site 3
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background Yorktown-Eastover Aqu**	Yorktown-Eastover			Yorktown-Eastover				Yorktown-Eastover		Yorktown-Eastover
Station ID			YS03-GW008A			YS03-GW008B				YS03-GW015		YS03-GW015A
Sample ID			YS03-MW008A-0205	YS03-MW008A-0505	YS03-MW008A-0805	YS03-MW008B-1004	YS03-MW008B-0205	YS03-MW008B-0505	YS03-MW008B-0805	YS03-MW015-0792	YS03-MW015-0296	YS03-MW015A-0296
Sample Date			02/11/05	05/04/05	08/03/05	10/06/04	02/11/05	05/04/05	08/03/05	07/21/92	02/12/96	02/11/96
Investigation			LTM Data	LTM Data	LTM Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data	Historical Data
Chemical Name												
Volatile Organic Compounds (UG/L)												
1,1-Dichloroethene	7	1	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	70	NA	NA	NA	NA	NA	NA	NA	NA	61	110	12
Bromodichloromethane	80	1	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	80	1	10 U	10 U	10 U	1 J	10 U	10 U	10 U	29	10 U	10 U
Methylene chloride	5	2	10 U	56	10 U	10 U	10 U	57	3 B	10 U	10 U	10 U
Toluene	1,000	1	2 B	10 U	10 U	2 J	0.9 B	10 U	10 U	10 U	10 U	10 U
Trichloroethene	5	1	10 U	10 U	10 U	5 J	4 B	5 J	4 J	86	83 B	10
Vinyl chloride	2	1	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	70	1	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA
trans-1,2-Dichloroethene	100	1	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA
Semi-volatile Organic Compounds (UG/L)												
Di-n-octylphthalate	No MCL	10	NA	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U
Phenanthrene	No MCL	10	NA	NA	NA	NA	NA	NA	NA	11 U	2 J	10 U
Total Metals (UG/L)												
Aluminum	No MCL	1160	NA	NA	NA	NA	NA	NA	NA	202,000 J	83.8 K	432 K
Arsenic	10	3.5	NA	NA	NA	NA	NA	NA	NA	4.1 J	0.9 U	0.9 U
Barium	2,000	43.6	NA	NA	NA	NA	NA	NA	NA	1,220	34.8	26.7
Beryllium	4	0.2	NA	NA	NA	NA	NA	NA	NA	23	0.8 U	0.8 U
Cadmium	5	2.3	NA	NA	NA	NA	NA	NA	NA	29.7	2.2 UL	2.2 U
Calcium	No MCL	67100	NA	NA	NA	NA	NA	NA	NA	232,000	105,000	86,500
Chromium	100	4.7	NA	NA	NA	NA	NA	NA	NA	1,100	2.4 U	3.7
Cobalt	No MCL	2.1	NA	NA	NA	NA	NA	NA	NA	191	3 U	3 U
Copper	1,300	4.5	NA	NA	NA	NA	NA	NA	NA	287	2 U	5.3
Iron	No MCL	2350	NA	NA	NA	NA	NA	NA	NA	66,700 J	212	2,100
Lead	15	1.5	NA	NA	NA	NA	NA	NA	NA	146 J	0.8 U	0.8 U
Magnesium	No MCL	3350	NA	NA	NA	NA	NA	NA	NA	75,000	2,270	1,590
Manganese	No MCL	18.4	NA	NA	NA	NA	NA	NA	NA	4,810	73.4	106
Mercury	2	0.2	NA	NA	NA	NA	NA	NA	NA	0.54	0.1 U	0.1 U
Nickel	No MCL	5.2	NA	NA	NA	NA	NA	NA	NA	594	11.3 U	11.3 U
Potassium	No MCL	5510	NA	NA	NA	NA	NA	NA	NA	46,400	4,240	2,470 L
Selenium	50	2.9	NA	NA	NA	NA	NA	NA	NA	20 UJ	1.3 U	1.3 U
Silver	No MCL	1.7	NA	NA	NA	NA	NA	NA	NA	44.2	3.1 U	3.1 U
Sodium	No MCL	8300	NA	NA	NA	NA	NA	NA	NA	23,300	11,200	7,880
Vanadium	No MCL	7.5	NA	NA	NA	NA	NA	NA	NA	498	2.4 U	2.4 U
Zinc	No MCL	14.9	NA	NA	NA	NA	NA	NA	NA	2,840 J	3.6 U	13.6
Dissolved Metals (UG/L)												
Aluminum	No MCL	146	NA	NA	NA	NA	NA	NA	NA	43.7 J	23.3 U	23.3 U
Arsenic	10	2.6	NA	NA	NA	NA	NA	NA	NA	2 UJ	0.9 U	0.9 U
Barium	2,000	30.9	NA	NA	NA	NA	NA	NA	NA	35.8	33.8	23.9
Cadmium	5	2.3	NA	NA	NA	NA	NA	NA	NA	4 U	2.2 UL	2.2 U
Calcium	No MCL	69800	NA	NA	NA	NA	NA	NA	NA	134,000	106,000	78,200
Chromium	100	1.5	NA	NA	NA	NA	NA	NA	NA	8 U	2.4 U	2.4 U
Copper	1,300	4	NA	NA	NA	NA	NA	NA	NA	5 U	2 U	2 U
Iron	No MCL	5.8	NA	NA	NA	NA	NA	NA	NA	82.8 J	9.7 U	9.7 U
Lead	15	1.5	NA	NA	NA	NA	NA	NA	NA	2.5 U	0.8 U	0.8 U
Magnesium	No MCL	3410	NA	NA	NA	NA	NA	NA	NA	3,230	2,220	1,400
Manganese	No MCL	12.2	NA	NA	NA	NA	NA	NA	NA	128	81.3	95.6

TABLE 4-5
Groundwater Analytical Detections at Site 3
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background Yorktown-Eastover Aqu**	Yorktown-Eastover			Yorktown-Eastover				Yorktown-Eastover		Yorktown-Eastover
Station ID			YS03-GW008A			YS03-GW008B				YS03-GW015		YS03-GW015A
Sample ID			YS03-MW008A-0205	YS03-MW008A-0505	YS03-MW008A-0805	YS03-MW008B-1004	YS03-MW008B-0205	YS03-MW008B-0505	YS03-MW008B-0805	YS03-MW015-0792	YS03-MW015-0296	YS03-MW015A-0296
Sample Date			02/11/05	05/04/05	08/03/05	10/06/04	02/11/05	05/04/05	08/03/05	07/21/92	02/12/96	02/11/96
Investigation			LTM Data	LTM Data	LTM Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data	Historical Data
Chemical Name												
Potassium	No MCL	5680	NA	NA	NA	NA	NA	NA	NA	2,200	3,660	1,920 L
Sodium	No MCL	8570	NA	NA	NA	NA	NA	NA	NA	14,400	9,260	7,680
Vanadium	No MCL	6.3	NA	NA	NA	NA	NA	NA	NA	13.9	2.8	2.4 U
Zinc	No MCL	5.9	NA	NA	NA	NA	NA	NA	NA	89.7 J	3.6 U	3.6 U
Wet Chemistry (MG/L)												
Nitrate	10	NA	NA	NA	NA	NA	NA	NA	NA	0.12	NA	NA

Notes:
Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
MCL = Federal Maximum Contaminant Level
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 4-5
Groundwater Analytical Detections at Site 3
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background Yorktown-Eastover Aqu**	Yorktown-Eastover	Yorktown-Eastover		Yorktown-Eastover								
Station ID			YS03-GW018	YS03-GW018		YS03-GW019								
Sample ID			YS03-MW018-0792	YS03-MW018-0296	YS03-MW018P-0296	YS03-MW019-0296	YS03-MW019-0600	YS03-MW019P-0600	YS03-MW019-1004	YS03-MW019-0205	YS03-MW019P-0205	YS03-MW019-0505	YS03-MW019-0805	YS03-MW019P-0805
Sample Date			07/21/92	02/11/96	02/11/96	02/11/96	06/12/00	06/12/00	10/06/04	02/08/05	02/08/05	05/05/05	08/03/05	08/03/05
Investigation			Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	LTM Data	LTM Data
Chemical Name														
Volatile Organic Compounds (UG/L)														
1,1-Dichloroethene	7	1	10 U	10 U	10 U	4 J	2 J	100 U	2 J	0.8 J	10 U	10 U	10 U	2 J
1,2-Dichloroethene (total)	70	NA	10 U	10 U	10 U	570	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	1	10 U	10 U	10 U	10 U	10 U	100 U	1 J	10 U	10 U	10 U	10 U	10 U
Chloroform	80	1	10 U	10 U	10 U	4 B	10 U	100 U	10 U	10 U	10 U	1 J	10 U	10 U
Methylene chloride	5	2	10 U	10 U	10 U	10 U	3 B	12 B	10 U	10 U	10 U	13 B	4 B	2 B
Toluene	1,000	1	10 U	10 U	10 U	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	5	1	10 U	10 U	10 U	860	510	480	120	160	150	190	140	140
Vinyl chloride	2	1	10 U	10 U	10 U	48	15	12 J	42	25	21	11	39	39
cis-1,2-Dichloroethene	70	1	NA	NA	NA	NA	490	470	320	290	260	230	440	400
trans-1,2-Dichloroethene	100	1	NA	NA	NA	NA	10 U	100 U	10 U	10 U	10 U	10 U	10 U	0.9 J
Semi-volatile Organic Compounds (UG/L)														
Di-n-octylphthalate	No MCL	10	10 U	10 U	10 U	10 U	NA	NA	10 U	NA	NA	NA	NA	NA
Phenanthrene	No MCL	10	2 J	10 U	10 U	10 U	NA	NA	10 U	NA	NA	NA	NA	NA
Total Metals (UG/L)														
Aluminum	No MCL	1160	6,450 J	1,660 K	1,740 K	32,300 K	NA	NA	140 B	NA	NA	NA	NA	NA
Arsenic	10	3.5	2 UJ	4.8	4.5	15.6	NA	NA	1.8 U	NA	NA	NA	NA	NA
Barium	2,000	43.6	96.4	37.9	40.5	131	NA	NA	38.9 J	NA	NA	NA	NA	NA
Beryllium	4	0.2	1 U	0.8 U	0.8 U	2.3	NA	NA	0.1 U	NA	NA	NA	NA	NA
Cadmium	5	2.3	4 U	2.2 U	2.2 U	2.5 L	NA	NA	0.2 U	NA	NA	NA	NA	NA
Calcium	No MCL	67100	310,000	77,800	83,500	252,000	NA	NA	159,000	NA	NA	NA	NA	NA
Chromium	100	4.7	17	2.4 U	2.4 U	177	NA	NA	2.2 B	NA	NA	NA	NA	NA
Cobalt	No MCL	2.1	8	3.3	3 U	13.5	NA	NA	0.47 B	NA	NA	NA	NA	NA
Copper	1,300	4.5	10.9	7.1	6.9	31.5	NA	NA	0.64 B	NA	NA	NA	NA	NA
Iron	No MCL	2350	18,600 J	1,130	1,440	91,100	NA	NA	417 B	NA	NA	NA	NA	NA
Lead	15	1.5	6.9 U	0.8 U	3.2	22	NA	NA	0.9 U	NA	NA	NA	NA	NA
Magnesium	No MCL	3350	1,820	390	460	14,200	NA	NA	4,660 J	NA	NA	NA	NA	NA
Manganese	No MCL	18.4	75.4	3.6	5.6	621	NA	NA	53.8	NA	NA	NA	NA	NA
Mercury	2	0.2	0.1 U	0.1 U	0.1 U	0.1 U	NA	NA	0.1 UJ	NA	NA	NA	NA	NA
Nickel	No MCL	5.2	18 U	11.3 U	11.3 U	58.6	NA	NA	1.6 B	NA	NA	NA	NA	NA
Potassium	No MCL	5510	18,100	4,090	3,540 L	11,800	NA	NA	604 J	NA	NA	NA	NA	NA
Selenium	50	2.9	2 UJ	1.3 U	1.5	1.3 U	NA	NA	2.6 U	NA	NA	NA	NA	NA
Silver	No MCL	1.7	6 U	3.1 U	3.1 U	3.1 U	NA	NA	0.7 U	NA	NA	NA	NA	NA
Sodium	No MCL	8300	25,500	11,300	11,300	9,880	NA	NA	11,600	NA	NA	NA	NA	NA
Vanadium	No MCL	7.5	42.3	9.5	6.6	225	NA	NA	1.1 B	NA	NA	NA	NA	NA
Zinc	No MCL	14.9	35.9 J	4.8	6.6	180	NA	NA	5.7 B	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)														
Aluminum	No MCL	146	1,620 J	1,100 K	1,110 K	23.3 U	NA	NA	4.8 B	NA	NA	NA	NA	NA
Arsenic	10	2.6	2 UJ	2.5 K	2.7	0.9 U	NA	NA	1.8 U	NA	NA	NA	NA	NA
Barium	2,000	30.9	74.7	34.7	35.1	30.1	NA	NA	37.1 J	NA	NA	NA	NA	NA
Cadmium	5	2.3	4 U	2.2 U	2.2 U	2.2 UL	NA	NA	0.2 U	NA	NA	NA	NA	NA
Calcium	No MCL	69800	325,000	66,100	68,300	127,000	NA	NA	157,000	NA	NA	NA	NA	NA
Chromium	100	1.5	8 U	2.4 U	2.4 U	2.4 U	NA	NA	0.5 U	NA	NA	NA	NA	NA
Copper	1,300	4	5.2	2 U	2 U	3.9	NA	NA	0.5 U	NA	NA	NA	NA	NA
Iron	No MCL	5.8	19 UJ	12.3	14	76.3	NA	NA	55.6 B	NA	NA	NA	NA	NA
Lead	15	1.5	2 U	0.8 U	0.8 U	0.8 U	NA	NA	0.9 U	NA	NA	NA	NA	NA
Magnesium	No MCL	3410	266	26.9 U	30.4 B	4,390	NA	NA	4,570 J	NA	NA	NA	NA	NA
Manganese	No MCL	12.2	2 U	1.8	1.6 U	204	NA	NA	53.5	NA	NA	NA	NA	NA

TABLE 4-5
Groundwater Analytical Detections at Site 3
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background Yorktown-Eastover Aqu**	Yorktown-Eastover	Yorktown-Eastover		Yorktown-Eastover								
Station ID			YS03-GW018	YS03-GW018		YS03-GW019								
Sample ID			YS03-MW018-0792	YS03-MW018-0296	YS03-MW018P-0296	YS03-MW019-0296	YS03-MW019-0600	YS03-MW019P-0600	YS03-MW019-1004	YS03-MW019-0205	YS03-MW019P-0205	YS03-MW019-0505	YS03-MW019-0805	YS03-MW019P-0805
Sample Date			07/21/92	02/11/96	02/11/96	02/11/96	06/12/00	06/12/00	10/06/04	02/08/05	02/08/05	05/05/05	08/03/05	08/03/05
Investigation			Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	LTM Data	LTM Data
Chemical Name														
Potassium	No MCL	5680	18,600	3,670 L	3,760 L	1,430	NA	NA	530 J	NA	NA	NA	NA	NA
Sodium	No MCL	8570	28,400	11,400	11,400	8,820	NA	NA	12,000	NA	NA	NA	NA	NA
Vanadium	No MCL	6.3	26.6	5.5	5.5	2.4 U	NA	NA	0.4 U	NA	NA	NA	NA	NA
Zinc	No MCL	5.9	190 J	3.6 U	3.6 U	3.6 U	NA	NA	0.7 U	NA	NA	NA	NA	NA
Wet Chemistry (MG/L)														
Nitrate	10	NA	0.11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
MCL = Federal Maximum Contaminant Level
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 4-5
Groundwater Analytical Detections at Site 3
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background Yorktown-Eastover Aqu**	Yorktown-Eastover						Yorktown-Eastover			
Station ID			YS03-GW019A						YS03-GW020			
Sample ID			YS03-MW019A-0296	YS03-MW019A-0600	YS03-MW019A-0904	YS03-MW019A-0205	YS03-MW019A-0505	YS03-MW019A-0805	YS03-MW020-1004	YS03-MW020-0205	YS03-MW020-0505	YS03-MW020-0805
Sample Date			02/11/96	06/12/00	09/22/04	02/08/05	05/05/05	08/03/05	10/06/04	02/08/05	05/05/05	08/02/05
Investigation			Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	GW RI Data	LTM Data	LTM Data	LTM Data
Chemical Name												
Volatile Organic Compounds (UG/L)												
1,1-Dichloroethene	7	1	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	70	NA	24	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	1	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	80	1	4 B	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	5	2	10 U	2 B	10 U	10 U	13 B	3 B	10 U	10 U	14 B	4 B
Toluene	1,000	1	3 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	5	1	24	5 J	6 J	6 J	4 J	2 J	10 U	10 U	10 U	10 U
Vinyl chloride	2	1	10 U	10 U	10 U	10 U	10 U	10 U	4 J	10 U	10 U	10 U
cis-1,2-Dichloroethene	70	1	NA	7 J	6 J	8 J	5 J	4 J	5 J	10 U	10 U	10 U
trans-1,2-Dichloroethene	100	1	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Semi-volatile Organic Compounds (UG/L)												
Di-n-octylphthalate	No MCL	10	3 J	NA	10 U	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	No MCL	10	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	NA
Total Metals (UG/L)												
Aluminum	No MCL	1160	6,780 K	NA	316	NA	NA	NA	NA	NA	NA	NA
Arsenic	10	3.5	10.6	NA	4.2 B	NA	NA	NA	NA	NA	NA	NA
Barium	2,000	43.6	41.4	NA	18.9 B	NA	NA	NA	NA	NA	NA	NA
Beryllium	4	0.2	0.8 U	NA	0.1 U	NA	NA	NA	NA	NA	NA	NA
Cadmium	5	2.3	2.2 UL	NA	0.2 U	NA	NA	NA	NA	NA	NA	NA
Calcium	No MCL	67100	108,000	NA	76,500	NA	NA	NA	NA	NA	NA	NA
Chromium	100	4.7	41.6	NA	1.7 B	NA	NA	NA	NA	NA	NA	NA
Cobalt	No MCL	2.1	3 U	NA	0.5 U	NA	NA	NA	NA	NA	NA	NA
Copper	1,300	4.5	9	NA	0.61 B	NA	NA	NA	NA	NA	NA	NA
Iron	No MCL	2350	16,400	NA	560	NA	NA	NA	NA	NA	NA	NA
Lead	15	1.5	5.7	NA	1.1 U	NA	NA	NA	NA	NA	NA	NA
Magnesium	No MCL	3350	4,220	NA	1,150 J	NA	NA	NA	NA	NA	NA	NA
Manganese	No MCL	18.4	119	NA	55.3	NA	NA	NA	NA	NA	NA	NA
Mercury	2	0.2	0.1 U	NA	0.1 UJ	NA	NA	NA	NA	NA	NA	NA
Nickel	No MCL	5.2	11.3 U	NA	0.6 U	NA	NA	NA	NA	NA	NA	NA
Potassium	No MCL	5510	4,520	NA	987 J	NA	NA	NA	NA	NA	NA	NA
Selenium	50	2.9	1.3 U	NA	2.4 U	NA	NA	NA	NA	NA	NA	NA
Silver	No MCL	1.7	3.1 U	NA	0.8 U	NA	NA	NA	NA	NA	NA	NA
Sodium	No MCL	8300	21,200	NA	5,530	NA	NA	NA	NA	NA	NA	NA
Vanadium	No MCL	7.5	32.1	NA	1.2 B	NA	NA	NA	NA	NA	NA	NA
Zinc	No MCL	14.9	44.7	NA	20.2 B	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)												
Aluminum	No MCL	146	23.3 U	NA	4.4 U	NA	NA	NA	NA	NA	NA	NA
Arsenic	10	2.6	0.9 U	NA	3.6 B	NA	NA	NA	NA	NA	NA	NA
Barium	2,000	30.9	23.6	NA	18.8 B	NA	NA	NA	NA	NA	NA	NA
Cadmium	5	2.3	2.2 UL	NA	0.2 U	NA	NA	NA	NA	NA	NA	NA
Calcium	No MCL	69800	69,700	NA	81,900	NA	NA	NA	NA	NA	NA	NA
Chromium	100	1.5	2.4 U	NA	0.5 U	NA	NA	NA	NA	NA	NA	NA
Copper	1,300	4	2 U	NA	0.5 U	NA	NA	NA	NA	NA	NA	NA
Iron	No MCL	5.8	9.7 U	NA	10.7 U	NA	NA	NA	NA	NA	NA	NA
Lead	15	1.5	0.8 U	NA	0.9 U	NA	NA	NA	NA	NA	NA	NA
Magnesium	No MCL	3410	1,510	NA	1,120 J	NA	NA	NA	NA	NA	NA	NA
Manganese	No MCL	12.2	51.3	NA	57.6	NA	NA	NA	NA	NA	NA	NA

TABLE 4-5
Groundwater Analytical Detections at Site 3
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background Yorktown-Eastover Aqu**	Yorktown-Eastover						Yorktown-Eastover			
Station ID			YS03-GW019A						YS03-GW020			
Sample ID			YS03-MW019A-0296	YS03-MW019A-0600	YS03-MW019A-0904	YS03-MW019A-0205	YS03-MW019A-0505	YS03-MW019A-0805	YS03-MW020-1004	YS03-MW020-0205	YS03-MW020-0505	YS03-MW020-0805
Sample Date			02/11/96	06/12/00	09/22/04	02/08/05	05/05/05	08/03/05	10/06/04	02/08/05	05/05/05	08/02/05
Investigation			Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	GW RI Data	LTM Data	LTM Data	LTM Data
Chemical Name												
Potassium	No MCL	5680	2,390	NA	845 J	NA	NA	NA	NA	NA	NA	NA
Sodium	No MCL	8570	20,600	NA	6,040	NA	NA	NA	NA	NA	NA	NA
Vanadium	No MCL	6.3	5.3	NA	0.4 U	NA	NA	NA	NA	NA	NA	NA
Zinc	No MCL	5.9	3.6 U	NA	12.8 B	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry (MG/L)												
Nitrate	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
MCL = Federal Maximum Contaminant Level
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
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TABLE 4-5
Groundwater Analytical Detections at Site 3
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background Yorktown-Eastover Aqu**	Yorktown-Eastover			
Station ID			YS03-GW020A			
Sample ID			YS03-MW020A-1004	YS03-MW020A-0205	YS03-MW020A-0505	YS03-MW020A-0805
Sample Date			10/06/04	02/08/05	05/05/05	08/02/05
Investigation			GW RI Data	LTM Data	LTM Data	LTM Data
Chemical Name						
Volatile Organic Compounds (UG/L)						
1,1-Dichloroethene	7	1	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	70	NA	NA	NA	NA	NA
Bromodichloromethane	80	1	10 U	10 U	10 U	10 U
Chloroform	80	1	10 U	10 U	10 U	10 U
Methylene chloride	5	2	10 U	10 U	13 B	3 B
Toluene	1,000	1	10 U	10 U	10 U	10 U
Trichloroethene	5	1	10 U	10 U	10 U	10 U
Vinyl chloride	2	1	1 J	10 U	10 U	10 U
cis-1,2-Dichloroethene	70	1	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	100	1	10 U	10 U	10 U	10 U
Semi-volatile Organic Compounds (UG/L)						
Di-n-octylphthalate	No MCL	10	NA	NA	NA	NA
Phenanthrene	No MCL	10	NA	NA	NA	NA
Total Metals (UG/L)						
Aluminum	No MCL	1160	NA	NA	NA	NA
Arsenic	10	3.5	NA	NA	NA	NA
Barium	2,000	43.6	NA	NA	NA	NA
Beryllium	4	0.2	NA	NA	NA	NA
Cadmium	5	2.3	NA	NA	NA	NA
Calcium	No MCL	67100	NA	NA	NA	NA
Chromium	100	4.7	NA	NA	NA	NA
Cobalt	No MCL	2.1	NA	NA	NA	NA
Copper	1,300	4.5	NA	NA	NA	NA
Iron	No MCL	2350	NA	NA	NA	NA
Lead	15	1.5	NA	NA	NA	NA
Magnesium	No MCL	3350	NA	NA	NA	NA
Manganese	No MCL	18.4	NA	NA	NA	NA
Mercury	2	0.2	NA	NA	NA	NA
Nickel	No MCL	5.2	NA	NA	NA	NA
Potassium	No MCL	5510	NA	NA	NA	NA
Selenium	50	2.9	NA	NA	NA	NA
Silver	No MCL	1.7	NA	NA	NA	NA
Sodium	No MCL	8300	NA	NA	NA	NA
Vanadium	No MCL	7.5	NA	NA	NA	NA
Zinc	No MCL	14.9	NA	NA	NA	NA
Dissolved Metals (UG/L)						
Aluminum	No MCL	146	NA	NA	NA	NA
Arsenic	10	2.6	NA	NA	NA	NA
Barium	2,000	30.9	NA	NA	NA	NA
Cadmium	5	2.3	NA	NA	NA	NA
Calcium	No MCL	69800	NA	NA	NA	NA
Chromium	100	1.5	NA	NA	NA	NA
Copper	1,300	4	NA	NA	NA	NA
Iron	No MCL	5.8	NA	NA	NA	NA
Lead	15	1.5	NA	NA	NA	NA
Magnesium	No MCL	3410	NA	NA	NA	NA
Manganese	No MCL	12.2	NA	NA	NA	NA

TABLE 4-5
Groundwater Analytical Detections at Site 3
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background Yorktown-Eastover Aqu**	Yorktown-Eastover			
Station ID			YS03-GW020A			
Sample ID			YS03-MW020A-1004	YS03-MW020A-0205	YS03-MW020A-0505	YS03-MW020A-0805
Sample Date			10/06/04	02/08/05	05/05/05	08/02/05
Investigation			GW RI Data	LTM Data	LTM Data	LTM Data
Chemical Name						
Potassium	No MCL	5680	NA	NA	NA	NA
Sodium	No MCL	8570	NA	NA	NA	NA
Vanadium	No MCL	6.3	NA	NA	NA	NA
Zinc	No MCL	5.9	NA	NA	NA	NA
Wet Chemistry (MG/L)						
Nitrate	10	NA	NA	NA	NA	NA

Notes:
Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
MCL = Federal Maximum Contaminant Level
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 4-6
Sediment Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS01-SD005		YS01-SD006				YS01-SD007			YS01-SD008	
Sample ID	YS01-SD005-A-0892	YS01-SD005-B-0892	YS01-SD006-A-0892	YS01-SD006P-A-0892	YS01-SD006-B-0892	YS01-SD006P-B-0892	YS01-SD007-A-0892	YS01-SD007P-A-0892	YS01-SD007-B-0892	YS01-SD008-A-0892	YS01-SD008-B-0892
Sample Date	08/06/92	08/06/92	08/06/92	08/06/92	08/06/92	08/06/92	08/07/92	08/07/92	08/07/92	08/11/92	08/11/92
Chemical Name											
Volatile Organic Compounds (UG/KG)											
2-Butanone	27 U	22 UJ	28 UJ	25 UJ	26 U	26 U	13 U	34 U	23 U	45 U	37 U
Acetone	160 U	130 UJ	98 UJ	67 UJ	72 U	39 U	59 U	34 U	120 U	420 U	250 J
Benzene	27 U	22 UJ	28 UJ	25 UJ	26 U	26 U	13 U	34 U	23 U	45 U	37 U
Carbon disulfide	10 J	27 J	11 J	12 J	24 J	9 J	13 U	34 U	13 J	34 J	5 J
Methylcyclohexane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	27 U	28 UJ	31 UJ	32 UJ	26 U	26 U	26 U	82 U	53 U	88 U	51 U
Toluene	27 UJ	22 UJ	28 UJ	25 UJ	26 U	26 U	13 U	34 U	23 U	45 U	37 U
Trichloroethene	27 UJ	22 UJ	28 UJ	25 UJ	26 U	26 U	13 U	34 U	23 U	45 U	37 U
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semi-volatile Organic Compounds (UG/KG)											
4-Methylphenol	880 U	750 U	910 U	830 U	850 U	93 J	410 U	1,100 U	780 U	1,400 U	1,200 U
Di-n-butylphthalate	880 U	750 U	910 U	830 U	850 U	840 U	410 U	1,100 U	780 U	230 J	350 J
Pentachlorophenol	2,200 U	2,000 U	2,300 U	110 J	2,100 U	2,100 U	1,000 U	2,700 U	2,000 U	3,500 U	3,000 U
Phenol	66 J	750 U	910 U	44 J	850 U	52 J	410 U	1,100 U	780 U	1,400 U	1,200 U
Total Metals (MG/KG)											
Aluminum	8,410	10,100	9,590	5,860	7,610	8,580	5,640	14,600	13,800	11,100	13,900
Antimony	23.2 UJ	19.3 UJ	24.5 UJ	20.7 UJ	21.2 UJ	21.7 UJ	11.2	27.3 U	19.1 U	33.7 U	31 U
Arsenic	8.7	9.6	9.4	5	9.1	9.4	3.3 J	9.4 J	12.3 J	6.5	9.6
Barium	19.3	22	20.6	12.9	18	19.3	10.7	28.8	27.2	20.1	28.2
Beryllium	0.84	0.84	0.89	0.52	0.92	0.74	0.4	1.1	0.91	1.5	1.7
Cadmium	2.11 U	1.76 U	2.23 U	1.88 U	1.93 U	1.98 U	1 U	2.48 U	1.73 U	3.07 U	2.82 U
Calcium	1,930	1,860	2,230	1,560	1,620	1,680	904	4,380	2,020	3,090	2,560
Chromium	22.5	89.6	25.1	13.2	20.1	20.9	14.3	36.7	34.3	28.4	38.6
Cobalt	6.8	9.1	5.1	4.1	6.9	5.2	3.5 U	10.4	9.8	5.3	13.2
Copper	14.7	20.7	18.9	11.9	16.3	25.4	6	19.3	17.9	11.4	19.8
Iron	27,500	32,000	31,000	20,000	29,000	29,400	10,900	29,000	29,800	25,200	34,800
Lead	21.5 J	22.2 J	21.6 J	16.9 J	17.4 J	21.6 J	9.1	26	24.7	24.5	27.4
Magnesium	5,540	5,780	5,990	4,310	4,950	5,300	2,730	7,200	5,700	6,640	6,780
Manganese	191	260	194	124	228	222	67.8	187	172	190 J	263 J
Nickel	16.1	162	10 U	12.9	13.9	14.6	7.8	18.2	20	13.8 U	20.6
Potassium	3,090	3,010	2,970	1,760	2,550	2,440	1,510	3,850	3,240	2,740	3,980
Selenium	9.8 UJ	8.43 UJ	11.1 UJ	9.6 UJ	10.2 UJ	9.85 UJ	0.49 U	1.28 UJ	0.92 UJ	1.54 UJ	1.46 UJ
Sodium	12,200	9,560	13,300	12,300	11,000	10,600	6,430	16,300	7,830	19,200	11,800
Vanadium	30.8	31.8	32.4	18.3	26.1	27.8	14	34.6	38.4	29.7	44.9
Zinc	98.2	108	101	68.1	69	84.3	39.7	109	89	100 J	122 J

Notes:

Shaded values indicate the analyte was detected
UG/KG = Micrograms per Kilogram
MG/KG = Milligrams per Kilogram
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
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UL = Not detected, quantitation limit is probably higher

TABLE 4-6
Sediment Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS01-SD009		YS01-SD010		YS01-SD011		YS01-SD012		YS01-SD013	
Sample ID	YS01-SD009-A-0892	YS01-SD009-B-0892	YS01-SD010-A-0892	YS01-SD010-B-0892	YS01-SD011-A-0892	YS01-SD011-B-0892	YS01-SD012-A-0892	YS01-SD012-B-0892	YS01-SD013-A-0995	YS01-SD013-B-0995
Sample Date	08/06/92	08/06/92	08/07/92	08/07/92	08/03/92	08/03/92	08/07/92	08/07/92	09/09/95	09/09/95
Chemical Name										
Volatile Organic Compounds (UG/KG)										
2-Butanone	16 U	15 U	13 UJ	13 UJ	13 U	13 U	13 UJ	12 UJ	12 U	11 U
Acetone	16 U	36 U	40 J	52 J	28 U	37 U	13 UJ	12 UJ	12 U	11 U
Benzene	16 U	15 U	13 UJ	13 UJ	13 U	13 U	13 UJ	12 UJ	12 U	11 U
Carbon disulfide	16 U	7 J	13 UJ	13 UJ	13 U	13 U	13 UJ	12 UJ	12 U	11 U
Methylcyclohexane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	18 U	15 U	17 UJ	13 UJ	13 U	13 U	15 UJ	12 UJ	12 U	11 U
Toluene	16 U	15 U	13 UJ	13 UJ	13 U	13 U	13 UJ	12 UJ	12 U	2 J
Trichloroethene	16 U	15 U	13 UJ	13 UJ	13 U	13 U	13 UJ	12 UJ	12 U	11 U
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semi-volatile Organic Compounds (UG/KG)										
4-Methylphenol	540 U	1,400 U	410 U	420 U	420 U	420 U	410 U	400 U	380 U	360 U
Di-n-butylphthalate	540 U	1,400 U	410 U	420 U	420 U	420 U	410 U	400 U	1,200 B	1,200 B
Pentachlorophenol	1,300 U	3,500 U	1,000 U	1,000 U	1,100 U	1,100 U	1,000 U	1,000 U	940 U	900 U
Phenol	540 U	1,400 U	410 U	420 U	420 U	420 U	410 U	400 U	380 U	360 U
Total Metals (MG/KG)										
Aluminum	2,840	1,630	2,010	2,420	194 J	691 J	1,790	1,090	1,760	1,240
Antimony	14.1 UJ	12.7 UJ	11.3 U	10.7 U	11.5 UJ	10.9 UJ	10.1 U	10.3 U	3.3 UL	3.5 UL
Arsenic	2.9	1.9	3.2 J	1.8 J	0.75 J	0.79 J	0.69 J	0.46 UJ	1.5	0.63
Barium	6.5	3.6	4.8	4.8	2.7 J	4.6 J	6.8	4.1	25.7 J	16.6 J
Beryllium	0.32 U	0.29 U	0.26 U	0.24 U	0.26 U	0.32	0.28	0.23 U	0.27 U	0.29 U
Cadmium	1.28 U	1.15 U	1.02 U	1.4 U	1.05 UJ	0.99 UJ	0.92 U	0.93 U	0.68 U	0.72 U
Calcium	1,000	870	77.8	90.5	576 J	441 J	460	249	716 J	341 J
Chromium	6.4	3.9	6.3	6.6	2.09 J	2.8 J	2.3	1.87 U	2.2	1.1
Cobalt	2.4	1.73 U	2 U	2 U	1.57 U	1.48 U	2.4 U	1.7 U	0.88 B	0.43 U
Copper	1.6 U	1.44 U	1.28 U	1.3	1.8 J	2.9 J	1.15 U	1.17 U	4.2	2.9
Iron	8,690	5,630	3,980	3,850	653 J	833 J	2,570	1,600	4,280	1,320
Lead	8.2 J	4.2 J	3.3	2.5	1.3 J	2.8 J	5	1.8	7.4	8.5
Magnesium	1,840	772	333	388	32.9 U	51.3	144	102	94.2	60.8
Manganese	64.9	36.4	9.8	8.6	6.2 J	4.6 J	42.9	7.3	66.1	9.1
Nickel	5.76 U	5.2 U	4.61 U	4.38 U	4.7 U	5.5	4.14 U	4.2 U	2.1 U	2.3 U
Potassium	1,050	352	431	721	253 U	240 U	223 U	226 U	97.9 U	104 U
Selenium	6.05 UJ	0.56 UJ	0.51 U	0.5 U	0.52 UJ	0.5 UJ	0.57 J	0.46 U	0.36 U	0.24 U
Sodium	4,110	1,090	19.6	39.4	48.6	117	89.6	44.8	24.5 B	16 B
Vanadium	9.6	4.7	6.2	7.1	1.57 U	1.8	4.1	1.9	4.3	2.3
Zinc	35.4	17.1	6.7	7.1	14.5 J	12.9 J	14.1	7.2	16.3	7.7

Notes:
Shaded values indicate the analyte was detected
UG/KG = Micrograms per Kilogram
MG/KG = Milligrams per Kilogram
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
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NA = Not analyzed
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TABLE 4-6
Sediment Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS01-SD014	YS01-SD014	YS01-SD015		YS01-SD016			YS01-SD017	YS01-SD018	
Sample ID	YS01-SD014-A-0995	YS01-SD014-B-0995	YS01-SD015-A-0995	YS01-SD015-B-0995	YS01-SD016-A-0995	YS01-SD016P-A-0995	YS01-SD016-B-0995	YS01-SD017-0995	YS01-SD018-0500	YS01-SD018P-0500
Sample Date	09/08/95	09/08/95	09/08/95	09/08/95	09/09/95	09/09/95	09/09/95	09/08/95	05/10/00	05/10/00
Chemical Name										
Volatile Organic Compounds (UG/KG)										
2-Butanone	12 U	12 U	35 U	26 U	30 UJ	31 UJ	25 U	42 U	23 J	25 J
Acetone	120	99	35 U	230	180 B	44 B	66	42 U	180 B	210 B
Benzene	12 U	12 U	35 U	26 U	30 UJ	31 UJ	25 U	42 U	30 U	31 U
Carbon disulfide	12 U	12 U	10 J	29	30 UJ	31 UJ	14 J	42 U	75 J	96 J
Methylcyclohexane	NA	NA	NA	NA	NA	NA	NA	NA	30 U	31 U
Methylene chloride	12 U	12 U	35 U	26 U	30 UJ	31 UJ	25 U	42 U	24 B	22 B
Toluene	12 U	12 U	35 U	26 UJ	30 UJ	31 UJ	25 U	42 U	30 U	31 U
Trichloroethene	12 U	12 U	35 U	26 U	30 UJ	31 UJ	25 U	42 U	30 U	31 U
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	30 U	31 U
Semi-volatile Organic Compounds (UG/KG)										
4-Methylphenol	390 U	390 UJ	1,200 U	840 U	990 U	1,000 U	840 U	1,400 U	NA	NA
Di-n-butylphthalate	1,200 B	1,100 B	1,900 B	2,900 B	3,100 B	3,000 B	3,000 B	2,500 B	NA	NA
Pentachlorophenol	960 U	970 UJ	2,900 U	2,100 U	2,500 U	2,600 U	2,100 U	3,500 U	NA	NA
Phenol	390 U	390 UJ	1,200 U	840 U	990 U	1,000 U	840 U	1,400 U	NA	NA
Total Metals (MG/KG)										
Aluminum	434	659	15,500	21,100	17,400	14,500	15,900	20,500	NA	NA
Antimony	3.4 UL	3.7 UL	10.7 UL	8.3 UL	10.2 UL	11.2 UL	7.9 UL	11.6 UL	NA	NA
Arsenic	0.37 U	0.3 U	8	12.6	9.5	15.4	12.7	8.1	NA	NA
Barium	1.9 J	3.9 J	46.1 J	37.6 J	33.5 J	30.3 J	31.4 J	39.9 J	NA	NA
Beryllium	0.28 U	0.31 U	0.88 U	0.69 U	0.84 U	0.92 U	0.66 U	0.96 U	NA	NA
Cadmium	0.69 U	0.76 U	2.2 U	1.7 U	2.1 U	2.3 U	1.7	2.4 U	NA	NA
Calcium	1,540 J	39,000 J	129,000 J	3,420 J	2,450 J	2,350 J	2,250 J	2,920 J	NA	NA
Chromium	0.7 U	1.5	32.2	42.2	39.7	36	36.3	45.8	NA	NA
Cobalt	0.46	0.45 U	6.2	8	7.1	8	6.9	8.9	NA	NA
Copper	0.82	0.96	20.2	14	26.1	26.7	23.7	26.4	NA	NA
Iron	577	1,350	31,400	37,200	39,100	38,200	36,600	38,100	NA	NA
Lead	0.91	1.4	56.8	14	25.6	29.2	28.8	26.2	NA	NA
Magnesium	109	525	7,680	6,590	7,730	7,380	6,850	9,050	NA	NA
Manganese	3.7	11.6	262	379	238	228	228	286	NA	NA
Nickel	2.1 U	2.4 U	11.8	17.3	18.4	17.5	17.5	21	NA	NA
Potassium	98.9 U	141	3,680	4,010	3,850	3,740	3,550	5,090	NA	NA
Selenium	0.33 U	0.26 U	0.97 U	0.59 U	0.74 U	0.85 U	0.76 U	1.2 U	NA	NA
Sodium	318	559	13,600	5,820	13,800	14,400	9,860	21,100	NA	NA
Vanadium	0.79	1.8	38.6	47.7	46.8	43.8	46.9	51.8	NA	NA
Zinc	3.1	4.8	99.8	72.1	128	120	112	135	NA	NA

Notes:

Shaded values indicate the analyte was detected
UG/KG = Micrograms per Kilogram
MG/KG = Milligrams per Kilogram
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
NA = Not analyzed
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TABLE 4-6
Sediment Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS01-SD019			YS01-SD019		YS01-SD020				
Sample ID	YS01-SD019-0500	YS01-SD019-0904	YS01-SD019-0205	YS01-SD019-0505	YS01-SD019-0805	YS01-SD020-0500	YS01-SD020-0904	YS01-SD020-0205	YS01-SD020-0505	YS01-SD020-0805
Sample Date	05/10/00	09/21/04	02/10/05	05/05/05	08/04/05	05/10/00	09/21/04	02/10/05	05/05/05	08/04/05
Chemical Name										
Volatile Organic Compounds (UG/KG)										
2-Butanone	6 J	22 U	17 U	27 U	37 U	15 J	16 U	16 U	16 U	34 U
Acetone	46 B	78 J	17 UJ	14 J	55 B	100 B	50 J	16 UJ	16 U	90 B
Benzene	17 U	22 U	17 U	27 U	37 U	31 U	16 U	16 U	16 U	34 U
Carbon disulfide	30 J	22 UJ	17 U	27 U	37 U	51 J	16 UJ	16 U	16 U	34 U
Methylcyclohexane	17 U	22 U	17 U	27 U	37 U	31 U	16 U	16 U	16 U	34 U
Methylene chloride	13 B	22 U	17 U	27 U	37 U	11 B	16 U	16 U	8 J	34 U
Toluene	17 U	22 U	17 U	27 U	37 U	31 U	16 U	16 U	16 U	34 U
Trichloroethene	17 U	22 U	17 U	27 U	37 U	31 U	16 U	16 U	16 U	34 U
cis-1,2-Dichloroethene	17 U	22 U	17 U	27 U	37 U	31 U	16 U	16 U	16 U	34 U
Semi-volatile Organic Compounds (UG/KG)										
4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Metals (MG/KG)										
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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TABLE 4-6
Sediment Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS01-SD021					
Sample ID	YS01-SD021-0500	YS01-SD021-0904	YS01-SD021-0205	YS01-SD021-0505	YS01-SD021P-0505	YS01-SD021-0805
Sample Date	05/10/00	09/21/04	02/10/05	05/05/05	05/05/05	08/04/05
Chemical Name						
Volatile Organic Compounds (UG/KG)						
2-Butanone	10 J	36 U	29 U	29 U	27 U	30 U
Acetone	110 B	430 J	29 UJ	16 J	12 J	64 B
Benzene	0.6 J	36 U	29 U	29 U	27 U	30 U
Carbon disulfide	53 J	36 UJ	29 U	29 U	27 U	25 J
Methylcyclohexane	30 U	36 UJ	29 U	29 U	27 U	30 U
Methylene chloride	9 B	36 U	29 U	6 J	27 U	30 U
Toluene	30 U	36 UJ	29 U	29 U	27 U	30 U
Trichloroethene	30 U	36 UJ	29 U	29 U	27 U	30 U
cis-1,2-Dichloroethene	30 U	36 U	29 U	29 U	27 U	30 U
Semi-volatile Organic Compounds (UG/KG)						
4-Methylphenol	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA
Total Metals (MG/KG)						
Aluminum	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA

Notes:

Shaded values indicate the analyte was detected
UG/KG = Micrograms per Kilogram
MG/KG = Milligrams per Kilogram
B = Not detected substantially above the level reported in laboratory or field blanks
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TABLE 4-6
Sediment Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS01-SD022					YS01-SD023					
Sample ID	YS01-SD022-0500	YS01-SD022-0904	YS01-SD022-0205	YS01-SD022-0505	YS01-SD022-0805	YS01-SD023-0500	YS01-SD023-0904	YS01-SD023P-0904	YS01-SD023-0205	YS01-SD023-0505	YS01-SD023-0805
Sample Date	05/10/00	09/21/04	02/10/05	05/05/05	08/04/05	05/10/00	09/21/04	09/21/04	02/10/05	05/04/05	08/04/05
Chemical Name											
Volatile Organic Compounds (UG/KG)											
2-Butanone	26 J	53 U	50 U	56 U	120	12 U	14 U	13 U	14 U	17 U	13 U
Acetone	230 B	130 J	50 UJ	86	340 J	12 U	26 J	13 U	14 UJ	7 J	13 UJ
Benzene	29 U	53 U	50 U	56 U	59 U	12 U	14 U	13 U	14 U	17 U	13 U
Carbon disulfide	71 J	53 U	50 U	56 U	59 U	12 U	14 UJ	13 UJ	14 U	17 U	13 U
Methylcyclohexane	29 U	53 U	50 U	56 U	59 U	12 U	14 U	13 U	14 U	17 U	13 U
Methylene chloride	12 B	53 U	50 U	56 U	59 U	15 B	14 U	13 U	14 U	17 U	13 U
Toluene	29 U	53 UJ	50 U	56 U	59 U	12 U	14 U	13 U	14 U	17 U	13 U
Trichloroethene	29 U	53 U	50 U	56 U	59 U	12 U	14 U	13 U	14 U	17 U	13 U
cis-1,2-Dichloroethene	29 U	53 U	50 U	56 U	59 U	12 U	14 U	13 U	14 U	17 U	13 U
Semi-volatile Organic Compounds (UG/KG)											
4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Metals (MG/KG)											
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Shaded values indicate the analyte was detected
UG/KG = Micrograms per Kilogram
MG/KG = Milligrams per Kilogram
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 4-6
Sediment Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS01-SD024		YS01-SD024				YS01-SD025					
Sample ID	YS01-SD024-0500	YS01-SD024-0904	YS01-SD024-0205	YS01-SD024P-0205	YS01-SD024-0505	YS01-SD024-0805	YS01-SD025-0500	YS01-SD025-0904	YS01-SD025-0205	YS01-SD025-0505	YS01-SD025-0805	YS01-SD025P-0805
Sample Date	05/10/00	09/22/04	02/11/05	02/11/05	05/05/05	08/02/05	05/10/00	09/22/04	02/11/05	05/05/05	08/04/05	08/04/05
Chemical Name												
Volatile Organic Compounds (UG/KG)												
2-Butanone	370	48 U	32 U	30 U	45 U	23 U	28	28 U	40 U	36 U	40 U	38 U
Acetone	320	110 J	32 UJ	30 UJ	46	41 B	130 B	61	40 UJ	25 J	51 B	63 B
Benzene	26 U	48 U	32 U	30 U	45 U	23 U	28 U	28 U	40 U	36 U	40 U	38 U
Carbon disulfide	120 J	48 U	32 U	30 U	45 U	23 U	190 J	28 U	30 J	31 J	13 J	12 J
Methylcyclohexane	3 J	48 UJ	32 U	30 U	45 U	23 U	28 U	28 U	40 U	36 U	40 U	38 U
Methylene chloride	35 B	48 U	32 U	30 U	45 U	23 U	33 B	28 U	40 U	36 U	40 U	38 U
Toluene	3 B	48 UJ	32 U	30 UJ	45 U	23 U	28 U	28 U	40 U	36 U	40 U	38 U
Trichloroethene	10 J	48 UJ	32 U	30 U	17 J	23 U	28 U	28 U	40 U	36 U	40 U	38 U
cis-1,2-Dichloroethene	9 J	48 U	32 U	30 U	180	23 U	3 J	28 U	25 J	36 U	40 U	38 U
Semi-volatile Organic Compounds (UG/KG)												
4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Metals (MG/KG)												
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Shaded values indicate the analyte was detected
UG/KG = Micrograms per Kilogram
MG/KG = Milligrams per Kilogram
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 4-6
Sediment Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS01-SD026			YS01-SD026		YS01-SD027				
Sample ID	YS01-SD026-0500	YS01-SD026-0904	YS01-SD026-0205	YS01-SD026-0505	YS01-SD026-0805	YS01-SD027-0500	YS01-SD027-0904	YS01-SD027-0205	YS01-SD027-0505	YS01-SD027-0805
Sample Date	05/10/00	09/22/04	02/11/05	05/05/05	08/02/05	05/12/00	09/22/04	02/11/05	05/05/05	08/02/05
Chemical Name										
Volatile Organic Compounds (UG/KG)										
2-Butanone	14 J	29 U	43 U	48 U	45 U	16 J	17 U	14 U	15 U	13 U
Acetone	82 B	48	43 UJ	48 U	60 B	93 B	38 K	14 UJ	15 U	9 B
Benzene	26 U	29 U	43 U	48 U	45 U	30 U	17 U	14 U	15 U	13 U
Carbon disulfide	110 J	29 U	19 J	48 U	14 J	25 J	17 U	14 U	15 U	13 U
Methylcyclohexane	26 U	29 U	43 U	48 U	45 U	30 U	17 U	14 U	15 U	13 U
Methylene chloride	21 B	29 U	43 U	48 U	45 U	28 B	17 U	14 U	15 U	13 U
Toluene	26 U	29 U	43 U	48 U	45 U	30 U	17 UJ	3 B	15 U	13 U
Trichloroethene	26 U	29 U	43 U	48 U	45 U	30 U	17 U	14 U	15 U	13 U
cis-1,2-Dichloroethene	26 U	29 U	43 U	48 U	45 U	30 U	17 U	14 U	15 U	13 U
Semi-volatile Organic Compounds (UG/KG)										
4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Metals (MG/KG)										
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Shaded values indicate the analyte was detected
UG/KG = Micrograms per Kilogram
MG/KG = Milligrams per Kilogram
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 4-7
Sediment Analytical Detections at Site 3
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS03-SD001		YS03-SD002	
Sample ID	YS03-SD001-A-0892	YS03-SD001-B-0892	YS03-SD002-A-0892	YS03-SD002-B-0892
Sample Date	08/10/92	08/10/92	08/06/92	08/06/92
Chemical Name				
Volatile Organic Compounds (UG/KG)				
Acetone	96 U	14 U	42 U	95 J
Carbon disulfide	7 J	14 U	42 U	99 J
Semi-volatile Organic Compounds (UG/KG)				
4-Methylphenol	750 U	470 U	400 J	510 U
Di-n-butylphthalate	190 J	110 U	1,000 U	510 U
Phenol	750 U	470 U	140 J	50 J
Total Metals (MG/KG)				
Aluminum	4,910	2,980	8,460	9,690
Arsenic	3.9	3.6	5.7	14.1
Barium	12.4	7.3	20.8	22
Beryllium	0.43 U	0.29 U	1.1	0.99
Calcium	1,050 J	1,040 J	2,280	2,690
Chromium	15.2 J	7.9 J	16.7	21.7
Cobalt	3.89 U	2.61 U	4.89 U	4.8
Copper	8.4	5.3	23.8	22.7
Iron	12,700 J	8,870 J	23,600	36,400
Lead	11.3	7.8	23.2 J	29.1 J
Magnesium	2,700	1,140	5,490	4,850
Manganese	80 J	48.3 J	171	210
Nickel	11.2 U	5.79 U	17.1	13.7
Potassium	1,660	799	2,900	2,460
Sodium	6,300	1,620	12,000	4,190
Vanadium	11.8	10.1	28.4	31.8
Zinc	44.1	26.6	101	88.6

Notes:
Shaded values indicate the analyte was detected
UG/KG = Micrograms per Kilogram
MG/KG - Milligrams per Kilogram
J = Analyte present. Reported value may or may not be accurate or precise
U = Not detected

TABLE 4-8
Surface Water Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS01-SW005	YS01-SW006		YS01-SW007	YS01-SW008	YS01-SW009	YS01-SW010	YS01-SW015	YS01-SW016		YS01-SW017	YS01-SW018
Sample ID	YS01-SW005-0892	YS01-SW006-0892	YS01-SW006P-0892	YS01-SW007-0892	YS01-SW008-0892	YS01-SW009-0892	YS01-SW010-0892	YS01-SW015-0995	YS01-SW016-0995	YS01-SW016P-0995	YS01-SW017-0995	YS01-SW018-0500
Sample Date	08/06/92	08/06/92	08/06/92	08/07/92	08/11/92	08/06/92	08/07/92	09/08/95	09/09/95	09/09/95	09/08/95	05/10/00
Chemical Name												
Volatile Organic Compounds (UG/L)												
Acetone	10 U	10 U	10 U	11 U	2 J	10 U	13 U	10 U	10 U	10 U	10 U	6 B
Carbon disulfide	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	2 B
Toluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Xylene, total	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U
Total Metals (UG/L)												
Aluminum	7,650	4,120	4,940	599	462	669	69.1	1,110	1,800	1,380	2,420	NA
Arsenic	20 UJ	20 UJ	20 UJ	20 UJ	20 U	2 U	5.4 J	1.8 UL	1.8 UL	1.8 UL	1.8 UL	NA
Barium	30.7	27.9	32.1	26	25.8	30.4	42.8	31	31.4	32	32	NA
Cadmium	4 U	4 U	4 U	4 U	4 U	4 U	4 U	8.9 L	7.8 L	9.1 L	9 L	NA
Calcium	120,000	158,000	165,000	189,000	200,000	62,500	7,190	242,000 J	194,000 J	198,000 J	249,000 J	NA
Chromium	18.5	8	8 U	8 U	8 U	8 U	8 U	3.8 UL	3.8 UL	3.8 UL	3.8 UL	NA
Copper	29.7	9.2	31	5 U	5 U	10	5 U	9.1 K	7.4 K	8 K	7.7 K	NA
Iron	12,800	6,510	8,320	1,210	855	1,720	6,660	1,220 J	1,900 J	1,760 J	3,250 J	NA
Lead	20 UJ	20 UJ	20 UJ	278 J	20 U	2 UJ	2 J	1.4 UL	1.8 L	2.4 L	14 UL	NA
Magnesium	357,000	498,000	524,000	591,000	699,000	17,900	670	769,000	598,000	616,000	786,000	NA
Manganese	239	170	201	92.1	83.9	57.3	840	20.8	53.3 J	54.9 J	47.4 J	NA
Nickel	23.7	20.3	18.7	18 U	18 U	18 U	18 U	11.6 U	11.6 U	11.6 U	11.6 U	NA
Potassium	123,000	163,000	173,000	189,000	222,000	6,770	1,680	245,000	193,000	198,000	249,000	NA
Sodium	3,090,000	4,280,000	4,450,000	5,150,000	5,490,000	125,000	1,010 J	5,870,000	4,680,000	4,800,000	6,040,000	NA
Vanadium	17.8	14.7	16.1	13.6	6 U	6 U	6 U	9.7	10.8	10	13.4	NA
Zinc	58.6	41.2	44.9	9.3	15.2	17.9	21.6	10.4 K	15 K	15.2 K	20.1 K	NA
Dissolved Metals (UG/L)												
Aluminum	49.4 U	37 U	37 U	35 U	35 U	75.6 U	35 U	33.2	16.9 U	17.2	38.3	NA
Antimony	44 U	44 U	45.3	44 U	44 U	44 U	44 U	18.1 U	18.1 U	18.1 U	18.1 U	NA
Arsenic	20 U	20 UJ	20 U	20 UJ	20 UJ	2.7	3.6 J	1.8 UL	1.8 UL	1.8 UL	1.8 UL	NA
Barium	32.6	29.7	31.8	44.9	27	31.8	45.9	22.5	26	25.7	21.9	NA
Cadmium	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4.8 L	3.7 UL	5.8 L	8.5 L	NA
Calcium	120,000	150,000	147,000	188,000	201,000	60,900	5,350	245,000 J	193,000 J	198,000 J	250,000 J	NA
Copper	5 U	5 U	5 U	5 U	6.9	5 U	14.2	6.5 K	10.2 K	22.3 K	5.5 K	NA
Iron	67.6 U	19 U	19 U	19 U	19 U	112 U	1,350	18.2 J	15.7 J	10.3 J	6.3 J	NA
Lead	2 U	2 U	2 U	269 J	21 J	2 U	2 UJ	7 UL	2.6 L	1.4 UL	7 UL	NA
Magnesium	359,000	468,000	460,000	590,000	706,000	16,700	708	772,000	597,000	611,000	790,000	NA
Manganese	83.7	87.8	86.3	53.7	51.8	42.2	57.4	7.6 J	29.8 J	27 J	0.7 U	NA
Mercury	0.1 U	0.1 U	0.1 U	0.1 U	0.11	0.1 U	0.1 U	0.2 U	0.2 U	0.2 U	0.2 U	NA
Potassium	126,000	159,000	159,000	193,000	224,000	5,460	970 U	245,000	192,000	197,000	250,000	NA
Sodium	3,140,000	4,080,000	4,050,000	4,990,000	5,550,000	120,000	1,260 J	5,990,000	4,710,000	5,020,000	6,110,000	NA
Vanadium	6 U	6 U	9.5	12.2	6 U	6 U	6 U	7.4	5.5	7.3	8.7	NA
Zinc	12.9 U	9.1 U	9.6 U	8.6	15.7	9.7 U	28.2	6.5 K	8.5 K	15.7 K	7.4 K	NA

Notes:

Shaded values indicate the analyte was detected
UG/L = Micrograms per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 4-8
Surface Water Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS01-SW019		YS01-SW019					YS01-SW020					
Sample ID	YS01-SW019-0500	YS01-SW019P-0500	YS01-SW019-0904	YS01-SW019-0205	YS01-SW019P-0205	YS01-SW019-0505	YS01-SW019-0805	YS01-SW020-0500	YS01-SW020-0904	YS01-SW020-0205	YS01-SW020-0505	YS01-SW020P-0505	YS01-SW020-0805
Sample Date	05/10/00	05/10/00	09/21/04	02/10/05	02/10/05	05/05/05	08/04/05	05/10/00	09/21/04	02/10/05	05/05/05	05/05/05	08/04/05
Chemical Name													
Volatile Organic Compounds (UG/L)													
Acetone	7 B	9 B	10 U	10 U	10 U	10 U	8 B	9 B	10 U	10 U	10 U	10 U	5 B
Carbon disulfide	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	1 B	2 B	10 U	10 U	10 U	14 B	3 B	2 J	10 U	10 U	14 B	14 B	3 B
Toluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	4 B	10 U	10 U	10 U
Trichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	2 B	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Xylene, total	10 U	10 U	2 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Total Metals (UG/L)													
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)													
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Shaded values indicate the analyte was detected
UG/L = Micrograms per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 4-8
Surface Water Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS01-SW021			YS01-SW021		YS01-SW022					
Sample ID	YS01-SW021-0500	YS01-SW021-0904	YS01-SW021-0205	YS01-SW021-0505	YS01-SW021-0805	YS01-SW022-0500	YS01-SW022-0904	YS01-SW022-0205	YS01-SW022-0505	YS01-SW022-0805	YS01-SW022P-0805
Sample Date	05/10/00	09/21/04	02/10/05	05/05/05	08/04/05	05/10/00	09/21/04	02/10/05	05/05/05	08/04/05	08/04/05
Chemical Name											
Volatile Organic Compounds (UG/L)											
Acetone	9 B	10 U	10 U	10 U	5 B	5 B	10 U	10 U	10 U	7 B	10 U
Carbon disulfide	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	1 B	1 J	10 U	14 B	3 B	10 U	1 J	10 U	14 B	3 B	4 B
Toluene	10 U	1 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Xylene, total	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	10 U	10 U	10 U	10 U	10 U	2 J	2 J	10 U	10 U	10 U	10 U
Total Metals (UG/L)											
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)											
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Shaded values indicate the analyte was detected
UG/L = Micrograms per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 4-8
Surface Water Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS01-SW023						YS01-SW024				
Sample ID	YS01-SW023-0500	YS01-SW023-0904	YS01-SW023P-0904	YS01-SW023-0205	YS01-SW023-0505	YS01-SW023-0805	YS01-SW024-0500	YS01-SW024-0904	YS01-SW024-0205	YS01-SW024-0505	YS01-SW024-0805
Sample Date	05/10/00	09/21/04	09/21/04	02/10/05	05/04/05	08/04/05	05/10/00	09/22/04	02/11/05	05/05/05	08/02/05
Chemical Name											
Volatile Organic Compounds (UG/L)											
Acetone	7 B	10 U	10 U	10 U	10 U	10 U	11 B	10 U	10 U	10 U	10 U
Carbon disulfide	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1 J
Methylene chloride	2 B	2 J	5 J	10 U	14 B	3 B	10 U	5 J	10 U	15 B	3 B
Toluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	2 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Xylene, total	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	6 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	2 J	5 J	10 U
Total Metals (UG/L)											
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)											
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Shaded values indicate the analyte was detected
UG/L = Micrograms per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
NA = Not analyzed
R = Unreliable result
U = Not detected
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UL = Not detected, quantitation limit is probably higher

TABLE 4-8
Surface Water Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS01-SW025					YS01-SW026				YS01-SW026
Sample ID	YS01-SW025-0500	YS01-SW025-0904	YS01-SW025-0205	YS01-SW025-0505	YS01-SW025-0805	YS01-SW026-0500	YS01-SW026-0904	YS01-SW026-0205	YS01-SW026-0505	YS01-SW026-0805
Sample Date	05/10/00	09/22/04	02/11/05	05/05/05	08/04/05	05/10/00	09/22/04	02/11/05	05/05/05	08/02/05
Chemical Name										
Volatile Organic Compounds (UG/L)										
Acetone	13 B	10 U	10 U	10 U	10 U	9 B	10 U	10 U	10 U	10 U
Carbon disulfide	6 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1 J
Methylene chloride	1 B	5 J	10 U	14 B	4 B	1 B	10 U	10 U	15 B	3 B
Toluene	10 U	10 U	2 J	10 U	10 U	10 U	10 U	2 J	10 U	10 U
Trichloroethene	10 U	10 U	1 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U	1 J	10 U	10 U	10 U	10 U	10 U	10 U
Xylene, total	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	10 U	5 J	3 J	7 J	10 U	10 U	10 U	10 U	10 U	10 U
Total Metals (UG/L)										
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)										
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Shaded values indicate the analyte was detected
UG/L = Micrograms per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
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TABLE 4-8
Surface Water Analytical Detections at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS01-SW027				
Sample ID	YS01-SW027-0500	YS01-SW027-0904	YS01-SW027-0205	YS01-SW027-0505	YS01-SW027-0805
Sample Date	05/12/00	09/22/04	02/11/05	05/05/05	08/02/05
Chemical Name					
Volatile Organic Compounds (UG/L)					
Acetone	6 B	10 U	10 U	10 U	10 U
Carbon disulfide	10 U	10 U	10 U	10 U	10 U
Methylene chloride	10 U	10 U	10 U	15 B	3 B
Toluene	10 U	10 U	10 U	10 U	10 U
Trichloroethene	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U	10 U	10 U
Xylene, total	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	10 U	10 U	10 U	10 U	10 U
Total Metals (UG/L)					
Aluminum	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)					
Aluminum	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA

Notes:
Shaded values indicate the analyte was detected
UG/L = Micrograms per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 4-9
Surface Water Analytical Detections at Site 3
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS03-SW001	YS03-SW002
Sample ID	YS03-SW001-0892	YS03-SW002-0892
Sample Date	08/10/92	08/06/92
Chemical Name		
Total Metals (UG/L)		
Aluminum	2,220	2,230
Arsenic	2 UJ	2.1 J
Barium	23.6	20.4
Calcium	70,800	48,600
Chromium	9 U	13.7
Copper	12	5 U
Iron	4,110	4,060
Lead	2 U	2.8 J
Magnesium	131,000 J	88,200
Manganese	128	168
Potassium	50,600	30,900
Selenium	2 UJ	2 UJ
Sodium	1,630,000	673,000
Zinc	23.3	22.3
Dissolved Metals (UG/L)		
Aluminum	50.4	103 U
Barium	17.1	29.7
Calcium	73,000	45,400
Iron	217	452
Manganese	93.2	134
Potassium	52,000	28,700
Selenium	2 UJ	2 UJ
Sodium	1,270,000	685,000
Zinc	10.7	13.4 U

Notes:

Shaded values indicate the analyte was detected

UG/L = Micrograms per Liter

J = Analyte present. Reported value may or may not be accurate or precise

U = Not detected

UJ = Not detected, quantitation limit may be inaccurate or imprecise

TABLE 4-10
Summary of Groundwater Samples Analyses at Sites 1, 3
Phase I Groundwater Remedial Investigation for Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Medium	Sample ID	Analysis				QA/QC Samples	
				TAL Inorganics			
		TCL Organics	Nitramine Compounds	Total	Dissolved	Duplicate	MS/MSD
Site 1 Groundwater	1GW04-001[1]	X		X	X		
	1GW04A-001[1]	X		X	X		
	1GW05-001[1]	X		X	X	X	X
	1GW05A-001[1]	X		X	X		
	1GW12-001[1]	X		X	X		
	1GW12B-001[1]	X		X	X		
	1GW20-001[1]	X					
Site 3 Groundwater	3GW08A-001[1]	X					
	3GW08B-001[1]	X					
	3GW19-001[1]	X		X	X		
	3GW19A-001[1]	X		X	X		
	3GW20-002[1]	X					
	3GW20A-002[1]	X					

Notes:
- Field measurements of groundwater included pH, specific conductivity, temperature, and turbidity.
- TCL organics analysis included VOCs, SVOCs, and Pesticides/PCBs.
- TAL inorganics analysis included cyanide analysis.
- MS/MSD = Matrix Spike/Matrix Spike Duplicate

[1]Monitoring well sampled for VOCs only under the Long-Term Monitoring program for Sites 1, 3, and 7.

TABLE 4-11
Summary of Groundwater Field Parameters at Sites 1, 3
Phase I Groundwater Remedial Investigation for Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Well No.	pH[1]	Specific Conductance at 25°C[2] (µmhos/cm)	Temperature[2] (°C)	Turbidity[3] (NTUs)	Gallons Purged	Date
1GW04	6.71	388	17.8	169	2.3	09/21/2004
	6.84	413	16.15	8.45	4.6	
	6.73	533	17.08	3.41	6.9	
1GW04A	7.08	169	15.72	35.9	6.5	09/21/2004
	7.04	169	15.62	12.4	13	
	7.28	174	15.78	3.56	19.5	
1GW05	5.08	592	19.53	13.9	2.5	09/19/2004
	4.84	558	19.79	3.23	5	
	4.83	529	19.61	3.86	7.5	
1GW05A	7.57	211	18.53	16.3	6.5	09/23/2004
	7.55	210	18.5	8.56	13	
	7.56	211	18.54	2.31	19.5	
1GW12	5.48	473	19.36	5.12	5	09/21/2004
	5.26	467	19.13	3.32	10	
	5.29	476	19.1	4.05	15	
1GW12B[4]	--	--	--	--	--	09/21/2004
1GW20	6.39	251	21.01	40	0.2	09/21/2004
	6.29	247	20.86	30	0.4	
	6.34	247	21.25	137	0.6	
3GW08A	6.38	512	15.59	16.8	9	09/19/2004
	6.65	495	15.59	7.66	18	
	6.8	498	15.84	6.96	27	
3GW08B	6.32	635	15.68	19.4	2.5	10/06/2004
	6.29	637	15.83	11.9	5	
	6.55	625	15.85	10.4	8	
3GW19	6.83	833	16.82	21	2	10/06/2004
	6.8	854	17.71	11	4	
	6.75	853	17.64	8.4	6	
3GW19A	6.37	422	19.47	>1000	8	09/22/2004
	7.27	428	20.04	136	16	
	7.34	425	20.32	50.6	24	
3GW20	7.29	714	16.23	9.92	4	10/06/2004
	7.3	714	15.91	6.4	8	
	7.39	718	15.96	5.07	12	
3GW20A	7.52	369	16.75	721	15	10/06/2004
	7.45	364	16.65	575	10	
	7.44	357	15.62	221	15	

Notes:

-1 pH measured using an Orion pH meter, Model No. 290A.
-2 Specific conductance and temperature measured using YSI conductivity meter, Model No. 335 CT.
-3 Turbidity measured using a Lamotte 2020 meter.
-4 Well purged dry immediately; sample collected after recharge.
-5 Monitoring well 6GW05B replaced monitoring well 6GW05.
-6 Well pumped dry before any readings collected; sample collected after recharge.
-- No measurement
NTU Nephelometric Turbidity Unit

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Legend

- Columbia Monitoring Wells
- Yorktown-Eastover Monitoring Wells
- Study Area Boundary
- Area of Excavation of Arsenic Contaminated Soil
- Interpreted (Geophysical Survey) Northern Extent of Main Disposal Area (Roy F. Weston, Inc., 1993)

N
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Feet

Figure 4-1
Site 1 Layout
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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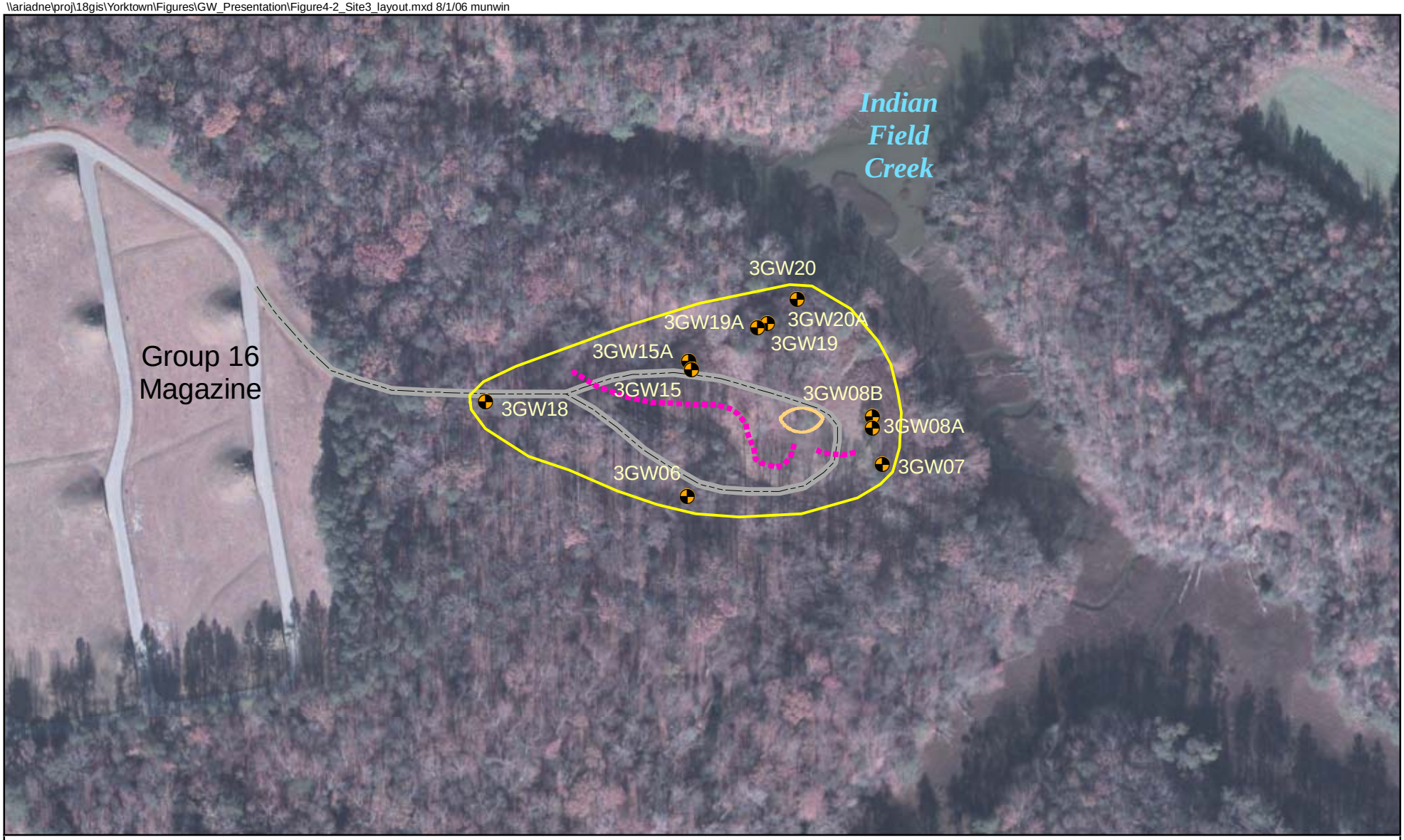

Legend

- Yorktown-Eastover Monitoring Wells
- Study Area Boundary
- Area of Excavation of PAH Contaminated Soil
- Landfill Access Road
- Interpreted (Geophysical Survey) Southern Extent of Waste Boundary (Roy F. Weston, Inc., 1993)

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Feet

Figure 4-2
Site 3 Layout
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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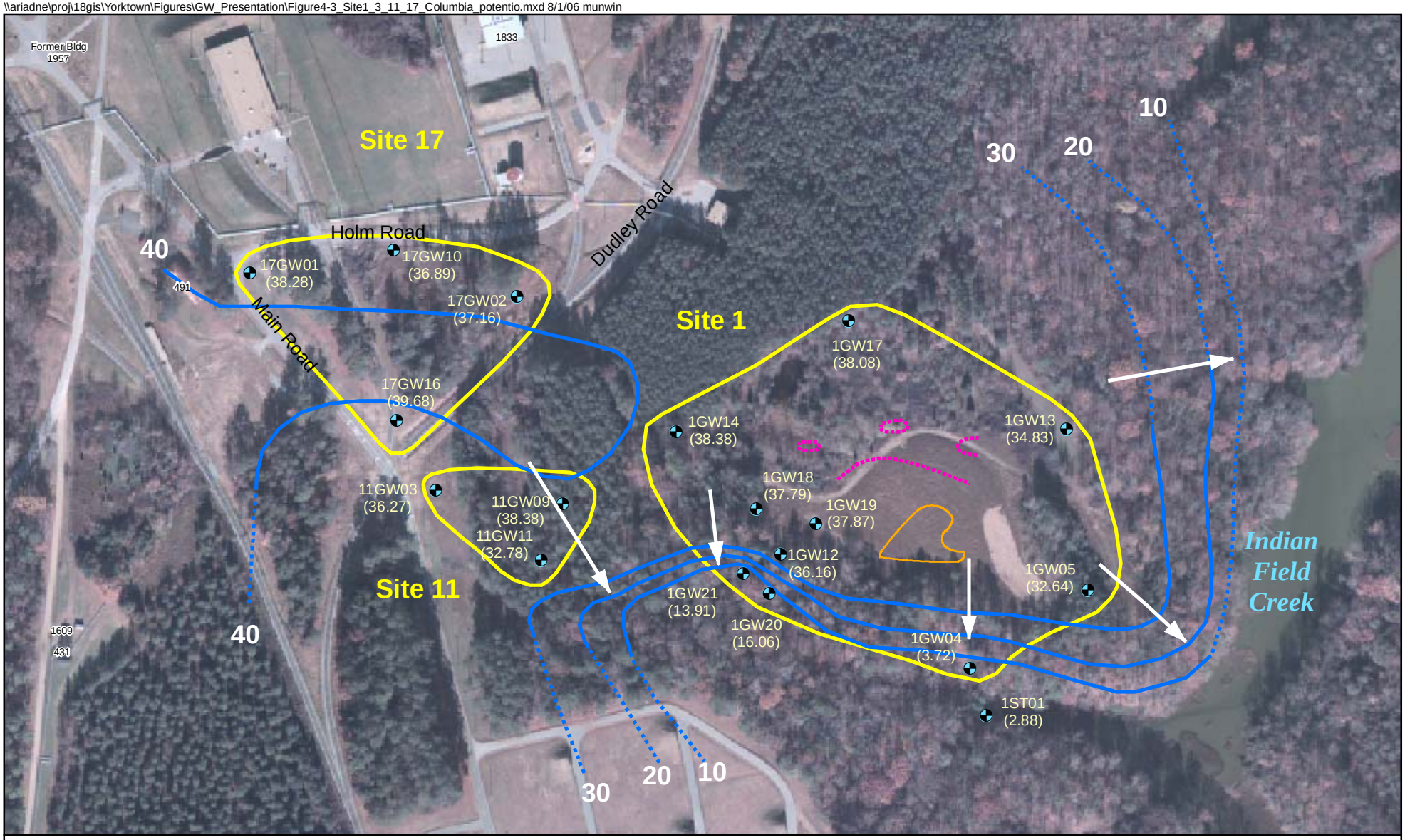

Legend

- Columbia Monitoring Wells
- Study Area Boundaries
- Area of Excavation of Arsenic Contaminated Soil
- Groundwater Contour Line
- Inferred Groundwater Contour Line
- Groundwater Flow Direction
- Interpreted (Geophysical Survey) Northern Extent of Main Disposal Area (Roy F. Weston, Inc.,1993)

N
W E
S

0 150 300
Feet

Figure 4-3
Columbia Aquifer Groundwater Contour Map
for Sites 1, 11, and 17
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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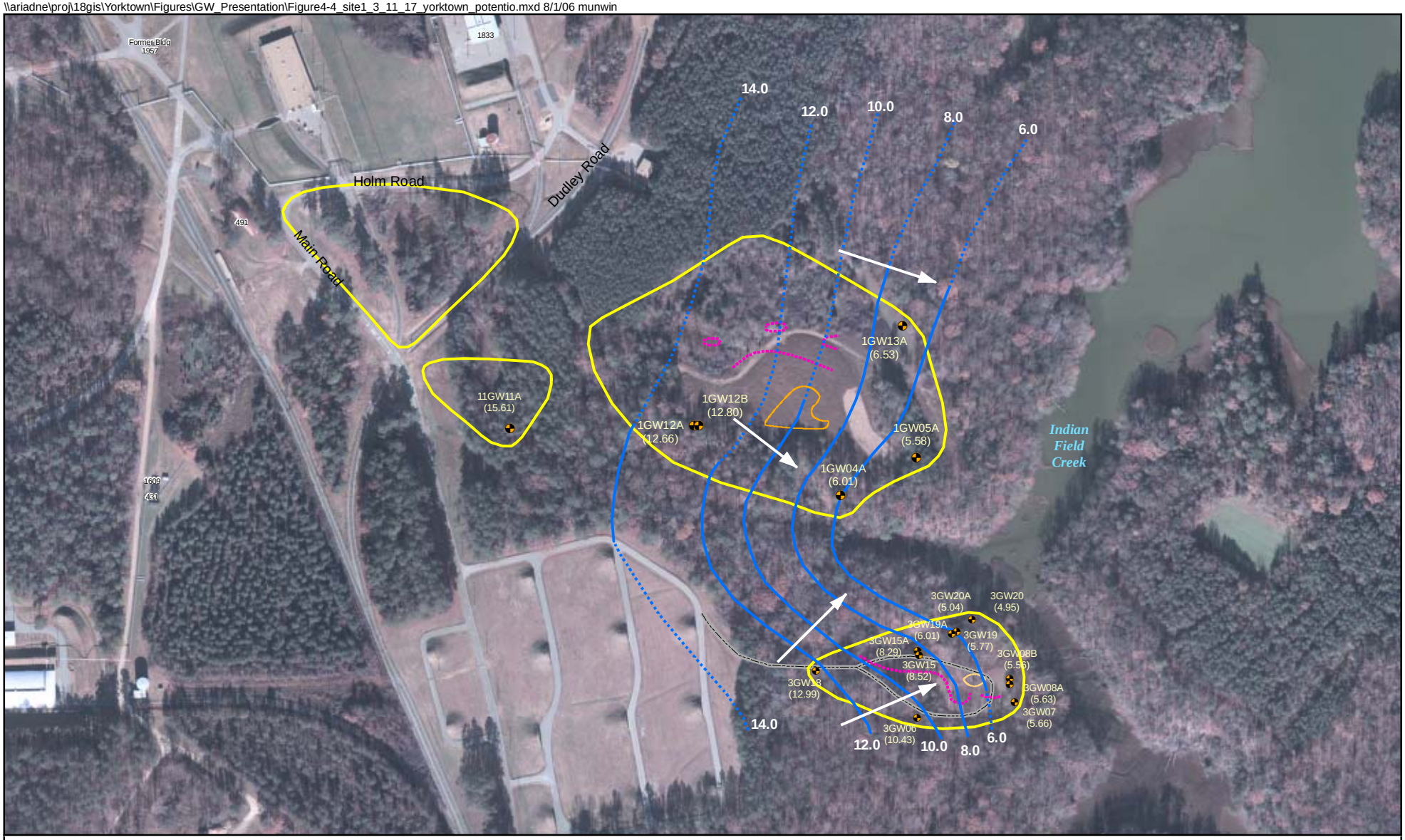

Legend

- Yorktown-Eastover Monitoring Wells
- Study Area Boundaries
- Area of Excavation of Arsenic Contaminated Soil
- Area of Excavation of PAH Contaminated Soil
- Landfill Access Road
- Interpreted (Geophysical Survey) Northern & Southern Extent of Waste Boundary (Roy F. Weston, Inc., 1993)
- Groundwater Flow Direction
- Groundwater Contour Line
- Inferred Groundwater Contour Line

N
W E
S

0 200 400
Feet

Figure 4-4
Yorktown-Eastover Aquifer Groundwater Contour Map
for Sites 1, 3, 11, and 17
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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Legend

- Columbia Monitoring Wells
- Yorktown-Eastover Monitoring Wells
- Test Pit Locations
- Staff Guage Sampling Locations
- Surface Water/Sediment Sampling Locations
- Shelby Tube Sampling Locations
- Surface Soil Sampling Locations
- Study Area Boundary
- Area of Excavation of Arsenic Contaminated Soil
- Interpreted (Geophysical Survey) Northern Extent of Main Disposal Area (Roy F. Weston, Inc., 1993)

N
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0 225 450
Feet

Figure 4-5
Previous Investigations Sampling Locations at Site 1
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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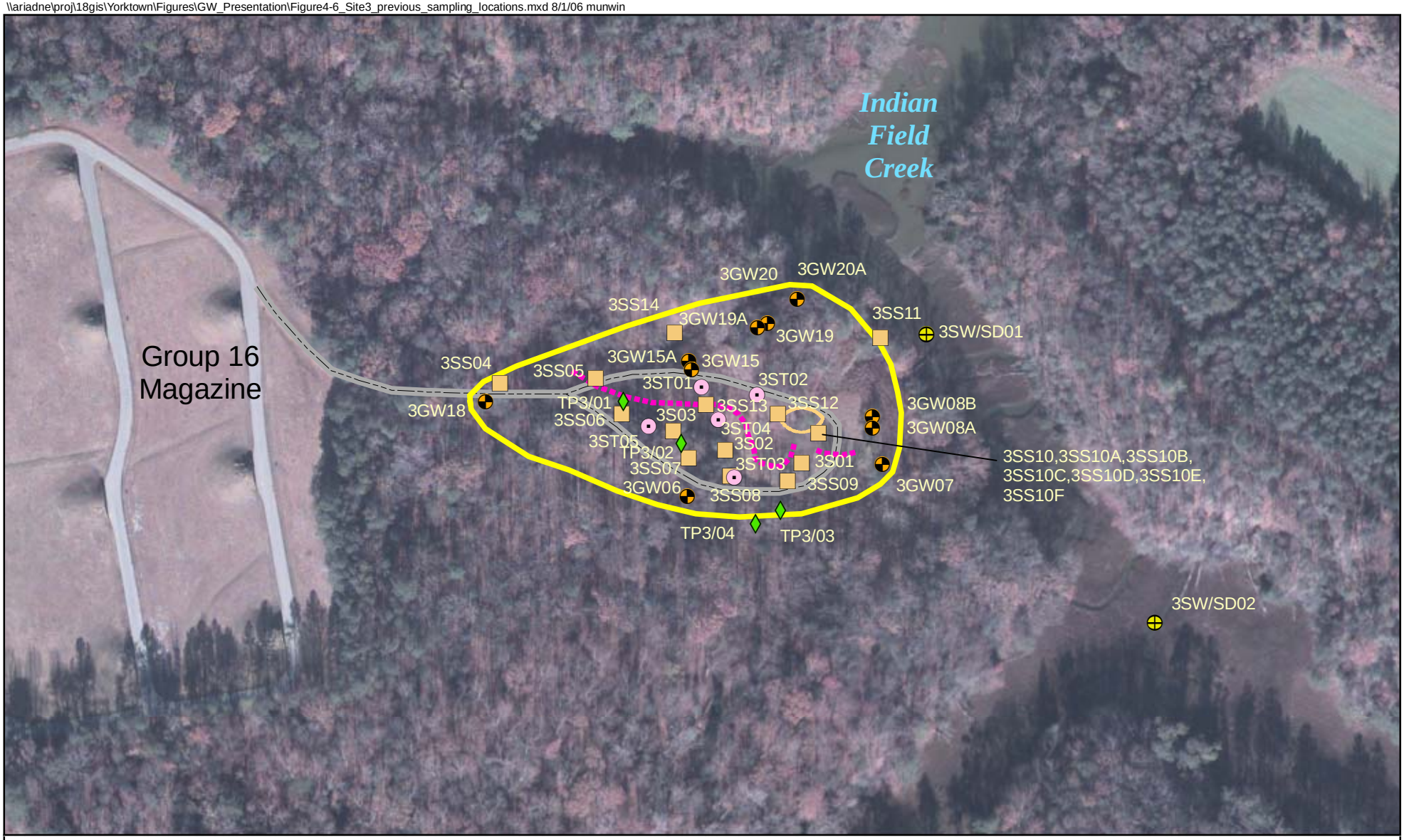

Legend

- Yorktown-Eastover Monitoring Wells
- Test Pit Locations
- Surface Water/Sediment Sampling Locations
- Shelby Tube Sampling Locations
- Surface Soil Sampling Locations
- Study Area Boundary
- Area of Excavation of PAH Contaminated Soil
- Landfill Access Road
- Interpreted (Geophysical Survey) Southern Extent of Waste Boundary (Roy F. Weston, Inc., 1993)

N W E S

0 100 200 Feet

Figure 4-6
Previous Investigations Sampling Locations for Site 3
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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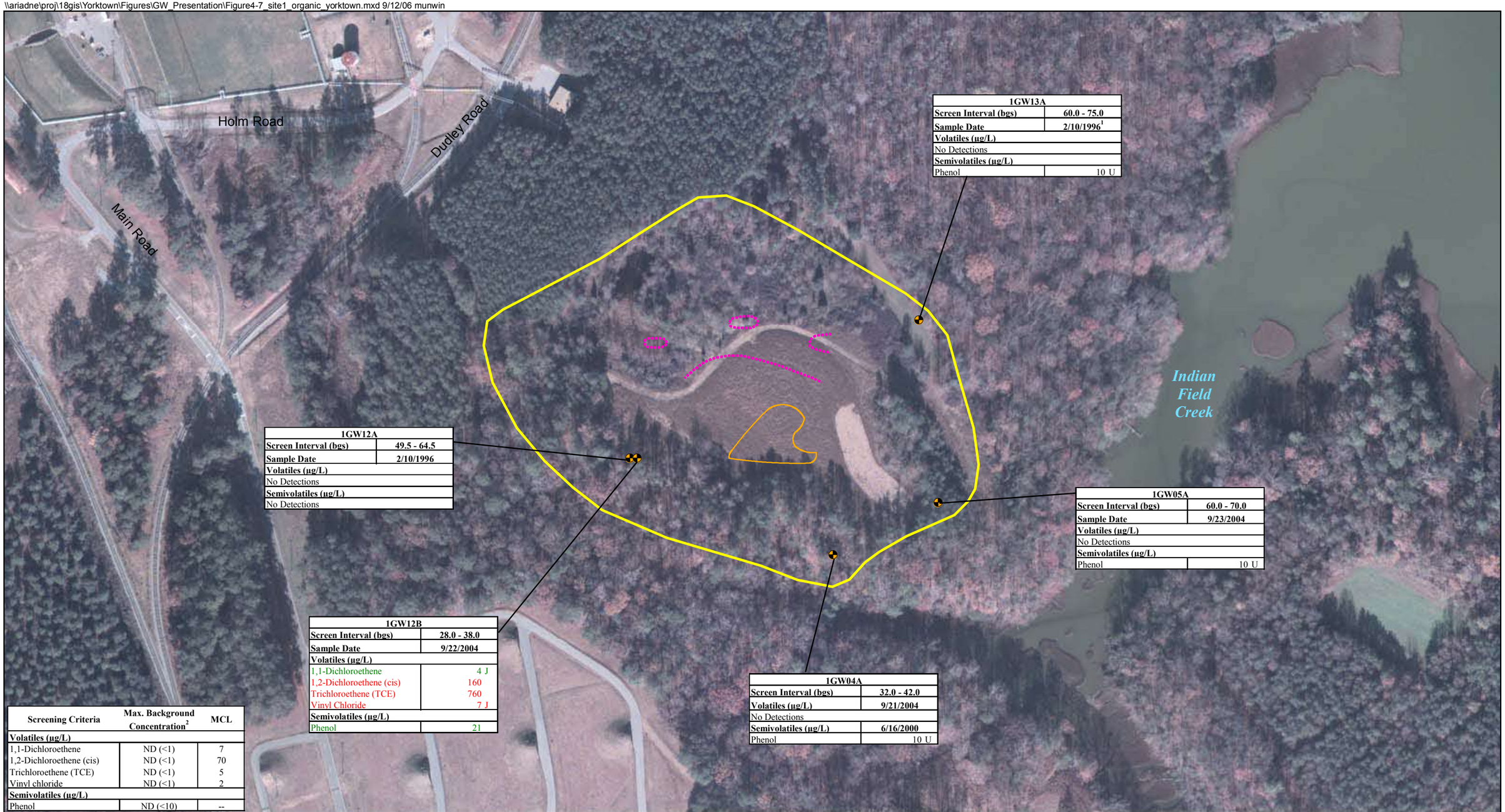

1GW13A	
Screen Interval (bgs)	60.0 - 75.0
Sample Date	2/10/1996[1]
Volatiles (µg/L)	
No Detections	
Semivolatiles (µg/L)	
Phenol	10 U

1GW12A	
Screen Interval (bgs)	49.5 - 64.5
Sample Date	2/10/1996
Volatiles (µg/L)	
No Detections	
Semivolatiles (µg/L)	
No Detections	

1GW05A	
Screen Interval (bgs)	60.0 - 70.0
Sample Date	9/23/2004
Volatiles (µg/L)	
No Detections	
Semivolatiles (µg/L)	
Phenol	10 U

1GW12B	
Screen Interval (bgs)	28.0 - 38.0
Sample Date	9/22/2004
Volatiles (µg/L)	
1,1-Dichloroethene	4 J
1,2-Dichloroethene (cis)	160
Trichloroethene (TCE)	760
Vinyl Chloride	7 J
Semivolatiles (µg/L)	
Phenol	21

1GW04A	
Screen Interval (bgs)	32.0 - 42.0
Volatiles (µg/L)	9/21/2004
No Detections	
Semivolatiles (µg/L)	6/16/2000
Phenol	10 U

Screening Criteria	Max. Background Concentration[2]	MCL
Volatiles (µg/L)		
1,1-Dichloroethene	ND (<1)	7
1,2-Dichloroethene (cis)	ND (<1)	70
Trichloroethene (TCE)	ND (<1)	5
Vinyl chloride	ND (<1)	2
Semivolatiles (µg/L)		
Phenol	ND (<10)	--

Legend

- Yorktown-Eastover Monitoring Wells
- Study Area Boundary
- Area of Excavation of Arsenic Contaminated Soil
- Interpreted (Geophysical Survey) Northern Extent of Main Disposal Area (Roy F. Weston, Inc., 1993)

Notes:
Contaminants shaded green exceed Background concentrations.
Contaminants shaded red exceed Federal MCLs and Background.
[1]Duplicate sample taken at this location, most conservative value reported.
[2]Background values are maximum detected values in respective aquifer from Baker (1995) Background Report.
µg/L = micrograms per liter
B = Value may be associated with laboratory or field blank contamination. B-flagged values are generally considered non-detects; however, the B-flagged values from the 2004 groundwater data set may be erroneously B-flagged due to potentially incorrect field and equipment blank collection procedures.
J = Value is estimated.
MCL = Federal Maximum Contaminant Level
U = Not detected above associated detection limit.
-- No criteria established

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Feet

Figure 4-7
Organic Exceedances of Background and/or MCLs in the Yorktown-Eastover Aquifer at Site 1
Phase I Remedial Investigation Report for Groundwater at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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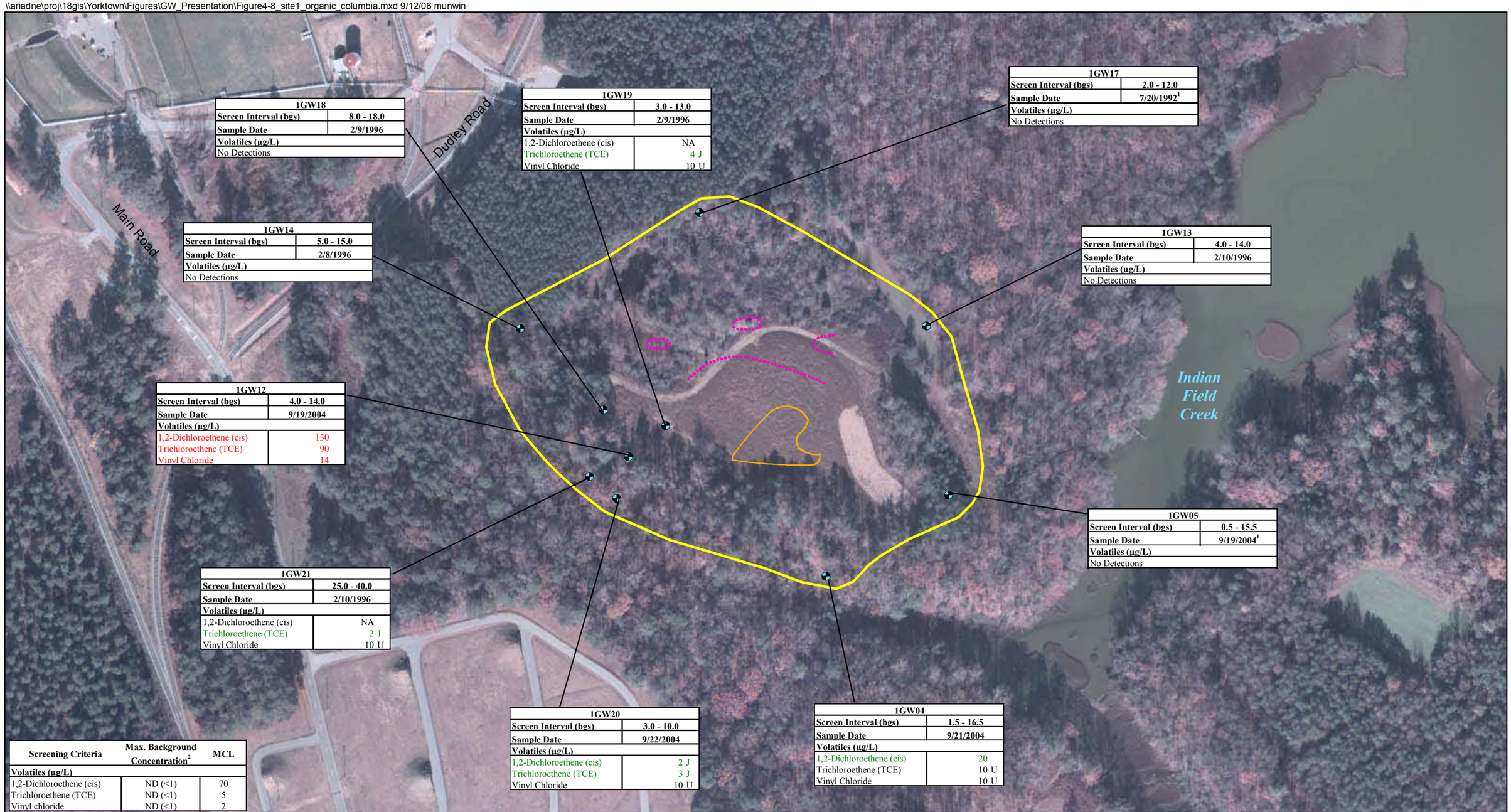

1GW18	
Screen Interval (bgs)	8.0 - 18.0
Sample Date	2/9/1996
Volatiles (µg/L)	
No Detections	

1GW19	
Screen Interval (bgs)	3.0 - 13.0
Sample Date	2/9/1996
Volatiles (µg/L)	
1,2-Dichloroethene (cis)	NA
Trichloroethene (TCE)	4 J
Vinyl Chloride	10 U

1GW17	
Screen Interval (bgs)	2.0 - 12.0
Sample Date	7/20/1992[1]
Volatiles (µg/L)	
No Detections	

1GW14	
Screen Interval (bgs)	5.0 - 15.0
Sample Date	2/8/1996
Volatiles (µg/L)	
No Detections	

1GW13	
Screen Interval (bgs)	4.0 - 14.0
Sample Date	2/10/1996
Volatiles (µg/L)	
No Detections	

1GW12	
Screen Interval (bgs)	4.0 - 14.0
Sample Date	9/19/2004
Volatiles (µg/L)	
1,2-Dichloroethene (cis)	130
Trichloroethene (TCE)	90
Vinyl Chloride	14

1GW05	
Screen Interval (bgs)	0.5 - 15.5
Sample Date	9/19/2004[1]
Volatiles (µg/L)	
No Detections	

1GW21	
Screen Interval (bgs)	25.0 - 40.0
Sample Date	2/10/1996
Volatiles (µg/L)	
1,2-Dichloroethene (cis)	NA
Trichloroethene (TCE)	2 J
Vinyl Chloride	10 U

1GW20	
Screen Interval (bgs)	3.0 - 10.0
Sample Date	9/22/2004
Volatiles (µg/L)	
1,2-Dichloroethene (cis)	2 J
Trichloroethene (TCE)	3 J
Vinyl Chloride	10 U

1GW04	
Screen Interval (bgs)	1.5 - 16.5
Sample Date	9/21/2004
Volatiles (µg/L)	
1,2-Dichloroethene (cis)	20
Trichloroethene (TCE)	10 U
Vinyl Chloride	10 U

Screening Criteria	Max. Background Concentration[2]	MCL
Volatiles (µg/L)		
1,2-Dichloroethene (cis)	ND (<1)	70
Trichloroethene (TCE)	ND (<1)	5
Vinyl chloride	ND (<1)	2

Legend

- Columbia Monitoring Wells
- Study Area Boundary
- Area of Excavation of Arsenic Contaminated Soil
- Interpreted (Geophysical Survey) Northern Extent of Main Disposal Area (Roy F. Weston, Inc., 1993)

Notes:
Contaminants shaded green exceed Background concentrations.
Contaminants shaded red exceed Federal MCLs and Background.
[1]Duplicate sample taken at this location, most conservative value reported.
[2]Background values are maximum detected values in respective aquifer from Baker (1995) Background Report.
µg/L = micrograms per liter
B = Value may be associated with laboratory or field blank contamination. B-flagged values are generally considered non-detects; however, the B-flagged values from the 2004 groundwater data set may be erroneously B-flagged due to potentially incorrect field and equipment blank collection procedures.
J = Value is estimated.
MCL = Federal Maximum Contaminant Level
U = Not detected above associated detection limit.
-- No criteria established
NA = Not analyzed

N
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0 200 400 Feet

Figure 4-8
Organic Exceedances of Background and/or MCLs in the Columbia Aquifer at Site 1
Phase I Remedial Investigation Report for Groundwater at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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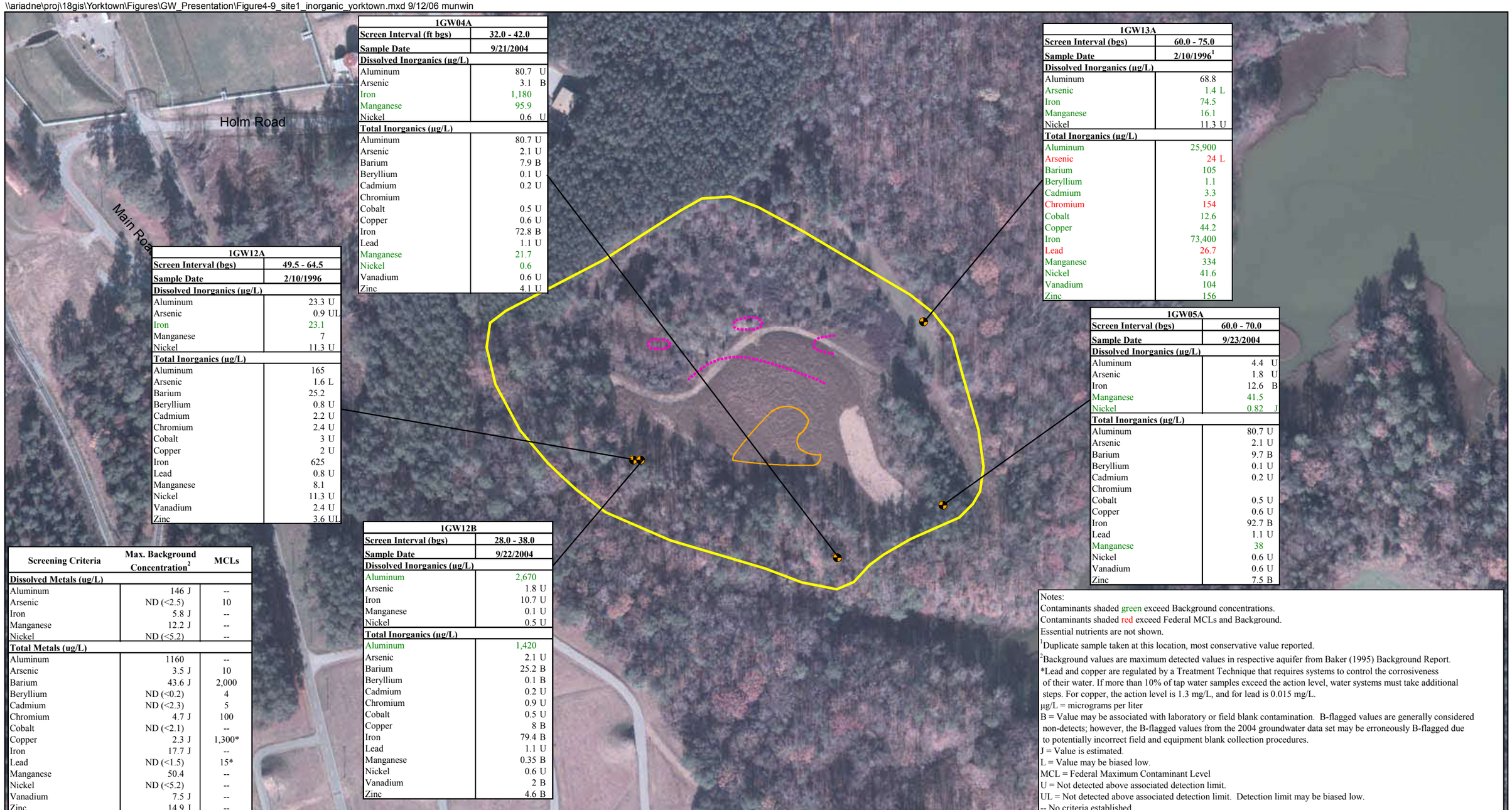

1GW04A	
Screen Interval (ft bgs)	32.0 - 42.0
Sample Date	9/21/2004
Dissolved Inorganics (µg/L)	
Aluminum	80.7 U
Arsenic	3.1 B
Iron	1,180
Manganese	95.9
Nickel	0.6 U
Total Inorganics (µg/L)	
Aluminum	80.7 U
Arsenic	2.1 U
Barium	7.9 B
Beryllium	0.1 U
Cadmium	0.2 U
Chromium	
Cobalt	0.5 U
Copper	0.6 U
Iron	72.8 B
Lead	1.1 U
Manganese	21.7
Nickel	0.6
Vanadium	0.6 U
Zinc	4.1 U

1GW13A	
Screen Interval (bgs)	60.0 - 75.0
Sample Date	2/10/1996[1]
Dissolved Inorganics (µg/L)	
Aluminum	68.8
Arsenic	1.4 L
Iron	74.5
Manganese	16.1
Nickel	11.3 U
Total Inorganics (µg/L)	
Aluminum	25,900
Arsenic	24 L
Barium	105
Beryllium	1.1
Cadmium	3.3
Chromium	154
Cobalt	12.6
Copper	44.2
Iron	73,400
Lead	26.7
Manganese	334
Nickel	41.6
Vanadium	104
Zinc	156

1GW12A	
Screen Interval (bgs)	49.5 - 64.5
Sample Date	2/10/1996
Dissolved Inorganics (µg/L)	
Aluminum	23.3 U
Arsenic	0.9 UL
Iron	23.1
Manganese	7
Nickel	11.3 U
Total Inorganics (µg/L)	
Aluminum	165
Arsenic	1.6 L
Barium	25.2
Beryllium	0.8 U
Cadmium	2.2 U
Chromium	2.4 U
Cobalt	3 U
Copper	2 U
Iron	625
Lead	0.8 U
Manganese	8.1
Nickel	11.3 U
Vanadium	2.4 U
Zinc	3.6 UL

1GW05A	
Screen Interval (bgs)	60.0 - 70.0
Sample Date	9/23/2004
Dissolved Inorganics (µg/L)	
Aluminum	4.4 U
Arsenic	1.8 U
Iron	12.6 B
Manganese	41.5
Nickel	0.82 J
Total Inorganics (µg/L)	
Aluminum	80.7 U
Arsenic	2.1 U
Barium	9.7 B
Beryllium	0.1 U
Cadmium	0.2 U
Chromium	
Cobalt	0.5 U
Copper	0.6 U
Iron	92.7 B
Lead	1.1 U
Manganese	38
Nickel	0.6 U
Vanadium	0.6 U
Zinc	7.5 B

1GW12B	
Screen Interval (bgs)	28.0 - 38.0
Sample Date	9/22/2004
Dissolved Inorganics (µg/L)	
Aluminum	2,670
Arsenic	1.8 U
Iron	10.7 U
Manganese	0.1 U
Nickel	0.5 U
Total Inorganics (µg/L)	
Aluminum	1,420
Arsenic	2.1 U
Barium	25.2 B
Beryllium	0.1 B
Cadmium	0.2 U
Chromium	0.9 U
Cobalt	0.5 U
Copper	8 B
Iron	79.4 B
Lead	1.1 U
Manganese	0.35 B
Nickel	0.6 U
Vanadium	2 B
Zinc	4.6 B

Screening Criteria	Max. Background Concentration[2]	MCLs
Dissolved Metals (ug/L)		
Aluminum	146 J	--
Arsenic	ND (<2.5)	10
Iron	5.8 J	--
Manganese	12.2 J	--
Nickel	ND (<5.2)	--
Total Metals (ug/L)		
Aluminum	1160	--
Arsenic	3.5 J	10
Barium	43.6 J	2,000
Beryllium	ND (<0.2)	4
Cadmium	ND (<2.3)	5
Chromium	4.7 J	100
Cobalt	ND (<2.1)	--
Copper	2.3 J	1,300*
Iron	17.7 J	--
Lead	ND (<1.5)	15*
Manganese	50.4	--
Nickel	ND (<5.2)	--
Vanadium	7.5 J	--
Zinc	14.9 J	--

Notes:
Contaminants shaded green exceed Background concentrations.
Contaminants shaded red exceed Federal MCLs and Background.
Essential nutrients are not shown.
[1]Duplicate sample taken at this location, most conservative value reported.
[2]Background values are maximum detected values in respective aquifer from Baker (1995) Background Report.
*Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10% of tap water samples exceed the action level, water systems must take additional steps. For copper, the action level is 1.3 mg/L, and for lead is 0.015 mg/L.
µg/L = micrograms per liter
B = Value may be associated with laboratory or field blank contamination. B-flagged values are generally considered non-detects; however, the B-flagged values from the 2004 groundwater data set may be erroneously B-flagged due to potentially incorrect field and equipment blank collection procedures.
J = Value is estimated.
L = Value may be biased low.
MCL = Federal Maximum Contaminant Level
U = Not detected above associated detection limit.
UL = Not detected above associated detection limit. Detection limit may be biased low.
-- No criteria established

Legend

- Yorktown-Eastover Monitoring Wells
- Study Area Boundary
- Area of Excavation of Arsenic Contaminated Soil
- Interpreted (Geophysical Survey) Northern Extent of Main Disposal Area (Roy F. Weston, Inc., 1993)

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Feet

Figure 4-9
Inorganic Exceedances of Background and/or MCLs
in the Yorktown-Eastover Aquifer at Site 1
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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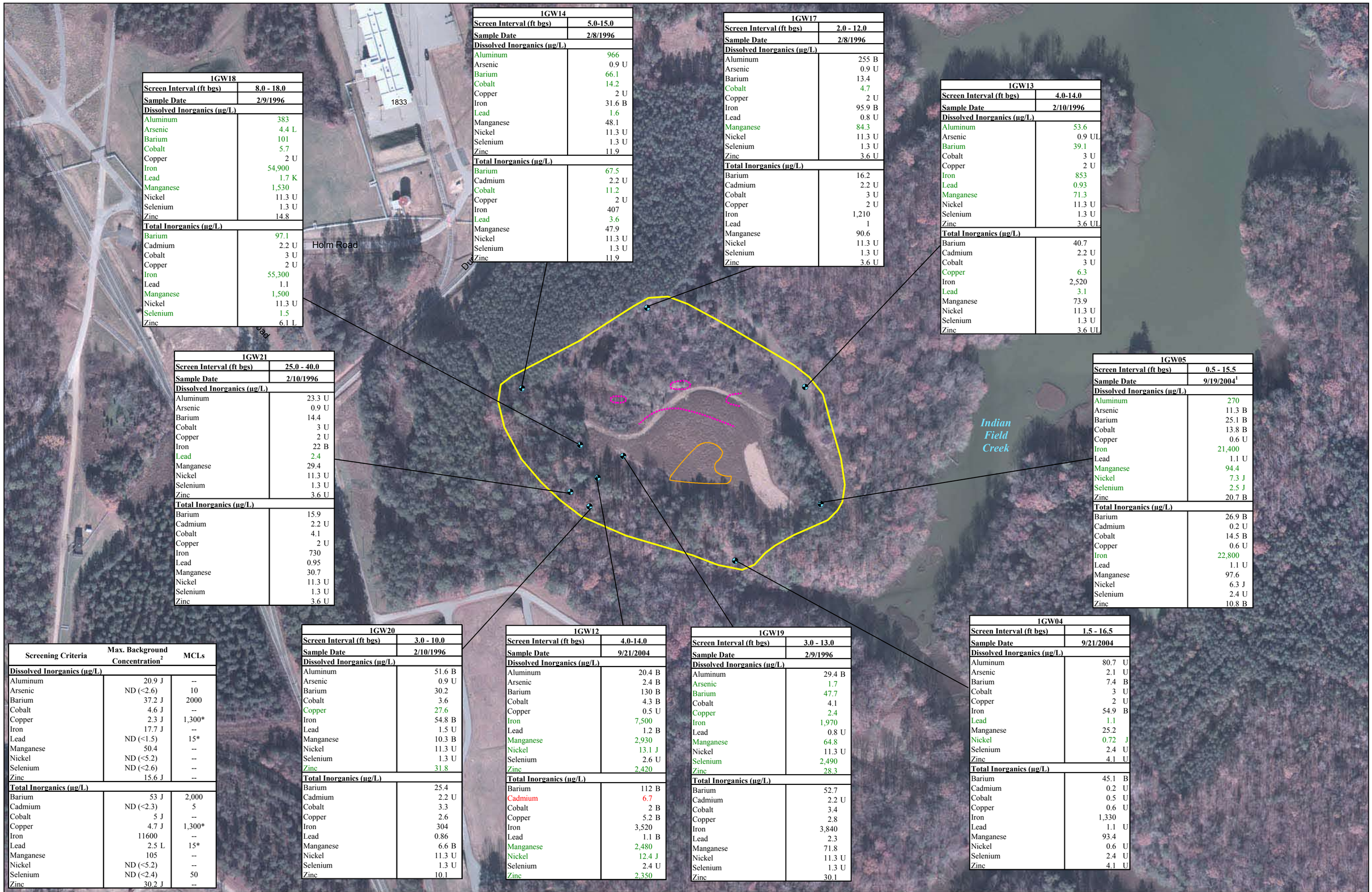

1GW14	
Screen Interval (ft bgs)	5.0-15.0
Sample Date	2/8/1996
Dissolved Inorganics (µg/L)	
Aluminum	966
Arsenic	0.9 U
Barium	66.1
Cobalt	14.2
Copper	2 U
Iron	31.6 B
Lead	1.6
Manganese	48.1
Nickel	11.3 U
Selenium	1.3 U
Zinc	11.9
Total Inorganics (µg/L)	
Barium	67.5
Cadmium	2.2 U
Cobalt	11.2
Copper	2 U
Iron	407
Lead	3.6
Manganese	47.9
Nickel	11.3 U
Selenium	1.3 U
Zinc	11.9

1GW17	
Screen Interval (ft bgs)	2.0 - 12.0
Sample Date	2/8/1996
Dissolved Inorganics (µg/L)	
Aluminum	255 B
Arsenic	0.9 U
Barium	13.4
Cobalt	4.7
Copper	2 U
Iron	95.9 B
Lead	0.8 U
Manganese	84.3
Nickel	11.3 U
Selenium	1.3 U
Zinc	3.6 U
Total Inorganics (µg/L)	
Barium	16.2
Cadmium	2.2 U
Cobalt	3 U
Copper	2 U
Iron	1,210
Lead	1
Manganese	90.6
Nickel	11.3 U
Selenium	1.3 U
Zinc	3.6 U

1GW18	
Screen Interval (ft bgs)	8.0 - 18.0
Sample Date	2/9/1996
Dissolved Inorganics (µg/L)	
Aluminum	383
Arsenic	4.4 L
Barium	101
Cobalt	5.7
Copper	2 U
Iron	54,900
Lead	1.7 K
Manganese	1,530
Nickel	11.3 U
Selenium	1.3 U
Zinc	14.8
Total Inorganics (µg/L)	
Barium	97.1
Cadmium	2.2 U
Cobalt	3 U
Copper	2 U
Iron	55,300
Lead	1.1
Manganese	1,500
Nickel	11.3 U
Selenium	1.5
Zinc	6.1 L

1GW13	
Screen Interval (ft bgs)	4.0-14.0
Sample Date	2/10/1996
Dissolved Inorganics (µg/L)	
Aluminum	53.6
Arsenic	0.9 UL
Barium	39.1
Cobalt	3 U
Copper	2 U
Iron	853
Lead	0.93
Manganese	71.3
Nickel	11.3 U
Selenium	1.3 U
Zinc	3.6 UL
Total Inorganics (µg/L)	
Barium	40.7
Cadmium	2.2 U
Cobalt	3 U
Copper	6.3
Iron	2,520
Lead	3.1
Manganese	73.9
Nickel	11.3 U
Selenium	1.3 U
Zinc	3.6 UL

1GW21	
Screen Interval (ft bgs)	25.0 - 40.0
Sample Date	2/10/1996
Dissolved Inorganics (µg/L)	
Aluminum	23.3 U
Arsenic	0.9 U
Barium	14.4
Cobalt	3 U
Copper	2 U
Iron	22 B
Lead	2.4
Manganese	29.4
Nickel	11.3 U
Selenium	1.3 U
Zinc	3.6 U
Total Inorganics (µg/L)	
Barium	15.9
Cadmium	2.2 U
Cobalt	4.1
Copper	2 U
Iron	730
Lead	0.95
Manganese	30.7
Nickel	11.3 U
Selenium	1.3 U
Zinc	3.6 U

1GW05	
Screen Interval (ft bgs)	0.5 - 15.5
Sample Date	9/19/2004[1]
Dissolved Inorganics (µg/L)	
Aluminum	270
Arsenic	11.3 B
Barium	25.1 B
Cobalt	13.8 B
Copper	0.6 U
Iron	21,400
Lead	1.1 U
Manganese	94.4
Nickel	7.3 J
Selenium	2.5 J
Zinc	20.7 B
Total Inorganics (µg/L)	
Barium	26.9 B
Cadmium	0.2 U
Cobalt	14.5 B
Copper	0.6 U
Iron	22,800
Lead	1.1 U
Manganese	97.6
Nickel	6.3 J
Selenium	2.4 U
Zinc	10.8 B

Screening Criteria	Max. Background Concentration[2]	MCLs
Dissolved Inorganics (µg/L)		
Aluminum	20.9 J	--
Arsenic	ND (<2.6)	10
Barium	37.2 J	2000
Cobalt	4.6 J	--
Copper	2.3 J	1,300*
Iron	17.7 J	--
Lead	ND (<1.5)	15*
Manganese	50.4	--
Nickel	ND (<5.2)	--
Selenium	ND (<2.6)	--
Zinc	15.6 J	--
Total Inorganics (µg/L)		
Barium	53 J	2,000
Cadmium	ND (<2.3)	5
Cobalt	5 J	--
Copper	4.7 J	1,300*
Iron	11600	--
Lead	2.5 L	15*
Manganese	105	--
Nickel	ND (<5.2)	--
Selenium	ND (<2.4)	50
Zinc	30.2 J	--

1GW20	
Screen Interval (ft bgs)	3.0 - 10.0
Sample Date	2/10/1996
Dissolved Inorganics (µg/L)	
Aluminum	51.6 B
Arsenic	0.9 U
Barium	30.2
Cobalt	3.6
Copper	27.6
Iron	54.8 B
Lead	1.5 U
Manganese	10.3 B
Nickel	11.3 U
Selenium	1.3 U
Zinc	31.8
Total Inorganics (µg/L)	
Barium	25.4
Cadmium	2.2 U
Cobalt	3.3
Copper	2.6
Iron	304
Lead	0.86
Manganese	6.6 B
Nickel	11.3 U
Selenium	1.3 U
Zinc	10.1

1GW12	
Screen Interval (ft bgs)	4.0-14.0
Sample Date	9/21/2004
Dissolved Inorganics (µg/L)	
Aluminum	20.4 B
Arsenic	2.4 B
Barium	130 B
Cobalt	4.3 B
Copper	0.5 U
Iron	7,500
Lead	1.2 B
Manganese	2,930
Nickel	13.1 J
Selenium	2.6 U
Zinc	2,420
Total Inorganics (µg/L)	
Barium	112 B
Cadmium	6.7
Cobalt	2 B
Copper	5.2 B
Iron	3,520
Lead	1.1 B
Manganese	2,480
Nickel	12.4 J
Selenium	2.4 U
Zinc	2,350

1GW19	
Screen Interval (ft bgs)	3.0 - 13.0
Sample Date	2/9/1996
Dissolved Inorganics (µg/L)	
Aluminum	29.4 B
Arsenic	1.7
Barium	47.7
Cobalt	4.1
Copper	2.4
Iron	1,970
Lead	0.8 U
Manganese	64.8
Nickel	11.3 U
Selenium	2,490
Zinc	28.3
Total Inorganics (µg/L)	
Barium	52.7
Cadmium	2.2 U
Cobalt	3.4
Copper	2.8
Iron	3,840
Lead	2.3
Manganese	71.8
Nickel	11.3 U
Selenium	1.3 U
Zinc	30.1

1GW04	
Screen Interval (ft bgs)	1.5 - 16.5
Sample Date	9/21/2004
Dissolved Inorganics (µg/L)	
Aluminum	80.7 U
Arsenic	2.1 U
Barium	7.4 B
Cobalt	3 U
Copper	2 U
Iron	54.9 B
Lead	1.1
Manganese	25.2
Nickel	0.72 J
Selenium	2.4 U
Zinc	4.1 U
Total Inorganics (µg/L)	
Barium	45.1 B
Cadmium	0.2 U
Cobalt	0.5 U
Copper	0.6 U
Iron	1,330
Lead	1.1 U
Manganese	93.4
Nickel	0.6 U
Selenium	2.4 U
Zinc	4.1 U

Legend

- Columbia Monitoring Wells
- Study Area Boundary
- Area of Excavation of Arsenic Contaminated Soil
- Interpreted (Geophysical Survey) Northern Extent of Main Disposal Area (Roy F. Weston, Inc., 1993)

Notes:
Contaminants shaded green exceed Background concentrations.
Contaminants shaded red exceed Federal MCLs and Background.
Essential nutrients are not shown.
[1]Duplicate sample taken at this location, most conservative value reported.
[2]Background values are maximum detected values in respective aquifer from Baker (1995) Background Report.
*Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10% of tap water samples exceed the action level, water systems must take additional steps. For copper, the action level is 1.3 mg/L, and for lead is 0.015 mg/L.
µg/L = micrograms per liter
B = Value may be associated with laboratory or field blank contamination. B-flagged values are generally considered non-detects; however, the B-flagged values from the 2004 groundwater data set may be erroneously B-flagged due to potentially incorrect field and equipment blank collection procedures.
J = Value is estimated.
K = Value may be biased high.
L = Value may be biased low.
MCL = Federal Maximum Contaminant Level
U = Not detected above associated detection limit.
UJ = Not detected above associated detection limit. Detection limit is estimated.
UL = Not detected above associated detection limit. Detection limit may be biased low.
-- No criteria established

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Figure 4-10
Inorganic Exceedances of Background and/or MCLs
in the Columbia Aquifer at Site 1
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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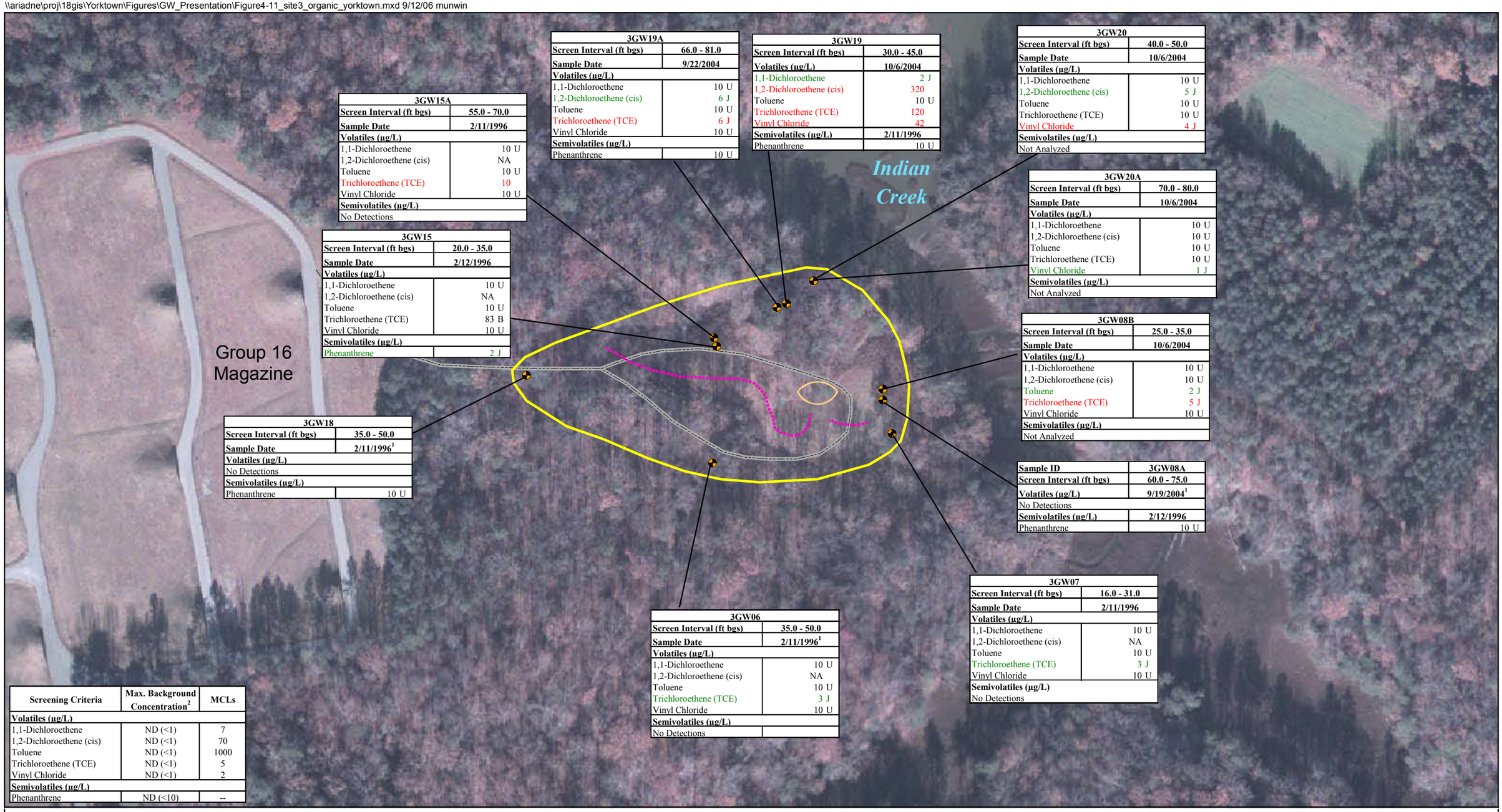

3GW19A	
Screen Interval (ft bgs)	66.0 - 81.0
Sample Date	9/22/2004
Volatiles (µg/L)	
1,1-Dichloroethene	10 U
1,2-Dichloroethene (cis)	6 J
Toluene	10 U
Trichloroethene (TCE)	6 J
Vinyl Chloride	10 U
Semivolatiles (µg/L)	
Phenanthrene	10 U

3GW19	
Screen Interval (ft bgs)	30.0 - 45.0
Volatiles (µg/L)	10/6/2004
1,1-Dichloroethene	2 J
1,2-Dichloroethene (cis)	320
Toluene	10 U
Trichloroethene (TCE)	120
Vinyl Chloride	42
Semivolatiles (µg/L)	2/11/1996
Phenanthrene	10 U

3GW20	
Screen Interval (ft bgs)	40.0 - 50.0
Sample Date	10/6/2004
Volatiles (µg/L)	
1,1-Dichloroethene	10 U
1,2-Dichloroethene (cis)	5 J
Toluene	10 U
Trichloroethene (TCE)	10 U
Vinyl Chloride	4 J
Semivolatiles (µg/L)	
Not Analyzed	

3GW15A	
Screen Interval (ft bgs)	55.0 - 70.0
Sample Date	2/11/1996
Volatiles (µg/L)	
1,1-Dichloroethene	10 U
1,2-Dichloroethene (cis)	NA
Toluene	10 U
Trichloroethene (TCE)	10
Vinyl Chloride	10 U
Semivolatiles (µg/L)	
No Detections	

3GW20A	
Screen Interval (ft bgs)	70.0 - 80.0
Sample Date	10/6/2004
Volatiles (µg/L)	
1,1-Dichloroethene	10 U
1,2-Dichloroethene (cis)	10 U
Toluene	10 U
Trichloroethene (TCE)	10 U
Vinyl Chloride	1 J
Semivolatiles (µg/L)	
Not Analyzed	

3GW15	
Screen Interval (ft bgs)	20.0 - 35.0
Sample Date	2/12/1996
Volatiles (µg/L)	
1,1-Dichloroethene	10 U
1,2-Dichloroethene (cis)	NA
Toluene	10 U
Trichloroethene (TCE)	83 B
Vinyl Chloride	10 U
Semivolatiles (µg/L)	
Phenanthrene	2 J

3GW08B	
Screen Interval (ft bgs)	25.0 - 35.0
Sample Date	10/6/2004
Volatiles (µg/L)	
1,1-Dichloroethene	10 U
1,2-Dichloroethene (cis)	10 U
Toluene	2 J
Trichloroethene (TCE)	5 J
Vinyl Chloride	10 U
Semivolatiles (µg/L)	
Not Analyzed	

3GW18	
Screen Interval (ft bgs)	35.0 - 50.0
Sample Date	2/11/1996[1]
Volatiles (µg/L)	
No Detections	
Semivolatiles (µg/L)	
Phenanthrene	10 U

Sample ID	3GW08A
Screen Interval (ft bgs)	60.0 - 75.0
Volatiles (µg/L)	9/19/2004[1]
No Detections	
Semivolatiles (µg/L)	2/12/1996
Phenanthrene	10 U

3GW07	
Screen Interval (ft bgs)	16.0 - 31.0
Sample Date	2/11/1996
Volatiles (µg/L)	
1,1-Dichloroethene	10 U
1,2-Dichloroethene (cis)	NA
Toluene	10 U
Trichloroethene (TCE)	3 J
Vinyl Chloride	10 U
Semivolatiles (µg/L)	
No Detections	

3GW06	
Screen Interval (ft bgs)	35.0 - 50.0
Sample Date	2/11/1996[1]
Volatiles (µg/L)	
1,1-Dichloroethene	10 U
1,2-Dichloroethene (cis)	NA
Toluene	10 U
Trichloroethene (TCE)	3 J
Vinyl Chloride	10 U
Semivolatiles (µg/L)	
No Detections	

Screening Criteria	Max. Background Concentration[2]	MCLs
Volatiles (µg/L)		
1,1-Dichloroethene	ND (<1)	7
1,2-Dichloroethene (cis)	ND (<1)	70
Toluene	ND (<1)	1000
Trichloroethene (TCE)	ND (<1)	5
Vinyl Chloride	ND (<1)	2
Semivolatiles (µg/L)		
Phenanthrene	ND (<10)	--

Legend

- Yorktown-Eastover Monitoring Wells
- Study Area Boundary
- Area of Excavation of PAH Contaminated Soil
- Landfill Access Road
- Interpreted (Geophysical Survey) Southern Extent of Waste Boundary (Roy F. Weston, Inc., 1993)

Notes:
Contaminants shaded green exceed Background concentrations.
Contaminants shaded red exceed Federal MCLs and Background.
[1]Duplicate sample taken at this location, most conservative value reported.
[2]Background values are maximum detected values in respective aquifer from Baker (1995) Background Report.
µg/L = micrograms per liter
B = Value may be associated with laboratory or field blank contamination. B-flagged values are generally considered non-detects; however, the B-flagged values from the 2004 groundwater data set may be erroneously B-flagged due to potentially incorrect field and equipment blank collection procedures.
J = Value is estimated.
MCL = Federal Maximum Contaminant Level
U = Not detected above associated detection limit.
-- No criteria established

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Figure 4-11
Organic Exceedances of Background and/or MCLs in the Yorktown-Eastover Aquifer at Site 3
Phase I Remedial Investigation Report for Groundwater at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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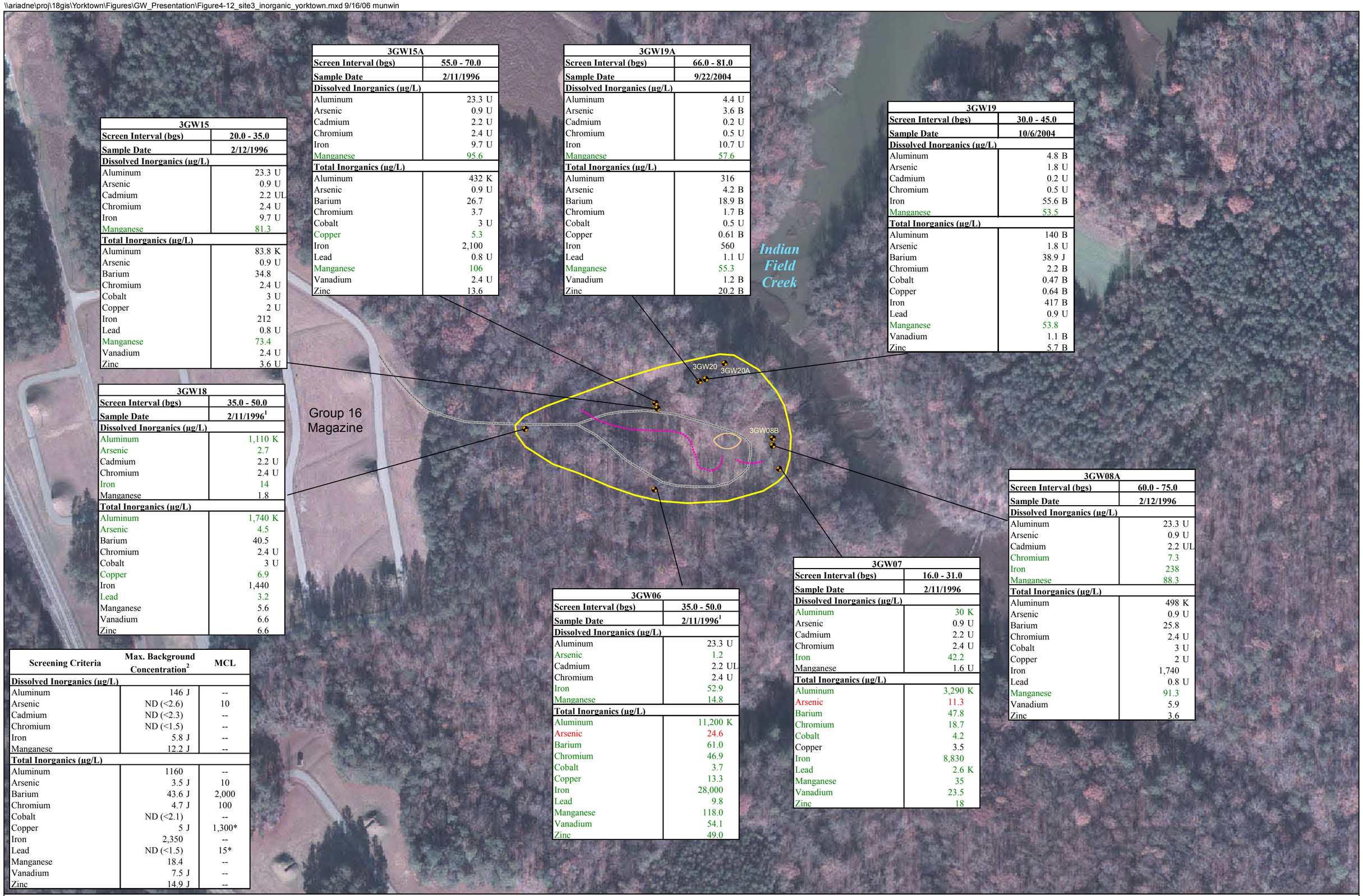

3GW15	
Screen Interval (bgs)	**20.0 - 35.0**
Sample Date	**2/12/1996**
Dissolved Inorganics (µg/L)	
Aluminum	23.3 U
Arsenic	0.9 U
Cadmium	2.2 UL
Chromium	2.4 U
Iron	9.7 U
Manganese	81.3
Total Inorganics (µg/L)	
Aluminum	83.8 K
Arsenic	0.9 U
Barium	34.8
Chromium	2.4 U
Cobalt	3 U
Copper	2 U
Iron	212
Lead	0.8 U
Manganese	73.4
Vanadium	2.4 U
Zinc	3.6 U

3GW15A	
Screen Interval (bgs)	**55.0 - 70.0**
Sample Date	**2/11/1996**
Dissolved Inorganics (µg/L)	
Aluminum	23.3 U
Arsenic	0.9 U
Cadmium	2.2 U
Chromium	2.4 U
Iron	9.7 U
Manganese	95.6
Total Inorganics (µg/L)	
Aluminum	432 K
Arsenic	0.9 U
Barium	26.7
Chromium	3.7
Cobalt	3 U
Copper	5.3
Iron	2,100
Lead	0.8 U
Manganese	106
Vanadium	2.4 U
Zinc	13.6

3GW19A	
Screen Interval (bgs)	**66.0 - 81.0**
Sample Date	**9/22/2004**
Dissolved Inorganics (µg/L)	
Aluminum	4.4 U
Arsenic	3.6 B
Cadmium	0.2 U
Chromium	0.5 U
Iron	10.7 U
Manganese	57.6
Total Inorganics (µg/L)	
Aluminum	316
Arsenic	4.2 B
Barium	18.9 B
Chromium	1.7 B
Cobalt	0.5 U
Copper	0.61 B
Iron	560
Lead	1.1 U
Manganese	55.3
Vanadium	1.2 B
Zinc	20.2 B

3GW19	
Screen Interval (bgs)	**30.0 - 45.0**
Sample Date	**10/6/2004**
Dissolved Inorganics (µg/L)	
Aluminum	4.8 B
Arsenic	1.8 U
Cadmium	0.2 U
Chromium	0.5 U
Iron	55.6 B
Manganese	53.5
Total Inorganics (µg/L)	
Aluminum	140 B
Arsenic	1.8 U
Barium	38.9 J
Chromium	2.2 B
Cobalt	0.47 B
Copper	0.64 B
Iron	417 B
Lead	0.9 U
Manganese	53.8
Vanadium	1.1 B
Zinc	5.7 B

3GW18	
Screen Interval (bgs)	**35.0 - 50.0**
Sample Date	**2/11/1996[1]**
Dissolved Inorganics (µg/L)	
Aluminum	1,110 K
Arsenic	2.7
Cadmium	2.2 U
Chromium	2.4 U
Iron	14
Manganese	1.8
Total Inorganics (µg/L)	
Aluminum	1,740 K
Arsenic	4.5
Barium	40.5
Chromium	2.4 U
Cobalt	3 U
Copper	6.9
Iron	1,440
Lead	3.2
Manganese	5.6
Vanadium	6.6
Zinc	6.6

3GW08A	
Screen Interval (bgs)	**60.0 - 75.0**
Sample Date	**2/12/1996**
Dissolved Inorganics (µg/L)	
Aluminum	23.3 U
Arsenic	0.9 U
Cadmium	2.2 UL
Chromium	7.3
Iron	238
Manganese	88.3
Total Inorganics (µg/L)	
Aluminum	498 K
Arsenic	0.9 U
Barium	25.8
Chromium	2.4 U
Cobalt	3 U
Copper	2 U
Iron	1,740
Lead	0.8 U
Manganese	91.3
Vanadium	5.9
Zinc	3.6

3GW07	
Screen Interval (bgs)	**16.0 - 31.0**
Sample Date	**2/11/1996**
Dissolved Inorganics (µg/L)	
Aluminum	30 K
Arsenic	0.9 U
Cadmium	2.2 U
Chromium	2.4 U
Iron	42.2
Manganese	1.6 U
Total Inorganics (µg/L)	
Aluminum	3,290 K
Arsenic	11.3
Barium	47.8
Chromium	18.7
Cobalt	4.2
Copper	3.5
Iron	8,830
Lead	2.6 K
Manganese	35
Vanadium	23.5
Zinc	18

3GW06	
Screen Interval (bgs)	**35.0 - 50.0**
Sample Date	**2/11/1996[1]**
Dissolved Inorganics (µg/L)	
Aluminum	23.3 U
Arsenic	1.2
Cadmium	2.2 UL
Chromium	2.4 U
Iron	52.9
Manganese	14.8
Total Inorganics (µg/L)	
Aluminum	11,200 K
Arsenic	24.6
Barium	61.0
Chromium	46.9
Cobalt	3.7
Copper	13.3
Iron	28,000
Lead	9.8
Manganese	118.0
Vanadium	54.1
Zinc	49.0

Screening Criteria	Max. Background Concentration[2]	MCL
Dissolved Inorganics (µg/L)		
Aluminum	146 J	--
Arsenic	ND (<2.6)	10
Cadmium	ND (<2.3)	--
Chromium	ND (<1.5)	--
Iron	5.8 J	--
Manganese	12.2 J	--
Total Inorganics (µg/L)		
Aluminum	1160	--
Arsenic	3.5 J	10
Barium	43.6 J	2,000
Chromium	4.7 J	100
Cobalt	ND (<2.1)	--
Copper	5 J	1,300*
Iron	2,350	--
Lead	ND (<1.5)	15*
Manganese	18.4	--
Vanadium	7.5 J	--
Zinc	14.9 J	--

Legend

- Yorktown-Eastover Monitoring Wells
- Study Area Boundary
- Area of Excavation of PAH Contaminated Soil
- Landfill Access Road
- Interpreted (Geophysical Survey) Southern Extent of Waste Boundary (Roy F. Weston, Inc., 1993)

Notes:
Contaminants shaded green exceed Background concentrations.
Contaminants shaded red exceed Federal MCLs and Background.
Essential nutrients are not shown.
[1]Duplicate sample taken at this location, most conservative value reported.
[2]Background values are maximum detected values in respective aquifer from Baker (1995) Background Report.
*Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10% of tap water samples exceed the action level, water systems must take additional steps. For copper, the action level is 1.3 mg/L, and for lead is 0.015 mg/L.
µg/L = micrograms per liter
B = Value may be associated with laboratory or field blank contamination. B-flagged values are generally considered non-detects; however, the B-flagged values from the 2004 groundwater data set may be erroneously B-flagged due to potentially incorrect field and equipment blank collection procedures.
J = Value is estimated.
K = Value may be biased high.
MCL = Federal Maximum Contaminant Level
U = Not detected above associated detection limit.
UJ = Not detected above associated detection limit. Detection limit is estimated.
UL = Not detected above associated detection limit. Detection limit may be biased low.
-- No criteria established

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Figure 4-12
Inorganic Exceedances of Background and/or MCLs
in the Yorktown-Eastover Aquifer at Site 3
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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SECTION 5

Site 6 Summary and Investigation Results

5.1 Site 6 Background and Physical Characteristics

5.1.1 Site 6 History and Physical Setting

Site 6 is located in the western portion of Croaker Flat adjacent to an unnamed tributary of Felgates Creek (Figure 5-1). Site 6 consists of a wastewater impoundment area with associated drainage way and the area surrounding Buildings 109, 110, and 501.

The three acre surface impoundment received drainage from two buildings: Building 109 (R-1) which was used for explosives reclamation, and Building 110 (Plant 2) which was used for explosives loading, mixing, and casting. The impoundment was created by building a dam across the headwaters of the small tributary to Felgates Creek. Contaminated wastewaters, possibly containing explosives [TNT, RDX, and 2,4-dinitrotoluene (DNT)] and solvents [TCE, trichloroethane (TCA), and cyclohexanone] from Buildings 109 and 110, were discharged to the impoundment from 1942 to 1975. The Site 6 impoundment area was used during this period as a settling basin from nitramine-contaminated (explosives) washdown water as documented in *Final Round Two Remedial Investigation Report for Sites 6 and 7* (Baker, 1998b). In 1975, a carbon adsorption tower was installed to treat the contaminated wastewater prior to discharge into the drainage way In 1986, the effluent from the tower was diverted to the sanitary sewer and ultimately to the Hampton Roads Sanitation District (HRSD), thus ensuring the impoundment only collected surface run-off from the area between Buildings 109 and 110 (Baker, 1998b).

In addition to the impoundment, an excavated pit lies within the boundaries of Site 6 northwest of Building 1249. The pit may have been used historically to contain packed explosives. This area is currently wooded, but concrete rubble and miscellaneous debris are evident. Cadmium and zinc contaminated soil was previously identified and excavated in this area.

5.1.2 Site 6 Geology and Hydrogeology

Detailed geology and hydrogeology information on WPNSTA Yorktown is described in Section 2.2. Well construction details for Site 6 monitoring wells are summarized in Table 5-1. Boring logs are included as Appendix A. Cross-sections are provided as Appendix E. Based on these boring logs and consistent with the 1997 USGS study, the Columbia aquifer does not occur at Site 6 and the Yorktown-Eastover aquifer occurs at the surface or in some areas is overlain by a thin (no more than a few feet thick) deposit of clayey sediments lithologically consistent with the Yorktown confining unit. Clayey organic marsh sediments overlie the aquifer materials in the lower reaches of the creek. The Yorktown-Eastover aquifer is approximately 80 feet thick in the vicinity of Site 6 based on the 1997 USGS study of the base. The Eastover-Calvert confining unit lies beneath the Yorktown Eastover aquifer, but no environmental monitoring wells have been installed as deep as this confining unit.

The results of aquifer tests conducted on wells screened in the Yorktown-Eastover aquifer measured the hydraulic conductivity of the geologic sediments to be between 0.82 ft/day and 1.9 ft/day and based upon this measurement the groundwater flow velocity was calculated to be 4.6×10^{-2} ft/day.

Groundwater within the upper portion of the Yorktown-Eastover aquifer flows west to Felgates Creek based upon groundwater elevations measured in October 2004 (Table 5-2 and Figure 5-2).

5.2 Previous Investigations

5.2.1 Initial Assessment Study (1984)

The IAS at NWS Yorktown was conducted in 1984 by NEESA to identify and assess sites posing a potential threat to human health and the environment because of contamination from prior waste management activities. This effort was documented in the *Initial Assessment Study (IAS) of Naval Weapons Station Yorktown, Virginia (NEESA, 1984).* The purpose of the IAS was to identify and assess sites posing a potential threat to human health or the environment due to contamination from past operations. Based on the use of the Site 6 impoundment area as a discharge area for solvent and explosives contaminated wastewater, Site 6 was identified for further evaluation. Activity records relating to waste generation; handling, and disposal were reviewed, physical conditions at the site were characterized, and migration pathways and potential receptors were identified. The results of the data evaluation were used to develop recommendations concerning the need for a confirmation study at Site 6. The IAS concluded that sampling of Site 6 surface water, sediment, and soil samples would be needed to evaluate possible explosives and VOC contamination within these media.

5.2.2 Confirmation Study Round I (1986)

In 1986, consistent with the recommendations in the IAS, four soil (6S01 through 6S04) and three co-located surface water and sediment samples (6SD/SW01 through 6SD/SW03) were collected from Site 6 as part of the Confirmation Study Round I. Samples were analyzed for VOCs, base neutral extractables (BNAs, a.k.a., SVOCs), and explosives. Sample locations are shown on Figure 5-3. This effort was documented in the *Confirmation Study Step IA (Verification), Round One*, (Dames & Moore, 1986).

Toluene was detected in all four soil samples at concentrations of less than 10 µg/kg. TCE and trans-1,2-DCE were detected at concentrations of 35 µg/kg and 9 µg/kg respectively in 6S02, located within the impoundment. 1,1,1-TCA and trans-1,2-DCE were detected at concentrations of 11 µg/kg and 14 µg/kg in sample 6S04 located just south of the impoundment. With the exception of methylene chloride (a common lab contaminant), these were the only detections of VOCs in Round I soil samples. Two BNAs, chrysene, and phenanthrene were detected at concentrations of 90 µg/kg and 70 µg/kg respectively in the 6S03, located in the northwest corner of Building 109. TNT was detected in three of the four soil samples: 6S01 (1,340 µg/kg), 6S02 (127,000 µg/kg), and 6S04 (727,000 µg/kg). 4-amino-2,6-DNT, 2-amino-4,6-DNT, 2,4-diamino-6 nitrotoluene, and 2,6-diamino-4-nitrotoluene

were detected in soil samples 6S02 and 6S04 (in or adjacent to the impoundment) at maximum concentrations of 64,000 µg/kg, 222,000 µg/kg, 2120 µg/kg and 1630 µg/kg.

Toluene, 1,1,1-TCA, and methylene chloride (a common lab contaminant) were detected in the three sediment samples (6SD01 through 6SD03) at maximum concentrations of 2 µg/kg, 14 µg/kg, and 105 µg/kg respectively. The highest concentrations of these constituents were detected in sample 6SD01, collected just upgradient of the coffer dam (Figure 5-3). There were no BNAs detected in sediment samples collected during the Round I event. One explosive (2,4-diamino-6-nitrotoluene) was detected in one sample (6SD02) at a concentration of 186 µg/kg. 6SD02 is located just downgradient of the coffer dam. This was the only detection of an explosive in sediments collected during the Round I event.

With the exception of methylene chloride, there were no detections of VOCs, BNAs, or explosives in surface water collected in Felgates Creek, just downgradient of Site 6 (7SW03). However, VOCs were detected in surface water samples collected just upgradient (7SW01) and downgradient (7SW02) of the coffer dam. 1,1,1-TCA, TCE, and 1,2-trans-DCE were detected at maximum concentrations of 4 µg/L, 4 µg/L, and 3 µg/L, respectively. Explosives were also detected in these surface water samples at maximum concentrations of: RDX (2.01 µg/L), HMX (8.17 µg/L), 4-amino-2,6-DNT (0.24 µg/L), and 2,4-diamino-4-nitrotoluene (0.078 µg/L). There were no detections of BNAs in these surface water samples.

In general, the Confirmation Study Round I indicated elevated levels of contaminants (primarily explosives) confined to the impoundment or immediately downgradient of the dam. Additional sediment and surface water sampling was recommended to determine the extent of the contamination.

5.2.3 Confirmation Study Round II (1988)

Consistent with the recommendations in the Confirmation Study Round I, three surface water samples were collected in the same locations as those previously sampled and seven sediment samples (6SD01 through 6SD07) were collected at Site 6 in November and December 1987 as part of Round II of the Confirmation Study. This effort was documented in the *Confirmation Study Step IA (Verification), Round Two*, (Dames & Moore, 1988). Sample locations are shown on Figure 5-3. Samples were analyzed for VOCs, BNAs, and explosives. With the exception of laboratory contaminants (acetone and methylene chloride), there were no detections of these constituents in surface water. Acetone and methylene chloride were also detected in sediment samples, but no other VOCs were detected.

TNT was detected in impoundment sediment samples 6SD01, 6SD02, and 6SD05 at concentrations of 2.44 µg/kg, 21 µg/kg, and 1240 µg/kg respectively. HMX was detected in the same three samples at concentrations ranging from 1.41 µg/kg (6SD01) to 44.3 µg/kg (6SD02). 4-amino-2,6-DNT was detected in these three samples at concentrations ranging from 5.39 µg/L to 543 µg/L. 2,4-DNT, 2-amino-4,6-DNT and 2,6-diamino-4-nitrotoluene were detected in one impoundment area sediment sample each at concentrations of 17 µg/kg, 15 µg/kg, and 8 µg/kg respectively. There were no detections of explosives in the samples collected on the north side of the impoundment (6SD04 and 6SD06) or from the bottom of Felgates Creek, (6SD03). Based on these results, it was recommended that additional sediment, surface water, and biota data be collected and analyzed for VOAs,

BNAs, and explosives to further evaluate site conditions, site-related contaminants, and the extent of contaminant migration.

5.2.4 Remedial Investigation Interim Report (1991)

The *RI Interim Report* (Versar, 1991) was drafted by Dames & Moore in 1989 and revised by Versar in 1991 to incorporate comments from the TRC. The purpose of this report was to facilitate movement of the sites into the RI process. The report summarized available data from the Confirmation Studies for those sites recommended for further investigation in the IAS and, based on these data, provided recommendations for additional efforts to be conducted to complete the RI. The Interim RI recommended that benthic and fish communities in the tributary to Felgates Creek be sampled nearby Site 6, and additional surface water samples be collected and analyzed for TCL VOCs, explosives, and TCL BNAs. The Interim RI also recommended that the existing and additional data be used to conduct a risk assessment (Versar Inc., 1991).

5.2.5 Round One RI (1993)

Round One RI activities took place during the spring/summer 1992 based on recommendations made in the Interim RI Report. This information is documented in the *Final Round One RI for Sites 1-9, 11, 12, 16-19, and 21* (Baker and Weston, 1993b). The objectives of the RI were to assess the nature and extent of contamination and to perform human health and ecological risk assessments to evaluate the impacts on human health and the environment. Field activities included the collection of geophysical data, aquifer testing, installation and sampling of one groundwater monitoring well (6GW01), surface and subsurface soil sampling at six locations (6S05 through 6S09), surface water sampling at eight locations (6SW02 and 6SW08 through 6SW14), sediment sampling at eight locations (6SD02 and 6SD08 through 6SD14), and the collection of Shelby tubes. Sample locations are shown on Figure 5-3.

Explosives and VOCs were detected in sediments near the discharge from Building 109 at similar concentrations to those detected during the Confirmation Studies. Additionally, RDX, HMX, and TNT, and chlorinated VOCs were detected in the surface water adjacent to Building 109. RDX, HMX. Chlorinated VOCs were also detected in site groundwater. The concentration of TCE in groundwater was 380 µg/L (6GW01). As only one groundwater monitoring well was installed at Site 6, the Round One RI provided limited information on the subsurface conditions, including both subsurface soil and groundwater. Several BNAs were detected in surface soil, surface water, and sediment, but not in the groundwater. Concentrations of TCE and explosives were highest near Building 109 and decreased further downgradient.

The Round One RI recommended that Site 6 be a candidate for an accelerated remedial action under a FFS upon confirmation that the contamination was localized in the upstream portion of the ditch. In order to evaluate if the contamination was localized, the Round One RI recommended that additional surface soil and sediment samples be collected in the area north of Building 109 to define the extent of contamination and additional groundwater sampling be conducted to delineate the extent of VOC and explosives contaminated groundwater in the area (Baker and Weston, 1993a).

5.2.6 Round Two RI (1998)

A Round Two RI field program was conducted between July 1994 and February 1996 at Site 6 to assess the nature and extent of contamination at the site and to address potential data gaps observed following the Round One RI. Efforts from this field event are documented in the *Final Round Two RI Report, Sites 6 and 7* (Baker, 1998b). Surface and subsurface soils, groundwater, surface water, and sediment samples were collected. Sample locations are shown on Figure 5-3. No CVOCs were identified in surface soil samples. CVOCs were detected in subsurface soil just downgradient of Building 109. Concentrations and the number of compounds increased with depth. Nitramines were detected during a soil characterization study which focused on the Site 6 discharge point of two concrete drainage channels, which formerly conveyed waste water from Buildings 109 and 110 and was suspected of having high concentrations of nitramines. Sediment samples indicated the presence of SVOCs within the drainage ways to the impoundment area and VOCs, SVOCs and nitramine compounds within the impoundment area itself. CVOCs and explosive constituents were detected in the groundwater samples from both Hydropunch™ locations and four new permanent monitoring wells (6GW02 through 6GW05). The highest concentrations of TCE (37,000 µg/L), cis 1,2-DCE (26,000 µg/L), and vinyl chloride (21,000 µg/L) were detected at Hydropunch™ location 6HP08 located within the impoundment just north of the impoundment boundary and northwest of Building 109. According to the Round Two RI Report sample numbering scheme, this sample was collected approximately 15 ft below the top of the water table. Hydropunch™ groundwater detections from the Round II RI are included in Table 5-3. Monitoring well groundwater sample results from the Round II RI are included with the data from this Phase I Groundwater RI as Table 5-4. Surface water and sediment samples indicated the presence of CVOCs and nitramines within the impoundment area, but these constituents were not detected in surface water and sediment collected at the mouth of the tributary to Felgates Creek or in Felgates Creek itself (6SD/SW17 through 6SD/SW21). Sediment and surface water analytical detections from the Round Two RI are shown in Tables 5-5 and 5-6.

5.2.7 Focused Feasibility Study (1998)

The purpose of the *Final v2 FFS for Sites 6 and 7* (Baker, 1998c) in regards to Site 6 was to identify RAAs to address soil and sediment contamination at the site. The FFS involved the development, screening, and detailed analysis of RAAs. The FFS examined four RAAs to address contamination at Site 6: 1) no action, 2) no action with monitoring and sludge removal, and 3) *in situ* biological treatment; soil cover; and sludge removal, 4) *ex situ* biological treatment; limited excavation; and off-site disposal and sludge removal, 5) excavation with thermal treatment and sludge removal, and *ex situ* biological treatment; soil cover; limited excavation and sludge removal (Baker, 1998c). Alternative 4 was identified as the preferred alternative.

5.2.8 Proposed Remedial Action Plan/Record of Decision (1998)

The *Final v2 PRAP* for Sites 6 and 7 (Baker, 1998d) was released to the public in May 1998 presenting the preferred alternative identified in the FFS. The *Final ROD for Sites 6 and 7* (Baker, 1998e) was signed in October 1998. The ROD documented the *ex situ* biological treatment, limited excavation, off-site disposal and sludge removal remedial action to reduce the risks posed by soil and sediments at Site 6.

5.2.9 Remedial Action

A remedial action at the Site 6 Impoundment Area was started in 1999 and was completed in July 2006. The remedial action included the excavation and *ex situ* bioremediation of contaminated soil at the Site 24 Biocell and excavation and *in situ* bioremediation of contaminated soil in the treatment cell at the Impoundment Area.

5.2.10 Long-Term Monitoring

LTM for VOCs, nitramine compounds, and TAL inorganics (including cyanide) of the Impoundment Area surface water and sediment and Site 6 groundwater began in May 2000. Following the baseline round of sampling, LTM at Site 6 was suspended pending completion of the remedial action. The Site 6 LTM data indicated the potential for unacceptable risks to ecological receptors from total and dissolved inorganics.

5.3 Site 6 Phase I Groundwater RI Field Activities

In order to provide additional data to evaluate the nature and extent of chlorinated solvents in groundwater, nine additional wells were installed as described in Section 3.1.1, and samples were collected from thirteen Yorktown-Eastover aquifer monitoring wells (6GW01, 6GW01A, 6GW04, 6GW05B, 6GW06, 6GW06B, 6GW07, 6GW08, 6GW09, 6GW09A, 6GW09B, 6GW10, and 6GW10A) as part of this RI. These wells are screened at various depth intervals. Construction details are in Table 5-1. The groundwater samples collected were analyzed for TCL VOCs, TCL SVOCs, TCL pesticides/PCBs, explosives, and TAL total and dissolved metals and cyanide. Sampling and QA/QC procedures are included in Sections 3.1.3 and 3.1.4 of this document respectively.

Table 5-7 presents the samples collected, including associated QA/QC samples, and the analytical parameters for these samples, while Figure 5-1 shows the locations of the Site 6 monitoring wells. Geochemical parameters (specific conductance, pH, turbidity, and temperature) for each well are listed on 5-8.

5.4 Site 6 Groundwater Analytical Results

Table 5-4 presents analytical results of the Site 6 Phase I Groundwater RI sampling event along with the results of the monitoring well sampling conducted during the Round Two RI. Appendix F presents complete analytical results for the Phase I Groundwater RI field event only. Figures 5-4 and 5-5 depict concentrations of constituents exceeding MCL and maximum background concentrations.

5.4.1 VOC Analytical Results

Of the 48 VOCs analyzed in Site 6 groundwater samples collected as part of this Phase I Groundwater RI, twelve were detected in one or more samples: 1,1,1-TCA, 1,1-dichloroethane (1,1-DCA), 1,1-DCE, 1,2-dichloroethane (1,2-DCA), carbon disulfide, chloromethane, cis 1,2-DCE, cis 1,3-dichloropropene, methylene chloride, trans 1,2-DCE, TCE, and vinyl chloride. Concentrations of TCE exceeded the corresponding MCL of 5 µg/L in samples from 6GW08 (36,000 µg/L) and 6GW01 (94 µg/L). Concentrations of 1,1-DCE exceeded the corresponding MCL of 7 µg/L in the samples from 6GW01 (15 µg/L) and

6GW06 (23 µg/L). The concentrations of cis 1,2-DCE (550 J µg/L) and vinyl chloride (8 K µg/L) both exceeded corresponding MCLs of 70 µg/L and 2 µg/L respectively in the sample from 6GW08. There were no VOCs detected in the background data set. VOCs are not typically naturally occurring or resultant from widespread anthropogenic activities. Therefore, all detections of VOCs at Site 6 represent exceedances of background. Figure 5-4 depicts concentrations of VOCs exceeding MCLs and maximum background results.

5.4.2 SVOC Analytical Results

Bis(2-ethylhexyl phthalate) was the only SVOC detected in groundwater samples from Site 6 during the Phase I Groundwater RI. This constituent was detected in samples from 6GW07 (3 J µg/L), 6GW08 (13 µg/L) and 6GW09 (6 J µg/L). The MCL for this constituent is 6 µg/L. Bis(2-ethylhexyl) phthalate is a common laboratory contaminant and is likely to be unrelated to the site.

5.4.3 Pesticide/PCB Analytical Results

Five pesticides/PCBs were detected in samples from Site 6 collected during the Phase I Groundwater RI: 4,4-DDE, beta-BHC, delta-BHC, gamma-BHC, and heptachlor epoxide. The concentrations of heptachlor epoxide in the samples from 6GW04 (13 µg/L), 6GW05B (0.59 µg/L), 6GW09 (1.2 µg/L) were above the corresponding MCL of 0.2 µg/L for this constituent. There were no detections of pesticides or PCBs in the Yorktown aquifer background data set.

5.4.4 Explosives Analytical Results

Ten explosives were detected in samples from Site 6 collected during the Phase I Groundwater RI: 1,3,5-trinitrobenzene, 1,3-dinitrobenzene, 2,4,6-TNT, 2,4-DNT, 2-amino-4,6-DNT, 2-nitrotoluene, 4-amino-2,6-DNT, HMX, RDX, and tertyl. The highest concentrations of these constituents were detected in the sample from 6GW04. There were no explosives detected in the Yorktown aquifer background data set and none would be expected since explosives are not typically naturally occurring or resultant from widespread anthropogenic activities. Therefore, all detections of explosives at Site 6 represent exceedances of background. Figure 5-4 depicts concentrations of explosives detected in one or more wells.

5.4.5 Total Metals and Cyanide Analytical Results

Of the 24 inorganics analyzed in Site 6 unfiltered samples, twelve were detected: aluminum, arsenic, barium, calcium, cyanide, iron, magnesium, manganese, potassium, sodium, vanadium, and zinc. Antimony, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, nickel, selenium, silver, and thallium were not detected in any groundwater sample from Site 6 collected during the Phase I Groundwater RI. The concentration of aluminum in the sample from 6GW09B (3,770 µg/L) was in exceedance of the maximum background concentration of 1,160 µg/L. Concentrations of barium exceeded the background maximum concentration of 43.6 µg/L in samples from 6GW04 (319 µg/L), 6GW06B (53.1 µg/L), 6GW07 (49.8 µg/L), 6GW09 (57.7 µg/L), and 6GW09A (59.4 µg/L). Iron, manganese, and zinc were not detected in any background samples from the Yorktown-Eastover aquifer. Iron was detected in six unfiltered samples at concentrations of up to 21,300 µg/L (6GW09B). Manganese was detected in fifteen unfiltered samples at

concentrations of up to 324 µg/L (6GW09B). Zinc was detected in unfiltered samples at concentrations of up to 16,700 µg/L (6GW04).

It should be noted that several inorganics comprising beryllium, cadmium, chromium, cobalt, copper, and nickel were actually detected in Site 6 unfiltered samples, but were flagged with B qualifiers during validation and are thus considered as non-detects. This may have been due to detections of these constituents in the field blank collected on the non-potable drilling water. Consequently these non-detect results may not be reflective of actual concentrations in aquifer water.

5.4.6 Dissolved Metals Analytical Results

Barium, calcium, iron, magnesium, manganese, nickel, potassium, sodium, and zinc were detected in one or more samples collected at Site 6 during the Phase I Groundwater RI. Aluminum, antimony, arsenic, cadmium, chromium, cobalt, copper, lead, mercury, thallium, and vanadium were not detected in any samples. Arsenic was not detected in the dissolved background data set for the Yorktown confining unit. Therefore, dissolved concentrations of arsenic in samples from 6GW04 (5.3 J µg/L), 6 GW09A (2 J µg/L), 6GW09B (3 J µg/L) exceeded background, but did not exceed the MCL of 10 µg/L. Concentrations of dissolved iron in samples from 6GW01 (8450 µg/L), 6GW01A (627 µg/L), 6GW04 (11,000 µg/L), 6GW06B (1760 µg/L), and 6GW10A (1240 µg/L) exceeded the maximum background concentration of 5.8 µg/L. Concentrations of dissolved barium in samples from 6GW04 (332 µg/L), 6GW06B (38.3 µg/L), 6GW07 (50.6 J µg/L), 6GW09 (59 J µg/L), and 6GW09A (58.1 J µg/L) exceeded the maximum dissolved background concentration for the Yorktown-Eastover aquifer of 30.9 µg/L. Concentrations of dissolved manganese in samples from all sampled wells with the exception of 6GW10 exceeded the maximum background concentration of 12.2 µg/L. The concentration of zinc in the sample from 6GW04 (1980 µg/L) exceeded the maximum background concentration for zinc of 5.9 µg/L.

It should be noted that several inorganics comprising aluminum, arsenic, chromium, and vanadium were actually detected in Site 6 dissolved samples, but were flagged with B qualifiers during validation and are thus considered as non-detects. This may have been due to detections of these constituents in the field blank collected on the non-potable drilling water. Consequently these non-detect results may not be reflective of actual concentrations in aquifer water.

5.4.7 Site 6 Nature and Extent of Contamination

Concentrations of inorganics in Site 6 groundwater exceed corresponding maximum background values in numerous wells. Since these concentrations are in some cases more than an order of magnitude greater than background concentrations, it is likely that they are site related. Concentrations of iron and manganese in samples from 6GW04 and 6GW05 are most notably higher than background. There were no MCL exceedances of inorganics during this RI sampling Round.

Pesticide compounds exceeded background levels in several wells and the MCL for heptachlor epoxide in several wells (6GW04, 6GW05B, 6GW09). There was no particular pattern of depth or aerial distribution of heptachlor epoxide at the site and the presence of

this pesticide is not consistent with the historical use of the site. Therefore, the primary contaminants at the Site are CVOCs and explosives.

Chlorinated organic compounds extend across the site at varying concentrations with the highest concentrations located beneath the actual impoundment. The highest concentration of TCE in a permanent monitoring well was in the sample from 6GW08 (just downgradient of the coffer dam) with a concentration of 35,000 µg/L. Additionally, the Hydropunch™ groundwater sample collected during the Round Two RI from 6HP08 (where the wastewater was discharged to the impoundment) was 37,000 µg/L. 6GW08 is the deepest site monitoring well and contains the highest TCE concentration of any permanent site well. Since no other wells were installed at this depth, the aerial extent of the CVOCs in groundwater is unknown. Additionally, since this well is not screened to the Eastover-Calvert confining unit, the vertical extent of the CVOCs in groundwater is unknown.

Although no free product was observed in the site wells, based on concentration data, it is possible that some of the CVOC contamination at the site exists in the dense non-aqueous phase liquid (DNAPL) phase. One of the "rule of thumb" indicators that DNAPL may be present at a site is when chemicals that are known to behave as DNAPLs due to their hydrophobic nature and density are found in concentrations above 1 percent of their pure phase solubility in water. For TCE, with a water solubility of 1,100 mg/L, a concentration of 11,000 µg/L is typically used as an indicator for potential DNAPL. Since the concentrations of TCE from 6GW08 and Hydropunch™ sample 6HP08 are above 11,000 µg/L, DNAPL is possibly present.

Explosives were detected in samples from wells 6GW04, 6GW05B, 6GW07, 6GW09, and 6GW10. The highest concentrations of explosives were detected in the sample from 6GW04 at the downgradient edge of the impoundment by the coffer dam. Since no other groundwater samples were collected downgradient of the flume area at the same depth interval as 6GW04, the extent of the explosives in groundwater is not fully delineated.

Explosives and VOCs were detected during investigations conducted prior to the removal action in impoundment area sediments and surface water. These constituents were not detected in surface water and sediments collected at the mouth of the tributary to Felgates Creek and Felgates Creek itself. The contaminated sediments in the impoundment area have been excavated and remediated. Therefore, current impact to surface water and sediment are minimal.

5.5 Site 6 Fate and Transport

5.5.1 Fate and Transport of VOCs

Historical accounts indicate that wastewater was discharged to the Site 6 impoundment from the flume area. It is likely that the wastewater containing TCE entered the impoundment and contaminants migrated downward via gravity and downgradient via advection. It is unlikely that contaminants would migrate upgradient. Therefore, CVOCs may aerially span most or all of the extent of the impoundment, but may not extend very far beyond the boundaries of the impoundment. Based on existing data, TCE is present in the dissolved phase at Site 6. It cannot be positively determined whether DNAPL is present at

the site, but the presence of DNAPL is possible based on the TCE concentrations in groundwater samples.

The primary transport mechanism for TCE at Site 6 is via advection in the direction of groundwater flow (west towards Felgates Creek). Fate and transport mechanisms for flow though porous media that may be influencing TCE migration include hydrodynamic dispersion and retardation. Hydrodynamic dispersion describes the tendency of contaminants to spread out from the path that they would be expected to follow based on advective hydraulics alone. Hydrodynamic dispersion occurs due to mechanical mixing during fluid advection and molecular diffusion due to the thermal-kinetic energy of the solute particles. Retardation results from the transfer by adsorption or other chemical processes of contaminant mass from the flowing pore water to surrounding soil particles resulting in slower transport of the contaminant mass.

If DNAPL is present at the site, the predominant direction flow is most likely downward, directed by gravity. As TCE migrates downward, some of the DNAPL most likely remains in the pore spaces of the aquifer material as residual contamination. Some DNAPL may be dissolving in the groundwater and/or sorbing to the soil, contributing to aqueous-phase and sorbed-phase contamination. If the volume of the release at Site 6 was sufficient to provide enough mass of DNAPL to reach the Eastover-Calvert confining unit, the DNAPL may be collecting on the confining clay and possibly continuing to move under the force of gravity down the slope of the aquitard.

Based on analytical results, a small percentage of the TCE released at Site 6 has been degraded via biological reductive dechlorination. Biological reductive dechlorination is a naturally-occurring, microbially mediated, anaerobic process in which chlorine atoms on a parent CVOC molecule are sequentially replaced with hydrogen. In the reductive dechlorination process, electrons are transferred from an electron donor source to the CVOC compound, which functions as the electron acceptor. Anaerobic (reducing) conditions are required for effective reductive dechlorination.

The principal anaerobic biodegradation pathway for reductive dechlorination of chlorinated ethenes is:

TCE → DCE → vinyl chloride → ethene

The transformation rate for each step varies but tends to become slower with progress along the breakdown sequence, often resulting in accumulation of 1,2-DCE and VC. These degradation products have been detected in groundwater at Site 6, but at low concentrations, indicating that biodegradation may be occurring, but at a slow rate.

5.5.2 Fate and Transport of Explosives

The explosive compounds detected at Site 6 are considered to be slightly mobile and tend to be transported along with the sediments to which they adsorb. Explosives contaminated sediments have been removed from the impoundment area and treated in the biocell. Therefore, the majority of the remaining explosives at the site likely exist in the saturated zone. Based on the existing data at the site, it is not possible to delineate the extent of explosives contamination in groundwater because explosives may exist in groundwater

beneath the impoundment area where no wells have been installed. Explosives have not been detected in sediment and surface water samples collected within Felgates Creek.

5.5.3 Fate and Transport of Inorganics

Inorganics, particularly iron and manganese are elevated well over background concentrations in 6GW04 and 6GW05. Based on the spatial distribution of these wells and the concentrations, it is possible that these constituents are site related. Iron and manganese are relatively immobile, but may be migrating slowly downgradient via advection.

5.6 Conclusions and Recommendations

Groundwater at Site 6 is contaminated with CVOCs, explosives, and inorganics. The concentrations of CVOCs in groundwater are indicative of DNAPL, but the vertical and horizontal extent of these compounds has not been defined and risks at the site have not been quantified. The vertical and horizontal extent of explosives contamination also has not been defined.

Based on the historical land use and the topography of the site, it is likely that any TCE that entered the impoundment entered the soil and sediment and flowed via porous media flow into the groundwater where it continued to move downward due to gravity and downgradient via advective flow. The highest groundwater concentrations of TCE have been detected within the boundaries of the impoundment itself (in the deep monitoring well adjacent to the coffer dam and in the sample from the Round Two RI by the flume area).

1. It is recommended that additional study using a real-time sampling technology be completed within the impoundment to define the extent and concentrations of the contaminants. Since the Site 6 impoundment has been restored as a wetland area, it is likely that this real-time study will necessitate specialized drilling equipment for on-water drilling, installation of temporary wells, and analysis using a mobile lab.
2. If the results of the real-time study indicate migration of contaminants into or across Felgates Creek, additional sampling of surface water, sediment, and/pore water should be conducted to further evaluate the groundwater to surface water interaction.
3. It is recommended that saturated soil samples be collected and analyzed using dye kits to better determine if DNAPL is present at the site.
4. It is recommended that additional monitoring wells be installed based on the results of the real-time study.
5. It is recommended that saturated soil samples be collected to determine the soil oxidant demand at the site.
6. New and existing wells should be sampled for metals, VOCs (including phthalates), explosives (including nitroglycerin, 3,5-dinitroaniline, PETN, diphenylamine, n-nitro-sodiphenylamine, ammonium nitrate, and nitroguanidine), perchlorate, and natural attenuation parameters [methane, ethane, ethene, nitrate, nitrite, sulfide, sulfate, chloride, dissolved oxygen (DO), oxidation-reduction potential (ORP), total organic carbon (TOC) and *Dehalococcoides*].

7. Following this additional investigation, it is recommended that risks due to groundwater contamination at this site be quantified in a revision to the HHRA and ERA from the Round Two RI. Furthermore, it is recommended that the potential for future vapor intrusion risks be evaluated.
8. If data from this Phase I Groundwater RI is used for risk assessment purposes, it is recommended that the inorganic data be revalidated without using the field blank, which was collected on non-potable drilling water.

TABLE 5-1
Groundwater Monitoring Well Construction Details at Site 6
Phase I Groundwater Remedial Investigation for Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Well Number	Aquifer	Date Installed	Top of PVC Casing Elevation (ft msl)	Ground Surface Elevation (ft msl)	Boring Total Depth (ft bgs)	Elevation Bottom of Boring (ft msl)	Well Diameter	Total Well Depth (ft bgs)	Bottom Well Elevation (ft msl)	Outer Casing Interval (ft bgs)	Depth to Screen Interval (ft bgs)	Top of Screen Interval Elevation (ft msl)	Bottom of Screen Interval Elevation (ft msl)	Depth to Top of Sand Pack (ft bgs)	Depth to Top of Bentonite (ft bgs)
6GW01	Yorktown-Eastover	06/15/1992	12.8	10.45	20	-9.55	4	20	-9.55	--	5 - 20	5.5	-9.6	4	2
6GW01A	Yorktown-Eastover	09/09/1994	12.1	10.01	64	-53.99	2	61.9	-51.89	--	47.9 - 61.9	-37.9	-51.9	41	5
6GW02	Yorktown-Eastover	09/23/1994	38.37	35.97	57	-21.03	2	55	-19.03	--	40 - 55	-4.0	-19.0	37	11
6GW03	Yorktown-Eastover	10/20/1994	30.67	28.31	49	-20.69	2	46.9	-18.59	--	36.9 - 46.9	-8.6	-18.6	33	6
6GW04 (2)	Yorktown-Eastover	06/10/1992	5.23	3.36	10	-6.64	2	10	-6.64	--	5 - 10	-1.6	-6.6	33	0
6GW05B	Yorktown-Eastover	9/14/2004	8.59	6.83	15	-8.17	2	15	-8.17	--	5 - 15	1.8	-8.2	4	2
6GW06	Yorktown-Eastover	05/12/2000	11.77	10.66	18	-7.34	2	18	-7.34	--	8 - 18	2.7	-7.3	6	4
6GW06B	Yorktown-Eastover	9/18/2004	11.46	9.20	88	-78.80	2	38	-28.80	--	28 - 38	-18.8	-28.8	26	24
6GW07	Yorktown-Eastover	9/14/2004	8.66	6.84	18	-11.16	2	18	-11.16	--	8 - 18	-1.2	-11.2	6	4
6GW08	Yorktown-Eastover	9/20/2004	5.61	3.07	36	-32.93	2	36	-32.93	18	31 - 36	-27.9	-32.9	30	18
6GW09	Yorktown-Eastover	9/17/2004	14.38	11.83	30	-18.17	2	30	-18.17	--	20 - 30	-8.2	-18.2	18	16
6GW09A	Yorktown-Eastover	9/16/2004	15.17	12.76	50	-37.24	2	50	-37.24	--	40 - 50	-27.2	-37.2	38	36
6GW09B	Yorktown-Eastover	9/16/2004	15.11	13.53	76	-62.47	2	75	-61.47	--	65 - 75	-51.5	-61.5	63	61
6GW10	Yorktown-Eastover	9/18/2004	15.52	13.30	22	-8.70	2	22	-8.70	--	12 - 22	1.3	-8.7	10	8
6GW10A	Yorktown-Eastover	9/16/2004	15.66	13.43	40	-26.57	2	40	-26.57	--	30 - 40	-16.6	-26.6	28	26

NOTES:
msl - mean sea level (in feet)
bgs - Below Ground Surface (in feet)
-- NA
(1) Modified well construction due to shallow groundwater table
(2) Drive point, no sand pack
(3) Staff gauge

TABLE 5-2
Summary of Groundwater Elevation Data at Site 6
Phase I Groundwater Remedial Investigation for Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Monitoring Well	Aquifer	Depth to Water (ft) October 12, 2004	Top of Casing (ft above msl)	Groundwater Elevation (ft above msl) October 12, 2004
6GW01	Yorktown-Eastover	6.30	12.8	6.50
6GW01A	Yorktown-Eastover	5.66	12.1	6.44
6GW02	Yorktown-Eastover	34.09	38.37	4.28
6GW03	Yorktown-Eastover	19.09	30.67	11.58
6GW04	Yorktown-Eastover	3.35	4.71	1.36
6GW05	Yorktown-Eastover	4.36	5.3	0.94
6GW06	Yorktown-Eastover	8.54	11.77	3.23
6GW06B	Yorktown-Eastover	7.12	11.46	4.34
6GW07	Yorktown-Eastover	4.38	8.66	4.28
6GW08	Yorktown-Eastover	1.74	5.61	3.87
6GW09	Yorktown-Eastover	11.10	14.38	3.28
6GW09A	Yorktown-Eastover	11.71	15.17	3.46
6GW09B	Yorktown-Eastover	11.60	15.11	3.51
6GW10	Yorktown-Eastover	12.22	15.52	3.30
6GW10A	Yorktown-Eastover	12.08	15.66	3.58

Note:
msl - mean sea level

TABLE 5-3
Hydropunch Groundwater Sampling Analytical Results at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS06-DW002	YS06-DW003	YS06-DW004	YS06-DW005			YS06-DW006	YS06-DW007	YS06-DW008		YS06-DW009
Sample ID	YS06-DW002-0894	YS06-DW003-0894	YS06-DW004-0894	YS06-DW005-A-0894	YS06-DW005-B-0894	YS06-DW005-C-0894	YS06-DW006-0894	YS06-DW007-0794	YS06-DW008-0894	YS06-DW008P-0894	YS06-DW009-0894
Sample Date	08/01/94	08/02/94	08/06/94	08/03/94	08/03/94	08/03/94	08/05/94	07/27/94	08/19/94	08/19/94	08/21/94
Chemical Name											
Volatile Organic Compounds (UG/L)											
2-Butanone	10 U	5 J	10 U	10 U	10 U	10 U	10 U	10 U	5,000 R	5,000 R	10 U
Acetone	10 U	18	10 U	10 U	10 J	10 U	10 U	10 U	5,000 U	5,000 U	10 U
Methylene chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	5,000 U	5,000 U	1 J
Trichloroethene	10 U	10 U	10 U	76	46	10 U	10 U	10 U	37,000	32,000	10 U
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	21,000	17,000	10 U
cis-1,2-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	26,000	24,000	NA
m- and p-Xylene	10 U	10 U	10 U	10 U	10 U	7 J	10 U	10 U	5,000 U	5,000 U	NA
Explosives (UG/L)											
Tetryl	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4.9	1 U	1 U

Notes:

Shaded values indicate the analyte was detected
UG/L = Micrograms per Liter
NA = Not analyzed
U = Analyte not detected
J = Result may be estimated
R = Unreliable result

TABLE 5-4
Groundwater Analytical Detections at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Yorktown-Eastover Aquifer**	Yorktown-Eastover					Yorktown-Eastover			Yorktown-Eastover		
Station ID			YS06-GW001					YS06-GW001A			YS06-GW002		
Sample ID			YS06-MW001-0994	YS06-MW001P-0994	YS06-MW001-0600	YS06-MW001P-0600	YS06-MW001-0904	YS06-MW001A-1094	YS06-MW001A-0600	YS06-MW001A-0904	YS06-MW002-1094	YS06-MW002-0600	YS06-MW002P-0600
Sample Date			09/11/94	09/11/94	06/19/00	06/19/00	09/15/04	10/12/94	06/19/00	09/14/04	10/10/94	06/21/00	06/21/00
Investigation			Historical Data	Historical Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	Historical Data
Chemical Name													
Volatile Organic Compounds (UG/L)													
1,1,1-Trichloroethane	200	1 U	13	14 J	1 J	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
1,1-Dichloroethane	No MCL	1 U	14	14 J	9 J	NA	3 J	1 U	10 U	10 U	1 U	10 U	10 U
1,1-Dichloroethene	7	1 U	36	45	22 J	NA	15	1 U	10 U	10 U	1 U	10 U	10 U
1,2-Dichloroethane	5	1 U	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
Carbon disulfide	No MCL	1 U	1 U	25 U	10 UJ	NA	10 U	1 U	10 UJ	10 U	1 U	10 U	10 U
Chloroform	80	1 U	2	25 U	10 U	NA	10 U	1 U	10 U	10 U	0.6 B	10 U	10 U
Chloromethane	No MCL	1 U	1 U	25 U	10 U	NA	10 U	1 UJ	10 U	10 U	1 U	10 U	10 U
Methylene chloride	5	2 U	2 U	50 U	3 B	NA	10 U	0.6 B	2 B	10 U	1 B	2 B	3 B
Trichloroethene	5	1 U	320	350	120	NA	94	1 U	10 U	10 U	1 U	10 U	10 U
Vinyl chloride	2	1 U	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
cis-1,2-Dichloroethene	70	1 U	110	98	56	NA	46	1 U	10 U	10 U	1 U	10 U	10 U
cis-1,3-Dichloropropene	No MCL	1 U	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
trans-1,2-Dichloroethene	100	1 U	1	25 U	10 U	NA	2 J	1 U	10 U	10 U	1 U	10 U	10 U
Semi-volatile Organic Compounds (UG/L)													
2,4-Dinitrotoluene	No MCL	10 U	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
bis(2-Ethylhexyl)phthalate	6	10 U	10 U	10 U	NA	NA	11 U	1 J	NA	10 U	10 U	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/L)													
4,4'-DDE	No MCL	0.1 U	NA	NA	NA	NA	0.1 U	NA	NA	0.1 U	NA	NA	NA
Heptachlor epoxide	0.2	0.05 U	NA	NA	NA	NA	0.21 B	NA	NA	0.05 U	NA	NA	NA
beta-BHC	No MCL	0.05 U	NA	NA	NA	NA	0.051 U	NA	NA	0.05 U	NA	NA	NA
delta-BHC	No MCL	0.05 U	NA	NA	NA	NA	0.051 U	NA	NA	0.05 U	NA	NA	NA
gamma-BHC (Lindane)	0.2	0.05 U	NA	NA	NA	NA	0.051 U	NA	NA	0.05 U	NA	NA	NA
Explosives (UG/L)													
1,3,5-Trinitrobenzene	No MCL	0.66 U	0.66 U	0.66 U	0.8 UL	NA	2.5 U	0.66 U	1.6 U	2.5 U	0.66 U	2 U	1.3 U
1,3-Dinitrobenzene	No MCL	1.1 U	1.1 U	1.1 U	0.8 UL	NA	2.5 U	1.1 U	1.6 U	2.5 U	1.1 U	2 U	1.3 U
2,4,6-Trinitrotoluene	No MCL	0.62 U	0.62 U	0.62 U	1.6 UL	NA	2.5 U	0.62 U	3.2 U	2.5 U	0.62 U	4 U	2.6 U
2,4-Dinitrotoluene	No MCL	1 U	1 U	1 U	2 UL	NA	2.5 U	1 U	4 U	2.5 U	1 U	5 U	3.25 U
2-Amino-4,6-dinitrotoluene	No MCL	NA	NA	NA	2.4 UL	NA	5 U	NA	4.8 U	5 U	NA	6 U	3.9 U
2-Nitrotoluene	No MCL	0.75 U	0.75 U	0.75 U	2 UL	NA	5 U	0.75 U	4 U	5 U	0.75 U	5 U	3.25 U
4-Amino-2,6-dinitrotoluene	No MCL	1 U	1.2	1.4	1.6 UL	NA	5 U	1 U	3.2 U	5 U	1 U	4 U	2.6 U
HMX	No MCL	0.61 U	3.2	4.1	1.6 UL	NA	19	0.61 U	3.2 U	2.5 U	0.61 U	4 U	2.6 U
RDX	No MCL	0.59 U	63	80	39.6 L	NA	32	0.59 U	4 UJ	2.5 U	0.59 U	5 U	3.25 U
Tetryl	No MCL	1 U	1 U	1 U	1.6 UL	NA	5 U	1 U	3.2 U	5 U	1 U	4 U	2.6 U
Total Metals (UG/L)													
Aluminum	No MCL	1160	466	666	37 U	37 U	80.7 U	233 J	38.4 J	80.7 U	1,510 J	248	250
Arsenic	10	3.5 J	37.1	36.7	7.6 J	7.85 B	9.3 B	2.3 U	2.3 U	2.1 U	3.3	2.3 U	3.8 J
Barium	2,000	43.6 J	22.5	23	24.1 J	22.3 B	18 B	35.2	26.8 J	26.5 B	38.4	36.4 J	36.2 J
Beryllium	4	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.1 U	1 U	0.2 U	0.1 U	1 U	0.2 U	0.2 U
Cadmium	5	2.3 U	2.3 U	2.3 U	0.2 U	0.2 U	0.2 U	1.5 U	0.2 U	0.2 U	1.5 U	0.2 U	0.2 U
Calcium	No MCL	67100	94,000	93,200	93,700	91,532	81,800	71,200	70,700	74,000	83,300	88,100	88,700
Chromium	100	4.7 L	2	1.8	0.4 U	0.454 B	0.9 U	1.8 U	0.51 J	0.9 U	4.7	23.1	24
Cobalt	No MCL	2.1 U	2.1 U	2.1 U	0.7 J	0.5 U	0.5 U	1.9 U	0.5 U	0.5 U	2.2	0.88 J	0.5 U
Copper	1,300	4.5 J	3.8	3.9	0.69 J	0.836 B	3.9 B	1.4 U	0.72 J	0.6 U	2.8	1.6 J	1.2 J
Cyanide	200	5 U	5 UL	5 UL	1 J	0.9 U	3.1 B	5 U	0.9 U	1.1 U	5 U	0.9 U	0.9 U
Iron	No MCL	2350	10,900	10,900	6,990	6,803	8,830	1,000	831	794	3,610	1,350	1,370
Lead	15	1.5 U	1.5 U	1.5 U	1.3 U	1.3 U	1.1 U	1.4 U	1.3 U	1.1 U	2 K	1.3	1.3 U
Magnesium	No MCL	3350 J	4,220	4,190	3,610 J	3,518 B	3,370 J	3,010	2,910 J	2,870 J	2,860	2,380 J	2,380 J
Manganese	No MCL	18.4	240	239	161	157	180	25.8	24.2	23.8	79	44.2	43.5

TABLE 5-4
Groundwater Analytical Detections at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Yorktown-Eastover Aquifer**	Yorktown-Eastover					Yorktown-Eastover			Yorktown-Eastover		
Station ID			YS06-GW001					YS06-GW001A			YS06-GW002		
Sample ID			YS06-MW001-0994	YS06-MW001P-0994	YS06-MW001-0600	YS06-MW001P-0600	YS06-MW001-0904	YS06-MW001A-1094	YS06-MW001A-0600	YS06-MW001A-0904	YS06-MW002-1094	YS06-MW002-0600	YS06-MW002P-0600
Sample Date			09/11/94	09/11/94	06/19/00	06/19/00	09/15/04	10/12/94	06/19/00	09/14/04	10/10/94	06/21/00	06/21/00
Investigation			Historical Data	Historical Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	Historical Data
Chemical Name													
Mercury	2	0.2 UL	0.2 UL	0.2 UL	0.15 L	0.154 B	0.1 UJ	0.2 UL	0.15 L	0.1 UJ	0.2 UL	0.16 L	0.14 L
Nickel	No MCL	5.2 U	5.2 U	5.2 U	0.88 J	1.63 B	0.6 U	4.3 U	1.3 B	0.6 U	4.3 U	17.7 B	17.9 J
Potassium	No MCL	5510	1,920	1,870	1,460 J	1,426 B	1,380 J	2,890	2,740 J	2,740 J	2,730	1,270 J	1,240 J
Selenium	50	2.9 J	2.4 U	4.4 K	2.7 B	2.2 U	2.4 U	2.6 U	2.2 U	2.4 U	2.6 U	2.2 U	2.2 U
Sodium	No MCL	8300	11,000	10,800	11,500	11,270	7,830	16,400	20,000	17,500	6,340	5,810	5,580
Vanadium	No MCL	7.5 J	5.2	5.6	1.1 J	0.644 B	0.6 U	1.4 U	0.6 J	0.6 U	6.9	0.56 J	0.66 J
Zinc	No MCL	14.9 J	24.1 B	17.9 B	0.97 B	0.8 U	6.9 B	8.2 B	0.8 U	4.1 U	15.9 B	0.9 B	1.6 B
Dissolved Metals (UG/L)													
Aluminum	No MCL	146 J	11.5 U	11.5 U	37 U	37 U	80.7 U	11 U	37 U	80.7 U	11 U	37 U	37 U
Antimony	6	18.5 J	20.6	17.1	2.1 U	2.1 U	1.9 U	12.2 U	2.1 U	1.9 U	12.2 U	2.1 U	2.1 U
Arsenic	10	2.6 UL	12.6	11.8	8 J	7 B	7 B	3	2.3 U	2.1 U	2.3 U	4.1 J	3.2 J
Barium	2,000	30.9 J	13.6	13.4	19.9 J	20 B	17.5 B	32	27 J	25.1 B	32.7	33.3 J	33.7 J
Cadmium	5	2.3 U	2.3 U	2.3 U	0.2 U	0.2 U	0.2 U	1.5 UL	0.22 J	0.2 U	1.5 UL	0.2 U	0.2 U
Calcium	No MCL	69800	93,400	95,300	90,800	90,813	81,500	71,600	73,400	71,300	82,200	84,400	85,700
Chromium	100	1.5 U	1.5 U	1.5 U	0.4 U	0.4 U	0.9 U	1.8 U	0.4 U	0.9 U	1.8 U	1.1 J	0.4 U
Cobalt	No MCL	2.1 U	2.1 U	2.1 U	0.5 U	0.5 U	0.5 U	1.9 U	0.5 U	0.5 U	1.9 U	0.5 U	0.5 U
Copper	1,300	4 J	3.9	2.9	1.2 J	0.6 U	0.6 U	1.4 U	1.3 J	0.6 U	1.4 U	1.9 J	1.7 J
Iron	No MCL	5.8 J	509	329	5,270	5,282	8,450	231	262	627	153	58.9 J	14.3 U
Lead	15	1.5 U	1.5 U	1.5 U	1.3 U	1.3 U	1.1 U	1.4 U	1.3 U	1.1 U	1.4 U	1.3 U	1.3 U
Magnesium	No MCL	3410 J	4,070	4,130 B	3,450 J	3,453 B	3,260 J	2,790	3,060 J	2,750 J	2,330	2,220 J	2,250 J
Manganese	No MCL	12.2 J	229	233	147	147	174	23	25	23	61.9	38.4	38.4
Mercury	2	0.2 UL	0.2 UL	0.2 UL	NA	0.138 B	0.1 UJ	0.2 UL	0.15 L	0.1 UJ	0.2 UL	0.14 L	0.16 L
Nickel	No MCL	5.2 U	5.2 U	5.2 U	1.8 B	0.7 U	0.6 U	4.3 U	0.98 B	0.7 J	4.3 U	10.6 J	10 J
Potassium	No MCL	5680	1,940	2,090	1,370 J	1,356 B	1,390 J	2,910	2,900 J	2,680 J	1,670	1,120 J	1,130 J
Sodium	No MCL	8570	10,800	11,000	10,600	10,727	8,110	15,900	19,500	17,600	5,850	5,490	5,470
Thallium	2	5.7 U	5.7 U	6.3 K	3.9 J	4 B	2.8 U	4 UL	3.2 U	2.8 U	4 UL	3.2 U	3.2 U
Vanadium	No MCL	6.3 J	1.8 U	2.5	0.53 J	0.61 B	0.6 U	1.4 U	0.4 U	0.6 U	1.4 U	0.4 U	0.4 U
Zinc	No MCL	5.9 J	19.3 B	8.8 B	1.9 J	0.8 U	4.1 U	6.3 B	0.8 U	4.1 U	7.4 B	0.92 J	0.89 J
Wet Chemistry (MG/L)													
Nitrate/Nitrite	10	NA	0.06	0.06	NA	NA	NA	0.02 U	NA	NA	0.05	NA	NA
Total dissolved solids (TDS)	No MCL	NA	330	330	NA	NA	NA	330	NA	NA	240	NA	NA
Total suspended solids (TSS)	No MCL	NA	46	51	NA	NA	NA	230	NA	NA	72	NA	NA

Notes:

Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
MCL = Federal Maximum Contaminant Level
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 5-4
Groundwater Analytical Detections at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Yorktown-Eastover Aquifer**	Yorktown-Eastover	Yorktown-Eastover		Yorktown-Eastover	Yorktown-Eastover		Yorktown-Eastover			Yorktown-Eastover	Yorktown-Eastover
Station ID			YS06-GW003	YS06-GW004		YS06-GW005	YS06-GW005B		YS06-GW006			YS06-GW006B	YS06-GW007
Sample ID			YS06-MW003-1194	YS06-MW004-0600	YS06-MW004-1004	YS06-MW005-0600	YS06-MW005B-1004	YS06-MW005BP-1004	YS06-MW006-0600	YS06-MW006-0904	YS06-MW006P-0904	YS06-MW006B-1004	YS06-MW007-1004
Sample Date			11/09/94	06/23/00	10/05/04	06/22/00	10/04/04	10/04/04	06/23/00	09/20/04	09/20/04	10/07/04	10/07/04
Investigation			Historical Data	Historical Data	GW RI Data	Historical Data	GW RI Data	GW RI Data	Historical Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data
Chemical Name													
Volatile Organic Compounds (UG/L)													
1,1,1-Trichloroethane	200	1 U	1 U	10 U	10 U	10 U	10 U	NA	52	8 J	10	10 U	10 U
1,1-Dichloroethane	No MCL	1 U	1 U	10 U	10 U	1 J	10 U	NA	39	16	19	10 U	10 U
1,1-Dichloroethene	7	1 U	1 U	10 U	10 U	1 J	2 J	NA	64	19	23	10 U	10 U
1,2-Dichloroethane	5	1 U	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	No MCL	1 U	52	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Chloroform	80	1 U	0.6 J	10 U	10 U	10 U	10 U	NA	9 J	10 U	10 U	10 U	10 U
Chloromethane	No MCL	1 U	1 UJ	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
Methylene chloride	5	2 U	2 U	3 B	10 U	3 B	2 J	NA	4 B	10 U	10 U	10 U	10 U
Trichloroethene	5	1 U	1 U	10 U	10 U	13	5 J	NA	10 U	10 U	10 U	10 U	3 J
Vinyl chloride	2	1 U	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	70	1 U	1 U	10 U	10 U	41	10 U	NA	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	No MCL	1 U	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	100	1 U	1 U	10 U	10 U	4 J	10 U	NA	10 U	10 U	10 U	10 U	10 U
Semi-volatile Organic Compounds (UG/L)													
2,4-Dinitrotoluene	No MCL	10 U	10 U	NA	11 J	NA	12	NA	NA	10 U	10 U	10 U	15
bis(2-Ethylhexyl)phthalate	6	10 U	10 U	NA	20 U	NA	10 U	NA	NA	10 U	5 B	10 U	3 J
Pesticide/Polychlorinated Biphenyls (UG/L)													
4,4'-DDE	No MCL	0.1 U	NA	NA	0.038 J	NA	0.1 U	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U
Heptachlor epoxide	0.2	0.05 U	NA	NA	13	NA	0.59	NA	NA	0.05 U	0.05 U	0.05 U	0.029 B
beta-BHC	No MCL	0.05 U	NA	NA	0.05 U	NA	0.063 J	NA	NA	0.05 U	0.05 U	0.013 J	0.036 J
delta-BHC	No MCL	0.05 U	NA	NA	0.05 U	NA	0.05 U	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U
gamma-BHC (Lindane)	0.2	0.05 U	NA	NA	0.018 J	NA	0.05 U	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U
Explosives (UG/L)													
1,3,5-Trinitrobenzene	No MCL	0.66 U	0.66 U	200 U	4	2 U	0.68 J	NA	1 UL	2.5 U	2.5 U	2.5 U	2.5 U
1,3-Dinitrobenzene	No MCL	1.1 U	1.1 U	200 U	2.6	2 U	0.74 J	NA	1 UL	2.5 U	2.5 U	2.5 U	2.5 U
2,4,6-Trinitrotoluene	No MCL	0.62 U	0.62 U	15,270 J	4,100	4 U	1.2 J	NA	2 UL	2.5 U	2.5 U	2.5 U	2.5 U
2,4-Dinitrotoluene	No MCL	1 U	1 U	500 U	40	5 U	13	NA	2.5 UL	2.5 U	2.5 U	2.5 U	17
2-Amino-4,6-dinitrotoluene	No MCL	NA	NA	4,073	2,300	6 U	6.6	NA	3 UL	5 U	5 U	5 U	5 U
2-Nitrotoluene	No MCL	0.75 U	0.75 U	500 U	17	5 U	5 U	NA	2.5 UL	5 U	5 U	5 U	5 U
4-Amino-2,6-dinitrotoluene	No MCL	1 U	1 U	2,797	1,900	4 U	9.1	NA	2 UL	5 U	5 U	5 U	5 U
HMX	No MCL	0.61 U	0.61 U	665	2.5 U	2.74 J	8.2	NA	2 UL	2.5 U	2.5 U	2.5 U	2.5 U
RDX	No MCL	0.59 U	0.59 U	500 U	2.5 U	5 U	28	NA	2.5 UL	2.5 U	2.5 U	2.5 U	2.5 U
Tetryl	No MCL	1 U	1 U	400 U	5 U	4 U	2.3 J	NA	2 UL	5 U	5 U	5 U	5 U
Total Metals (UG/L)													
Aluminum	No MCL	1160	794 J	869	154 B	133 J	18.6 B	21.5 B	1,080	80.7 U	80.7 U	600	56.9 B
Arsenic	10	3.5 J	2.5	13.3	2.9 J	17.5	1.8 U	1.8 U	8.2 J	2.1 U	2.1 U	1.8 U	1.8 U
Barium	2,000	43.6 J	32.3	305 J	319	11.8 J	22.4 J	21.3 B	32.5 J	20.6 B	19.4 B	53.1 J	49.8 J
Beryllium	4	0.2 U	0.1 U	0.2 U	0.14 B	0.2 U	0.1 U	0.1 U	0.22 J	0.1 U	0.1 U	0.36 B	0.1 U
Cadmium	5	2.3 U	1.5 U	0.2 U	0.61 B	0.2 U	0.23 B	0.2 U	0.6 J	0.2 U	0.2 U	0.34 B	0.24 B
Calcium	No MCL	67100	91,800	174,000	158,000	73,700	108,000	108,213	136,000	117,000	112,000	111,000	161,000
Chromium	100	4.7 L	2.5	1.2 J	0.5 U	1.2 J	0.86 B	0.5 U	5.6 J	0.9 U	0.9 U	3.3 B	0.52 B
Cobalt	No MCL	2.1 U	1.9 U	1.6 J	0.95 B	0.5 U	0.88 B	0.37 B	1.9 J	0.5 U	0.5 U	3.3 B	0.81 B
Copper	1,300	4.5 J	4.8	3.4 J	0.5 U	1.1 J	0.53 B	0.5 U	2.2 J	0.6 U	0.6 U	1.9 B	0.5 U
Cyanide	200	5 U	5 U	156	189	0.9 U	1.6 U	1.6 B	0.9 U	1.1 U	1.1 U	1.6 U	1.6 U
Iron	No MCL	2350	2,120 J	7,480	21,300	1,870	25.1 B	25.3 B	3,100	43 U	43 U	2,550	66.3 B
Lead	15	1.5 U	1.9 K	10.5	0.9 U	2.1 J	0.9 U	0.9 U	1.3 U	1.1 U	1.1 U	0.9 U	0.9 U
Magnesium	No MCL	3350 J	3,100	400,000	357,000	12,500	3,330 J	3,349 B	4,560 J	2,790 J	2,680 J	3,270 J	4,500 J
Manganese	No MCL	18.4	86.2	223	200	119	64.4	64.9	306	220	207	45.4	169

TABLE 5-4
Groundwater Analytical Detections at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Yorktown-Eastover Aquifer**	Yorktown-Eastover	Yorktown-Eastover		Yorktown-Eastover	Yorktown-Eastover		Yorktown-Eastover			Yorktown-Eastover	Yorktown-Eastover
Station ID			YS06-GW003	YS06-GW004		YS06-GW005	YS06-GW005B		YS06-GW006			YS06-GW006B	YS06-GW007
Sample ID			YS06-MW003-1194	YS06-MW004-0600	YS06-MW004-1004	YS06-MW005-0600	YS06-MW005B-1004	YS06-MW005BP-1004	YS06-MW006-0600	YS06-MW006-0904	YS06-MW006P-0904	YS06-MW006B-1004	YS06-MW007-1004
Sample Date			11/09/94	06/23/00	10/05/04	06/22/00	10/04/04	10/04/04	06/23/00	09/20/04	09/20/04	10/07/04	10/07/04
Investigation			Historical Data	Historical Data	GW RI Data	Historical Data	GW RI Data	GW RI Data	Historical Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data
Chemical Name													
Mercury	2	0.2 UL	0.2 U	0.17 L	0.1 UJ	0.17 L	0.1 UJ	0.1 U	0.15 L	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Nickel	No MCL	5.2 U	4.3 U	0.95 J	3 B	2.7 J	1.4 B	1.38 B	6.4 J	0.6 U	0.6 U	3.5 B	2.3 B
Potassium	No MCL	5510	3,690	203,000	162,000	4,540 J	742 J	743 B	1,850 J	556 J	524 J	1,960 J	1,280 J
Selenium	50	2.9 J	2.6 U	2.2 U	2.6 U	2.2 U	2.6 U	2.6 U	2.2 U	2.4 U	2.4 U	2.6 U	2.6 U
Sodium	No MCL	8300	12,700	3,150,000	3,300,000	70,500	9,050	9,065	17,600	25,700	24,000	9,390	32,600
Vanadium	No MCL	7.5 J	4.4	3.6 J	0.62 B	1.3 J	0.87 B	0.59 B	8.8 J	0.6 U	0.6 U	5.3 J	0.71 B
Zinc	No MCL	14.9 J	36 B	16,700	5,540	13,100	1.8 B	1.7 B	4.8 J	4.1 U	4.1 U	6.3 B	2.6 B
Dissolved Metals (UG/L)													
Aluminum	No MCL	146 J	596 J	37 U	5.8 B	37 U	5.4 B	4.4 U	37 U	80.7 U	80.7 U	5.2 B	4.4 U
Antimony	6	18.5 J	12.2 U	2.1 U	2 U	2.1 U	2 U	2 U	2.1 U	1.9 U	1.9 U	2 U	2 U
Arsenic	10	2.6 UL	2.3 U	3.7 J	5.3 J	15.8	1.8 U	1.81 B	3.3 J	2.1 U	2.1 U	1.8 U	1.8 U
Barium	2,000	30.9 J	30.9	280	332	10.2 J	21.8 J	21.2 B	27.5 J	18.5 B	18.7 B	38.3 J	50.6 J
Cadmium	5	2.3 U	1.5 U	1 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Calcium	No MCL	69800	90,100	180,000	170,000	81,000	108,000	108,554	142,000	109,000	109,000	108,000	164,000
Chromium	100	1.5 U	1.8 U	2.4 J	0.5 U	0.4 U	0.5 U	0.5 U	0.4 U	0.9 U	0.9 U	0.5 U	0.5 U
Cobalt	No MCL	2.1 U	1.9 U	0.5 U	1.2 B	0.5 U	0.71 B	0.59 B	1.2 J	0.5 U	0.5 U	0.87 B	0.93 B
Copper	1,300	4 J	14.6	0.78 J	0.5 U	1.2 J	0.5 U	0.5 U	1.6 J	0.6 U	0.6 U	0.5 U	0.5 U
Iron	No MCL	5.8 J	794 J	14.3 U	11,000	380	10.7 U	10.7 U	20.9 J	43 U	43 U	1,760	10.7 U
Lead	15	1.5 U	2.1 K	1.3 U	0.9 U	1.3 U	0.9 U	0.9 U	1.3 U	1.1 U	1.1 U	0.9 U	0.9 U
Magnesium	No MCL	3410 J	2,960	430,000	374,000	13,500	3,390 J	3,392 B	4,330 J	2,590 J	2,600 J	3,000 J	4,490 J
Manganese	No MCL	12.2 J	110 J	206	187	126	56.2	55.9	298	199	201	42.9	157
Mercury	2	0.2 UL	0.2 U	0.18 L	0.1 UJ	0.14 L	0.1 UJ	0.1 U	0.15 L	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Nickel	No MCL	5.2 U	4.3 U	3.1 J	1.3 B	1.9 B	0.91 B	0.63 B	3.2 B	1.6 J	1.5 J	0.5 U	1.8 B
Potassium	No MCL	5680	3,600	202,000 J	176,000	4,500 J	712 J	723 B	1,460 J	522 J	533 J	1,670 J	1,400 J
Sodium	No MCL	8570	13,000	3,240,000	3,530,000	72,100	9,220	9,355	17,100	24,100	24,500	9,400	32,400
Thallium	2	5.7 U	4 U	4.2 J	1.9 U	3.2 U	3 B	1.9 U	3.2 U	2.8 U	2.8 U	1.9 U	1.9 U
Vanadium	No MCL	6.3 J	1.4 U	0.4 U	0.4 U	0.56 J	0.73 B	0.4 U	0.56 J	0.6 U	0.6 U	0.4 U	0.48 B
Zinc	No MCL	5.9 J	1,740 J	20,000	1,980	13,300	0.7 U	0.7 U	53.5	4.1 U	4.1 U	0.7 U	0.7 U
Wet Chemistry (MG/L)													
Nitrate/Nitrite	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	No MCL	NA	250	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total suspended solids (TSS)	No MCL	NA	230	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
- Shaded values indicate the analyte was detected
- GW = Groundwater
- LTM = Long Term Monitoring
- RI = Remedial Investigation
- MCL = Federal Maximum Contaminant Level
- UG/L = Micrograms per Liter
- MG/L = Milligrams per Liter
- B = Not detected substantially above the level reported in laboratory or field blanks
- J = Analyte present. Reported value may or may not be accurate or precise
- K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- NA = Not analyzed
- R = Unreliable result
- U = Not detected
- UJ = Not detected, quantitation limit may be inaccurate or imprecise
- UL = Not detected, quantitation limit is probably higher

TABLE 5-4
Groundwater Analytical Detections at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Yorktown-Eastover Aquifer**	Yorktown-Eastover			Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover
Station ID			YS06-GW008			YS06-GW009	YS06-GW009A	YS06-GW009B	YS06-GW010	YS06-GW010A
Sample ID			YS06-MW008-1004	YS06-MW008-0305	YS06-MW008P-0305	YS06-MW009-1004	YS06-MW009A-1004	YS06-MW009B-1004	YS06-MW010-1004	YS06-MW010A-1004
Sample Date			10/05/04	03/17/05	03/17/05	10/05/04	10/05/04	10/07/04	10/04/04	10/05/04
Investigation			GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data
Chemical Name										
Volatile Organic Compounds (UG/L)										
1,1,1-Trichloroethane	200	1 U	5,000 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	No MCL	1 U	5,000 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	7	1 U	5,000 U	5.9 K	5.6 K	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	5	1 U	5,000 U	0.26 K	0.24 K	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	No MCL	1 U	5,000 U	0.17 K	0.23 K	10 U	10 U	10 U	10 U	10 U
Chloroform	80	1 U	5,000 U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
Chloromethane	No MCL	1 U	5,000 U	0.5 U	0.17 K	10 U	10 U	10 U	10 U	10 U
Methylene chloride	5	2 U	5,000 U	0.34 B	0.31 B	10 U	3 J	10 U	3 J	10 U
Trichloroethene	5	1 U	36,000	17,000 J	19,000 J	10 U	3 J	10 U	1 J	10 U
Vinyl chloride	2	1 U	5,000 U	8 K	7.8 K	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	70	1 U	5,000 U	550 J	530 J	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	No MCL	1 U	5,000 U	0.15 K	0.17 B	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	100	1 U	5,000 U	7.7 K	7.3 K	10 U	10 U	10 U	10 U	10 U
Semi-volatile Organic Compounds (UG/L)										
2,4-Dinitrotoluene	No MCL	10 U	10 U	10 U	10 U	120	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	6	10 U	13	10 U	10 U	6 J	10 U	10 U	10 U	10 U
Pesticide/Polychlorinated Biphenyls (UG/L)										
4,4'-DDE	No MCL	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Heptachlor epoxide	0.2	0.05 U	0.05 U	0.05 U	0.05 U	1.2	0.05 U	0.05 U	0.062	0.05 U
beta-BHC	No MCL	0.05 U	0.05 U	0.05 U	0.05 U	0.26 J	0.036 J	0.036 J	0.05 U	0.028 J
delta-BHC	No MCL	0.05 U	0.05 U	0.05 U	0.05 U	0.016 J	0.05 U	0.05 U	0.05 U	0.05 U
gamma-BHC (Lindane)	0.2	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Explosives (UG/L)										
1,3,5-Trinitrobenzene	No MCL	0.66 U	2.5 U	2.5 U	2.5 U	1.9 J	2.5 U	2.5 U	2.5 U	2.5 U
1,3-Dinitrobenzene	No MCL	1.1 U	2.5 U	2.5 U	2.5 U	57	2.5 U	2.5 U	2.5 U	2.5 U
2,4,6-Trinitrotoluene	No MCL	0.62 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	0.95 J	2.5 U
2,4-Dinitrotoluene	No MCL	1 U	2.5 U	2.5 U	2.5 U	130	2.5 U	2.5 U	2.5 U	2.5 U
2-Amino-4,6-dinitrotoluene	No MCL	NA	5 U	5 U	5 U	16	5 U	5 U	5 U	5 U
2-Nitrotoluene	No MCL	0.75 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Amino-2,6-dinitrotoluene	No MCL	1 U	5 U	5 U	5 U	17	5 U	5 U	5 U	5 U
HMX	No MCL	0.61 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
RDX	No MCL	0.59 U	2.5 U	2.5 U	2.5 U	84	2.5 U	2.5 U	2.5 U	2.5 U
Tetryl	No MCL	1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Total Metals (UG/L)										
Aluminum	No MCL	1160	226	97.1 B	88.5 B	12.9 B	364	3,770	70.3 B	49.3 B
Arsenic	10	3.5 J	1.8 U	2.1 U	2.1 U	1.8 U	1.8 U	2.9 J	1.8 U	1.8 U
Barium	2,000	43.6 J	30.3 J	26.6 B	27 B	57.7 J	59.4 J	33.1 J	29.4 J	24 J
Beryllium	4	0.2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.28 B	0.1 U	0.1 U
Cadmium	5	2.3 U	0.2 U	0.3 U	0.3 U	0.23 B	0.2 U	0.23 B	0.2 U	0.2 U
Calcium	No MCL	67100	96,100	102,000	102,000	222,000	114,000	94,000	118,000	100,000
Chromium	100	4.7 L	1.5 B	0.63 B	0.6 U	0.5 U	2.5 B	18.9 B	0.68 B	0.5 U
Cobalt	No MCL	2.1 U	0.3 U	0.6 U	0.6 U	1.6 B	0.38 B	3.2 B	0.3 U	0.38 B
Copper	1,300	4.5 J	0.52 B	0.4 U	0.4 U	0.5 U	0.5 U	1.9 B	0.5 U	0.5 U
Cyanide	200	5 U	1.6 U	0.8 U	0.8 U	2.4 B	1.6 U	1.6 U	1.6 U	1.6 U
Iron	No MCL	2350	1,010 B	700	689	10.7 U	822 B	6,320	147 B	923 B
Lead	15	1.5 U	0.9 U	1.3 U	1.3 U	0.9 U	0.9 U	1.1 B	0.9 U	0.9 U
Magnesium	No MCL	3350 J	3,930 J	3,810 J	3,860 J	13,400	5,360	11,600	5,230	7,940
Manganese	No MCL	18.4	58.4	55.1	55.5	97	204	324	6.7 J	59.3

TABLE 5-4
Groundwater Analytical Detections at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Yorktown-Eastover Aquifer**	Yorktown-Eastover			Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover
Station ID			YS06-GW008			YS06-GW009	YS06-GW009A	YS06-GW009B	YS06-GW010	YS06-GW010A
Sample ID			YS06-MW008-1004	YS06-MW008-0305	YS06-MW008P-0305	YS06-MW009-1004	YS06-MW009A-1004	YS06-MW009B-1004	YS06-MW010-1004	YS06-MW010A-1004
Sample Date			10/05/04	03/17/05	03/17/05	10/05/04	10/05/04	10/07/04	10/04/04	10/05/04
Investigation			GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data
Chemical Name										
Mercury	2	0.2 UL	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Nickel	No MCL	5.2 U	0.5 U	0.8 U	0.8 U	1.1 B	1 B	6.9 B	0.94 B	1.1 B
Potassium	No MCL	5510	2,670 J	2,770 J	2,820 J	3,410 J	4,240 J	9,150	1,910 J	2,680 J
Selenium	50	2.9 J	2.6 U	2.7 U	2.7 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U
Sodium	No MCL	8300	33,300	34,500	34,900	274,000	77,000	128,000	42,600	31,400
Vanadium	No MCL	7.5 J	0.8 B	0.5 U	0.5 U	0.64 B	1.1 B	11.2 J	0.84 B	0.4 U
Zinc	No MCL	14.9 J	6 B	1.6 B	1.5 B	2.9 B	5 B	39.6	2.1 B	3.4 B
Dissolved Metals (UG/L)										
Aluminum	No MCL	146 J	9.3 B	29.1 B	24.3 U	20.1 B	8.2 B	7.5 B	8.7 B	6 B
Antimony	6	18.5 J	2 U	2.5 U	2.5 U	2 U	2 U	2 U	2 U	2 U
Arsenic	10	2.6 UL	1.8 U	3.6 U	3.6 U	1.8 U	2 J	3 J	1.8 U	1.8 U
Barium	2,000	30.9 J	30.4 J	35.6 J	34 J	59 J	58.1 J	24.2 J	29.6 J	26.1 J
Cadmium	5	2.3 U	0.2 U	0.3 U	0.3 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Calcium	No MCL	69800	99,600	105,000	101,000	229,000	113,000	86,500	119,000	108,000
Chromium	100	1.5 U	0.5 U	0.9 U	0.9 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Cobalt	No MCL	2.1 U	0.3 B	0.6 U	0.6 U	2 B	0.82 B	5.4 B	0.67 B	0.72 B
Copper	1,300	4 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Iron	No MCL	5.8 J	647 B	646	631	10.7 U	217 B	10.7 U	10.7 U	1,240
Lead	15	1.5 U	0.9 U	1.7 U	1.7 U	1.1 B	0.9 U	0.9 U	0.9 U	0.9 U
Magnesium	No MCL	3410 J	4,020 J	4,140 J	3,970 J	13,700	5,240	10,500	5,240	8,190
Manganese	No MCL	12.2 J	59.2	56.1	54	103	200	287	7.1 J	72.3
Mercury	2	0.2 UL	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Nickel	No MCL	5.2 U	0.5 U	1 U	1 U	0.86 B	0.5 U	1.8 B	0.5 U	0.89 B
Potassium	No MCL	5680	2,730 J	3,090 J	3,020 J	3,590 J	4,140 J	8,120	1,910 J	2,820 J
Sodium	No MCL	8570	35,600	34,600	33,300	283,000	79,000	136,000	43,900	34,000
Thallium	2	5.7 U	1.9 U	6.2 U	6.2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Vanadium	No MCL	6.3 J	0.4 U	0.4 U	0.4 U	0.79 B	0.4 U	0.4 U	0.59 B	0.4 U
Zinc	No MCL	5.9 J	0.7 U	3.6 U	3.6 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
Wet Chemistry (MG/L)										
Nitrate/Nitrite	10	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	No MCL	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total suspended solids (TSS)	No MCL	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
MCL = Federal Maximum Contaminant Level
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 5-5
Sediment Analytical Detections at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS06-SD015		YS06-SD016		YS06-SD017		YS06-SD018		YS06-SD019		YS06-SD020	
Sample ID	YS06-SD015-A-0794	YS06-SD015-B-0794	YS06-SD016-A-0794	YS06-SD016-B-0794	YS06-SD017-A-0794	YS06-SD017-B-0794	YS06-SD018-A-0794	YS06-SD018-B-0794	YS06-SD019-A-0794	YS06-SD019-B-0794	YS06-SD020-A-1294	YS06-SD020P-A-1294
Sample Date	07/26/94	07/26/94	07/26/94	07/26/94	07/24/94	07/24/94	07/24/94	07/24/94	07/24/94	07/24/94	12/01/94	12/01/94
Chemical Name												
Volatile Organic Compounds (UG/KG)												
1,1-Dichloroethane	240 U	170 U	22 UJ	170 U	42 U	24 U	NA	NA	NA	NA	33 U	34 U
1,1-Dichloroethene	240 U	170 U	22 UJ	170 U	42 U	24 U	NA	NA	NA	NA	33 U	34 U
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	33 U	34 U
2-Butanone	240 U	150 J	22 UJ	170 U	34 J	21 J	NA	NA	NA	NA	33 U	34 U
Acetone	150 J	760 J	27 J	220 J	180 J	120	NA	NA	NA	NA	33 U	34 U
Carbon disulfide	240 U	170 U	22 UJ	110 J	42 U	12 J	NA	NA	NA	NA	33 U	34 U
Chloroethane	240 U	170 U	22 UJ	170 U	42 U	24 U	NA	NA	NA	NA	33 U	34 U
Chloromethane	240 U	170 U	22 UJ	170 U	42 U	24 U	NA	NA	NA	NA	33 U	34 U
Methyl acetate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	240 U	170 U	22 UJ	170 U	42 U	40	NA	NA	NA	NA	33 U	34 U
Toluene	240 U	170 U	22 UJ	170 U	42 U	24 U	NA	NA	NA	NA	33 U	34 U
Trichloroethene	240 U	170 U	22 UJ	170 U	42 U	24 U	NA	NA	NA	NA	33 U	34 U
Vinyl chloride	240 U	170 U	22 UJ	170 U	42 U	24 U	NA	NA	NA	NA	33 U	34 U
cis-1,2-Dichloroethene	240 U	170 U	22 UJ	170 U	42 U	24 U	NA	NA	NA	NA	NA	NA
Semi-volatile Organic Compounds (UG/KG)												
2,4-Dinitrotoluene	1,100 U	870 U	1,100 U	1,000 U	1,100 U	780 U	1,100 UJ	810 UJ	1,100 U	820 UJ	1,000 U	1,200 U
2-Methylnaphthalene	1,100 U	870 U	1,100 U	1,000 U	1,100 U	780 U	1,100 UJ	870 UJ	1,100 U	820 UJ	1,000 U	1,200 U
4-Methylphenol	1,100 U	870 U	1,100 U	1,000 U	1,100 U	780 U	1,100 U	870 U	1,100 U	820 U	1,000 U	1,200 U
Acenaphthene	440 J	870 U	1,100 U	1,000 U	1,100 U	780 U	1,100 UJ	870 UJ	1,100 U	820 UJ	1,000 U	1,200 U
Anthracene	1,100 U	870 U	1,100 U	1,000 U	1,100 U	780 U	1,100 UJ	870 UJ	1,100 U	820 UJ	1,000 U	1,200 U
Benzo(a)anthracene	700 J	350 J	1,100 U	1,000 U	1,100 U	780 U	1,100 UJ	870 UJ	1,100 U	820 UJ	1,000 U	1,200 U
Benzo(a)pyrene	570 J	870 UJ	1,100 U	1,000 U	1,100 U	780 U	1,100 UJ	870 UJ	1,100 U	820 UJ	1,000 U	1,200 U
Benzo(b)fluoranthene	1,300 J	660 J	1,100 U	1,000 U	1,100 U	780 U	1,100 UJ	870 UJ	1,100 U	820 UJ	1,000 U	1,200 U
Benzo(g,h,i)perylene	1,100 UJ	870 UJ	1,100 U	1,000 U	1,100 U	780 U	1,100 UJ	870 UJ	1,100 U	820 UJ	1,000 U	1,200 U
Benzo(k)fluoranthene	350 J	210 J	1,100 U	1,000 U	1,100 U	780 U	1,100 UJ	870 UJ	1,100 U	820 UJ	1,000 U	1,200 U
Carbazole	1,100 U	870 U	1,100 U	1,000 U	1,100 U	780 U	1,100 UJ	870 UJ	1,100 U	820 UJ	1,000 U	1,200 U
Chrysene	670 J	540 J	1,100 U	1,000 U	1,100 U	780 U	1,100 UJ	870 UJ	1,100 U	820 UJ	1,000 U	1,200 U
Di-n-butylphthalate	1,100 U	870 U	1,100 U	1,000 U	1,100 U	780 U	6,800 J	870 UJ	1,100 U	820 UJ	3,800	5,800
Dibenz(a,h)anthracene	1,100 UJ	870 UJ	1,100 U	1,000 U	1,100 U	780 U	1,100 UJ	870 UJ	1,100 U	820 UJ	1,000 U	1,200 U
Fluoranthene	1,400	400 J	1,100 U	1,000 U	1,100 U	780 U	1,100 UJ	870 UJ	1,100 U	820 UJ	1,000 U	1,200 U
Fluorene	1,100 U	870 U	1,100 U	1,000 U	1,100 U	780 U	1,100 UJ	870 UJ	1,100 U	820 UJ	1,000 U	1,200 U
Indeno(1,2,3-cd)pyrene	1,100 UJ	870 UJ	1,100 U	1,000 U	1,100 U	780 U	1,100 UJ	870 UJ	1,100 U	820 UJ	1,000 U	1,200 U
Naphthalene	1,100 U	870 U	1,100 U	1,000 U	1,100 U	780 U	1,100 UJ	870 UJ	1,100 U	820 UJ	1,000 U	1,200 U
Phenanthrene	1,200	870 U	1,100 U	1,000 U	1,100 U	780 U	1,100 UJ	870 UJ	1,100 U	820 UJ	1,000 U	1,200 U
Phenol	1,100 U	870 U	1,100 U	1,000 U	1,100 U	780 U	890 J	870 U	1,100 U	820 U	1,000 U	1,200 U
Pyrene	2,000	850 J	1,100 U	1,000 U	1,100 U	780 U	1,100 UJ	870 UJ	1,100 U	820 UJ	1,000 U	1,200 U
bis(2-Ethylhexyl)phthalate	1,500	870 U	1,100 U	680 J	1,100 U	180 U	1,100 UJ	870 UJ	1,100 U	820 UJ	1,000 U	1,200 U
Pesticide/Polychlorinated Biphenyls (UG/KG)												
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	51 J	38 J
Methoxychlor	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.2 J	61 U
Explosives (UG/KG)												
1,3,5-Trinitrobenzene	560 U	560 U	560 U	560 U	560 U	560 U	560 U	560 U	560 U	560 U	250 U	250 U
1,3-Dinitrobenzene	420 U	420 U	420 U	420 U	420 U	420 U	420 U	420 U	420 U	420 U	250 U	250 U
2,4,6-Trinitrotoluene	440 U	440 U	440 U	440 U	440 U	440 U	440 U	440 U	440 U	440 U	250 U	250 U
2-Amino-4,6-dinitrotoluene	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	250 U	250 U
2-Nitrotoluene	820 U	820 U	820 U	820 U	820 U	820 U	820 U	820 U	820 U	820 U	NA	NA
4-Amino-2,6-dinitrotoluene	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	250 U	250 U
HMX	500 U	500 U	500 U	500 U	500 U	500 U	500 U	500 U	500 U	500 U	500 U	500 U
Nitrobenzene	580 U	580 U	580 U	580 U	580 U	580 U	580 U	580 U	580 U	580 U	260 U	260 U
RDX	590 U	590 U	590 U	590 U	590 U	590 U	590 U	590 U	590 U	590 U	500 U	500 U

TABLE 5-5
Sediment Analytical Detections at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS06-SD015		YS06-SD016		YS06-SD017		YS06-SD018		YS06-SD019		YS06-SD020	
Sample ID	YS06-SD015-A-0794	YS06-SD015-B-0794	YS06-SD016-A-0794	YS06-SD016-B-0794	YS06-SD017-A-0794	YS06-SD017-B-0794	YS06-SD018-A-0794	YS06-SD018-B-0794	YS06-SD019-A-0794	YS06-SD019-B-0794	YS06-SD020-A-1294	YS06-SD020P-A-1294
Sample Date	07/26/94	07/26/94	07/26/94	07/26/94	07/24/94	07/24/94	07/24/94	07/24/94	07/24/94	07/24/94	12/01/94	12/01/94
Chemical Name												
Tetryl	1,200 U	1,200 U	1,200 U	1,200 U	1,200 U	1,200 U	1,200 U	1,200 U	1,200 U	1,200 U	750 U	650 U
Total Metals (MG/KG)												
Aluminum	18,800	38,900	9,430	21,700	33,300	27,900	31,100	21,000	30,700	21,100	13,700	20,900
Antimony	35.9 UL	24.7 UL	16 UL	24.9 UL	30.3 UL	19.8 B	26.7 UL	18.3 UL	24.7 UL	22.1 B	7.4 UL	8.3 UL
Arsenic	8.9	22.1	4.5	8.8	8.3	11.2	9.8	10.9	7.7 K	8.7 K	6.7	12.5
Barium	47.2	178	24.1	44.1	61.5	48.5	56.4	40.6	56.7	40.3	31	41.7
Beryllium	1.4	1.4	0.43 U	1.1	1.5	1.3	1.4	1.1	1.3	1.1	0.88	1.2
Cadmium	4.9 U	3.3 U	2.4	3.4 U	4.1 UL	2.3 UL	3.6 UL	2.5 UL	3.3 UL	2.5 UL	0.91 U	1 U
Calcium	13,000	30,700	15,500	4,730	3,170	2,400	2,620	43,400	3,280	3,250	2,030	2,650
Chromium	44.4	66.3	20.2	40.7	58.8	49.6	53.8	43.1	56	44.3	29.4	45.8
Cobalt	11.5	12.4	2.6	6.8	11.5	8.4	9.6	8.1	12.5	8.2	7.7	11.4
Copper	48.1	24	14.1	14.1	24	23.5	23.8	25.8	25.5	21.6	15.6	23.8
Cyanide	2.4 U	1.7 U	1.1 U	1.7 U	2 U	1.2 U	1.8 U	1.2 U	1.7 U	1.3 U	7.7 U	8.9 U
Iron	33,400	61,600	19,000	31,500	39,100	39,900	37,100	32,500	38,800	34,100	25,100	37,000
Lead	42.8 L	49.7 L	20.3 L	20.1 L	28.2 L	31.5 L	31.3 L	33.8 L	24.6 L	29.6 L	17.1	31.5
Magnesium	6,850	6,940	2,920	6,540	8,730	7,150	8,690	6,870	9,260	7,400	5,990	8,200
Manganese	245	150	67.1	197	248	286	224	195	255	232	202	272
Mercury	0.23 U	0.22 K	0.11 U	0.17 U	0.19 UL	0.11 UL	0.18 UL	0.12 UL	0.16 UL	0.12 UL	0.31 U	0.36 U
Nickel	59.6	31	13.4	21.5	29.9	32.2	30.2	25.7	36.1	27.1	13.2	21.4
Potassium	3,800	5,330	1,120	3,700	6,080	5,350	5,980	4,550	5,900	4,050	3,400	4,910
Selenium	0.97 UL	0.64 UL	0.82 B	0.66 UL	0.81 UL	0.47 UL	0.72 UL	0.55 L	0.67 UL	0.49 UL	2.3 K	2.5 K
Silver	3.9 U	2.7 U	1.7 U	2.7 U	3.3 U	1.9 U	2.9 U	2 U	2.7 U	2 U	1.2 U	1.4 U
Sodium	6,040	2,210	4,390	7,340	14,900	7,120	15,400	9,560	15,900	9,540	13,600	14,700
Thallium	0.97 U	0.64 U	0.42 U	0.66 U	0.81 U	0.47 U	0.72 U	0.49 U	0.67 U	0.49 U	2.4 U	2.8 U
Vanadium	273	69.5	37.2	51.5	67.2	81.9	68.4	54	65.2	54.3	36.2	56.2
Zinc	282	173	119	79.6	153	145	144	133	149	129	101 J	172 J
Wet Chemistry (MG/KG)												
Total organic carbon (TOC)	81,400	71,900	18,800	44,600	33,400	27,500	27,800	2,300	25,800	20,100	NA	NA
pH	6.64	6.94	6.76	6.19	7.19	7.55	6.85	7.32	7.21	6.51	8.43	8.4

Notes:

Shaded values indicate the analyte was detected
UG/KG = Micrograms per Kilogram
MG/KG = Milligrams per Kilogram
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 5-5
Sediment Analytical Detections at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS06-SD020	YS06-SD021		YS06-SD022		YS06-SD023			YS06-SD024		
Sample ID	YS06-SD020-B-1294	YS06-SD021-A-1294	YS06-SD021-B-1294	YS06-SD022-A-0794	YS06-SD022-B-0794	YS06-SD023-A-0794	YS06-SD023P-A-0794	YS06-SD023-B-0794	YS06-SD024-A-0794	YS06-SD024P-A-0794	YS06-SD024-B-0794
Sample Date	12/01/94	12/01/94	12/01/94	07/26/94	07/26/94	07/27/94	07/27/94	07/27/94	07/26/94	07/26/94	07/26/94
Chemical Name											
Volatile Organic Compounds (UG/KG)											
1,1-Dichloroethane	34 U	28 U	26 U	NA	NA	20 U	19 UJ	17 U	14 U	21 UJ	22 UJ
1,1-Dichloroethene	34 U	28 U	26 U	NA	NA	20 U	19 UJ	17 U	14 U	21 UJ	22 UJ
1,2-Dichloroethene (total)	34 U	28 U	26 U	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	34 U	28 U	26 U	NA	NA	23	19 UJ	17 U	14 U	21 UJ	22 UJ
Acetone	34 U	28 U	26 U	NA	NA	96	24 B	24 B	14 U	21 UJ	52 J
Carbon disulfide	34 U	28 U	26 U	NA	NA	20 U	19 UJ	17 U	14 U	21 UJ	22 UJ
Chloroethane	34 U	28 U	26 U	NA	NA	15 J	24 J	17 U	14 U	21 UJ	22 UJ
Chloromethane	34 U	28 U	26 U	NA	NA	20 U	16 J	17 U	14 U	21 UJ	22 UJ
Methyl acetate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	34 U	28 U	26 U	NA	NA	20 U	19 UJ	17 U	14 U	21 UJ	12 J
Toluene	34 U	28 U	26 U	NA	NA	20 U	19 UJ	12 J	14 UJ	21 UJ	22 UJ
Trichloroethene	34 U	28 U	26 U	NA	NA	20 U	19 U	17 U	14 U	21 UJ	22 U
Vinyl chloride	34 U	28 U	26 U	NA	NA	20 U	19 UJ	17 U	14 U	21 UJ	22 UJ
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	20 U	19 UJ	17 U	14 U	21 UJ	22 UJ
Semi-volatile Organic Compounds (UG/KG)											
2,4-Dinitrotoluene	1,200 U	940 U	840 U	920 U	460 U	610 U	540 U	490 U	430 U	450 U	470 U
2-Methylnaphthalene	1,200 U	940 U	840 U	920 U	460 U	610 U	540 U	490 U	430 U	450 U	470 U
4-Methylphenol	1,200 U	940 U	840 U	920 U	460 U	610 U	540 U	490 U	430 U	450 U	470 U
Acenaphthene	1,200 U	940 U	840 U	920 U	460 U	610 U	540 U	490 U	430 U	450 U	470 U
Anthracene	1,200 U	940 U	840 U	920 U	460 U	610 U	540 U	490 U	430 U	450 U	470 U
Benzo(a)anthracene	1,200 U	940 U	840 U	920 U	460 U	610 U	540 U	490 U	210 J	450 J	470 U
Benzo(a)pyrene	1,200 U	940 U	840 U	920 UJ	460 U	610 U	540 U	490 U	180 J	400 J	470 U
Benzo(b)fluoranthene	1,200 U	940 U	840 U	920 UJ	460 U	610 U	540 U	490 U	290 J	630	470 U
Benzo(g,h,i)perylene	1,200 U	940 U	840 U	920 UJ	460 U	610 U	540 U	490 U	430 UJ	450 U	470 U
Benzo(k)fluoranthene	1,200 U	940 U	840 U	920 UJ	460 U	610 U	540 U	490 U	83 J	210 J	470 U
Carbazole	1,200 U	940 U	840 U	920 U	460 U	610 U	540 U	490 U	430 U	450 U	470 U
Chrysene	1,200 U	940 U	840 U	920 U	460 U	610 U	540 U	490 U	220 J	500	470 U
Di-n-butylphthalate	16,000	3,500	5,300	920 U	460 U	610 U	540 U	490 U	430 U	170 J	470 U
Dibenz(a,h)anthracene	1,200 U	940 U	840 U	920 UJ	460 U	610 U	540 U	490 U	430 UJ	450 U	470 U
Fluoranthene	1,200 U	940 U	840 U	920 U	460 U	610 U	540 U	490 U	480	930	470 U
Fluorene	1,200 U	940 U	840 U	920 U	460 U	610 U	540 U	490 U	430 U	450 U	470 U
Indeno(1,2,3-cd)pyrene	1,200 U	940 U	840 U	920 UJ	460 U	610 U	540 U	490 U	430 UJ	170 J	470 U
Naphthalene	1,200 U	940 U	840 U	920 U	460 U	610 U	540 U	490 U	430 U	450 U	470 U
Phenanthrene	1,200 U	940 U	840 U	920 U	460 U	610 U	540 U	490 U	400 J	550	470 U
Phenol	1,200 U	940 U	840 U	920 U	460 U	610 U	540 U	490 U	430 U	450 U	470 U
Pyrene	1,200 U	940 U	840 U	920 U	460 U	610 U	540 U	490 U	400 J	790	470 U
bis(2-Ethylhexyl)phthalate	1,200 U	940 U	840 U	920 U	460 U	16,000	35,000	620	430 U	630	220 J
Pesticide/Polychlorinated Biphenyls (UG/KG)											
Aroclor-1260	52 J	94 U	39 J	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	61 U	48 U	44 U	NA	NA	NA	NA	NA	NA	NA	NA
Explosives (UG/KG)											
1,3,5-Trinitrobenzene	250 U	250 U	250 U	560 U	560 U	560 U	560 U	560 U	560 U	560 U	560 U
1,3-Dinitrobenzene	250 U	250 U	250 U	420 U	420 U	420 U	420 U	420 U	420 U	420 U	420 U
2,4,6-Trinitrotoluene	250 U	250 U	250 U	440 U	440 U	440 U	440 U	440 U	440 U	440 U	440 U
2-Amino-4,6-dinitrotoluene	250 U	250 U	250 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
2-Nitrotoluene	NA	NA	NA	820 U	820 U	820 U	820 U	820 U	820 U	820 U	820 U
4-Amino-2,6-dinitrotoluene	250 U	250 U	250 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
HMX	500 U	500 U	500 U	500 U	500 U	500 U	500 U	500 U	500 U	500 U	500 U
Nitrobenzene	260 U	260 U	260 U	580 U	580 U	580 U	580 U	580 U	580 U	580 U	580 U
RDX	500 U	500 U	500 U	590 U	590 U	590 U	590 U	590 U	590 U	590 U	590 U

TABLE 5-5
Sediment Analytical Detections at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS06-SD020	YS06-SD021		YS06-SD022		YS06-SD023			YS06-SD024		
Sample ID	YS06-SD020-B-1294	YS06-SD021-A-1294	YS06-SD021-B-1294	YS06-SD022-A-0794	YS06-SD022-B-0794	YS06-SD023-A-0794	YS06-SD023P-A-0794	YS06-SD023-B-0794	YS06-SD024-A-0794	YS06-SD024P-A-0794	YS06-SD024-B-0794
Sample Date	12/01/94	12/01/94	12/01/94	07/26/94	07/26/94	07/27/94	07/27/94	07/27/94	07/26/94	07/26/94	07/26/94
Chemical Name											
Tetryl	870 U	650 U	650 U	1,200 U	1,200 U	1,200 U	1,200 U	1,200 U	1,200 U	1,200 U	1,200 U
Total Metals (MG/KG)											
Aluminum	27,200	16,700	22,000	10,100	11,200	5,420	6,410	4,080	2,560	10,800	16,000
Antimony	8.3 UL	6.7 UL	6 UL	23 UL	9.6 UL	14.5 UL	13.6 UL	12.2 UL	9.9 UL	15.7 UL	15.6 UL
Arsenic	14.9	9.8	9.6	13.5	3.8	1.7	1.5	4.4	6.8	18.2	23.8
Barium	53.2	33.7	41.8	54.8	28.3	20.8	24.3	16.2	17.3	47.1	48.9
Beryllium	1.3	0.93	1	0.62 U	0.5	0.39 U	0.45	0.33	0.27 U	0.86	0.69
Cadmium	1 U	0.93 K	0.74 U	3.1 U	1.3 U	2 UL	1.8 UL	1.6 UL	1.3 U	2.1 U	2.1 U
Calcium	2,980	2,120	2,760	4,020	1,490	4,790	4,670	3,140	11,500	10,700	10,500
Chromium	54.3	35	42.2	21.7	21.2	31.4	33.1	14.8	12.5	33.1	35.7
Cobalt	12.2	9.2	10.4	4.7	2.8	1.6	2.1	2.7	1.1 U	5.4	4.6
Copper	26.1	17.1	19.7	13.5	3.1	21.2	15	2.3	10.3	28.2	12.8
Cyanide	8.9 U	7.1 U	6.4 U	1.6 U	0.65 U	0.97 U	0.92 U	0.83 U	0.67 U	1.1 U	1.1 U
Iron	43,800	30,200	33,000	20,100	11,900 J	8,130	8,810	8,450	17,400	25,400	27,000
Lead	36.9	24.2	30.8	47.6 L	6.2 L	59.4	40.8	6.1	20.4 L	49.7 L	48.4 L
Magnesium	9,520	6,540	6,980	2,070	1,600	990	1,140	589	572	1,760	2,220
Manganese	327	222	239	29.8	20.8	13.6	17.1	10.7	28	47.4	68.3
Mercury	0.35 U	0.28 U	0.31 K	0.14 U	0.06 U	0.1 UL	0.09 UL	0.08 UL	0.06 U	0.1 U	0.1 U
Nickel	23.3	16.8	18.8	21.9	8 K	6.3 U	6.4	5.8	4.9 K	24.1	17.2
Potassium	5,350	3,820	4,070	1,480	1,570	1,130	575	516 U	451	2,310	2,120
Selenium	1.8 U	1.5 U	1.3 U	1.1 B	0.37 B	0.43 L	0.39 L	0.36 L	0.31 B	1.2 L	1.1 B
Silver	1.4 U	1.1 U	0.99 U	2.5 U	1 U	1.6 U	1.5 U	1.3 U	1.1 U	1.7 U	1.7 U
Sodium	14,500	11,900	9,780	1,070	238	31.7	29	18.4	65.3 B	82.3 B	68.4 B
Thallium	2.7 U	2.3 U	2 U	0.63 U	0.26 U	0.4 U	37 U	0.33 U	0.27 U	0.42 U	0.42 U
Vanadium	69	44.8	53.9	30.5	22.2	16	14.5	9.2	21.8	81.6	37.4
Zinc	169 J	106 J	126 J	90.8	22.8	63	56	22.6	101	207	139
Wet Chemistry (MG/KG)											
Total organic carbon (TOC)	NA	NA	NA	55,100	15,600	31,300	NA	26,200	6,280	NA	28,400
pH	8.26	8.41	8.43	4.85	5.15	6.06	5.71	5.24	6.97	6.67	7.11

Notes:

Shaded values indicate the analyte was detected
UG/KG = Micrograms per Kilogram
MG/KG = Milligrams per Kilogram
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 5-5
Sediment Analytical Detections at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS06-SD025	YS06-SD025	YS06-SDC01			YS06-SDC02	YS06-SDC03	YS06-SDC04	YS06-SDC05
Sample ID	YS06-SD025-A-1294	YS06-SD025-B-1294	YS06-SDC01-A-0894	YS06-SDC01P-A-0894	YS06-SDC01-B-0894	YS06-SDC02-0894	YS06-SDC03-0894	YS06-SDC04-0894	YS06-SDC05-0894
Sample Date	12/01/94	12/01/94	08/19/94	08/19/94	08/19/94	08/19/94	08/19/94	08/19/94	08/19/94
Chemical Name									
Volatile Organic Compounds (UG/KG)									
1,1-Dichloroethane	26 U	24 U	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	26 U	24 U	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	26 U	24 U	NA	NA	NA	NA	NA	NA	NA
2-Butanone	26 U	24 U	NA	NA	NA	NA	NA	NA	NA
Acetone	26 U	24 U	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	26 U	24 U	NA	NA	NA	NA	NA	NA	NA
Chloroethane	26 U	24 U	NA	NA	NA	NA	NA	NA	NA
Chloromethane	26 U	24 U	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	26 U	24 U	NA	NA	NA	NA	NA	NA	NA
Toluene	26 U	24 U	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	26 U	24 U	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	26 U	24 U	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semi-volatile Organic Compounds (UG/KG)									
2,4-Dinitrotoluene	820 U	730 U	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	820 U	730 U	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	820 U	730 U	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	820 U	730 U	NA	NA	NA	NA	NA	NA	NA
Anthracene	820 U	730 U	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	820 U	730 U	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	820 U	730 U	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	820 U	730 U	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	820 U	730 U	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	820 U	730 U	NA	NA	NA	NA	NA	NA	NA
Carbazole	820 U	730 U	NA	NA	NA	NA	NA	NA	NA
Chrysene	820 U	730 U	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	3,800	4,100	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	820 U	730 U	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	820 U	730 U	NA	NA	NA	NA	NA	NA	NA
Fluorene	820 U	730 U	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	820 U	730 U	NA	NA	NA	NA	NA	NA	NA
Naphthalene	820 U	730 U	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	820 U	730 U	NA	NA	NA	NA	NA	NA	NA
Phenol	820 U	730 U	NA	NA	NA	NA	NA	NA	NA
Pyrene	820 U	730 U	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	820 U	730 U	NA	NA	NA	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/KG)									
Aroclor-1260	82 U	73 U	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	42 U	38 U	NA	NA	NA	NA	NA	NA	NA
Explosives (UG/KG)									
1,3,5-Trinitrobenzene	250 U	250 U	37,000 J	59,000 J	6,900	120,000 J	560 U	110,000 J	560 U
1,3-Dinitrobenzene	250 U	250 U	420 U	420 U	420 U	4,600 J	420 U	420 U	420 U
2,4,6-Trinitrotoluene	250 U	250 U	1,500,000	4,400,000	79,000	93,000,000	17,000	14,000,000	6,400
2-Amino-4,6-dinitrotoluene	250 U	250 U	1,000 U	1,000 U	160,000	1,000 U	1,000 U	1,000 U	1,000 U
2-Nitrotoluene	NA	NA	450 U	450 U	450 U	450 U	450 U	450 U	450 U
4-Amino-2,6-dinitrotoluene	250 U	250 U	1,000 U	1,000 U	160,000	1,000 U	1,000 U	1,000 U	1,000 U
HMX	500 U	500 U	84,000 J	230,000 J	18,000	730,000	500 U	95,000 J	9,200
Nitrobenzene	260 U	260 U	580 R	580 U	2,100 J	580 R	580 U	580 U	580 R
RDX	500 U	500 U	800,000 J	3,800,000 J	190,000	7,900 J	590 U	3,900,000 J	710

TABLE 5-5
Sediment Analytical Detections at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS06-SD025	YS06-SD025	YS06-SDC01			YS06-SDC02	YS06-SDC03	YS06-SDC04	YS06-SDC05
Sample ID	YS06-SD025-A-1294	YS06-SD025-B-1294	YS06-SDC01-A-0894	YS06-SDC01P-A-0894	YS06-SDC01-B-0894	YS06-SDC02-0894	YS06-SDC03-0894	YS06-SDC04-0894	YS06-SDC05-0894
Sample Date	12/01/94	12/01/94	08/19/94	08/19/94	08/19/94	08/19/94	08/19/94	08/19/94	08/19/94
Chemical Name									
Tetryl	880 U	650 U	1,200 U	1,200 U	5,200 J	70,000 J	1,200 U	1,200 U	890 J
Total Metals (MG/KG)									
Aluminum	15,000	14,300	NA	NA	NA	NA	NA	NA	NA
Antimony	5.9 UL	5.3 UL	NA	NA	NA	NA	NA	NA	NA
Arsenic	8.9	10.7	NA	NA	NA	NA	NA	NA	NA
Barium	29	28.9	NA	NA	NA	NA	NA	NA	NA
Beryllium	0.91	1	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.73 U	0.65 U	NA	NA	NA	NA	NA	NA	NA
Calcium	2,370	2,180	NA	NA	NA	NA	NA	NA	NA
Chromium	34.1	32.7	NA	NA	NA	NA	NA	NA	NA
Cobalt	8.8	10.5	NA	NA	NA	NA	NA	NA	NA
Copper	14.6	14.9	NA	NA	NA	NA	NA	NA	NA
Cyanide	6.3 U	5.5 U	NA	NA	NA	NA	NA	NA	NA
Iron	27,400	31,500	NA	NA	NA	NA	NA	NA	NA
Lead	20.8	18.7	NA	NA	NA	NA	NA	NA	NA
Magnesium	5,910	6,070	NA	NA	NA	NA	NA	NA	NA
Manganese	207	227	NA	NA	NA	NA	NA	NA	NA
Mercury	0.25 U	0.22 U	NA	NA	NA	NA	NA	NA	NA
Nickel	13	16.1	NA	NA	NA	NA	NA	NA	NA
Potassium	4,360	3,880	NA	NA	NA	NA	NA	NA	NA
Selenium	1.3 U	1.4 K	NA	NA	NA	NA	NA	NA	NA
Silver	0.97 U	0.87 U	NA	NA	NA	NA	NA	NA	NA
Sodium	9,430	7,540	NA	NA	NA	NA	NA	NA	NA
Thallium	2 U	1.7 U	NA	NA	NA	NA	NA	NA	NA
Vanadium	40.7	44.7	NA	NA	NA	NA	NA	NA	NA
Zinc	101 J	99.7 J	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry (MG/KG)									
Total organic carbon (TOC)	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	8.57	8.7	NA	NA	NA	NA	NA	NA	NA

Notes:

Shaded values indicate the analyte was detected
UG/KG = Micrograms per Kilogram
MG/KG = Milligrams per Kilogram
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 5-6
Surface Water Analytical Detections at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS06-SW016	YS06-SW017	YS06-SW018	YS06-SW019	YS06-SW020		YS06-SW021	YS06-SW024		YS06-SW025	
Sample ID	YS06-SW016-0794	YS06-SW017-0794	YS06-SW018-0794	YS06-SW019-0794	YS06-SW020-0794	YS06-SW020P-0794	YS06-SW021-0794	YS06-SW024-0794	YS06-SW024P-0794	YS06-SW025-A-0794	YS06-SW025-B-0794
Sample Date	07/26/94	07/24/94	07/24/94	07/24/94	07/21/94	07/21/94	07/21/94	07/26/94	07/26/94	07/21/94	07/21/94
Chemical Name											
Volatile Organic Compounds (UG/L)											
1,1,1-Trichloroethane	6 J	10 U	10 U	10 U	1 U	1 U	1 U	98	99	1 U	1 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U	1 U	1 U	1 U	4 J	4 J	1 U	1 U
1,1-Dichloroethene	10 U	10 U	10 U	10 U	1 U	1 U	1 U	5 J	6 J	1 U	1 U
Acetone	10	10 U	10 U	10 U	5 R	5 R	5 R	10 U	10 U	5 R	5 R
Carbon disulfide	10 U	10 U	10 U	10 U	1 U	1 U	1 U	10 U	10 U	1 U	1 U
Toluene	10 U	10 U	10 U	10 U	1 U	1 U	1 U	10 U	10 U	1 U	1 U
Trichloroethene	10 U	10 U	10 U	10 U	1 U	1 U	1 U	10 U	10 U	1 U	1 U
Vinyl chloride	10 U	10 U	10 U	10 U	1 U	1 U	1 U	10 U	10 U	1 U	1 U
cis-1,2-Dichloroethene	10 U	10 U	10 U	10 U	1 U	1 U	1 U	10 U	10 U	1 U	1 U
trans-1,2-Dichloroethene	10 U	10 U	10 U	10 U	1 U	1 U	1 U	10 U	10 U	1 U	1 U
Semi-volatile Organic Compounds (UG/L)											
Phenol	10 U	10 U	10 U	6 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	10 U	6 J	10 U	9 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Explosives (UG/L)											
1,3-Dinitrobenzene	1.1 U	1.1 U	1.1 U	1.1 UJ	1.1 U	NA	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
2,4,6-Trinitrotoluene	0.62 U	0.62 U	0.62 U	0.62 UJ	0.62 U	NA	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U
2,4-Dinitrotoluene	1 U	1 U	1 U	1 UJ	1 U	NA	1 U	1 U	1 U	1 U	1 U
2-Amino-4,6-dinitrotoluene	1 U	1 U	1 U	1 UJ	1 U	NA	1 U	1 U	1 U	1 U	1 U
4-Amino-2,6-dinitrotoluene	1 U	1 U	1 U	1 UJ	1 U	NA	1 U	1 U	1 U	1 U	1 U
HMX	0.61 UJ	0.61 UJ	0.61 UJ	0.61 UJ	0.61 UJ	NA	0.61 UJ	0.61 UJ	0.61 UJ	0.61 UJ	0.61 UJ
Nitrobenzene	0.73 U	0.73 U	0.73 U	0.73 UJ	0.73 U	NA	0.73 U	0.73 U	0.73 U	0.73 U	0.73 U
RDX	0.59 U	0.59 U	0.59 U	0.59 UJ	0.59 U	NA	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U
Total Metals (UG/L)											
Aluminum	491	872	911	1,130	1,360 J	1,200 J	975 J	66.7	36.3	666 J	838 J
Antimony	37 UL	37 UL	37 UL	37 UL	37 UL	37 UL	37 UL	37 UL	38.9 L	37 UL	37 UL
Arsenic	1.8 J	2.3 B	1.3 B	1.2 B	1.3 L	1 UL	1.3 L	1.2 J	1.6 J	1 UL	1 UL
Barium	33.1	33	34.1	34.1	37.6	36.2	38	19.3	19.2	35	33.5
Beryllium	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	5 UL	5 U	5 U	5 U	5 UL	5 UL	5 UL	5 UL	5 UL	5 UL	5 UL
Calcium	99,200	172,000	184,000	181,000	176,000 J	170,000 J	164,000 J	93,400	96,000	174,000 J	175,000 J
Chromium	3.1	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Cobalt	4 U	4 U	4 U	4 U	4 U	4.6	4 U	4 U	4 U	4 U	4 U
Copper	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Cyanide	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Iron	1,520	1,200	1,360	1,530	1,980 J	1,700 J	1,560 J	569	514	957 J	1,350 J
Lead	2.1	1.3 L	1 UL	1 UL	1.9 L	1.2 L	2.2 L	1 U	1 U	1 UL	1 L
Magnesium	13,600	534,000	582,000	576,000	524,000	509,000	473,000	1,870	1,900	524,000	542,000
Manganese	53.2	86.1	75.5	76.4	141 J	133 J	168 J	15.8	15.8	115 J	98.4 J
Mercury	0.1 UL	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UL	0.1 UL	0.1 U	0.1 U
Nickel	16 U	16 U	19.8	49.6	16 U	16 U	27.8 K	16 U	16 U	21.6 K	16 U
Potassium	6,040 B	176,000	193,000	191,000	173,000	166,000	154,000	3,790 B	2,640	172,000	177,000
Selenium	1.5	10 UL	5 UL	10 UL	1.3 L	1 UL	1 UL	1.5	1.5	1.3 L	1.7 L
Silver	4 U	4 U	4 U	4 U	4 UL	4 UL	4 UL	4 U	4 U	4 UL	4 UL
Sodium	99,800	4,560,000	5,370,000	5,150,000	4,740,000	4,470,000	4,070,000	5,310	5,430	4,700,000	4,740,000
Vanadium	12.6	4 U	4.2	4 U	5	4 U	5.4	4 U	4 U	5.9	4 U

TABLE 5-6
Surface Water Analytical Detections at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS06-SW016	YS06-SW017	YS06-SW018	YS06-SW019	YS06-SW020		YS06-SW021	YS06-SW024		YS06-SW025	
Sample ID	YS06-SW016-0794	YS06-SW017-0794	YS06-SW018-0794	YS06-SW019-0794	YS06-SW020-0794	YS06-SW020P-0794	YS06-SW021-0794	YS06-SW024-0794	YS06-SW024P-0794	YS06-SW025-A-0794	YS06-SW025-B-0794
Sample Date	07/26/94	07/24/94	07/24/94	07/24/94	07/21/94	07/21/94	07/21/94	07/26/94	07/26/94	07/21/94	07/21/94
Chemical Name											
Zinc	11.1	3 U	3 U	3 U	3 U	5.5 B	3 U	12.6	11.1	3 U	3 U
Dissolved Metals (UG/L)											
Aluminum	18 U	61.7	47.1	44.6	18 U	18 U	18.3 J	18 U	18 U	33.5 J	18 U
Arsenic	1.5 J	2.3 B	1 U	1 UL	1 UL	1 UL	1 UL	1.2 J	1.5 L	1 UL	1 UL
Barium	29.6	31.4	30.8	30.7	33.2	34.4	33.7	18.1	17.8	33.4	31.9
Calcium	97,000	175,000	171,000	180,000	169,000 J	172,000 J	161,000 J	92,900	90,100	176,000 J	178,000 J
Copper	5 U	5.9	11.1	8.6	9	8.1	5 U	5 U	7.6	5 U	7.4
Iron	27.6	31.5	44.3	38	3.6 J	4.2 J	4.6 J	20.4	14.3	3 U	5.9 J
Lead	1 U	1 UL	1 UL	3.6 L	1 UL	1 UL	1 UL	1 U	1 U	1 UL	1 UL
Magnesium	13,200	538,000	534,000	567,000	512,000	514,000	466,000	1,860	1,820	536,000	561,000
Manganese	44.4	33.4	21.1	18.6	52.8 J	51.8 J	99.7 J	15.2	14.1	50.5 J	36.7 J
Nickel	16 U	27.6	48.3	27	16 U	21.9 K	20.6 K	16 U	16 U	19.3 K	34.8 K
Potassium	4,970 B	178,000	174,000	186,000	167,000	168,000	152,000	2,170 B	3,030 B	175,000	183,000
Selenium	1 U	1 UL	5 UL	1 UL	1 UL	1 UL	1.1 L	1 U	1.2	1.8 L	1.6 L
Silver	4 U	4 U	4 U	4 U	8.6 L	4 UL	4 UL	4 U	4 U	4 UL	4 UL
Sodium	97,900	4,530,000	5,400,000	5,150,000	4,540,000	4,690,000	3,920,000	5,280	5,210	4,540,000	4,870,000
Vanadium	10.3	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Wet Chemistry (MG/L)											
Hardness	340	3,300	3,400	3,400	3,200	NA	2,900	240	NA	3,200	3,400
Total organic carbon (TOC)	4.97	4.56	3.45	3.17	4.42	4.24	5.84	3.18	NA	5.53	5.48

Notes:
- Shaded values indicate the analyte was detected
- MG/L = Milligrams per Liter
- UG/L = Micrograms per Liter
- B = Not detected substantially above the level reported in laboratory or field blanks
- J = Analyte present. Reported value may or may not be accurate or precise
- K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- NA = Not analyzed
- R = Unreliable result
- U = Not detected
- UJ = Not detected, quantitation limit may be inaccurate or imprecise
- UL = Not detected, quantitation limit is probably higher

TABLE 5-6
Surface Water Analytical Detections at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS06-SW048	YS06-SW049	YS06-SW050	YS06-SW051	YS06-SW052	YS06-SW053	YS06-SW054	YS06-SW055	YS06-SW056	YS06-SW057
Sample ID	YS06-SW048-0500	YS06-SW049-0500	YS06-SW050-0500	YS06-SW051-0500	YS06-SW052-0500	YS06-SW053-0500	YS06-SW054-0500	YS06-SW055-0500	YS06-SW056-0500	YS06-SW057-0500
Sample Date	05/11/00	05/11/00	05/11/00	05/11/00	05/11/00	05/11/00	05/11/00	05/11/00	05/11/00	05/11/00
Chemical Name										
Volatile Organic Compounds (UG/L)										
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	3 J	10 UJ	3 J	10 U	10 U	6 J	5 J	10 U	10 U	5 J
Carbon disulfide	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	4 J	10 U
Toluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	2 J	10 U
Trichloroethene	2 J	10 U	10 U	10 U	10 U	10 U	10 U	1 J	10 U	4 J
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	3 J	10 U	6 J
trans-1,2-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Semi-volatile Organic Compounds (UG/L)										
Phenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Explosives (UG/L)										
1,3-Dinitrobenzene	1.2 U	1.2 U	1.2 U	1.9 UL	1.2 U	0.8 U	0.8 UL	1.2 U	1 UJ	1.2 U
2,4,6-Trinitrotoluene	2.4 U	2.4 U	2.4 U	3.8 UL	2.4 U	1.6 U	1.6 UL	2.4 U	1.41 J	2.4 U
2,4-Dinitrotoluene	3 U	3 U	3 U	4.75 UL	3 U	2 U	2 UL	3 U	2.5 UJ	3 U
2-Amino-4,6-dinitrotoluene	3.6 U	3.6 U	1.42 J	5.7 UL	3.6 U	2.4 U	2.4 UL	3.6 U	2 J	3.6 U
4-Amino-2,6-dinitrotoluene	2.4 U	2.4 U	2.26 J	3.8 UL	2.4 U	1.6 U	1.6 UL	1.17 J	2 UJ	2.4 U
HMX	2.4 U	2.4 U	2.4 U	3.8 UL	2.4 U	1.6 U	1.6 UL	2.4 U	2 UJ	1.46 J
Nitrobenzene	1.8 U	1.8 U	1.8 U	2.85 UL	1.8 U	1.2 U	1.2 UL	1.8 U	0.97 J	1.8 U
RDX	3 U	3 U	2.99 J	4.75 UL	3 U	1.88 J	2 UL	2.43 J	2.5 UJ	3 U
Total Metals (UG/L)										
Aluminum	1,430	753	6,520	5,790	415	42,800	32,500	2,160	136,000	33,900
Antimony	3 J	2.1 J	4 J	2.1 U	2.1 U	4.6 J	2.1 U	2.1 U	35.8 J	15.6 J
Arsenic	2.3 U	2.3 U	5.3 J	4.2 J	2.3 U	17.5	15.5	2.3 U	85.9	16.9
Barium	26 J	24.2 J	54.5 J	45.9 J	24.2 J	202	89.8 J	62.2 J	750	625
Beryllium	0.29 J	0.28 J	0.78 J	0.57 J	0.2 U	4.9 J	2.4 J	0.46 J	15.8	3.9 J
Cadmium	0.44 J	0.2 U	2.4 J	0.45 J	0.2 U	5.4	2.6 J	1 J	36.5	16.1
Calcium	121,000	123,000	140,000	176,000	117,000	169,000	165,000	148,000	424,000	242,000
Chromium	3.9 J	2.3 J	17.1	14.1	1.6 B	92.7	75.4	6.3 J	320	87.2
Cobalt	0.79 J	0.5 U	3.7 J	2.7 J	0.66 J	18.8 J	14.3 J	1.2 J	58.5	16.5 J
Copper	7 J	2.2 J	23.7 J	6.7 J	1.6 J	74.8	45.3	13.4 J	518	144
Cyanide	0.9 U	0.9 U	0.9 U	0.9 U	1.6 J	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U
Iron	3,090	1,500	15,700	8,980	1,060	88,900	59,700	4,730	327,000	85,100
Lead	5.7	2.5 J	40.6	4.9	2.8 J	121	71.3	13.9	699	195
Magnesium	32,200	26,100	26,400	316,000	7,960	132,000	165,000	48,100	123,000	57,300
Manganese	64.5	46	184	308	21.7	929	465	243	1,870	1,210
Mercury	0.1 J	0.1 U	0.23	0.13 J	0.1 U	0.59	0.36	0.14 J	1.5	1.1
Nickel	3.8 J	2 J	19.6 J	7.5 J	1.5 J	78.8	43.2	9.2 J	398	123
Potassium	14,700 J	11,400 J	12,600 J	184,000 J	3,330 J	76,100 J	103,000 J	23,300 J	66,700 J	31,500 J
Selenium	3.6 J	2.2 U	2.2 U	2.2 U	2.2 U	6.2	3.4 J	2.2 U	18.2	5.8
Silver	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	1.4 J	0.6 U
Sodium	238,000	192,000	186,000	2,260,000	51,100	815,000	1,160,000	347,000	268,000	320,000
Vanadium	14.1 J	12.7 J	55.5	25.7 J	14.5 J	315	128	29.8 J	1,200	395

TABLE 5-6
Surface Water Analytical Detections at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS06-SW048	YS06-SW049	YS06-SW050	YS06-SW051	YS06-SW052	YS06-SW053	YS06-SW054	YS06-SW055	YS06-SW056	YS06-SW057
Sample ID	YS06-SW048-0500	YS06-SW049-0500	YS06-SW050-0500	YS06-SW051-0500	YS06-SW052-0500	YS06-SW053-0500	YS06-SW054-0500	YS06-SW055-0500	YS06-SW056-0500	YS06-SW057-0500
Sample Date	05/11/00	05/11/00	05/11/00	05/11/00	05/11/00	05/11/00	05/11/00	05/11/00	05/11/00	05/11/00
Chemical Name										
Zinc	23.4	11 J	188	28.6	10 J	907	314	69.5	3,740	1,870
Dissolved Metals (UG/L)										
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry (MG/L)										
Hardness	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
- Shaded values indicate the analyte was detected
- MG/L = Milligrams per Liter
- UG/L = Micrograms per Liter
- B = Not detected substantially above the level reported in laboratory or field blanks
- J = Analyte present. Reported value may or may not be accurate or precise
- K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- NA = Not analyzed
- R = Unreliable result
- U = Not detected
- UJ = Not detected, quantitation limit may be inaccurate or imprecise
- UL = Not detected, quantitation limit is probably higher

TABLE 5-6
Surface Water Analytical Detections at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS06-SW058	YS06-SW059	YS06-SW060		YS06-SW062		YS06-SW065	YS06-SW066
Sample ID	YS06-SW058-0500	YS06-SW059-0500	YS06-SW060-0500	YS06-SW060P-0500	YS06-SW062-0500	YS06-SW062P-0500	YS06-SW065-0500	YS06-SW066-0500
Sample Date	05/12/00	05/12/00	05/12/00	05/12/00	05/12/00	05/12/00	05/12/00	05/12/00
Chemical Name								
Volatile Organic Compounds (UG/L)								
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	3 J	2 J	1 J	1 J
1,1-Dichloroethane	10 U	10 U	10 U	2 J	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10 U	10 U	3 J	2 J	10 U	10 U	10 U	10 U
Acetone	10 U	10 U	10 U	10 UJ	10 UJ	10 UJ	10 U	10 UJ
Carbon disulfide	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	6 J	22	74	55	10 U	10 U	10 U	10 U
Vinyl chloride	1 J	5 J	15	15	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	20	73	230	170 J	10 U	10 U	3 J	10 U
trans-1,2-Dichloroethene	10 U	10 U	2 J	3 J	10 U	10 U	10 U	10 U
Semi-volatile Organic Compounds (UG/L)								
Phenol	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA	NA	NA
Explosives (UG/L)								
1,3-Dinitrobenzene	1.2 UL	2 U	2.10 J	1.2 UJ	1.2 UL	1 U	1.2 UL	1 UL
2,4,6-Trinitrotoluene	2.4 UL	3.53 J	13.2 J	6.02 J	0.86 L	3.71 J	2.4 UL	2 UL
2,4-Dinitrotoluene	3 UL	5 U	3.5 U	3 U	3 UL	0.49 J	3 UL	2.5 UL
2-Amino-4,6-dinitrotoluene	1.42 L	83.9 J	50.8 J	108 J	3.6 UL	1.01 J	4.71 L	3 UL
4-Amino-2,6-dinitrotoluene	2.4 UL	4 U	2.8 R	2.4 U	2.4 UL	2 U	2.4 UL	2 UL
HMX	2.4 UL	28.9 J	46.1 J	35 J	2.4 UL	2 U	1.47 L	2 UL
Nitrobenzene	1.8 UL	3 U	2.1 U	1.8 U	1.8 UL	1.5 U	1.8 UL	1.5 UL
RDX	2.13 L	12.3 J	13.1 J	9.02 J	3 UL	5.23 J	5.38 L	2.5 UL
Total Metals (UG/L)								
Aluminum	2,560	1,740	832	775	64.6 J	108 J	1,450	218
Antimony	5 J	6.2 J	13.2 J	7.5 J	2.1 U	2.1 U	3.9 J	2.1 U
Arsenic	2.3 J	3 J	3.1 J	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
Barium	76.4 J	68.4 J	71.9 J	70 J	19.3 J	19.7 J	36.9 J	23.3 J
Beryllium	0.33 J	0.39 J	0.28 J	0.2 U	0.21 J	0.32 J	0.25 J	0.2 U
Cadmium	1.3 J	0.91 J	0.51 J	0.62 J	0.2 U	0.24 J	0.65 J	0.2 U
Calcium	147,000	141,000	144,000	143,000	120,000	120,000	127,000	106,000
Chromium	7.2 J	5.4 J	3.4 J	2.9 J	0.43 B	0.73 B	4.7 J	1.3 B
Cobalt	1.9 J	1.3 J	1.1 J	0.83 J	0.5 U	0.5 U	1.1 J	0.5 U
Copper	15.2 J	10.1 J	9.6 J	7.8 J	0.6 U	0.6 U	10.1 J	0.82 J
Cyanide	0.9 U	0.9 U	1.8 J	1.6 J	0.9 U	1.7 J	0.9 U	1.3 J
Iron	7,630	6,090	2,490	2,770	291	450	4,580	724
Lead	20.3	12.7	11.8	12.7	1.3 U	1.3 U	14.4	1.5 J
Magnesium	64,800	68,900	89,300	90,700	2,280 J	2,320 J	17,700	9,340
Manganese	420	238	113	214	11.1 J	15.7	60.6	49.4
Mercury	0.23	0.15 J	0.15 J	0.14 J	0.1 U	0.1 U	0.19 J	0.1 U
Nickel	11.4 J	7.4 J	7.4 J	5.7 J	0.7 U	0.7 U	8.1 J	2 J
Potassium	32,900 J	34,800 J	46,000 J	46,700 J	1,050 J	1,100 J	7,490 J	4,070 J
Selenium	2.2 U	2.7 J	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
Silver	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Sodium	477,000	520,000	72,502	680,000	7,580	7,560	133,000	52,000
Vanadium	42.8 J	32.9 J	54.9	39.3 J	1.8 J	2 J	28.5 J	9 J

TABLE 5-6
Surface Water Analytical Detections at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS06-SW058	YS06-SW059	YS06-SW060		YS06-SW062		YS06-SW065	YS06-SW066
Sample ID	YS06-SW058-0500	YS06-SW059-0500	YS06-SW060-0500	YS06-SW060P-0500	YS06-SW062-0500	YS06-SW062P-0500	YS06-SW065-0500	YS06-SW066-0500
Sample Date	05/12/00	05/12/00	05/12/00	05/12/00	05/12/00	05/12/00	05/12/00	05/12/00
Chemical Name								
Zinc	98.9	72.7	40.4	47.8	0.8 U	5.5 J	63.9	4 J
Dissolved Metals (UG/L)								
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry (MG/L)								
Hardness	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Shaded values indicate the analyte was detected
MG/L = Milligrams per Liter
UG/L = Micrograms per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 5-7
Summary of Groundwater Samples Analyses at Site 6
Phase I Groundwater Remedial Investigation for Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Medium	Sample ID	Analysis				QA/QC Samples	
				TAL Inorganics			
		TCL Organics	Nitramine Compounds	Total	Dissolved	Duplicate	MS/MSD
Site 6 Groundwater	6GW01-002	X	X	X	X		
	6GW01A-002	X	X	X	X		
	6GW04-001	X	X	X	X		
	6GW05B-001	X	X	X	X		X
	6GW06-002	X	X	X	X	X	X (VOC only)
	6GW06B-001	X	X	X	X		
	6GW07-001	X	X	X	X		
	6GW08-001	X	X	X	X		
	6GW09-001	X	X	X	X		
	6GW09A-001	X	X	X	X		
	6GW09B-001	X	X	X	X		
	6GW10-001	X	X	X	X		
	6GW10A-001	X	X	X	X		

Notes:
- Field measurements of groundwater included pH, specific conductivity, temperature, and turbidity.
- TCL organics analysis included VOCs, SVOCs, and Pesticides/PCBs.
- TAL inorganics analysis included cyanide analysis.
- MS/MSD = Matrix Spike/Matrix Spike Duplicate

(1)Monitoring well sampled for VOCs only under the Long-Term Monitoring program for Sites 1, 3, and 7.

TABLE 5-8
Summary of Groundwater Field Parameters at Site 6
Phase I Groundwater Remedial Investigation for Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Well No.	pH[1]	Specific Conductance at 25°C[2] (µmhos/cm)	Temperature[2] (°C)	Turbidity[3] (NTUs)	Gallons Purged	Date
6GW01	6.86	519	17.14	11	12.2	09/17/2004
	6.85	512	16.87	7.83	24.4	
	6.86	505	17.16	6.34	36.6	
6GW01A	7.09	440	17.08	18.1	9.6	09/14/2004
	7.17	460	16.8	8.58	19.2	
	7.22	460	17.07	7.29	28.8	
6GW04	6.57	19,849	19.74	137	0.5	10/04/2004
	6.69	19,400	20.1	205	1	
	6.72	19,503	20.1	--	1.5	
6GW05B[5]	6.41	615	17.14	16.4	2	10/04/2004
	6.33	611	17.07	11.8	4	
	6.33	610	16.93	10.23	6	
6GW06	6.51	928	18.03	9.52	2	09/20/2004
	6.71	839	17.71	10.84	4	
	6.82	749	17.93	6.93	30	
6GW06B	6.53	599	15.95	30	5.5	10/07/2004
	6.77	603	15.82	320	11	
	6.68	603	15.82	95	16.5	
	6.68	602	15.9	35	21	
6GW07	6.6	985	16.22	18	2.5	10/07/2004
	6.47	987	16.06	14	5	
	6.48	984	15.96	13	7.5	
6GW08	6.29	690	16.23	67.9	5	09/14/2004
	6.33	685	16	59.2	10	
	6.39	685	15.97	36.1	15	
	6.42	684	16.05	40.7	18	
	--	--	--	16.1	24	
6GW09	6.37	2,625	16.17	16	3.7	10/05/2004
	6.57	2,696	15.91	22.7	7.4	
	6.58	2,705	15.88	11.6	11.1	
6GW09A	6.59	939	16.04	338	6	10/05/2004
	6.77	946	16	110	13	
	6.83	972	16.05	108.2	19.5	
6GW09B[6]	--	--	--	--	15	10/07/2004
6GW10	6.06	812	16.52	40.6	2	10/05/2004
	6.35	814	16.51	16.4	4	
	6.46	818	16.26	12	6	
6GW10A	6.67	723	16.29	21	5	10/06/2004
	6.69	716	16.37	13	10	
	6.58	710	15.28	12	15	

Notes:

-1 pH measured using an Orion pH meter, Model No. 290A.
-2 Specific conductance and temperature measured using YSI conductivity meter, Model No. 335 CT.
-3 Turbidity measured using a Lamotte 2020 meter.
-4 Well purged dry immediately; sample collected after recharge.
-5 Monitoring well 6GW05B replaced monitoring well 6GW05.
-6 Well pumped dry before any readings collected; sample collected after recharge.
-- No measurement
NTU Nephelometric Turbidity Unit

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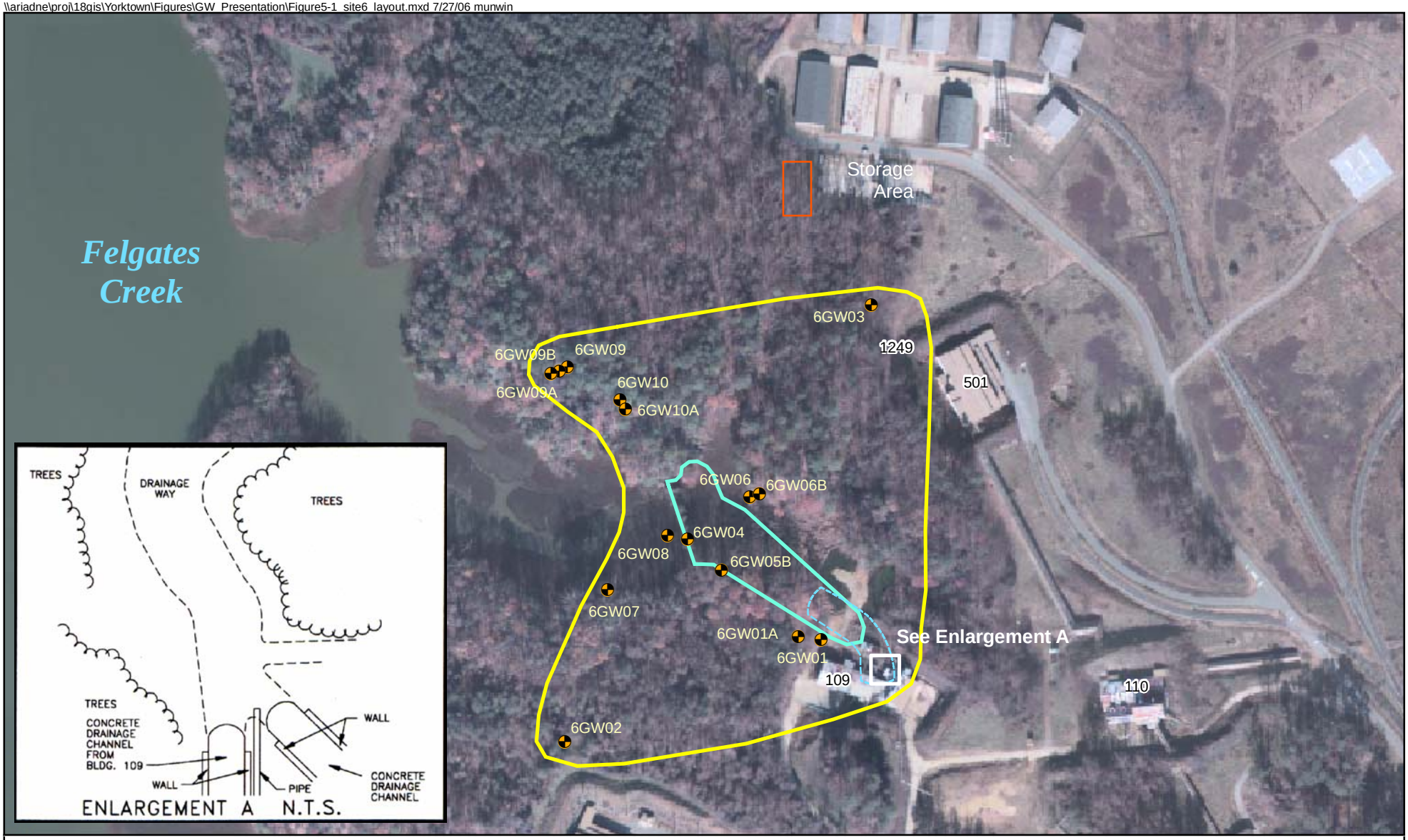

Legend

- Yorktown-Eastover Monitoring Wells
- Study Area Boundary
- Surface Impoundment Area
- Drainage
- Area of Excavation of Cadmium and Zinc Contaminated Soil

N
W E
S

0 150 300
Feet

Figure 5-1
Site 6 Layout
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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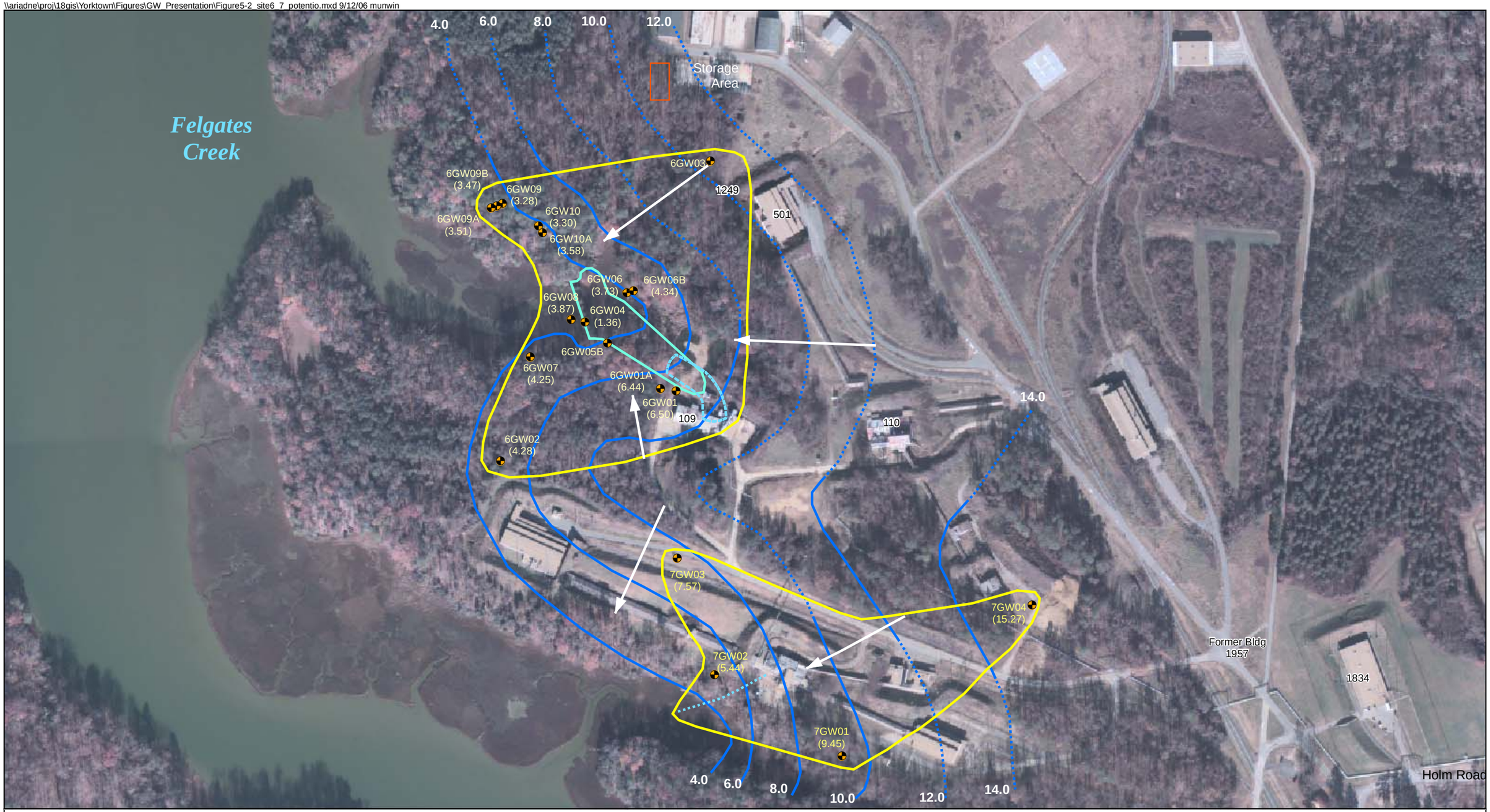

Legend

- Yorktown-Eastover Monitoring Wells
- Drainage
- Surface Impoundment Area
- Area of Excavation
- Study Area Boundaries
- Groundwater Contour Line
- Inferred Groundwater Contour Line
- Groundwater Flow Direction

N
W E
S

0 300 600
Feet

Figure 5-2
Yorktown-Eastover Aquifer Groundwater Contour Map for Sites 6 and 7
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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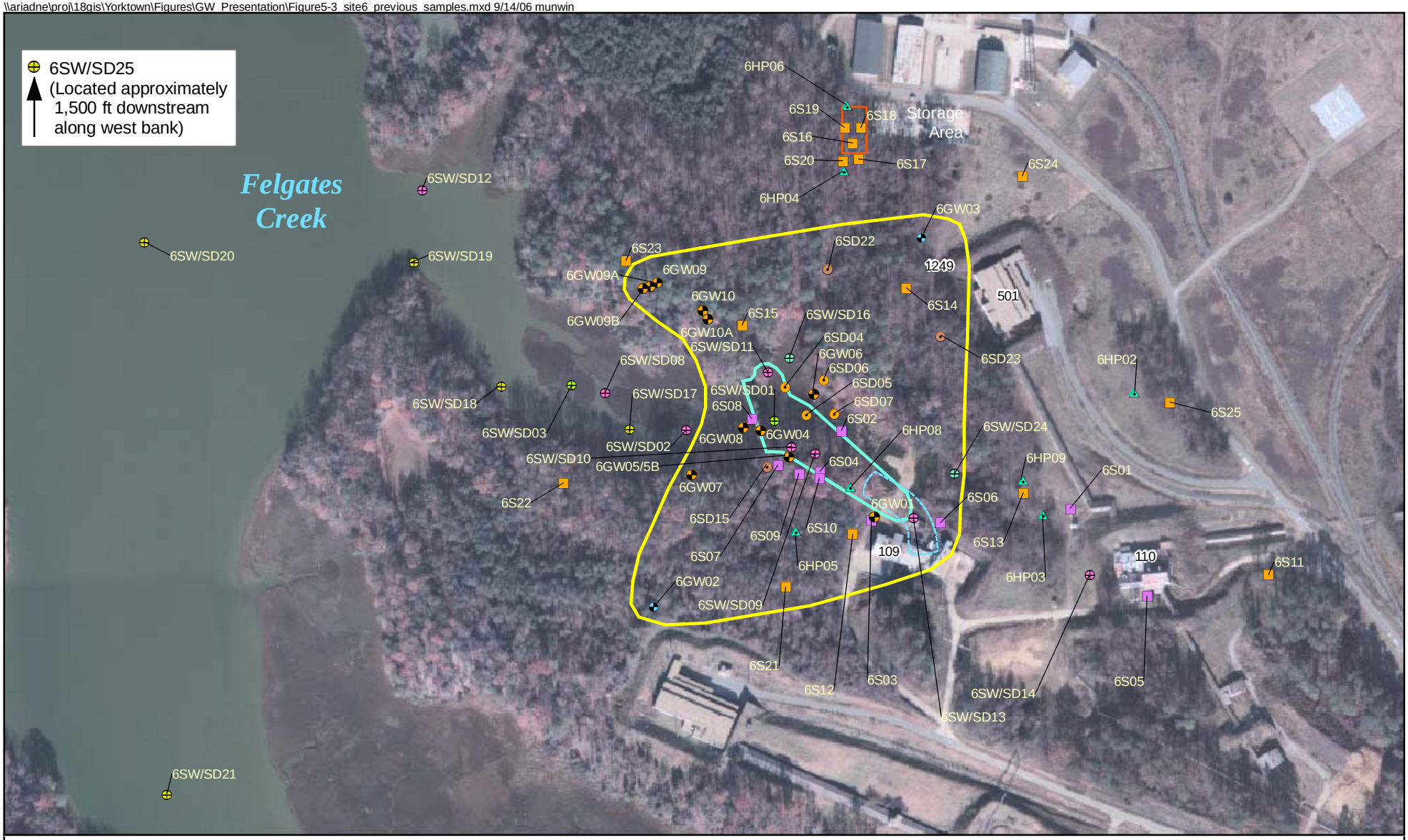

Legend

- Round 2 Monitoring Well Location
- Round 2 Sediment Sampling Location
- Round 1 Surface Soil Sampling Location
- Round 2 Surface Soil Sampling Location
- Round 1 and 2 Surface Water/Sediment Sampling Locations
- Round 1 Surface Water/Sediment Sampling Locations
- Round 2 Surface Water/Sediment Sampling Locations
- Study Area Boundary
- Surface Impoundment Area
- Drainage
- Area of Excavation of Cadmium and Zinc Contaminated Soil
- Yorktown-Eastover Monitoring Wells
- Hydropunch Sampling Locations
- Sediment Sampling Locations
- Surface Water/Sediment Sampling Locations

N W E S

0 175 350 Feet

Figure 5-3
Site 6 Previous Investigations Sampling Locations at Site 6
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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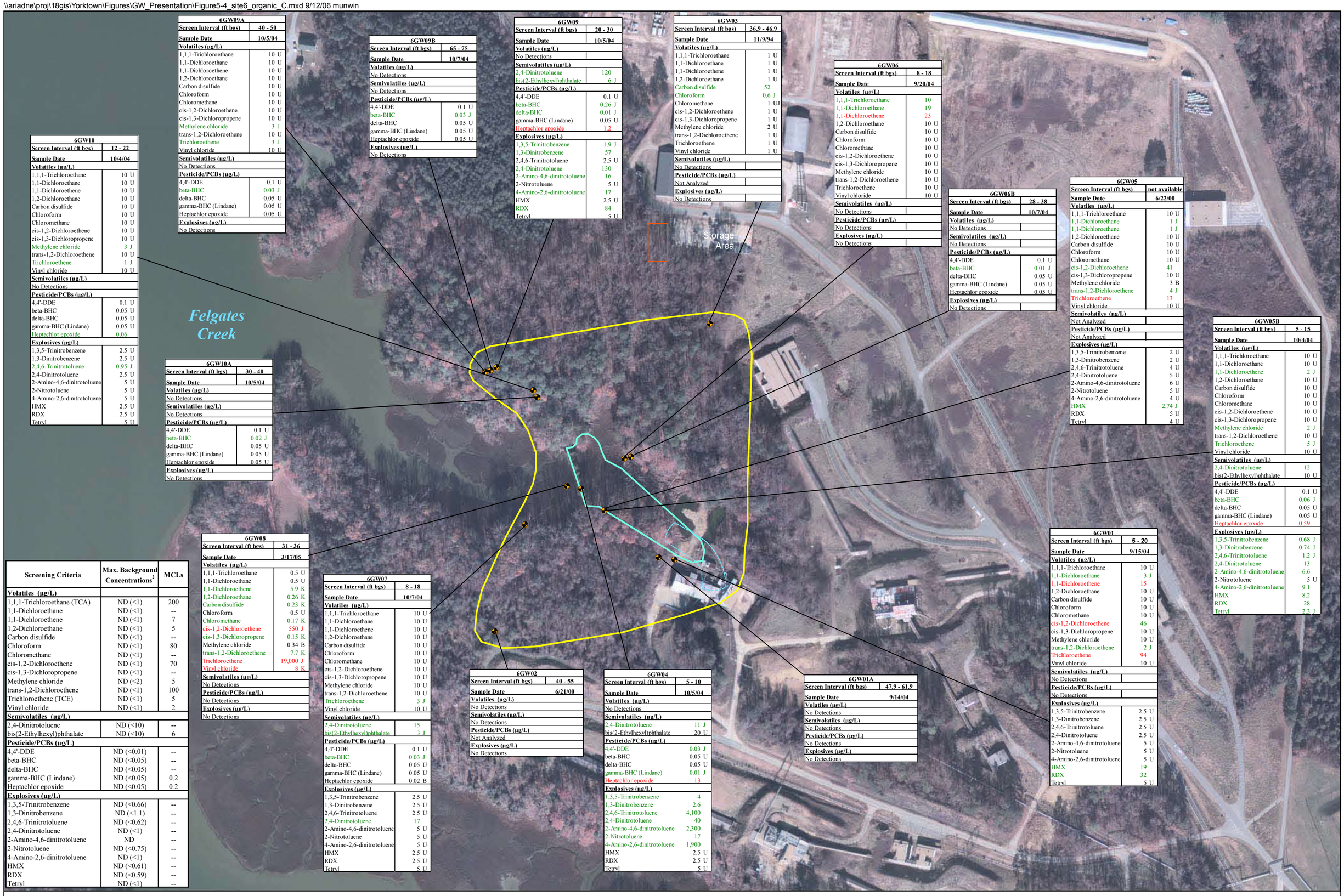

6GW09A	
Screen Interval (ft bgs)	40 - 50
Sample Date	10/5/04
Volatiles (µg/L)	
1,1,1-Trichloroethane	10 U
1,1-Dichloroethane	10 U
1,1-Dichloroethene	10 U
1,2-Dichloroethane	10 U
Carbon disulfide	10 U
Chloroform	10 U
Chloromethane	10 U
cis-1,2-Dichloroethene	10 U
cis-1,3-Dichloropropene	10 U
Methylene chloride	3 J
trans-1,2-Dichloroethene	10 U
Trichloroethene	3 J
Vinyl chloride	10 U
Semivolatiles (µg/L)	
No Detections	
Pesticide/PCBs (µg/L)	
4,4'-DDE	0.1 U
beta-BHC	0.03 J
delta-BHC	0.05 U
gamma-BHC (Lindane)	0.05 U
Heptachlor epoxide	0.05 U
Explosives (µg/L)	
No Detections	

6GW09B	
Screen Interval (ft bgs)	65 - 75
Sample Date	10/7/04
Volatiles (µg/L)	
No Detections	
Semivolatiles (µg/L)	
No Detections	
Pesticide/PCBs (µg/L)	
4,4'-DDE	0.1 U
beta-BHC	0.03 J
delta-BHC	0.05 U
gamma-BHC (Lindane)	0.05 U
Heptachlor epoxide	0.05 U
Explosives (µg/L)	
No Detections	

6GW09	
Screen Interval (ft bgs)	20 - 30
Sample Date	10/5/04
Volatiles (µg/L)	
No Detections	
Semivolatiles (µg/L)	
2,4-Dimitrotoluene	120
bis(2-Ethylhexyl)phthalate	6 J
Pesticide/PCBs (µg/L)	
4,4'-DDE	0.1 U
beta-BHC	0.26 J
delta-BHC	0.01 J
gamma-BHC (Lindane)	0.05 U
Heptachlor epoxide	1.2
Explosives (µg/L)	
1,3,5-Trinitrobenzene	1.9 J
1,3-Dinitrobenzene	57
2,4,6-Trinitrotoluene	2.5 U
2,4-Dinitrotoluene	130
2-Amino-4,6-dinitrotoluene	16
2-Nitrotoluene	5 U
4-Amino-2,6-dinitrotoluene	17
HMX	2.5 U
RDX	84
Tetryl	5 U

6GW03	
Screen Interval (ft bgs)	36.9 - 46.9
Sample Date	11/9/94
Volatiles (µg/L)	
1,1,1-Trichloroethane	1 U
1,1-Dichloroethane	1 U
1,1-Dichloroethene	1 U
1,2-Dichloroethane	1 U
Carbon disulfide	52
Chloroform	0.6 J
Chloromethane	1 UJ
cis-1,2-Dichloroethene	1 U
cis-1,3-Dichloropropene	1 U
Methylene chloride	2 U
trans-1,2-Dichloroethene	1 U
Trichloroethene	1 U
Vinyl chloride	1 U
Semivolatiles (µg/L)	
No Detections	
Pesticide/PCBs (µg/L)	
Not Analyzed	
Explosives (µg/L)	
No Detections	

6GW06	
Screen Interval (ft bgs)	8 - 18
Sample Date	9/20/04
Volatiles (µg/L)	
1,1,1-Trichloroethane	10
1,1-Dichloroethane	19
1,1-Dichloroethene	23
1,2-Dichloroethane	10 U
Carbon disulfide	10 U
Chloroform	10 U
Chloromethane	10 U
cis-1,2-Dichloroethene	10 U
cis-1,3-Dichloropropene	10 U
Methylene chloride	10 U
trans-1,2-Dichloroethene	10 U
Trichloroethene	10 U
Vinyl chloride	10 U
Semivolatiles (µg/L)	
No Detections	
Pesticide/PCBs (µg/L)	
No Detections	
Explosives (µg/L)	
No Detections	

6GW06B	
Screen Interval (ft bgs)	28 - 38
Sample Date	10/7/04
Volatiles (µg/L)	
No Detections	
Semivolatiles (µg/L)	
No Detections	
Pesticide/PCBs (µg/L)	
4,4'-DDE	0.1 U
beta-BHC	0.01 J
delta-BHC	0.05 U
gamma-BHC (Lindane)	0.05 U
Heptachlor epoxide	0.05 U
Explosives (µg/L)	
No Detections	

6GW05	
Screen Interval (ft bgs)	not available
Sample Date	6/22/00
Volatiles (µg/L)	
1,1,1-Trichloroethane	10 U
1,1-Dichloroethane	1 J
1,1-Dichloroethene	1 J
1,2-Dichloroethane	10 U
Carbon disulfide	10 U
Chloroform	10 U
Chloromethane	10 U
cis-1,2-Dichloroethene	41
cis-1,3-Dichloropropene	10 U
Methylene chloride	3 B
trans-1,2-Dichloroethene	4 J
Trichloroethene	13
Vinyl chloride	10 U
Semivolatiles (µg/L)	
Not Analyzed	
Pesticide/PCBs (µg/L)	
Not Analyzed	
Explosives (µg/L)	
1,3,5-Trinitrobenzene	2 U
1,3-Dinitrobenzene	2 U
2,4,6-Trinitrotoluene	4 U
2,4-Dinitrotoluene	5 U
2-Amino-4,6-dinitrotoluene	6 U
2-Nitrotoluene	5 U
4-Amino-2,6-dinitrotoluene	4 U
HMX	2.74 J
RDX	5 U
Tetryl	4 U

6GW05B	
Screen Interval (ft bgs)	5 - 15
Sample Date	10/4/04
Volatiles (µg/L)	
1,1,1-Trichloroethane	10 U
1,1-Dichloroethane	10 U
1,1-Dichloroethene	2 J
1,2-Dichloroethane	10 U
Carbon disulfide	10 U
Chloroform	10 U
Chloromethane	10 U
cis-1,2-Dichloroethene	10 U
cis-1,3-Dichloropropene	10 U
Methylene chloride	2 J
trans-1,2-Dichloroethene	10 U
Trichloroethene	5 J
Vinyl chloride	10 U
Semivolatiles (µg/L)	
2,4-Dinitrotoluene	12
bis(2-Ethylhexyl)phthalate	10 U
Pesticide/PCBs (µg/L)	
4,4'-DDE	0.1 U
beta-BHC	0.06 J
delta-BHC	0.05 U
gamma-BHC (Lindane)	0.05 U
Heptachlor epoxide	0.59
Explosives (µg/L)	
1,3,5-Trinitrobenzene	0.68 J
1,3-Dinitrobenzene	0.74 J
2,4,6-Trinitrotoluene	1.2 J
2,4-Dinitrotoluene	13
2-Amino-4,6-dinitrotoluene	6.6
2-Nitrotoluene	5 U
4-Amino-2,6-dinitrotoluene	9.1
HMX	8.2
RDX	28
Tetryl	2.3 J

6GW10	
Screen Interval (ft bgs)	12 - 22
Sample Date	10/4/04
Volatiles (µg/L)	
1,1,1-Trichloroethane	10 U
1,1-Dichloroethane	10 U
1,1-Dichloroethene	10 U
1,2-Dichloroethane	10 U
Carbon disulfide	10 U
Chloroform	10 U
Chloromethane	10 U
cis-1,2-Dichloroethene	10 U
cis-1,3-Dichloropropene	10 U
Methylene chloride	3 J
trans-1,2-Dichloroethene	10 U
Trichloroethene	1 J
Vinyl chloride	10 U
Semivolatiles (µg/L)	
No Detections	
Pesticide/PCBs (µg/L)	
4,4'-DDE	0.1 U
beta-BHC	0.05 U
delta-BHC	0.05 U
gamma-BHC (Lindane)	0.05 U
Heptachlor epoxide	0.06
Explosives (µg/L)	
1,3,5-Trinitrobenzene	2.5 U
1,3-Dinitrobenzene	2.5 U
2,4,6-Trinitrotoluene	0.95 J
2,4-Dinitrotoluene	2.5 U
2-Amino-4,6-dinitrotoluene	5 U
2-Nitrotoluene	5 U
4-Amino-2,6-dinitrotoluene	5 U
HMX	2.5 U
RDX	2.5 U
Tetryl	5 U

6GW10A	
Screen Interval (ft bgs)	30 - 40
Sample Date	10/5/04
Volatiles (µg/L)	
No Detections	
Semivolatiles (µg/L)	
No Detections	
Pesticide/PCBs (µg/L)	
4,4'-DDE	0.1 U
beta-BHC	0.02 J
delta-BHC	0.05 U
gamma-BHC (Lindane)	0.05 U
Heptachlor epoxide	0.05 U
Explosives (µg/L)	
No Detections	

6GW08	
Screen Interval (ft bgs)	31 - 36
Sample Date	3/17/05
Volatiles (µg/L)	
1,1,1-Trichloroethane	0.5 U
1,1-Dichloroethane	0.5 U
1,1-Dichloroethene	5.9 K
1,2-Dichloroethane	0.26 K
Carbon disulfide	0.23 K
Chloroform	0.5 U
Chloromethane	0.17 K
cis-1,2-Dichloroethene	550 J
cis-1,3-Dichloropropene	0.15 K
Methylene chloride	0.34 B
trans-1,2-Dichloroethene	7.7 K
Trichloroethene	19,000 J
Vinyl chloride	8 K
Semivolatiles (µg/L)	
No Detections	
Pesticide/PCBs (µg/L)	
No Detections	
Explosives (µg/L)	
No Detections	

6GW07	
Screen Interval (ft bgs)	8 - 18
Sample Date	10/7/04
Volatiles (µg/L)	
1,1,1-Trichloroethane	10 U
1,1-Dichloroethane	10 U
1,1-Dichloroethene	10 U
1,2-Dichloroethane	10 U
Carbon disulfide	10 U
Chloroform	10 U
Chloromethane	10 U
cis-1,2-Dichloroethene	10 U
cis-1,3-Dichloropropene	10 U
Methylene chloride	10 U
trans-1,2-Dichloroethene	10 U
Trichloroethene	3 J
Vinyl chloride	10 U
Semivolatiles (µg/L)	
2,4-Dinitrotoluene	15
bis(2-Ethylhexyl)phthalate	3 J
Pesticide/PCBs (µg/L)	
4,4'-DDE	0.1 U
beta-BHC	0.03 J
delta-BHC	0.05 U
gamma-BHC (Lindane)	0.05 U
Heptachlor epoxide	0.02 B
Explosives (µg/L)	
1,3,5-Trinitrobenzene	2.5 U
1,3-Dinitrobenzene	2.5 U
2,4,6-Trinitrotoluene	2.5 U
2,4-Dinitrotoluene	17
2-Amino-4,6-dinitrotoluene	5 U
2-Nitrotoluene	5 U
4-Amino-2,6-dinitrotoluene	5 U
HMX	2.5 U
RDX	2.5 U
Tetryl	5 U

6GW02	
Screen Interval (ft bgs)	40 - 55
Sample Date	6/21/00
Volatiles (µg/L)	
No Detections	
Semivolatiles (µg/L)	
No Detections	
Pesticide/PCBs (µg/L)	
Not Analyzed	
Explosives (µg/L)	
No Detections	

6GW04	
Screen Interval (ft bgs)	5 - 10
Sample Date	10/5/04
Volatiles (µg/L)	
No Detections	
Semivolatiles (µg/L)	
2,4-Dinitrotoluene	11 J
bis(2-Ethylhexyl)phthalate	20 U
Pesticide/PCBs (µg/L)	
4,4'-DDE	0.03 J
beta-BHC	0.05 U
delta-BHC	0.05 U
gamma-BHC (Lindane)	0.01 J
Heptachlor epoxide	13
Explosives (µg/L)	
1,3,5-Trinitrobenzene	4
1,3-Dinitrobenzene	2.6
2,4,6-Trinitrotoluene	4,100
2,4-Dinitrotoluene	40
2-Amino-4,6-dinitrotoluene	2,300
2-Nitrotoluene	17
4-Amino-2,6-dinitrotoluene	1,900
HMX	2.5 U
RDX	2.5 U
Tetryl	5 U

6GW01A	
Screen Interval (ft bgs)	47.9 - 61.9
Sample Date	9/14/04
Volatiles (µg/L)	
No Detections	
Semivolatiles (µg/L)	
No Detections	
Pesticide/PCBs (µg/L)	
No Detections	
Explosives (µg/L)	
No Detections	

6GW01	
Screen Interval (ft bgs)	5 - 20
Sample Date	9/15/04
Volatiles (µg/L)	
1,1,1-Trichloroethane	10 U
1,1-Dichloroethane	3 J
1,1-Dichloroethene	15
1,2-Dichloroethane	10 U
Carbon disulfide	10 U
Chloroform	10 U
Chloromethane	10 U
cis-1,2-Dichloroethene	46
cis-1,3-Dichloropropene	10 U
Methylene chloride	10 U
trans-1,2-Dichloroethene	2 J
Trichloroethene	94
Vinyl chloride	10 U
Semivolatiles (µg/L)	
No Detections	
Pesticide/PCBs (µg/L)	
No Detections	
Explosives (µg/L)	
1,3,5-Trinitrobenzene	2.5 U
1,3-Dinitrobenzene	2.5 U
2,4,6-Trinitrotoluene	2.5 U
2,4-Dinitrotoluene	2.5 U
2-Amino-4,6-dinitrotoluene	5 U
2-Nitrotoluene	5 U
4-Amino-2,6-dinitrotoluene	5 U
HMX	19
RDX	32
Tetryl	5 U

Screening Criteria	Max. Background Concentrations[2]	MCLs
Volatiles (µg/L)		
1,1,1-Trichloroethane (TCA)	ND (<1)	200
1,1-Dichloroethane	ND (<1)	--
1,1-Dichloroethene	ND (<1)	7
1,2-Dichloroethane	ND (<1)	5
Carbon disulfide	ND (<1)	--
Chloroform	ND (<1)	80
Chloromethane	ND (<1)	--
cis-1,2-Dichloroethene	ND (<1)	70
cis-1,3-Dichloropropene	ND (<1)	--
Methylene chloride	ND (<2)	5
trans-1,2-Dichloroethene	ND (<1)	100
Trichloroethene (TCE)	ND (<1)	5
Vinyl chloride	ND (<1)	2
Semivolatiles (µg/L)		
2,4-Dinitrotoluene	ND (<10)	--
bis(2-Ethylhexyl)phthalate	ND (<10)	6
Pesticide/PCBs (µg/L)		
4,4'-DDE	ND (<0.01)	--
beta-BHC	ND (<0.05)	--
delta-BHC	ND (<0.05)	--
gamma-BHC (Lindane)	ND (<0.05)	0.2
Heptachlor epoxide	ND (<0.05)	0.2
Explosives (µg/L)		
1,3,5-Trinitrobenzene	ND (<0.66)	--
1,3-Dinitrobenzene	ND (<1.1)	--
2,4,6-Trinitrotoluene	ND (<0.62)	--
2,4-Dinitrotoluene	ND (<1)	--
2-Amino-4,6-dinitrotoluene	ND	--
2-Nitrotoluene	ND (<0.75)	--
4-Amino-2,6-dinitrotoluene	ND (<1)	--
HMX	ND (<0.61)	--
RDX	ND (<0.59)	--
Tetryl	ND (<1)	--

Legend

- Yorktown-Eastover Monitoring Wells
- Study Area Boundary
- Surface Impoundment Area
- Drainage
- Area of Excavation of Cadmium and Zinc Contaminated Soil

Contaminants shaded **green** exceed Background concentrations.
Contaminants shaded **red** exceed Federal MCLs and Background.
µg/L = micrograms per liter
J = Value is estimated.
K = Value may be biased high.
MCL = Federal Maximum Contaminant Level
NA=Not analyzed
PCBs=Polychlorinated biphenyls
U = Not detected above associated detection limit.
UJ = Not detected above associated detection limit. Detection limit is estimated.
-- No criteria established

[1]Duplicate sample taken at this location, most conservative value reported.
[2]Background values are maximum detected values in respective aquifer from Baker (1995) Background Report.
B = Value may be associated with laboratory or field blank contamination. B-flagged values are generally considered non-detects; however, the B-flagged values from the 2004 groundwater data set may be erroneously B-flagged due to potentially incorrect field and equipment blank collection procedures.

N W E S

0 200 400 Feet

Figure 5-4
Organic Exceedances of Background and/or MCLs
in the Yorktown-Eastover Aquifer at Site 6
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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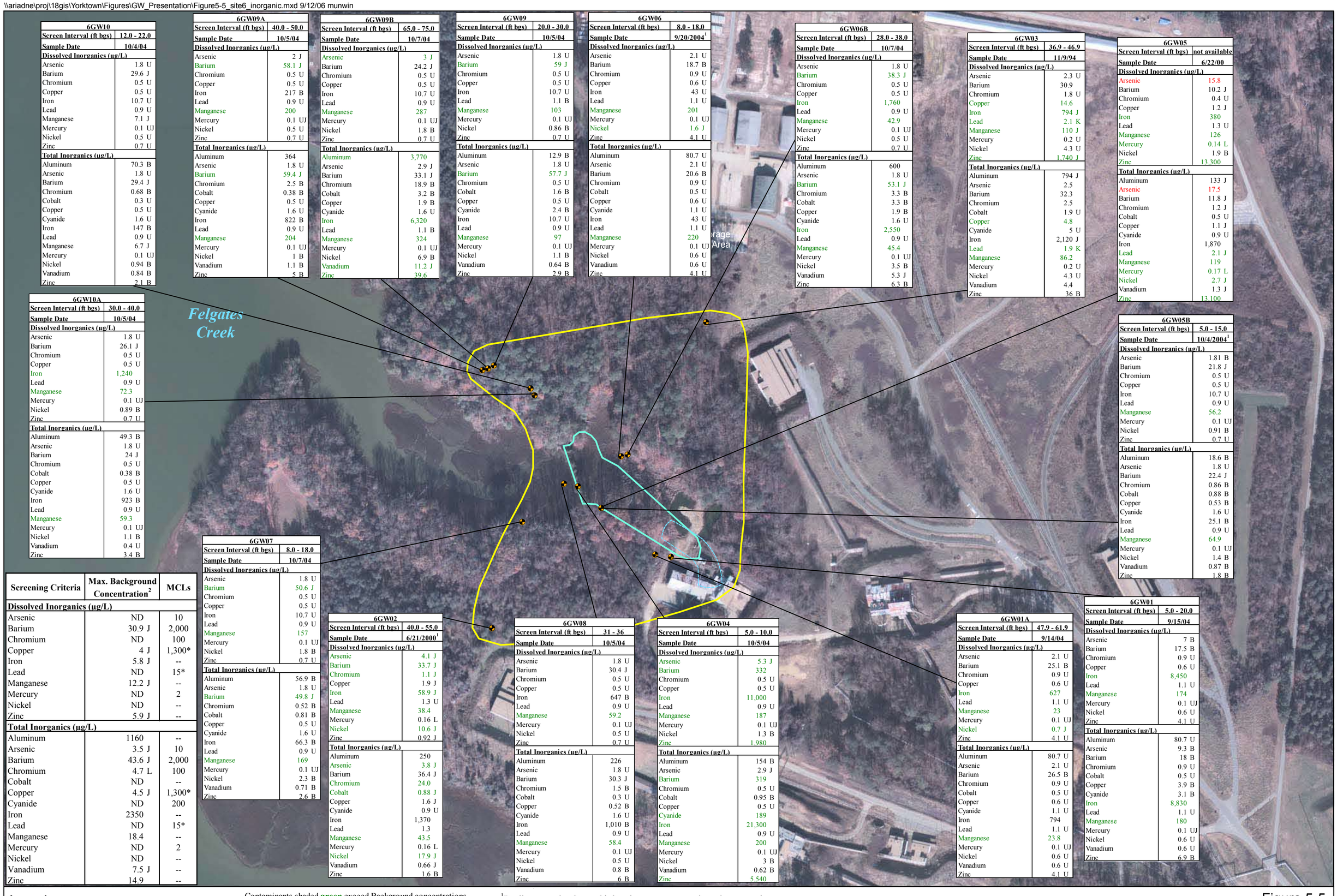

6GW10	
Screen Interval (ft bgs)	12.0 - 22.0
Sample Date	10/4/04
Dissolved Inorganics (µg/L)	
Arsenic	1.8 U
Barium	29.6 J
Chromium	0.5 U
Copper	0.5 U
Iron	10.7 U
Lead	0.9 U
Manganese	7.1 J
Mercury	0.1 UJ
Nickel	0.5 U
Zinc	0.7 U
Total Inorganics (µg/L)	
Aluminum	70.3 B
Arsenic	1.8 U
Barium	29.4 J
Chromium	0.68 B
Cobalt	0.3 U
Copper	0.5 U
Cyanide	1.6 U
Iron	147 B
Lead	0.9 U
Manganese	6.7 J
Mercury	0.1 UJ
Nickel	0.94 B
Vanadium	0.84 B
Zinc	2.1 B

6GW09A	
Screen Interval (ft bgs)	40.0 - 50.0
Sample Date	10/5/04
Dissolved Inorganics (µg/L)	
Arsenic	2 J
Barium	58.1 J
Chromium	0.5 U
Copper	0.5 U
Iron	217 B
Lead	0.9 U
Manganese	200
Mercury	0.1 UJ
Nickel	0.5 U
Zinc	0.7 U
Total Inorganics (µg/L)	
Aluminum	364
Arsenic	1.8 U
Barium	59.4 J
Chromium	2.5 B
Cobalt	0.38 B
Copper	0.5 U
Cyanide	1.6 U
Iron	822 B
Lead	0.9 U
Manganese	204
Mercury	0.1 UJ
Nickel	1 B
Vanadium	1.1 B
Zinc	5 B

6GW09B	
Screen Interval (ft bgs)	65.0 - 75.0
Sample Date	10/7/04
Dissolved Inorganics (µg/L)	
Arsenic	3 J
Barium	24.2 J
Chromium	0.5 U
Copper	0.5 U
Iron	10.7 U
Lead	0.9 U
Manganese	287
Mercury	0.1 UJ
Nickel	1.8 B
Zinc	0.7 U
Total Inorganics (µg/L)	
Aluminum	3,770
Arsenic	2.9 J
Barium	33.1 J
Chromium	18.9 B
Cobalt	3.2 B
Copper	1.9 B
Cyanide	1.6 U
Iron	6,320
Lead	1.1 B
Manganese	324
Mercury	0.1 UJ
Nickel	6.9 B
Vanadium	11.2 J
Zinc	39.6

6GW09	
Screen Interval (ft bgs)	20.0 - 30.0
Sample Date	10/5/04
Dissolved Inorganics (µg/L)	
Arsenic	1.8 U
Barium	59 J
Chromium	0.5 U
Copper	0.5 U
Iron	10.7 U
Lead	1.1 B
Manganese	103
Mercury	0.1 UJ
Nickel	0.86 B
Zinc	0.7 U
Total Inorganics (µg/L)	
Aluminum	12.9 B
Arsenic	1.8 U
Barium	57.7 J
Chromium	0.5 U
Cobalt	1.6 B
Copper	0.5 U
Cyanide	2.4 B
Iron	10.7 U
Lead	0.9 U
Manganese	97
Mercury	0.1 UJ
Nickel	1.1 B
Vanadium	0.64 B
Zinc	2.9 B

6GW06	
Screen Interval (ft bgs)	8.0 - 18.0
Sample Date	9/20/2004[1]
Dissolved Inorganics (µg/L)	
Arsenic	2.1 U
Barium	18.7 B
Chromium	0.9 U
Copper	0.6 U
Iron	43 U
Lead	1.1 U
Manganese	201
Mercury	0.1 UJ
Nickel	1.6 J
Zinc	4.1 U
Total Inorganics (µg/L)	
Aluminum	80.7 U
Arsenic	2.1 U
Barium	20.6 B
Chromium	0.9 U
Cobalt	0.5 U
Copper	0.6 U
Cyanide	1.1 U
Iron	43 U
Lead	1.1 U
Manganese	220
Mercury	0.1 UJ
Nickel	0.6 U
Vanadium	0.6 U
Zinc	4.1 U

6GW06B	
Screen Interval (ft bgs)	28.0 - 38.0
Sample Date	10/7/04
Dissolved Inorganics (µg/L)	
Arsenic	1.8 U
Barium	38.3 J
Chromium	0.5 U
Copper	0.5 U
Iron	1,760
Lead	0.9 U
Manganese	42.9
Mercury	0.1 UJ
Nickel	0.5 U
Zinc	0.7 U
Total Inorganics (µg/L)	
Aluminum	600
Arsenic	1.8 U
Barium	53.1 J
Chromium	3.3 B
Cobalt	3.3 B
Copper	1.9 B
Cyanide	1.6 U
Iron	2,550
Lead	0.9 U
Manganese	45.4
Mercury	0.1 UJ
Nickel	3.5 B
Vanadium	5.3 J
Zinc	6.3 B

6GW03	
Screen Interval (ft bgs)	36.9 - 46.9
Sample Date	11/9/94
Dissolved Inorganics (µg/L)	
Arsenic	2.3 U
Barium	30.9
Chromium	1.8 U
Copper	14.6
Iron	794 J
Lead	2.1 K
Manganese	110 J
Mercury	0.2 U
Nickel	4.3 U
Zinc	1,740 J
Total Inorganics (µg/L)	
Aluminum	794 J
Arsenic	2.5
Barium	32.3
Chromium	2.5
Cobalt	1.9 U
Copper	4.8
Cyanide	5 U
Iron	2,120 J
Lead	1.9 K
Manganese	86.2
Mercury	0.2 U
Nickel	4.3 U
Vanadium	4.4
Zinc	36 B

6GW05	
Screen Interval (ft bgs)	not available
Sample Date	6/22/00
Dissolved Inorganics (µg/L)	
Arsenic	15.8
Barium	10.2 J
Chromium	0.4 U
Copper	1.2 J
Iron	380
Lead	1.3 U
Manganese	126
Mercury	0.14 L
Nickel	1.9 B
Zinc	13,300
Total Inorganics (µg/L)	
Aluminum	133 J
Arsenic	17.5
Barium	11.8 J
Chromium	1.2 J
Cobalt	0.5 U
Copper	1.1 J
Cyanide	0.9 U
Iron	1,870
Lead	2.1 J
Manganese	119
Mercury	0.17 L
Nickel	2.7 J
Vanadium	1.3 J
Zinc	13,100

6GW10A	
Screen Interval (ft bgs)	30.0 - 40.0
Sample Date	10/5/04
Dissolved Inorganics (µg/L)	
Arsenic	1.8 U
Barium	26.1 J
Chromium	0.5 U
Copper	0.5 U
Iron	1,240
Lead	0.9 U
Manganese	72.3
Mercury	0.1 UJ
Nickel	0.89 B
Zinc	0.7 U
Total Inorganics (µg/L)	
Aluminum	49.3 B
Arsenic	1.8 U
Barium	24 J
Chromium	0.5 U
Cobalt	0.38 B
Copper	0.5 U
Cyanide	1.6 U
Iron	923 B
Lead	0.9 U
Manganese	59.3
Mercury	0.1 UJ
Nickel	1.1 B
Vanadium	0.4 U
Zinc	3.4 B

6GW05B	
Screen Interval (ft bgs)	5.0 - 15.0
Sample Date	10/4/2004[1]
Dissolved Inorganics (µg/L)	
Arsenic	1.81 B
Barium	21.8 J
Chromium	0.5 U
Copper	0.5 U
Iron	10.7 U
Lead	0.9 U
Manganese	56.2
Mercury	0.1 UJ
Nickel	0.91 B
Zinc	0.7 U
Total Inorganics (µg/L)	
Aluminum	18.6 B
Arsenic	1.8 U
Barium	22.4 J
Chromium	0.86 B
Cobalt	0.88 B
Copper	0.53 B
Cyanide	1.6 U
Iron	25.1 B
Lead	0.9 U
Manganese	64.9
Mercury	0.1 UJ
Nickel	1.4 B
Vanadium	0.87 B
Zinc	1.8 B

6GW07	
Screen Interval (ft bgs)	8.0 - 18.0
Sample Date	10/7/04
Dissolved Inorganics (µg/L)	
Arsenic	1.8 U
Barium	50.6 J
Chromium	0.5 U
Copper	0.5 U
Iron	10.7 U
Lead	0.9 U
Manganese	157
Mercury	0.1 UJ
Nickel	1.8 B
Zinc	0.7 U
Total Inorganics (µg/L)	
Aluminum	56.9 B
Arsenic	1.8 U
Barium	49.8 J
Chromium	0.52 B
Cobalt	0.81 B
Copper	0.5 U
Cyanide	1.6 U
Iron	66.3 B
Lead	0.9 U
Manganese	169
Mercury	0.1 UJ
Nickel	2.3 B
Vanadium	0.71 B
Zinc	2.6 B

Screening Criteria	Max. Background Concentration[2]	MCLs
Dissolved Inorganics (µg/L)		
Arsenic	ND	10
Barium	30.9 J	2,000
Chromium	ND	100
Copper	4 J	1,300*
Iron	5.8 J	--
Lead	ND	15*
Manganese	12.2 J	--
Mercury	ND	2
Nickel	ND	--
Zinc	5.9 J	--
Total Inorganics (µg/L)		
Aluminum	1160	--
Arsenic	3.5 J	10
Barium	43.6 J	2,000
Chromium	4.7 L	100
Cobalt	ND	--
Copper	4.5 J	1,300*
Cyanide	ND	200
Iron	2350	--
Lead	ND	15*
Manganese	18.4	--
Mercury	ND	2
Nickel	ND	--
Vanadium	7.5 J	--
Zinc	14.9	--

6GW02	
Screen Interval (ft bgs)	40.0 - 55.0
Sample Date	6/21/2000[1]
Dissolved Inorganics (µg/L)	
Arsenic	4.1 J
Barium	33.7 J
Chromium	1.1 J
Copper	1.9 J
Iron	58.9 J
Lead	1.3 U
Manganese	38.4
Mercury	0.16 L
Nickel	10.6 J
Zinc	0.92 J
Total Inorganics (µg/L)	
Aluminum	250
Arsenic	3.8 J
Barium	36.4 J
Chromium	24.0
Cobalt	0.88 J
Copper	1.6 J
Cyanide	0.9 U
Iron	1,370
Lead	1.3
Manganese	43.5
Mercury	0.16 L
Nickel	17.9 J
Vanadium	0.66 J
Zinc	1.6 B

6GW08	
Screen Interval (ft bgs)	31 - 36
Sample Date	10/5/04
Dissolved Inorganics (µg/L)	
Arsenic	1.8 U
Barium	30.4 J
Chromium	0.5 U
Copper	0.5 U
Iron	647 B
Lead	0.9 U
Manganese	59.2
Mercury	0.1 UJ
Nickel	0.5 U
Zinc	0.7 U
Total Inorganics (µg/L)	
Aluminum	226
Arsenic	1.8 U
Barium	30.3 J
Chromium	1.5 B
Cobalt	0.3 U
Copper	0.52 B
Cyanide	1.6 U
Iron	1,010 B
Lead	0.9 U
Manganese	58.4
Mercury	0.1 UJ
Nickel	0.5 U
Vanadium	0.8 B
Zinc	6 B

6GW04	
Screen Interval (ft bgs)	5.0 - 10.0
Sample Date	10/5/04
Dissolved Inorganics (µg/L)	
Arsenic	5.3 J
Barium	332
Chromium	0.5 U
Copper	0.5 U
Iron	11,000
Lead	0.9 U
Manganese	187
Mercury	0.1 UJ
Nickel	1.3 B
Zinc	1,980
Total Inorganics (µg/L)	
Aluminum	154 B
Arsenic	2.9 J
Barium	319
Chromium	0.5 U
Cobalt	0.95 B
Copper	0.5 U
Cyanide	189
Iron	21,300
Lead	0.9 U
Manganese	200
Mercury	0.1 UJ
Nickel	3 B
Vanadium	0.62 B
Zinc	5,540

6GW01A	
Screen Interval (ft bgs)	47.9 - 61.9
Sample Date	9/14/04
Dissolved Inorganics (µg/L)	
Arsenic	2.1 U
Barium	25.1 B
Chromium	0.9 U
Copper	0.6 U
Iron	627
Lead	1.1 U
Manganese	23
Mercury	0.1 UJ
Nickel	0.7 J
Zinc	4.1 U
Total Inorganics (µg/L)	
Aluminum	80.7 U
Arsenic	2.1 U
Barium	26.5 B
Chromium	0.9 U
Cobalt	0.5 U
Copper	0.6 U
Cyanide	1.1 U
Iron	794
Lead	1.1 U
Manganese	23.8
Mercury	0.1 UJ
Nickel	0.6 U
Vanadium	0.6 U
Zinc	4.1 U

6GW01	
Screen Interval (ft bgs)	5.0 - 20.0
Sample Date	9/15/04
Dissolved Inorganics (µg/L)	
Arsenic	7 B
Barium	17.5 B
Chromium	0.9 U
Copper	0.6 U
Iron	8,450
Lead	1.1 U
Manganese	174
Mercury	0.1 UJ
Nickel	0.6 U
Zinc	4.1 U
Total Inorganics (µg/L)	
Aluminum	80.7 U
Arsenic	9.3 B
Barium	18 B
Chromium	0.9 U
Cobalt	0.5 U
Copper	3.9 B
Cyanide	3.1 B
Iron	8,830
Lead	1.1 U
Manganese	180
Mercury	0.1 UJ
Nickel	0.6 U
Vanadium	0.6 U
Zinc	6.9 B

Legend

- Yorktown-Eastover Monitoring Wells
- Study Area Boundary
- Surface Impoundment Area
- Drainage
- Area of Excavation of Cadmium and Zinc Contaminated Soil

Contaminants shaded **green** exceed Background concentrations.
Contaminants shaded **red** exceed Federal MCLs and Background.
Essential nutrients are not shown.
µg/L = micrograms per liter
J = Value is estimated.
K = Value may be biased high.
L = Value may be biased low.
MCL = Federal Maximum Contaminant Level
NA=Not analyzed
U = Not detected above associated detection limit.
UJ = Not detected above associated detection limit. Detection limit is estimated.
-- No criteria established

[1]Duplicate sample taken at this location, most conservative value reported.
[2]Background values are maximum detected values in respective aquifer from Baker (1995) Background Report.
*Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10% of tap water samples exceed the action level, water systems must take additional steps. For copper, the B = Value may be associated with laboratory or field blank contamination. B-flagged values are generally considered non-detects; however, the B-flagged values from the 2004 groundwater data set may be erroneously B-flagged due to

N W E S

0 200 400 Feet

Figure 5-5
Inorganic Exceedances of Background and/or MCLs
in the Yorktown-Eastover Aquifer at Site 6
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

CH2MHILL

SECTION 6

Site 7 Summary and Investigation Results

6.1 Site 7 Background and Physical Characteristics

6.1.1 Site 7 History and Physical Setting

Site 7 is located in the western portion of Croaker flat in the vicinity of Poe Road and adjacent to an unnamed tributary leading to Felgates Creek, approximately 1 mile upstream from the confluence of Felgates Creek and the York River (Figure 6-1).

Site 7 consists of the Plant 3 Explosives-Contaminated Wastewater Discharge Area, including a 300-foot long drainage area located adjacent to the wetlands, and the surrounding area. This drainage area received nitroamine-contaminated wastewater from Loading Plant 3 from 1945 to 1975. From 1975 to 1986, the wastewater was treated in an activated carbon unit, which removed dissolved explosives from the water prior to discharge to the site. After 1986, the carbon treated wastewater was directed to the sanitary sewer system and ultimately to HRSD. The wastewater discharged to this site contained TNT, RDX, TCE, and cyclohexane according to the *Initial Assessment Study (IAS) of Naval Weapons Station Yorktown* (C.C. Johnson, 1984). The site has reverted to a natural drainage area and received no discharge from the Plant 3 complex after 1986.

6.1.2 Site 7 Geology and Hydrogeology

Detailed geology and hydrogeology information on WPNSTA Yorktown is described in Section 2.2. Well construction details for Site 7 monitoring wells are summarized in Table 6-1. Boring Logs are included as Appendix A. Cross-sections are provided as Appendix E.

Due to their close proximity and location within the floodplain of Felgates Creek, the hydrogeologic conditions for Sites 6 and 7 are similar. The Yorktown-Eastover aquifer is unconfined at Site 7 and is overlain by a relatively thin unsaturated deposit consistent with the Yorktown confining unit in the topographically high areas of the site. The Yorktown-Eastover aquifer groundwater discharges to Felgates Creek located west/southwest of the site.

Hydraulic conductivity values calculated based on the results of aquifer testing at Site 7 ranged from 0.425 ft/day to 3.4 ft/day.

Groundwater within the upper portion of the Yorktown-Eastover aquifer flows west to Felgates Creek based upon groundwater elevations measured in October 2004 (Figure 5-2 and Table 6-2).

6.2 Previous Investigations

6.2.1 Initial Assessment Study (1984)

The IAS at NWS Yorktown was conducted in 1984 by NEESA to identify and assess sites posing a potential threat to human health and the environment because of contamination from prior waste management activities. This effort was documented in the *IAS of Naval Weapons Station Yorktown, Virginia (NEESA, 1984).* The purpose of the IAS was to identify and assess sites posing a potential threat to human health or the environment due to contamination from past operations. Based on the use of the Site 7 area as a discharge area for solvent and explosives contaminated wastewater, Site 7 was identified for further evaluation. Activity records relating to waste generation; handling, and disposal were reviewed, physical conditions at the site were characterized, and migration pathways and potential receptors were identified. The results of the data evaluation were used to develop recommendations concerning the need for a confirmation study at Site 7. The IAS concluded that sampling of Site 7 surface water, sediment, and soil samples would be needed to evaluate possible explosives and VOC contamination within these media.

6.2.2 Confirmation Study Round I (1986)

In 1986, consistent with the recommendations of the IAS, two soil (7S01 and 7S02) and two co-located surface water and sediment samples (7SW/SD01 and 7SW/SD02) were collected from Site 7. This effort was documented in the *Confirmation Study Step IA (Verification), Round One*, (Dames & Moore, 1986).These sample locations are shown on Figure 6-2. Explosives were detected in soil in the drainage way leading from Plant 3 to Felgates Creek. No applicable standards or criteria were used to evaluate potential exceedances. Methylene chloride (a common laboratory contaminant) and four explosives (TNT, RDX, HMX, and 4-amino-2,6-DNT) were detected in one or both surface water samples located in the tributary to Felgates Creek. The highest detected concentrations of these constituents in surface water were: TNT (0.232 µg/L), RDX (1.57 µg/L), HMX (0.267 µg/L), and 4-amino-2,6-DNT (0.287 µg/L). One purgeable organic (methylene chloride at 148 µg/L), two BNAs (bis-2-ethylhexyl phthalate and di-n-butyl phthalate at 316 and 70 mg/kg, respectively), and one explosive (2-amino-5,4-DNT at 412 µg/kg) were detected in sediment samples from the tributary to Felgates Creek. Additional sampling was recommended to further evaluate possible VOC and explosives contamination.

6.2.3 Confirmation Study Round II (1988)

Consistent with the recommendations in the Confirmation Study Round I, three soil (7S03, 7S04, and 7S05) and two co-located surface water and sediment samples from the same locations sampled during the Round I event (7SW/SD01 and 7SW/SD02) were collected in November and December 1987. This effort was documented in the *Confirmation Study Step IA (Verification), Round Two*, (Dames & Moore, 1988). These sample locations are shown on Figure 6-2.

The only VOCs detected in soils, surface water and sediment from Site 7 during the Round II event were common laboratory contaminants (phthalates and methylene chloride). There were no detectable levels of explosives in the surface water or sediment samples. However, TNT, HMX, and RDX were detected at maximum concentrations of 644 mg/kg, 121 mg/kg,

and 284 mg/kg respectively in soils from the former discharge area. Additionally, several BNAs were detected in one of the three soil samples collected within the discharge area (7S03). Explosives concentrations in soil generally increased toward the wastewater discharge location, which is consistent with the likelihood that Site 7 was the source of the explosives. Based on these results, it was recommended that additional surface water and biota be analyzed for TCL VOCs, explosives, and TCL BNAs to further evaluate site conditions, site-related contaminants, and the extent of contaminant migration.

6.2.4 Draft RI Interim Report (1991)

The *RI Interim Report* (Versar, 1991) was drafted by Dames & Moore in 1989 and revised by Versar in 1991 to incorporate comments from the Technical Review Committee (TRC). The purpose of this report was to facilitate movement of the sites into the RI process. The report summarized available data from the Confirmation Studies for those sites recommended for further investigation in the IAS and, based on these data, provided recommendations for additional efforts to be conducted to complete the RI. The Interim RI recommended that benthic and fish communities in the tributary to Felgates Creek be sampled, and additional surface water samples be collected and analyzed for TCL VOCs, explosives, and BNAs. The Interim RI also recommended that the existing and additional data be used to conduct a risk assessment (Versar Inc., 1991).

6.2.5 Focused Biological Sampling and Risk Evaluation Report (1993)

The *Focused Biological Sampling and Preliminary Risk Evaluation Report* (Baker and Weston, 1993c) summarized the results of a limited biological tissue, surface water and sediment sampling effort conducted in October 1992. The primary objective of the sampling program was to evaluate the potential human health risk associated with the consumption of fish and shellfish taken from select waters within WPNSTA Yorktown, including Felgates Creek, which is adjacent to Site 7. The results of the biota sampling indicated that contaminants from WPNSTA Yorktown had not bioaccumulated in significant quantities in the fish and shell fish of Felgates Creek to pose a significant risk to individuals fishing from this water body (Baker and Weston, 1993b).

6.2.6 Round One RI (1993)

The Round One RI was performed June to October 1992 and was based on the recommendations made in the Interim RI Report. This information is documented in the *Final Round One RI for Sites 1-9, 11, 12, 16-19, and 21* (Baker and Weston, 1993b). The objectives of the RI were to assess the nature and extent of contamination and to perform human health and ecological risk assessments to evaluate the impacts on human health and the environment. Field activities included the collection of geophysical data, aquifer testing, collection of a Hydropunch™ groundwater sample, installation and sampling of groundwater monitoring wells (7GW01 through 7GW04), surface and subsurface soil sampling (7S06 and 7S07), surface water and sediment sampling (7SD/SW01 through 7SD/SW10), a groundwater elevation survey, and the collection of Shelby tubes. Sample locations are shown on Figure 6-2.

One Hydropunch™ (7HP01) groundwater sample was collected in addition to two soil (7S06 and 7S07), four surface water (7SW01 through 7SW04), and ten sediment samples

(7SD01 through 7SD10). Sample locations are shown on Figure 6-2. The samples were analyzed for VOCs, BNAs, metals, cyanide, explosives, nitrates, TOC, hardness, pH, specific conductance, and temperature (Table 6-3 through 6-6). No site-related explosives or organic compounds were detected in surface soil samples. Surface water samples in the tidal creek contained only trace levels of explosives, and no explosives were detected in the soil or sediment samples. DCA (240 µg/L) and TCA (15 µg/L) were detected in a surface water sample collected at the mouth of the ditch. VOCs were not detected in any other surface water sampling locations. Metals, comprising copper, mercury, lead, and nickel, were also detected at concentrations above background in the total metals surface water sample location at the discharge end of Site 7. TCA, DCA, DCE, and RDX were detected in groundwater.

The Round One RI concluded that the main concern at Site 7 was contaminated groundwater, which may be impacting surface water. The RI recommended that a risk evaluation and FFS be conducted upon further characterization. It was also recommended that benthic macroinvertebrate and fish population data be evaluated to determine the potential risks to the environment from media at Site 7. In order to evaluate if the contamination was localized, it was recommended that additional surface water samples be analyzed for VOCs (Baker and Weston, 1993a).

6.2.7 Round Two RI (1998)

A Round Two RI was conducted between 1994 and 1996 at Site 7 to assess the nature and extent of contamination at the site and to address potential data gaps observed following the Round One RI. Efforts from this field event are documented in the *Final Round Two RI Report, Site 6 and 7* (Baker, 1998b). The media sampled during this investigation included surface and subsurface soils, groundwater, surface water, and sediment. Sample locations are shown on Figure 6-2. Analytical detections are included in Tables 6-3 through 6-6.

CVOCs were detected in the surface and subsurface sediment samples at Site 7, however most detections were common laboratory contaminants (2-butanone, acetone, and methylene chloride). 1,1,1-trichloroethane, chlorobenzene, and xylenes were detected at concentrations of 28 µg/kg, 26 µg/kg, and 15 µg/kg in samples collected at 7SD10, located upgradient of the site within Felgates Creek. There were no other detections of chlorinated compounds in sediment samples associated with Site 7. There were no detections of any organic compounds in surface water samples associated with Site 7. There were also no SVOCs or nitramine compounds detected in the surface water or sediment samples collected during the Round Two RI.

VOCs (1,1,1-TCA, 1,1,1-DCA, and 1,1-DCE) and nitramine compounds (2,4,6-TNT, 2-nitrotoluene, and 3-nitrotoluene) were detected in groundwater with the highest concentrations observed in the general area around the explosives-contaminated wastewater discharge/drainage area (7HP07). 1,1,1-TCA, 1,1-DCA, and 1,1-DCE were detected at concentrations 200 µg/L, 58 µg/L, and 33 µg/L in the sample collected at this location. Concentrations of VOCs detected in site groundwater did not exceed any corresponding risk based concentrations (RBCs) or MCLs.

Various inorganics were detected in all media sampled during the Round Two RI, but there we no notable differences in concentrations in samples collected from various locations

across the site (upgradient and downgradient). Consequently, metals are unlikely to be site related.

6.2.8 Soil Characterization Study (1995)

A Soil Characterization Study was conducted in December 1995. It focused on the Site 7 drainage area from Building 375, which was suspected of having high concentrations of nitramines. The purpose of the study was to characterize the nitramine-contaminated soil and to collect representative soil samples for a treatability study. Nitramines were detected at Site 7. Specific results from this study were presented and discussed in the *Final* v2 *Feasibility Study (FS) for Sites 6 and 7 (Baker, 1998d).*

6.2.9 Field Scale Pilot Study (1997)

A field-scale pilot study to treat explosives-contaminated soil at Site 7 was conducted between September and December 1996. The efforts during this study were included in the *Pilot Study Report for the Explosives-Contaminated Soil at the Naval Weapons Station* Yorktown (Baker, 1997c). Approximately 770 cubic yards of soil were excavated from the drainage area leading to the tributary at Site 7. Soil with TNT concentrations exceeding 30 ppm was excavated and sent to the newly-constructed biocell at Site 22. The TNT concentrations in the soil entering the biocell averaged over 1000 ppm. After treatment, the TNT concentrations ranged from less than 1 ppm to 4 ppm.

6.2.10 Feasibility Study (1998)

An FS was developed for Site 7 based on the recommendations of the Round Two RI in May 1998. This information is documented in the *Final v2 Feasibility Study for Sites 6 and* 7 (Baker, 1998c). Based on the final remediation goals for the contaminants of concern presented in the FS, Site 7 soil was not identified as a Site Area of Concern because all of the contaminated sediment was removed to be used in the Field Scale Pilot Study conducted for evaluating biological remediation of explosives contaminated soils. As a result, Site 7 soils no longer posed a potential threat to human health or the environment (Baker, 1998c) and no further action was recommended to address risks due to soils at the site.

6.2.11 Proposed Remedial Action Plan/Record of Decision (1998)

The *Final v2 PRAP* for Sites 6 and 7 (Baker, 1998d) was released to the public in May 1998 presenting the no further action alternative for soils at Site 7. The *Final ROD for Sites 6 and 7* (Baker, 1998e) was signed in October 1998 indicating that no further action was required for Site 7 soils.

6.2.12 Long Term Monitoring (2000-2005)

LTM for VOCs, nitramine compounds and TAL inorganics (including cyanide) of the groundwater at Site 7 began in May 2000 and was completed in 2005. Following the baseline round of sampling, LTM at Site 7 was altered slightly to include the collection and analysis of surface and sediment for VOCs, nitramine compounds and TAL inorganics (including cyanide) analysis from three locations(1SD/SW01 through 1SD/SW03).

During the final round of LTM (August 2005), 1,1,1-TCA and 1,1-DCA were detected in the groundwater sample collected from 7GW02, both at concentrations of 2 J µg/L. With the

exception of laboratory contaminants, there were no other detections of VOCs. Explosives including 2-amino-4,6-DNT (3.4J µg/L), 4-amino-2,6-DNT (1.6J µg/L), HMX (12 µg/L) and RDX (38 µg/L) were also detected in the sample from this well. There were no other detections of explosives during the August 2005 round of LTM. Various inorganics were detected in groundwater from Site 7 during LTM; however, the detected concentrations were not notably different between upgradient well and 7GW02, located closer to the source area.

With the exception of toluene (at concentrations of 2 J µg/L or less), and methylene chloride (a common laboratory contaminant), there were no detections of VOCs or explosives in surface water samples collected during the LTM at Site 7. Acetone, methylene chloride, and carbon disulfide were detected in sediment. The former two compounds are common laboratory contaminants, and the latter can be naturally occurring due to degradation of organic matter. There were no detections of explosives in sediment. Various inorganics were detected in surface water and sediment; however, concentrations were comparable to concentrations detected in the upgradient samples (7SD/SW10) collected during the Round Two RI.

A draft report for this sampling has been completed, but has not yet been finalized. LTM results are included in 6-4, 6-5 and 6-6.

6.3 Site 7 RI Field Activities

In order to provide additional data to evaluate the nature and extent of explosives in groundwater, samples were collected from three Yorktown-Eastover aquifer monitoring wells (7GW01, 7GW02, and 7GW03) as part of this RI. Construction details for these wells are included in Table 6-1. The groundwater samples collected were analyzed for explosives, and TAL total and dissolved metals and cyanide. Sampling and QA/QC procedures are included in Sections 3.1.3 and 3.1.4 of this document respectively. A summary of samples collected is included as Table 6-7. VOC results from LTM sampling also conducted in September 2004 are also included in this section for the purpose of creating a more complete description of the site.

Table 6-7 presents the samples collected, including associated QA/QC samples, and the analytical parameters for these samples, while Figure 6-1 shows the locations of the Site 7 monitoring wells. Geochemical parameters (specific conductance, pH, turbidity, and temperature) for each well are listed on Table 6-8.

6.4 Site 7 Analytical Results

6.4.1 VOC Analytical Results

VOCs were not detected in groundwater samples collected in September 2004 from Site 7 concurrent with the Phase I Groundwater RI. However, the detection limit during this round was 10 µg/L. As stated above, during the most recent round of LTM at Site 7, 1,1,1-TCA and 1,1-DCA were detected in the sample collected from 7GW02, both at concentrations of 2 J µg/L. The only other VOC detected during recent rounds was a common laboratory contaminant (methylene chloride).

6.4.2 Explosives Analytical Results

Four explosives were detected in groundwater samples collected at Site 7 during this Phase I Groundwater RI: 2-Amino-4,6-DNT, 4-Amino-2,6-DNT, HMX, and RDX. 2-Amino-4,6-DNT was detected in samples from 7GW01 and 7GW02 at concentrations of 2.2 J µg/L and 3.7 J µg/L respectively. 4-Amino-2,6-DNT was detected in the sample from 7GW02 at a concentration of 8.4 J µg/L. HMX was detected in samples from 7GW01 and 7GW02 at concentrations of 21 µg/L and 12 µg/L respectively. RDX was detected in samples from 7GW01 and 7GW02 at concentrations of 13 µg/L and 67 µg/L respectively. There are no MCL values for these constituents. None of these constituents were detected in background samples, therefore, all detections are exceedances of background. The distribution of these compounds is depicted on Figure 6-3.

6.4.3 Metals and Cyanide Analytical Results

Of the 24 inorganics analyzed in groundwater from Site 7, eight were detected: barium, calcium, copper, cyanide, magnesium, manganese, potassium, and sodium. Aluminum, antimony, arsenic, beryllium, chromium, cobalt, lead, nickel, and selenium were not detected in any sample (U or UJ qualified). Iron, vanadium, and zinc were detected in one or more samples, but the results were qualified with Bs indicating blank contamination and were consequently treated as non-detects. The B flags on these results may have been the result of a blank collected using non-potable water.

Cyanide was detected at concentrations of 1.6 J µg/L and 4.5 J µg/L in the samples collected from 7GW02 and 7GW03 respectively. Cyanide was not detected in background samples from The Yorktown-Eastover aquifer. Manganese was detected at a concentration of 24.7 µg/L in the sample from 7GW03, in exceedance of the maximum background concentration 18.4 µg/L. Zinc was detected at a concentration of 21.9 µg/L in the sample from 7GW03 in exceedance of the maximum background concentration of 14.9 µg/L.

Of the 23 inorganics analyzed in groundwater from Site 7, eight were detected in one or more samples: barium, calcium, cobalt, magnesium, manganese, potassium, sodium, and zinc. Aluminum, antimony, arsenic, chromium, copper, iron, mercury, nickel, selenium, and vanadium were not detected in any samples. Cobalt was detected in the sample from 7GW03 at a concentration of 0.82 J µg/L. Cobalt was not detected in Yorktown-Eastover background samples. Manganese was detected in the sample from 7GW03 (24.7 µg/L) above the maximum Yorktown-Eastover aquifer background concentration (12.2 J µg/L). Zinc was detected at a concentration of 21.9 µg/L in the sample from 7GW03. This concentration exceeds the maximum background concentration of 5.9 J µg/L.

6.5 Site 7 Nature and Extent of Contamination

2-Amino-4,6-DNT, 4-Amino-2,6-DNT, HMX, and RDX and CVOCs were detected in Site 7 groundwater samples. However, it is not possible to sufficiently determine the extent of these contaminants in groundwater based on existing data. 7GW02 and 7GW03 are located upgradient of the area in which the wastewater containing these contaminants was discharged, and are sufficient for background purposes. However, 7GW01 is not located within or downgradient of the historical discharge area. Further, although 7GW02 is located in the vicinity of the former discharge area, the extent of groundwater

contamination as a result of historical releases there (both vertically and horizontally) cannot be sufficiently delineated without additional characterization. Based on data collected as part of the LTM program, explosives and CVOCs are not impacting Site 7 surface water and sediment.

There were no detections of inorganics at concentrations exceeding corresponding MCLs during this Phase I Groundwater RI round of sampling. Some concentrations of metals exceeded background, but these detections may not present unacceptable risk and may not be site related based on historical operations at the site and the distribution of the metals Concentrations detected in groundwater samples collected upgradient of the source area are similar to those detected in samples collected near the source area. Similarly, concentrations of inorganics in the upgradient Felgates Creek surface water and sediment samples collected during the Round Two RI (7SD/SW10) were similar to those collected downgradient of the site, indicating that inorganics are not site related.

6.6 Site 7 Fate and Transport

The explosive compounds detected at Site 7 are considered to be slightly mobile and tend to be transported along with the sediments to which they adsorb. Since soils and sediments contaminated with explosives have been removed from the site, concentrations of explosives are expected to decline over time. Consistent with this hypothesis, LTM data indicates that concentrations of explosives in the samples collected from the well closest to the source (7GW02) have shown a steady decline (Table 6-4) since the removal action was completed in 1997.

6.7 Site 7 Conclusions and Recommendations

Explosives (4 -Amino-4,6-DNT, 4-Amino-2,6-DNT, HMX, and RDX) and low concentrations of CVOCs (2 µg/L or less) have been detected in groundwater at Site 7 during recent rounds of sampling. The concentrations of inorganics detected in site groundwater (i.e., wells 7GW01 and 7GW02) are generally comparable to those in upgradient groundwater (i.e., wells 7GW03 and 7GW04) and are not likely to be site related.

No explosives or CVOCs have been detected in surface water and sediment adjacent to Site 7 during the LTM program. Further, the concentrations of inorganics in surface water and sediment adjacent to Site 7 are generally comparable to the inorganics concentrations detected upstream of Site 7. This information suggests there is no adverse affect on surface water and sediment from historical releases of wastewater at Site 7 or discharges of groundwater.

The concentrations of explosives in the well (7GW02) in the area where the historical discharges took place and where the 1997 removal action took place have steadily declined since the 1997 removal action. This suggests the source removal was a successful remedy not only for soil contamination, but for groundwater contamination as well.

To confirm this, it is recommended that:

1. Groundwater monitoring be continued until concentrations are determined to have reached acceptable levels.

2. LTM program for Site 7 be modified

    a. to add an additional monitoring well within the former discharge drainage way,

    b. to sample the well within the drainage way for VOCs, perchlorate, metals, and explosives (including nitroglycerin, 3,5-dinitroaniline, PETN, diphenylamine, n-nitro-sodiphenylamine, ammonium nitrate, and nitroguanidine)

    c. eliminate inorganics analysis for groundwater at all other wells, and

    d. eliminate surface water and sediment sampling.

TABLE 6-1
Groundwater Monitoring Well Construction Details at Site 7
Phase I Groundwater Remedial Investigation for Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Well Number	Aquifer	Date Installed	Top of PVC Casing Elevation (ft msl)	Ground Surface Elevation (ft msl)	Boring Total Depth (ft bgs)	Elevation Bottom of Boring (ft msl)	Well Diameter	Total Well Depth (ft bgs)	Bottom Well Elevation (ft msl)	Outer Casing Interval (ft bgs)	Depth to Screen Interval (ft bgs)	Top of Screen Interval Elevation (ft msl)	Bottom of Screen Interval Elevation (ft msl)	Depth to Top of Sand Pack (ft bgs)	Depth to Top of Bentonite (ft bgs)
7GW01	Yorktown-Eastover	09/08/1994	28.72	26.50	35	-8.50	2	38	-11.50	--	19 - 34	7.5	-7.5	18	15.5
7GW02	Yorktown-Eastover	09/08/1994	24.53	22.70	32	-9.30	2	14	8.70	--	17 - 32	5.7	-9.3	13.7	11.2
7GW03	Yorktown-Eastover	09/13/1994	38.38	38.60	55	-16.40	2	55	-16.40	--	40 - 55	-1.4	-16.4	35	25
7GW04	Yorktown-Eastover	09/14/1994	42.71	42.90	53	-10.10	2	53	-10.10	--	38 - 53	4.9	-10.1	33	21

NOTES:
msl - mean sea level (in feet)
bgs - Below Ground Surface (in feet)
-- NA
(1) Modified well construction due to shallow groundwater table
(2) Drive point, no sand pack
(3) Staff gauge

TABLE 6-2
Summary of Groundwater Elevation Data at Site 7
Phase I Groundwater Remedial Investigation for Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Monitoring Well	Aquifer	Depth to Water (ft) October 12, 2004	Top of Casing (ft above msl)	Groundwater Elevation (ft above msl) October 12, 2004
7GW01	Yorktown-Eastover	19.27	28.72	9.45
7GW02	Yorktown-Eastover	19.09	24.53	5.44
7GW03	Yorktown-Eastover	30.81	38.38	7.57
7GW04	Yorktown-Eastover	27.44	42.71	15.27

Note:
msl - mean sea level

TABLE 6-3
Hydropunch Groundwater Sampling Results at Site 7
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS07-DW003	YS07-DW004		YS07-DW005	YS07-DW006	YS07-DW007			YS07-DW008
Sample ID	YS07-DW003-0794	YS07-DW004-0794	YS07-DW004P-0794	YS07-DW005-0794	YS07-DW006-0794	YS07-DW007-A-0794	YS07-DW007-B-0794	YS07-DW007-C-0794	YS07-DW008-1094
Sample Date	07/11/94	07/23/94	07/23/94	07/24/94	07/24/94	07/23/94	07/25/94	07/25/94	10/21/94
Chemical Name									
Volatile Organic Compounds (UG/L)									
1,1,1-Trichloroethane	13	21	21	10 U	10 U	200	10 U	10 U	10 U
1,1-Dichloroethane	10 U	19	20	10 U	10 U	58	10 U	10 U	10 U
1,1-Dichloroethene	10 U	10 U	10 U	10 U	10 U	33	10 U	10 U	10 U
Methylene chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1 J
Explosives (UG/L)									
2,4,6-Trinitrotoluene	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	56 J	0.62 UJ	0.62 U	0.62 U
2-Nitrotoluene	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 R	0.75 UJ	0.75 U	0.75
3-Nitrotoluene	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 R	0.91 UJ	0.91 U	0.91

Notes:

Shaded values indicate the analyte was detected
UG/L = Micrograms per Liter
NA = Not analyzed
J = Result may be estimated
R = Unreliable result
U = Analyte not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise

TABLE 6-4
Groundwater Analytical Detections at Site 7
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Yorktown-Eastover Aquifer**	Yorktown-Eastover		Yorktown-Eastover							Yorktown-Eastover	
Station ID			YS07-GW001		YS07-GW002							YS07-GW003	
Sample ID			YS07-MW001-1094	YS07-MW001-0904	YS07-MW002-1094	YS07-MW002-0600	YS07-MW002-0904	YS07-MW002P-0904	YS07-MW002-0205	YS07-MW002-0505	YS07-MW002-0805	YS07-MW003-1094	YS07-MW003-0600
Sample Date			10/07/94	09/17/04	10/07/94	06/09/00	09/20/04	09/20/04	02/09/05	05/03/05	08/02/05	10/07/94	06/09/00
Investigation			Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data
Chemical Name													
Volatile Organic Compounds (UG/L)													
1,1,1-Trichloroethane	200	1 U	2	NA	40	7 J	10 U	10 U	2 J	10 U	2 J	1 U	10 U
1,1-Dichloroethane	No MCL	1 U	1 U	NA	16	6 J	10 U	10 U	2 J	2 J	2 J	1 U	10 U
1,1-Dichloroethene	7	1 U	1 U	NA	4	2 J	10 U	10 U	10 U	10 U	10 U	1 U	10 U
Methylene chloride	5	2 U	2 U	NA	2 U	2 J	10 U	10 U	10 U	1 J	10 U	2 U	4 J
Toluene	1,000	1 U	1 U	NA	1 U	10 U	10 U	10 U	10 U	5 J	10 U	1 U	10 U
Explosives (UG/L)													
2-Amino-4,6-dinitrotoluene	No MCL	NA	NA	2.2 J	NA	6.76	3.7 J	3.5 J	6	5.2	3.4 J	NA	4.8 U
4-Amino-2,6-dinitrotoluene	No MCL	1 U	5.5	5 U	37	8.94	8.4 J	8.1 J	6.3	4.5 J	1.6 J	2.5	3.2 U
HMX	No MCL	0.61 U	34	21	28	18.5	12	12	20	15	12 J	2.4	3.2 U
RDX	No MCL	0.59 U	34	13	180	96.4	67	64	84	69	38	13	4 U
Total Metals (UG/L)													
Aluminum	No MCL	1160	1,680 L	80.7 U	7,060 L	263	80.7 U	80.7 U	90.8 B	17.5 B	13 U	2,970 L	74 B
Antimony	6	12.4 U	12.4 U	1.9 U	13.8 K	2.1 U	1.9 U	1.9 U	2.8 B	1.3 U	3.7 U	14.2 K	2.1 U
Arsenic	10	3.5 J	7.6	2.1 U	35.9	2.3 U	2.1 U	2.1 U	2.1 U	1.6 U	3.7 U	4.9	2.3 U
Barium	2,000	43.6 J	32.6	14.4 B	53.1	25.4 B	23.3 J	22.6 J	17 B	24.1 B	22.4 J	25.5	27.2 B
Beryllium	4	0.2 U	0.2 U	0.1 U	0.56 B	0.2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.2 U	0.2 U
Calcium	No MCL	67100	120,000	98,400	164,000	125,000	126,000	124,000	135,000	130,000	123,000	80,600	92,800
Chromium	100	4.7 L	6.2 L	0.9 U	37.5 L	44.6	0.9 U	0.9 U	1.6 B	1.2 B	1.1 U	10.3 L	10.8
Cobalt	No MCL	2.1 U	2.1 U	0.5 U	7.7	0.65 B	0.5 U	0.5 U	0.6 U	0.4 U	1.1 U	2.2	0.5 U
Copper	1,300	4.5 J	2.9	0.6 U	10.8	1.9 B	0.6 U	0.6 U	0.4 U	0.6 U	0.8 U	3.8	1.4 B
Cyanide	200	5 U	5 U	1.3 B	5 U	1.2 B	1.1 J	1.6 J	0.8 U	0.8 U	2.8 U	5 U	1.5 B
Iron	No MCL	2350	3,910	43 U	21,200	1,110	43 U	43 U	49 J	61.2 B	28 U	6,270	468
Lead	15	1.5 U	1.5 UL	1.1 U	4.2 L	1.3 U	1.1 UL	1.1 UL	1.3 U	1.2 U	1.6 U	1.5 UL	1.3 U
Magnesium	No MCL	3350 J	2,960	2,000 J	4,990	2,510 B	2,310 J	2,290 J	2,520 J	2,540 B	2,580 J	1,980	2,320 B
Manganese	No MCL	18.4	38.8	3.9 J	98.6	8.8 B	0.2 U	0.2 U	1.1 B	0.92 B	0.3 U	32.9	27.2
Nickel	No MCL	5.2 U	5.2 U	0.6 U	19.5	32.5 B	0.6 U	0.6 U	0.81 B	0.84 B	1.3 U	5.2 U	8.4 B
Potassium	No MCL	5510	1,880	669 J	3,980	929 B	691 J	679 J	677 J	721 B	675 J	3,440	1,160 B
Selenium	50	2.9 J	2.4 UL	2.4 U	2.4 UL	2.7 B	2.4 UL	2.4 UL	3.8 J	2.2 U	4.5 U	2.4 UL	2.2 B
Sodium	No MCL	8300	6,880	4,840 J	9,970	11,000	9,600	9,620	9,870	9,180	9,060	7,560	7,520
Vanadium	No MCL	7.5 J	10.7	0.6 U	57.4	3.2 B	0.6 U	0.6 U	0.5 U	0.56 B	0.8 U	21.5	1.4 B
Zinc	No MCL	14.9 J	14.2 B	4.1 U	52.5 U	1.3 B	4.1 U	4.1 U	1.7 B	1.9 B	1.3 U	24.9 J	0.97 B
Dissolved Metals (UG/L)													
Aluminum	No MCL	146 J	11.5 U	80.7 U	11.5 U	37 U	80.7 U	80.7 U	13.5 U	11.4 U	12.7 B	27.8	37 U
Antimony	6	18.5 J	12.4 U	1.9 U	12.4 U	2.1 U	1.9 U	1.9 U	2.9 B	1.3 U	1.7 U	13.7	2.1 U
Arsenic	10	2.6 UL	2.3 UL	2.1 U	2.3 UL	2.3 U	2.1 U	2.1 U	2.1 U	1.6 U	1.9 U	2.3 UL	2.7 J
Barium	2,000	30.9 J	27.3	14 B	27.6	25.3 J	22.3 J	22.4 J	16 B	23 J	23.4 J	12.6	27.7 J
Calcium	No MCL	69800	118,000	97,400	131,000	128,000	121,000	124,000	132,000	123,000	125,000	46,200	93,600
Chromium	100	1.5 UL	1.5 UL	0.9 U	1.5 U	0.5 J	0.9 U	0.9 U	1.3 B	1.2 B	1.6 J	1.5 UL	0.4 U
Cobalt	No MCL	2.1 UL	2.1 U	0.5 U	2.3	0.5 U	0.5 U	0.5 U	0.6 U	0.7 B	0.6 U	2.1 U	0.5 U
Copper	1,300	4 J	1.1 U	0.6 U	1.1 U	1 J	0.6 U	0.6 U	0.4 U	1.1 B	0.5 U	1.5	1.3 J
Iron	No MCL	5.8 J	3.8 B	43 U	1.9 U	19.2 J	43 U	43 U	11.2 U	10 U	13.1 U	11.1 B	15.6 J
Magnesium	No MCL	3410 J	2,580	1,990 J	2,630	2,550 J	2,230 J	2,280 J	2,430 J	2,440 J	2,490 J	930	2,400 J
Manganese	No MCL	12.2 J	21	0.72 B	1.8	6 J	0.2 U	0.2 U	0.74 B	2.5 B	0.26 B	0.9	26.7
Mercury	2	0.2 UL	0.2 U	0.1 UJ	0.2 U	0.14 L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.2 U	0.14 L

TABLE 6-4
Groundwater Analytical Detections at Site 7
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Yorktown-Eastover Aquifer**	Yorktown-Eastover		Yorktown-Eastover							Yorktown-Eastover	
Station ID			YS07-GW001		YS07-GW002							YS07-GW003	
Sample ID			YS07-MW001-1094	YS07-MW001-0904	YS07-MW002-1094	YS07-MW002-0600	YS07-MW002-0904	YS07-MW002P-0904	YS07-MW002-0205	YS07-MW002-0505	YS07-MW002-0805	YS07-MW003-1094	YS07-MW003-0600
Sample Date			10/07/94	09/17/04	10/07/94	06/09/00	09/20/04	09/20/04	02/09/05	05/03/05	08/02/05	10/07/94	06/09/00
Investigation			Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data
Chemical Name													
Nickel	No MCL	5.2 U	5.2 U	0.6 U	5.2 U	22.3 J	0.6 U	0.6 U	0.8 U	0.8 U	0.9 U	5.2 U	7 J
Potassium	No MCL	5680	1,100	709 J	1,200	847 J	652 J	654 J	629 J	774 B	735 J	2,160	1,140 J
Selenium	50	3.9 K	2.8 K	2.4 U	2.6 U	2.2 U	2.4 UL	2.4 UL	2.7 U	2.2 UL	3 U	2.6 U	2.2 U
Sodium	No MCL	8570	6,600	5,150	10,000	11,100	9,130	9,380	9,540	9,040	8,620	7,020	7,600
Vanadium	No MCL	6.3 J	1.8 U	0.6 U	2	0.41 J	0.6 U	0.6 U	0.5 U	0.3 B	0.5 U	8.6	0.73 J
Zinc	No MCL	5.9 J	3.8 B	4.1 U	4 B	0.8 U	4.1 U	4.1 U	1.7 B	4.4 B	1.8 B	4.6 B	0.8 U
Wet Chemistry (MG/L)													
Nitrate/Nitrite	10	NA	1.8	NA	2	NA	NA	NA	NA	NA	NA	0.03	NA
Total dissolved solids (TDS)	No MCL	NA	250	NA	370	NA	NA	NA	NA	NA	NA	110	NA
Total suspended solids (TSS)	No MCL	NA	63	NA	530	NA	NA	NA	NA	NA	NA	190	NA

Notes:
Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
MCL = Federal Maximum Contaminant Level
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 6-4
Groundwater Analytical Detections at Site 7
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Yorktown-Eastover Aquifer**	Yorktown-Eastover							Yorktown-Eastover	
Station ID			YS07-GW003							YS07-GW004	
Sample ID			YS07-MW003-0904	YS07-MW003-0205	YS07-MW003P-0205	YS07-MW003-0505	YS07-MW003P-0505	YS07-MW003-0805	YS07-MW003P-0805	YS07-MW004-1094	YS07-MW004P-1094
Sample Date			09/22/04	02/11/05	02/11/05	05/05/05	05/05/05	08/04/05	08/04/05	10/08/94	10/08/94
Investigation			GW RI Data	LTM Data	LTM Data	LTM Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data
Chemical Name											
Volatile Organic Compounds (UG/L)											
1,1,1-Trichloroethane	200	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
1,1-Dichloroethane	No MCL	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
1,1-Dichloroethene	7	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
Methylene chloride	5	2 U	10 U	10 U	10 U	10 U	1 J	10 U	10 U	2 U	0.7 B
Toluene	1,000	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
Explosives (UG/L)											
2-Amino-4,6-dinitrotoluene	No MCL	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA
4-Amino-2,6-dinitrotoluene	No MCL	1 U	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U	1 U	1 U
HMX	No MCL	0.61 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	0.61 U	0.61 U
RDX	No MCL	0.59 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	0.59 U	0.59 U
Total Metals (UG/L)											
Aluminum	No MCL	1160	80.7 U	69.7 B	28.4 B	20.2 B	19.4 B	30.7 B	27.6 B	6,070 L	9,590 J
Antimony	6	12.4 U	1.9 U	2.1 B	2.1 U	1.8 B	1.3 U	3.7 U	3.7 U	14.4 K	12.2 U
Arsenic	10	3.5 J	2.1 U	2.1 U	2.1 U	1.6 U	1.6 U	3.7 U	3.7 U	14.3	15.9
Barium	2,000	43.6 J	25 J	21.9 B	20.4 B	30 B	30 B	27 J	25.9 J	51.6	62.6
Beryllium	4	0.2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.61	1 U
Calcium	No MCL	67100	97,600	111,000	108,000	109,000	110,000	103,000	99,700	131,000	153,000
Chromium	100	4.7 L	0.9 U	0.77 B	0.65 B	1.5 B	1.5 B	1.1 J	1.1 U	23.7 L	36.2
Cobalt	No MCL	2.1 U	0.5 U	1.4 J	1.1 J	1.6 B	1.4 B	1.2 J	1.1 U	5.3	7.8
Copper	1,300	4.5 J	0.93 J	0.4 U	0.4 U	1.3 B	0.96 B	0.8 U	0.8 U	8.5	9.8
Cyanide	200	5 U	4.5 J	1 B	0.8 U	0.8 U	0.8 U	2.8 U	2.8 U	5 U	5 U
Iron	No MCL	2350	139 B	255	171	211	214	177	153	20,100	29,600
Lead	15	1.5 U	1.1 UL	1.3 U	1.3 U	1.2 U	1.2 U	1.6 U	1.6 U	2.7 L	8.3 K
Magnesium	No MCL	3350 J	2,280 J	2,610 J	2,510 J	2,640 B	2,690 B	2,620 J	2,550 J	4,470	5,970
Manganese	No MCL	18.4	23.4	27.6	26.3	26.4	26.7	25.3 J	24.3 J	101	125
Nickel	No MCL	5.2 U	0.6 U	0.93 B	0.8 U	1.9 B	1.3 B	1.3 U	1.3 U	11.7	12
Potassium	No MCL	5510	910 J	896 J	843 J	1,040 B	1,180 B	1,020 J	997 J	5,280	6,950
Selenium	50	2.9 J	2.4 UL	2.7 U	2.7 U	2.2 U	2.2 U	4.5 U	4.5 U	2.4 UL	2.6 U
Sodium	No MCL	8300	6,810	7,670	7,340	7,930	8,070	7,700	7,380	4,710	5,330
Vanadium	No MCL	7.5 J	0.6 U	0.5 U	0.5 U	0.5 B	0.3 U	0.8 U	0.8 U	24.6	36.9
Zinc	No MCL	14.9 J	21.9	14.8 J	79.1	2.7 B	4 B	1.3 U	1.3 U	47.6 J	52.7 J
Dissolved Metals (UG/L)											
Aluminum	No MCL	146 J	80.7 U	13.5 U	13.5 U	11.4 U	11.4 U	11.7 U	19.4 B	11.5 U	11 U
Antimony	6	18.5 J	1.9 U	2.6 B	2.1 U	2.1 B	1.3 U	1.7 U	1.7 U	12.8	12.2 U
Arsenic	10	2.6 UL	2.1 U	2.1 U	2.1 U	1.6 U	1.6 U	1.9 U	1.9 U	2.3 UL	2.3 U
Barium	2,000	30.9 J	25.2 J	21.6 B	21.4 B	28.9 J	28.3 J	27.4 J	27.5 J	29.3	28.8
Calcium	No MCL	69800	99,200	110,000	111,000	106,000	103,000	101,000	101,000	62,000	63,100
Chromium	100	1.5 UL	0.9 U	0.6 U	0.6 U	1.3 B	2.7 B	1.2 J	1.8 J	1.5 U	1.8 U
Cobalt	No MCL	2.1 UL	0.82 J	0.6 U	0.6 U	0.4 U	0.4 U	0.82 J	0.69 J	2.1 U	1.9 U
Copper	1,300	4 J	0.6 U	0.4 U	0.4 U	1.3 B	1.3 B	0.5 U	0.5 U	1.1 U	2
Iron	No MCL	5.8 J	43 U	133	120	145	146	187	206	3.3 B	7 B
Magnesium	No MCL	3410 J	2,310 J	2,590 J	2,610 J	2,570 J	2,510 J	2,480 J	2,500 J	999	1,000
Manganese	No MCL	12.2 J	24.7	26.5	26.8	26.7	25.6	25	25.8	26.5	26.3
Mercury	2	0.2 UL	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.2 U	0.2 UL

TABLE 6-4
Groundwater Analytical Detections at Site 7
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Yorktown-Eastover Aquifer**	Yorktown-Eastover							Yorktown-Eastover	
Station ID			YS07-GW003							YS07-GW004	
Sample ID			YS07-MW003-0904	YS07-MW003-0205	YS07-MW003P-0205	YS07-MW003-0505	YS07-MW003P-0505	YS07-MW003-0805	YS07-MW003P-0805	YS07-MW004-1094	YS07-MW004P-1094
Sample Date			09/22/04	02/11/05	02/11/05	05/05/05	05/05/05	08/04/05	08/04/05	10/08/94	10/08/94
Investigation			GW RI Data	LTM Data	LTM Data	LTM Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data
Chemical Name											
Nickel	No MCL	5.2 U	0.6 U	0.8 U	0.8 U	1.8 B	2.8 B	8.3 J	4.7 J	5.2 U	4.3 U
Potassium	No MCL	5680	903 J	881 J	872 J	1,090 B	1,060 B	1,060 J	1,060 J	1,370	1,490
Selenium	50	3.9 K	2.4 UL	2.7 U	2.7 U	2.2 UL	2.2 UL	3 U	3 U	2.6 U	2.6 UL
Sodium	No MCL	8570	6,730	7,780	7,890	7,720	7,570	7,220	7,200	4,210	4,150
Vanadium	No MCL	6.3 J	0.6 U	0.5 U	0.5 U	0.3 U	0.3 U	0.5 U	0.5 U	1.8 U	1.4 U
Zinc	No MCL	5.9 J	22.5	16.4 J	18.1 J	4.5 B	6.9 B	2.1 B	3.2 B	4.8 B	5.3 B
Wet Chemistry (MG/L)											
Nitrate/Nitrite	10	NA	NA	NA	NA	NA	NA	NA	NA	0.05	0.04
Total dissolved solids (TDS)	No MCL	NA	NA	NA	NA	NA	NA	NA	NA	180	20
Total suspended solids (TSS)	No MCL	NA	NA	NA	NA	NA	NA	NA	NA	620	500

Notes:
Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
MCL = Federal Maximum Contaminant Level
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 6-5
Sediment Analytical Detections at Site 7
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	BTAG	BTAG	Lower	YS07-SD001						YS07-SD002						YS07-SD003	YS07-SD003		
Sample ID	Fresh	Marine	Brackish	YS07-SD001-0904	YS07-SD001P-0904	YS07-SD001-0205	YS07-SD001P-0205	YS07-SD001-0505	YS07-SD001-0805	YS07-SD002-0904	YS07-SD002-0205	YS07-SD002-0505	YS07-SD002P-0505	YS07-SD002-0805	YS07-SD002P-0805	YS07-SD003-0904	YS07-SD003-0205	YS07-SD003-0505	YS07-SD003-0805
Sample Date	7/06	8/06		09/22/04	09/22/04	02/11/05	02/11/05	05/03/05	08/02/05	09/22/04	02/11/05	05/03/05	05/03/05	08/02/05	08/02/05	09/22/04	02/11/05	05/03/05	08/02/05
Chemical Name																			
Volatile Organic Compounds (UG/KG)																			
1,1,1-Trichloroethane	30.2	856	30.2	53 UJ	43 U	34 U	34 U	36 U	36 U	43 U	45 U	24 U	28 U	37 U	33 U	43 U	37 U	42 U	50 U
2-Butanone	--	--	--	53 UJ	43 U	34 U	34 U	36 U	36 U	43 U	45 U	24 U	28 U	37 U	33 U	43 U	37 U	42 U	50 U
Acetone	--	--	--	110 J	100 B	34 UJ	34 UJ	28 J	32 B	80 B	45 UJ	23 J	28 U	72 B	63 B	120 B	37 UJ	48	130 B
Carbon disulfide	0.85	--	0.85	12 J	43 U	85	34 J	17 J	36 U	21 K	45 U	31	28 U	10 J	10 J	43 U	27 J	42 U	50 U
Chlorobenzene	8.42	162	8.42	53 UJ	43 UJ	34 U	34 U	36 UL	36 U	43 UJ	45 U	24 U	28 U	37 U	33 U	43 UJ	37 U	42 U	50 U
Methylene chloride	--	--	--	53 UJ	43 U	34 U	34 U	36 U	36 U	43 U	45 U	5 J	28 U	37 U	33 U	43 U	37 U	42 U	50 U
o-Xylene	25.2	--	25.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semi-volatile Organic Compounds (UG/KG)																			
Di-n-butylphthalate	6,470	1,160	1,160	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	420	--	420	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	180	182	180	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Explosives (UG/KG)																			
No Detections																			
Total Metals (MG/KG)																			
Aluminum	--	--	--	28,300	21,200	21,400	19,900	14,100	21,700	23,000	18,300	16,100	11,700	18,000	21,700	27,200	20,400	15,000	19,500
Arsenic	9.8	7.24	7.24	12.6	8.1 J	11.2	11.4	7.3	12.7	12.4	9.9	8.7	7.5	11.9	12.7	12	12.1	12.5	14.3
Barium	--	--	--	49.5 J	38.1 J	34.4 J	30.7 J	29.3 J	38.3 J	42.6 J	30 J	30.5 J	23.5 J	33.2 J	39.2 J	47.3 J	32.7 J	35 J	36.8 J
Beryllium	--	--	--	1.4 J	1.1 J	1.2 J	1.1 J	1 B	1.2 J	1.2 J	1.1 J	1.1 B	0.84 B	0.96 J	1.2 J	1.4 J	1.1 J	1.2 B	1.1 J
Calcium	--	--	--	4,720 J	4,050 J	4,140	3,410 J	3,870	3,490 J	7,360	5,660	1,920 J	2,700 J	4,080	2,710 J	4,030 J	3,750	8,330	4,340 J
Chromium	43.4	52.3	43.4	53.3	40.1	45.1	41.9	32.5	44.3	44.6	39.6	35.7	26.4	36.3	43.7	52.3	43.3	39.3	42.3
Cobalt	50	--	50	10.7 J	8 J	8.1 J	7.6 J	6.3 J	10 J	9.4 J	7.1 J	6.2 J	5 J	8.1 J	9.8 J	10.3 J	7.6 J	7.6 J	9.8 J
Copper	31.6	18.7	18.7	25.4 J	19.2 J	21.4	20 J	17.1 J	22.3	22.8	18.7 J	18.3	12.9 J	19	22.3	27.9	21.2	20.1 J	22.1 J
Cyanide	0.1	--	0.1	0.28 U	0.24 U	0.44 B	0.71 B	0.14 U	0.5 U	0.23 U	0.53 B	0.097 U	0.11 U	0.51 U	0.47 U	0.61 J	0.35 B	0.17 U	0.71 U
Iron	20,000	--	20,000	47,300	35,600	40,900	38,300	30,900	39,200	42,400	36,900	31,900	25,900	33,100	38,600	45,000	40,000	42,200	40,600
Lead	35.8	30.2	30.2	35.1	27.1	32.5	30	25.5 K	30.7 L	31.6	27.9	28 K	19 K	25 L	30.7 L	35.7	29.5	31.9 K	30.6 L
Magnesium	--	--	--	8,190	6,230	7,280	7,230	5,630	7,280 J	7,480	6,920	5,450	4,560	6,160 J	7,010 J	7,970	6,680	6,490	8,120 J
Manganese	460	--	460	425	318	332	357	236	340	370	298	235	205	292	327	362	415	336	335
Mercury	0.18	0.13	0.13	0.26 U	0.16 U	0.19 U	0.16 U	0.21 J	0.18 U	0.17 U	0.17 U	0.12 U	0.15 J	0.13 U	0.15 U	0.15 U	0.14 U	0.26 J	0.19 U
Nickel	22.7	15.9	15.9	22.6 J	17.5 J	19.8 J	19 J	14.9 J	20.6 J	19.2 J	17.4 J	16.5 J	11.9 J	16.6 J	20.4 J	22.8 J	19.6 J	17.3 J	19.4 J
Potassium	--	--	--	5,340 J	4,000 J	4,450 J	4,240 J	3,290 J	4,780 J	4,760 J	3,910 J	3,490 J	2,800 J	3,970 J	4,630 J	5,270 J	3,950 J	3,660 J	4,630 J
Selenium	2	--	2	2.5 J	2.4 J	3 J	2.5 J	1.5 U	3.2 U	3 J	2.2 U	1 U	1.2 U	3.2 U	2.8 U	3.1 J	3.3 J	1.8 U	4.3 U
Silver	1	0.73	0.73	1.1 B	0.74 B	0.62 U	0.68 U	0.41 U	0.94 U	0.8 B	0.67 U	0.28 U	0.33 U	0.92 U	0.81 U	1.2 B	0.58 U	0.5 U	1.3 U
Sodium	--	--	--	10,700 B	8,470 B	12,600	14,700	9,430 J	12,300	12,600 B	13,000	7,330 J	8,670 J	12,100	11,100	8,470 B	9,000	9,990 J	19,100
Vanadium	--	--	--	63.3	48.1	52.9	50.8	38.2	54.8	55.5	46.3	46.3	32.1	44	54.3	61.8	50.9	51.3	53.6
Zinc	121	124	121	149	112	128	124	104	134	142	117	101	78.6	111	128	157	132	128	139
Wet Chemistry (MG/KG)																			
Total organic carbon (TOC)	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

NA - Not analyzed

B - Analyte not detected above associated blank
J - Reported value is estimated
K - Reported value may be biased high
L - Reported value may be biased low
U - Analyte not detected
UJ - Analyte not detected, quantiation limit may be inaccurate or imprecise
UL - Analyte not detected, quantitation limit is probably higher

Exceeds one or more criteria

TABLE 6-5
Sediment Analytical Detections at Site 7
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS07-SD006		YS07-SD007		YS07-SD008		YS07-SD009			YS07-SD010	
Sample ID	YS07-SD006-A-0794	YS07-SD006-B-0794	YS07-SD007-A-0794	YS07-SD007-B-0794	YS07-SD008-A-0794	YS07-SD008-B-0794	YS07-SD009-A-0794	YS07-SD009-B-0794	YS07-SD009P-A-0794	YS07-SD010-A-0794	YS07-SD010-B-0794
Sample Date	07/23/94	07/23/94	07/25/94	07/25/94	07/23/94	07/23/94	07/23/94	07/23/94	07/23/94	07/23/94	07/23/94
Chemical Name											
Volatile Organic Compounds (UG/KG)											
1,1,1-Trichloroethane	37 U	31 UJ	42 U	28 U	43 U	24 U	38 U	29 U	34 U	37 U	28 J
2-Butanone	19 J	24 J	43 J	28 U	43 U	23 J	38 U	29 U	34 U	37 U	28 U
Acetone	130	180 J	300 J	25 J	95	130 J	38 U	29 U	26 J	87	160 J
Carbon disulfide	37 U	66 J	42 U	28 U	43 U	24 U	38 U	29 U	34 U	37 U	28 U
Chlorobenzene	37 U	31 UJ	42 U	28 UJ	43 U	24 U	38 UJ	29 U	34 U	26 J	28 U
Methylene chloride	67	31 U	42 U	28 U	43 U	24 U	38 U	27 J	34 U	37 U	28 U
o-Xylene	37 U	31 UJ	42 U	28 UJ	43 U	24 U	38 UJ	29 U	34 U	15 J	28 U
Semi-volatile Organic Compounds (UG/KG)											
Di-n-butylphthalate	1,100 U	1,100 U	1,100 U	1,000 U	2,700	850 U	1,000 U	890 UJ	1,200 U	1,300 U	970 U
Phenol	1,100 U	1,100 U	1,100 U	1,000 U	660 J	850 U	1,000 U	890 U	1,200 U	1,300 U	970 U
bis(2-Ethylhexyl)phthalate	1,100 U	360 J	1,100 U	1,000 U	1,100 U	850 U	1,000 U	890 UJ	1,200 U	1,300 U	970 U
Explosives (UG/KG)											
No Detections											
Total Metals (MG/KG)											
Aluminum	26,500	19,300	30,700	28,900	34,100	27,600	30,300	32,100	38,500	30,800	31,800
Arsenic	11.4 L	11.5	9.7	13.3	11.8	10.6	10.5	8.9	9.3	9.1	10.4
Barium	49.7	36.1	56.6	50.9	62.6	50.2	54.8	56.7	70.9	55.3	55.9
Beryllium	1.5	1.1	1.5	1.3	1.6	1.3	1.3	1.4	1.6	1.4	1.4
Calcium	4,100	3,190	4,100	3,100	3,600	2,850	2,970	2,690	2,900	2,920	2,610
Chromium	52.2	42.5	58.8	52.3	61.5	51.1	56.1	53.3	59.8	54.3	53.6
Cobalt	9.9	7.9	11.5	10.8	10.1	10.5	9.5	9.7	9.7	9.6	9.3
Copper	25.2	21.4	25.6	23.8	26.8	23.6	23	22.1	22.7	22.4	21.9
Cyanide	1.9 U	1.6 U	2 U	1.4 U	2.1 U	1.2 U	1.9 U	1.5 U	1.7 U	1.8 U	1.4 U
Iron	43,100	40,300	43,000	45,500	42,900	39,100	39,600	36,800	39,700	39,400	37,600
Lead	30.7 L	34.8 L	38.2 L	36.5 L	32.4 L	32 L	32.8 L	32 L	30 L	26.2 L	29.4 L
Magnesium	8,720	6,850	9,060	7,890	9,890	7,840	8,900	8,160	9,000	8,630	7,790
Manganese	385	322	309	307	297	252	274	252	267	277	283
Mercury	0.17 UL	0.16 UL	0.19 UL	0.15 L	0.2 UL	0.12 UL	0.17 UL	0.15 UL	0.17 UL	0.18 UL	0.13 UL
Nickel	28.5	31.6	29.6	31.9	40.9	33.4	28.5	37.9	34.2	30.4	28.8
Potassium	5,850	4,330	5,500	5,180	5,590	4,900	5,850	5,360	6,320	5,550	5,380
Selenium	0.84 L	0.63 UL	0.81 UL	0.56 UL	0.86 UL	0.49 UL	0.86 L	0.66 L	0.97 L	0.73 UL	0.63 L
Silver	3.1	2.5 U	3.3 U	2.4	3.4 U	1.9 U	3 U	2.4 U	2.8 U	2.9 U	2.2 U
Sodium	12,700	9,620	15,200	8,630	17,800	9,080	15,400	11,100	13,400	14,100	9,210
Vanadium	62.9	52.1	63.5	65.8	69.2	61.4	64.7	67.6	71.2	63	63
Zinc	153	131	153	146	154	139	144	136	144	143	133
Wet Chemistry (MG/KG)											
Total organic carbon (TOC)	45,900	70,300	46,500	41,000	28,900	24,700	27,800	25,300	NA	28,700	26,200
pH	6.6	7.68	7.23	7.55	7.52	7.93	7.29	8.18	7.28	7.5	7.96

Notes:

NA - Not analyzed

B - Analyte not detected above associated blank
J - Reported value is estimated
K - Reported value may be biased high
L - Reported value may be biased low
U - Analyte not detected
UJ - Analyte not detected, quantiation limit may be inaccurate or imprecise
UL - Analyte not detected, quantitation limit is probably higher

Exceeds one or more criteria

TABLE 6-6
Surface Water Analytical Detections at Site 7
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS07-SW001						YS07-SW002					
Sample ID	YS07-SW001-0904	YS07-SW001P-0904	YS07-SW001-0205	YS07-SW001P-0205	YS07-SW001-0505	YS07-SW001-0805	YS07-SW002-0904	YS07-SW002-0205	YS07-SW002-0505	YS07-SW002P-0505	YS07-SW002-0805	YS07-SW002P-0805
Sample Date	09/22/04	09/22/04	02/11/05	02/11/05	05/03/05	08/02/05	09/22/04	02/11/05	05/03/05	05/03/05	08/02/05	08/02/05
Chemical Name												
Volatile Organic Compounds (UG/L)												
Methylene chloride	10 U	10 U	10 U	10 U	1 J	3 B	10 U	10 U	2 J	1 J	3 B	3 B
Toluene	10 U	10 U	1 J	2 J	10 U	10 U	10 U	1 J	10 U	10 U	10 U	10 U
Total Metals (UG/L)												
Aluminum	235	271	474	426	466	1,160 J	748	967	441	450	399 J	352 J
Antimony	3.4 B	1.9 U	2.1 U	2.1 U	1.3 U	3.9 J	1.9 B	2.1 U	1.3 U	1.3 U	3.7 U	3.7 U
Arsenic	2.1 U	2.1 U	2.1 U	2.1 U	1.6 U	5.7 J	2.1 U	2.1 U	1.6 U	1.6 U	4.4 J	6.9 J
Barium	14.1 J	13.5 J	7.7 B	7.6 B	16.7 B	33.2 J	15 J	10 B	16.1 B	16.4 B	36.2 J	35.6 J
Calcium	108,000	105,000	119,000	122,000	117,000	160,000	106,000	124,000	114,000	117,000	171,000	172,000
Chromium	0.9 U	0.9 U	0.97 B	0.76 B	0.89 B	1.5 J	1.9 B	1.9 B	1.3 B	0.8 U	1.1 U	1.1 U
Copper	0.6 U	0.6 U	0.4 U	0.4 U	1.6 B	0.91 J	1 B	0.81 J	0.95 B	0.86 B	0.8 U	0.8 U
Cyanide	1.1 U	1.1 U	0.8 U	0.8 U	0.8 U	2.8 U	1.1 U	0.8 U	0.8 U	0.8 U	2.8 U	2.8 U
Iron	633	669	848	801	1,230	1,740 J	1,610	1,730	1,170	1,160	625 J	633 J
Lead	1.1 U	1.1 U	1.3 U	1.3 U	1.2 U	1.6 U	1.7 J	1.9 J	1.2 U	1.2 U	1.6 U	1.6 U
Magnesium	24,800	24,200	58,200	59,400	30,200	323,000	26,600	85,700	32,200	32,900	417,000	420,000
Manganese	76.7	74.9	59.3	59.4	60.1	340	89.7	73.1	60	61	372	373
Nickel	1 B	0.81 B	0.8 U	0.8 U	0.8 U	1.7 J	1.5 B	1.1 B	0.8 U	0.8 U	1.3 U	1.3 U
Potassium	9,390 J	9,240 J	20,200	20,300	11,000	174,000 J	10,200 J	31,800	11,900	12,300	241,000 J	242,000 J
Selenium	2.4 U	2.4 U	2.7 U	2.7 U	2.2 UN	4.5 U	2.4 U	2.7 U	2.2 UN	2.2 UN	4.5 U	4.5 U
Sodium	194,000	191,000	473,000	492,000	246,000	3,010,000	199,000	713,000	262,000	273,000	3,880,000	3,940,000
Thallium	3.3 J	2.8 U	3 UL	3 UL	2.8 U	4 U	2.8 U	3 UL	2.8 U	2.8 U	4 U	4 U
Vanadium	1.5 J	1.6 J	1.7 J	1.8 J	2.2 B	5.2 J	2.8 J	3.1 J	2 B	1.7 B	2.9 J	3 J
Zinc	4.1 U	4.1 U	1.9 B	1.8 B	3.4 B	1.3 U	5.3 J	3.5 B	2.9 B	3.7 B	1.3 U	1.3 U
Dissolved Metals (UG/L)												
Aluminum	80.7 U	80.7 U	13.5 U	13.5 U	23.5 B	40.6 B	80.7 U	13.5 U	11.4 U	11.4 U	40.6 B	47.1 B
Arsenic	2.1 U	2.1 U	2.1 U	2.1 U	1.6 U	2.9 J	2.1 U	2.1 U	1.6 U	1.6 U	2.5 J	4.2 J
Barium	13.8 J	12.7 J	6.5 B	6.2 B	14.3 J	27.7 J	12.1 J	6.7 B	14.3 J	13.7 J	34.4 J	34.2 J
Calcium	112,000	108,000	124,000	121,000	111,000	151,000	105,000	122,000	115,000	110,000	172,000	173,000
Chromium	0.9 U	0.9 U	0.6 U	0.6 U	2.9 B	0.6 U	0.9 U	0.6 U	0.8 U	0.8 U	0.6 U	0.6 U
Cobalt	0.5 U	0.5 U	0.6 U	0.6 U	1.9 B	0.6 U	0.78 J	0.6 U	1.4 B	0.4 U	0.6 U	0.93 J
Copper	0.6 U	0.6 U	0.4 U	0.4 U	1.4 B	0.5 U	0.6 U	0.4 U	1.1 B	1.1 B	0.5 U	0.5 U
Iron	43 U	43 U	11.2 U	11.2 U	10 U	13.1 U	43 U	11.2 U	10 U	10 U	13.1 U	20.8 J
Magnesium	25,900	24,700	62,000	60,300	28,700	305,000	26,800	80,600	32,200	30,800	443,000	447,000
Manganese	74.6	72.2	54	53.9	50.6	273	75.9	57.1	53.3	49.1	349	353
Nickel	0.6 U	0.6 U	0.8 U	0.8 U	2.9 B	0.93 J	0.6 U	0.8 U	0.8 U	0.8 U	0.9 U	1.2 J
Potassium	9,440 J	9,020 J	21,200	21,100	11,100	143,000	9,790 J	29,400	14,200	12,100	213,000	216,000
Selenium	2.4 UL	2.4 UL	2.7 U	2.7 U	2.2 UL	29.5 K	2.4 UL	2.7 U	2.2 UL	2.2 UL	38.9 K	39.1 K
Sodium	195,000	187,000	503,000	514,000	233,000	2,950,000	200,000	670,000	262,000	253,000	4,040,000	4,180,000
Vanadium	1.3 J	1 J	0.73 J	0.59 J	1.3 B	2.6 J	1.3 J	0.75 J	1.2 B	0.84 B	1.9 J	2.1 J
Zinc	4.1 U	4.1 U	1.2 U	1.2 U	4.8 B	0.5 U	4.1 U	1.2 U	4.3 B	2.1 B	0.5 U	0.5 U
Wet Chemistry (MG/L)												
Hardness	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Shaded values indicate the analyte was detected
MG/L = Milligrams per Liter
UG/L = Micrograms per Liter
NA = Not analyzed
J = Analyte present. Reported value may or may not be accurate or precise
U = Not detected
B = Not detected substantially above the level reported in laboratory or field blanks
R = Unreliable result
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 6-6
Surface Water Analytical Detections at Site 7
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS07-SW003		YS07-SW003		YS07-SW006	YS07-SW007	YS07-SW008	YS07-SW009		YS07-SW010	
Sample ID	YS07-SW003-0904	YS07-SW003-0205	YS07-SW003-0505	YS07-SW003-0805	YS07-SW006-0794	YS07-SW007-0794	YS07-SW008-0794	YS07-SW009-0794	YS07-SW009P-0794	YS07-SW010-A-0794	YS07-SW010-B-0794
Sample Date	09/22/04	02/11/05	05/03/05	08/02/05	07/25/94	07/25/94	07/25/94	07/21/94	07/21/94	07/21/94	07/21/94
Chemical Name											
Volatile Organic Compounds (UG/L)											
Methylene chloride	10 U	10 U	2 J	2 B	10 U	10 U	10 U	2 U	2 U	2 U	2 U
Toluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U	1 U	1 U
Total Metals (UG/L)											
Aluminum	937	426	519	485 J	965	841	1,460	562 J	750 J	433 J	910 J
Antimony	1.9 U	2.1 U	1.3 U	3.7 U	37 U	37 U	37 U	37 UL	37 UL	37 UL	37 UL
Arsenic	2.1 U	2.1 U	1.6 U	3.7 U	2.2 L	1.4 L	2.3 L	1.3 L	2.1 L	1 L	1.9 L
Barium	15.3 J	11 B	16.6 B	36.2 J	36.6	34.5	35.7	36.6	37.1	36.2	35.9
Calcium	106,000	129,000	116,000	171,000	175,000	175,000	179,000	165,000 J	164,000 J	161,000 J	177,000 J
Chromium	1.8 B	0.6 U	0.97 B	1.1 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Copper	0.9 B	0.4 U	1.2 B	0.8 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Cyanide	1.1 U	0.8 U	191	2.8 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Iron	1,740	528	1,320	791 J	1,250	1,090	1,870	951 J	1,120 J	810 J	1,450 J
Lead	1.1 U	1.3 U	1.2 U	1.6 UL	1 UL	1 UL	1 UL	1 L	1.2 L	1.2 L	1.2 L
Magnesium	30,800	133,000	36,400	437,000	544,000	543,000	561,000	479,000	473,000	465,000	542,000
Manganese	99.7	61	64.4	377	87.5	83.6	79.7	151 J	160 J	149 J	124 J
Nickel	1.5 B	0.8 U	0.8 U	1.3 U	36.5	16 U	16 U	16 U	16 U	21.2 K	16 U
Potassium	12,100 J	54,300	13,400	251,000 J	180,000	178,000	184,000	157,000	154,000	151,000	177,000
Selenium	2.4 U	2.7 U	2.2 UN	4.5 U	10 UL	1 UL	5 UL	1 UL	1.3 L	1 UL	1 UL
Sodium	199,000	1,130,000	301,000	4,080,000	5,350,000	5,410,000	5,600,000	4,140,000	4,130,000	4,000,000	4,650,000
Thallium	2.8 U	3 UL	2.8 U	4 U	10 R	10 R	10 R	5 R	10 R	10 R	10 R
Vanadium	3.2 J	1.6 J	2.5 B	3.2 J	5.3	4.6	4.3	4	4 U	4 U	4 U
Zinc	5.3 J	1.2 U	3.4 B	1.3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Dissolved Metals (UG/L)											
Aluminum	80.7 U	13.5 U	17.7 B	279 B	56.7	53.5	26.6	18	21.2 J	18 U	26.6 J
Arsenic	2.1 U	2.1 U	1.6 U	4 J	1.3	1.8	10 UL	1 UL	1 UL	1 UL	1 UL
Barium	11.1 J	9.4 B	14.2 J	34.9 J	31.7	31.4	31.7	34.6	32.8	34.4	33
Calcium	106,000	131,000	111,000	169,000	170,000	166,000	172,000	157,000 J	158,000 J	161,000 J	173,000 J
Chromium	0.9 U	0.6 U	2.3 B	0.66 J	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Cobalt	4.2 J	0.6 U	0.4 U	0.88 J	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Copper	0.6 U	0.4 U	1.1 B	0.5 U	8.7	11.8	9.7	8.6	6.9	6.7	7.9
Iron	43 U	11.2 U	10 U	363	43.2	36.9	34.5	6.8 J	7.8 J	5.8 J	6.2 J
Magnesium	30,900	128,000	34,700	457,000	524,000	511,000	533,000	459,000	460,000	466,000	535,000
Manganese	80	57.9	52	350	35.2	35.4	27.2	93.3 J	94.6 J	93.3 J	55.4 J
Nickel	0.6 U	0.8 U	2 B	1 J	16 U	16.2	16 U	16 U	31.2 K	17.4 K	33.4 K
Potassium	11,500 J	51,100	13,600	220,000	172,000	167,000	175,000	150,000	150,000	153,000	175,000
Selenium	2.4 UL	2.7 U	2.2 UL	41.2 K	5 UL	10.8	5 UL	1.1 L	1.1 L	1.6 L	1.6 L
Sodium	199,000	1,100,000	292,000	4,260,000	5,020,000	5,140,000	5,180,000	3,920,000	4,100,000	4,040,000	4,610,000
Vanadium	2.2 J	0.51 J	0.98 B	2.5 J	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Zinc	4.1 U	1.2 U	4.4 B	0.5 U	3 U	6.3	3.1	3 U	3 U	3 U	3 U
Wet Chemistry (MG/L)											
Hardness	NA	NA	NA	NA	3,200	3,500	3,600	28,800	NA	2,800	3,200
Total organic carbon (TOC)	NA	NA	NA	NA	7.03	5.01	4.88	4.98	5.45	5.78	5.01

Notes:

Shaded values indicate the analyte was detected
MG/L = Milligrams per Liter
UG/L = Micrograms per Liter
NA = Not analyzed
J = Analyte present. Reported value may or may not be accurate or precise
U = Not detected
B = Not detected substantially above the level reported in laboratory or field blanks
R = Unreliable result
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 6-7
Summary of Groundwater Sample Analyses at Site 7
Phase I Groundwater Remedial Investigation for Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Medium	Sample ID	Analysis				QA/QC Samples	
				TAL Inorganics			
		TCL Organics	Nitramine Compounds	Total	Dissolved	Duplicate	MS/MSD
Site 7 Groundwater	7GW01-001		X	X	X		
	7GW02-001[(1)]	X	X	X	X		
	7GW03-001[(1)]	X	X	X	X		

Notes:
- Field measurements of groundwater included pH, specific conductivity, temperature, and turbidity.
- TCL organics analysis included VOCs, SVOCs, and Pesticides/PCBs.
- TAL inorganics analysis included cyanide analysis.
- MS/MSD = Matrix Spike/Matrix Spike Duplicate

[(1)]Monitoring well sampled for VOCs only under the Long-Term Monitoring program for Sites 1, 3, and 7.

TABLE 6-8
Summary of Groundwater Field Parameters at Site 7
Phase I Groundwater Remedial Investigation for Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Well No.	pH(1)	Specific Conductance at 25°C(2) (µmhos/cm)	Temperature(2) (°C)	Turbidity(3) (NTUs)	Gallons Purged	Date
7GW01	6.75	677	18.14	5.9	2.7	09/17/2004
	6.81	549	17.59	4.01	5.4	
	6.69	546	17.45	4.21	8.1	
7GW02	6.51	928	17.03	9.52	2.25	09/20/2004
	6.71	839	16.71	10.84	4.5	
	6.82	709	16.94	11.6	6.75	
7GW03	6.51	928	17.03	9.52	2.25	09/20/2004
	6.71	839	16.71	10.84	4.5	
	6.82	709	16.94	11.6	6.75	

Notes:

-1 pH measured using an Orion pH meter, Model No. 290A.
-2 Specific conductance and temperature measured using YSI conductivity meter, Model No. 335 CT.
-3 Turbidity measured using a Lamotte 2020 meter.
-4 Well purged dry immediately; sample collected after recharge.
-5 Monitoring well 6GW05B replaced monitoring well 6GW05.
-6 Well pumped dry before any readings collected; sample collected after recharge.
-- No measurement
NTU Nephelometric Turbidity Unit

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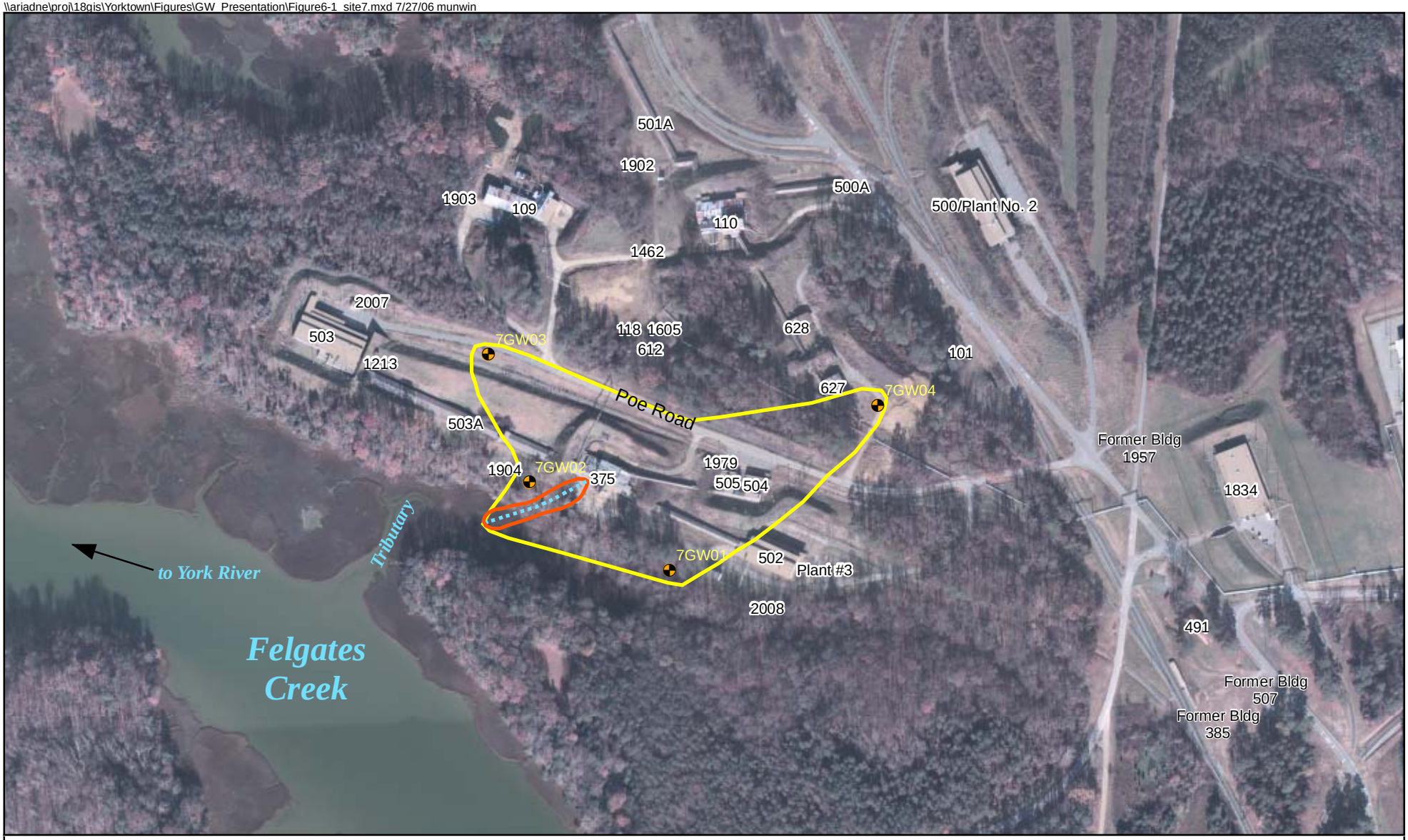

Legend

- Yorktown-Eastover Monitoring Wells
- Study Area Boundary
- Drainage
- Area of Excavation of Nitroamine / Nitroaromatic Compounds of Contaminated Soil

N
W E
S

0 200 400
Feet

Figure 6-1
Site 7 Layout
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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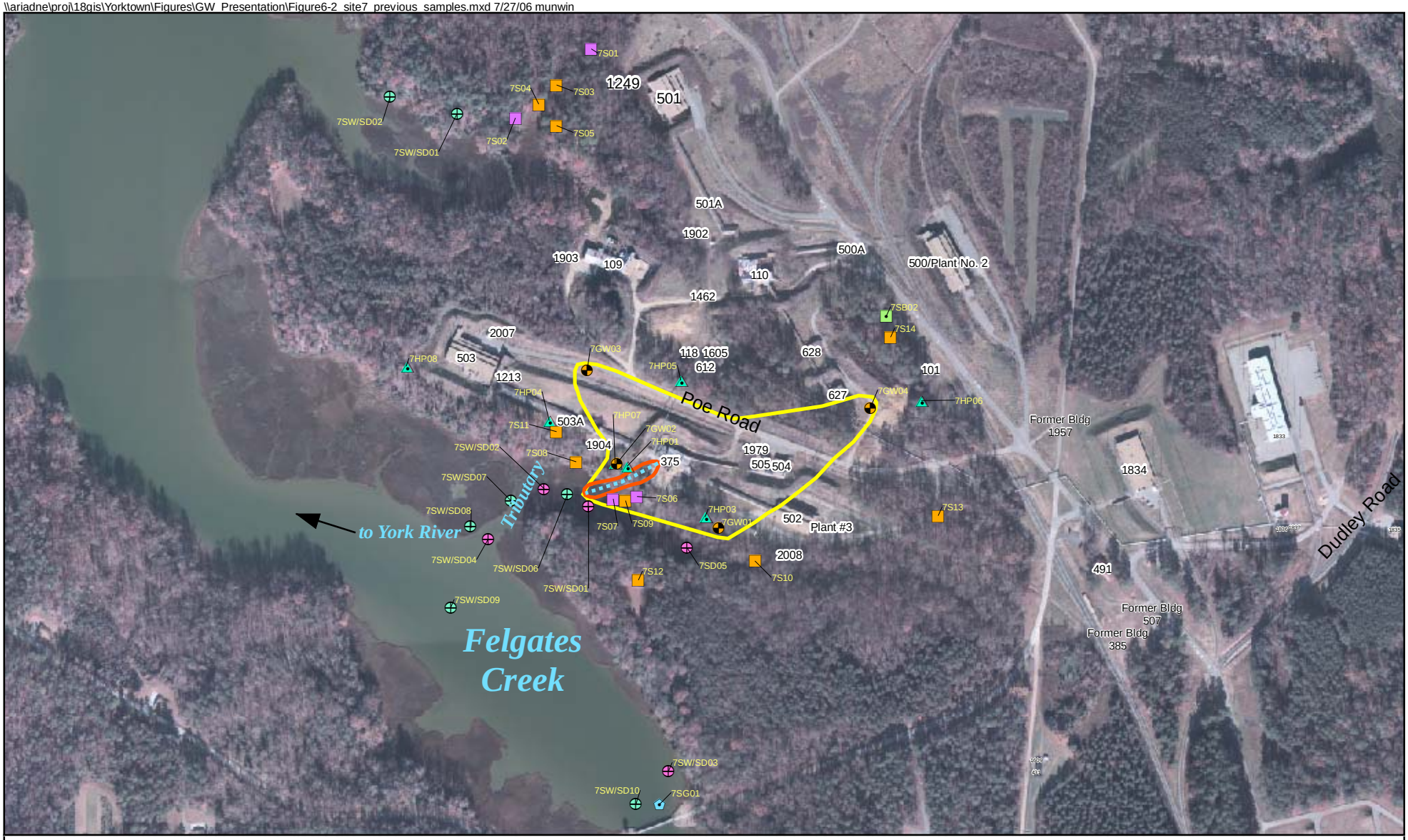

Legend

- Round 2 Soil Boring Location
- Round 2 Staff Gauge Location
- Round 1 Surface Soil Sampling Location
- Round 2 Surface Soil Sampling Location
- Round 1 Surface Water/Sediment Sampling Location
- Round 2 Surface Water/Sediment Sampling Location
- Study Area Boundary
- Drainage
- Area of Excavation of Nitroamine / Nitroaromatic Compounds of Contaminated Soil
- Yorktown Monitoring Wells
- Hydropunch Sampling Locations

N
W E
S

0 275 550
Feet

Figure 6-2
Previous Investigations Sampling Locations at Site 7
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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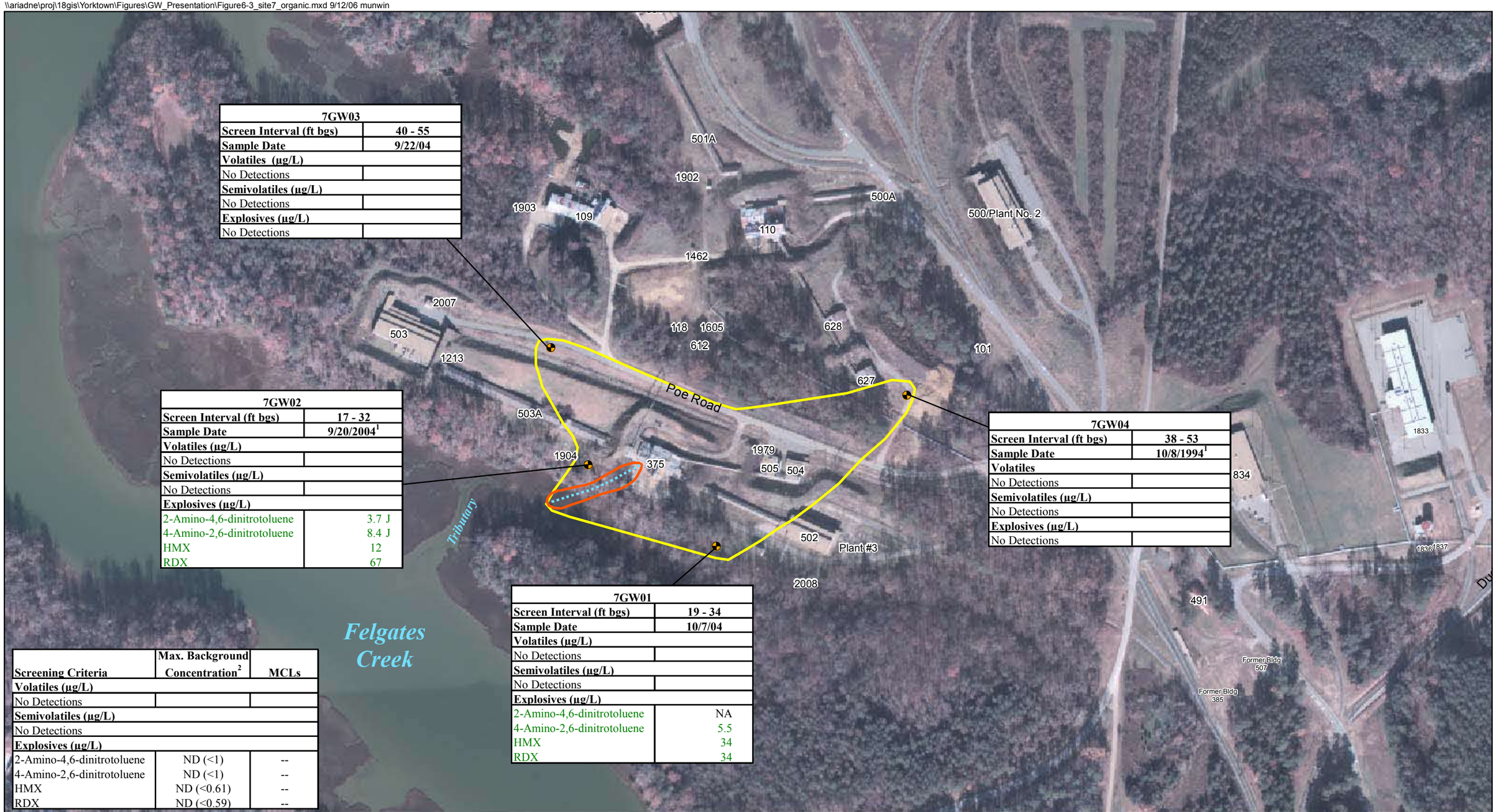

7GW03	
Screen Interval (ft bgs)	**40 - 55**
Sample Date	**9/22/04**
Volatiles (µg/L)	
No Detections	
Semivolatiles (µg/L)	
No Detections	
Explosives (µg/L)	
No Detections	

7GW02	
Screen Interval (ft bgs)	**17 - 32**
Sample Date	**9/20/2004[1]**
Volatiles (µg/L)	
No Detections	
Semivolatiles (µg/L)	
No Detections	
Explosives (µg/L)	
2-Amino-4,6-dinitrotoluene	3.7 J
4-Amino-2,6-dinitrotoluene	8.4 J
HMX	12
RDX	67

7GW04	
Screen Interval (ft bgs)	**38 - 53**
Sample Date	**10/8/1994[1]**
Volatiles	
No Detections	
Semivolatiles (µg/L)	
No Detections	
Explosives (µg/L)	
No Detections	

7GW01	
Screen Interval (ft bgs)	**19 - 34**
Sample Date	**10/7/04**
Volatiles (µg/L)	
No Detections	
Semivolatiles (µg/L)	
No Detections	
Explosives (µg/L)	
2-Amino-4,6-dinitrotoluene	NA
4-Amino-2,6-dinitrotoluene	5.5
HMX	34
RDX	34

Screening Criteria	Max. Background Concentration[2]	MCLs
Volatiles (µg/L)		
No Detections		
Semivolatiles (µg/L)		
No Detections		
Explosives (µg/L)		
2-Amino-4,6-dinitrotoluene	ND (<1)	--
4-Amino-2,6-dinitrotoluene	ND (<1)	--
HMX	ND (<0.61)	--
RDX	ND (<0.59)	--

Legend

- Yorktown-Eastover Monitoring Wells
- Study Area Boundary
- Drainage
- Area of Excavation of Nitroamine / Nitroaromatic Compounds of Contaminated Soil

Notes:
Contaminants shaded green exceed Background concentrations.
[1]Duplicate sample taken at this location, most conservative value reported.
[2]Background values are maximum detected values in respective aquifer from Baker (1995) Background Report.
µg/L = micrograms per liter
J = Value is estimated.
MCL = Federal Maximum Contaminant Level

N
W E
S

0 300 600
Feet

Figure 6-3
Organic Exceedances of Background and/or MCLs
in the Yorktown-Eastover Aquifer at Site 7
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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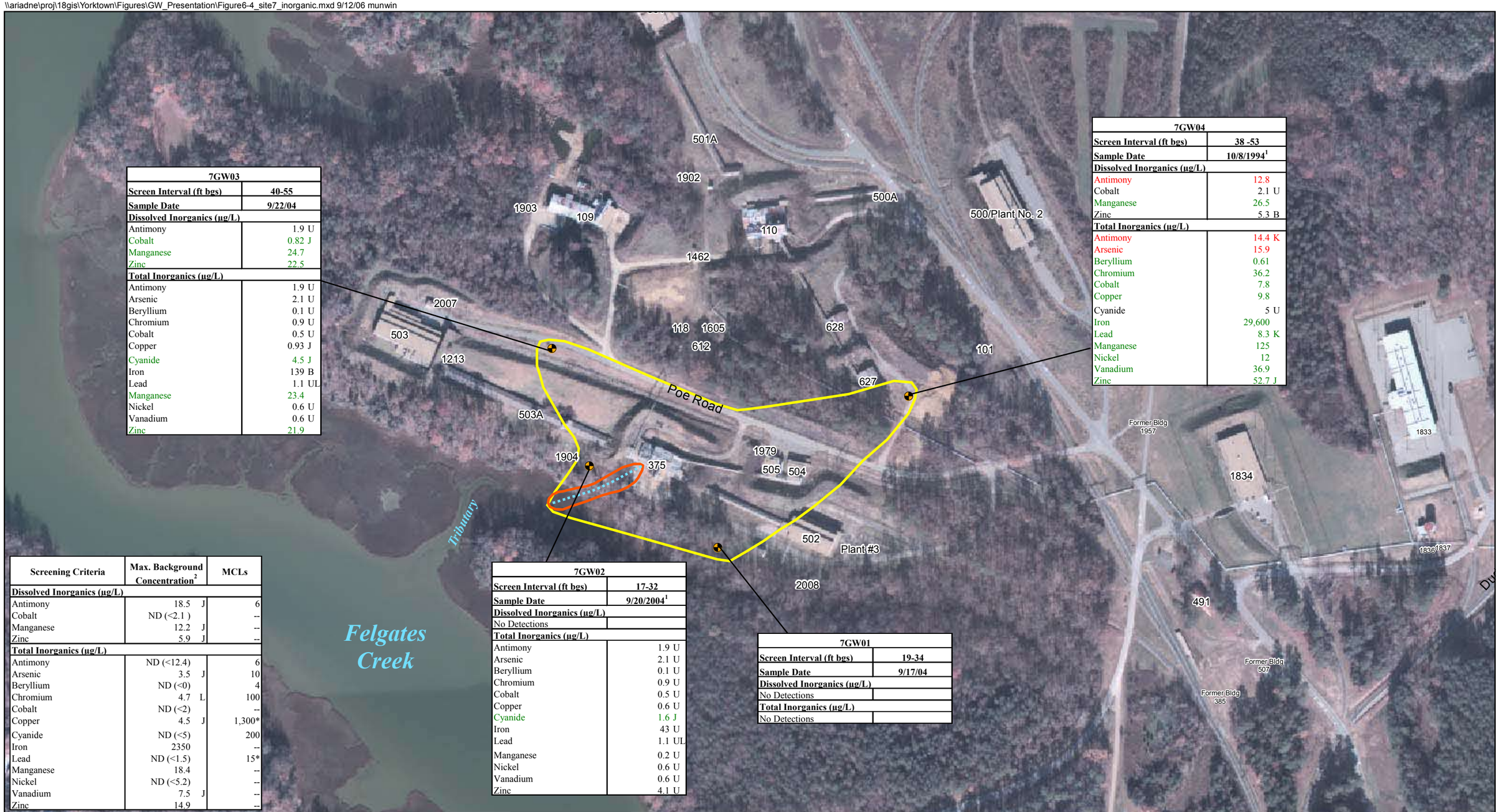

7GW03	
Screen Interval (ft bgs)	**40-55**
Sample Date	**9/22/04**
Dissolved Inorganics (µg/L)	
Antimony	1.9 U
Cobalt	0.82 J
Manganese	24.7
Zinc	22.5
Total Inorganics (µg/L)	
Antimony	1.9 U
Arsenic	2.1 U
Beryllium	0.1 U
Chromium	0.9 U
Cobalt	0.5 U
Copper	0.93 J
Cyanide	4.5 J
Iron	139 B
Lead	1.1 UL
Manganese	23.4
Nickel	0.6 U
Vanadium	0.6 U
Zinc	21.9

7GW04	
Screen Interval (ft bgs)	**38 -53**
Sample Date	**10/8/1994[1]**
Dissolved Inorganics (µg/L)	
Antimony	12.8
Cobalt	2.1 U
Manganese	26.5
Zinc	5.3 B
Total Inorganics (µg/L)	
Antimony	14.4 K
Arsenic	15.9
Beryllium	0.61
Chromium	36.2
Cobalt	7.8
Copper	9.8
Cyanide	5 U
Iron	29,600
Lead	8.3 K
Manganese	125
Nickel	12
Vanadium	36.9
Zinc	52.7 J

7GW02	
Screen Interval (ft bgs)	**17-32**
Sample Date	**9/20/2004[1]**
Dissolved Inorganics (µg/L)	
No Detections	
Total Inorganics (µg/L)	
Antimony	1.9 U
Arsenic	2.1 U
Beryllium	0.1 U
Chromium	0.9 U
Cobalt	0.5 U
Copper	0.6 U
Cyanide	1.6 J
Iron	43 U
Lead	1.1 UL
Manganese	0.2 U
Nickel	0.6 U
Vanadium	0.6 U
Zinc	4.1 U

7GW01	
Screen Interval (ft bgs)	**19-34**
Sample Date	**9/17/04**
Dissolved Inorganics (µg/L)	
No Detections	
Total Inorganics (µg/L)	
No Detections	

Screening Criteria	Max. Background Concentration[2]	MCLs
Dissolved Inorganics (µg/L)		
Antimony	18.5 J	6
Cobalt	ND (<2.1)	--
Manganese	12.2 J	--
Zinc	5.9 J	--
Total Inorganics (µg/L)		
Antimony	ND (<12.4)	6
Arsenic	3.5 J	10
Beryllium	ND (<0)	4
Chromium	4.7 L	100
Cobalt	ND (<2)	--
Copper	4.5 J	1,300*
Cyanide	ND (<5)	200
Iron	2350	--
Lead	ND (<1.5)	15*
Manganese	18.4	--
Nickel	ND (<5.2)	--
Vanadium	7.5 J	--
Zinc	14.9	--

Legend

- Yorktown-Eastover Monitoring Wells
- Study Area Boundary
- Drainage
- Area of Excavation of Nitroamine / Nitroaromatic Compounds of Contaminated Soil

Notes:
Contaminants shaded green exceed Background concentrations.
Contaminants shaded red exceed Federal MCLs and Background.
Essential nutrients are not shown.
[1]Duplicate sample taken at this location, most conservative value reported.
[2]Background values are maximum detected values in respective aquifer from Baker (1995) Background Report.
*Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10% of tap water samples exceed the action level, water systems must take additional steps. For copper, the action level is 1.3 mg/L, and for lead is 0.015 mg/L.
µg/L = micrograms per liter
B = Value may be associated with laboratory or field blank contaminantion. B-flagged values are generally considered non-detects; however, the B-flagged values from the 2004 groundwater data set may be erroneously B-flagged due to potentially incorrect field and equipment blank collection procedures.
J = Value is estimated.
K = Value may be biased high.
MCL = Federal Maximum Contaminant Level
U = Not detected above associated detection limit.

N
W E
S

0 300 600
Feet

Figure 6-4
Inorganic Exceedances of Background and/or MCLs
in the Yorktown-Eastover Aquifer at Site 7
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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SECTION 7

Site 11 Summary and Investigation Results

7.1 Site 11 Background and Physical Characteristics

7.1.1 Site 11 History and Physical Setting

Site 11, Abandoned Explosives Burning Pits, is a 0.5-acre-area located east of Main Road and south of Dudley Road, north of a steep ravine which leads to Indian Field Creek (Figure 7-1). Wastes disposed at this site from 1930 to 1950 included residuals from waste solid explosives (e.g., TNT, RDX, and HMX), explosive contaminated sludges, and packaging contaminated with explosives, which were placed in pits and ignited. The intent of the disposal operations was to burn all of the waste residue so that no solid wastes remained in the pits. However, investigation results indicated that soil and groundwater were affected by site operations. It is assumed that approximately 200 pounds of residual explosives may have been deposited at the site after 20 years of burning disposal activities according to the *IAS of Naval Weapons Station Yorktown* (NEESA, 1984).

Remedial actions for soil included the excavation of approximately 45 cubic yards of copper and mercury contaminated soil to a depth of 2 feet in August 2000. Confirmation sample results indicated that all soil concentrations were below the remediation cleanup levels for the inorganic contaminants. No unacceptable human health risks were identified in soil for Site 11 and the remedial action mitigated the potential unacceptable ecological risks related to site soils.

7.1.2 Site 11 Geology and Hydrogeology

Site 11 is located on the Croaker Flat Terrace within the Virginia Coastal Plain Physiographic Province. Descriptions of the lithologic units present at Site 11 are included in Section 2.2.

Construction details for Site 11 wells are provided in Table 7-1. Boring logs are included in Appendix A. Cross-sections depicting the subsurface geologic conditions for Sites 11 and 17 are presented in Appendix F. The surficial aquifer at Site 11 is the Columbia aquifer. Three of the four monitoring wells at Site 11 (11GW03, 11GW09, and 11GW11) are screened in the Columbia aquifer. The Yorktown Confining unit underlies the Columbia aquifer at Site 11 and extends across the entire are of the site. The top of the Yorktown confining unit was encountered during RI activities at approximately 25- to 31-ft amsl. At Site 11, only one monitoring well (11GW11A) penetrates the clayey confining unit into the Yorktown-Eastover aquifer. The top of this unit was noted at approximately 1-foot msl.

Site 11 is located topographically above a drainage channel (i.e., unnamed tributary) that runs from west to east to the Indian Field Creek floodplain (Figure 7-2). Surface water drains toward the creek to the east through the tributary, with remaining surface water recharging the surficial Columbia aquifer. Within Site 11, the unnamed tributary is no more

than 2 feet deep and is only wet following storm events (groundwater does not recharge the tributary).

Groundwater elevations were collected during field Phase I Groundwater RI field investigations, from wells at Site 11 (Table 7-2). Figure 4-3 presents estimated water level contours for the Columbia aquifer at Sites 11 and 17 and vicinity, while Figure 4-4 presents the estimated piezometric surface of the Yorktown-Eastover aquifer. Figure 4-3 shows that groundwater in the unconfined Columbia aquifer flows from Sites 11 generally toward the east to Indian Field Creek as well as south toward the unnamed tributary of Indian Field Creek. Figure 4-4 shows that groundwater in the upper portion of the Yorktown-Eastover aquifer flows east from Sites 11 and 17 toward Indian Field Creek.

Slug test data collected during the RI indicate that the horizontal hydraulic conductivity of the Columbia aquifer in the vicinity of Site 11 were between 1.7 ft/day and 21 ft/day. The hydraulic conductivity of the Yorktown-Eastover aquifer at Site 11 was determined to be approximately 0.43 ft/day.

7.2 Previous Investigations

7.2.1 Initial Assessment Study (1984)

The IAS at WPNSTA Yorktown was conducted to identify and assess sites posing a potential threat to human health and the environment because of contamination from prior waste management activities. This effort was documented in the *Initial Assessment Study (IAS) of Naval Weapons Station Yorktown, Virginia (NEESA, 1984)*. Based upon their previous use for the disposal of explosives, Site 11 was identified for further evaluation. Activity records relating to waste generation, handling and disposal were reviewed; physical conditions at the site were characterized; and migration pathways and potential receptors were identified. The results of the data evaluation were used to develop recommendations concerning the need for a confirmation study at Site 11. The IAS concluded that because migration pathways to groundwater and surface water were present, sampling would be needed to verify the presence of contamination and determine the need for further characterization and/or remediation.

7.2.2 Confirmation Study Round I (1986)

The purpose of the Confirmation Study Round I was to verify the presence and/or absence of contamination at the sites recommended for further investigation in the IAS. The scope of work for the confirmation study at Site 11 included monitoring well installation and groundwater sampling. This effort was documented in the *Confirmation Study Step IA (Verification), Round One*, (Dames & Moore, 1986). Site 11 was investigated along with Sites 1, 3, and 17 due to their close proximity. Sediment and surface water samples were collected from Indian Field Creek and were intended to evaluate impacts to sediment from all four sites. The analytical results of these samples are discussed in Section 4.2.2; however, these samples are not believed to be representative of impacts to sediment and surface water from Site 11 because Indian Field Creek receives discharge from many sources.

During Round I, two monitoring wells (11GW03 and 11GW09) were installed at Site 11 and samples were collected and analyzed for VOCs, pesticides/PCBs, oil and grease, metals, and

explosives. Two surface water samples and two sediment samples associated with Site 1, but intended to evaluate impacts to surface water from upgradient sites including Site 11 were also collected and analyzed for the same constituents. No soil samples were collected. Sample locations associate with Site 11 are shown on Figure 7-2.

Of the two wells installed at Site 11, well 11GW03 is an upgradient well and 11GW09 is a downgradient well in relation to the abandoned burning pits. No explosive constituents were detected in Round 1. Only methylene chloride (a common laboratory blank analysis contaminant), barium, chromium, nickel, and zinc were detected in the groundwater samples. Total chromium was not detected; however, the speciation analysis detected hexavalent chromium (Cr VI or Cr^{+6}) at 13 µg/L in upgradient well 11GW03, but less than 10 µg/L (nondetect) in downgradient well 11GW09. Zinc was detected above the Virginia Criteria for the Protection of Aquatic Life (48 µg/L) both upgradient (68 µg/L) and downgradient (51µg/L) of the pits. No contaminants were detected above established MCLs. Although zinc was not associated with historical site operations and likely attributed to upgradient Site 17, the Round I of the Confirmation Study recommended that a second round of sampling be conducted at Site 11 (in conjunction with Sites 1, 3, and 17). This is likely due to a continuing bundled investigation of Sites 1, 3, 11, and 17.

7.2.3 Confirmation Study Round II (1988)

During Round II of the Confirmation Study, the same groundwater monitoring wells, surface water locations, and sediment locations were sampled and analyzed for the same constituents as in Round I at Sites 1, 3, 11, and 17. In addition, two new surface water and sediment locations were sampled in Indian Field Creek to evaluate impacts to the creek from Sites 1, 3, 11, and 17. This effort was documented in the *Confirmation Study Step IA (Verification), Round Two*, (Dames & Moore, 1988). Again, the sediment and surface water samples collected from Indian Field Creek were intended to evaluate impacts to sediment from all four sites. The analytical results of these samples are discussed in Section 4.2.2, however, these samples are not believed to be representative of impacts to sediment and surface water from Site 11 because Indian Field Creek receives discharge from many sources. No soil samples were collected at Site 11. Sample locations associated with Site 11 are shown on Figure 7-2.

No explosive constituents were detected in groundwater during Round 2. Only methylene chloride (a common laboratory blank analysis contaminant), barium, nickel, selenium, and zinc were detected in the groundwater samples (note that no hexavalent chromium was detected in Round 2 at Site 11). During Round II, no contaminants were above any applicable criteria or MCLs. No conclusions or recommendations were included in the Round II Report.

7.2.4 Remedial Investigation Interim Report (1991)

The *RI Interim Report* (Versar, 1991) was drafted by Dames & Moore in 1989 and revised by Versar in 1991 to incorporate comments from the Technical Review Committee (TRC). The purpose of this report was to facilitate movement of the sites into the RI process. The report summarized available data from the Confirmation Studies for those sites recommended for further investigation in the IAS and, based on these data, provided recommendations for additional efforts to be conducted to complete the RI. The Interim RI recommended a risk

assessment and additional sampling be conducted at Site 11 as part of the bundled investigation with Sites 1, 3, and 17. Additional investigation activities were to include groundwater, surface water and sediment sampling, as well as a hydrogeologic investigation and site boundary survey.

7.2.5 Round One Remedial Investigation (1993)

Based on the recommendations included in the Interim RI Report, Site 11 was investigated during the 1992 Round One RI. This information is documented in the *Final Round One RI for Sites 1-9, 11, 12, 16-19, and 21* (Baker and Weston, 1993b). Wells 11GW11 (Columbia aquifer) and 11GW11A (Yorktown-Eastover aquifer) were installed as a well cluster downgradient of the abandoned burning pits as part of the Round One RI effort (Baker and Weston, 1993). Three subsurface soil samples were collected above the water table while installing the boring for 11GW11A and analyzed for VOCs, SVOCs, metals, and explosives. No surface soil samples were collected other than the first subsurface soil sample that was collected from 0 to 2 ft bgs. Four sediment and two surface water samples were collected from the drainage channel south of Site 11 and analyzed for VOCs, SVOCs, total and dissolved metals, explosives, pH, and TOC (Tables 7-3 and 7-4). Groundwater samples were collected at all four monitoring wells and analyzed for VOCs, SVOCs, metals, explosives, and nitrates. Sample locations are shown on Figure 7-2.

There were no detections in the subsurface soil samples that warrant discussion. In surface water, total copper, lead, and mercury exceeded Clean Water Act freshwater chronic levels in one or more samples. However, there were no dissolved exceedances of the chronic levels in surface water. Surface water samples were collected from a drainage ditch that is dry most of the time and maintains no baseflow. It is likely that the total metals samples were excessively turbid, resulting in the elevated concentrations. In groundwater, no contaminants exceeded MCLs in the Columbia aquifer, but arsenic and cadmium exceed their MCLs in the Yorktown-Eastover well 11GW11A. RDX and HMX were detected at relatively low concentrations (HMX from 3 to 4.2 µg/L and RDX from 20 to 28 µg/L) in well 11GW11. Groundwater analytical results for this sampling event are included in Table 7-5 with the results for this Phase I Groundwater RI.

The Round One RI concluded that minimal impacts to soil, groundwater, surface water, and sediment had resulted from site operations. However, the report recommended an aerial photo survey to better determine the location of the abandoned pits, followed by surface and subsurface soil samples in the pits and a risk assessment using available site data. Depending on the results of the risk assessment, a soil removal could be performed to remove adversely impacted soil.

7.2.6 Focused Biological Sampling and Preliminary Risk Evaluation Report (1993)

The *Focused Biological Sampling and Preliminary Risk Evaluation Report* (Baker and Weston, 1993c) summarized the results of a limited biological tissue, surface water, and sediment sampling effort conducted in October 1992 as part of the Round One RI activities. The primary objective of the sampling program was to evaluate the potential human health risk associated with consumption of fish and shellfish taken from select waters within WPNSTA

Yorktown, including Lee Pond, Roosevelt Pond, Felgates Creek, and Indian Field Creek. No adverse effects were found to be attributable to Site 11.

7.2.7 Round Two Remedial Investigation (1998)

The Round Two RI was conducted in 1996. Efforts from this field event are documented in the *Final Round Two RI Report, Sites 11 and 17* (Baker, 1998f). The field activities included collecting eleven surface soil, eight subsurface soil, four sediment samples, and groundwater sampling of all four monitoring wells at Site 11. Sample locations are shown on Figure 7-2. Surface soil samples were analyzed for TCL SVOCs, Pesticides/PCBs, explosives, TAL inorganics, cyanide, pH, TOC, and cation exchange capacity (CEC). Subsurface soil samples were analyzed for TCL SVOCs, pesticides/PCBs, explosives, TAL inorganics, cyanide, pH, TOC, CEC, nitrate, nitrite, grain size, and bulk density. Sediment samples were analyzed for TCL VOCs, SVOCs, pesticides/PCBs, explosives, TAL inorganics, cyanide, pH, TOC, CEC, nitrate, nitrite, grain size, and bulk density. Groundwater samples were analyzed for TCL VOCs, SVOCs, Pesticides/PCBs, explosives, filtered and unfiltered TAL inorganics, cyanide, nitrate, nitrite, dissolved gases, bromide, chloride, sulfate, orthophosphate, total dissolved solids (TDS), and total suspended solids (TSS).

In surface and subsurface soil, some pesticides and explosives were detected at low concentrations below applicable screening criteria (Residential Region III RBCs, and BTAG ecological screening values). Almost all of the TAL inorganics were detected (some exceeding background concentrations), but only copper (max conc. = 220 mg/kg) and mercury (max conc. = 1.6 mg/kg) exceeded both background and an applicable screening value (in this case BTAG ecological screening values). In sediment, no pesticides, PCBs, or explosives were detected. Toluene and two phthalates were detected at low concentrations in one of the four sediment samples, all below applicable criteria. In groundwater, only one VOC (chloromethane) and two explosives (amino-dintriotoluenes and RDX) were detected in the Columbia aquifer. Several inorganics were detected below tap water RBCs and MCLs. In the Yorktown-Eastover aquifer, only inorganics were detected. No chemicals exceeded applicable criteria in groundwater during the Round Two RI. Groundwater analytical results for the Round Two RI are included on Table 7-5 with the results from this Phase I Groundwater RI.

Results of the human health and ecological risk assessments conducted as part of the Round Two RI indicated that there were no unacceptable human health risks, but there was the potential for adverse ecological effects due to exposure to aluminum, cobalt, and vanadium due to the lack of comparable criteria values for these constituents in sediment. The area in which these samples were collected is a dry drainage ditch that contains water only after heavy rain events, it is likely this area does not provide a significant habitat for aquatic organisms.

7.2.8 Feasibility Study (1999)

The *Final FS for Sites 11 and 17 (Baker, 1999b)* presented the following remedial action alternatives for soil at Site 11: 1) No Action; 2) No Action with Institutional Control; 3) Soil Cover; On-Site Treatment; and 4) Soil Excavation with Off-Site Disposal. The recommended alternative identified in the FS was Soil Excavation with Off-Site Disposal.

7.2.9 Proposed Remedial Action Plan/Record of Decision (1999-2000)

The *Final PRAP for Sites 11 and 17* (Baker, 1999c) soil was finalized in 1999 after public review and comment. The remedy proposed in the PRAP for Site 11 was identified as Excavation of soils with Off-Site Disposal. The *Final ROD for Sites 11 and 17* (Baker, 2000) for the soil medium was signed in October 2000. The remedy included in the ROD for Site 11 was consistent with the proposal in the PRAP.

7.2.10 Soil Removal Action (2000)

The soil removal remedial action at Site 11 was conducted from May to August 2000 and is documented in the *Final Report, Remedial Action, Sites 11 and 17 (OHM, 2001b)*.. It consisted of the removal and off-site disposal of approximately 655 tons of copper and mercury-contaminated waste, along with ash material discovered during the excavation; collection and analysis of confirmation samples; placement of clean fill and topsoil; and establishment of vegetative cover.

7.3 Analytical Results of Phase I Groundwater Remedial Investigation (2004)

Groundwater samples were collected from all four monitoring wells at Site 11 in September 2004 for the Phase I Groundwater RI (described herein) and analyzed for explosives and TAL inorganics (total and dissolved). Sample analyses are presented in Table 7-6. Stabilized groundwater field parameter data are presented in Table 7-7. Detected chemicals from the 1992, 1996, and 2004 sampling rounds are presented in Table 7-5. Maximum background values and MCLs are provided in Table 7-5 for comparison. Chemicals exceeding background are presented on Figure 7-3.

7.3.1 Total Explosives Analytical Results

No explosives were detected (detection limit of 2.5 µg/L) during the September 2004 sampling round conducted as part of this RI.

7.3.2 Metals and Cyanide Analytical Results

Inorganics were detected in the Columbia aquifer wells and the Yorktown-Eastover well. No unfiltered metals concentrations exceeded maximum background values in either aquifer; however, it should be noted that several inorganics (both unfiltered and filtered sample results) were detected at this site and were flagged with B-qualifiers during third-party data validation. This may have been due to detections of these constituents in the field blank collected on the non-potable drilling water (i.e., incorrect field and/or equipment blank collection procedure). Consequently these results may not be reflective of actual concentrations in aquifer water.

Concentrations of dissolved fractions of aluminum and iron exceeded background concentrations in the Columbia aquifer samples. Aluminum and iron are not associated with the historical ordnance burning activities at Site 11 and there are no MCLs for these metals.

7.4 Nature and Extent of Contamination

Explosives were not detected in groundwater after the soil removal in 2000. The only dissolved inorganics that exceeded maximum background values in groundwater samples from Site 11 were iron and aluminum. These chemicals did not present unacceptable risk based on the Round Two RI risk assessment.

7.5 Conclusions and Recommendations

Results of groundwater sampling indicates that no explosives were detected in either aquifer at Site 11 in September 2004, and the previous sampling rounds show non-detects to low detects. The risk assessments performed during the Round Two RI for Sites 11 and 17 (Baker, 1998) determined no unacceptable risk from exposure to groundwater from these compounds. No unacceptable ecological risks were identified associated with sediment/soil collected from the dry drainage channel at the site. Any groundwater discharges to surface water at the site migrate through Site 1 before discharging to Indian Field Creek and its unnamed tributary. While many inorganics were detected in groundwater, only aluminum and iron exceed maximum background concentrations. These chemicals are not associated with historical site operations and were determined to not present an unacceptable risk in the Round Two RI (Baker, 1998).

Groundwater flows southeast from Site 11 toward Indian Field Creek and the portion of the tributary downgradient of Site 11 where the tributary is recharged by groundwater. Monitoring wells 11GW11 and 11GW09 are located between the former burning pits and the potential receiving surface water bodies (gaining portion of unnamed tributary downgradient of Site 11 and Indian Fields Creek). Results from these wells show that there is no contaminant migration from Site 11 to the creek. Therefore, it is not anticipated that Site 11 groundwater is negatively impacting surface water and sediment in the tributary.

Risks were mitigated previously for soil, sediment, and/or surface water at Site 11. It was determined in the Round One RI that there are no unacceptable current or future risks to human health from exposure to groundwater.

1. One grab groundwater sample at 11GW11 (just downgradient of the site) will be collected and analyzed for 3,5-dinitroaniline, nitroglycerine, and PETN to verify that a release of these constituents to site groundwater has not occurred.
2. A No Further Action Proposed Plan will be developed for groundwater at Site 11.

TABLE 7-1
Groundwater Monitoring Well Construction Details at Site 11
Phase I Groundwater Remedial Investigation
Naval Weapons Station Yorktown
Yorktown, Virginia

Well Number	Aquifer	Date Installed	Top of PVC Casing Elevation (ft msl)	Ground Surface Elevation (ft msl)	Boring Total Depth (ft bgs)	Elevation Bottom of Boring (ft msl)	Well Diameter	Total Well Depth (ft bgs)	Bottom Well Elevation (ft msl)	Outer Casing Interval (ft bgs)	Depth to Screen Interval (ft bgs)	Top of Screen Interval Elevation (ft msl)	Bottom of Screen Interval Elevation (ft msl)	Depth to Top of Sand Pack (ft bgs)	Depth to Top of Bentonite (ft bgs)
11GW03	Columbia	12/10/1985	44.11	42.40	17	25.40	4	17	25.40	--	2 - 17	40.4	25.4	1	0
11GW09	Columbia	12/10/1985	49.00	46.10	19	27.10	4	19	27.10	--	4 - 19	42.1	27.1	2	0
11GW11	Columbia	06/11/1992	44.5	41.80	12	29.80	2	12	29.80	--	4 - 12	37.8	29.8	3	2
11GW11A	Yorktown-Eastover	06/11/1992	44.21	41.20	52	-10.80	2	52	-10.80	--	46 - 52	-4.8	-10.8	44	43

NOTES:
msl - mean sea level (in feet)
bgs - Below Ground Surface (in feet)
-- NA
(1) Modified well construction due to shallow groundwater table
(2) Drive point, no sand pack
(3) Staff gauge

TABLE 7-2
Summary of Groundwater Elevation Data at Site 11
Phase I Groundwater Remedial Investigation
Naval Weapons Station Yorktown
Yorktown, Virginia

Monitoring Well	Aquifer	Depth to Water (ft) October 12, 2004	Top of Casing (ft above msl)	Groundwater Elevation (ft above msl) October 12, 2004
11GW03	Columbia	8.35	44.62	36.27
11GW09	Columbia	11.18	49.56	38.38
11GW11	Columbia	9.02	41.8	32.78
11GW11A	Yorktown-Eastover	25.59	41.2	15.61

Note:
msl - mean sea level

TABLE 7-3
Sediment Analytical Detections at Site 11
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS11-SD001		YS11-SD002		YS11-SD003			YS11-SD004	
Sample ID	YS11-SD001-A-0892	YS11-SD001-B-0892	YS11-SD002-A-0892	YS11-SD002-B-0892	YS11-SD003-A-1196	YS11-SD003P-A-1196	YS11-SD003-B-1196	YS11-SD004-A-1196	YS11-SD004-B-1196
Sample Date	08/03/92	08/03/92	08/03/92	08/03/92	11/01/96	11/01/96	11/01/96	11/01/96	11/01/96
Chemical Name									
Volatile Organic Compounds (UG/KG)									
Acetone	150	13 U	37 U	39	13 U	13 U	12 U	12 U	13 U
Toluene	22 U	13 UJ	17 U	14 U	13 U	13 U	3 J	12 U	13 U
Semi-volatile Organic Compounds (UG/KG)									
Di-n-octylphthalate	700 U	440 U	520 U	440 UJ	410 U	420 U	390 U	140 J	430 U
bis(2-Ethylhexyl)phthalate	700 U	440 U	520 U	440 U	410 U	420 U	390 U	120 J	430 U
Total Metals (MG/KG)									
Aluminum	NA	1,820 J	3,630 J	1,380 J	5,260	5,850	3,320	3,590	2,590
Arsenic	8.8 J	1.4 J	15.4 J	2 J	7.2	6.7	2	2	0.94
Barium	178 J	75.1 J	89.8 J	26.6 J	63.2	62.8	32.1	37.4	26.6
Beryllium	0.56	0.32	0.74	0.35	0.25 U	0.26 U	0.24 U	0.25 U	0.26 U
Cadmium	1.73 UJ	1.06 UJ	1.3 UJ	1.08 UJ	0.49	0.47	0.24 U	0.25 U	0.26 U
Calcium	3,590 J	562 J	3,460 J	841 J	1,850	1,820	759	1,170	733
Chromium	10.4 J	2.12 UJ	5.18 J	2.16 UJ	6.8	7.4	4.4 B	4.8 B	3.4 K
Cobalt	5.8 U	2.6 U	8.71	3.6 U	4	4.1	1.4	1.1	0.6
Copper	39.6 J	20.4 J	13 J	3.6 J	11.4	11.7	5.7	29.4	13.2
Iron	15,600 J	2,440 J	27,400 J	6,520 J	11,800	14,900	4,560	3,020	1,670
Lead	30.7 J	16.4 J	14 J	4.5 J	18	17.7	8.2	11.6	10.5
Magnesium	330	81.9	164	72.5	327	369	217	249	176
Manganese	28.2 J	6.9 J	329 J	81.2 J	129	128	26.7	34.9	19.1
Mercury	0.13	0.07 U	0.18	0.07 U	0.08 B	0.07 B	0.06 U	0.06 U	0.06 U
Nickel	12.1	6.6	7.32	4.86 U	4	4.6	2.6	2.3	1.7
Potassium	420 U	256 U	314 U	262 U	215	256	153	207	148
Selenium	0.87 UJ	0.53 UJ	0.65 UJ	0.52 UJ	0.76 U	0.87	0.71 U	0.74 U	0.78 U
Silver	2.6 UJ	1.61 J	1.96 UJ	1.52 UJ	1.2	1	0.32	0.28	0.26 U
Sodium	223	65.2	83.3	46.4	43.1 U	43.8 U	40.4 U	41.9 U	44.3 U
Vanadium	22.1	2.5	9.1	3.6	13.9	14.6	6.4	7.8	4.9
Zinc	97.1 J	40.1 J	74.2 J	23.8 J	50.8 J	53.9 J	30.6 J	14.5 J	10.3 J

Notes:

Shaded values indicate the analyte was detected
UG/KG = Micrograms per Kilogram
MG/KG = Milligrams per Kilogram
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 7-4
Surface Water Analytical Detections at Site 11
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS11-SW001	YS11-SW002
Sample ID	YS11-SW001-0892	YS11-SW002-0892
Sample Date	08/03/92	08/03/92
Chemical Name		
Volatile Organic Compounds (UG/L)		
Acetone	12 J	12
Total Metals (UG/L)		
Aluminum	66,700	4,930
Antimony	44 UJ	44 UJ
Arsenic	143 J	33.7 J
Barium	1,570	379
Beryllium	6.6	1.5
Cadmium	9.2	4 U
Calcium	93,700	43,000
Chromium	71.6 J	8.4 J
Cobalt	40.6	45.4
Copper	258 J	29.9 J
Iron	207,000	118,000
Lead	300	46.7
Magnesium	3,930	1,190
Manganese	323	1,840
Mercury	1.46	0.16 U
Nickel	61.9	18 U
Potassium	970 U	970 U
Sodium	5,190 J	4,600 J
Vanadium	275	14.7
Zinc	904 J	131 J
Dissolved Metals (UG/L)		
Aluminum	87.8	80.6
Antimony	44 UJ	44 UJ
Arsenic	8.7 J	3 R
Barium	0.00E+00	127
Beryllium	1.1	1 U
Calcium	34,500	33,200
Chromium	8 U	8 U
Cobalt	6 U	6.2
Copper	6.7 J	9.6 J
Iron	10,200	305
Magnesium	910	1,060
Manganese	68.5	328
Mercury	0.1 U	0.1 U
Silver	6 U	8.6
Sodium	4,430 J	4,330 J
Thallium	2 UJ	2 UJ
Zinc	15.9 J	27 J

Notes:

Shaded values indicate the analyte was detected
UG/L = Micrograms per Liter
J = Analyte present. Reported value may or may not be accurate or precise
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise

TABLE 7-5
Groundwater Analytical Detections at Site 11
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Columbia Aquifer**	**Maximum Background - Yorktown-Eastover Aquifer**	Columbia			Columbia			Columbia			
Station ID				YS11-GW003			YS11-GW009			YS11-GW011			
Sample ID				YS11-MW003-0792	YS11-MW003-1196	YS11-MW003-0904	YS11-MW009-0792	YS11-MW009-1196	YS11-MW009-0904	YS11-MW011-0792	YS11-MW011P-0792	YS11-MW011-0296	YS11-MW011-1196
Sample Date				07/21/92	11/14/96	09/16/04	07/21/92	11/16/96	09/16/04	07/21/92	07/21/92	02/10/96	11/15/96
Investigation				Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	Historical Data	Historical Data
Chemical Name													
Volatile Organic Compounds (UG/L)													
Chloromethane	No MCL	1 U	1 U	10 U	3 J	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U
Semi-volatile Organic Compounds (UG/L)													
Diethylphthalate	No MCL	10 U	10 U	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U
Pentachlorophenol	1	25 U	25 U	26 U	25 U	NA	26 U	25 U	NA	30 U	27 U	1 J	25 U
Explosives (UG/L)													
Aminodinitrotoluenes	No MCL	NA	NA	NA	200 U	NA	NA	200 U	NA	NA	NA	0.14 U	1,100
HMX	No MCL	1.1 U	0.61 U	63 U	500 U	2.5 U	63 U	500 U	2.5 U	3	4.2	0.74 U	1,000 U
RDX	No MCL	0.78 U	0.59 U	63 U	500 U	2.5 U	63 U	500 U	2.5 U	20	28	0.36 U	6,200
Total Metals (UG/L)													
Aluminum	No MCL	3170	1160	15,400 J	1,390	811	20,000 J	526	1,350	1,370 J	1,460 J	294 B	254
Antimony	6	12.4 U	12.4 U	44 J	3 U	1.9 U	44 U	3 U	1.9 U	44	44 U	19.8 U	3 U
Arsenic	10	5.2 L	3.5 J	7.5	11.4 B	2.4 B	13.7 J	3 U	2.1 U	2 U	2 UJ	0.9 U	3 U
Barium	2,000	53 J	43.6 J	82.9	12.7	12.1 B	152	73.2	107 B	66.9 B	69.5	58.4	43.7
Beryllium	4	0.38 K	0.2 U	1.1	1 U	0.1 U	152	1.1	0.68 B	1 U	1 U	0.8 U	1 U
Cadmium	5	2.3 U	2.3 U	4 U	1 U	0.2 U	4 U	1 U	0.2 U	4 U	4 U	2.2 U	1 U
Calcium	No MCL	155000	67100	8,910	5,720	6,250	5,600	2,160	457 J	5,190	5,420	4,210	4,220
Chromium	100	12.8 L	4.7 L	36.6	1 UL	0.9 U	61.4	1 UL	0.9 U	8 U	14	2.4 U	1 UL
Cobalt	No MCL	5 J	2.1 U	11.7	2 U	0.88 B	19.3	3.9	4.3 B	7.3	7.3	6.6	4.4
Copper	1,300	4.7 J	4.5 J	18.6	2.9 B	0.6 U	19.2	1 U	0.6 U	6.2	5.9	2 U	2.7 B
Iron	No MCL	11600	2350	31,300 J	5,710	2,580	457 J	2,000	622	2,710	2,990 J	229	1,230
Lead	15	2.5 L	1.5 U	15.7	2 U	1.1 U	19.5	2 U	1.1 U	6.9	2 U	0.95	2 U
Magnesium	No MCL	3400 J	3350 J	2,010	333	290 J	5,000	970	495 J	1,970	2,050	772	1,210
Manganese	No MCL	105	18.4	104	10.9	14.8 J	117	10.4	16.5	25.7	30.7	8.3 B	17.7
Nickel	No MCL	5.2 U	5.2 U	18 U	2 U	0.6 U	30.1	5.3	1.7 J	18 U	18 U	11.3 U	10.8
Potassium	No MCL	1710 J	5510	2,240	269 B	152 J	3,880	240 B	93.5 J	996	970 U	828 U	475
Selenium	50	2.4 U	2.9 J	2 UJ	3 UL	2.4 U	2 UJ	3 UL	2.4 U	2 U	2 UJ	1.3 U	3 UL
Sodium	No MCL	7110	8300	2,000	2,770	2,250 J	6,450	5,360	4,250 J	3,700	3,870	2,390	3,080
Thallium	2	5.7 U	5.7 U	2 UJ	6 U	2.8 U	20 U	6 U	2.8 U	2 U	2 UJ	0.9 U	6 U
Vanadium	No MCL	16 J	7.5 J	28.6	2.7	1.7 B	44.9	1 U	0.6 U	6 U	6 U	2.4 U	1 U
Zinc	No MCL	30.2 J	14.9 J	56.7 J	15.1 B	4.1 U	104 J	15.6 B	4.1 U	33	28.6 UJ	4.8	12.2 B
Dissolved Metals (UG/L)													
Aluminum	No MCL	20.9 J	146 J	38.3 J	759	178 B	765 J	437	1,330	108 J	77.3 J	160 B	136 B
Arsenic	10	2.6 U	2.6 UL	3.8 J	8.5 B	2.1 U	2 UJ	3.2 B	2.1 U	2 UJ	2 UJ	0.9 U	3 B
Barium	2,000	37.2 J	30.9 J	6.3	10	9.7 B	56.7	70.1	107 B	59.5	57.7	56.4	42.7
Calcium	No MCL	129000	69800	6,940	5,230	6,110	3,600 B	2,230	459 J	5,730	5,880	4,210	4,490
Cobalt	No MCL	4.6 J	2.1 U	6 U	2 U	1.2 B	6 U	4.1	4.3 B	6.2	6 U	5.4	4.4
Copper	1,300	2.3 J	4 J	5 U	1 U	0.6 U	5 U	1 U	0.83 B	5 U	5 U	2	1 U
Iron	No MCL	17.7 J	5.8 J	2,390 J	5,320	2,020	506 J	2,110	653	282 J	233 J	48.1 B	1,240
Lead	15	1.5 UL	1.5 U	17.4	2 U	1.1 U	2 UJ	2 U	1.1 U	2.3 UJ	2 UJ	3.3	2 U
Magnesium	No MCL	2520 J	3410 J	196	249	257 J	1,640	992	495 J	2,340	2,200	777	1,490
Manganese	No MCL	50.4	12.2 J	30.1	9.8	15	22.2	11.2	17.1	18.9	21.3	8.5 B	18
Nickel	No MCL	5.2 U	5.2 U	18 U	2 U	0.85 J	18 U	4.9	3.5 J	18 U	18 U	11.3 U	4.6
Potassium	No MCL	1270 J	5680	970 U	179 B	132 J	970 U	249 B	100 J	970 U	970 U	828 U	507
Selenium	50	2.6 U	3.9 K	2 UJ	3 UL	2.4 U	2 UJ	3 UL	2.4 U	2 U	2 UJ	1.3 U	3.3 L

TABLE 7-5
Groundwater Analytical Detections at Site 11
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Columbia Aquifer**	**Maximum Background - Yorktown-Eastover Aquifer**	Columbia			Columbia			Columbia			
Station ID				YS11-GW003			YS11-GW009			YS11-GW011			
Sample ID				YS11-MW003-0792	YS11-MW003-1196	YS11-MW003-0904	YS11-MW009-0792	YS11-MW009-1196	YS11-MW009-0904	YS11-MW011-0792	YS11-MW011P-0792	YS11-MW011-0296	YS11-MW011-1196
Sample Date				07/21/92	11/14/96	09/16/04	07/21/92	11/16/96	09/16/04	07/21/92	07/21/92	02/10/96	11/15/96
Investigation				Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	Historical Data	Historical Data
Chemical Name													
Sodium	No MCL	6720	8570	2,000	1,830	2,450 J	6,120	5,090	4,470 J	4,460	4,640	2,440	3,150
Vanadium	No MCL	2.7 J	6.3 J	6 U	1.2	0.62 B	6 U	1 U	0.6 U	6 U	6 U	2.4 U	1 U
Zinc	No MCL	15.6 J	5.9 J	83.6 J	6.3 B	4.1 U	81.5 J	17.4 B	6.3 B	33.5 J	100 J	3.6 U	NA
Wet Chemistry (MG/L)													
Nitrate	10	NA	NA	0.4	NA	NA	0.22	NA	NA	0.12	0.35	NA	NA

Notes:

Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
MCL = Federal Maximum Contaminant Level
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 7-5
Groundwater Analytical Detections at Site 11
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Columbia Aquifer**	**Maximum Background - Yorktown-Eastover Aquifer**	Columbia		Yorktown-Eastover			
Station ID				YS11-GW011		YS11-GW011A			
Sample ID				YS11-MW011P-1196	YS11-MW011-0904	YS11-MW011A-0792	YS11-MW011A-0296	YS11-MW011A-1196	YS11-MW011A-0904
Sample Date				11/15/96	09/16/04	07/21/92	02/10/96	11/16/96	09/17/04
Investigation				Historical Data	GW RI Data	Historical Data	Historical Data	Historical Data	GW RI Data
Chemical Name									
Volatile Organic Compounds (UG/L)									
Chloromethane	No MCL	1 U	1 U	10 U	NA	10 U	10 U	NA	NA
Semi-volatile Organic Compounds (UG/L)									
Diethylphthalate	No MCL	10 U	10 U	10 U	NA	1 J	10 U	NA	NA
Pentachlorophenol	1	25 U	25 U	25 U	NA	26 U	25 U	NA	NA
Explosives (UG/L)									
Aminodinitrotoluenes	No MCL	NA	NA	1,400	NA	NA	0.14 U	NA	NA
HMX	No MCL	1.1 U	0.61 U	500 U	2.5 U	0.63 U	0.77 U	NA	2.5 U
RDX	No MCL	0.78 U	0.59 U	5,100 J	2.5 U	0.63 U	0.38 U	NA	2.5 U
Total Metals (UG/L)									
Aluminum	No MCL	3170	1160	151 B	166 B	14,500 J	287 B	163,000	116 B
Antimony	6	12.4 U	12.4 U	3 U	1.9 U	44 U	19.8 U	17 B	1.9 U
Arsenic	10	5.2 L	3.5 J	3 U	2.1 U	90.3 J	0.9 U	501	2.1 U
Barium	2,000	53 J	43.6 J	43.1	128 B	89.6	11	534	7 B
Beryllium	4	0.38 K	0.2 U	1 U	1 B	2.2	0.8 U	8	0.1 U
Cadmium	5	2.3 U	2.3 U	1 U	0.2 U	10.3	2.2 U	39.9	0.2 U
Calcium	No MCL	155000	67100	4,340	2,650 J	218,000	31,300	1,070,000	28,200
Chromium	100	12.8 L	4.7 L	1 UL	0.9 U	88.2	2.4 U	782	0.9 U
Cobalt	No MCL	5 J	2.1 U	4.4	5.4 B	15.8	3.9	77.6	0.5 U
Copper	1,300	4.7 J	4.5 J	1 U	0.6 U	30.1	2 U	5,090	1.7 B
Iron	No MCL	11600	2350	1,250	3,130	52,600 J	545	342,000	203 B
Lead	15	2.5 L	1.5 U	2 U	1.1 U	20.7	1.6	547	1.1 U
Magnesium	No MCL	3400 J	3350 J	1,290	866 J	7,530	447	47,900	293 J
Manganese	No MCL	105	18.4	18.2	21.9	206	5.2 B	965	5.5 J
Nickel	No MCL	5.2 U	5.2 U	4	1.9 J	59.2	11.3 U	382	0.6 U
Potassium	No MCL	1710 J	5510	524	319 J	6,650	828 U	50,700	291 J
Selenium	50	2.4 U	2.9 J	3 UL	2.4 U	2 J	1.3 U	40.1	2.4 U
Sodium	No MCL	7110	8300	3,230	3,920 J	7,260	3,510	13,200	3,230 J
Thallium	2	5.7 U	5.7 U	6 U	2.8 U	2 U	0.9 U	16.5 K	2.8 U
Vanadium	No MCL	16 J	7.5 J	1 U	0.6 U	127	2.6	1,260	0.95 B
Zinc	No MCL	30.2 J	14.9 J	8.7 B	7.7 B	134 J	3.6 U	1,190	4.1 U
Dissolved Metals (UG/L)									
Aluminum	No MCL	20.9 J	146 J	103 B	146 B	35 U	23.3 U	232	80.7 U
Arsenic	10	2.6 U	2.6 UL	3 U	2.1 U	3.4 J	0.9 U	9.9 B	2.1 U
Barium	2,000	37.2 J	30.9 J	43.4	117 B	7.5	9.2	20.8	5.9 B
Calcium	No MCL	129000	69800	4,540	3,250 J	28,500	27,500	28,800	25,200
Cobalt	No MCL	4.6 J	2.1 U	4.5	5.8 B	6 U	3 U	2 U	0.5 U
Copper	1,300	2.3 J	4 J	1 U	0.6 U	5 U	2 U	2.9 B	0.6 U
Iron	No MCL	17.7 J	5.8 J	1,390	3,240	29.3 J	48 B	211	43 U
Lead	15	1.5 UL	1.5 U	2 U	1.1 U	2 UJ	0.86	2 U	1.1 U
Magnesium	No MCL	2520 J	3410 J	1,350	1,040 J	488	373	370	241 J
Manganese	No MCL	50.4	12.2 J	18.5	24.7	2 U	4.8 B	3 B	5.3 J
Nickel	No MCL	5.2 U	5.2 U	3.8	3.8 J	18 U	11.3 U	2 U	0.6 U
Potassium	No MCL	1270 J	5680	532	371 J	970 U	828 U	840	251 J
Selenium	50	2.6 U	3.9 K	3 U	2.4 U	2 UJ	1.3 U	3 UL	2.4 U

TABLE 7-5
Groundwater Analytical Detections at Site 11
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Columbia Aquifer**	**Maximum Background - Yorktown-Eastover Aquifer**	Columbia		Yorktown-Eastover			
Station ID				YS11-GW011		YS11-GW011A			
Sample ID				YS11-MW011P-1196	YS11-MW011-0904	YS11-MW011A-0792	YS11-MW011A-0296	YS11-MW011A-1196	YS11-MW011A-0904
Sample Date				11/15/96	09/16/04	07/21/92	02/10/96	11/16/96	09/17/04
Investigation				Historical Data	GW RI Data	Historical Data	Historical Data	Historical Data	GW RI Data
Chemical Name									
Sodium	No MCL	6720	8570	3,350	4,480 J	6,130	3,520	3,550	3,260 J
Vanadium	No MCL	2.7 J	6.3 J	1 U	0.6 U	6 U	2.4 U	6.2	0.6 U
Zinc	No MCL	15.6 J	5.9 J	12.3 B	9.5 B	85	3.6 U	12.5 B	4.1 U
Wet Chemistry (MG/L)									
Nitrate	10	NA	NA	NA	NA	0.1 U	NA	NA	NA

Notes:

Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
MCL = Federal Maximum Contaminant Level
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 7-6
Summary of Groundwater Sample Analyses at Site 11
Phase I Groundwater Remedial Investigation
Naval Weapons Station Yorktown
Yorktown, Virginia

Medium	Sample ID	Analysis				QA/QC Samples	
				TAL Inorganics			
		TCL Organics	Nitramine Compounds	Total	Dissolved	Duplicate	MS/MSD
Site 11 Groundwater	11GW03-001		X	X	X		
	11GW09-001		X	X	X		
	11GW11-001		X	X	X		
	11GW11A-001		X	X	X		

Notes:
- Field measurements of groundwater included pH, specific conductivity, temperature, and turbidity.
- TCL organics analysis included VOCs, SVOCs, and Pesticides/PCBs.
- TAL inorganics analysis included cyanide analysis.
- MS/MSD = Matrix Spike/Matrix Spike Duplicate

(1)Monitoring well sampled for VOCs only under the Long-Term Monitoring program for Sites 1, 3, and 7.

TABLE 7-7
Summary of Groundwater Field Parameters at Site 11
Phase I Groundwater Remedial Investigation
Naval Weapons Station Yorktown
Yorktown, Virginia

Well No.	pH[1]	Specific Conductance at 25°C[2] (µmhos/cm)	Temperature[2] (°C)	Turbidity[3] (NTUs)	Gallons Purged	Date
11GW03	5.17	62	21.67	19.7	1.99	09/16/2004
	5.18	61	21.48	16.7	3.98	
	5.25	61	21.51	16.1	4.95	
	5.5	60	21.42	16.1	5.92	
11GW09	4.23	83	20.1	7.05	0.5	09/16/2004
	4.16	88	19.7	6.36	1	
	4.16	90	19.77	6.28	1.5	
11GW11	4.63	74	19.65	9.07	4.5	09/16/2004
	5.06	72	19.86	7.32	9	
	4.84	72	19.55	6.75	13.5	
11GW11A	6.44	159	16.45	255	4.5	09/14/2004
	6.67	161	16.94	29.5	9	
	7.44	164	17	9.7	13.5	

Notes:

-1 pH measured using an Orion pH meter, Model No. 290A.
-2 Specific conductance and temperature measured using YSI conductivity meter, Model No. 335 CT.
-3 Turbidity measured using a Lamotte 2020 meter.
-4 Well purged dry immediately; sample collected after recharge.
-5 Monitoring well 6GW05B replaced monitoring well 6GW05.
-6 Well pumped dry before any readings collected; sample collected after recharge.
-- No measurement
NTU Nephelometric Turbidity Unit

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Legend

- Columbia Monitoring Wells
- Yorktown-Eastover Monitoring Wells
- Study Area Boundary
- Area of Excavation to Remove Copper and Mercury Contaminated Soil

N
W E
S

0 100 200
Feet

Figure 7-1
Site 11 Layout
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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Legend

- Columbia Monitoring Wells
- Yorktown-Eastover Monitoring Wells
- Study Area Boundary
- Area of Excavation to Remove Copper and Mercury Contaminated Soil
- Round 2 RI Subsurface/Surface Soil Sample Location
- Round 2 RI Sediment Sample Location
- EPA Surface Soil Sample Location
- Round 2 RI Surface Soil/Test Kit Sample Location
- Round 1 RI Surface Water/Sediment Sample Location

N
W E
S

0 100 200
Feet

Figure 7-2
Previous Investigations Sampling Locations at Site 11
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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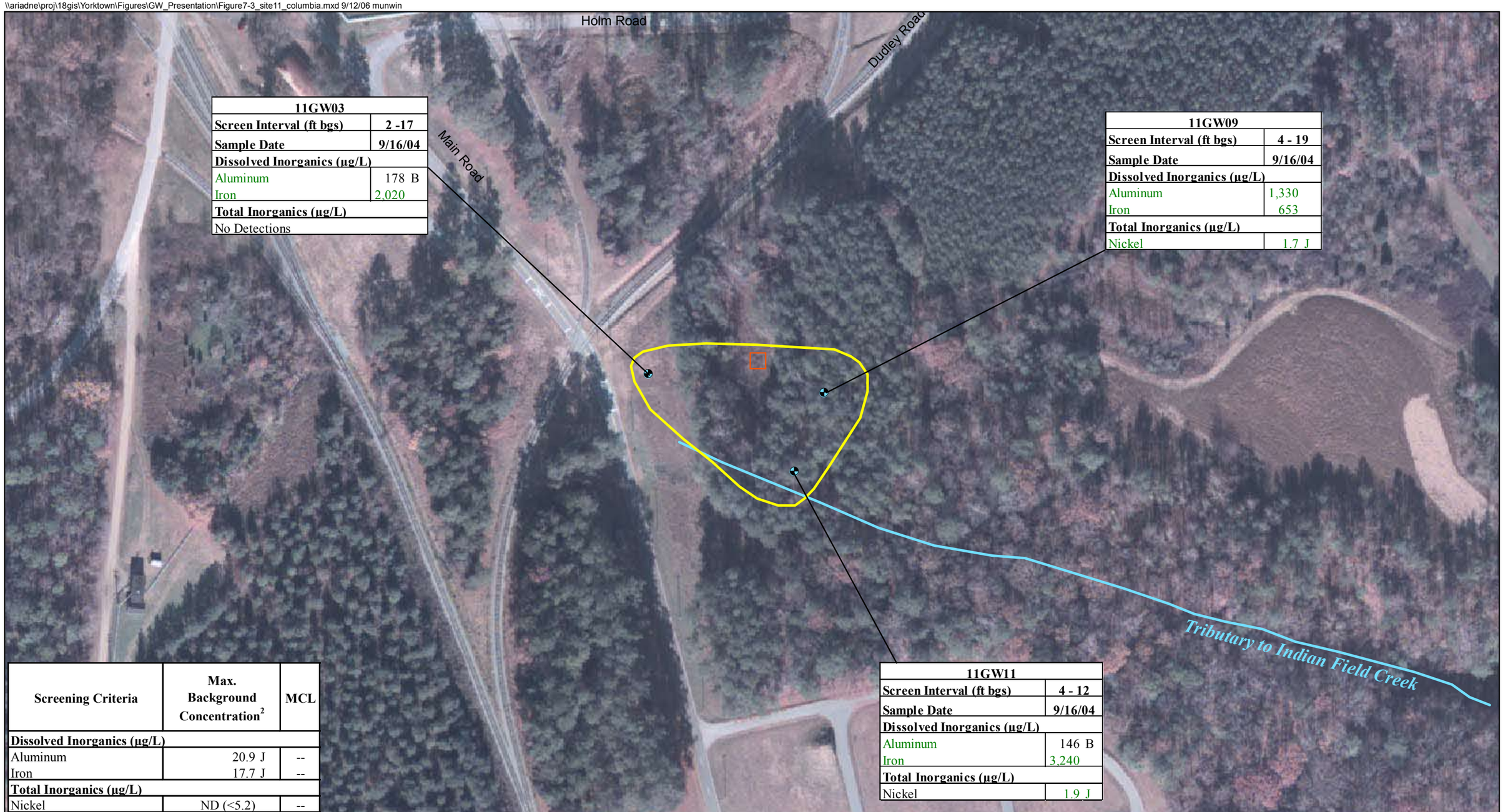

11GW03	
Screen Interval (ft bgs)	2 -17
Sample Date	9/16/04
Dissolved Inorganics (µg/L)	
Aluminum	178 B
Iron	2,020
Total Inorganics (µg/L)	
No Detections	

11GW09	
Screen Interval (ft bgs)	4 - 19
Sample Date	9/16/04
Dissolved Inorganics (µg/L)	
Aluminum	1,330
Iron	653
Total Inorganics (µg/L)	
Nickel	1.7 J

11GW11	
Screen Interval (ft bgs)	4 - 12
Sample Date	9/16/04
Dissolved Inorganics (µg/L)	
Aluminum	146 B
Iron	3,240
Total Inorganics (µg/L)	
Nickel	1.9 J

Screening Criteria	Max. Background Concentration[2]	MCL
Dissolved Inorganics (µg/L)		
Aluminum	20.9 J	--
Iron	17.7 J	--
Total Inorganics (µg/L)		
Nickel	ND (<5.2)	--

Legend

- Columbia Monitoring Wells
- Study Area Boundary
- Area of Excavation to Remove Copper and Mercury Contaminated Soil

Notes:

Contaminants shaded green exceed Background concentrations.

µg/L = micrograms per liter

B = Value may be associated with laboratory or field blank contamination.

J = Value is estimated.

MCL = Federal Maximum Contaminant Level

[2]Background values are maximum detected values in respective aquifer from Baker (1995) Background Report.

N W E S

0 150 300 Feet

Figure 7-3
Exceedances of Background and/or MCLs
in the Columbia Aquifer at Site 11
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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SECTION 8

Site 17 Summary and Investigation Results

8.1 Site Background and Physical Characteristics

8.1.1 Site History

Site 17, Holm Road Landfill, is a 2-acre [former] disposal area located south of Holm Road and east of Main Road (Figure 8-1). The site was operated for approximately 10 years from the 1950s to the 1960s. Wastes reportedly disposed included acid batteries from underwater weapons, hydraulic fluids (Dolconik) from the demilling of torpedoes, other types of hydraulic fluids, drums from the Public Works Department and ordnance production shops, and scrap metal. An estimated 60 tons of waste were deposited during in the disposal area over 10 years. However, the geophysical investigation of this site during the Round I RI did not indicate any evidence of buried material.

Remedial activities completed in August 2000 included the excavation of approximately 1,300 cubic yards of PAH-contaminated soil to a depth of 2 feet. Confirmation sample results indicated that all concentrations were below the remediation cleanup levels. The remedial action mitigated unacceptable human health and adverse ecological risks from soil.

8.1.2 Geology and Hydrogeology

Site 17 is located on Croaker Flat terrace within the Virginia Coastal Plain Physiographic Province. Descriptions of the lithologic units present at Site 17 are included in Section 2.2. Construction details for Site 17 wells are provided in Table 8-1. Boring logs are included in Appendix A. Cross-sections depicting the subsurface geologic conditions for Sites 11 and 17 are presented in Appendix F. The surficial aquifer at Site 17 is the Columbia aquifer (refer to Section 2.2), which was encountered during RI activities at elevations from 36- to 42-ft msl. All four wells at Site 17 (17GW01, 17GW02, 17GW10, and 17GW16) are screened in the Columbia aquifer.

The Yorktown confining unit underlies the Columbia aquifer (refer to Section 2.2). The top of the Yorktown confining unit was encountered during RI activities at approximately 25- to 31-ft msl. The Yorktown-Eastover aquifer is confined in the area of Site 17.

Site 17 is located on a topographically high area with surface runoff draining to tributaries of Indian Field Creek located east of the site. Most of the area is cleared.

Groundwater elevations were collected on October 12, 2004, from wells at Site 17 (Table 8-2). Figure 4-3 presents estimated water level contours for the Columbia aquifer at Sites 11 and 17 and vicinity, while Figure 4-4 presents the estimated piezometric surface of the Yorktown-Eastover aquifer based on data collected at Sites 1, 3, and 11 wells. Figure 4-3 shows that groundwater in the unconfined Columbia aquifer flows from Sites 11 and 17 generally toward the east to Indian Field Creek as well as south toward the tributary that flows east toward Indian Field Creek. Figure 4-4 shows that groundwater in the upper

portion of the Yorktown-Eastover aquifer flows east from Sites 11 and 17 toward Indian Field Creek.

Slug test data collected during the RI indicate that the horizontal hydraulic conductivity of the Columbia aquifer in the vicinity of Site 17 is between 0.88 ft/day and 47 ft/day.

8.1.3 Initial Assessment Study (1984)

The IAS at NWS Yorktown was conducted to identify and assess sites posing a potential threat to human health and the environment because of contamination from prior waste management activities. This effort was documented in the *IAS of Naval Weapons Station Yorktown, Virginia (NEESA, 1984).* Based upon their previous use for the disposal of explosives, Site 17 was identified for further evaluation. Activity records relating to waste generation, handling and disposal were reviewed; physical conditions at the site were characterized; and migration pathways and potential receptors were identified. The results of the data evaluation were used to develop recommendations concerning the need for a confirmation study at Site 17. The IAS concluded that because migration pathways to groundwater and surface water were present, sampling would be needed to verify the presence of contamination and determine the need for further characterization and/or remediation.

8.1.4 Confirmation Study Round I (1986)

Consistent with the recommendations in the IAS, a Confirmation Study Round I was conducted in 1986 in order to confirm the presence of contamination at Site 17 and other WPNSTA Yorktown sites. This effort was documented in the *Confirmation Study Step IA (Verification), Round One*, (Dames & Moore, 1986). During Round I, two monitoring wells (17GW01 and 17GW02) were installed at Site 17 and samples were collected and analyzed for VOCs, pesticides/PCBs, oil and grease, metals, and explosives. Sample locations are shown on Figure 8-1.

Of the two wells installed at Site 17, well 17GW01 is an upgradient well and 17GW02 is a downgradient well in relation to the old disposal area. Other than low concentrations of methylene chloride (a common laboratory blank analysis contaminant) and bis(2-ethylhexyl)phthalate, no organics were detected in groundwater at Site 17 during Round I. Barium, cadmium, and zinc were detected in the groundwater samples. Zinc was the only inorganic above applicable criteria, with the exceedance in the downgradient well at 140 µg/L. No contaminants were detected above established MCLs. Round I of the Confirmation Study recommended that a second round of sampling be conducted at Site 17 (in conjunction with Sites 1, 3, and 11).

8.1.5 Confirmation Study Round II (1988)

During Round II of the Confirmation Study, the same groundwater monitoring wells were sampled and analyzed for the same constituents as in Round I at Site 17. This effort was documented in the *Confirmation Study Step IA (Verification), Round Two*, (Dames & Moore, 1988).

Similar to Round I, methylene chloride (a common laboratory blank analysis contaminant) and bis(2-ethylhexyl)phthalate were detected. In addition another phthalate (di-n-octyl

phthalate) was detected. Barium and zinc were detected at lower levels than in Round I, and cadmium was not detected at all. No contaminants were detected above any applicable criteria or MCLs. No conclusions or recommendations were included in the Round II Report.

8.1.6 Remedial Investigation Interim Report (1991)

The *RI Interim Report* (Versar, 1991) was drafted by Dames & Moore in 1989 and revised by Versar in 1991 to incorporate comments from the Technical Review Committee (TRC). The purpose of this report was to facilitate movement of the sites into the RI process. The report summarized available data from the Confirmation Studies for those sites recommended for further investigation in the IAS and, based on these data, provided recommendations for additional efforts to be conducted to complete the RI. The Interim RI recommended a risk assessment and additional sampling be conducted at Site 17 as part of the bundled investigation with Sites 1, 3, and 11. Additional investigation activities were to include groundwater, surface water and sediment sampling, as well as a hydrogeologic investigation and site boundary survey.

8.1.7 Round One Remedial Investigation (1992)

The activities from this event are documented in the *Final Round One RI for Sites 1-9, 11, 12, 16-19, and 21* (Baker and Weston, 1993b). Wells 17GW10 and 17GW16 were installed in the Columbia aquifer north and south of the old disposal area as part of the Round One RI effort (Baker and Weston, 1993). One DPT groundwater sample was collected on the southwest portion of the site and analyzed for VOCs, SVOCs, total and dissolved metals, pesticides/PCBs, pH, total petroleum hydrocarbons (TPH), and nitrates. Three soil samples were collected during the installation of the wells and analyzed for VOCs, SVOCs, metals, and pesticides/PCBs, pH, and TPH. One soil sample was collected between 0 and 2 ft bgs while installing 17GW10, one was collected between 0 and 2 ft bgs while installing 17GW16, and the other was collected just above the water table while installing 17GW16. Six surface soil samples were collected and analyzed for VOCs, SVOCs, metals, cyanide, pesticides/PCBs, pH, and TPH.

Groundwater samples were collected at all four monitoring wells and analyzed for VOCs, SVOCs, metals, pesticides/PCBs, TPH, and nitrates. Slug tests were performed on all four Site 17 monitoring wells in 1992. Groundwater detections during the Round One RI are included in Table 8-3.

An electromagnetic geophysical survey was performed to delineate subsurface waste. No clearly defined waste boundary could be determined, but several anomalies (i.e., potential metallic waste) were identified.

There were no exceedances of applicable screening criteria (USEPA Residential Region III RBCs and BTAG ecological screening values) in subsurface soil samples. In surface soil, many SVOCs were detected at low levels below applicable criteria and were attributed to a nearby railroad. Mercury and TPH were detected in some surface soil samples. No organics were detected in groundwater. Metals (e.g., arsenic, chromium, iron, lead, and zinc) were detected above applicable criteria (MCLs, PMCLs, and USEPA Residential Region III Tapwater COC Values) in groundwater samples; however, most of the elevated detections of metals were from unfiltered samples (i.e., elevated concentrations may be

attributed to turbidity). One dissolved detection of arsenic (17 µg/L in the sample from 17GW02) was above the corresponding MCL of 10 µg/L.

The Round One RI concluded that site operations made a minimal impact on soil, groundwater, surface water, and sediment. However, the report recommended additional surface soil sampling, test pitting, soil sampling within the test pits, followed by a risk assessment using available site data and a focused feasibility study. Depending on the results of the risk assessment, a soil removal could be performed to remove adversely impacted soil from historical ordnance burning.

The *Focused Biological Sampling and Preliminary Risk Evaluation Report* (Baker and Weston, 1993c) summarized the results of a limited biological tissue, surface water, and sediment sampling effort conducted in October 1992. The primary objective of the sampling program was to evaluate the potential human health risk associated with consumption of fish and shellfish taken from select waters within NWS Yorktown, including Lee Pond, Roosevelt Pond, Felgates Creek, and Indian Field Creek. No adverse effects were found to be attributable to Site 17.

8.1.8 Round Two Remedial Investigation (1998)

The Round Two RI was conducted in 1996. Efforts from this field event are documented in the *Final Round Two RI Report, Sites 11 and 17* (Baker, 1998f). Consistent with the recommendations in the Round One RI, the field activities included test pitting and collecting 21 surface soil, 6 subsurface soil, and groundwater sampling of all four monitoring wells at Site 17. Test pit and sample locations are shown on Figure 8-2. Surface soil samples were analyzed for TCL SVOCs, pesticides/PCBs, explosives, TAL inorganics, cyanide, pH, TOC, and CEC. Subsurface soil samples were analyzed for TCL SVOCs, Pesticides/PCBs, explosives, TAL inorganics, cyanide, TOC, and CEC. Groundwater samples were analyzed for TCL VOCs, SVOCs, pesticides/PCBs, explosives, filtered and unfiltered TAL inorganics, cyanide, nitrate, nitrite, dissolved gases, bromide, chloride, sulfate, orthophosphate, TDS, and TSS.

For evaluating soil at Site 17, the site was divided into two sub-areas because of the unexpected detection of PAHs in a well-defined hot spot area. In surface and subsurface soil, no explosives or PCBs were detected. Some pesticides and SVOCs were detected mostly at low concentrations below applicable screening criteria (USEPA Residential Region III RBCs and BTAG ecological screening values); however, there were five surface soil locations and one subsurface soil location where PAHs were detected above applicable criteria. Almost all of the TAL inorganics were detected (some exceeding background concentrations), but only arsenic (in surface and subsurface soil) and beryllium (in surface soil) were above applicable screening criteria. In groundwater, no VOCs, SVOCs, pesticides, or PCBs were detected. One explosive (amino-dinitrotoluene) was detected at levels below criteria. Several inorganics were detected below criteria. Groundwater analytical results for the Round Two RI are included with data from this Phase I Groundwater RI in Table 8-3.

Results of the human health and ecological risk assessments conducted as part of the Round Two RI indicated that there were no unacceptable human health risks, but there was

the potential for adverse ecological effects due to exposure to several inorganics in surface soil and potentially sediment and surface water.

8.1.9 Feasibility Study (1999)

The *Final FS for Sites 11 and 17 (Baker, 1999b)* presented the following remedial action alternatives for soil at Site 17: 1) No Action; 2) No Action with Institutional Controls; 3) Soil Cover; On-Site Treatment; and 4) Soil Excavation with Off-Site Disposal. Alternative 4 was selected as the recommended alternative.

8.1.10 Proposed Remedial Action Plan/Record of Decision (1999-2000)

The *Final PRAP for Sites 11 and 17 (Baker, 1999c)* soil was finalized in 1999 after public review and comment. The preferred alternative remedy for Site 17 was identified as Excavation with Off-Site Disposal. The *Final ROD for Sites 11 and 17 (Baker, 2000)* was signed in October 2000. The selected remedy for Site 17 was identified as Excavation with Off-Site Disposal.

8.1.11 Soil Removal Action (2000)

The remedial action at Site 17 was conducted from May to August 2000. It consisted of the excavation and off-site disposal of approximately 940 tons of PAH-contaminated soil; collection and analysis of confirmation samples; placement of clean fill and topsoil; and establishment of vegetative cover as is detailed in the *Final Report, Remedial Action, Sites 11 and 17* (OHM, 2001b). Because no unacceptable human health risks were identified for Site 17 soil (after the soil removal) and actions were taken to reduce the potential for adverse ecological effects, no land use controls were required.

8.2 Analytical Results of Phase I Groundwater RI

Groundwater samples were collected from all four monitoring wells at Site 17 in September 2004 for the Phase I Groundwater RI (described herein) and analyzed for TCL PCBs and TAL inorganics (total and dissolved). Sample analyses are presented in Table 8-4. Stabilized groundwater field parameter data are presented in Table 8-5. Detected chemicals from the 1992, 1996, and 2004 sampling rounds are presented in Table 8-3 through 8-5. Maximum background values and MCLs are provided in Table 8-3 for comparison. Chemicals exceeding background are presented on Figure 8-3.

8.2.1 Polychlorinated Biphenyls

No PCBs were detected during the September 2004 sampling round.

8.2.2 Metals Analytical Results

Total concentrations of aluminum and manganese exceeded maximum background values for these constituents. Dissolved (filtered) fractions of iron and manganese also exceeded corresponding maximum background values for these constituents. The detection limit for filtered aluminum was 81 µg/L, above the 21 µg/L background value.

It should be noted that several inorganics (both unfiltered and filtered sample results) were detected at this site and were flagged with B-qualifiers during third-party data validation.

This may have been due to detections of these constituents in the field blank collected on the non-potable drilling water (i.e., incorrect field and/or equipment blank collection procedure). Consequently the unqualified results may not completely represent actual concentrations in groundwater.

8.3 Fate and Transport of Contaminants

Iron and manganese were detected at concentrations exceeding background in Site 17 filtered metals samples. However, no unacceptable risk was identified related to groundwater during the Round Two RI. Groundwater from Site 17 flows south to Site 11 or east to Site 1; hence it does not discharge directly to a surface water body and the groundwater to surface water pathway does not exist.

8.4 Conclusions and Recommendations

Results of groundwater sampling indicate that no organic compounds were detected in the Columbia aquifer at Site 17. Inorganics were detected in the groundwater samples at levels greater than established background concentrations, but none were above MCLs. Groundwater from Site 17 would have to flow through Site 1 to discharge to a surface water body (since the portion of the drainage channel south of Site 11 is dry and not hydraulically connected to groundwater). Therefore any groundwater to surface water interaction that would involve Site 17 groundwater would be appropriately addressed in discussions about Site 1. While these inorganics may be associated with historical site operations, they were determined to not present an unacceptable risk in the Round Two RI (Baker, 1998). The concentrations of these constituents detected during the Round Two RI were similar to those detected during this round of sampling. Therefore, it is likely that a revised risk assessment would yield similar results.

Because risks were mitigated previously for soil, sediment, and/or surface water at Site 17, and because there are no unacceptable risks in groundwater, it recommended that no further action be conducted at Site 17.

TABLE 8-1
Groundwater Monitoring Well Construction Details at Site 17
Phase I Groundwater Remedial Investigation
Naval Weapons Station Yorktown
Yorktown, Virginia

Well Number	Aquifer	Date Installed	Top of PVC Casing Elevation (ft msl)	Ground Surface Elevation (ft msl)	Boring Total Depth (ft bgs)	Elevation Bottom of Boring (ft msl)	Well Diameter	Total Well Depth (ft bgs)	Bottom Well Elevation (ft msl)	Outer Casing Interval (ft bgs)	Depth to Screen Interval (ft bgs)	Top of Screen Interval Elevation (ft msl)	Bottom of Screen Interval Elevation (ft msl)	Depth to Top of Sand Pack (ft bgs)	Depth to Top of Bentonite (ft bgs)
17GW01	Columbia	12/09/1985	46.05	43.90	21.5	22.40	2	17.5	26.40	--	3 - 17.5	40.9	26.4	22	20
17GW02 (1)	Columbia	12/09/1985	42.32	39.10	15	24.10	2	15	24.10	--	0 - 15	39.1	24.1	0	1
17GW10	Columbia	06/06/1992	40.7	38.60	11	27.60	4	11	27.60	--	2 - 11	36.6	27.6	22	20
17GW16	Columbia	06/06/1992	47.65	45.20	13	32.20	4	13	32.20	--	3 - 13	42.2	32.2	22	20

NOTES:
msl - mean sea level (in feet)
bgs - Below Ground Surface (in feet)
-- NA
(1) Modified well construction due to shallow groundwater table
(2) Drive point, no sand pack
(3) Staff gauge

TABLE 8-2
Summary of Groundwater Elevation Data at Site 17
Phase I Groundwater Remedial Investigation
Naval Weapons Station Yorktown
Yorktown, Virginia

Monitoring Well	Aquifer	Depth to Water (ft) October 12, 2004	Top of Casing (ft above msl)	Groundwater Elevation (ft above msl) October 12, 2004
17GW01	Columbia	8.33	46.61	38.28
17GW02	Columbia	5.55	42.71	37.16
17GW10	Columbia	4.00	40.89	36.89
17GW16	Columbia	8.22	47.9	39.68

Note:
msl - mean sea level

TABLE 8-3
Groundwater Analytical Detections at Site 17
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	**MCL-Groundwater**	**Maximum Background - Columbia Aquifer**	Columbia			Columbia			Columbia			Columbia			
Station ID			YS17-GW001			YS17-GW002			YS17-GW010			YS17-GW016			
Sample ID			YS17-MW001-0792	YS17-MW001-1196	YS17-MW001-0904	YS17-MW002-0792	YS17-MW002-1196	YS17-MW002-0904	YS17-MW010-0792	YS17-MW010-1196	YS17-MW010-0904	YS17-MW016-0792	YS17-MW016-1196	YS17-MW016P-1196	YS17-MW016-0904
Sample Date			07/21/92	11/15/96	09/15/04	07/21/92	11/15/96	09/16/04	07/21/92	11/15/96	09/15/04	07/21/92	11/15/96	11/15/96	09/15/04
Investigation			Historical Data	Historical data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	Historical Data	GW RI Data
Chemical Name															
Pesticide/Polychlorinated Biphenyls (UG/L)															
Aroclor-1221	0.5	2 U	2 U	2 U	2.1 U	2.2 U	1.2 J	2 U	2.2 U	2 U	2 U	2.2 U	2 U	2 U	2 U
Explosives (UG/L)															
Aminodinitrotoluenes	No MCL	NA	NA	0.2 U	NA	NA	0.2 U	NA	NA	0.2 U	NA	NA	1.3	1.2	NA
Total Metals (UG/L)															
Aluminum	No MCL	3170	3,840 J	76.1 B	80.7 U	12,100 J	182	80.7 U	728 J	102 B	80.7 U	6,400 J	413	398	1,030
Arsenic	10	5.2 L	18.7 J	3 U	2.1 U	20.6 J	15.2	2.1 U	2 UJ	3 U	8.7 B	2.4 J	4 B	3.6 B	3.3 B
Barium	2,000	53 J	81.1	4.9	4 B	34.1	5.9	15 B	67.6	58.4	119 B	70.9	16.8	17.3	19.2 B
Beryllium	4	0.38 K	2.2	1 U	0.1 U	1 U	1 U	0.1 U	1 U	1 U	0.1 U	1 U	1 U	1 U	0.1 U
Calcium	No MCL	155000	94,400	17,800	15,800	7,890	9,910	11,100	92,800	181,000	199,000	11,500	12,800	13,400	12,400
Chromium	100	12.8 L	92.8	1 UL	0.9 U	32	1 UL	0.9 U	8 U	1 UL	0.9 U	17	1 UL	1 UL	0.9 U
Cobalt	No MCL	5 J	17	2 U	0.5 U	6 U	2 U	0.5 U	6 U	2 U	1 B	8.7	2 U	2 U	1 B
Copper	1,300	4.7 J	18.6	1 U	0.6 U	9.9	1 U	0.6 U	5 U	1 U	0.6 U	7.9	1.4 B	1 U	0.76 B
Iron	No MCL	11600	50,600 J	40 B	43 U	17,400 J	3,680	53.8 B	3,970 J	698	7,390	8,360 J	222	229	1,370
Lead	15	2.5 L	22	2 U	1.1 U	10.7 U	2 U	1.1 U	4.9 UJ	2 U	1.1 U	7.7 UJ	2 U	2 U	1.1 U
Magnesium	No MCL	3400 J	5,520	324	337 J	1,460	407	333 J	5,820	8,410	8,570	1,680	1,410	1,560	995 J
Manganese	No MCL	105	216	4.8 B	1.8 J	138	124	55	238	71	235	43.6	4.1 B	4.5 B	10.2 J
Nickel	No MCL	5.2 U	23.2	2 U	0.6 U	18 U	2 U	0.6 U	18 U	2.2	0.6 U	18 U	2 U	2 U	0.6 U
Potassium	No MCL	1710 J	4,960	313	122 J	1,470	370	529 J	4,630	3,620	2,340 J	4,750	890	943	883 J
Sodium	No MCL	7110	9,650	6,030	8,740	2,340	1,700	1,980 J	26,400	14,200	12,800	2,060	1,280	1,290	1,720 J
Vanadium	No MCL	16 J	98.3	1 U	0.6 U	39.4	1.6	2 B	12.3	1 U	0.6 U	17.1	1.4	1	2.4 B
Zinc	No MCL	30.2 J	84.9 J	7.2 B	4.1 U	40.2 J	8.3 B	4.1 U	25.4 J	6.3 B	4.1 U	33 J	8 B	12.6 B	5.7 B
Dissolved Metals (UG/L)															
Aluminum	No MCL	20.9 J	35 U	28 B	80.7 U	35 U	160	80.7 U	35 U	26 B	80.7 U	35 U	85.7 B	63 B	182 B
Arsenic	10	2.6 U	2 UJ	3 U	2.1 U	17 J	13.9 B	2.1 U	2 UJ	3 U	8.4 B	2 UJ	3.7 B	3 U	2.5 B
Barium	2,000	37.2 J	4.1	3.7	3.8 B	3 U	6.3	13.9 B	58.3	58.5	116 B	32.2	16.2	16.3	16.5 B
Calcium	No MCL	129000	38,100	16,500	15,700	7,370	9,720	11,100	90,900	184,000	193,000	9,640	12,800	13,600	12,300
Cobalt	No MCL	4.6 J	6 U	2 U	0.5 U	6 U	2 U	0.53 B	6 U	2 U	5.4 B	8.6	2 U	2 U	1.1 B
Iron	No MCL	17.7 J	19 UJ	10 U	43 U	5,460 J	3,620	43 U	2,250 J	529	7,370	131 J	43.3 B	36.5 B	759
Magnesium	No MCL	2520 J	621	296	339 J	513	404	335 J	5,710	8,510	8,320	1,440	1,390	1,450	959 J
Manganese	No MCL	50.4	10.5	4.6 B	3 J	92.4	122	52.5	227	73.4	239	27.5	4.7 B	3.7 B	10 J
Nickel	No MCL	5.2 U	18 U	2 U	0.68 J	18 U	2 U	0.89 J	18 U	2.7	1.7 J	18 U	2 U	2 U	1.2 J
Potassium	No MCL	1270 J	970 U	304	135 J	970 U	365	560 J	4,380	3,680	2,370 J	2,860	883	889	906 J
Sodium	No MCL	6720	9,660	5,970	8,830	2,580	1,660	2,080 J	25,600	14,000	13,100	2,490	1,330	1,310	1,990 J
Vanadium	No MCL	2.7 J	8	1 U	0.66 B	6 U	1.4	1.9 B	13.4	1 U	0.6 U	6 U	1 U	1 U	0.89 B
Zinc	No MCL	15.6 J	29.9 J	5.3 B	4.1 U	51.3 J	6.5 B	4.1 U	62.8 J	16.2 B	4.1 U	80 J	8.8 B	7.1 B	4.3 B
Wet Chemistry (MG/L)															
Nitrate	10	NA	1	NA	NA	0.68	NA	NA	0.25	NA	NA	2.3	NA	NA	NA

Notes:

Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
MCL = Federal Maximum Contaminant Level
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 8-4
Sediment Analytical Detections at Site 11
Phase I Groundwater RI at Sites 1, 3, 6, 7, 11, 17, 25, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Medium	Sample ID	Analysis				QA/QC Samples	
				TAL Inorganics			
		TCL Organics	Nitramine Compounds	Total	Dissolved	Duplicate	MS/MSD
Site 17 Groundwater	17GW01-001	X (PCBs only)		X	X		
	17GW02-001	X (PCBs only)		X	X		
	17GW10-001	X (PCBs only)		X	X		
	17GW16-001	X (PCBs only)		X	X		

Notes:
- Field measurements of groundwater included pH, specific conductivity, temperature, and turbidity.
- TCL organics analysis included VOCs, SVOCs, and Pesticides/PCBs.
- TAL inorganics analysis included cyanide analysis.
- MS/MSD = Matrix Spike/Matrix Spike Duplicate

TABLE 8-5
Summary of Groundwater Field Parameters at Site 17
Phase I Groundwater Remedial Investigation
Naval Weapons Station Yorktown
Yorktown, Virginia

Well No.	pH[1]	Specific Conductance at 25°C[2] (µmhos/cm)	Temperature[2] (°C)	Turbidity[3] (NTUs)	Gallons Purged	Date
17GW01	5.52	168	22.02	6.31	2	09/15/2004
	5.29	161	21.87	6.94	4	
	5.23	158	21.8	5.57	6	
17GW02	5.23	97	22.29	7.19	1.6	09/16/2004
	5.08	89	22.25	8.32	3.2	
	5.17	89	22.4	7.3	4.8	
17GW10	6.52	1064	22.05	6.36	6.7	09/15/2004
	6.5	1080	22.54	6.24	13.4	
	6.5	1079	22.23	5.97	20.1	
17GW16	6	103	24.35	14	5	09/15/2004
	5.94	95	23.97	14.8	10	
	9.97	94	24.42	16.5	15	

Notes:

-1 pH measured using an Orion pH meter, Model No. 290A.
-2 Specific conductance and temperature measured using YSI conductivity meter, Model No. 335 CT.
-3 Turbidity measured using a Lamotte 2020 meter.
-4 Well purged dry immediately; sample collected after recharge.
-5 Monitoring well 6GW05B replaced monitoring well 6GW05.
-6 Well pumped dry before any readings collected; sample collected after recharge.
-- No measurement
NTU Nephelometric Turbidity Unit

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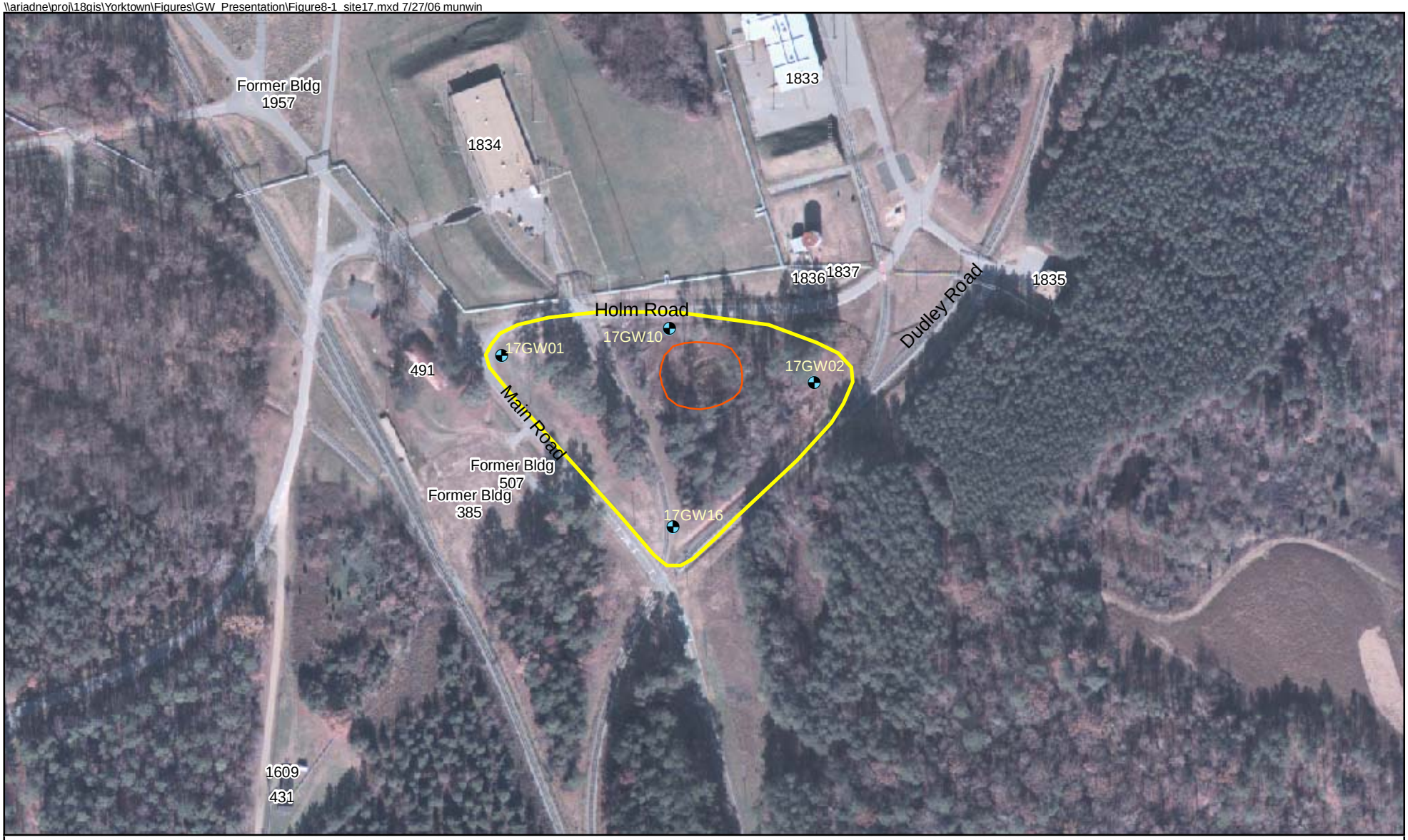

Legend

- Columbia Monitoring Wells
- Study Area Boundary
- Area of Excavation to Remove PAH and Metals Contaminated Soil

N
W E
S

0 100 200
Feet

Figure 8-1
Site 17 Layout
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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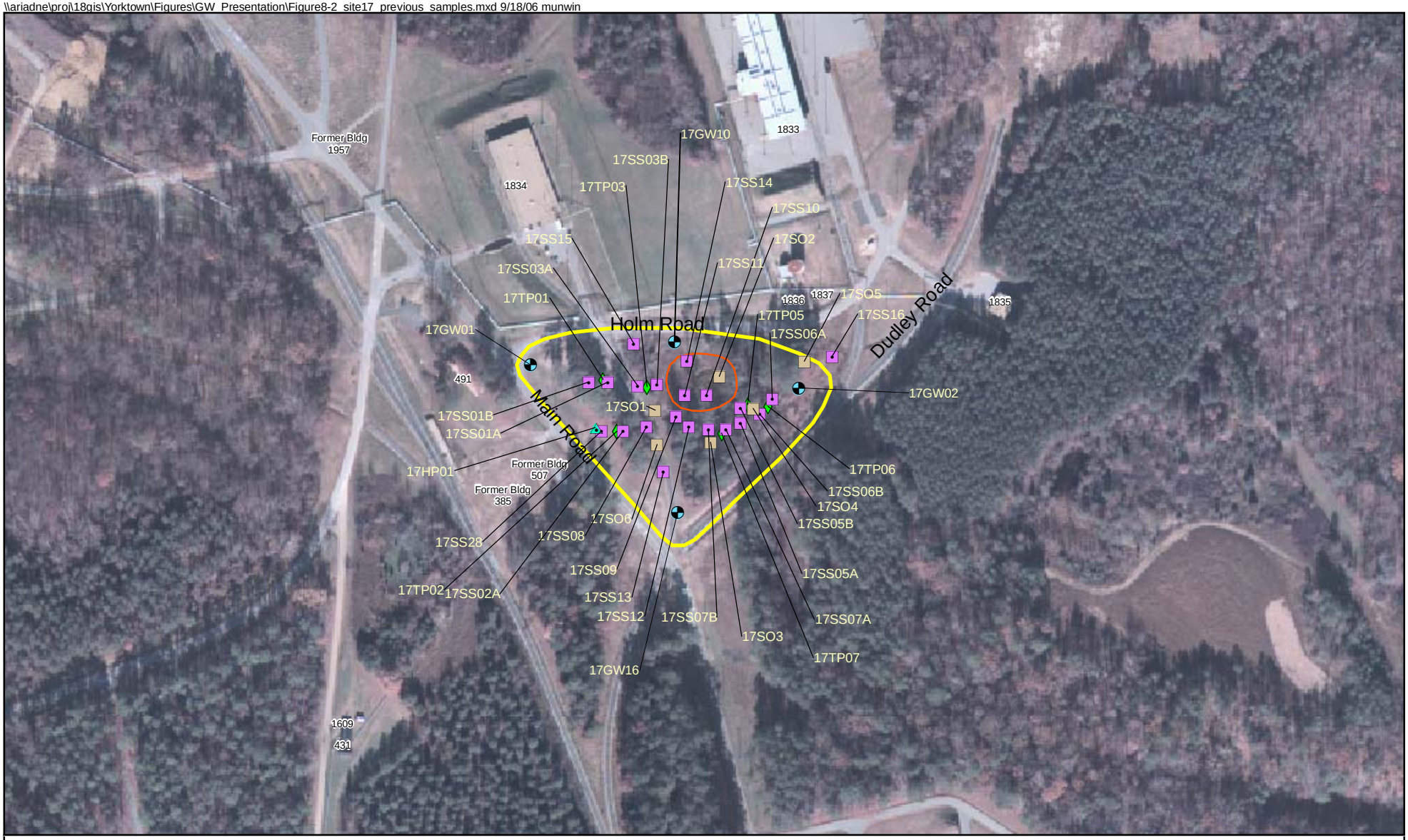

Legend

- Round 1 RI Hydropunch Sample Location
- Round 1 RI Surface Soil Sample Location
- Round 2 RI Monitoring Wells
- Round 2 RI Test Pit and Surface Soil Sample Location
- Round 2 RI Surface Soil/Test Kit Sample Location
- Study Area Boundary
- Area of Excavation to Remove PAH and Metals Contaminated So

N
W E
S

0 150 300
Feet

Figure 8-2
Previous Investigations Sampling Locations at Site 17
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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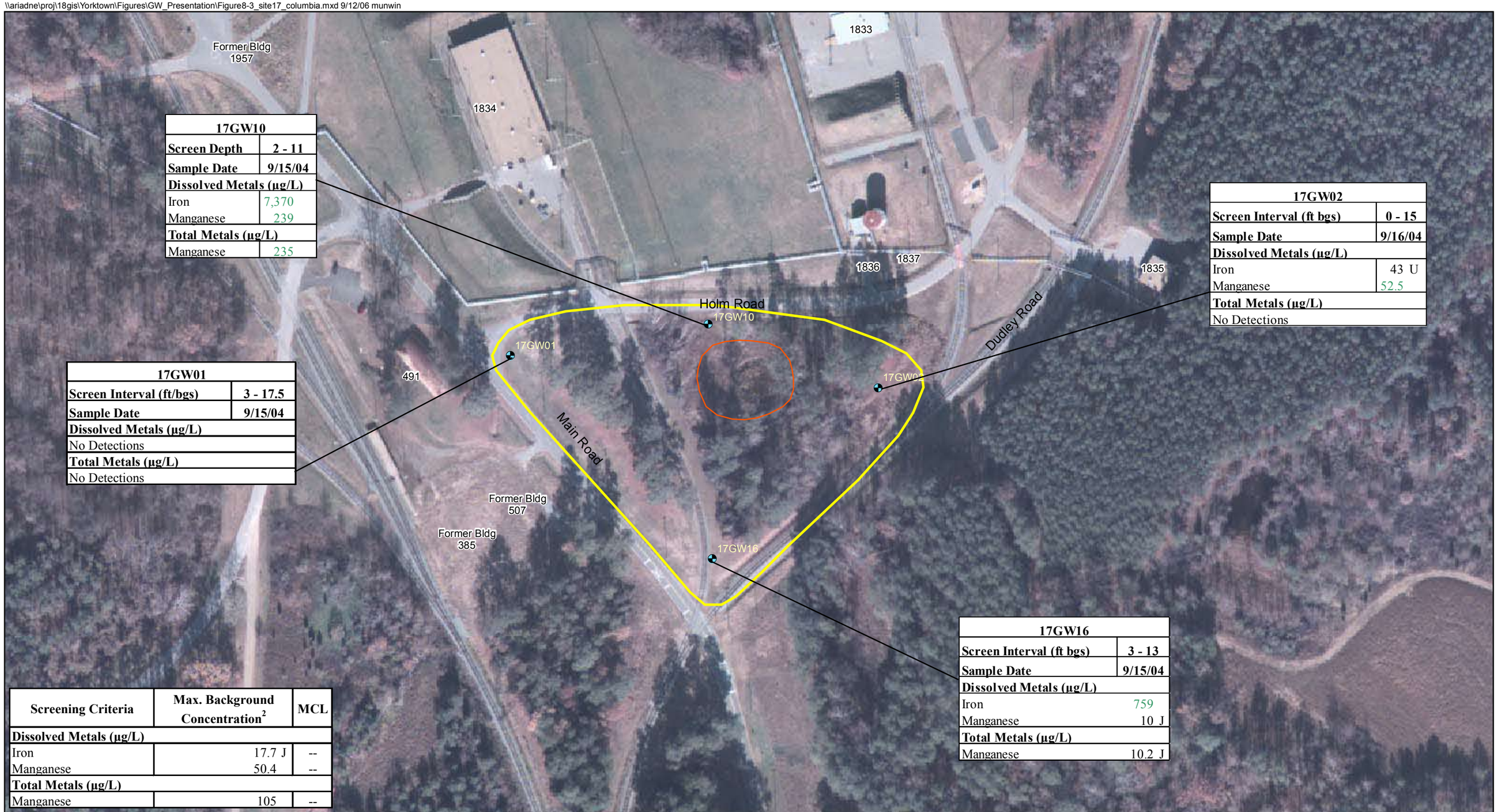

17GW10	
Screen Depth	**2 - 11**
Sample Date	**9/15/04**
Dissolved Metals (µg/L)	
Iron	7,370
Manganese	239
Total Metals (µg/L)	
Manganese	235

17GW02	
Screen Interval (ft bgs)	**0 - 15**
Sample Date	**9/16/04**
Dissolved Metals (µg/L)	
Iron	43 U
Manganese	52.5
Total Metals (µg/L)	
No Detections	

17GW01	
Screen Interval (ft/bgs)	**3 - 17.5**
Sample Date	**9/15/04**
Dissolved Metals (µg/L)	
No Detections	
Total Metals (µg/L)	
No Detections	

17GW16	
Screen Interval (ft bgs)	**3 - 13**
Sample Date	**9/15/04**
Dissolved Metals (µg/L)	
Iron	759
Manganese	10 J
Total Metals (µg/L)	
Manganese	10.2 J

Screening Criteria	Max. Background Concentration[2]	MCL
Dissolved Metals (µg/L)		
Iron	17.7 J	--
Manganese	50.4	--
Total Metals (µg/L)		
Manganese	105	--

Legend

- Columbia Monitoring Wells
- Study Area Boundary
- Area of Excavation to Remove PAH and Metals Contaminated Soil

Notes:

Contaminants shaded green exceed Background concentrations.
µg/L = micrograms per liter
J = Value is estimated.
MCL = Federal Maximum Contaminant Level
U = Not detected above associated detection limit.
[2]Background values are maximum detected values in respective aquifer from Baker (1995) Background Report.

N
W E
S

0 150 300
Feet

Figure 8-3
Exceedances of Background and/or MCLs
in the Columbia Aquifer at Site 17
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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SECTION 9

Site 24 Summary and Investigation Results

9.1 Site Background and Physical Characteristics

9.1.1 Site Setting and History

Site 24, Aviation Field, is an open grassy area around the Helicopter Landing Pad at WPNSTA Yorktown, just south of the York River (Figure 9-1). The site is bounded by Bellfield Road to the north, railroad tracks to the east, Main Road to the south, and storage areas to the west (Figure 9-1).

Historically, the site was utilized as an aviation field until 1927, after which it was used for storage of munitions on the surface and in underground caches. The site was also used for storage of miscellaneous debris including batteries and cables. Aerial photographs indicate that peak surface storage occurred in 1968. The area where the helicopter landing pad is currently located may also have been used briefly as an explosives burning area. Sludge from WPNSTA Sewage Treatment Plant #1 was reportedly dried in the eastern portion of the site (Figure 9-1).

Existing site features at Site 24 include a helicopter pad and an air control tower. The Daramend™ greenhouse/biocell was constructed in 1999 at Site 24 to treat Site 6 soil and sediment. The biocell was used to remediate Site 6 impoundment area sediment. Site 24 was previously evaluated as Site Screening Area (SSA) 6.

9.1.2 Site Geology and Hydrogeology

The only subsurface borings completed at Site 24 were completed during installation of temporary wells associated with the SSA 6 Site Screening Process (SSP) Investigation as documented in *Final Site Screening Process Report for Sites Screening Areas 1, 6, 7, and 15* (Baker, 1996). Based on cross-sections provided in the SSP Report and presented as Appendix E in this document, an unsaturated unit lithologically consistent with Columbia aquifer material overlies the Yorktown confining unit and Yorktown aquifer in the southernmost portion of the site. In the northern portion of the site, closer to the York River, the Columbia aquifer and Yorktown confining unit appear to be absent. These findings are consistent with the results of the 1997 USGS study (Figure 2-6).

No permanent monitoring wells have been constructed at the site. Therefore, no potentiometric surface survey has been completed. However, groundwater flow is expected to be northward toward the York River.

9.2 Previous Investigations

9.2.1 Geophysical Survey (1993)

A geophysical survey was conducted in January of 1993 to identify areas of buried debris and fill material. The information is documented in the *Geophysical Investigation Report for Sites 1, 2, 3, 4, 12, 16, 17, and 21* (Baker and Weston, 1993a) and can be found as Appendix A of the *Round One Remedial Investigation Report* (Baker and Weston, 1993b).The geophysical data indicated several areas of buried material around the site. The subsurface debris identified was both ferrous and non-ferrous and was generally buried just below the surface. The buried debris areas identified during the geophysical survey are shown on Figure 9-1.

9.2.2 Site Screening Process (SSP) Investigation (1994)

Site 24 was initially investigated as SSA 6 during the 1994 SSP Investigation. The SSP investigation was conducted to determine if further investigation was needed in several SSAs, including SSA 6. The SSP investigation at Site 24 (SSA 6) included excavation of test pits, and collection of surface soil, subsurface soil, and groundwater samples. Sample locations are shown on Figure 9-2.

Nine test pits were excavated as part of the SSP investigation. The pits were excavated to depths ranging from 2 to 13 feet bgs. The debris encountered consisted of metal banding, pipes, metal grating, wire, and inert ordnance components (activating devices and rocket motor casings). The material excavated from the test pits was stockpiled on plastic sheeting and returned to the trench after subsurface soil samples were collected from each test pit.

Surface soil samples were collected at twenty-eight sampling locations (Figure 9-2). Other than common laboratory contaminants, three organics (tetrachloroethene, toluene, and chlorobenzene) were detected at concentrations of less than 5 µg/kg. Several PAHs were also detected in two surface soil samples (A06-SS02 and A06-SS09). The highest concentrations were in samples collected at location A06-SS02: Concentrations detected in this sample were: 4,chloroanaline (950 µg/kg), phananthrene (83 µg/kg), benzo(b)fluoranthene (250 µg/kg), benzo(k)fluoranthene (150 µg/kg), benzo(a)pyrene (150 µg/kg), indeno(1,2,3-cd)pyrene (81 µg/kg). Several pesticides/PCBs were also detected in surface soil samples comprising beta-BHC, delta-BHC, gamma-BHC (Lindane), heptachlor epoxide, dieldren, 4,4-DDE, 4,4-DDT, methoxychlor, endrin aldehyde, alpha-chlordane, gamma-chlordane, Arochlor-1254, and Arochlor-1260. The highest concentrations of these constituents were detected in A06-SS02 located on the eastern edge of the site by Diggs Road. Arochlor-1254 was detected at a concentration of 4,200 µg/kg in this sample. Inorganics including aluminum, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, iron, mercury, nickel, silver, vanadium, and zinc were detected in surface sample locations. Concentrations from multiple locations were comparable, and no specific area of contamination was defined.

Subsurface soil samples were collected at fourteen boring locations. Eighteen additional subsurface soil samples were collected at the base of the nine test pits (two at each test pit location). Organic constituents were not detected or were detected at low concentrations in most of the subsurface soil locations. However, the polychlorinated biphenyl (PCB),

Arochlor-1254, was detected in five subsurface soil samples at concentrations of up to 79,000 µg/kg (A06-TP03). Arochlor-1260 was also detected in three subsurface soil samples at concentrations of up to 4,900 µg/kg (A06-TP02). Pesticides comprising alpha-chlordane and gamma-chlordane were detected at elevated concentrations in the samples from A06-TP02 and A06-TP03. The concentrations of inorganics were also elevated in samples from these test pits. Cadmium was detected in subsurface soil samples at concentrations up to 786 mg/kg (A06-TP02). A06-TP02 and A06-TP03 are located in the waste area to the southeast of the helicopter pad. Concentrations of explosives less than 5 mg/kg were detected in one subsurface soil sample collected at A06-TP05.

Groundwater samples were collected from ten temporary well sampling locations (Figure 9-2). Groundwater detections are included in Table 9-1. Three VOCs (TCE, cis-1,2 DCE, and ethylbenzene) were detected at low concentrations in the sample collected at A06-HP03, south of the helicopter landing pad. Maximum concentrations of these constituents were 1 µg/L, 0.6 µg/L, and 10 µg/L respectively. Nitrobenzene was detected in the sample collected at A06-HP04 at a concentration of 3.2 µg/L. 2,4,6-Trinitrotoluene (2,4,6-TNT) and 4-amino-2,6-dinitrotoluene (4-amino-2,6-DNT) were detected in the sample collected at A06-HP10 at concentrations of 0.73 µg/L and 1.3 µg/L respectively. No SVOCs or PCBs were detected in groundwater samples. Concentrations of dissolved inorganics were comparable to background concentrations.

The SSP report recommended that additional RI/FS efforts be conducted for the portion of SSA 6 which is now considered to be Site 24 to define the extent of potential soil and groundwater contamination (Baker, 1996).

9.2.3 Round One Remedial Investigation (RI) - 2002

The Round One RI at Site 24 conducted in September 1997, consisted of a surface soil investigation to obtain information to be used in the baseline human health and ecological risk assessments and to further evaluate the nature of surface soil contamination at the site. The efforts from this investigation are documented in the *Draft Final Remedial Investigation Report for Sites 23, 24, 25, and* 26 (Baker, 2002). Five surface soil samples and one duplicate sample were collected at Site 24 during the Round One RI (Figure 9-2). Sample locations were located just south and east of the test pits from which the soil samples with high concentrations of PCBs and cadmium were collected during the SSP investigation (TP02 and TP03). These data and the data collected during the SSP were evaluated as part of the human health and ecological risk assessments. The human health risk assessment identified a cumulative risk to the future adult construction worker from ingestion of and dermal contact with cadmium and PCBs in subsurface soil (Baker, 2002). The ecological risk assessment indicated that terrestrial receptors may be adversely impacted by soil concentrations of aluminum, chromium, copper, iron, mercury, silver, and vanadium. The Round One RI has not been finalized. Both the human health and ecological risk assessments will be updated based on more current guidance.

9.2.4 Nature and Extent of Groundwater Contamination and Fate and Transport Mechanisms

The nature and extent of groundwater contamination at Site 24 has not been defined. There are no permanent monitoring wells on site. Temporary well samples collected at the site

were not located in all of the areas where wastes were previously disposed. Low concentrations of organics detected in temporary wells were not above corresponding MCLs. Concentrations of explosives were generally low.

Based on the human health risk assessment, there is an unacceptable cumulative risk to the future construction worker due to cadmium and PCB contamination in soils. PCBs in general are characterized by low water solubility, low volatility, a high affinity for organic matter, and high resistance to chemical or biological degradation. The PCB congeners present in aroclors generally become tightly adsorbed to soil particles if they are released to soil. Due to their low solubility and high tendency to adsorb to soil, PCBs in the soil generally do not result in significant groundwater contamination. Cadmium also binds strongly to soil and does not have a tendency to leach into groundwater. Therefore, it is possible that identified soil contamination at the site is not impacting other media.

9.3 Site Status and Recommendations

Groundwater samples were not collected from Site 24 as part of this Phase I Groundwater RI. Existing groundwater data collected from temporary wells cannot be used for the purposes of a risk assessment because the temporary wells were not constructed with filter packs and were not developed. Consequently, analytical samples collected from them may not be representative of aquifer characteristics. Additionally, groundwater sample locations from the SSP investigation were not located in the disposal areas identified during the geophysical survey and there were no groundwater samples collected in the areas of PCB and cadmium contaminated soil. The Round One RI for soil at Sites 23, 24, 25, and 26 has not been finalized.

Therefore, it is recommended that Site 24 be removed from the Round One RI for soil report and that additional soil and groundwater characterization be conducted to sufficiently delineate the nature and extent of contamination. Furthermore, it is recommended that potential risks associated with contaminated media be quantified including the addition of a Step 3a ERA into the RI.

It is recommended that future activities at the site involve investigation groundwater beneath the former areas of debris identified during the geophysical survey and areas where soil contamination has been identified during previous investigations.

TABLE 9-1
Hydropunch Groundwater Sampling Analytical Results at Site 24
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS24-DW001	YS24-DW002	YS24-DW003		YS24-DW004	YS24-DW005	YS24-DW006	YS24-DW007	YS24-DW008	YS24-DW009	YS24-DW010
Sample ID	YS24-DW001-1194	YS24-DW002-1194	YS24-DW003-1194	YS24-DW003P-1194	YS24-DW004-1194	YS24-DW005-1194	YS24-DW006-1194	YS24-DW007-1194	YS24-DW008-1194	YS24-DW009-1194	YS24-DW010-1194
Sample Date	11/07/94	11/08/94	11/15/94	11/15/94	11/05/94	11/08/94	11/07/94	11/05/94	11/16/94	11/05/94	11/08/94
Chemical Name											
Volatile Organic Compounds (UG/L)											
Ethylbenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.8 J	1 U
Trichloroethene	1 U	1 U	1 U	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	1 U	1 U	3	10	1 U	1 U	1 U	1 U	1 U	1 U	4
Pesticide/Polychlorinated Biphenyls (UG/L)											
beta-BHC	0.05 UJ	0.05 UJ	0.05 U	0.05 UJ	0.05 UJ	0.026 J	0.05 UJ	0.05 UJ	0.05 U	0.05 UL	0.05 UJ
delta-BHC	0.05 UJ	0.029 J	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U	0.05 UL	0.029 J
Explosives (UG/L)											
2,4,6-Trinitrotoluene	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.73
4-Amino-2,6-dinitrotoluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.7
Nitrobenzene	0.73 U	0.73 U	0.73 U	0.73 U	3.2	0.73 U	2.6 U	0.73 U	4.1 U	0.73 U	0.73 U
Total Metals (UG/L)											
Aluminum	77,200 J	29,000 J	14,800 J	18,300 J	9,040	52,700 J	44,000 J	15,500 J	4,580	98,800 J	19,100 J
Antimony	19.8 L	12.7 L	12.2 UL	15.7 L	12.2 UL	23 L	13.3 L	12.2 UL	12.2 R	28.3 L	12.2 UL
Arsenic	65.7	26.3	15.5	22.2	8.9	67.3	59.9	19.6	5.8	436	16.5
Barium	255	146	74.4	94	56.6	187	190	92.3	37.7	474	95.4
Beryllium	4.4	1.8	1.1	1.6	1 U	3.8	3.2	1.1	1.4	7.8	1.2
Cadmium	1.9	1.5 U	1.5 U	1.5 U	1.5 U	2.8	1.7	1.8	1.5 U	27.1	1.5 U
Calcium	2,350,000	880,000	656,000	836,000	350,000	2,170,000	1,140,000	168,000	8,640	1,230,000	594,000
Chromium	232	86.1	41.5	64.7	27.2	159	160	62.4	15.8	500	49.6
Cobalt	42.9	19.6	12	19.6	9.7	42.6	30.9	9.7	9.4	87.2	16.3
Copper	66	28	16.9	23.1	9	52.5	45.3	18.6	7.4	107	19.4
Cyanide	20 U	5.4	5 U	5 U	5 U	20 U	5 U	5 U	5 U	6.8	5.2
Iron	155,000	70,400	33,000	52,500	26,900	153,000	131,000	38,900	13,900	279,000	39,500
Lead	61.2	27.2	13.6	21.7	7.5 J	51.3	43.8	16.2	4.2	113	17.8
Magnesium	76,000	20,200	10,300	14,600	13,800	29,100	24,000	12,100	4,250	56,800	10,800
Manganese	1,010	452	205	286	193	920	631	247	116	1,690	321
Nickel	93.9	35.2	16.6	32.2	8.9	89.4	63.8	17.8	23.1	237	20.9
Potassium	19,900	8,760	5,580	7,170	3,990	14,100	18,200	12,900	4,870	42,900	5,430
Selenium	6.2	2.6 U	2.6 U	3.7	2.6 U	4.3	2.8	2.6 U	2.6 UL	28.4	2.6 U
Sodium	14,400	7,880	7,710	8,420	6,510	9,790	11,700	7,410	4,710	17,400	6,340
Vanadium	210	80.6	44.1	61.3	24	144	140	50.8	13.2 L	603	55.5
Zinc	322 J	134 J	68.4 J	112 J	41 J	294 J	242 J	91.6 J	39 B	618 J	96.3 J
Dissolved Metals (UG/L)											
Aluminum	11 U	11 U	11 U	11 U	11 U	20.3	11 U	11 U	11 U	11 U	11 U
Barium	21.1	34.3	23	23.2	21	9.9	25.5	38.8	21.5	63.4	23
Beryllium	0.1 U	0.11	0.18	0.13	1 U	0.16	0.1 U	0.13	0.23 B	0.1 U	0.22
Calcium	79,200	141,000	112,000	116,000	89,000	85,300	87,500	77,900	7,920	72,500	99,400
Cobalt	1.9 U	1.9 U	1.9 U	1.9 U	2.2	1.9 U	1.9 U	1.9 U	2.1	1.9 U	1.9 U
Copper	14.1	11.3	15.6	8.8	9.6	15.4	1.5	8.8	7.3	7.3	13.4
Iron	1.5 U	66.1	40.8 B	1.5 U	1.5 U	35.6 B	12.5 B	8.3 B	3,080	12.1 B	2.4 B
Magnesium	2,310	4,260	2,600	2,630	3,950	2,180	2,370	4,700	2,600	5,720	2,170
Manganese	3.7	59.6	13	14.5	27.6	6	33.9	55.1	76.7	25.6	12.2
Nickel	4.3 U	4.8	4.5	4.3 U	4.3 U	4.4	4.3 U	6.1	9.3	4.3 U	6.2
Potassium	1,540	1,870	1,750	1,430	1,700	1,950	4,230	6,640	3,050	3,720	1,730
Sodium	6,700	5,090	6,100	6,250	5,250	4,090	6,720	6,570	4,620	8,110	4,320
Thallium	4 U	5.3	4 U	4.4	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Vanadium	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.9

Notes:

Shaded values indicate the analyte was detected
UG/L = Micrograms per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

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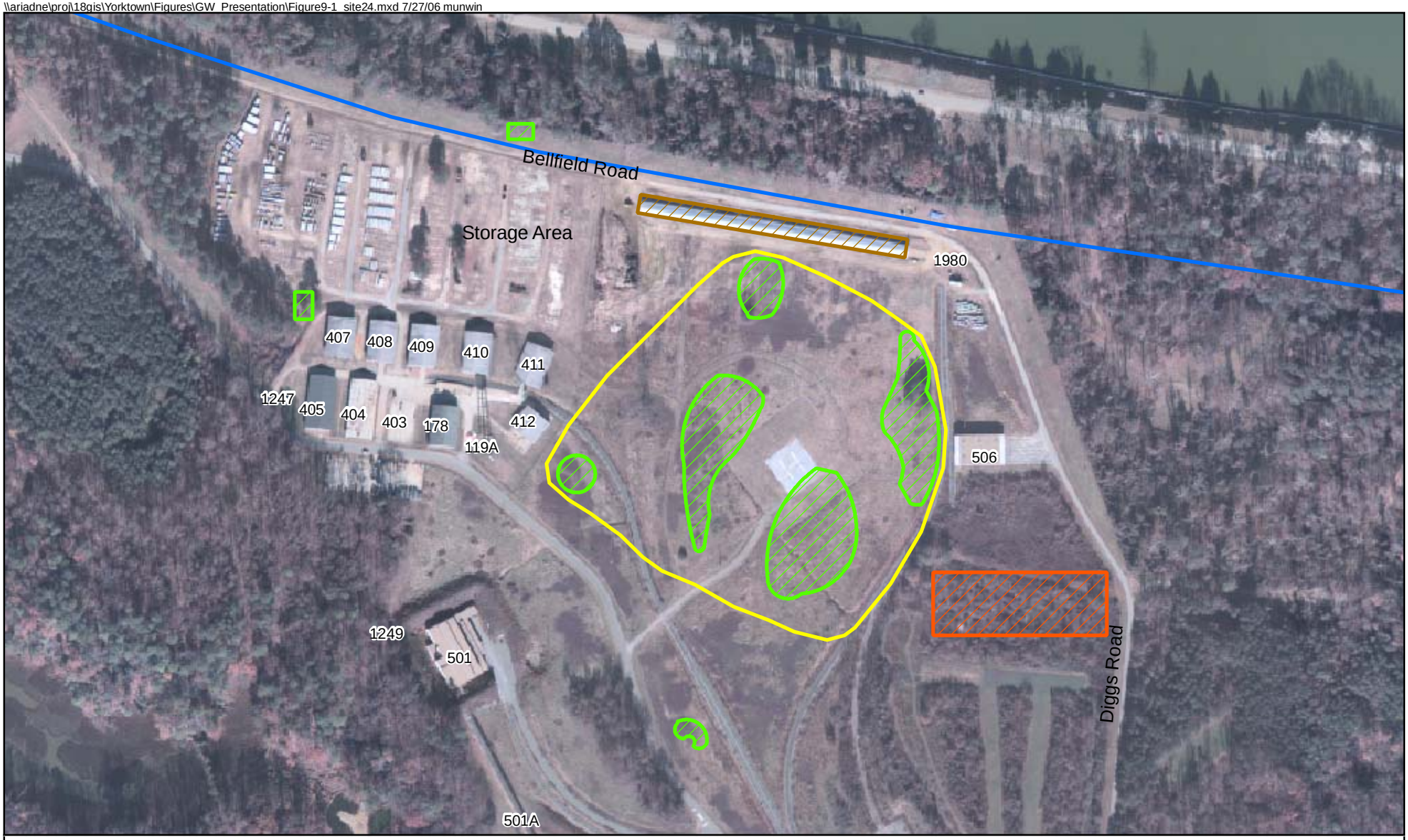

Legend

- Yorktown Base Boundary
- Study Area Boundary
- Buried Debris
- Sludge Disposal Area
- Site 6 Bioremediation Treatment Cell

N
W E
S

0 200 400
Feet

Figure 9-1
Site 24 Layout
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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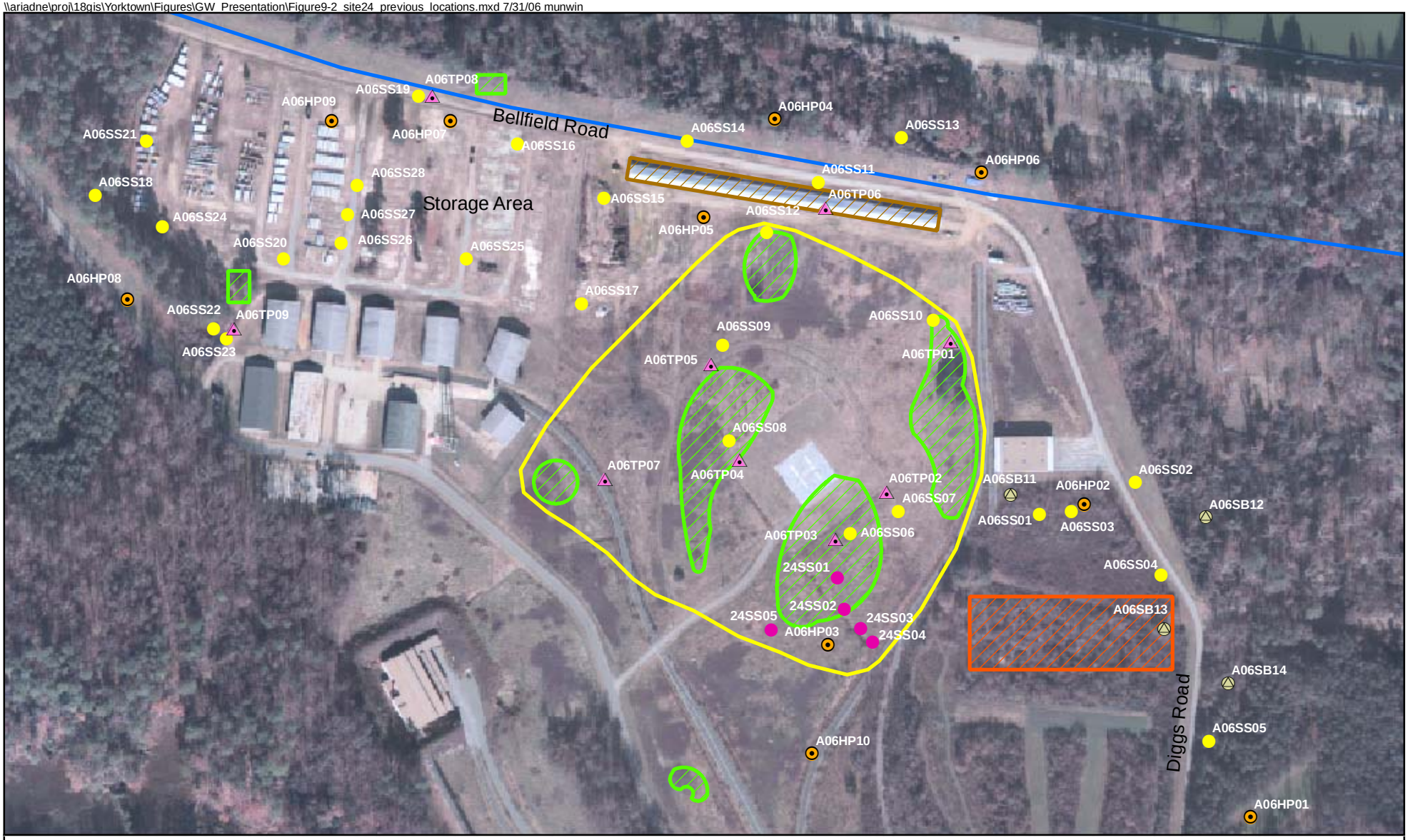

Legend

- Yorktown Base Boundary
- Study Area Boundary
- Buried Debris
- Sludge Disposal Area
- Site 6 Bioremediation Treatment Cell
- Soil Boring/Temporary Piezometer Location
- Soil Boring
- Test Pit Location
- Surface Soil Sample Location
- Round 1 RI Surface Soil Sample Location

N
W E
S

0 150 300
Feet

Figure 9-2
Previous Investigations Sample Locations at Site 24
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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SECTION 10

Site 25 Summary and Investigation Results

10.1 Site 25 Background and Physical Characteristics

10.1.1 Site Setting and History

Site 25, the Rocket Plant, formerly identified as SSA 7, is located at the end of Main Road just east of Felgates Creek (Figure 10-1). Building 373, where explosives loading was conducted, is located in the southwest portion of the site. Prior to the 1960s, wash/rinse water from the cleanup of formulation/pouring equipment drained into a settling basin within the building for removal of suspended solids. The solids were incinerated at Site 4 (Burning Pad Residue Landfill). The wash/rinse water was then discharged into Felgates Creek (Figure 10-1). The discharge line to the creek was plugged in the early 1980s and a 220-gallon underground wastewater storage tank (UST) was installed to contain the wash/rinse water. The UST was a precast concrete pipe installed vertically into the ground with a bottom section cast in the concrete pipe. The wastewater UST received batch wastes from Naval Explosives Development Engineering Department (NEDED) research and development and the wash/rinse water. Once the tank was filled, the water was filtered through a carbon unit and discharged to the sanitary sewer system. The use of the wastewater UST was curtailed in the early 1980s and an aboveground storage tank (AST) was installed at the north end of the building. Materials contained within the tanks consisted of binders, curatives, catalysts, stabilizers, and explosives.

Site 25 is relatively flat with a slight surface depression west of Building 373. A wooded area lies just west of this surface depression and separates the site area from Felgates Creek.

10.1.2 Site Hydrogeology

Site 25 is located on the Croaker Flat Terrace within the Virginia Coastal Plain Physiographic Province. Descriptions of the lithologic units present at Site 25 and WPNSTA Yorktown are provided in Section 2.2. Construction details for wells within Site 25 are provided on Table 10-1. Based on boring logs included in Appendix A, the surficial geology at Site 25 consists of an unsaturated clay layer lithologically consistent with the Yorktown confining unit. Since the water table consistently lies below the clay layer, the Yorktown-Eastover aquifer beneath the clay behaves as an unconfined aquifer. These findings are consistent with the results of the 1997 USGS study (Figure 2-6). Based on the 1997 USGS report, the Yorktown-Eastover aquifer is approximately 70 feet thick in the vicinity of Site 25. The Eastover-Calvert confining unit lies beneath the Yorktown-Eastover aquifer. Cross-sections of the site are provided in Appendix E of this document.

Groundwater elevation data collected as part of this Phase I Groundwater RI (Table 10-2) indicates groundwater flow to the west toward Felgates Creek (Figure 10-2).

10.2 Site 25 Previous Investigations

10.2.1 SSP Investigation -1996

Site 25 was initially investigated as SSA 7 during the SSP Investigation conducted in the fall of 1994. The SSP investigation was conducted to determine if further investigation was needed in several SSAs, including SSA 7. This information can be found in the *Final Site Screenig Process Report for Sites Screening Areas 1, 6, 7, and* 15 (Baker, 1996). The SSP investigation focused on four areas within SSA 7: the Group 18 Magazine Area, the Main Road Disposal Area, the Building 373 Rocket Plant Area, and the Building 373 UST. Soil, groundwater, surface water, and sediment were investigated. The sample locations in the Building 373 UST area are shown on Figure 10-3. Groundwater analytical results are included in Table 10-3 with the results of this Phase I Groundwater RI.

Nitramines were detected in three soil sample locations during the SSP: A07HA04, A07HA05, and A07SB06. These locations are in the proximity of the location of the former discharge line to Felgates Creek. HMX and RDX were detected at maximum concentrations of 30,000 µg/kg and 580 µg/kg respectively. VOCs and nitramine compounds were detected in SSP groundwater samples. The highest concentrations of these constituents were in the area of the former UST (HP02, HP05, and HP06). Volatiles detected in groundwater included 1,1-DCE; 1,1-DCA; 1,1,1-TCA; TCE, and ethylbenzene. Explosives and VOCs were not detected in surface water and sediment samples collected in Felgates Creek adjacent to the site.

Based on a risk screening, the SSP investigation report recommended additional RI/FS activities for the Building 373 UST area only. This area was renamed Site 25.

10.2.2 Removal Action - 1996

A removal action was conducted at in June and July of 1996 by OHM. The purpose of the removal action was to remove the 500-gallon UST and associated piping. During the removal action, the bottom section, which had been cast to the concrete pipe, was heavily stained. The soil from beneath and around the UST was removed. Confirmation sampling conducted indicated the presence of VOCs and nitramine compounds in the soil remaining after the tank was removed. Total VOCs concentrations in soils within the excavation ranged from not detected to 93 µg/kg. Total nitramine concentrations ranged from not detected to 8,530 µg/kg.

10.2.3 Round One RI - 2002

A Round One RI was conducted in 1997 to further determine the nature and extent of groundwater contamination at the site and to evaluate the extent of remaining soil contamination around the excavated UST. The efforts from this investigation are documented in the *Draft Final Remedial Investigation Report for Sites 23, 24, 25, and 26* (Baker, 2002). Five monitoring wells were installed to support groundwater investigation at the site. Surface soil, subsurface soil, groundwater, and sediment samples were obtained at locations shown on Figure 10-3. These samples were analyzed for TCL organics, nitramines, and inorganics. Groundwater analytical detections are included with the results of this RI

on Table 10-3. Sediment and surface water sample results are included on Tables 10-4 and 10-5, respectively.

With the exception of a methylene chloride, a common laboratory contaminant, no VOCs were detected in surface soil samples collected during the Round One RI. One pesticide, endrin ketone, was detected in a sample collected just south of the former UST at a concentration of 0.33 J µg/L. There were no other organics detected in surface soil samples during the Round One RI. Aluminum, arsenic, barium, chromium, cobalt, copper, iron, lead, manganese, nickel, vanadium and zinc were detected in one or more surface soil samples. However, no discernable pattern or hot spots were identified associated with these metals concentrations. Results for samples collected across the site were comparable. Therefore, it was concluded that site surface soils were not impacted by previous site operations.

Concentrations of methylene chloride, acetone, 1,1,1-TCA, TCE, toluene, and xylenes, were detected in Site 25 subsurface soil samples collected as part of the Round One RI. Methylene chloride and acetone are common laboratory contaminants. 1,1,1-TCA and TCE were detected at concentrations of 15 µg/kg or less in only two samples. HMX was detected in subsurface soil at concentrations of up to 7,430 µg/kg. The highest concentrations of HMX were in the vicinity of the abandoned UST. Twenty-two metals and cyanide were also detected in subsurface soil samples at Site 25.

No pesticides, PCBs, or SVOCs were detected in Site 25 groundwater. Six VOCs were detected in groundwater samples: 1,1-DCE, 1,1-DCA, chloroform, 1,1,1-TCA, bromodichloromethane, and ethylbenzene. The highest CVOC detection was the concentration of 1,1,1-TCA in the sample from shallow well 25GW02 (110 µg/L). RDX was detected in one Site 25 groundwater sample during the Round One RI (25GW02) at a concentration of 22 µg/L. This was the only explosives detection in groundwater during the Round One RI. The concentrations of total arsenic exceeded the MCL in samples from all site wells. The maximum concentration was detected in the unfiltered sample from 25GW04 (501 µg/L). Arsenic was not detected in the filtered groundwater samples collected at the site.

BEHP, 3-nitrotoluene and several inorganics were detected in one or more surface water samples. 3-nitrotoluene was detected in the parent and duplicate samples from station 25SW01 at a maximum concentration of 0.27 J µg/L. This sampling location is located west of the excavated UST on the east side of Felgates Creek. Several inorganic constituents were also detected it surface water. Concentrations of these constituents detected in samples collected southwest of the former discharge line were comparable to those collected northwest of Building 373, downgradient of the former piping and excavated UST (Table 10-5).

Benzene, tetrachloroethene (PCE), and toluene were detected in Site 25 sediment samples collected during the RI. Toluene and PCE were detected at concentrations of 88 µg/kg and 2 J µg/kg in a sample from location 25SD008 located near the former discharge pipe to Felgates Creek. Benzene was detected at a concentration of 2 J µg/kg in a sample from location 25SD006 located downgradient of the former discharge pipe. Nine SVOCs were detected in the duplicated sediment sample from 25SD001: benzo(a) anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene,

indeno(1,2,3)pyrene, pyrene and bis(2-ethylhexyl)phthalate. These results may be erroneous, however, because these compounds were not detected in the parent sample collected from this location at the same depth. Three pesticides (endosulfan I, methoxychlor, and alpha chlordane) were detected in one or more samples at concentrations of up to 8.7 J µg/kg. Arochlor 1260 was detected at a maximum concentration of 16 J µg/kg in the sample collected at 25SD11, upgradient of the discharge line and the location of the former UST (Figure 10-3 and Table 10-4).

Risk calculations performed on the Round One RI data indicated that no unacceptable human health risks or hazards were present at Site 25. Potential risks to the terrestrial environment at Site 25 were identified based on a screening of concentrations against flora and fauna toxicity values. These potential risks were related to concentrations of aluminum, chromium, copper, iron, vanadium and zinc in soils. Potential risk to the aquatic environment was also identified resulting from concentrations of 3-nitrotoluene, aluminum, cobalt, copper, cyanide, iron, and manganese in surface water (Baker, 2002).

10.3 Site 25 Field Activities

In order to provide additional data to evaluate the nature and extent of explosives and metals in groundwater, samples were collected from four Site 25 Yorktown-Eastover aquifer monitoring wells as part of this Phase I Groundwater RI (25GW02, 25GW02A, 25GW03, and 25GW04). Because potential risks at this site based on data included in the RI were related to metals and nitramines, samples were analyzed for nitramine compounds and total and dissolved TAL inorganics only. VOCs, although present, were not analyzed because they were not found to present a risk to potential human receptors.

Sampling and QA/QC procedures are included in Sections 3.1.3 and 3.1.4 of this document respectively. Table 10-6 presents the samples collected, including associated QA/QC samples, and the analytical parameters for these samples and those collected during the 1997 RI, while Figure 10-1 shows the location of the Site 25 monitoring wells. Field parameters measured during well purging (pH, temperature, conductivity, and turbidity) are included in Table 10-7.

10.4 Site 25 Analytical Results

This section summarizes the analytical results of sampling conducted during RI field activities. Analytical detections are presented in Table 10-3. Analytical results that exceeded MCLs and/or background concentrations are shown on Figure 10-4. Complete analytical results are included in Appendix F.

10.4.1 Metals and Cyanide Analytical Results

Six inorganics were detected in unfiltered metals samples: aluminum, calcium, magnesium, nickel, potassium, and sodium. Constituents not considered detections (B and U flagged results) included antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, cyanide, iron, lead, manganese, mercury, selenium, silver, thallium, vanadium and zinc.

The total concentration of nickel in the sample from 25GW02A (7.7 µg/L) exceeded the base wide maximum background concentration of 7.7 J µg/L for this metal. There were no other exceedances of background maximums for non-human nutrients.

The inorganics detected in unfiltered groundwater samples in addition to barium were also detected in filtered groundwater samples.

The dissolved concentration of aluminum in the sample from 25GW02A (674 µg/L) exceeded the base wide maximum concentration for this metal (146 µg/L). The concentrations of dissolved nickel in the samples from 25GW02 (0.93 J µg/L) and 25GW02A (1.4 J µg/L) also exceeded the maximum background concentration as nickel was not detected in the dissolved background data set. There were no other exceedances of background maximum concentrations for non-human nutrient inorganics.

Barium, vanadium, and zinc were detected in Site 25 dissolved metals samples, but were flagged with B qualifiers during validation and are thus considered non-detections. For the same reason described in the section on total metals, these non-detect results may not be reflective of actual concentrations in aquifer water.

10.4.2 Explosives Analytical Results

HMX and RDX were detected at concentrations of 32 µg/L and 35 µg/L respectively in the sample collected at 25GW04. The concentration of RDX was greater than the tap water value of 0.61 µg/L. These were the only detections of explosives at Site 25. Explosives were not detected in the background data set. Explosives are not considered naturally occurring and are not anthropogenic chemicals that are generally found across wide-spread areas under typical land use scenarios.

10.5 Site 25 Nature and Extent of Contamination and Fate and Transport

HMX and RDX were detected in groundwater from 25GW04. RDX exceeds the tap water RBC of 0.61 µg/L. Concentrations of RDX were detected in only one well (25GW04) located south of the former discharge line to Felgates Creek. It is possible that the source of this constituent may be this discharge line where nitramines were detected soil samples during the SSP. There are currently no wells installed in this area. HMX and RDX tend to adsorb to soil and are not typically very mobile. If they were transported in groundwater, they would likely flow to the west toward Felgates Creek. However, these constituents were not detected in surface water or sediment samples collected during the Round One RI conducted at the site indicating that the compounds are not being transported in measurable quantities into the surface water body.

10.6 Conclusions and Recommendations

Although the concentration of dissolved aluminum exceeded the maximum background concentration in groundwater and potential risks to aquatic receptors were identified during the RI related to exposure to metals in surface water and sediment, it is likely that metals concentrations are not site related. There is no history of a release of metals at the

site. Additionally, concentrations of aluminum are higher in the deeper portion of the Yorktown-Eastover aquifer (25GW02A) than they are in the shallow well pair for this well. This well pair was installed in the location of historic release from the UST. Aluminum is not very mobile and would not be expected to migrate from the known source area to the lower portion of the Yorktown-Eastover aquifer. Dissolved concentrations of metals in groundwater are comparable across the site. Concentrations in the known source area are not higher than those detected in upgradient wells (25GW01 and 25GW03).

1. Therefore, no additional investigation is recommended to address concentrations of metals in groundwater, surface water, or sediment.

HMX and RDX were detected in groundwater from 25GW04. Although a quantitative risk assessment has not been conducted, it is possible that the concentrations of RDX present an unacceptable risk to human health based on the corresponding tap water RBC of 0.61 µg/L. Based on soil sample results from the SSP study, it is possible that the former discharge line to Felgates Creek is the source of the explosives contamination at the site.

2. Further investigation should be conducted to delineate perchlorates and explosives (including nitroglycerin, 3,5-dinitroaniline, PETN, diphenylamine, n-nitro-sodiphenylamine, ammonium nitrate, and nitroguanidine) in groundwater at the site. This sampling will include the analysis of perchlorate.

3. If groundwater contamination is identified that could discharge to Felgates Creek, additional surface water and/or sediment sampling is recommended.

Additionally, it is recommended that human health and ecological risks at the site be quantified using current guidance.

TABLE 10-1
Groundwater Monitoring Well Construction Details at Site 25
Phase I Groundwater Remedial Investigation for Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Well Number	Aquifer	Date Installed	Top of PVC Casing Elevation (ft msl)	Ground Surface Elevation (ft msl)	Boring Total Depth (ft bgs)	Elevation Bottom of Boring (ft msl)	Well Diameter	Total Well Depth (ft bgs)	Bottom Well Elevation (ft msl)	Outer Casing Interval (ft bgs)	Depth to Screen Interval (ft bgs)	Top of Screen Interval Elevation (ft msl)	Bottom of Screen Interval Elevation (ft msl)	Depth to Top of Sand Pack (ft bgs)	Depth to Top of Bentonite (ft bgs)
25GW01	Yorktown-Eastover	09/14/97	24.29	22.20	29	-6.80	2	19	3.20	--	19 - 29	3.2	-6.8	14	17
25GW02	Yorktown-Eastover	09/13/97	24.55	22.51	29	-6.49	2	29	-6.49	--	19 - 29	3.5	-6.5	14	17
25GW02A	Yorktown-Eastover	09/12/97	24.41	22.45	69	-46.55	2	69	-46.55	--	59 - 69	-36.6	-46.6	54	57
25GW03	Yorktown-Eastover	09/14/97	23.87	21.71	29	-7.29	2	29	-7.29	--	19 - 29	2.7	-7.3	14	17
25GW04	Yorktown-Eastover	09/13/97	24.18	22.31	29	-6.69	2	29	-6.69	--	19 - 29	3.3	-6.7	14	17

NOTES:
msl - mean sea level (in feet)
bgs - Below Ground Surface (in feet)
-- NA
(1) Modified well construction due to shallow groundwater table
(2) Drive point, no sand pack
(3) Staff gauge

TABLE 10-2
Summary of Groundwater Elevation Data at Site 25
Phase I Groundwater Remedial Investigation for Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Monitoring Well	Aquifer	Depth to Water (ft) October 12, 2004	Top of Casing (ft above msl)	Groundwater Elevation (ft above msl) October 12, 2004
25GW01	Yorktown-Eastover	21.06	24.29	3.23
25GW02	Yorktown-Eastover	18.84	24.55	5.71
25GW02A	Yorktown-Eastover	20.43	24.41	3.98
25GW03	Yorktown-Eastover	17.84	23.87	6.03
25GW04	Yorktown-Eastover	21.48	24.18	2.70

Note:
msl - mean sea level

TABLE 10-3
Groundwater Analytical Detections at Site 25
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	MCL-Groundwater	Maximum Background - Yorktown-Eastover Aquifer	Yorktown-Eastover		Yorktown-Eastover		Yorktown-Eastover			Yorktown-Eastover		Yorktown-Eastover	
Station ID			YS25-GW001		YS25-GW002		YS25-GW002A			YS25-GW003		YS25-GW004	
Sample ID			YS25-MW001-1097	YS25-MW001P-1097	YS25-MW002-0997	YS25-MW002-0904	YS25-MW002A-1097	YS25-MW002A-0904	YS25-MW002AP-0904	YS25-MW003-1097	YS25-MW003-0904	YS25-MW004-1097	YS25-MW004-0904
Sample Date			10/08/97	10/08/97	09/27/97	09/17/04	10/08/97	09/23/04	09/23/04	10/08/97	09/17/04	10/08/97	09/17/04
Investigation			Historical Data	Historical Data	Historical Data	GW RI Data	Historical Data	GW RI Data	GW RI Data	Historical Data	GW RI Data	Historical Data	GW RI Data
Chemical Name													
Volatile Organic Compounds (UG/L)													
1,1,1-Trichloroethane	200	1 U	2 J	2 J	110	NA	10 U	NA	NA	17	NA	3 J	NA
1,1-Dichloroethane	No MCL	1 U	10 U	10 U	5 J	NA	10 U	NA	NA	10 U	NA	10 U	NA
1,1-Dichloroethene	7	1 U	10 U	10 U	20	NA	10 U	NA	NA	5 J	NA	4 J	NA
Bromodichloromethane	80	1 U	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	4 J	NA
Chloroform	80	1 U	4 J	4 J	5 J	NA	10 U	NA	NA	1 J	NA	37	NA
Ethylbenzene	700	1 U	0.5 J	0.6 J	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Explosives (UG/L)													
HMX	No MCL	0.61 U	0.5 U	0.5 U	21 B	6.7 B	0.5 U	2.5 U	2.5 U	0.5 U	2.5 U	0.5 U	32
RDX	No MCL	0.59 U	0.5 U	0.5 U	22	2.5 U	0.5 U	2.5 U	2.5 U	0.5 U	2.5 U	0.5 U	35
Total Metals (UG/L)													
Aluminum	No MCL	1160	34,600 K	27,600 K	7,060 K	80.7 U	2,690 K	580	599	50,100 K	80.7 U	166,000 K	80.7 U
Arsenic	10	3.5 J	139	142	19.4	2.1 U	4.8 B	3.3 B	2.9 B	222	2.1 U	501	2.1 U
Barium	2,000	43.6 J	125 J	116 J	40.6 J	15.4 B	15.9 J	13.7 B	14.7 B	165 J	7.3 B	528	17.7 B
Beryllium	4	0.2 U	2.1 B	2 B	0.2 U	0.1 U	0.58 B	0.1 U	0.1 U	2.8 B	0.1 U	9.4 K	0.1 U
Cadmium	5	2.3 U	4 J	4.1 J	1 J	0.2 U	0.2 U	0.2 U	0.2 U	6.8	0.2 U	23.3	0.2 U
Calcium	No MCL	67100	231,000	232,000	130,000 J	91,600	64,000	44,200	46,500	250,000	80,100	592,000	106,000
Chromium	100	4.7 L	188	168	33.7	0.9 U	27.5	6.6 B	4.4 B	259	0.9 U	857	0.93 B
Cobalt	No MCL	2.1 U	19.9 J	19 J	3.6 J	0.5 U	1.6 J	0.5 U	0.5 U	28.2 J	0.5 U	80.2	0.5 U
Copper	1,300	4.5 J	25.1	25 J	3.9 UL	0.6 U	3.9 B	0.6 U	0.65 B	37.4	0.6 U	120	0.6 U
Cyanide	200	5 U	10 R	10 R	2.9 J	2.9 B	10 R	1.1 U	1.5 B	10 R	2.5 B	10 R	3 B
Iron	No MCL	2350	83,000	78,800	13,300	43 U	5,440	61.7 B	73 B	113,000	43 U	349,000	56.8 B
Lead	15	1.5 U	30.1 J	27.5 J	4.7 J	1.1 U	2 UL	1.1 U	1.1 U	38.7 J	1.1 U	140 J	1.1 U
Magnesium	No MCL	3350 J	11,500	10,700	4,130 J	1,740 J	1,730 J	43.8 U	43.8 U	15,400	1,720 J	45,300	1,140 J
Manganese	No MCL	18.4	298	293	81.3	0.2 U	27.1	0.68 B	0.85 B	401	0.2 U	1,180	0.4 B
Mercury	2	0.2 UL	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 UJ	0.1 UJ	0.1 U	0.1 UJ	0.17 J	0.1 UJ
Nickel	No MCL	5.2 U	63.2	59	10 J	0.6 U	3.9 J	7.7 J	3.7 J	103	0.6 U	301	0.6 U
Potassium	No MCL	5510	11,600	11,000	3,200 J	1,150 J	23,300	10,400	10,700	14,200	132 J	45,600	318 J
Selenium	50	2.9 J	3.2 U	5.5 K	4.1 UL	2.4 U	3.2 U	2.4 U	2.4 U	6.4 K	2.4 U	17.1	2.4 U
Sodium	No MCL	8300	8,220	8,680	6,300	35,800	25,400	16,900	17,600	5,270	10,900	14,600	6,320
Vanadium	No MCL	7.5 J	243	212	47 J	0.6 U	13.2 J	1.4 B	1.2 B	398	0.6 U	1,140	0.7 B
Zinc	No MCL	14.9 J	162 J	160 J	32.6 J	4.1 U	16.8 B	4.1 U	4.1 U	251 J	4.1 U	707 J	4.3 B
Dissolved Metals (UG/L)													
Aluminum	No MCL	146 J	85.1 B	22.7 B	52.3 U	80.7 U	731	674	657	32.9 B	80.7 U	41.6 B	80.7 U
Barium	2,000	30.9 J	14.9 J	12.5 J	17.7 J	14.8 B	2 B	15.7 B	15.3 B	12.1 J	7 B	10.2 J	17.4 B
Cadmium	5	2.3 U	0.2 B	0.2 U	0.3 U	0.2 U	0.2 U	0.2 U	0.2 U	0.22 J	0.2 U	0.2 U	0.2 U
Calcium	No MCL	69800	106,000	105,000	118,000 J	87,900	4,840 J	47,800	48,100	86,300	77,700	58,700	104,000
Copper	1,300	4 J	1.6 J	1.2 U	3.9 UL	0.6 U	1.6 B	0.5 U	0.5 U	1.7 J	0.6 U	1.2 U	0.6 U
Magnesium	No MCL	3410 J	1,930 J	1,870 J	2,470 J	1,680 J	879 J	4.9 U	4.9 U	1,890 J	1,590 J	722 J	1,120 J
Manganese	No MCL	12.2 J	14.5 J	11.8 J	33.1	5.5 J	1.9 B	0.1 U	0.1 U	14.7 J	1 J	12.6 J	0.86 B
Nickel	No MCL	5.2 U	1.5 U	1.5 U	2.8 U	0.93 J	1.5 U	0.5 U	1.4 J	1.5 U	0.6 U	1.5 U	0.75 J
Potassium	No MCL	5680	1,310 J	1,280 J	1,020 J	1,190 J	20,700	11,300	11,300	598 J	132 J	646 J	326 J
Sodium	No MCL	8570	7,090 B	6,060 B	4,790 J	36,700	25,700	18,600	18,900	3,290 B	11,200	8,250	6,710
Vanadium	No MCL	6.3 J	0.61 B	0.6 U	1 U	0.6 U	5.8 J	1.9 B	1.6 B	0.6 U	0.6 U	0.81 B	0.6 U
Zinc	No MCL	5.9 J	6.3 B	6.3 B	12.7 J	6 B	2.7 B	3.5 B	8.2 B	6.4 B	4.1 U	58.7	4.1 U

Aquifer	**MCL-Groundwater**	**Maximum Background - Yorktown-Eastover Aquifer**	Yorktown-Eastover		Yorktown-Eastover		Yorktown-Eastover			Yorktown-Eastover		Yorktown-Eastover	
Station ID			YS25-GW001		YS25-GW002		YS25-GW002A			YS25-GW003		YS25-GW004	
Sample ID			YS25-MW001-1097	YS25-MW001P-1097	YS25-MW002-0997	YS25-MW002-0904	YS25-MW002A-1097	YS25-MW002A-0904	YS25-MW002AP-0904	YS25-MW003-1097	YS25-MW003-0904	YS25-MW004-1097	YS25-MW004-0904
Sample Date			10/08/97	10/08/97	09/27/97	09/17/04	10/08/97	09/23/04	09/23/04	10/08/97	09/17/04	10/08/97	09/17/04
Investigation			Historical Data	Historical Data	Historical Data	GW RI Data	Historical Data	GW RI Data	GW RI Data	Historical Data	GW RI Data	Historical Data	GW RI Data
Chemical Name													
Wet Chemistry (MG/L)													
Chloride	No MCL	NA	3.9	NA	4.2	NA	8.4	NA	NA	2.6	NA	10.9	NA
Methane	No MCL	NA	2.00E-07	NA	5.00E-07	NA	3.00E-07	NA	NA	4.00E-07	NA	1.10E-06	NA
Sulfate	No MCL	NA	13.8	NA	12	NA	14	NA	NA	7.5	NA	27.5	NA
Sulfide	No MCL	NA	0.65	NA	1.5	NA	0.65	NA	NA	3.1	NA	0.5 U	NA
Total dissolved solids (TDS)	No MCL	NA	90	NA	320	NA	140	NA	NA	220	NA	65	NA
Total organic carbon (TOC)	No MCL	NA	0.005	NA	1.00E-03	NA	1.00E-03	NA	NA	0.002	NA	0.003	NA
Total suspended solids (TSS)	No MCL	NA	2,200	NA	700	NA	66	NA	NA	1,700	NA	5,100	NA

Notes:

Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
MCL = Federal Maximum Contaminant Level
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 10-4
Sediment Analytical Detections at Site 25
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS25-SD001			YS25-SD002		YS25-SD003		YS25-SD004		YS25-SD005		YS25-SD006		YS25-SD007	
Sample ID	YS25-SD001-A-1294	YS25-SD001P-A-1294	YS25-SD001-B-1294	YS25-SD002-A-1294	YS25-SD002-B-1294	YS25-SD003-A-1294	YS25-SD003-B-1294	YS25-SD004-A-1294	YS25-SD004-B-1294	YS25-SD005-A-0997	YS25-SD005-B-0997	YS25-SD006-A-0997	YS25-SD006-B-0997	YS25-SD007-A-0997	YS25-SD007-B-0997
Sample Date	12/01/94	12/01/94	12/01/94	12/01/94	12/01/94	12/01/94	12/01/94	12/04/94	12/04/94	09/27/97	09/27/97	09/27/97	09/27/97	09/27/97	09/27/97
Chemical Name															
Volatile Organic Compounds (UG/KG)															
Acetone	34 U	32 U	27 U	32 U	22 U	16 U	15 U	12 U	13 U	14 U	14 U	14 U	16 U	14 U	14 U
Benzene	34 U	32 U	27 U	32 U	22 U	16 U	15 U	12 U	13 U	14 U	14 U	1 J	2 J	14 U	14 U
Carbon disulfide	34 U	32 U	27 U	32 U	22 U	16 U	15 U	12 U	13 U	14 U	14 U	0.8 J	3 J	14 U	14
Tetrachloroethene	34 U	32 U	27 U	32 U	22 U	16 U	15 U	12 U	13 U	14 U	14 U	14 U	16 U	14 U	14 U
Toluene	34 U	32 U	27 U	32 U	22 U	16 U	15 U	12 U	13 U	14 U	14 U	14 U	16 U	14 U	14 U
Semi-volatile Organic Compounds (UG/KG)															
2,4-Dinitrotoluene	1,100 U	1,100 U	870 U	1,000 U	690 U	530 U	460 U	400 U	410 U	440 U	450 U	450 U	540 U	470 U	440 U
Benzo(a)anthracene	1,100 U	260 J	870 U	1,000 U	690 U	530 U	460 U	400 U	410 U	440 U	450 U	450 U	540 U	470 U	440 U
Benzo(a)pyrene	1,100 U	300 J	870 U	1,000 U	690 U	530 U	460 U	400 U	410 U	440 U	450 U	450 U	540 U	470 U	440 U
Benzo(b)fluoranthene	1,100 U	440 J	870 U	1,000 U	690 U	530 U	460 U	400 U	410 U	440 U	450 U	450 U	540 U	470 U	440 U
Benzo(k)fluoranthene	1,100 U	340 J	870 U	1,000 U	690 U	530 U	460 U	400 U	410 U	440 U	450 U	450 U	540 U	470 U	440 U
Butylbenzylphthalate	1,100 U	1,100 U	870 U	600 J	2,300	690	810	400 U	410 U	440 U	450 U	450 U	540 U	470 U	440 U
Chrysene	1,100 U	360 J	870 U	1,000 U	690 U	530 U	460 U	400 U	410 U	440 U	450 U	450 U	540 U	470 U	440 U
Di-n-butylphthalate	14,000	550 B	12,000	13,000	7,800	7,700	5,100	3,000 B	3,100 B	440 U	450 U	450 U	540 U	470 U	440 U
Fluoranthene	1,100 U	360 J	870 U	1,000 U	690 U	530 U	460 U	400 U	410 U	440 U	450 U	450 U	540 U	470 U	440 U
Indeno(1,2,3-cd)pyrene	1,100 U	190 J	870 U	1,000 U	690 U	530 U	460 U	400 U	410 U	440 U	450 U	450 U	540 U	470 U	440 U
Pyrene	1,100 U	470 J	870 U	1,000 U	690 U	530 U	460 U	400 U	410 U	440 U	450 U	450 U	540 U	470 U	440 U
bis(2-Ethylhexyl)phthalate	1,100 U	220 J	870 U	1,000 U	2,300	310 J	550	400 U	410 U	440 U	450 U	450 U	540 U	470 U	440 U
Pesticide/Polychlorinated Biphenyls (UG/KG)															
Aroclor-1260	110 U	110 U	87 U	100 U	69 U	53 U	46 U	40 U	41 U	45 U	220 U	9.4 UL	54 UJ	470 U	45 UL
Endosulfan I	5.5 U	5.5 U	4.5 U	5.1 U	3.5 U	2.7 U	2.4 U	2.1 U	2.1 U	2.2 U	11 U	2.3 UL	2.7 UJ	24 U	2.2 UL
Methoxychlor	55 U	55 U	45 U	51 U	35 U	27 U	24 U	21 U	21 U	22 U	110 U	2.2 B	1.5 B	240 U	22 UL
alpha-Chlordane	5.5 U	5.5 U	4.5 U	5.1 U	3.5 U	2.7 U	2.4 U	2.1 U	2.1 U	2.2 U	11 U	2.3 UL	2.7 UJ	24 U	2.2 UL
Total Metals (MG/KG)															
Aluminum	20,800	15,400	17,600	14,200	12,100	4,380	5,890	3,460	2,550	2,670	3,320	5,280	5,570	4,870	3,810
Arsenic	9.6	8.8	17.1	10.3	10.5	6.8	6.3	7.7	5.4	3.4 J	4.8 J	4.4 J	10.3 J	3.6 J	4.8 J
Barium	42.1	32.1	36.2	31.7	25.9	9.7	12.4	5.8	4.8	6 J	7.7 J	10.6 J	13.1 J	10 J	8.9 J
Beryllium	1 L	0.87 L	1.1 L	0.9 L	0.77 L	0.33 L	0.37 L	0.51	0.39	0.14 B	0.18 B	0.16 B	0.46 B	0.18 B	0.21 B
Calcium	2,390	2,170	2,270	2,450	1,640	1,690	4,560	20,600 J	22,500 J	982 J	1,840	1,790	45,900	3,160	2,870 J
Chromium	40.5	34.8	40	33.5	27.7	11.6	13.2	12.1	7.9 L	15.1 J	11.4 J	13.3 J	18 J	12.6 J	11.2
Cobalt	9.5	8.8	10.7	8.7	7.3	3.4	3	5.9	4.7	1.7 J	2 J	2.4 J	2.4 J	2.4 J	1.9 J
Copper	21.8	21.2	23	19.8	15.7	6	6.2	2.4	2.1	3.8 K	4.1 K	4.1 K	2.5 K	3.4 K	2.6 L
Iron	31,400	30,200	35,800	29,400	24,500	10,800	12,600	14,200	11,100	14,600 J	12,400 J	11,300 J	17,200	10,700 J	10,900
Lead	26.8	27.4	36	28.5	26.6	9.3	13.3	5.4 J	3.3 J	7.1	7.4	8.8	5.4	9.9	15
Magnesium	7,240	6,640	7,100	6,300	5,060	2,190	2,290	1,950	1,470	1,150 J	1,060 J	1,800	2,280	1,720	1,390
Manganese	223	223	252	200	178	58.3	87.5	46.9	30.1	50.8 J	40.5 J	58.2 J	43.9 J	51.9 J	42.3
Nickel	17.6	17.9	21.9	14.1	13.4	4.4	5.8	5.2	4.5	4.2 J	5.1 J	4.4 J	4.8 J	4.8 J	3.8 J
Potassium	4,320	3,850	4,310	3,720	3,240	1,930	2,210	2,740	1,830	756 J	853 J	1,540	2,820	1,570	1,230 J
Selenium	2.2 K	1.7 U	1.3 U	1.6 U	1 U	0.8 U	0.7 U	0.64 U	0.64 U	0.86 UL	0.87 UL	0.87 UL	1.2 K	0.91 UL	0.86 UL
Silver	1.3 UL	1.3 UL	1 UL	1.2 UL	0.82	0.61 UL	0.54 UL	0.49 UL	0.49 UL	0.13 U	0.14 U	0.14 U	0.16 U	0.14 U	0.13 U
Sodium	12,900	11,400	8,590	8,000	6,190	3,460	2,430	1,600	1,710	2,170 B	800 B	2,870 B	1,250 B	2,230 B	886 B
Thallium	2.5 U	2.6 U	2 U	2.4 U	1.6 UL	1.2 U	1.1 U	0.98 U	0.98 K	1 U	1.7 B	1.2 B	1.2 U	1.8 B	1.5 B
Vanadium	48.9	42.3	55.8	45.4	39.2	13.8	16.6	8.7	7.9	9.9 J	11.8 J	15.6 J	19.2 J	14.6 J	13.1 J
Zinc	124 J	123 J	137 J	119 J	96.6 J	42.2 J	44.3 J	20 J	16.6 J	124 J	116 J	56.9 J	25.3 J	58.2 J	48.9 J
Wet Chemistry (MG/KG)															
% Moisture	NA	NA	NA	NA	NA	NA	NA	NA	NA	25.8	26.2	26.4	39.1	29.5	25.5
Cation Exchange Capacity (MEQ/100G)	NA	NA	NA	NA	NA	NA	NA	NA	NA	-1	-1	NA	NA	NA	NA
Total organic carbon (TOC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	11,000	12,000	9,600	18,000	4,400	13,000
pH	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.7	7.7	NA	NA	NA	NA

Notes:

Shaded values indicate the analyte was detected
UG/KG = Micrograms per Kilogram
MG/KG - Milligrams per Kilogram
MEQ/100G = Milli-equivalents per 100 grams dry soil
NA = Not analyzed
J = Analyte present. Reported value may or may not be accurate or precise
U = Not detected
B = Not detected substantially above the level reported in laboratory or field blanks
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 10-4
Sediment Analytical Detections at Site 25
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS25-SD008		YS25-SD009		YS25-SD010			YS25-SD011			YS25-SD012	
Sample ID	YS25-SD008-A-0997	YS25-SD008-B-0997	YS25-SD009-A-0997	YS25-SD009-B-0997	YS25-SD010-A-0997	YS25-SD010-B-0997	YS25-SD010P-B-0997	YS25-SD011-A-0997	YS25-SD011P-A-0997	YS25-SD011-B-0997	YS25-SD012-A-0997	YS25-SD012-B-0997
Sample Date	09/27/97	09/27/97	09/27/97	09/27/97	09/27/97	09/27/97	09/27/97	09/27/97	09/27/97	09/27/97	09/27/97	09/27/97
Chemical Name												
Volatile Organic Compounds (UG/KG)												
Acetone	16 U	13 U	10 J	13 U	20 U	13 U	14 U	30	21 U	13 U	18 U	13 U
Benzene	16 U	13 U	14 U	13 U	20 U	13 U	14 U	23 U	21 U	13 U	18 U	13 U
Carbon disulfide	16 U	6 J	14 U	4 J	2 J	2 J	7 J	23 U	3 J	4 J	3 J	4 J
Tetrachloroethene	2 J	13 U	14 U	13 U	20 U	13 U	14 U	23 U	21 U	13 U	18 U	13 U
Toluene	88	13 U	14 U	13 U	20 U	13 U	14 U	23 U	21 U	13 U	18 U	13 U
Semi-volatile Organic Compounds (UG/KG)												
2,4-Dinitrotoluene	510 UL	430 U	460 U	420 U	650 U	440 U	130 J	760 U	690 U	440 U	580 U	440 U
Benzo(a)anthracene	510 UL	430 U	460 U	420 U	650 U	440 U	450 U	760 U	690 U	440 U	580 U	440 U
Benzo(a)pyrene	510 UL	430 U	460 U	420 U	650 U	440 U	450 U	760 U	690 U	440 U	580 U	440 U
Benzo(b)fluoranthene	510 UL	430 U	460 U	420 U	650 U	440 U	110 J	760 U	690 U	440 U	580 U	440 U
Benzo(k)fluoranthene	510 UL	430 U	460 U	420 U	650 U	440 U	450 U	760 U	690 U	440 U	580 U	440 U
Butylbenzylphthalate	510 UL	430 U	460 U	420 U	650 U	440 U	450 U	760 U	690 U	440 U	580 U	440 U
Chrysene	510 UL	430 U	460 U	420 U	650 U	440 U	78 J	760 U	690 U	440 U	580 U	440 U
Di-n-butylphthalate	510 UL	430 U	460 U	420 U	650 U	440 U	450 U	760 U	690 U	440 U	580 U	440 U
Fluoranthene	510 UL	430 U	460 U	420 U	650 U	440 U	89 J	760 U	690 U	440 U	580 U	440 U
Indeno(1,2,3-cd)pyrene	510 UL	430 U	460 U	420 U	650 U	440 U	450 U	760 U	690 U	440 U	580 U	440 U
Pyrene	510 UL	430 U	460 U	420 U	650 U	440 U	78 J	760 U	690 U	440 U	580 U	440 U
bis(2-Ethylhexyl)phthalate	510 UL	430 U	460 U	420 U	650 U	440 U	450 U	760 U	690 U	440 U	580 U	440 U
Pesticide/Polychlorinated Biphenyls (UG/KG)												
Aroclor-1260	52 UL	43 UL	47 UL	42 U	7.8 L	44 U	8.6 J	16 J	14 J	44 UL	11 L	44 U
Endosulfan I	2.6 UL	2.2 UL	2.3 UL	2.1 U	3.2 UL	2.2 U	2.3 UJ	3.8 U	3.5 UJ	0.71 J	2.9 UL	2.2 U
Methoxychlor	26 UL	3 B	23 UL	7.1 J	7.7 L	7 J	1.3 B	8.7 J	3.3 B	4 B	6 B	3.4 B
alpha-Chlordane	2.6 UL	2.2 UL	2.3 UL	2.1 U	3.2 UL	2.2 U	2.3 UJ	3.8 U	3.5 UJ	0.6 L	2.9 UL	2.2 U
Total Metals (MG/KG)												
Aluminum	4,360	3,010	5,930	3,740	8,590	3,490	4,640	9,440	10,400	5,470	8,690	5,250
Arsenic	5.3 J	5 J	5.6 J	5.6 J	8 J	4.3 J	4.3 J	8.5 J	8.5 J	5.1 J	5.9 J	6.6 J
Barium	10 J	8.3 J	11.8 J	10.3 J	17.7 J	10.4 J	10.9 J	20.4 J	21.5 J	12.2 J	17.9 J	13 J
Beryllium	0.24 B	0.23 B	0.35 B	0.3 B	0.44 B	0.3 B	0.3 B	0.61 J	0.58 B	0.33 B	0.49 B	0.35 B
Calcium	18,500 J	70,500 J	7,650 J	22,600 J	3,740 J	24,200 J	2,960 J	8,700 J	35,500 J	35,000 J	7,380 J	4,740 J
Chromium	13.5	10.2	16	12.1	22.6	11.1	14.1	26.9	26	15	23.2	14.9
Cobalt	3.1 J	2 J	3 J	2.6 J	4.3 J	2.1 J	3 J	5.7 J	4.7 J	2.7 J	4.8 J	3.2 J
Copper	4.2 L	1.4 L	5 L	1.7 L	8 L	2.1 L	5.1 L	11.1 J	10.6	3.8 L	10.9	4.7 L
Iron	12,400	9,830	14,000	12,000	19,900	10,600	13,100	25,400	23,700	13,600	20,700	14,600
Lead	8.1	4.9	8.8	5.2	13.9	6.1	10.1	18.1	16.8	7.7	15.1	9.5
Magnesium	2,150	1,440	2,330	1,500	3,470	1,610	2,040	4,520	4,230	2,120	3,730	1,960
Manganese	63.2	35.6	76.4	45.4	139	54.9	63.8	173	167	87.5	117	72.2
Nickel	4.3 J	3 J	5.5 J	3.7 J	8.4 J	3.3 J	5.1 J	10.6 J	9.1 J	4.8 J	9 J	5.4 J
Potassium	1,980 J	1,580 J	2,280 J	1,840 J	2,850 J	1,680 J	1,860 J	3,720 J	3,630 J	1,920 J	3,140 J	1,860 J
Selenium	0.99 UL	0.83 UL	0.9 UL	0.82 UL	1.3 UL	0.85 UL	0.93 B	1.5 UL	1.3 UL	0.86 UL	1.1 UL	0.86 UL
Silver	0.16 U	0.13 U	0.14 U	0.13 U	0.2 U	0.13 U	0.14 U	0.23 U	0.21 U	0.13 U	0.17 U	0.13 U
Sodium	2,610 B	1,000 B	2,110 B	542 B	4,200	657 B	991 B	5,870	5,190	723 B	4,740	976 B
Thallium	1.4 B	1.3 B	1.9 B	1.3 B	2.2 B	1 U	1.1 B	1.7 U	3.1 B	1 U	1.3 U	1 U
Vanadium	15.3 J	11.1 J	18.1 J	12.2 J	26 J	11.9 J	15.6 J	31.4 J	31.2 J	16.6 J	26.9 J	18.1 J
Zinc	34.5 J	13.9 J	37.6 J	18.6 J	63.8 J	21.4 J	43.7 J	88.7 J	78.7 J	33 J	66.9 J	35.2 J
Wet Chemistry (MG/KG)												
% Moisture	35.5	23	29.1	21.6	48.9	24.7	26.6	56.5	52.5	25.5	42.7	25.3
Cation Exchange Capacity (MEQ/100G)	-1	-1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	8,400	5,700	6,900	7,600	8,800	7,300	NA	14,000	NA	4,300	10,000	7,200
pH	7.9	8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Shaded values indicate the analyte was detected
UG/KG = Micrograms per Kilogram
MG/KG - Milligrams per Kilogram
MEQ/100G = Milli-equivalents per 100 grams dry soil
NA = Not analyzed
J = Analyte present. Reported value may or may not be accurate or precise
U = Not detected
B = Not detected substantially above the level reported in laboratory or field blanks
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 10-5
Surface Water Analytical Detections at Site 25
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Station ID	YS25-SW001		YS25-SW002	YS25-SW003	YS25-SW004		YS25-SW005	YS25-SW006	YS25-SW007	YS25-SW008	YS25-SW009	YS25-SW010	YS25-SW011
Sample ID	YS25-SW001-1294	YS25-SW001P-1294	YS25-SW002-1294	YS25-SW003-1294	YS25-SW004-0997	YS25-SW004P-0997	YS25-SW005-0997	YS25-SW006-0997	YS25-SW007-0997	YS25-SW008-0997	YS25-SW009-0997	YS25-SW010-0997	YS25-SW011-0997
Sample Date	12/01/94	12/01/94	12/01/94	12/01/94	09/27/97	09/27/97	09/27/97	09/27/97	09/27/97	09/27/97	09/27/97	09/27/97	09/27/97
Chemical Name													
Semi-volatile Organic Compounds (UG/L)													
bis(2-Ethylhexyl)phthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	8 J	10 U	10 U	10 U	10 U
Explosives (UG/L)													
3-Nitrotoluene	0.91 U	0.91 U	0.91 U	0.91 U	0.25	0.27	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Total Metals (UG/L)													
Aluminum	116	81.6	114	75.1	801	787 K	1,430	921 K	805 K	559 K	836 K	1,210 K	686 K
Arsenic	2.3 U	2.3 U	2.3 U	2.3 U	3.2 U	4.4 U	3.2 K	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U
Barium	23.4 L	23.4 L	22.9 L	22.9 L	37.2 J	41.4 J	41.4 J	41.3 J	40.6 J	38.7 J	38.2 J	40.3 J	39.6 J
Beryllium	0.1 L	0.1 UL	0.1 UL	0.1 UL	0.34 B	0.2 U	0.29 B	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Cadmium	1.5 U	1.5 U	1.5 U	1.5 U	0.25 J	0.3 U	0.2 U	0.32 J	0.3 U	0.3 U	0.51 J	0.48 J	0.3 U
Calcium	175,000	182,000	179,000	180,000	244,000 J	240,000 J	234,000 J	248,000 J	253,000 J	236,000 J	229,000 J	246,000 J	249,000 J
Chromium	1.8 U	1.8 U	1.8 U	1.8 U	0.6 U	1.8 U	1.6 J	1.8 U	1.8 U	1.8 U	1.8 U	2.3 J	1.8 U
Cobalt	1.9 U	1.9 U	1.9 U	1.9 U	1.4 U	1.2 U	1.4 U	1.2 U	1.6 J	1.8 J	1.2 U	1.2 U	1.2 U
Copper	2.4	1.4 U	1.4 U	1.4 U	1.2 UL	4 L	1.2 UL	7.2 L	4.3 L	3.9 UL	4 L	7.2 L	6.3 L
Cyanide	5 R	5 R	5 R	5 R	10 U	10 U	10 U	10 U	10 U	10 U	17.9	10 U	10 U
Iron	167 L	133 L	161 L	130 L	574 J	686	1,170 J	700	569	394	610	965	509
Magnesium	544,000	562,000	553,000	553,000	629,000	782,000	632,000	765,000	783,000	769,000	740,000	748,000	779,000
Manganese	9.1	8.7	8.7	8.1	45	52.2	54.3	51.4	51.6	46.4	50.4	59	51.5
Nickel	4.3 UL	4.3 UL	4.3 UL	4.3 UL	1.5 U	2.9 J	1.5 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U
Potassium	196,000	202,000	198,000	199,000	186,000 J	213,000	194,000 J	225,000	214,000	223,000	214,000	216,000	213,000
Sodium	4,990,000	5,180,000	5,140,000	5,140,000	5,000,000	5,660,000	5,220,000	5,710,000	5,650,000	5,710,000	5,650,000	5,690,000	5,620,000
Thallium	4.6 K	6.9 K	10 K	5.7 K	9.1 B	6.6 B	10.5 B	8.2 B	10.6 B	5.9 U	5.9 U	5.9 U	6 B
Vanadium	6.8 L	5.1 L	4.1 L	5.9 L	0.6 U	1.1 J	0.61 J	1 J	1 U	1 U	2.1 J	2.7 J	1 J
Zinc	6.1 J	3 J	2.3 J	2.2 J	2.4 UL	14.3 J	11.1 L	10.4 B	15.2 J	14.4 J	5.9 B	5.2 B	8.2 B

Notes:

Shaded values indicate the analyte was detected
UG/L = Micrograms per Liter
NA = Not analyzed
J = Analyte present. Reported value may or may not be accurate or precise
U = Not detected
B = Not detected substantially above the level reported in laboratory or field blanks
R = Unreliable result
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

TABLE 10-6
Summary of Groundwater Samples and Analyses at Site 25
Phase I Groundwater Remedial Investigation for Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Medium	Sample ID	Analysis				QA/QC Samples	
				TAL Inorganics			
		TCL Organics	Nitramine Compounds	Total	Dissolved	Duplicate	MS/MSD
Site 25 Groundwater	25GW02-001		X	X	X		
	25GW02A-001		X	X	X	X	X
	25GW03-001		X	X	X		
	25GW04-001		X	X	X		

Notes:
- Field measurements of groundwater included pH, specific conductivity, temperature, and turbidity.
- TCL organics analysis included VOCs, SVOCs, and Pesticides/PCBs.
- TAL inorganics analysis included cyanide analysis.
- MS/MSD = Matrix Spike/Matrix Spike Duplicate

(1)Monitoring well sampled for VOCs only under the Long-Term Monitoring program for Sites 1, 3, and 7.

TABLE 10-7
Summary of Groundwater Field Parameters at Site 25
Phase I Groundwater Remedial Investigation for Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Well No.	pH(1)	Specific Conductance at 25°C(2) (µmhos/cm)	Temperature(2) (°C)	Turbidity(3) (NTUs)	Gallons Purged	Date
25GW02	6.33	702	19.25	5.29	2	09/17/2004
	6.78	644	19.28	4.02	4	
	6.93	639	19.27	3.83	6	
25GW02A	10.11	664	21.65	124	8.3	09/17/2004
	10.65	675	21.74	19.5	10.3	
	10.81	647	21.37	16.3	10.6	
	10.87	6.5	21.77	15	11.2	
25GW03	6.94	577	23.32	7.68	2.3	09/17/2004
	6.98	489	22.98	4.74	4.6	
	6.92	488	23.02	3.45	6.9	
	6.93	486	23.12	2.51	9.2	
25GW04	6.47	684	20.05	32.1	1.56	09/17/2004
	6.6	588	19.67	6.92	3.12	
	6.53	588	19.62	4.89	4.68	
	6.68	588	19.62	4.11	6.24	

Notes:

-1 pH measured using an Orion pH meter, Model No. 290A.
-2 Specific conductance and temperature measured using YSI conductivity meter, Model No. 335 CT.
-3 Turbidity measured using a Lamotte 2020 meter.
-4 Well purged dry immediately; sample collected after recharge.
-5 Monitoring well 6GW05B replaced monitoring well 6GW05.
-6 Well pumped dry before any readings collected; sample collected after recharge.
-- No measurement
NTU Nephelometric Turbidity Unit

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Legend

- Yorktown-Eastover Monitoring Wells
- Study Area Boundary
- Limits of Excavation
- Former Discharge Line

N
W E
S

0 40 80
Feet

Figure 10-1
Site 25 Layout
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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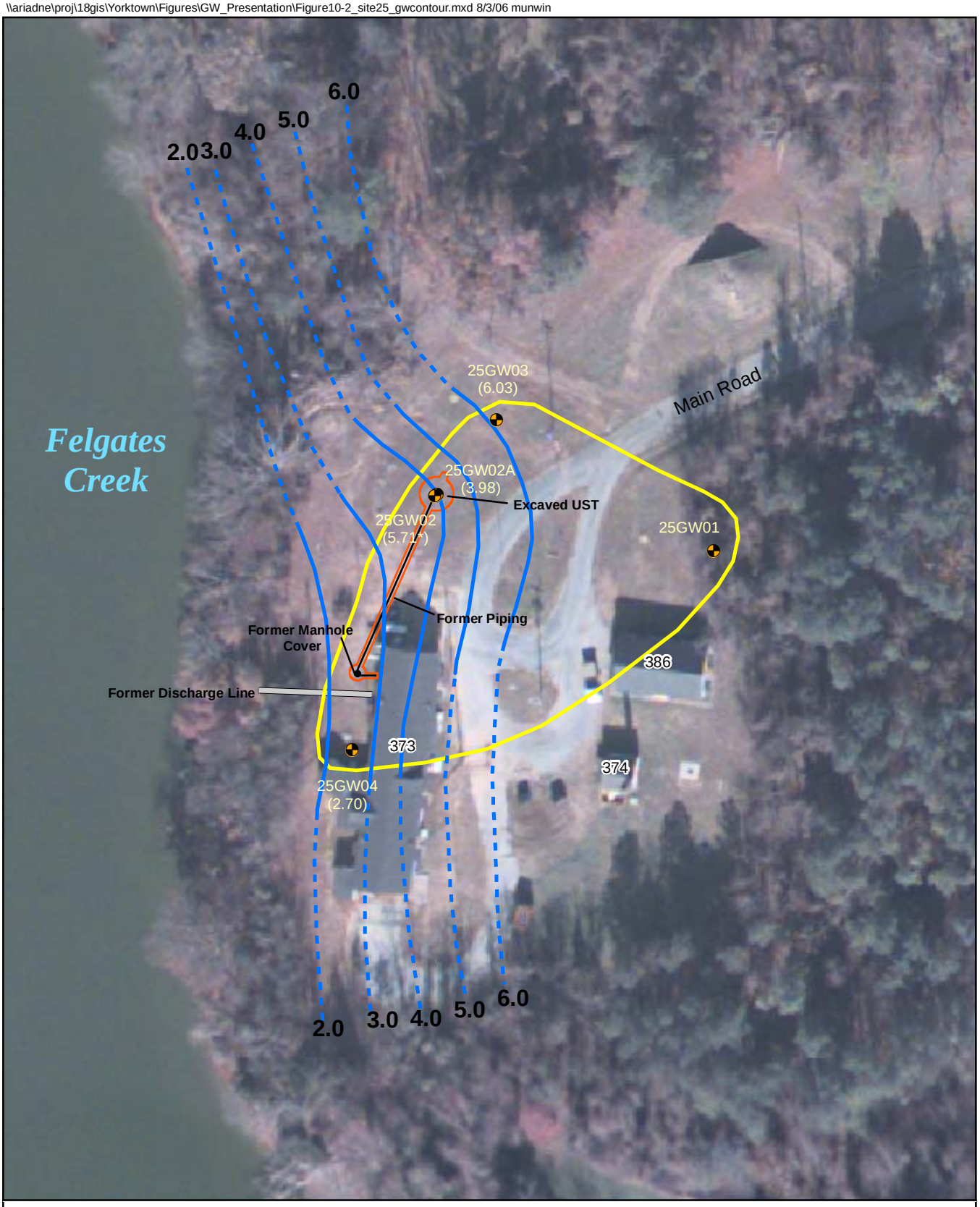

Legend

- Yorktown-Eastover Monitoring Wells
- Study Area Boundary
- Former Discharge Line
- Limits of Excavation
- Groundwater Contour Line
- Inferred Groundwater Contour Line

*Believed to be erroneous based on other data points; not considered during contouring

N
W E
S

0 40 80
Feet

Figure 10-2
Yorktown-Eastover Aquifer Groundwater Contour Map for Site 25
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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Legend

- Yorktown-Eastover Monitoring Wells
- Hydropunch Sampling Location
- Sediment Sampling Location
- Surface Water/Sediment Sampling Location
- Hand Auger Location
- Study Area Boundary
- Former Discharge Line
- Limits of Excavation

N W E S

0 65 130 Feet

Figure 10-3
Previous Investigations Sampling Locations at Site 25
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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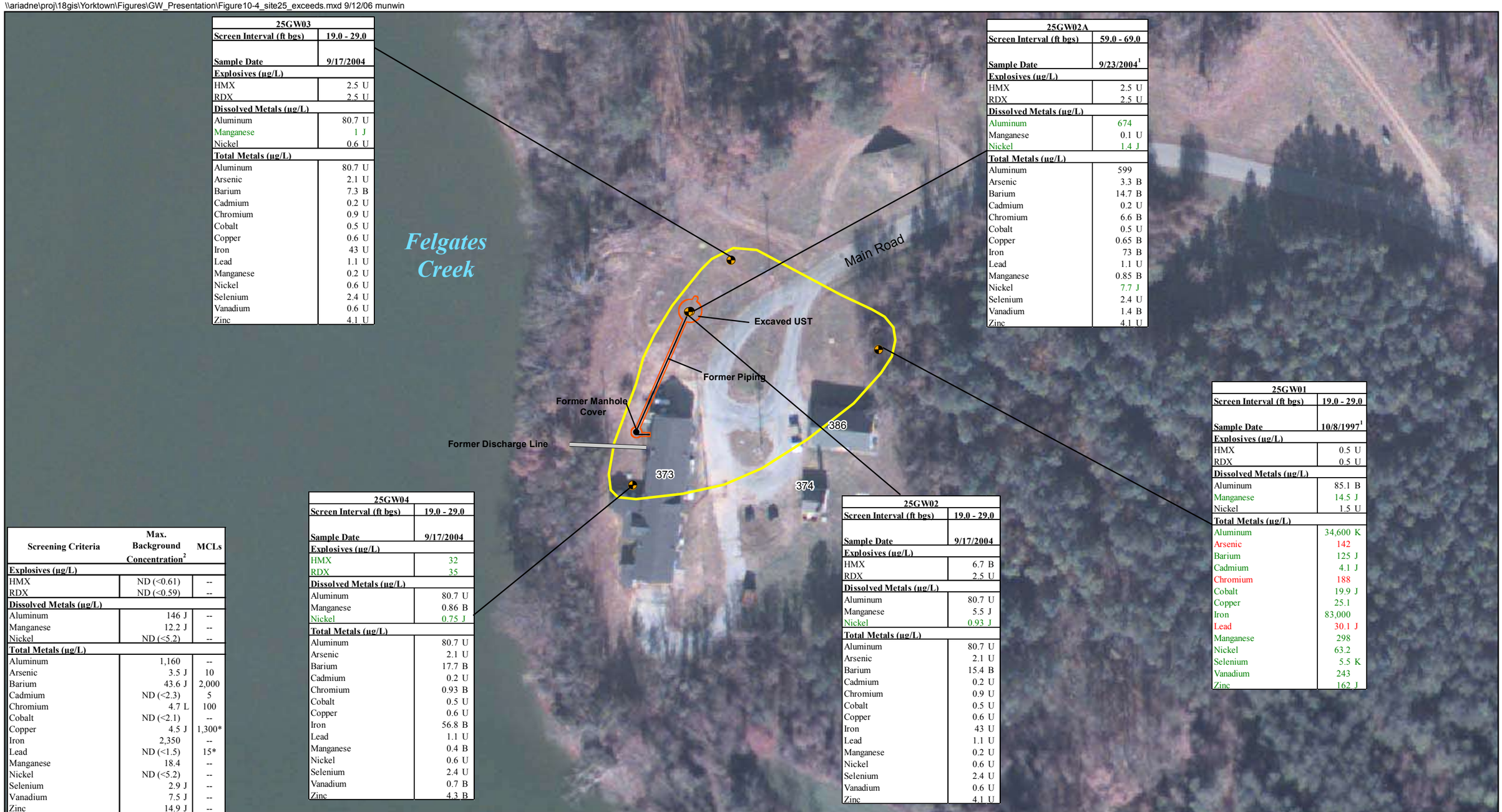

25GW03	
Screen Interval (ft bgs)	19.0 - 29.0
Sample Date	9/17/2004
Explosives (µg/L)	
HMX	2.5 U
RDX	2.5 U
Dissolved Metals (µg/L)	
Aluminum	80.7 U
Manganese	1 J
Nickel	0.6 U
Total Metals (µg/L)	
Aluminum	80.7 U
Arsenic	2.1 U
Barium	7.3 B
Cadmium	0.2 U
Chromium	0.9 U
Cobalt	0.5 U
Copper	0.6 U
Iron	43 U
Lead	1.1 U
Manganese	0.2 U
Nickel	0.6 U
Selenium	2.4 U
Vanadium	0.6 U
Zinc	4.1 U

25GW02A	
Screen Interval (ft bgs)	59.0 - 69.0
Sample Date	9/23/2004[1]
Explosives (µg/L)	
HMX	2.5 U
RDX	2.5 U
Dissolved Metals (µg/L)	
Aluminum	674
Manganese	0.1 U
Nickel	1.4 J
Total Metals (µg/L)	
Aluminum	599
Arsenic	3.3 B
Barium	14.7 B
Cadmium	0.2 U
Chromium	6.6 B
Cobalt	0.5 U
Copper	0.65 B
Iron	73 B
Lead	1.1 U
Manganese	0.85 B
Nickel	7.7 J
Selenium	2.4 U
Vanadium	1.4 B
Zinc	4.1 U

25GW01	
Screen Interval (ft bgs)	19.0 - 29.0
Sample Date	10/8/1997[1]
Explosives (µg/L)	
HMX	0.5 U
RDX	0.5 U
Dissolved Metals (µg/L)	
Aluminum	85.1 B
Manganese	14.5 J
Nickel	1.5 U
Total Metals (µg/L)	
Aluminum	34,600 K
Arsenic	142
Barium	125 J
Cadmium	4.1 J
Chromium	188
Cobalt	19.9 J
Copper	25.1
Iron	83,000
Lead	30.1 J
Manganese	298
Nickel	63.2
Selenium	5.5 K
Vanadium	243
Zinc	162 J

Screening Criteria	Max. Background Concentration[2]	MCLs
Explosives (µg/L)		
HMX	ND (<0.61)	--
RDX	ND (<0.59)	--
Dissolved Metals (µg/L)		
Aluminum	146 J	--
Manganese	12.2 J	--
Nickel	ND (<5.2)	--
Total Metals (µg/L)		
Aluminum	1,160	--
Arsenic	3.5 J	10
Barium	43.6 J	2,000
Cadmium	ND (<2.3)	5
Chromium	4.7 L	100
Cobalt	ND (<2.1)	--
Copper	4.5 J	1,300*
Iron	2,350	--
Lead	ND (<1.5)	15*
Manganese	18.4	--
Nickel	ND (<5.2)	--
Selenium	2.9 J	--
Vanadium	7.5 J	--
Zinc	14.9 J	--

25GW04	
Screen Interval (ft bgs)	19.0 - 29.0
Sample Date	9/17/2004
Explosives (µg/L)	
HMX	32
RDX	35
Dissolved Metals (µg/L)	
Aluminum	80.7 U
Manganese	0.86 B
Nickel	0.75 J
Total Metals (µg/L)	
Aluminum	80.7 U
Arsenic	2.1 U
Barium	17.7 B
Cadmium	0.2 U
Chromium	0.93 B
Cobalt	0.5 U
Copper	0.6 U
Iron	56.8 B
Lead	1.1 U
Manganese	0.4 B
Nickel	0.6 U
Selenium	2.4 U
Vanadium	0.7 B
Zinc	4.3 B

25GW02	
Screen Interval (ft bgs)	19.0 - 29.0
Sample Date	9/17/2004
Explosives (µg/L)	
HMX	6.7 B
RDX	2.5 U
Dissolved Metals (µg/L)	
Aluminum	80.7 U
Manganese	5.5 J
Nickel	0.93 J
Total Metals (µg/L)	
Aluminum	80.7 U
Arsenic	2.1 U
Barium	15.4 B
Cadmium	0.2 U
Chromium	0.9 U
Cobalt	0.5 U
Copper	0.6 U
Iron	43 U
Lead	1.1 U
Manganese	0.2 U
Nickel	0.6 U
Selenium	2.4 U
Vanadium	0.6 U
Zinc	4.1 U

Legend

- Yorktown-Eastover Monitoring Wells
- Study Area Boundary
- Limits of Excavation
- Former Discharge Line

Contaminants shaded green exceed Background concentrations.
Contaminants shaded red exceed Federal MCLs and Background.
Essential nutrients are not shown.
µg/L = micrograms per liter
J = Value is estimated.
K = Value may be biased high.
MCL = Federal Maximum Contaminant Level
U = Not detected above associated detection limit.
-- No criteria established

[1]Duplicate sample taken at this location, most conservative value reported.

[2]Background values are maximum detected values in respective aquifer from Baker (1995) Background Report.

*Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10% of tap water samples exceed the action level, water systems must take additional steps. For copper, the action level is 1.3 mg/L, and for lead is 0.015 mg/L.

B = Value may be associated with laboratory or field blank contamination. B-flagged values are generally considered non-detects; however, the B-flagged values from the 2004 groundwater data set may be erroneously B-flagged due to potentially incorrect field and equipment blank collection procedures.

N
W E
S

0 80 160 Feet

Figure 10-4
Exceedances of Background and/or MCLs
in the Yorktown-Eastover Aquifer at Site 25
Phase I Remedial Investigation Report for Groundwater
at Sites 1, 3, 6, 7, 11, 17, 24, and 25
Naval Weapons Station Yorktown
Yorktown, Virginia

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SECTION 11

Recommendations

Recommendations for each site are presented below.

11.1 Sites 1 and 3

Based on the conclusions included in Section 4, it is recommended that a real-time technology such as MIP be used at Sites 1 and 3 to delineate the extent of CVOCs at the sites and assist in determining the extent of the confining unit. Additional monitoring well installation, surface water, sediment, and pore water sampling is recommended based on the results of the real-time delineation. It is also recommended that one additional well be installed on the parcel of land east of Indian Field Creek to ensure that migration under the creek is not occurring. It is recommended that new and existing wells be sampled for metals, VOCs, and natural attenuation parameters including nitrate, nitrite, sulfate, sulfide, TOC, chloride, alkalinity, methane, ethane, ethene, DO, ORP, and *Dehalococcoides*.

It is also recommended that risks due to groundwater contamination at these sites be quantified in a revision the existing HHRA and ERA.

11.2 Site 6

Based on the conclusions included in Section 5, it is recommended that additional study be completed within the impoundment to the depth of the Eastover-Calvert confining unit to define the extent and concentrations of the contaminants. Since the Site 6 impoundment surface has been restored as a wetland area, it is likely that this real-time study will necessitate specialized drilling equipment for on-water drilling, installation of temporary wells, and analysis using a mobile lab. It is recommended that additional monitoring wells be installed based on the results of this real-time investigation. New and existing wells should be sampled for metals, VOCs, explosives (including nitroglycerin, 3,5-dinitroaniline, PETN, diphenylamine, n-nitro-sodiphenylamine, ammonium nitrate, and nitroguanidine), perchlorate, and natural attenuation parameters [methane, ethane, ethene, nitrate, nitrite, sulfide, sulfate, chloride, dissolved oxygen (DO), oxidation-reduction potential (ORP), total organic carbon (TOC) and *Dehalococcoides*]. If the results of the real-time study indicate migration of contaminants into or across Felgates Creek, additional sampling of surface water, sediment, and/pore water should be conducted to further evaluate the groundwater to surface water interaction.

It is also recommended that saturated soil samples be collected and analyzed using dye kits to better determine if DNAPL is present at the site. One saturated soil sample should also be collected to determine the soil oxidant demand at the site for use during the Feasibility Study (FS) phase of the CERLA process.

Following this additional investigation, it is recommended that risks due to groundwater contamination at this site be quantified in a revision to the HHRA and ERA from the Round Two RI.

11.3 Site 7

Based on data included in Section 6, the source removal action at Site 7 was a successful remedy not only for soil contamination, but for groundwater contamination as well. To confirm this, it is recommended that groundwater monitoring be continued to verify the contaminant concentrations continue to decline to acceptable levels. It is further proposed that the LTM program for Site 7 be modified to the following:

- an additional monitoring well will be installed directly within the former discharge drainage way
- the newly installed well will be sampled for perchlorate analysis (one time), VOCs, metals, and explosives (including nitroglycerin, 3,5-dinitroaniline, PETN, diphenylamine, n-nitro-sodiphenylamine, ammonium nitrate, and nitroguanidine)
- eliminate surface water and sediment sampling.

11.4 Site 11

Based on data and conclusions included in Section 7, no further action is recommended for Site 11, pending the analysis of a groundwater sample for 3,5-dinitroaniline, nitroglycerine, PETN from well 11GW11.

11.5 Site 17

Based on data included in Section 8, no further action is recommended for Site 17.

11.6 Site 24

Based on the lack of groundwater data at this site, it is recommended that additional sampling be completed to characterize the nature and extent of groundwater contamination at the site. It is recommended that the Site 24 study be removed from the draft RI for these sites and be included in a report that addressed all media after groundwater sampling has been conducted. Future groundwater investigation should include the installation of permanent monitoring wells. It is recommended that additional groundwater data collected be screened against risk based screening criteria in order to quantify potential risks related to groundwater at the site. Furthermore, it is recommended that the risk assessment portion of the draft RI be extended to include a Step 3a ecological risk assessment.

11.7 Site 25

Based on data collected in Section 10, analysis of perchlorate and explosives (including nitroglycerin, 3,5-dinitroaniline, PETN, diphenylamine, n-nitro-sodiphenylamine,

ammonium nitrate, and nitroguanidine) should be conducted at Site 25 If groundwater contamination is found to discharge to surface water, it is recommended further surface water/sediment sampling be conducted. Additionally, it is recommended that risks be quantified using current guidance.

SECTION 12

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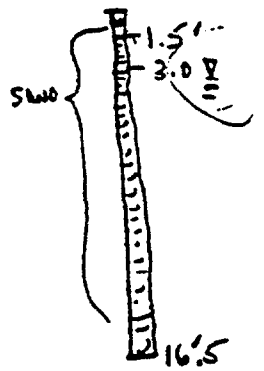
Appendix A: Well Boring Logs

Dames & Moore

LOCATION OF BORING



DATUM ELEVATION

JOB NO.	CLIENT	LOCATION
13592	LANTDIV - US NAVY	NWS - Yorktown VA

DRILLING METHOD: Acker AN MC55 7¾" HSA

SAMPLING METHOD: 24" gel spoon

BORING NO. 1GW04

SHEET 1 OF 1

					DRILLING START	DRILLING FINISH
WATER LEVEL	3-3.5'		-			
TIME	16:00				TIME 14:15	TIME 16:30
DATE	1-7-86				DATE 1-7-86	DATE 1-7-86
CASING DEPTH						

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	
				1		0		clean ~~and~~ poorly sorted (well graded) fine to coarse sands, LOOSE
				2 2 2 (4)		1		
						2	SP	Brown silty well graded fine to med sand
				1 2 (3)		3		saturated
				1 1 1 (1)		4		
						5	SM	silty poorly sorted fine to med sands, LOOSE
						6		
						7		
						8		
						9		
				4 4 5 (9)		10		
						11	SC	grey-green clayey fine sand, LOOSE
						12		
						13		
				4 5 7 (13)		14		
						15		
						16	SP	grey-green silty med and fine sand ~~[illegible]~~ MEDIUM DENSE
						17		
						18		
						19		
						20		

DRILLING CONTR. ____ BY ____ DATE ____ CHK'D BY ____

No. 28408

DDD-3 (R) (REV. 11-80)

Baker

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Yorktown Naval Weapon Station - Well Installation,

PROJ. NO.: CTO 102 BORING NO.: 1GW04A

COORDINATES: EAST: 2562919.6 NORTH: 342881.34

ELEVATION: SURFACE: TOP OF PVC CASING 9.36

Rig: BLF-150 MiniSonic								
	Split Spoon	**Casing**	**Augers**	**Core Barrel**	**Date**	**Progress (Ft.)**	**Weather**	**Depth to Water (Ft.)**
Size (ID)	--	8"	--	--	05/11/2000	18		
Length	--	--	--	--	05/12/2000	24		
Type	--	--	--	--				
Hammer Wt.	--	--	--	--				
Fall	--	--	--	--				

Remarks: (1) Based on log for 1GW04, lithology known and boring advanced without split spoon sampling, except when determining where to set the 10" steel casing.

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

WELL INFORMATION

Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Schedule 40 PVC riser	2 in	0	32 ft
Sch 40 .010 Slot Screen	2 in	32 ft	42 ft

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1	A-N	(1)			BKG= 0.0ppm 0		cement bentonite grout	-1.00
2								
3								
4								
5								
6								
7								
8								
9								
10						Match to Sheet 2		

DRILLING CO.: Parrot Wolfe BAKER RE Dave Martin

DRILLER: Jim Lansing BORING N 1GW04A SHEET 1 OF 3

16W05

Dames & Moore

No. 28451

JOB NO.	CLIENT	LOCATION
13542	LANTDIV - US. NAVY	NWS - Yorktown VA

DRILLING METHOD: NC 45 7¼ H.S.A. NW

BORING NO.: 1(

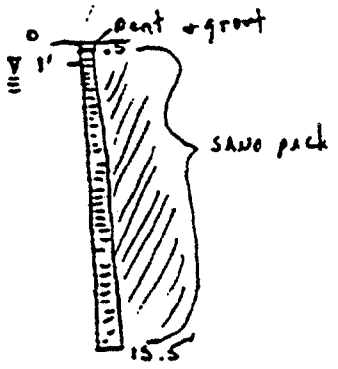
SHEET: 1 OF

SAMPLING METHOD: 24" split spoon

DRILLING CONTR.

WATER LEVEL	1.0'				START TIME	13:15
TIME	14:00					
DATE	12-11-85				DATE	12-11-85
CASING DEPTH	15'.5'					

LOCATION OF BORING



DATUM

ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	
				3 4 4 / 8		0		TAN silty uniform med SAND - saturated, u
				5 6 7 / 12		1		
				3 3 3 / 6		2	SP	heavy white-gray fine SAND - v. uniform - dark minerals present - saturated, MEDIUM DENSE
						3		
						4		orange to brown, uniform fine SAND w/ dark minerals present, LOOSE
						5		
						6		
						7		
						8		
						9		
				2 2 2 / 5		10		dk green-grey clayey silt to fine SAND, ME
						11	ML SM	
						12		
						13		
						14		
				3 3 3 / 6		15	ML	
						16		grey green w/ brown mottling clayey silt,
						17		
						18		
						19		
						20		

BY ____ DATE ____ CHK'D BY ____

DB.1 (8) (REV. 11-8)

Baker

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT:	Yorktown Naval Weapon Station - Well Installation,		
PROJ. NO.:	CTO 102	BORING NO.:	1GW05A
COORDINATES:	EAST: 2563183.6	NORTH:	343041.69
ELEVATION:	SURFACE:	TOP OF PVC CASING:	37.83

Rig: BLF-150 MiniSonic	**Split Spoon**	**Casing**	**Augers**	**Core Barrel**	**Date**	**Progress (Ft.)**	**Weather**	**Depth to Water (Ft.)**
Size (ID)	--	8"	--	--	05/10/2000	22		
Length	--	--	--	--	05/11/2000	50		
Type	--	--	--	--				
Hammer Wt.	--	--	--	--				
Fall	--	--	--	--				

Remarks: (1) Based on log for 1GW05, lithology known and boring advanced without split spoon sampling, except when determining where to set the 10" steel casing.

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

WELL INFORMATION

Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Schedule 40 PVC riser	2 in	0	62 ft
Sch 40 .010 Slot Screen	2 in	62 ft	72 ft

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1								-1.00
2	A-N						cement bentonite grout	
3								.
4								10-inch steel casing
5								
6	S-1		2 3 2 1			Orange, moist to wet, medium SAND, little silt		
7								
8								
9								
10								
	S-2		2			Match to Sheet 2		

DRILLING CO.:	Parrot Wolfe	BAKER REP.:	Marlene Ivester (first 22') and Dave Martin (<22')
DRILLER:	Jim Lansing	BORING NO.:	1GW05A SHEET 1 OF 5

Borehole Location Data **ROY F. WESTON, Inc.**

BOREHOLE ID : 1GW12 SITE NAME/NO: WPNSTA YORKTOWN
BEGIN DATE : 06/10/92 END DATE : 06/10/92

LOGGER/COMPANY : W. BREW

BOREHOLE COMPLETED IN (<O>verburden <B>edrock) :

TOTAL DEPTH : 14.00 DEPTH TO BEDROCK : 0.00

BOREHOLE DIAMETER #1: 12.00
INTERVAL: 0.00 ft. to 16.00 ft. BGS
METHOD : HSA FLUID :
BOREHOLE DIAMETER #2:
INTERVAL:
METHOD : FLUID :
BOREHOLE DIAMETER #3:
INTERVAL:
METHOD : FLUID :

DRILLING COMPANY : HARDIN-HUBER
DRILLER : ROYCE KEENAN
DRILL RIG TYPE : B-61

	ESTIMATED	SURVEYED
SURFACE ELEVATION :	0.000	42.500
N. COORDINATE :	0.0000	343136.0000
E. COORDINATE :	0.0000	2562505.0000

WELL PERMIT.....(Y)es (N)o: N PERMIT # :

HOLE ABANDONED...(Y)es (N)o: N
WELL INSTALLED...(Y)es (N)o: Y
WELL CLUSTER.....(Y)es (N)o: N No. OF WELLS : 0
WELL NEST.....(Y)es (N)o: N No. OF WELLS : 0
PUMPS INSTALLED..(Y)es (N)o: N TYPE DEPTH
PURGE : 0.00
SAMPLE : 0.00

BOREHOLE TESTING
BOREHOLE GEOPHYSICS.....(Y)es (N)o: N
SLUG TESTS.....(Y)es (N)o: Y
PACKER TESTS.....(Y)es (N)o: N
PUMPING TESTS.....(Y)es (N)o: N

COMMENTS :

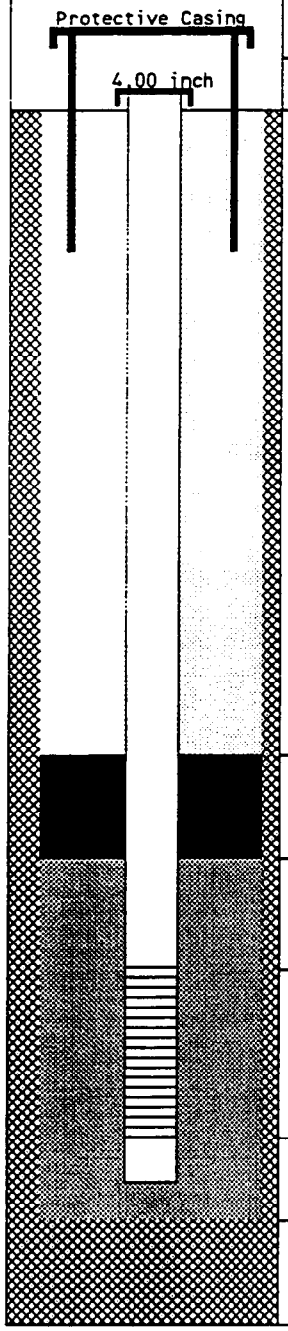
NWS-00313-03.13-07/01/93

Well Completion Summary

ROY F. WESTON, Inc.

CLIENT	WPNSTA YORKTOWN	*DRILLING FIRM*	HARDIN-HUBER
SITE NAME	WPNSTA YORKTOWN	*INSPECTOR*	W. BREW

WELL ID	1GW12	*WATER LEVELS*	
START DATE	06/10/92	6.20 FT (TOC) ON 07/15/92	
COMPLETION DATE	06/10/92		



DEPTH		ELEV.
2.50	TC	45.00
0.00	GS	42.50
2.00	BN	40.50
3.00	SP	39.50
4.00	SC	38.50
14.00	BS	28.50
14.00	TD	28.50

DRILLING SUMMARY

Driller ROYCE KEENAN
Drilling Fluid NONE
Well Type SINGLE CASED SCREENED

WELL DESIGN CONSTRUCTION

Casing #1 Diameter: 4.00 *inch* *Interval:* 0.00 to 4.00 *ft.*
Type : PVC SCH 40

Stick Up Inner Casing: 2.50 *ft.* *Protective Casing:* 0.00 *ft.*

Casing Grout: CEMT/BENT *Interval:* 0.00 to 2.00 *ft.*

Seal Type: BENTONITE PELLETS *Interval:* 2.00 to 3.00 *ft.*

Sand Pack Type : #2 SAND *Interval:* 3.00 to 14.00 *ft.*
Grain Size : UNIFORM *Median Diameter:*
Screen Diameter: 4.00 *Interval:* 4.00 to 14.00 *ft.*
Type : PVC *Slots:* .020 *inches*

Silt Trap Interval: 0.00 to 0.00 *ft.*
Backfill Type : *Interval:* 0.00 to 0.00 *ft.*

WELL DEVELOPMENT

Date / /
Method
Yield *Purged Volume*

COMMENTS

TC = Top of Casing
GS = Ground Surface
BN = Top Seal
SP = Top Sand Pack
SC = Top Screen
BS = Bottom Screen
TD = Total Depth
= Grout
= Seal
= Sand Pack
= Formation

Additional Comments:

NOTE: Well Diagram not to Scale

Elevations are feet above mean sea level

01/06/93

Borehole Log

ROY F. WESTON, Inc.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 14.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 1GW12	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343136.0000 surveyed	DRILLING RIG	: B-61
EASTING	: 2562505.0000 surveyed	DATE STARTED	: 06/10/92
ELEVATION	: 42.500 surveyed	DATE COMPLETED	: 06/10/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
			65	Fill	DK YLLWISH BRN	SFT	MST	2 1 1 1	OVA 0.0	
41	1									
40	2		10	Fill	DK YLLWISH BRN	SFT	MST	3 3 4 3	OVA 0.0	
39	3									
38	4		60	Fill	BROWNISH YELLOW	LSE	MST	2 4 3 6	OVA 0.0	0.2' piece of wood in spoon OVA = 3 units.
37	5									
36	6		85	Fill	BROWNISH YELLOW	LSE	MST	5 7 9 8	OVA 0.0	
35	7			Silty sand, SM	YLLWISH BROWN	SFT	WET		OVA 0.0	
34	8		75	Silty sand, SM	YELLOWISH BROWN	SFT	WET	3 6 4 4	OVA 0.0	
33	9			Poorly graded sand with silt, SP-SM	LT GRAY	SFT	WET		OVA 0.0	
32	10		80	Poorly graded sand with silt, SP-SM	LT GRAY	SFT	WET	1 3 2 2	OVA 0.0	

Borehole Log **ROY F. WESTON, Inc.**

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 14.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 1GW12	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343136.0000 surveyed	DRILLING RIG	: B-61
EASTING	: 2562505.0000 surveyed	DATE STARTED	: 06/10/92
ELEVATION	: 42.500 surveyed	DATE COMPLETED	: 06/10/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Poorly graded sand with silt, SP-SM	LT GRAY	SFT	WET		OVA 0.0	
31	11			Silty sand, SM		SFT	WET		OVA 18.2	
30	12		95	Silty sand, SM		SFT	WET	2 3 4 6	OVA 0.0	
29	13			Silty sand, SM		FRM	WET		OVA 0.0	
28	14		90	Silty sand, SM		FRM	WET	3 3 3 4		
27	15			Sandy lean clay, CL		FRM	MST		OVA 0.0	
26	16									
25	17									
24	18									
23	19									
22	20									

DATE: 12/08/92 **** LITHOLOGICAL DATA FOR - CLIENT ID: BAKER *** PAGE: 14

BOREHOLE /WELL ID	SMP NUM	LTH NUM	LITHOLOGY INT. (FT BGS)		SAMPLING METHOD	SIZE GRAVEL	GRAVEL PCT.	SIZE SAND	SAND PCT	SILT PCT	CLAY PCT	ORGANIC PCT	ROCK TYPE	PLAST	SORT	STRENGTH	MOISTURE	STRAT UNIT
1GW12	1	1	0.00	2.00	SPS		0	F	40	50	10	0		MOD	POR	SFT	MST	
1GW12	2	1	2.00	4.00	SPS		0	F	40	50	10	0		MOD	POR	SFT	MST	
1GW12	3	1	4.00	6.00	SPS		0	F	90	10	0	0			MOD	LSE	MST	
1GW12	4	1	6.00	7.10	SPS		0	F	90	10	0	0			MOD	LSE	MST	
1GW12	4	2	7.10	8.00	SPS		0	F	80	20	0	0			MOD	SFT	WET	
1GW12	5	1	8.00	9.00	SPS		0	F	80	20	0	0			MOD	SFT	WET	
1GW12	5	2	9.00	10.00	SPS		0	F	90	10	0	0			MOD	SFT	WET	
1GW12	6	1	10.00	10.70	SPS		0	F	90	10	0	0			MOD	SFT	WET	
1GW12	6	2	10.70	12.00	SPS		0	F	85	15	0	0			MOD	SFT	WET	
1GW12	7	1	12.00	12.80	SPS		0	F	85	15	0	0			MOD	SFT	WET	
1GW12	7	2	12.80	14.00	SPS		0	F	50	50	0	0		MOD		FRM	WET	
1GW12	8	1	14.00	14.80	SPS		0	F	50	50	0	0		MOD		FRM	WET	
1GW12	8	2	14.80	16.00	SPS		0		40	20	40	0		MOD		FRM	MST	

Borehole Location Data **ROY F. WESTON, Inc.**

BOREHOLE ID : 1GW13 SITE NAME/NO: WPNSTA YORKTOWN
BEGIN DATE : 06/10/92 END DATE : 06/10/92

LOGGER/COMPANY : W. BREW

BOREHOLE COMPLETED IN (<O>verburden <B>edrock) : O

TOTAL DEPTH : 16.00 DEPTH TO BEDROCK : 0.00

BOREHOLE DIAMETER #1: 12.00
INTERVAL: 0.00 ft. to 16.00 ft. BGS
METHOD : HSA FLUID : NONE
BOREHOLE DIAMETER #2:
INTERVAL:
METHOD : FLUID :
BOREHOLE DIAMETER #3:
INTERVAL:
METHOD : FLUID :

DRILLING COMPANY : HARDIN-HUBER
DRILLER : ROYCE KEENAN
DRILL RIG TYPE : B61

	ESTIMATED	SURVEYED
SURFACE ELEVATION :	0.000	40.700
N. COORDINATE :	0.0000	343392.0000
E. COORDINATE :	0.0000	2563140.0000

WELL PERMIT.....(Y)es (N)o: N PERMIT # :

HOLE ABANDONED...(Y)es (N)o: N
WELL INSTALLED...(Y)es (N)o: Y
WELL CLUSTER.....(Y)es (N)o: N No. OF WELLS : 0
WELL NEST.....(Y)es (N)o: N No. OF WELLS : 0
PUMPS INSTALLED..(Y)es (N)o: N TYPE DEPTH
PURGE : 0.00
SAMPLE : 0.00

BOREHOLE TESTING
BOREHOLE GEOPHYSICS.....(Y)es (N)o: N
SLUG TESTS.....(Y)es (N)o: Y
PACKER TESTS.....(Y)es (N)o: N
PUMPING TESTS.....(Y)es (N)o: N

COMMENTS :

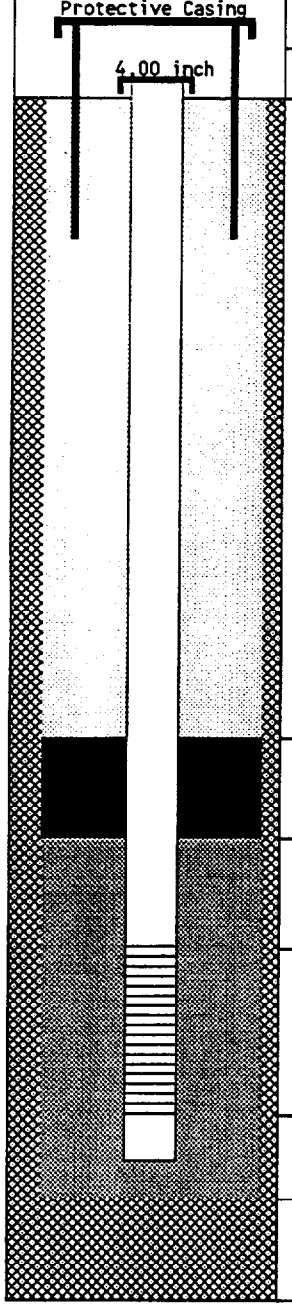
NWS-00313-03.13-07/01/93

Well Completion Summary **ROY F. WESTON, Inc.**

CLIENT	WPNSTA YORKTOWN	*DRILLING FIRM*	HARDIN-HUBER
SITE NAME	WPNSTA YORKTOWN	*INSPECTOR*	W. BREW

WELL ID	1GW13
START DATE	06/10/92
COMPLETION DATE	06/10/92

WATER LEVELS



DEPTH		ELEV.
2.50	TC	43.20
0.00	GS	40.70
2.00	BN	38.70
3.00	SP	37.70
4.00	SC	36.70
14.00	BS	26.70
14.00	TD	26.70

DRILLING SUMMARY

Driller ROYCE KEENAN
Drilling Fluid NONE
Well Type SINGLE CASED SCREENED

WELL DESIGN CONSTRUCTION

Casing #1 Diameter: 4.00 *inch* *Interval:* 0.00 to 4.00 *ft.*
Type : PVC SCH 40

Stick Up Inner Casing: 2.50 *ft.* *Protective Casing:* 0.00 *ft.*

Casing Grout: CEMT/BENT *Interval:* 0.00 to 2.00 *ft.*

Seal Type: BENTONITE *Interval:* 2.00 to 3.00 *ft.*

Sand Pack Type : #2 *Interval:* 3.00 to 14.00 *ft.*
Grain Size : UNIFORM *Median Diameter:* 2-3
Screen Diameter: 4.00 *Interval:* 4.00 to 14.00 *ft.*
Type : PVC *Slots:* .020 *inches*

Silt Trap Interval: 0.00 to 0.00 *ft.*
Backfill Type : *Interval:* 0.00 to 0.00 *ft.*

WELL DEVELOPMENT

Date / /
Method
Yield *Purged Volume*

COMMENTS

TC = Top of Casing
GS = Ground Surface
BN = Top Seal
SP = Top Sand Pack
SC = Top Screen
BS = Bottom Screen
TD = Total Depth
= Grout
= Seal
= Sand Pack
= Formation

Additional Comments:

NOTE: Well Diagram not to Scale *Elevations are feet above mean sea level*

01/06/93

Borehole Log

ROY F. WESTON, Inc.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 16.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 1GW13	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343392.0000 surveyed	DRILLING RIG	: B61
EASTING	: 2563140.0000 surveyed	DATE STARTED	: 06/10/92
ELEVATION	: 40.700 surveyed	DATE COMPLETED	: 06/10/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
			65	Silty sand, SM	YELLOWISH BROWN	SFT	MST	2 2 4 5		
39	1									
38	2		90	Silty sand, SM	YELLOWISH BROWN	SFT	MST	4 6 6 5		
37	3									
36	4		70	Silty sand, SM	YELLOWISH BROWN	SFT	MST	2 3 5 6		
35	5			Poorly graded sand, SP	PALE BROWN	SFT	WET			
34	6		85	Poorly graded sand, SP	PALE BROWN	SFT	WET	4 5 5 4		
				Silty sand, SM	YELLOWISH BROWN	LSE	WET			
33	7									
32	8		80	Silty sand, SM	YELLOWISH BROWN	LSE	WET	2 2 2 2		
31	9			Silty sand, SM	PALE BROWN	FRM	WET			
30	10		85	Silty sand, SM	PALE BROWN	FRM	WET	1 2 1 1		

Borehole Log

ROY F. WESTON, Inc.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 16.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 1GW13	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343392.0000 surveyed	DRILLING RIG	: B61
EASTING	: 2563140.0000 surveyed	DATE STARTED	: 06/10/92
ELEVATION	: 40.700 surveyed	DATE COMPLETED	: 06/10/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Silty sand, SM	PALE BROWN	FRM	WET			
29	11									
				Silty sand, SM		FRM	WET			
28	12		90	Silty sand, SM		FRM	WET	1 2 5 3		
27	13									
26	14		90	Sandy lean clay, CL		FRM	MST	2 2 3 2	OVA 0.0	Same lith unit as above except gradational changes with depth.
25	15									
24	16									
23	17									
22	18									
21	19									
20	20									

DATE: 12/08/92 **** LITHOLOGICAL DATA FOR - CLIENT ID: BAKER *** PAGE: 15

BOREHOLE /WELL ID	SMP NUM	LTH NUM	LITHOLOGY INT. (FT BGS)		SAMPLING METHOD	SIZE GRAVEL	GRAVEL PCT.	SIZE SAND	SAND PCT	SILT PCT	CLAY PCT	ORGANIC PCT	ROCK TYPE	PLAST	SORT	STRENGTH	MOISTURE	STRAT UNIT
1GW13	1	1	0.00	2.00	SPS		0	F	85	15	0	0			MOD	SFT	MST	
1GW13	2	1	2.00	4.00	SPS		0	F	85	15	0	0			MOD	SFT	MST	
1GW13	3	1	4.00	5.00	SPS		0	F	85	15	0	0			MOD	SFT	MST	
1GW13	3	2	5.00	6.00	SPS		0	F	95	5	0	0			MOD	SFT	WET	
1GW13	4	1	6.00	6.20	SPS		0	F	95	5	0	0			MOD	SFT	WET	
1GW13	4	2	6.20	8.00	SPS		0	F	75	25	0	0			MOD	LSE	WET	
1GW13	5	1	8.00	9.10	SPS		0	F	75	25	0	0			MOD	LSE	WET	
1GW13	5	2	9.10	10.00	SPS		0	F	85	15	0	0		LOW		FRM	WET	
1GW13	6	1	10.00	11.80	SPS		0	F	85	15	0	0		LOW		FRM	WET	
1GW13	6	2	11.80	12.00	SPS		0	F	60	35	5	0		LOW		FRM	WET	
1GW13	7	1	12.00	14.00	SPS		0	F	60	35	5	0		LOW		FRM	WET	
1GW13	8	1	14.00	16.00	SPS		0	F	30	30	40	0		MOD		FRM	MST	

Borehole Location Data **ROY F. WESTON, Inc.**

BOREHOLE ID : 1GW14 SITE NAME/NO: WPNSTA YORKTOWN
BEGIN DATE : 06/09/92 END DATE : 06/09/92

LOGGER/COMPANY : W. BREW

BOREHOLE COMPLETED IN (<O>verburden <B>edrock) : O

TOTAL DEPTH : 16.00 DEPTH TO BEDROCK : 0.00

BOREHOLE DIAMETER #1: 12.00
INTERVAL: 0.00 ft. to 16.00 ft. BGS
METHOD : HSA FLUID : NONE
BOREHOLE DIAMETER #2:
INTERVAL:
METHOD : FLUID :
BOREHOLE DIAMETER #3:
INTERVAL:
METHOD : FLUID :

DRILLING COMPANY : HARDIN-HUBER
DRILLER : ROYCE KEENAN
DRILL RIG TYPE : B61

	ESTIMATED	SURVEYED
SURFACE ELEVATION :	0.000	44.800
N. COORDINATE :	0.0000	343412.0000
E. COORDINATE :	0.0000	2562286.0000

WELL PERMIT.....(Y)es (N)o: N PERMIT # :

HOLE ABANDONED...(Y)es (N)o: N
WELL INSTALLED...(Y)es (N)o: Y
WELL CLUSTER.....(Y)es (N)o: N No. OF WELLS : 0
WELL NEST.....(Y)es (N)o: N No. OF WELLS : 0
PUMPS INSTALLED..(Y)es (N)o: N TYPE DEPTH
PURGE : 0.00
SAMPLE : 0.00

BOREHOLE TESTING
BOREHOLE GEOPHYSICS.....(Y)es (N)o: N
SLUG TESTS.....(Y)es (N)o: Y
PACKER TESTS.....(Y)es (N)o: N
PUMPING TESTS.....(Y)es (N)o: N

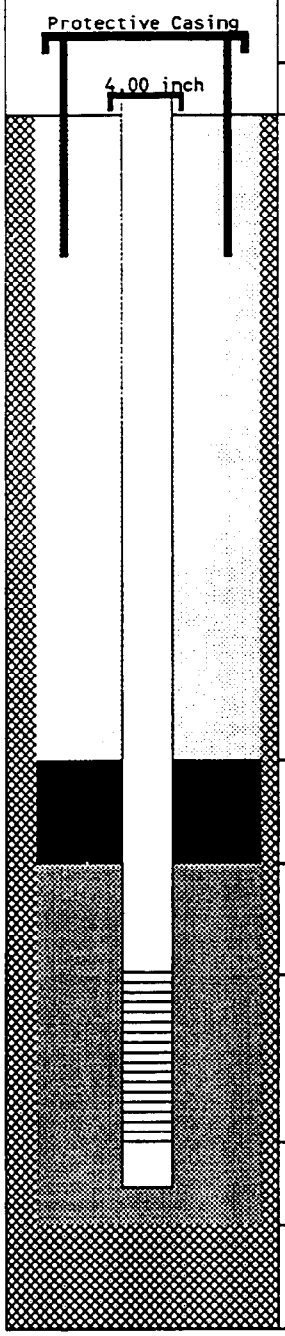
COMMENTS :

NWS-00313-03.13-07/01/93

Well Completion Summary **ROY F. WESTON, Inc.**

CLIENT	WPNSTA YORKTOWN	*DRILLING FIRM*	HARDIN-HUBER
SITE NAME	WPNSTA YORKTOWN	*INSPECTOR*	W. BREW

WELL ID	1GW14	*WATER LEVELS*
START DATE	06/09/92	
COMPLETION DATE	06/09/92	



DEPTH		ELEV.
2.50	TC	47.30
0.00	GS	44.80
3.00	BN	41.80
4.00	SP	40.80
5.00	SC	39.80
15.00	BS	29.80
15.00	TD	29.80

DRILLING SUMMARY

Driller ROYCE KEENAN
Drilling Fluid NONE
Well Type SINGLE CASED SCREENED

WELL DESIGN CONSTRUCTION

Casing #1 Diameter: 4.00 *inch* *Interval:* 0.00 to 5.00 *ft.*
Type : PVC SCH 40

Stick Up Inner Casing: 2.50 *ft.* *Protective Casing:* 0.00 *ft.*

Casing Grout: CEMT/BENT *Interval:* 0.00 to 3.00 *ft.*

Seal Type: BENTONITE *Interval:* 3.00 to 4.00 *ft.*

Sand Pack Type : #2 *Interval:* 4.00 to 15.00 *ft.*
Grain Size : UNIFORM *Median Diameter:*
Screen Diameter: 4.00 *Interval:* 5.00 to 15.00 *ft.*
Type : PVC *Slots:* .020 *inches*

Silt Trap Interval: 0.00 to 0.00 *ft.*
Backfill Type : *Interval:* 0.00 to 0.00 *ft.*

WELL DEVELOPMENT

Date / /
Method
Yield *Purged Volume*

COMMENTS

TC = Top of Casing
GS = Ground Surface
BN = Top Seal
SP = Top Sand Pack
SC = Top Screen
BS = Bottom Screen
TD = Total Depth
= Grout
= Seal
= Sand Pack
= Formation

Additional Comments:

NOTE: Well Diagram not to Scale *Elevations are feet above mean sea level*

01/06/93

Borehole Log **ROY F. WESTON, Inc.**

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 16.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 1GW14	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343412.0000 surveyed	DRILLING RIG	: B61
EASTING	: 2562286.0000 surveyed	DATE STARTED	: 06/09/92
ELEVATION	: 44.800 surveyed	DATE COMPLETED	: 06/09/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
			90	Silty sand, SM	V. DK BROWN	LSE	MST	2 2 2 2	OVA 0.0	
				Silty sand, SM	YELLOWISH BROWN	LSE	MST	3 3 3 4	OVA 0.0	
43	1									
42	2		60	Poorly graded sand, SP	YELLOWISH BROWN	LSE	MST		OVA 0.0	
41	3									
40	4		60	Poorly graded sand, SP	YELLOWISH BROWN	LSE	MST	5 8 10 9	OVA 0.0	
39	5									
38	6		65	Poorly graded sand, SP	YELLOWISH BROWN	LSE	MST	6	OVA 0.0	
				Poorly graded sand, SP	PALE BROWN	LSE	WET	7 7 9	OVA 0.0	
37	7									
36	8			No Sample Recovered				3 3 1 3		
35	9									
34	10		75	Poorly graded sand with silt, SP-SM	PALE BROWN	LSE	WET	2 4 5 4	OVA 0.0	

Borehole Log

ROY F. WESTON, Inc.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 16.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 1GW14	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343412.0000 surveyed	DRILLING RIG	: B61
EASTING	: 2562286.0000 surveyed	DATE STARTED	: 06/09/92
ELEVATION	: 44.800 surveyed	DATE COMPLETED	: 06/09/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Poorly graded sand with silt, SP-SM	PALE BROWN	LSE	WET		OVA 0.0	
33	11			Poorly graded sand with silt, SP-SM	V. DK GRYSH BRN	SFT	WET		OVA 0.0	
32	12		85	Poorly graded sand with silt, SP-SM	V DK GRYSH BRN	SFT	WET	3 2 1 2	OVA 0.0	
31	13									
30	14		95	Poorly graded sand with silt, SP-SM	V DK GRYSH BRN	SFT	WET	1 2 2 3	OVA 0.0	
29	15			Lean clay, CL	V DK GRYSH BRN	FRM	DRY		OVA 0.0	
28	16									
27	17									
26	18									
25	19									
24	20									

DATE: 12/08/92 **** LITHOLOGICAL DATA FOR - CLIENT ID: BAKER *** PAGE: 16

BOREHOLE /WELL ID	SMP NUM	LTH NUM	LITHOLOGY INT. (FT BGS)		SAMPLING METHOD	SIZE GRAVEL	GRAVEL PCT.	SIZE SAND	SAND PCT	SILT PCT	CLAY PCT	ORGANIC PCT	ROCK TYPE	PLAST	SORT	STRENGTH	MOISTURE	STRAT UNIT
1GW14	1	1	0.00	0.50	SPS		0	F	80	0	0	20			MOD	LSE	MST	
1GW14	1	2	0.50	2.00	SPS		0	MF	90	0	0	20			MOD	LSE	MST	
1GW14	2	1	2.00	4.00	SPS		0	MF	90	0	0	0			MOD	LSE	MST	
1GW14	3	1	4.00	6.00	SPS		0	MF	90	0	0	0			MOD	LSE	MST	
1GW14	4	1	6.00	6.10	SPS		0	MF	90	0	0	0			MOD	LSE	MST	
1GW14	4	2	6.10	8.00	SPS	F	10	MF	85	5	0	0			MOD	LSE	WET	
1GW14	5	1	8.00	10.00	SPS		0		0	0	0	0						
1GW14	6	1	10.00	11.00	SPS		0	F	90	10	0	0			MOD	LSE	WET	
1GW14	6	2	11.00	12.00	SPS		0	F	90	10	0	0			MOD	SFT	WET	
1GW14	7	1	12.00	14.00	SPS		0	F	90	10	0	0			MOD	SFT	WET	
1GW14	8	1	14.00	15.00	SPS		0	F	90	10	0	0			MOD	SFT	WET	
1GW14	8	2	15.00	16.00	SPS		0	VF	5	5	90	0		MOD		FRM	DRY	

Borehole Location Data **ROY F. WESTON, Inc.**

BOREHOLE ID : 1GW17 SITE NAME/NO: WPNSTA YORKTOWN
BEGIN DATE : 06/10/92 END DATE : 06/10/92

LOGGER/COMPANY : W. BREW

BOREHOLE COMPLETED IN (<O>verburden <B>edrock) : O

TOTAL DEPTH : 14.00 DEPTH TO BEDROCK : 0.00

BOREHOLE DIAMETER #1: 12.00
INTERVAL: 0.00 ft. to 14.00 ft. BGS
METHOD : HSA FLUID : NONE
BOREHOLE DIAMETER #2:
INTERVAL:
METHOD : FLUID :
BOREHOLE DIAMETER #3:
INTERVAL:
METHOD : FLUID :

DRILLING COMPANY : HARDIN-HUBER
DRILLER : ROYCE KEENEN
DRILL RIG TYPE : B61

	ESTIMATED	SURVEYED
SURFACE ELEVATION :	0.000	38.900
N. COORDINATE :	0.0000	343645.0000
E. COORDINATE :	0.0000	2652670.0000

WELL PERMIT.....(Y)es (N)o: N PERMIT # :

HOLE ABANDONED...(Y)es (N)o: N
WELL INSTALLED...(Y)es (N)o: Y
WELL CLUSTER.....(Y)es (N)o: N No. OF WELLS : 0
WELL NEST.....(Y)es (N)o: N No. OF WELLS : 0
PUMPS INSTALLED..(Y)es (N)o: N TYPE DEPTH
PURGE : 0.00
SAMPLE : 0.00

BOREHOLE TESTING
BOREHOLE GEOPHYSICS.....(Y)es (N)o: N
SLUG TESTS.....(Y)es (N)o: Y
PACKER TESTS.....(Y)es (N)o: N
PUMPING TESTS.....(Y)es (N)o: N

COMMENTS :

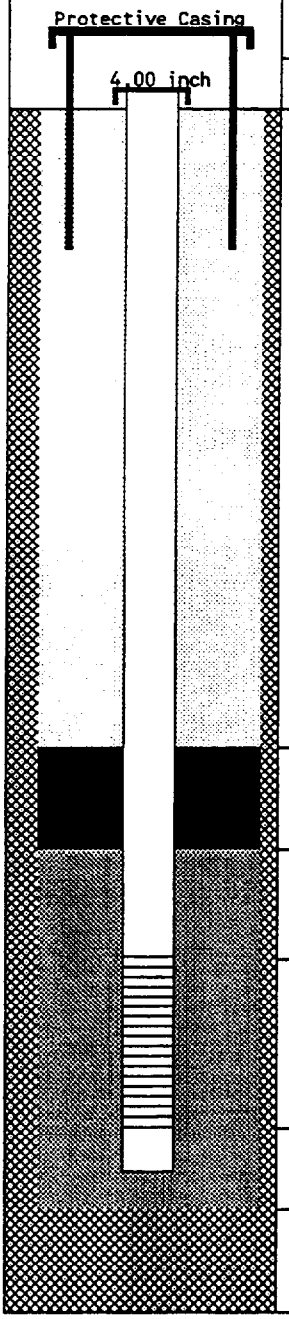
NWS-00313-03.13-07/01/93

Well Completion Summary **ROY F. WESTON, Inc.**

CLIENT	WPNSTA YORKTOWN	*DRILLING FIRM*	HARDIN-HUBER
SITE NAME	WPNSTA YORKTOWN	*INSPECTOR*	W. BREW

WELL ID	1GW17
START DATE	06/10/92
COMPLETION DATE	06/10/92

WATER LEVELS



DEPTH		ELEV.
2.50	TC	41.40
0.00	GS	38.90
0.50	BN	38.40
1.00	SP	37.90
2.00	SC	36.90
12.00	BS	26.90
12.00	TD	26.90

DRILLING SUMMARY

Driller ROYCE KEENAN
Drilling Fluid NONE
Well Type SINGLE CASED SCREENED

WELL DESIGN CONSTRUCTION

Casing #1 Diameter: 4.00 *inch* *Interval:* 0.00 to 2.00 *ft.*
Type : PVC SCH 40

Stick Up Inner Casing: 2.50 *ft.* *Protective Casing:* 0.00 *ft.*

Casing Grout: CEMT/BENT *Interval:* 0.00 to 0.50 *ft.*

Seal Type: BENTONITE *Interval:* 0.50 to 1.00 *ft.*

Sand Pack Type : #2 *Interval:* 1.00 to 12.00 *ft.*
Grain Size : UNIFORM *Median Diameter:* 2.3
Screen Diameter: 4.00 *Interval:* 2.00 to 12.00 *ft.*
Type : PVC *Slots:* .020 *inches*

Silt Trap Interval: 0.00 to 0.00 *ft.*
Backfill Type : *Interval:* 0.00 to 0.00 *ft.*

WELL DEVELOPMENT

Date / /
Method
Yield *Purged Volume*

COMMENTS

TC = Top of Casing
GS = Ground Surface
BN = Top Seal
SP = Top Sand Pack
SC = Top Screen
BS = Bottom Screen
TD = Total Depth
= Grout
= Seal
= Sand Pack
= Formation

Additional Comments:

NOTE: Well Diagram not to Scale *Elevations are feet above mean sea level*

01/06/93

Borehole Log **ROY F. WESTON, Inc.**

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 14.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 1GW17	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343645.0000 surveyed	DRILLING RIG	: B61
EASTING	: 2652670.0000 surveyed	DATE STARTED	: 06/10/92
ELEVATION	: 38.900 surveyed	DATE COMPLETED	: 06/10/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
			80	Poorly graded sand with silt, SP-SM	DK REDDISH BRN	SFT	MST	3 2 2 2	OVA 0.0	
37	1									
36	2		85	Poorly graded sand with silt, SP-SM	DK REDDISH BRN	SFT	MST	3 6 7 1	OVA 0.0	
35	3									
				Poorly graded sand with silt, SP-SM	DK REDDISH BRN	SFT	WET		OVA 0.0	Ion stained
				Poorly graded sand with silt, SP-SM	PALE BROWN	LSE	WET		OVA 0.0	
34	4		80	Poorly graded sand with silt, SP-SM	PALE BROWN	LSE	WET	2 2 3 2	OVA 0.0	
33	5			Silty sand, SM	PALE BROWN	LSE	WET		OVA 0.0	
32	6		75	Silty sand, SM	PALE BROWN	LSE	WET	3 6 3 4	OVA 0.0	
				Poorly graded sand, SP	V. DK GRAY	LSE	WET		OVA 0.0	
31	7									
30	8		90	Poorly graded sand, SP	V. DK GRAY	LSE	WET	3 3 3 3	OVA 0.0	
29	9			Silty sand, SM	V. DK GRAY	SFT	WET		OVA 0.0	
28	10		90	Silty sand, SM	V. DK GRAY	SFT	WET	2 2 2 1	OVA 0.0	

Borehole Log **ROY F. WESTON, Inc.**

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 14.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 1GW17	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343645.0000 surveyed	DRILLING RIG	: B61
EASTING	: 2652670.0000 surveyed	DATE STARTED	: 06/10/92
ELEVATION	: 38.900 surveyed	DATE COMPLETED	: 06/10/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Silty sand, SM	V. DK GRAY	SFT	WET		OVA 0.0	
27	11									
				Lean clay, CL	DK OLIVE	FRM	MST			
26	12		95	Lean clay, CL	DK OLIVE	FRM	MST	1 2 2 2		
25	13									
24	14									
23	15									
22	16									
21	17									
20	18									
19	19									
18	20									

DATE: 12/08/92 **** LITHOLOGICAL DATA FOR - CLIENT ID: BAKER *** PAGE: 17

BOREHOLE /WELL ID	SMP NUM	LTH NUM	LITHOLOGY INT. (FT BGS)		SAMPLING METHOD	SIZE GRAVEL	GRAVEL PCT.	SIZE SAND	SAND PCT	SILT PCT	CLAY PCT	ORGANIC PCT	ROCK TYPE	PLAST	SORT	STRENGTH	MOISTURE	STRAT UNIT
1GW17	1	1	0.00	2.00	SPS		0	MF	90	10	0	0			MOD	SFT	MST	
1GW17	2	1	2.00	3.20	SPS		0	MF	90	10	0	0			MOD	SFT	MST	
1GW17	2	2	3.20	3.80	SPS		0	F	90	10	0	0			MOD	SFT	WET	
1GW17	2	3	3.80	4.00	SPS		0	F	90	10	0	0			MOD	LSE	WET	
1GW17	3	1	4.00	5.00	SPS		0	F	90	10	0	0			MOD	LSE	WET	
1GW17	3	2	5.00	6.00	SPS		0	F	85	15	0	0			MOD	LSE	WET	
1GW17	4	1	6.00	6.20	SPS		0	F	85	15	0	0			MOD	LSE	WET	
1GW17	4	2	6.20	8.00	SPS		0	F	95	5	0	0			MOD	LSE	WET	
1GW17	5	1	8.00	9.00	SPS		0	F	95	5	0	0			MOD	LSE	WET	
1GW17	5	2	9.00	10.00	SPS		0	F	85	15	0	0			MOD	SFT	WET	
1GW17	6	1	10.00	11.70	SPS		0	F	85	15	0	0			MOD	SFT	WET	
1GW17	6	2	11.70	12.00	SPS		0		0	5	85	10		MOD		FRM	MST	
1GW17	7	1	12.00	14.00	SPS		0		0	5	85	10		MOD		FRM	MST	

Dames & Moore

LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	13542	LANTDIV. US NAVY	NWS Yorktown Va

DRILLING METHOD: MC 45 7½ HSA NW

SAMPLING METHOD: 24" gel. sp. 140 lb Ham.

BORING NO. 3GW06

SHEET 1 OF 3

WATER LEVEL				
TIME				
DATE				
CASING DEPTH				

DRILLING	START	FINISH
TIME	15:30	17:00
DATE	12-10-84	12-10-84

DATUM ELEVATION

DRILLING CONTR. 0.C0449

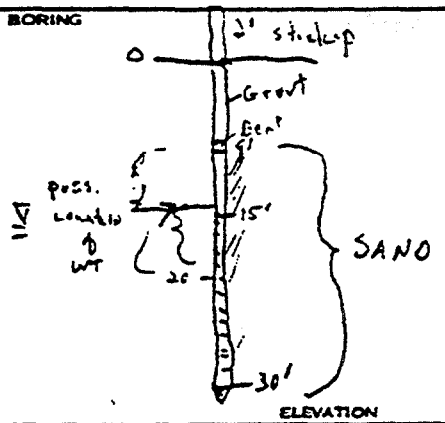
BY DATE CHK'D BY

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	SURFACE CONDITIONS:
						0		
				4 4 / 9		1		Dk brown silty med to coarse SAND, LOOSE
				6 8 / 17		2	SM	brown-orange clayey-silty fine SAND w/ small gravel present, some coarse SAND, MEDIUM DENSE
				5 6 6 / 12		3		
						4		Brown silty to clayey-silty fine SAND w/ appreciable coarse SAND to gravel, MEDIUM DENSE
						5		
						6		
						7		
						8		
						9		
				5 6 7 / 13		10	SP	Varied white + orange fine to med SANDS, MEDIUM DENSE
						11		
						2		
						3		
						4		
						15		
				8 8 12 / 20		16	ML SM	orange & white varied clayey silt or v. fine SAND. very tough - mica present VERY STIFF
						17		
						18		
						9		
						0		

SB.1 (3) (REV. 11-80)

Dames & Moore

LOCATION OF BORING



DATUM ELEVATION

JOB NO. 13542	CLIENT LANTDIV, US Navy	LOCATION Yorktown, NWS, VA		
DRILLING METHOD: M-45 7¼ H.S.A.			BORING NO. 36-W06	
			SHEET 2 OF 3	
SAMPLING METHOD: 24" spl spoon			DRILLING	
			START	FINISH
WATER LEVEL	15-20'		TIME 9:45	TIME 10:15
TIME				
DATE			DATE 12-11-85	DATE 12-11-85
CASING DEPTH	30'			

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	
				3 3 5 / 8		20		varved grey & brown clayey silts, STIFF
						21	ML	
						22		
						23		
						24		
				6 5 6 / 11		25		varved grey & brown clayey silts to fine sand in brown layers
						26		start grey green clayey silts, STIFF
						27		
						28		
						29		
				3 7 6 / 13		30		End of green grey clayey silts
						31		Tan-grey calcareous (plant frg) small fragments 5-10 mm and greater) silty fine sand, MEDIUM DENSE
						2		
						3		
						4	SP	
						5		
						6		
						7		
						8		
						9		
						0		

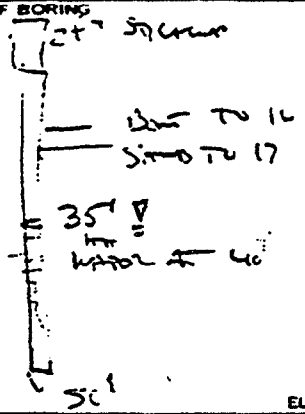
DRILLING CONTR. _____ BY _____ DATE _____ CHK'D BY _____

No. 28450

GSS.1 (3) (REV. 11-80)

Dames & Moore

LOCATION OF BORING



DATUM ELEVATION

JOB NO.	CLIENT	LOCATION
13542021	LANT DIV US NAVY	NAVAL WEAPONS STATION YORKTOWN VA

DRILLING METHOD: 7½" HSA

Arctic ATV MCE 55

SAMPLING METHOD:

BORING NO. ~~[illegible]~~ NW 3 GW OK

SHEET 3 OF 3

					DRILLING START	DRILLING FINISH
WATER LEVEL					TIME	TIME
TIME					15:25	16:45
DATE					DATE	DATE
CASING DEPTH					2/13/86	2/13/86

DRILLING CONTR.

BY CHK'D BY DATE

10.58289

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	SURFACE CONDITIONS:
						40		FINE QTZ SAND, COARSE STONE FRAGMENTS
						1		DARK GRAY (5Y 4/1)
						2		
						3		
						4	SP	
						5		
						6		
						7		
						8		
						9		
						50		FINE QTZ SAND, COARSE STONE FRAG
						1		(5Y 4/1)
						2		
						3		
						4		
						5		
						6		
						7		
						8		
						9		
						0		

888 1 (3) (REV 11-80)

Dames & Moore

No. 28404

JOB NO.	CLIENT	LOCATION
13542	LANTDIV - US NAVY	Yorktown, VA

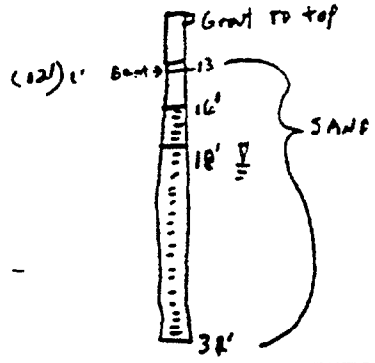
DRILLING METHOD: Ardco ATV MC55

SAMPLING METHOD: 24" Spl. spoon

BORING NO. 3GW0

SHEET 1 OF 2

LOCATION OF BORING



					DRILLING START	DRILLING FINISH
WATER LEVEL	18'		-		TIME 11:00	TIME 14:30
TIME	14:00					
DATE	1-6-86				DATE 1-6-86	DATE 1-6-86
CASING DEPTH	31'					

DATUM ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	
				4 5 6/11		0–1	SC	LT Brown - to tan clayey fine sand or silt MEDIUM DENSE
				5 5 4/12		2–3	SM	orange + tan mottled silty med to fine sand some coarser sands present - microscopic minerals present MEDIUM DENSE
				4 4 3/7		4–5	SC	orange-brown and grey mottled clayey v fine sands microscopic minerals present - more abundant in 1.5 to 3.0' sample Ok minerals + coarser sands in upper most section of sample
				4 5 4/9		10–12	CL	mixed orange brown clay and white shelly material >50% white chalky material + hard shells, STIFF
				4 5 5/10		15–16	SM	LT Brown to tan silt and fine sands w 30+% shelly material white light + dark shell frags MEDIUM DENSE

DRILLING CONTR. _____ BY _____ CHK'D BY _____ DATE _____

DSS-1 (3) (REV. 11-80)

Dames & Moore

LOCATION OF BORING

JOB NO.	CLIENT	LOCATION
13542	LANTDIV - US NAVY	yorktown NWS VA

DRILLING METHOD: Ardco ATV MC 53

SAMPLING METHOD: 24" spl spoon

BORING NO. NW 4

SHEET 2 OF 2

WATER LEVEL	14-20'			
TIME	14:00			
DATE	1-6-85			
CASING DEPTH	31'			

DRILLING

START	FIN
TIME 11:00	TI 14:3
DATE 1-6-86	DA 1-6

DATUM

ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	
				4		20		saturated sample
				6 7 / (13)		21	SM	TAN silty med to fine SANDS w/ much shell frag
						22		large - to 20 mm Light & dark frags
						23		heavy minerals present, MEDIUM DENS
						24		
				8 8 9 / (17)	8	25	SP	TAN shelly silty med SAND - uniform, ME
						26		
						27		
						28		
						29		
				5 7 7 / (14)		30		TAN shelly silty med SAND - uniform, MEDIUM DE
						31		
						32		
						33		
						34		
						35		
						6		
						7		
						8		
						9		
						0		

DRILLING CONTR. _____

No. 28405

BY _____ DATE _____ CHK'D BY _____

888.1 (3) (REV. 11-80)

Dames & Moore

LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	135-42	LANTDIV - US NAVY	NWS Yorktown VA

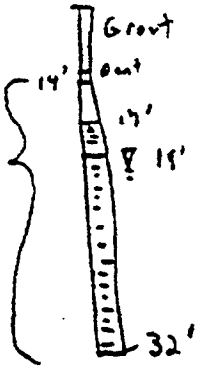
DRILLING METHOD: Arde: ATV Mc55

SAMPLING METHOD: 24" spl spoon

BORING NO. 3GW08

SHEET 1 OF 2

					DRILLING	
					START	FINISH
WATER LEVEL					TIME 0900	TIME 1-
TIME						
DATE					DATE 1-7-85	DATE
CASING DEPTH						



DATUM ELEVATION

DRILLING CONTR

No. 28406

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	SURFACE CONDITIONS:
				2 2		0		Brown silty med sand - coarse fraction present poorly sorted, LOOSE
				3	15	1		
				2 2	15	2	SM	orange brown silty med to fine sand more fines present than 0-1.5, LOOSE
				3 4		3		
				7	12	4	SC	orange brown + gray mottled clayed v. fine sands, MEDIUM DENSE
						5		
						6		
						7		
						8		
						9		
				4		10		
				5 6		11	SM SC	orange brown v. fine sand or coarse silt w/ clay present micaceous minerals present, MEDIUM DENSE
					11	12		
						13		
						14		
				6 6		15	SM	brown and tan very calcareous shelly silty fine sands, white + dark shell fragments bryozoans present (bottom ½ of sample) MEDIUM DENSE
				7	13	16		
						17		
						18		
						19		
						20		

BY DATE CHK'D BY

D&M 1 (3) (REV. 11-80)

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 3SB/6W08A

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 318
SITE/AREA:

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
						Continued from Sheet _		
71	S14	1.75/2.0 88%	3 7 10 16		*	fine to very fine SAND, some shell fragments little silt, dark gray, medium dense, wet	PVC screen #1 Qtz Sand	
72								
73	S15	1.75/2.0 88%	4 9 14 18		*	SAME		
74								
75	AW						bottom PVC screen 75'	
76						Boring Complete at 75' bgs		
77								
78								
79								
80								
81								
82								
83								
84								
85								
86								
87								
88								
89								
90						Match to Sheet _		

DRILLING CO.: Parratt-Wolff Inc
DRILLER: K. White

BAKER REP.: R Lewis
WELL/BORING NO.: 3SB/6W08A SHEET _ OF _

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT:	Remedial Investigation - Groundwater Operable Unit I		
PROJ. NO.:	CTO-213	BORING NO.:	3GW08B
COORDINATES	NORTHING: 342,352.65	EASTING:	2,563,454.37
ELEVATION:	GROUND SURFAC 25.98	TOP OF PVC CASING:	28.03

Rig: CME-55 ATV								
	Split Spoon	**Casing**	**Augers**	**Core Barrel**	**Date**	**Progress (Ft.)**	**Weather**	**Depth to Water (Ft.)**
Size (ID)	1 3/8"	--	4.25"	--	9/20/2004	35	Sunny, 60-78°	*24
Length (FT)	2.0		5.0					
Type	STD		HSA					
Hammer Wt.	140#							
Fall								

Remarks: *Approximate location. Augered to 35-ft bgs then constructed monitoring well, to replace the damaged 3GW08

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

WELL INFORMATION

Type	Dam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Sch. 40 PVC Riser	2"	0	25
Sch. 40 PVC (0.010 in.) screen	2"	25	35

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1								
2							Sch. 40 PVC riser	
3								
4								
5	A-N							
6							cement bentonite grout	
7								
8								
9								
10						Match to Sheet 2		

DRILLING CO.:	Parrott-Wolff, Inc.	BAKER REP.:	David Martin
DRILLER:	Gary Ellingworth	BORING NO.:	3GW08B SHEET 1 OF 3

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 3GW08B

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
11								
12								
13								
14								
15							Sch. 40 PVC Riser	
16								
17							cement bentonite grout	
18								
19								
20	A-N							
21							top of bentonite @ 21'	
22								
23							top of sand @ 23'	
24	▼					water @ ~24 feet		
25								
26							top of screen @ 25'	
27								
28								
29								
30								

Match to Sheet 3

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 3GW08B SHEET 2 OF 3

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 3GW08B

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
31							0.10 slot PVC screen	
32	A-N							
33								
34							Bottom of screen @ 35'	
35								
						EOB @ 35-ft		
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								
49								
50								

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 3GW08B SHEET 3 OF 3

Borehole Location Data **ROY F. WESTON, Inc.**

BOREHOLE ID : 3GW15 SITE NAME/NO: WPNSTA YORKTOWN
BEGIN DATE : 06/02/92 END DATE : 06/02/92

LOGGER/COMPANY : J. WILLIAMS

BOREHOLE COMPLETED IN (<O>verburden <B>edrock) : O

TOTAL DEPTH : 39.00 DEPTH TO BEDROCK : 0.00

BOREHOLE DIAMETER #1: 12.00
INTERVAL: 0.00 ft. to 39.00 ft. BGS
METHOD : HSA FLUID : NONE
BOREHOLE DIAMETER #2:
INTERVAL:
METHOD : FLUID :
BOREHOLE DIAMETER #3:
INTERVAL:
METHOD : FLUID :

DRILLING COMPANY : HARDIN-HUBER
DRILLER : ROYCE KEENAN
DRILL RIG TYPE : B61

	ESTIMATED	SURVEYED
SURFACE ELEVATION :	0.000	29.300
N. COORDINATE :	0.0000	342446.0000
E. COORDINATE :	0.0000	2563175.0000

WELL PERMIT.....(Y)es (N)o: N PERMIT # :

HOLE ABANDONED...(Y)es (N)o: N
WELL INSTALLED...(Y)es (N)o: Y
WELL CLUSTER.....(Y)es (N)o: N No. OF WELLS : 0
WELL NEST.....(Y)es (N)o: N No. OF WELLS : 0
PUMPS INSTALLED..(Y)es (N)o: N TYPE DEPTH
PURGE : 0.00
SAMPLE : 0.00

BOREHOLE TESTING
BOREHOLE GEOPHYSICS.....(Y)es (N)o: N
SLUG TESTS.....(Y)es (N)o: Y
PACKER TESTS.....(Y)es (N)o: N
PUMPING TESTS.....(Y)es (N)o: N

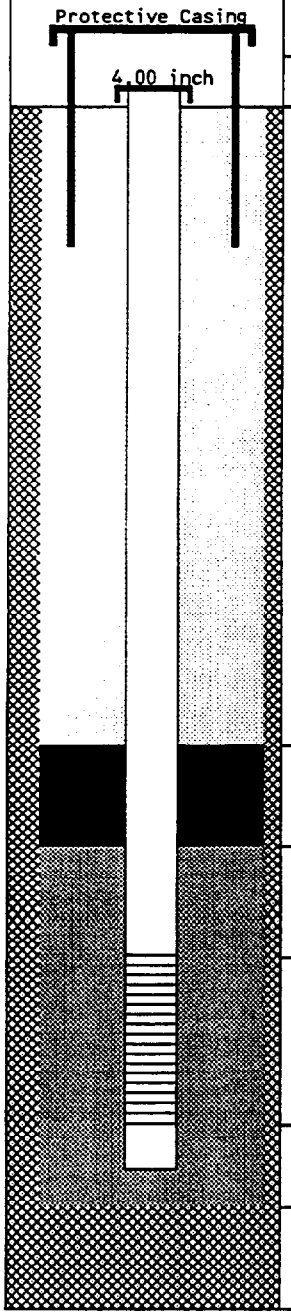
COMMENTS :

NWS-00313-03.13-07/01/93

Well Completion Summary **ROY F. WESTON, Inc.**

CLIENT	WPNSTA YORKTOWN	*DRILLING FIRM*	HARDIN-HUBER
SITE NAME	WPNSTA YORKTOWN	*INSPECTOR*	J. WILLIAMS

WELL ID	3GW15	*WATER LEVELS*
START DATE	06/04/92	26.00 FT (TOC) ON 06/04/92
COMPLETION DATE	06/05/92	



DEPTH		ELEV.
2.62	TC	31.92
0.00	GS	29.30
15.50	BN	13.80
15.50	SP	13.80
20.00	SC	9.30
35.00	BS	-5.70
37.00	TD	-7.70

DRILLING SUMMARY

Driller ROYCE KEENAN
Drilling Fluid
Well Type SINGLE CASED SCREENED

WELL DESIGN CONSTRUCTION

Casing #1 Diameter: 4.00 *inch* *Interval:* 0.00 to 25.00 *ft.*
Type : PVC SCH 40

Stick Up Inner Casing: 2.62 *ft.* *Protective Casing:* 0.00 *ft.*

Casing Grout: CEMT/BENT *Interval:* 0.00 to 15.50 *ft.*

Seal Type: BENTONITE PELLET *Interval:* 15.50 to 17.00 *ft.*

Sand Pack Type : *Interval:* 15.50 to 37.00 *ft.*
Grain Size : *Median Diameter:*
Screen Diameter: 4.00 *Interval:* 20.00 to 35.00 *ft.*
Type : PVC *Slots:* 0.020 *inches*

Silt Trap Interval: 0.00 to 0.00 *ft.*
Backfill Type : *Interval:* 0.00 to 0.00 *ft.*

WELL DEVELOPMENT

Date / /
Method
Yield *Purged Volume*

COMMENTS

TC = Top of Casing
GS = Ground Surface
BN = Top Seal
SP = Top Sand Pack
SC = Top Screen
BS = Bottom Screen
TD = Total Depth
= Grout
= Seal
= Sand Pack
= Formation

Additional Comments:
21 bags #2 sand/gravel suspended in viscous fine/false readings/gravel at 10'/had to lift 7' out with mud and wash.

NOTE: Well Diagram not to Scale *Elevations are feet above mean sea level*

01/06/93

Borehole Log **ROY F. WESTON, Inc.**

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 39.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: J. WILLIAMS
WELL ID	: 3GW15	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 342446.0000 surveyed	DRILLING RIG	: B61
EASTING	: 2563175.0000 surveyed	DATE STARTED	: 06/02/92
ELEVATION	: 29.300 surveyed	DATE COMPLETED	: 06/02/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Silty sand, SM	DK YLLOWISH BRN	LSE	MST	2 4 6 7	FID 0.0	0-2 took 2nd split spoon for additional BNA & metals vol.
28	1									
27	2			Silty sand, SM	DK YLLOWISH BRN	LSE	MST	3 6 7 9		
26	3									
25	4			Sandy lean clay, CL	DK YLLOWISH BRN		MST	3 4 4 5		Clay contact 5.1'
24	5									
23	6			SHELLY HASH	LT GRAY	STF	MST	3 5 6 7		Mottled, orange brown 90% SHELL FRAGMENTS
22	7									
21	8			Elastic silt, MH			WET	3 5 6 8		Interbedded clay & silt trace root matter.
20	9									
19	10			Fat clay, CH	PALE OLIVE	STF	MST	4 7 7 8		Gradational clay & silt.

Borehole Log

ROY F. WESTON, Inc.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 39.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: J. WILLIAMS
WELL ID	: 3GW15	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 342446.0000 surveyed	DRILLING RIG	: B61
EASTING	: 2563175.0000 surveyed	DATE STARTED	: 06/02/92
ELEVATION	: 29.300 surveyed	DATE COMPLETED	: 06/02/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Fat clay, CH	PALE OLIVE	STF	MST			Gradational clay & silt.
18	11									
17	12			Fat clay, CH	PALE OLIVE	FRM	MST	3 5 6 8		Trace root matter.
16	13									
15	14			Silt, ML	GRAY	FRM	MST	3 3 5 6	FID 0.0	Mottled olive gray to ylw brn. Trace mica 1" layer rotten oxidized Fe, accretion. Tr. Fe nodules
14	15									
13	16			Lean clay with sand, CL		FRM	MST	2 3 4 4		
12	17									
11	18			Sandy lean clay, CL		FRM	MST	1 1 3 4		Mottled orange brn to olive gray 18.7' contact of shell layer.
10	19			Shelly clay		FRM	MST		FID 0.5	18.7 to 19.5 shell frags. in fill matrix. Contact shell layer 18.7' BGS. 50% Shell fragments.
				No Sample Recovered						
9	20			Shelly clay		FRM	WET	1 2 4 5	FID 2.5	50% Shell Fragments

Borehole Log **ROY F. WESTON, Inc.**

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 39.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: J. WILLIAMS
WELL ID	: 3GW15	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 342446.0000 surveyed	DRILLING RIG	: B61
EASTING	: 2563175.0000 surveyed	DATE STARTED	: 06/02/92
ELEVATION	: 29.300 surveyed	DATE COMPLETED	: 06/02/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Shelly clay		FRM	WET		FID 2.5	50% Shell Fragments
8	21									
7	22			Shelly clay			WET	2 5 5 5	FID 0.0	FID reading over hole in auger 1.8. 50% Shell frag
6	23									
5	24			Shelly clay			WET		FID 3.5	50% shell fragments in clay matrix.
				Lean clay with sand, CL	OLIVE GR-YELLOW		WET			
4	25									
3	26			Interval Not Sampled						
2	27									
1	28									
0	29									
-1	30			Silty sand, SM	OLIVE BROWN	LSE	SAT	4 6 7 9	FID 0.0	OVA reading over hole in auger .2

Borehole Log

ROY F. WESTON, Inc.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 39.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: J. WILLIAMS
WELL ID	: 3GW15	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 342446.0000 surveyed	DRILLING RIG	: B61
EASTING	: 2563175.0000 surveyed	DATE STARTED	: 06/02/92
ELEVATION	: 29.300 surveyed	DATE COMPLETED	: 06/02/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Silty sand, SM	OLIVE BROWN	LSE	SAT		FID 0.0	OVA reading over hole in auger .2
-1	31									
-2	32			Interval Not Sampled						
-3	33									
-4	34									
-5	35			Silty sand, SM		SFT	SAT	5 7 7 6	FID 0.0	
-6	36									
-7	37			Silty sand, SM	DK OLIVE GRAY	LSE	SAT	13 13 14 13	FID 0.0	Some shell fragments (crumbly).
-8	38									
-9	39									
-10	40									

DATE: 12/08/92 **** LITHOLOGICAL DATA FOR - CLIENT ID: BAKER *** PAGE: 2

BOREHOLE /WELL ID	SMP NUM	LTH NUM	LITHOLOGY INT. (FT BGS)		SAMPLING METHOD	SIZE GRAVEL	GRAVEL PCT.	SIZE SAND	SAND PCT	SILT PCT	CLAY PCT	ORGANIC PCT	ROCK TYPE	PLAST	SORT	STRENGTH	MOISTURE	STRAT UNIT
3GW15	1	1	0.00	2.00	SPS		0	F	60	40	0	0		NON	MOD	LSE	MST	
3GW15	2	1	2.00	4.00	SPS		0	F	50	40	10	0		NON	MOD	LSE	MST	
3GW15	3	1	4.00	6.00	SPS		0		30	30	40	0		LOW			MST	
3GW15	4	1	6.00	8.00	SPS		0		0	0	10	90		HGH		STF	MST	
3GW15	5	1	8.00	10.00	SPS		0		0	50	50	0		MOD	POR		WET	
3GW15	6	1	10.00	12.00	SPS		0		0	10	85	5		HGH		STF	MST	
3GW15	7	1	12.00	14.00	SPS		0		5	20	75	0		HGH		FRM	MST	
3GW15	8	1	14.00	16.00	SPS		0		5	50	45	0		LOW		FRM	MST	
3GW15	9	1	16.00	18.00	SPS		0	F	25	35	40	0		MOD		FRM	MST	
3GW15	10	1	18.00	18.70	SPS		0		30	30	40	0		LOW		FRM	MST	
3GW15	10	2	18.70	19.50	SPS		0		0	0	50	50		LOW		FRM	MST	
3GW15	10	3	19.50	20.00	SPS		0		0	0	0	0						
3GW15	11	1	20.00	22.00	SPS		0		0	0	50	50		LOW		FRM	WET	
3GW15	12	1	22.00	24.00	SPS		0		0	0	50	50		LOW			WET	
3GW15	13	1	24.00	24.40	SPS		0		0	0	50	50		LOW			WET	
3GW15	13	2	24.40	26.00	SPS		0		20	30	50	0		LOW			WET	
3GW15	14	1	26.00	30.00	NS		0		0	0	0	0						
3GW15	15	1	30.00	32.00	SPS		0		50	15	5	30		NON		LSE	SAT	
3GW15	16	1	32.00	35.00	NS		0		0	0	0	0						
3GW15	17	1	35.00	37.00	SPS		0	F	50	50	0	0			WEL	SFT	SAT	
3GW15	18	1	37.00	39.00	SPS		0	MF	80	15	5	0		NON	WEL	LSE	SAT	

Baker
Baker Environmental, Inc

WELL/BORING NO.: 3GW15A

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN
CTO NO.: 0318
SITE/AREA: Site 3 - Group 16 Magazine Landfill
COORDINATES: NORTH: _____, EAST: _____
ELEVATIONS: SURFACE: _____

RIG:	SPLIT SPOON	AUGERS	SURFACE CASING	REAMING TOOL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	1 5/8	4-1/4" ID	—		1-29-96	49	Rain 35°	25
LENGTH	2.0'	5.0'	—	--				
TYPE	Std.	HSA	—					
HAMMER WT.	140#	--	--	--				
FALL	30"	--	--	--				

REMARKS: * HNu malfunction, raining

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

Well Information	Diam.	Type	Top Depth (ft.)	Bottom Depth (ft.)
Well Riser	2"	Sch. 40 PVC, Threaded	0	55
Well Screen	2"	No. 10 Slot Sch. 40 PVC, Threaded	55	70

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
1	A-N					SAND, coarse to fine, trace silt, light brown, damp		
2	S1	2.0/2.0 100%	3 6 7 6		*	SAME but	cement-bentonite grout	
3								
4	S2	2.0/2.0 100%	4 7 7 7			CLAY, little silt, trace sand gray and light brown, damp,		
5								
6	S3	2.0/2.0 100%	3 4 8 10			SAME except trace fine gravel, iron staining, dry,	PVC Riser	
7								
8	S4	1.5/2.0 75%	5 6 6 5					
9								
10	S5	1.5/2.0 75%	7 7 8 9			SAND and silt, trace clay, light brown, damp,		

Match to Sheet 2

DRILLING CO.: Parrott-Wolff Inc
BAKER REP.: R. M. Lewis
DRILLER: D Thoma
WELL/BORING NO.: 3GW15A
SHEET 1 OF ____

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 3GW15A

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0318
SITE/AREA: Site 3

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
						Continued from Sheet 1		
11								
12	S6	1.5/2.0 75%	8 9 12 12			fine SAND and silt, trace clay, light brown, damp,		
13								
14	S7	2.0/2.0 100%	4 5 6 7			CLAY, trace fine sand, gray, dry	cement-bentonite grout	
15								
16	S8	2.0/2.0 100%	WOH 1 4 5	3GW15A-08				
17								
18	S9	2.0/2.0 100%	5 7 7 6				PVC riser	
19								
20	S10	1.5/2.0 100%	5 4 3 8			SILT and clay, trace sand, light brown to gray, 50% shell fragments, damp,		
21								
22	S11	1.5/2.0 75%	5 5 4 5					
23						moist		
24	S12	1.8/2.0 90%	3 2 WOH/12"	3SB15A-12		slight hydrocarbon odor, very soft		
25								
26	S13	1.5/2.0 75%	WOR/12" WOH/12"			SILT and fine sand, trace clay, brown to gray, wet, very soft, hydrocarbon odor		
27								
28	S14	1.0/2.0 50%	WOR/18" 4			SAME except trace shell fragments, light brown		
29								
30	S15	1.0/2.0	WOR/6" WOH/6"			Approx 1 ft. void at 29' bgs		

Match to Sheet 3

DRILLING CO.: Parratt-Wolff Inc BAKER REP.: R. M. Lewis
DRILLER: D. Thoma WELL/BORING NO.: 3GW15A SHEET 2 OF ____

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 36W15A

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0318
SITE/AREA: Site 3

SAMPLE TYPE

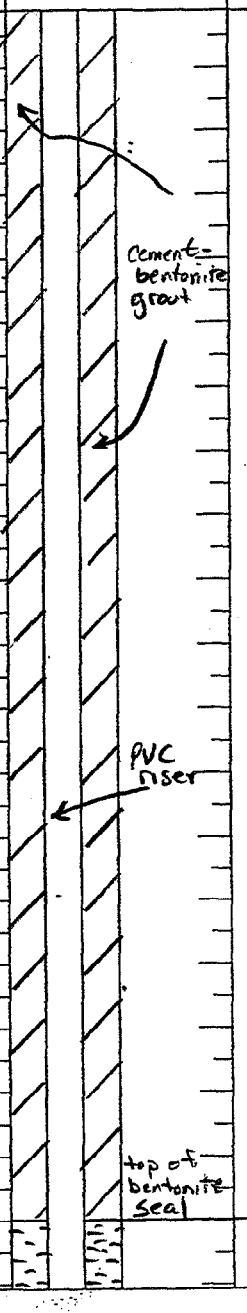
S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments
						Continued from Sheet _
31	S15	50%	3 4			SILT and fine sand, trace shell fragments light brown, soft, wet
2	S16	1.5/2.0 75%	WDH 4 8 10			SAME except, little shell fragments, stiff moist,
3						
4	S17	1.5/2.0 75%	4 11 14 16			SAME except hard
5						
6	S18	1.5/2.0 75%	10 12 16 13			
7						
8	S19	1.5/2.0 75%	9 10 10 13			
9						
40	S20	2.0/2.0 100%	5 10 13 16			SAME except, some shell fragments, gray to light brown
1						
2	S21	2.0/2.0 100%	12 13 32 34			
3						
4	S22	1.8/2.0 90%	8 12 14 16			fine to very fine SAND, and silt, trace clay, shell fragments, dark gray, dense moist to wet
5						
6	S23	1.8/2.0 90%	12 13 18 27			
7						SAME except no clay, very dense
8	S24	1.8/2.0 90%	16 42 50/3"			
9						
50	S25	1.5/2.0	9 9			Match to Sheet _

Well Installation Detail



Elevation (ft.)

DRILLING CO.: Parratt-Wolff
DRILLER: R Thoma

BAKER REP.: R.M. Lewis
WELL/BORING NO.: 36W15A SHEET __ OF __

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 36W15A

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN
CTO NO.: 0318
SITE/AREA: Site 3

SAMPLE TYPE

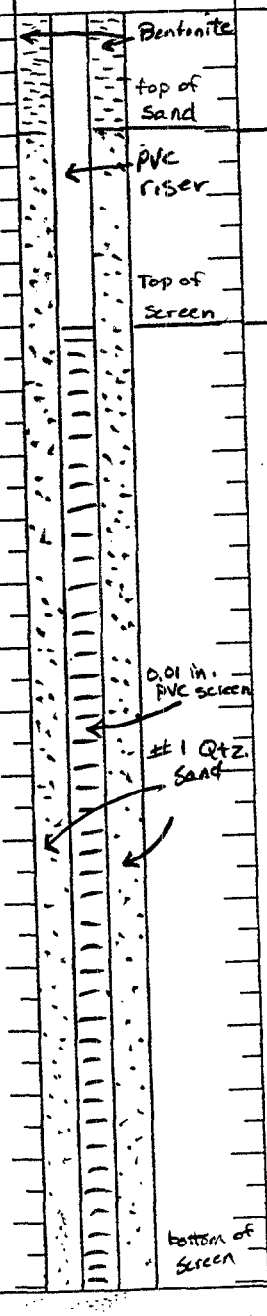
S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments
						Continued from Sheet _
51	S25	75%	15 18			SILT and fine sand, trace shell fragments, dark gray stiff, wet
2	S26	1.5/2.0 75%	6 12 11 13			
3						
4	S27	1.0/2.0 50%	9 11 12 12			SAME except little shell fragments
5						
6	S28	1.0/1.0 50%	3 8 8 7			
7						
8	S29	1.8/2.0 90%	6 9 9 12			
9						
60	S30	1.5/2.0 75%	12 18 32 41			SAME except hard
1						
2	S31	1.5/2.0 75%	17 22 36 44			
3						
4	S32	1.5/2.0 75%	8 26 20 22			
5						
6	S33	2.0/2.0 100%	6 6 14 29			SAME except very stiff
7						SAME except hard
8	S34	2.0/2.0 100%	15 28 35 32			SILT and fine sand, trace shell fragments, dark gray, hard, wet
9						Match to Sheet _
70	S35	2.0/2.0	17 32			

Well Installation Detail



Elevation (ft.)

DRILLING CO.: Parrott-Wolff, Inc
DRILLER: D. Thoma
BAKER REP.: R.M. Lewis
WELL/BORING NO.: 36W15A
SHEET __ OF __

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 3GW15A

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 038
SITE/AREA: Site 3

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
71	S35	100%	35 35			SILT and fine sand, trace shell fragments dark gray, hard, wet Continued from Sheet __	#1 Qtz Sand	
2						Boring Complete @ 71 ft. bgs		
3								
4								
5								
6								
7								
8								
9								
0								
1								
2								
3								
4								
5								
6								
7								
8								
9								
0						Match to Sheet __		

DRILLING CO.: Parrott-Wolff, Inc.
DRILLER: D. Thoma
BAKER REP.: R.M. Lewis
WELL/BORING NO.: 3GW15A SHEET __ OF __

Borehole Location Data **ROY F. WESTON, Inc.**

BOREHOLE ID : 3GW18 SITE NAME/NO: WPNSTA YORKTOWN
BEGIN DATE : 06/02/92 END DATE : 06/02/92

LOGGER/COMPANY : JOHN WILLIAMS

BOREHOLE COMPLETED IN (<O>verburden <B>edrock) : O

TOTAL DEPTH : 52.00 DEPTH TO BEDROCK : 0.00

BOREHOLE DIAMETER #1: 12.00
INTERVAL: 0.00 ft. to 52.00 ft. BGS
METHOD : HSA FLUID : NONE
BOREHOLE DIAMETER #2:
INTERVAL:
METHOD : FLUID :
BOREHOLE DIAMETER #3:
INTERVAL:
METHOD : FLUID :

DRILLING COMPANY : HARDIN HUBER
DRILLER : ROYCE KEEMAN
DRILL RIG TYPE : MOBILE B-47

	ESTIMATED	SURVEYED
SURFACE ELEVATION :	0.000	45.900
N. COORDINATE :	0.0000	342428.0000
E. COORDINATE :	0.0000	2562834.0000

WELL PERMIT.....(Y)es (N)o: N PERMIT # :

HOLE ABANDONED...(Y)es (N)o: N
WELL INSTALLED...(Y)es (N)o: Y
WELL CLUSTER.....(Y)es (N)o: N No. OF WELLS : 0
WELL NEST.....(Y)es (N)o: N No. OF WELLS : 0
PUMPS INSTALLED..(Y)es (N)o: N

	TYPE	DEPTH
PURGE :		0.00
SAMPLE :		0.00

BOREHOLE TESTING
BOREHOLE GEOPHYSICS.....(Y)es (N)o: N
SLUG TESTS.....(Y)es (N)o: Y
PACKER TESTS.....(Y)es (N)o: N
PUMPING TESTS.....(Y)es (N)o: N

COMMENTS :

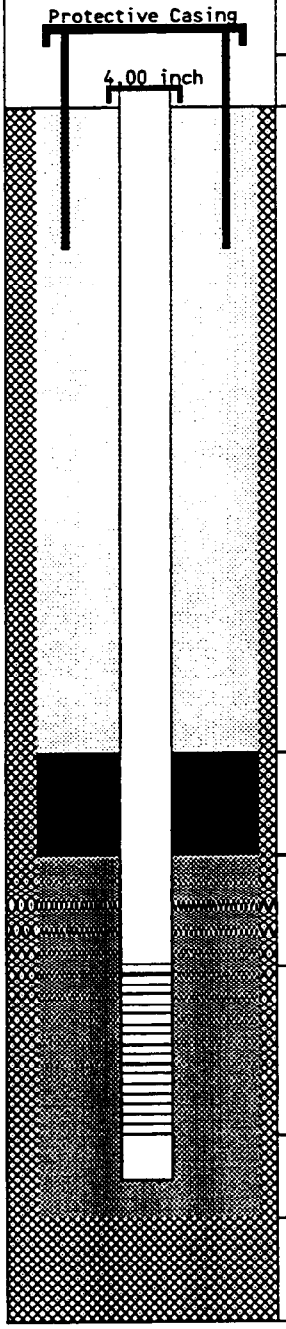
NWS-00313-03.13-07/01/93

Well Completion Summary **ROY F. WESTON, Inc.**

CLIENT	WPNSTA YORKTOWN	*DRILLING FIRM*	HARDIN-HUBER
SITE NAME	WPNSTA YORKTOWN	*INSPECTOR*	J. WILLIAMS

WELL ID	3GW18
START DATE	06/02/92
COMPLETION DATE	06/03/92

WATER LEVELS



DEPTH		ELEV.
2.43	TC	48.33
0.00	GS	45.90
30.00	BN	15.90
33.00	SP	12.90
35.00	SC	10.90
50.00	BS	-4.10
51.00	TD	-5.10

DRILLING SUMMARY

Driller ROYCE KEEMAN
Drilling Fluid
Well Type SINGLE CASED SCREENED

WELL DESIGN CONSTRUCTION

Casing #1 Diameter: 4.00 *inch* *Interval:* 0.00 to 35.00 *ft.*
Type : PVC SCH 40

Stick Up Inner Casing: 2.43 *ft.* *Protective Casing:* 0.00 *ft.*

Casing Grout: CEMT/BENT *Interval:* 0.00 to 0.00 *ft.*

Seal Type: PELLETS, BENTONITE *Interval:* 30.00 to 33.00 *ft.*

Sand Pack Type : #2 *Interval:* 33.00 to 51.00 *ft.*
Grain Size : UNIFORM *Median Diameter:* 2-3
Screen Diameter: 4.00 *Interval:* 35.00 to 50.00 *ft.*
Type : PVC *Slots:* 0.020 *inches*

Silt Trap Interval: 50.00 to 51.00 *ft.*
Backfill Type : *Interval:* 0.00 to 0.00 *ft.*

WELL DEVELOPMENT

Date / /
Method
Yield *Purged Volume*

COMMENTS

TC = Top of Casing
GS = Ground Surface
BN = Top Seal
SP = Top Sand Pack
SC = Top Screen
BS = Bottom Screen
TD = Total Depth
= Grout
= Seal
= Sand Pack
= Formation

Additional Comments:
21 bags sand, 2 buckets pellets; 12 cement. 1/2 bag bentonite.

NOTE: Well Diagram not to Scale *Elevations are feet above mean sea level*

01/06/93

Borehole Log **ROY F. WESTON, Inc.**

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 52.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: JOHN WILLIAMS
WELL ID	: 3GW18	DRILLING COMPANY	: HARDIN HUBER
NORTHING	: 342428.0000 surveyed	DRILLING RIG	: MOBILE B-47
EASTING	: 2562834.0000 surveyed	DATE STARTED	: 06/02/92
ELEVATION	: 45.900 surveyed	DATE COMPLETED	: 06/02/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Silty sand, SM				7 9 10 10		
44	1									
43	2			Silty sand, SM	DARK BROWN	LSE	DRY	7 11 13 11	FID 0.0	
42	3									
41	4			Silty sand, SM	DK YLLWISH BRN		MST	3 5 6 6	FID 0.0	
40	5									
39	6			Silty sand, SM	LT YLLWISH BRN	LSE	MST	4 5 6 8		
38	7									
37	8			Silty sand, SM	V. PALE BROWN		MST	3 7 7 9		
36	9									
35	10			Silty sand, SM	V. PALE BROWN		WET	3 4 5 4		Perched water.

Borehole Log

ROY F. WESTON, Inc.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 52.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: JOHN WILLIAMS
WELL ID	: 3GW18	DRILLING COMPANY	: HARDIN HUBER
NORTHING	: 342428.0000 surveyed	DRILLING RIG	: MOBILE B-47
EASTING	: 2562834.0000 surveyed	DATE STARTED	: 06/02/92
ELEVATION	: 45.900 surveyed	DATE COMPLETED	: 06/02/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Silty sand, SM	V. PALE BROWN		WET			Perched water.
34	11									
33	12			Fat clay, CH	DK YELLOWISH BR	STF	MST	2 4 6 3		
32	13									
31	14			Fat clay, CH	DK YLLOWISH BRN		IMT	4 4 6 7		
30	15									
29	16			Fat clay, CH	DK OLIVE GRAY	STF	MST	3 3 4 0		
28	17									
27	18			Fat clay, CH	OLIVE GRAY	STF	MST	3 3 4 4		
26	19									
25	20			Lean clay with sand, CL	OLIVE GRAY	FRM	MST	3 4 4 6	FID 0.0	Grading to sandy clay.

Borehole Log

ROY F. WESTON, Inc.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 52.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: JOHN WILLIAMS
WELL ID	: 3GW18	DRILLING COMPANY	: HARDIN HUBER
NORTHING	: 342428.0000 surveyed	DRILLING RIG	: MOBILE B-47
EASTING	: 2562834.0000 surveyed	DATE STARTED	: 06/02/92
ELEVATION	: 45.900 surveyed	DATE COMPLETED	: 06/02/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Lean clay with sand, CL	OLIVE GRAY	FRM	MST		FID 0.0	Grading to sandy clay.
24	21									
23	22			Not Classified - Incomplete Data	OLIVE	FRM	MST	3 3 6 8		
22	23									
21	24			Elastic silt, MH	OLIVE	FRM	MST	2 3 4 5	FID 0.0	
20	25									
19	26			Elastic silt, MH	OLIVE			3 3 4 0	FID 0.0	Varied interbedded vf silts and clay layers.
18	27									
17	28			Elastic silt, MH	OLIVE GRAY	FRM	WET	1 2 2 0	FID 0.0	
16	29									
15	30			Elastic silt, MH	DK GRY-LT OLV B		MST	1 1 2 2	FID 0.0	Color change at 31.5 from dk gray to lt olive brown.

Borehole Log

ROY F. WESTON, Inc.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 52.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: JOHN WILLIAMS
WELL ID	: 3GW18	DRILLING COMPANY	: HARDIN HUBER
NORTHING	: 342428.0000 surveyed	DRILLING RIG	: MOBILE B-47
EASTING	: 2562834.0000 surveyed	DATE STARTED	: 06/02/92
ELEVATION	: 45.900 surveyed	DATE COMPLETED	: 06/02/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Elastic silt, MH	DK GRY-LT OLV B		MST		FID 0.0	Color change at 31.5 from dk gray to lt olive brown.
14	31									
13	32			Shelly hash			WET			Shell fragments at 32.3 feet. Plentiful.
12	33									
11	34			Shelly clay		FRM	MST	4 4 6 7		Tan/gr. shell fragments, calcereous, matrix of clay & silt shell fragments plentiful.
10	35									
9	36			Shelly clay		FRM	MST	5 12 4 6	FID 0.0	Little shell fragments.
8	37									
7	38			Interval Not Sampled						
6	39									
5	40			Shelly sand	DK OLIVE GRAY		SAT	4 4 7 7		V.f. sand,shell fragments in a matrix of v.f. silty sand.

Borehole Log **ROY F. WESTON, Inc.**

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 52.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: JOHN WILLIAMS
WELL ID	: 3GW18	DRILLING COMPANY	: HARDIN HUBER
NORTHING	: 342428.0000 surveyed	DRILLING RIG	: MOBILE B-47
EASTING	: 2562834.0000 surveyed	DATE STARTED	: 06/02/92
ELEVATION	: 45.900 surveyed	DATE COMPLETED	: 06/02/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Shelly sand	DK OLIVE GRAY		SAT			V.f. sand,shell fragments in a matrix of v.f. silty sand.
4	41									
3	42			Interval Not Sampled						
2	43									
1	44									
0	45			Shelly sand	DARK GRAY	LSE	SAT	5 6 6 9	FID 0.0	Some shell fragments.
-1	46									
-2	47			Interval Not Sampled						
-3	48									
-4	49									
-5	50			Poorly graded sand with silt, SP-SM	DK OLIVE GRAY		SAT	11 15 17 21	FID 0.0	

Borehole Log **ROY F. WESTON, Inc.**

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 52.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: JOHN WILLIAMS
WELL ID	: 3GW18	DRILLING COMPANY	: HARDIN HUBER
NORTHING	: 342428.0000 surveyed	DRILLING RIG	: MOBILE B-47
EASTING	: 2562834.0000 surveyed	DATE STARTED	: 06/02/92
ELEVATION	: 45.900 surveyed	DATE COMPLETED	: 06/02/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Poorly graded sand with silt, SP-SM	DK OLIVE GRAY		SAT		FID 0.0	
-5	51									
-6	52									
-7	53									
-8	54									
-9	55									
-10	56									
-11	57									
-12	58									
-13	59									
-14	60									

DATE: 12/08/92 **** LITHOLOGICAL DATA FOR - CLIENT ID: BAKER *** PAGE: 3

BOREHOLE /WELL ID	SMP NUM	LTH NUM	LITHOLOGY INT. (FT BGS)		SAMPLING METHOD	SIZE GRAVEL	GRAVEL PCT.	SIZE SAND	SAND PCT	SILT PCT	CLAY PCT	ORGANIC PCT	ROCK TYPE	PLAST	SORT	STRENGTH	MOISTURE	STRAT UNIT
3GW18	1	1	0.00	2.00	SPS		0		75	20	0	5						
3GW18	1	1	2.00	4.00	SPS		0	MF	40	35	5	0		NON	WEL	LSE	DRY	
3GW18	3	1	4.00	6.00	SPS		0		65	35	0	0		NON	MOD		MST	
3GW18	4	1	6.00	8.00	SPS		5	CM	60	35	0	0		NON	MOD	LSE	MST	
3GW18	5	1	8.00	10.00	SPS		0	F	75	20	5	0		NON	WEL		MST	
3GW18	6	1	10.00	12.00	SPS		0	F	75	20	5	0		NON	WEL		WET	
3GW18	7	1	12.00	14.00	SPS		0	F	5	5	90	0		HGH		STF	MST	
3GW18	8	1	14.00	16.00	SPS		0	F	10	5	85	0		HGH			JMT	
3GW18	9	1	16.00	18.00	SPS		0	F	5	5	90	0		HGH		STF	MST	
3GW18	10	1	18.00	20.00	SPS		0		5	5	90	0		HGH		STF	MST	
3GW18	11	1	20.00	22.00	SPS		0	F	25	0	70	0		MOD		FRM	MST	
3GW18	12	1	22.00	24.00	SPS		0		0	0	0	0				FRM	MST	
3GW18	13	1	24.00	26.00	SPS		0		0	50	50	0		MOD		FRM	MST	
3GW18	14	1	26.00	28.00	SPS		0		0	0	0	0						
3GW18	15	1	28.00	30.00	SPS		0	F	5	50	45	0		MOD		FRM	WET	
3GW18	16	1	30.00	32.00	SPS		0		0	50	50	0		MOD			MST	
3GW18	17	1	32.00	34.00	SPS		0		0	0	0	0		MOD			WET	
3GW18	18	1	34.00	36.00	SPS		0		0	50	50	0		LOW		FRM	MST	
3GW18	19	1	36.00	38.00	SPS		0		0	50	50	0		LOW		FRM	MST	
3GW18	20	1	38.00	40.00	NS		0		0	0	0	0						
3GW18	21	1	40.00	42.00	SPS	F	0		50	50	0	0		NON			SAT	
3GW18	22	1	42.00	45.00	NS		0		0	0	0	0						
3GW18	23	1	45.00	47.00	SPS		0		0	0	0	0			WEL	LSE	SAT	
3GW18	24	1	47.00	50.00	NS		0		0	0	0	0						
3GW18	25	1	50.00	52.00	SPS	F	0		90	5	5	0		NON	WEL		SAT	

NWS-00313-03.13-07/01/93

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 3SB/GW19

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 318
SITE/AREA:
COORDINATES: NORTH: _____, EAST: _____
ELEVATIONS: SURFACE: 37.1

RIG:	SPLIT SPOON	AUGERS	SURFACE CASING	REAM-ING TOOL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)		4-1/4" ID			2-8-96	45	partly sunny	32'
LENGTH	2.0'	5.0'		--				
TYPE	Std.	HSA						
HAMMER WT.	140#	--	--	--				
FALL	30"	--	--	--				

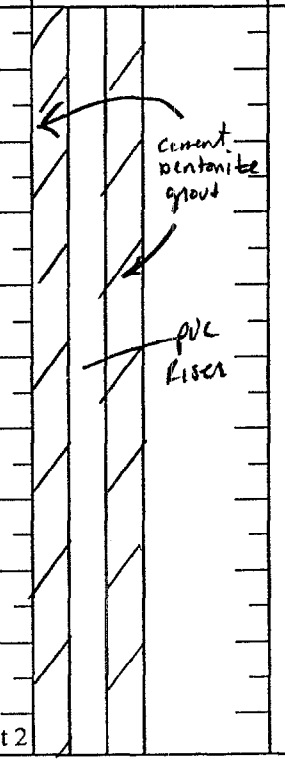
REMARKS:

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

Well Information	Diam.	Type	Top Depth (ft.)	Bottom Depth (ft.)
Well Riser	2"	Sch. 40 PVC, Threaded		
Well Screen	2"	No. 10 Slot Sch. 40 PVC, Threaded		

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
1								
2								
3						Refer to 3SB/GW19A for soil descriptions		
4								
5								
6								
7								
8								
9								
10						Match to Sheet 2		



DRILLING CO.: Parratt-Wolff Inc BAKER REP.: R. Lewis
DRILLER: K. White WELL/BORING NO.: 3SB/GW19 SHEET 1 OF ____

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 3SB/GW19

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 318
SITE/AREA: Site 3

SAMPLE TYPE		ACRONYMS	
S = Split Spoon	A = Auger	BG = Background	PID = Photoionization Detector
T = Shelby Tube	W = Wash	HSA = Hollow Stem Augers	ppm = parts per million
R = Air Rotary	C = Core	ID = Inside Diameter	SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
D = Denison	P = Piston		WD = While Drilling
N = No Sample			

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
						Continued from Sheet 1		
11								
12								
13							cement bentonite grout	
14								
15								
16						Refer to 3SB/GW19A for soil descriptions	PVC Riser	
17								
18								
19								
20								
21								
22							top of bentonite 23'	
23								
24								
25								
26							top of sand 27'	
27								
28								
29								
30						Match to Sheet 3		

DRILLING CO.: Parratt-Wolff Inc BAKER REP.: R. Lewis
DRILLER: K. White WELL/BORING NO.: 3SB/GW19 SHEET 2 OF ____

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 3 SB/GW 19 A

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0318
SITE/AREA: Site 3
COORDINATES: NORTH: _____, EAST: _____
ELEVATIONS: SURFACE: 37.3

RIG: ATV Track RIG

	SPLIT SPOON	AUGERS	SURFACE CASING	REAM-ING TOOL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)		4-1/4" ID			1-30-96	set up		
LENGTH	2.0'	5.0'		--	1-31-96	72	cloudy 30°	32'
TYPE	Std.	HSA			2-5-96	12	partly cloudy 25°	—
HAMMER WT.	140#	--	--	--				
FALL	30"	--	--	--				

REMARKS:

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

Well Information	Diam.	Type	Top Depth (ft.)	Bottom Depth (ft.)
Well Riser	2"	Sch. 40 PVC, Threaded	-2.5 stickup	66
Well Screen	2"	No. 10 Slot Sch. 40 PVC, Threaded	66	81

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
1	A-1V							
2	S1	1.5/2.0 75%	WOH/12 3 3		0.2	medium to fine SAND, trace silt, light brown to brown, loose, moist		
3								
4	S2	1.75/2.0 88%	9 8 7 7		0.2	same except coarse to fine SAND		
5								
6	S3	2.0/2.0 100%	3 5 7 9		0.2	Same		
7								
8	S4	1.5/2.0 75%	7 7 9 8		0.2	same		
9								
10	S5	1.5/2.0 75%	6 7 8 8		0.2	medium to fine SAND, trace silt, light brown, medium dense, moist		

Match to Sheet 2

DRILLING CO.: Parratt-Wolff Inc BAKER REP.: R. Lewis
DRILLER: K. White WELL/BORING NO.: 3SB/GW19A SHEET 1 OF ____

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 3 SB/GW19A

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0318
SITE/AREA: Site 3

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
						Continued from Sheet 1		
11	S5							
12	S6	1.0/2.0 50%	WOH 7 6 6		0.2	SILT, little fine sand, clay, gray and brown, stiff, damp		
13								
14	S7	1.0/2.0 50%	WOH/12 6 6		0.2	CLAY and silt, trace fine sand, gray and brown, stiff, dry		
15								
16	S8	1.5/2.0 75%	5 5 6 12		0.2	Same		
17								
18	S9	1.0/2.0 50%	12 10 17 19		0.2	Same		
19								
20	S10	1.5/2.0 50%	8 10 17 13		0.2	fine SAND and silt, light gray, dense, damp		
21								
22	S11	1.5/2.0 75%	19 21 18 23		0.2	Same except brown		
23								
24	S12	1.0/2.0 50%	6 3 9 13		0.2	SILT and clay, trace fine sand, brown stiff, damp		
25								
26	S13	2.0/2.0 100%	4 6 7 7		0.2	Same		
27								
28	S14	1.0/2.0 50%	7 8 9 12		0.2	Same		
29								
30	S15	2.0/2.0	4 6		0.2	Same except little clay, little shell fragments		
						Match to Sheet 3		

DRILLING CO.: Parrott-Wolff Inc BAKER REP.: R. Lewis
DRILLER: K. White WELL/BORING NO.: 3 SB/GW19A SHEET 2 OF ____

Baker
Baker Environmental, Inc.

WELL/BORING NO.:

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0318
SITE/AREA: Site 3

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
						Continued from Sheet _		
31	S15	100%	6 7					
2	S16	2.0/2.0 100%	3 1 1 1			SILT, little clay, sand, shell fragments brown, soft, damp to wet		
3								
4								
5								
6								
8	A-N							
9								
40								
1	S18	1.75/2.0 88%	3 4 7 11			medium to fine SAND, some silt, little shell fragments, light brown to gray medium dense, wet		
2								
3	A-N							
4								
5								
6	S19	2.0/2.0 100%	3 5 6 9			Same except little silt		
7								
8	A-N							
9								
50						Match to Sheet _		

DRILLING CO.: Parratt-Wolff Inc
DRILLER: K. White
BAKER REP.: R. Lewis
WELL/BORING NO.: 3SB/6W19A
SHEET __ OF __

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 3SB/GW19A

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN
CTO NO.: 0318
SITE/AREA: Site 3

SAMPLE TYPE

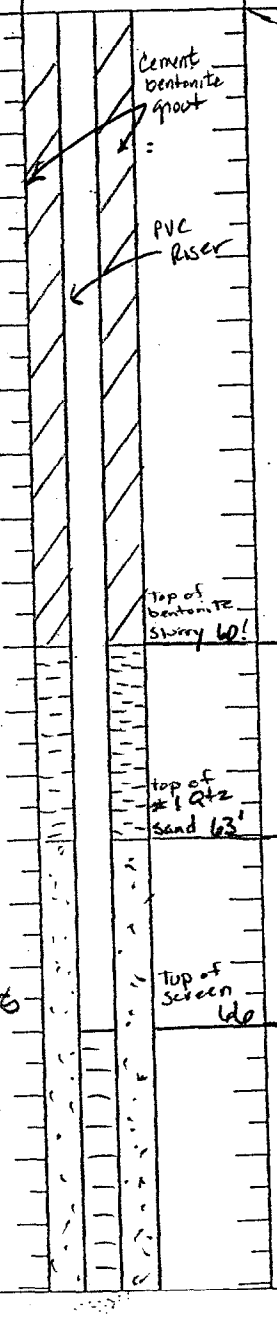
S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments
						Continued from Sheet:
51	S20	1.0/2.0 50%	6 15 20 7			SILT and fine sand, trace shell fragments, dark gray, hard, wet
2						
3	A-N					
4						
5						
6	S21	1.0/2.0 50%	9 21 22 23			Same
7						
8	A-N					
9						
60						
1	S22	1.0/2.0 50%	10 9 8 13			Same
2						
3	A-N					
4						
5						
6	S23	1.7/2.0 85%	4 6 7 18			SILT and fine sand, trace shell fragments dark gray, stiff, wet to moist
7						
8	A-N					
9						
70						Match to Sheet

Well Installation Detail



Elevation (ft.)

DRILLING CO.: Parratt-Wolff Inc
DRILLER: K White
BAKER REP.: R. Lewis
WELL/BORING NO.: 3SB/GW19A
SHEET __ OF __

Baker
Baker Environmental, Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

NS LATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 318
ITE/AREA: Site 3

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
						Continued from Sheet __		
71	S24	1.0/2.0 50%	3 4 21 14			fine SAND, little silt, trace shell fragments dark gray, medium dense, wet	0.01 inch PVC screen	
72								
73	S25	1.75/2.0 88%	22 19 24 23			SAME	No. 1 Qtz Sand	
74								
75	S26	1.5/2.0 75%	10 13 18 28			Same		
76								
77	S27	1.5/2.0 75%	15 12 13 16			Same		
78								
79	S28	2.0/2.0 100%	WOH 11 11 24			Same		
80							bottom of Screen 81' bgs	
81	S29	2.0/2.0 100%	10 12 19 21			Same		
82								
83	S30	2.0/2.0 100%	11 20 24 22			fine SAND, little silt, trace shell fragments, dark gray, dense, wet		
84								
5						Boring Complete at 84' bgs		
6								
7								
8								
9								
						Match to Sheet __		

DRILLING CO.: Parratt-Wolff, Inc. BAKER REP.: R. Lewis
DRILLER: K. White WELL/BORING NO.: 3SB/GW19A SHEET __ OF __

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 3 SB/GW19

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 318
SITE/AREA:

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
						Continued from Sheet _	30' top of screen	
31								
32								
33								
34								
35						Refer to 3 SB/GW19A for soil descriptions	#1 Qtz sand	
36								
37								
38							0.010 inch screen	
39								
40								
41								
42								
43								
44							Bottom of screen 45'	
45								
6						Boring complete at 45' bgs		
7								
8								
9								
0						Match to Sheet _		

DRILLING CO.: Parratt-Wolff, Inc.
DRILLER: K. White
BAKER REP.: R Lewis
WELL/BORING NO.: 3 SB/GW19
SHEET __ OF __

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT:	Remedial Investigation - Groundwater Operable Unit I		
PROJ. NO.:	CTO-213	BORING NO.:	3GW20
COORDINATES NORTHING:	342,530.98	EASTING:	2,563,347.70
ELEVATION: GROUND SURFACE	29.48	TOP OF PVC CASING:	31.18

Rig: CME-55 ATV								
	Split Spoon	**Casing**	**Augers**	**Core Barrel**	**Date**	**Progress (Ft.)**	**Weather**	**Depth to Water (Ft.)**
Size (ID)	1 3/8"	--	4.25"	--	9/20/2004	50	Sunny, 60-78°	*N/A
Length (FT)	2.0		5.0					
Type	STD		HSA					
Hammer Wt.	140#							
Fall								

Remarks: *Offset from 3GW20A, then augered to 50-ft bgs then constructed monitoring well. See boring record for 3GW20A for soil profile.

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

WELL INFORMATION

Type	Dam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Sch. 40 PVC Riser	2"	0	40
Sch. 40 PVC (0.010 in.) screen	2"	40	50

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1							Sch. 40 PVC riser	
2								
3							cement bentonite grout	
4								
5	A-N							
6								
7								
8								
9								
10						Match to Sheet 2		

DRILLING CO.:	Parrott-Wolff, Inc.	BAKER REP.:	David Martin
DRILLER:	Gary Ellingworth	BORING NO.:	3GW20 SHEET 1 OF 3

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 3GW20

SAMPLE TYPE	DEFINITIONS
S = Split Spoon A = Auger	SPT = Standard Penetration Test (ASTM D1586)
T = Shelby Tube W = Wash	PID = Photo Ionization Detector Measurement
R = Air Rotary C = Core	MSL = Mean Sea Level
D = Denison P = Piston N = No Sample	ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
11								
12								
13								
14								
15							Sch. 40 PVC Riser	
16								
17							cement bentonite grout	
18								
19								
20	A-N							
21								
22								
23								
24								
25								
26								
27								
28								
29								
30						Match to Sheet 3		

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 3GW20 SHEET 2 OF 3

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 3GW20

SAMPLE TYPE	DEFINITIONS
S = Split Spoon A = Auger	SPT = Standard Penetration Test (ASTM D1586)
T = Shelby Tube W = Wash	PID = Photo Ionization Detector Measurement
R = Air Rotary C = Core	MSL = Mean Sea Level
D = Denison P = Piston N = No Sample	ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
31								
32								
33								
34								
35								
36							top of bentonite '@ 36'	
37								
38	A-N						top of sand @ 38'	
39								
40							No. 1 Qtz sand	
41							top of screen @ 40'	
42								
43								
44								
45								
46								
47								
48								
49							Bottom of screen @ 50'	
50								
						EOB @ 50-ft		

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 3GW20 SHEET 3 OF 3

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT:	Remedial Investigation - Groundwater Operable Unit I		
PROJ. NO.:	CTO-213	BORING NO.:	3GW20A
COORDINATES	NORTHING: 342,534.39	EASTING:	2,563,350.66
ELEVATION:	GROUND SURFA 29.07	TOP OF PVC CASING:	31.31

Rig: CME-55 ATV	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	1 3/8"	--	4.25"	--	9/19&20/200	80	Sunny, 60-78°	*27
Length (FT)	2.0		5.0					
Type	STD		HSA					
Hammer Wt.	140#							
Fall								

Remarks:

*Approximate location. Augered to 30-ft bgs, then began split-spoon sampling at 5.0-ft centers

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

WELL INFORMATION

Type	Dam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Sch. 40 PVC Riser	2"	0	70
Sch. 40 PVC (0.010 in.) screen	2"	70	80

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1								
2								
3							Sch. 40 PVC riser	
4								
5	A-N							
6							cement bentonite grout	
7								
8								
9								
10						Match to Sheet 2		

DRILLING CO.:	Parrott-Wolff, Inc.	BAKER REP.:	David Martin
DRILLER:	Gary Ellingworth	BORING NO.:	3GW20A SHEET 1 OF 5

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 3GW20A

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
11								
12								
13								
14								
15								
16								
17								
18								
19								
20	A-N							
21								
22							Sch. 40 PVC Riser	
23								
24							cement bentonite grout	
25								
26								
27	▼					water @ ~27-ft		
28								
29								
30								

Match to Sheet 3

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 3GW20A SHEET 2 OF 5

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 3GW20A

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
31	S-1	1.2 60%	5 11 10			Wet, light-brown, fine SAND some silt, trace clay, shells		
32								
33	A-N							
34								
35								
36	S-2	2 100%	W-O-H 1 3 3			Wet, light-brown, fine SAND, little silt, trace clay		
37							Sch. 40 PVC Riser	
38	A-N							
39							cement bentonite grout	
40								
41	S-3	2 100%	5 10 13 20			Wet, light-brown, fine SAND, little silt, trace clay		
42								
43								
44								
45								
46	S-4	2 100%	5 9 7 10			Wet, light-gray, fine SAND some silt, trace clay, shells		
47								
48								
49						Wet, light-gray fine SAND, some silt, trace clay, shells		
50								
	S-5		3			Match to Sheet 4		

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 3GW20A SHEET 3 OF 5

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 3GW20A

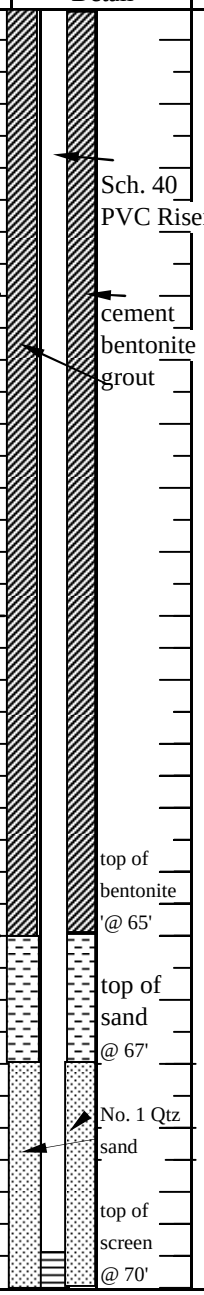
SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description
51	S-5	2 100%	6 8 10			Wet, gray very fine SANDand silt, trace clay, shells
52						
53	A-N					
54						
55						
56	S-6	1.2 60%	2 2 2 4			Wet, gray SILT and very fine sand trace clay, shells
57						
58	A-N					
59						
60						
61	S-7	1.8 90%	2 4 7 11			Wet, gray very fine SANDand silt, trace clay, shells
62						
63	A-N					
64						
65						
66	S-8	2 100%	7 9 10 18			Wet, gray very fine SANDand silt, trace clay, shells
67						
68						
69						
70						
	S-9		2			Match to Sheet 5



Elevation (Ft. MSL)

Well Installation Detail

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 3GW20A SHEET 4 OF 5

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 3GW20A

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
71	S-9	2 100%	6 6 6			Wet, gray very fine SANDand silt, trace clay, shells	No. 1 Qtz sand	
72								
73	A-N						0.10 slot PVC screen	
74								
75								
76	S-10	2 100%	4 7 12 17			Wet, gray very fine SANDand silt, trace clay, shells		
77								
78	A-N							
79							Bottom of screen @ 80'	
80								
81						EOB @ 80-ft		
82								
83								
84								
85								
86								
87								
88								
89								
90								

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 3GW20A SHEET 5 OF 5

Borehole Location Data **ROY F. WESTON, Inc.**

BOREHOLE ID : 6GW01 SITE NAME/NO: WPNSTA YORKTOWN
BEGIN DATE : 06/15/92 END DATE : 06/15/92

LOGGER/COMPANY : W. BREW

BOREHOLE COMPLETED IN (<O>verburden <B>edrock) : O

TOTAL DEPTH : 22.00 DEPTH TO BEDROCK : 0.00

BOREHOLE DIAMETER #1: 12.00
INTERVAL: 0.00 ft. to 22.00 ft. BGS
METHOD : HSA FLUID : NONE
BOREHOLE DIAMETER #2:
INTERVAL:
METHOD : FLUID :
BOREHOLE DIAMETER #3:
INTERVAL:
METHOD : FLUID :

DRILLING COMPANY : HARDIN-HUBER
DRILLER : ROYCE KEENAN
DRILL RIG TYPE : B-61

	ESTIMATED	SURVEYED
SURFACE ELEVATION :	0.000	9.800
N. COORDINATE :	0.0000	345079.0000
E. COORDINATE :	0.0000	2559217.0000

WELL PERMIT.....(Y)es (N)o: N PERMIT # :

HOLE ABANDONED...(Y)es (N)o: N
WELL INSTALLED...(Y)es (N)o: Y
WELL CLUSTER.....(Y)es (N)o: N No. OF WELLS : 0
WELL NEST.....(Y)es (N)o: N No. OF WELLS : 0
PUMPS INSTALLED..(Y)es (N)o: N TYPE DEPTH
PURGE : 0.00
SAMPLE : 0.00

BOREHOLE TESTING
BOREHOLE GEOPHYSICS.....(Y)es (N)o: N
SLUG TESTS.....(Y)es (N)o: Y
PACKER TESTS.....(Y)es (N)o: N
PUMPING TESTS.....(Y)es (N)o: N

COMMENTS :

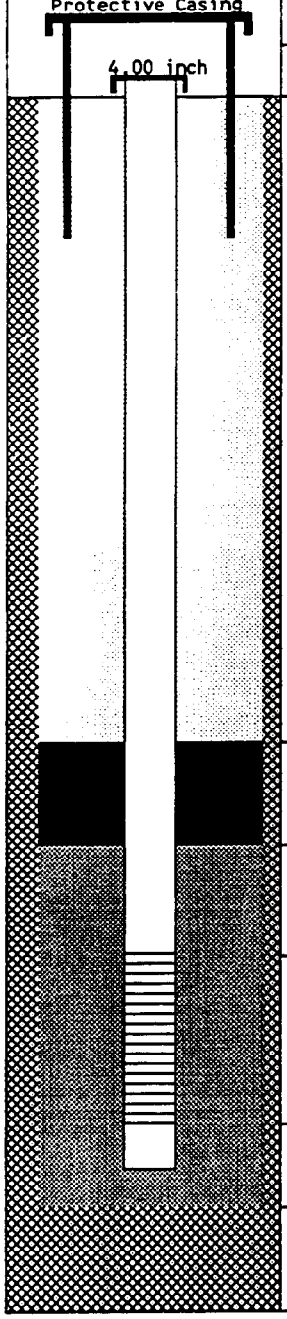
NWS-00313-03.13-07/01/93

Well Completion Summary — *ROY F. WESTON, Inc.*

CLIENT	WPNSTA YORKTOWN	*DRILLING FIRM*	HARDIN-HUBER
SITE NAME	WPNSTA YORKTOWN	*INSPECTOR*	W. BREW

WELL ID	6GW01
START DATE	06/15/92
COMPLETION DATE	06/15/92

WATER LEVELS



DEPTH		ELEV.
3.00	TC	12.80
0.00	GS	9.80
2.00	BN	7.80
4.00	SP	5.80
5.00	SC	4.80
20.00	BS	-10.20
20.00	TD	-10.20

DRILLING SUMMARY

Driller ROYCE KEENAN
Drilling Fluid NONE
Well Type SINGLE CASED SCREENED

WELL DESIGN CONSTRUCTION

Casing #1 Diameter: 4.00 *inch* *Interval:* 0.00 to 5.00 *ft.*
Type : PVC SCH 40

Stick Up Inner Casing: 3.00 *ft.* *Protective Casing:* 0.00 *ft.*

Casing Grout: CEMT/BENT *Interval:* 0.00 to 2.00 *ft.*

Seal Type: BENTONITE *Interval:* 2.00 to 3.00 *ft.*

Sand Pack Type : MORIE #2 *Interval:* 4.00 to 20.00 *ft.*
Grain Size : UNIFORM *Median Diameter:* 2-3
Screen Diameter: 4.00 *Interval:* 5.00 to 20.00 *ft.*
Type : PVC *Slots:* .020 *inches*

Silt Trap Interval: 0.00 to 0.00 *ft.*
Backfill Type : *Interval:* 0.00 to 0.00 *ft.*

WELL DEVELOPMENT

Date / /
Method
Yield *Purged Volume*

COMMENTS

TC = Top of Casing
GS = Ground Surface
BN = Top Seal
SP = Top Sand Pack
SC = Top Screen
BS = Bottom Screen
TD = Total Depth
= Grout
= Seal
= Sand Pack
= Formation

Additional Comments:

NOTE: Well Diagram not to Scale *Elevations are feet above mean sea level*

01/06/93

Borehole Log

ROY F. WESTON, Inc.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 22.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 6GW01	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 345079.0000 surveyed	DRILLING RIG	: B-61
EASTING	: 2559217.0000 surveyed	DATE STARTED	: 06/15/92
ELEVATION	: 9.800 surveyed	DATE COMPLETED	: 06/15/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
			90	Fill	DK YLLWISH BRN	SFT	MST	3 6 8 7	OVA 0.0	
				Fill	DK YLLWISH BRN		DRY		OVA 0.0	
8	1									
7	2		5	Fill	DK YLLWISH BRN		DRY	1 2 1 1	OVA 0.0	
6	3									
5	4		55	Fill	DK OLIVE GRAY	FRM	MST		OVA 0.0	Wood 0.2' thick observed at 5.0-5.2'. Appears that fill material ends w/this spoon.
4	5									
3	6		80	Fill	DK OLIVE GRAY	FRM	MST	1 2 1 1	OVA 0.0	
				Lean clay, CL	DK OLIVE GRAY	FRM	MST		OVA 40.0	
2	7									
1	8		75	Lean clay, CL	DK OLIVE GRAY	FRM	MST	1 1 2 1	OVA 0.0	
0	9									
-1	10		90	Lean clay, CL	DK OLIVE GRAY	FRM	MST	1 2 1 2		

Borehole Log **ROY F. WESTON, Inc.**

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 22.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 6GW01	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 345079.0000 surveyed	DRILLING RIG	: B-61
EASTING	: 2559217.0000 surveyed	DATE STARTED	: 06/15/92
ELEVATION	: 9.800 surveyed	DATE COMPLETED	: 06/15/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Lean clay, CL	DK OLIVE GRAY	FRM	MST			
-1	11									
				Silty sand, SM	YELLOWISH BROWN	SFT	WET		OVA 0.0	
-2	12		90	Silty sand, SM	YELLOWISH BROWN	SFT	WET	1 1 2 2	OVA 0.0	
-3	13									
-4	14		90	Silty sand, SM	YELLOWISH BROWN	SFT	WET	1 3 5 6	OVA 0.0	
-5	15									
-6	16		90	Silty sand, SM	YELLOWISH BROWN	SFT	WET		OVA 0.0	
-7	17									
-8	18									
-9	19									
-10	20		90	Silty sand, SM	YELLOWISH BROWN	SFT	WET	5 6 7 11	OVA 0.0	

Borehole Log **ROY F. WESTON, Inc.**

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 22.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 6GW01	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 345079.0000 surveyed	DRILLING RIG	: B-61
EASTING	: 2559217.0000 surveyed	DATE STARTED	: 06/15/92
ELEVATION	: 9.800 surveyed	DATE COMPLETED	: 06/15/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Silty sand, SM	YELLOWISH BROWN	SFT	WET		OVA 0.0	
				Shelly hash	YELLOWISH BROWN	SFT	WET		OVA 0.0	Gravel = shells
-11	21									
-12	22									
-13	23									
-14	24									
-15	25									
-16	26									
-17	27									
-18	28									
-19	29									
-20	30									

DATE: 12/08/92 **** LITHOLOGICAL DATA FOR - CLIENT ID: BAKER *** PAGE: 6

BOREHOLE /WELL ID	SMP NUM	LTH NUM	LITHOLOGY INT. (FT BGS)		SAMPLING METHOD	SIZE GRAVEL	GRAVEL PCT.	SIZE SAND	SAND PCT	SILT PCT	CLAY PCT	ORGANIC PCT	ROCK TYPE	PLAST	SORT	STRENGTH	MOISTURE	STRAT UNIT
6GW01	1	1	0.00	0.50	SPS	C	40	F	40	20	0	0		NON	POR	SFT	MST	
6GW01	1	2	0.50	2.00	SPS		0	F	10	30	60	0					DRY	
6GW01	2	1	2.00	4.00	SPS		0	F	10	30	60	0					DRY	
6GW01	3	1	4.00	6.00	SPS		0	F	20	10	70	0		MOD	POR	FRM	MST	
6GW01	4	1	6.00	6.20	SPS		0	F	20	10	70	0		MOD	POR	FRM	MST	
6GW01	4	2	6.20	8.00	SPS		0	F	5	15	80	0		MOD		FRM	MST	
6GW01	5	1	8.00	10.00	SPS		0	F	5	15	80	0		MOD		FRM	MST	
6GW01	6	1	10.00	11.70	SPS		0	F	5	15	80	0		MOD		FRM	MST	
6GW01	6	2	11.70	12.00	SPS		0	F	80	20	0	0		NON	POR	SFT	WET	
6GW01	7	1	12.00	14.00	SPS		0	F	80	20	0	0		NON	POR	SFT	WET	
6GW01	8	1	14.00	16.00	SPS		0	F	80	20	0	0		NON	POR	SFT	WET	
6GW01	9	1	16.00	20.00	SPS		0	F	80	20	0	0		NON	POR	SFT	WET	
6GW01	10	1	20.00	20.30	SPS		0	F	80	20	0	0		NON	POR	SFT	WET	
6GW01	10	2	20.30	22.00	SPS	CMF	50		40	10	0	0		NON	POR	SFT	WET	

Baker

Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 6HP/SB02

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319

SITE/AREA: Site 6

COORDINATES: NORTH: 345371.75, EAST: 2559785.98

SURFACE ELEVATION: 27.37

RIG: Mobile B-57 ATV	SPLIT SPOON	AUGERS	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	1 3/5"; 3"	4 1/4 ID	8-1-94	20'	Sunny 85°F	15.5
LENGTH	2.0	5.0				
TYPE	STD	HSA				
HAMMER WT.	140#	--				
FALL	30"	--				

REMARKS: * = 3" diameter split spoon

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
1	A-N					GRASS, TOP SOIL - 0.1'	
2	S1	NA	NA	6SB02-01	0.2 / 0.2	sandy CLAY, little shell fragments, trace silt, root material, brown, damp	
3–4	S2	1.1 / 2.0	3 3 5 10		0.2 / 0.2	fine SAND, some silt, trace clay, root material, dark to light brown, loose, damp	
5–6	S3	0.6 / 2.0	8 7 8 14		0.2 / 0.2	6.0	21.37
7						Sandy CLAY, little silt, brown, stiff damp	
8	S4	1.8 / 2.0	5 11 16 20	6SB02-04 6SB02-04D	0.2 / 0.2	silty CLAY, little sand, trace roots, brown w/gray mottling, very stiff, damp	
9–10	S5	1.6 / 2.0	2 4 7 8	6SB02-05	0.2 / 0.2	Same except trace sand, stiff	

Match to Sheet 2

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube

DRILLER: K. Callender BORING NO.: 6HP/SB02 SHEET 1 OF 2

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 6HP/SB02

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 6

SAMPLE TYPE
S = Split Spoon, A = Auger, T = Shelby Tube, W = Wash, R = Air Rotary, C = Core, D = Denison, P = Piston, N = No Sample

ACRONYMS
BG = Background, PID = Photoionization Detector, HSA = Hollow Stem Augers, ppm = parts per million, ID = Inside Diameter, SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5'), WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
11	S5					Continued from Sheet 1 — 11.0	16.37
12–13	S6	1.8/2.0 90%	2 3 3 6	6SB02-06	0.2/0.4	clayey SILT, little sand, brown with gray mottling, medium stiff, moist	
14–15	S7	2.0/2.0 100%	2 2 4 6	6SB02-07	0.2/0.2	same — 15.5	
16–17	S8	2.0/2.0 100%	2 2 4 7		0.2/0.2	SAME except and shell fragments (c-f) wet	
18–19	S9	2.0/2.0 100%	5 8 6 17		0.2/0.2	same except little shell cementation — 19.0	8.37
20–21	S10	2.0/2.0 100%	9 9 7 9		0.2/0.2	Silty SAND, some shell fragments (c-f) little clay	6.37
22–30						Boring terminated at 21' bgs. Note! Temporary piezometer installed at 20 bgs w/ 10 ft screen. Collected sample 6HP02-01 — Match to Sheet 3	

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube
DRILLER: K. Callender BORING NO.: 6HP/SB02 SHEET 2 OF 2

Baker
Baker Environmental, Inc

TEST BORING RECORD

BORING NO.: 6 HP/SB03

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 6
COORDINATES: NORTH: 345059.15, EAST: 2559553.82
SURFACE ELEVATION: 10.92

RIG: Mobile B-57 ATV	SPLIT SPOON	AUGERS	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	1 3/8 ; 3	4¼ ID	8-2-94	13.0	Partly Cloudy 85°F	7.0
LENGTH	2.0	5.0				
TYPE	STD	HSA				
HAMMER WT.	140#	--				
FALL	30"	--				

REMARKS: * = 3" diameter split spoon

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
1	A-N					Top Soil/Grass = 0.1'	
2, 3	S1	NA	NA	6SB03-01	0.2 / 0.2	silty CLAY and shells (coarse to fine), little sand, trace roots, light brown, damp	
4, 5	S2	1.5 / 2.0 75%	4* 5 5 6	6SB03-02	0.2 / 0.2	SHELL FRAGMENTS (coarse to fine), some silty clay, little sand, light brown gray, loose, damp to moist	
6, 7	S3	2.0 / 2.0 100%	3* 3 3 3	6SB03-03	0.2 / 0.2	ORGANIC SILT, little sand, wood fragments, dark brown, medium stiff, moist	
8, 9	S4	1.6 / 2.0 80%	1* 1 3 4		0.2 / 0.2	coarse to fine SAND, dark brown, loose wet SILT, little fine sand, clay, trace wood fragments	
10	S5	2.0 / 2.0 100%	2* 3 4 5		0.2 / 0.3	Match to Sheet 2	

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube
DRILLER: K. Callender BORING NO.: 6 HP/SB03 SHEET 1 OF 2

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 6HP/SB03

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 6

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
11	S5					Continued from Sheet 1	
12	S6	1.5/2.0 75%	2 2 1 5		0.2/0.2	Sandy SILT, little clay, dark brown, soft, moist 12.5	
13						fine SAND, some shell fragments (coarse to fine), silt, gray, loose, wet, 13.0	-1.58 -2.08
14						Boring terminated at 13' bgs	
15							
16						Note: Temporary piezometer installed at 13' w/10 ft. screen. Collected Sample 6HP03-01	
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30						Match to Sheet 3	

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube

DRILLER: K. Callender BORING NO.: 6HP/SB03 SHEET 2 OF 2

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 6HP/SB04

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 6
COORDINATES: NORTH: 345952.01, EAST: 2558894.26
SURFACE ELEVATION: 30.09

RIG: Mobile B-57 ATV	SPLIT SPOON	AUGERS	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	1 3/8, 3.0	4¼/10	8-5-94	21	Partly Sunny, humid 85°F	— —
LENGTH	2.0	5.0	8-6-94	12	Cloudy 70°F	28.8
TYPE	STD	HSA				
HAMMER WT.	140#	--				
FALL	30"	--				

REMARKS: * = 3.0" diameter split spoon

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
H = hand spoon
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
1	A-N					sandy SILT, little clay, dark brown, dry 1.0	29.09
2	H1			6SB04-01	0.2/0.2	sandy CLAY, little silt, trace root material, orange brown, damp	
3							
4	S2	1.3/2.0 65%	3 7 8 10		0.2/0.2	silty CLAY, trace sand, light brown-gray and orange brown (mottled), stiff, damp	
5							
6	S3	1.5/2.0 75%	4 7 7 9		0.2/0.2	same except light brown gray (trace orange brown), medium stiff, damp	
7							
8	S4	1.5/2.0 75%	3 5 6 8		0.2/0.2	same except little sand	
9						9.0	21.09
10	S5	0.4/2.0 20%	5 8 8 8		0.2/0.2	sandy SILT, little clay orange and light brown, stiff, damp Match to Sheet 2	

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube
DRILLER: K. Callender BORING NO.: 6HP/SB04 SHEET 1 OF 3

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 6HP/SB04

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN
SITE/AREA: Site 6
CTO NO.: 0319

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
11						Continued from Sheet 1 — 11.0	19.09
12	S6	1.5/2.0 75%	7* 7 6 12	6SB04-06	0.2/0.2	Clayey SILT, little fine sand, light brown-gray with orange staining, medium, stiff, damp — 13.0	17.09
14	S7	2.0/2.0 100%	12 6 8 6		0.2/0.2	silty SAND, trace clay, light to dark brown, medium dense, damp — 14.0	16.09
15						Silty CLAY, trace sand, light brown-gray with trace orange interbeds, red staining, medium dense, damp — 15.5	15.09
16–17	S8	2.0/2.0 100%	3 5 6 4		0.2/0.2	silty clay, sandy silt interbedded (thin beds), light brown-gray w/orange staining alternating w/ blue gray, stiff, damp	
18–19	S9	2.0/2.0 100%	3 4 5 8		0.2/0.2	Same	
20–21	S10	2.0/2.0 100%	3* 6 9 11		0.2/0.2	Same — 21.0	9.09
22–23	S11	2.0/2.0 100%	7* 7 4 4		0.2/0.2	Silty CLAY, trace fine sand in laminations, green-gray, stiff damp	
24–25	S12	2.0/2.0 100%	3* 8 8 14		0.2/0.2	Same except color alternates light brown and blue gray	
26–27	S13	2.0/2.0 100%	3* 9 16 17	6SB04-13	0.2/0.2	Silty CLAY, trace sand, light brown and gray, very stiff, damp — 26	4.09
28–29	S14	1.2/2.0	11* 8 1 1		0.2/0.2	SHELL FRAGMENTS (coarse to fine) little silty clay, orange w/ blue-gray mottling, medium dense, damp; Same except trace sand, no silty clay, light brown and gray, loose, damp to wet — 28.8	1.29
30	S15	1.3/2.0	5 13		0.2/0.2	Same except trace silty clay, medium dense — Match to Sheet 3	

DRILLING CO.: HARDIN-HUBER, INC.
BAKER REP.: M. Taube
DRILLER: K. Callender
BORING NO.: 6HP/SB04
SHEET 2 OF 3

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 6HP/SB04

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 6

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
1	S15	65%	15 13			Continued from Sheet __	
2	S16	2.0/2.0 100%	3* 8 8 10		0.2/0.2	SHELL FRAGMENTS, trace sand, silty clay, light gray brown w/ orange staining, loose, wet	
3						33.0	-2.91
4						Boring terminated at 33' bgs	
5						NOTE: TEMPORARY PIEZOMETER w/ 10 FT SCREEN INSTALLED FROM 23 TO 33' BGS. COLLECTED SAMPLE 6HP04-01	
6							
7							
8							
9							
0							
1							
2							
3							
4							
5							
6							
7							
8							
9							
0						Match to Sheet __	

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube

DRILLER: K. Callender BORING NO.: 6HP/SB04 SHEET 3 OF 3

Baker

Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 6HP/SB05

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319

SITE/AREA: Site 6

COORDINATES: NORTH: 345016.64, EAST: 2558923.97

SURFACE ELEVATION: 31.75

RIG: Mobile B-57 ATV	SPLIT SPOON	AUGERS	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	1 3/8; 30	4¼ ID	8-2-94	23	Partly Cloudy 90°F	18.5
LENGTH	2.0	5.0	8-3-94	36	Overcast humid 85°F	29.0
TYPE	STD	HSA				
HAMMER WT.	140#	--				
FALL	30"	--				

REMARKS: * = 3 inch diameter split spoon; sample 6SB05-01 collected w/ stainless steel spoon

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
NA = Not Applicable
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
						GRASS - TOPSOIL 0.1	
1	A-N						
2	S1	NA	NA	6SB05-01 6SB05-01D	0.2/0.2	medium to fine SAND, little silt, trace root material, fine gravel, dark to light brown, damp. 3.0	28.75
3							
4	S2	1.4/2.0 70%	4 4 8 8		0.2/0.2	sandy CLAY, trace silt, orange brown, stiff, damp 4.5	27.25
5						coarse to fine SAND, little clay, trace silt, fine gravel, roots, orange brown to yellow brown, medium dense, damp 6.0	25.75
6	S3	1.5/2.0 75%	3 3 5 6		0.2/0.2	silty CLAY, little sand, trace root material, yellow brown, stiff, damp	
7							
8	S4	1.0/2.0 50%	5 14 13 10		0.2/0.2	Same except very stiff	
9							
10	S5	1.5/2.0 75%	5 9 11 15		0.2/0.2	silty CLAY, little sand, trace root material, yellow brown to gray brown w/ gray mottling, very stiff, damp Match to Sheet 2	

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube

DRILLER: K. Callender BORING NO.: 6HP/SB05 SHEET 1 OF 4

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 6 HP/SB05

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 6

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
11	S5					Continued from Sheet 1	
12	S6	2.0/2.0 100%	9 11 17 20	6SB05-06	0.2/0.2	silty CLAY, little sand, trace root material, brown to red brown. 12.5	19.25
13						clayey SILT, little fine sand, light yellow brown, stiff, damp to moist	
14	S7	2.0/2.0 100%	4 6 8 8		0.2/0.2		
15							
16	S8	2.0/2.0 100%	5 3 3 5		0.2/0.2	Same except medium stiff	
17							
18	S9	2.0/2.0 100%	4* 4 6 11	6SB05-09	0.2/0.2	Same except brown w/orange staining, stiff, wet 18.5	13.25
19						19.0	12.75
20	S10	2.0/2.0 100%	4* 5 10 18		0.2/0.2	silty CLAY, trace fine sand, green-gray, stiff, damp 20.0	11.75
21						clayey SILT, little silty sand in partings, green-gray, very stiff, moist 21.0	10.75
22	S11	2.0/2.0 100%	5* 7 8 14		0.2/0.2	silty CLAY, trace fine sand in laminations, green-gray, stiff, damp	
23							
24	S12	2.0/2.0 100%	4* 12 14 20		HNu Malfunction	Same except damp, very stiff	
25							
26	S13	2.0/2.0 100%	6* 10 12 21			Same	
27							4.25
28	S14	2.0/2.0 100%	4* 7 18 23	6SB05-14		SHELL FRAGMENTS (medium to fine) and medium to fine sand, little silty clay, yellow brown, medium dense, moist to wet	
29							
30	S15					Match to Sheet 3	

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube

DRILLER: K. Callender BORING NO.: 6HP/SB05 SHEET 2 OF 4

Baker
Baker Environmental, Inc

TEST BORING RECORD

BORING NO.: 6HP/SB05

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN
SITE/AREA: Site 6
CTO NO.: 0319

SAMPLE TYPE
S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS
BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
						Continued from Sheet __	
31	S15						
32	S16	2.0 / 2.0	6 9		HNu Malfunction	fine SAND, some silt, little shell fragments, trace clay, yellow brown to olive, medium dense, wet	
33		100%	11 20				
34	S17	2.0 / 2.0	5 5			same	
35		100%	10 18			★Note: Temporary Piezometer installed 25-35' bgs - Sample 6HP05-01 collected ★	
36	S18	1.5 / 2.0	13 16			fine SAND, little silt, trace shell fragments, yellow brown and orange brown, dense, wet.	
37		75%	14 24				
38	S19	2.0 / 2.0	4 9			same except light olive brown with orange staining, medium dense	
39		100%	12 23				
40	S20	1.4 / 2.0	12 18			fine SAND, little shell fragments, light olive-brown w/orange staining, dense, wet	
41		70%	18 24				
42	S21	2.0 / 2.0	4 8			Same except little silt, trace fossils, (vertebra-whale)	
43		100%	12 23				
44	A-N	NA	NA			★Note: Hydropunch sample 6HP05-02 collected from 43 to 43.6' bgs ★	
45							
46	S23	1.5 / 2.0	16 20			fine SAND, little shell fragments (coarse to fine) little silt, light olive brown, dense, wet	
47		75%	15 25				
48	S24	1.0 / 2.0	16 20	6SB05-24		Same except trace shell fragments	
49		50%	15 12				
50	S25	1.1 / 2.0	8 12		↓	fine SAND, little silt, trace clay, shell fragments, dark gray, dense, wet	
						Match to Sheet __	

DRILLING CO.: HARDIN-HUBER, INC.
BAKER REP.: M. Taube
DRILLER: K. Callender
BORING NO.: 6HP/SB05
SHEET 3 OF 4

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 6HP/SB05

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 6

SAMPLE TYPE
S = Split Spoon, A = Auger, T = Shelby Tube, W = Wash, R = Air Rotary, C = Core, D = Denison, P = Piston, N = No Sample

ACRONYMS
BG = Background, PID = Photoionization Detector, HSA = Hollow Stem Augers, ppm = parts per million, ID = Inside Diameter, SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5'), WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
51	S25	55%	16 24			Continued from Sheet __	
52	S26	2.0/2.0 100%	4 7 9 11		HNu Malfunction	silty fine SAND, dark green-gray, medium dense, wet	
54	S27	2.0/2.0 100%	3 6 9 10			Same	
56	S28	2.0/2.0 100%	3 5 6 9			Same except, little shell fragments	
58	S29	2.0/2.0 100%	4 7 11 21			silty SAND, little shell fragments, trace clay, dark green-gray, medium dense wet	-27.25
59							
0						Boring terminated at 59' bgs	
1						Note: HydroPunch 6HP05-3 collected from 59.0 to 59.7 bgs	
2							
3							
4							
5							
6							
7							
8							
9							
0						Match to Sheet ___	

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube

DRILLER: K. Callender BORING NO.: 6HP/SB05 SHEET 4 OF 4

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 6HP/SB06

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN
CTO NO.: 0319
SITE/AREA: Site 6
COORDINATES: NORTH: 346,119.65, EAST: 2558,901.98
SURFACE ELEVATION: 75.17

RIG: Mobile B-57 ATV	SPLIT SPOON	AUGERS	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	1 3/8", 3.0"	4¼ ID	8-4-94	33	Partly Cloudy, Humid 85°F	28
LENGTH	2.0	5.0				
TYPE	STD	HSA				
HAMMER WT.	140#	--				
FALL	30"	--				

REMARKS: * = 3 inch diameter split spoon

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
H = hand spoon
N = No Sample
A = Auger
W = Wash
C = Core
P = Piston

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
1	A-N					GRASS, TOPSOIL	
2–3	H1	NA	NA	6SB06-01, 6SB06-010	0.2/0.4	silty SAND, trace clay, root material, light brown, damp.	
4–5	S2	1.5/2.0, 75%	5, 5, 6, 6		0.2/0.2	clayey SILT, little fine sand, dark brown to yellow brown, stiff, damp	
6–7	S3	1.4/2.0, 70%	5, 8, 10, 11		0.2/0.2	same except interbedded with silty clay, yellow brown to very light brown-gray, very stiff	68.17
8–9	S4	1.1/2.0, 55%	4, 7, 8, 11		0.2/0.2	silty CLAY, trace sand, very light brown-gray, stiff, damp	
10	S5	1.7/2.0, 85%	3*, 7, 9, 11	6SB06-05	0.2/0.2	same except color also orange mottled, stiff	

Match to Sheet 2

DRILLING CO.: HARDIN-HUBER, INC.
BAKER REP.: M. Taube
DRILLER: K. Callender
BORING NO.: 6HP/SB06
SHEET 1 OF 3

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 6HP/SB06

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN
SITE/AREA: Site 6
CTO NO.: 0319

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
11	S5					Continued from Sheet 1	64.17
12–13	S6	1.5/2.0 75%	8 11 9 12		0.2/0.2	clayey SILT, some sand (laminated) light brown-gray w/reddish-orange staining, very stiff, damp	
14–15	S7	1.6/2.0 80%	6* 9 11 14		0.2/0.2	same except sand interbeds contain silt, stiff	
16–17	S8	1.4/2.0 70%	2* 9 9 16		0.2/0.2	same 17.0	58.17
18–19	S9	2.0/2.0 100%	5* 8 8 9		0.2/0.2	silty CLAY and sandy silt laminations very light brown-gray, (silt laminations orange), very stiff, damp 19.0	56.17
20–21	S10	2.0/2.0 100%	5* 9 12 15		0.2/0.2	sandy SILT, interbedded with silty clay, light brown, trace orange laminations, very stiff, damp	54.17
22–23	S11	2.0/2.0 100%	4* 5 10 20		0.2/0.2	silty CLAY, trace sand, very light brown trace orange laminations, stiff, damp	52.17
24–25	S12	2.0/2.0 100%	3* 18 15 15		0.2/0.2	SHELL FRAGMENTS, trace silt, sand, light brown and red-orange mottled, dense, damp	
26–27	S13	2.0/2.0 100%	9* 17 13 12	6SB06-13	0.2/0.2	Same except damp to moist	
28–29	S14	1.7/2.0 85%	15 16 8 8		0.2/0.2	same except moist to wet	47.17
30	S15	1.5/2.0	7 7		0.2/0.2	SHELL FRAGMENTS little silty clay, trace sand, light brown slight orange staining, wet Match to Sheet 3	

DRILLING CO.: HARDIN-HUBER, INC.
BAKER REP.: M. Taube
DRILLER: K. Callender
BORING NO.: 6HP/SB06
SHEET 2 OF 3

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 6HP/SB06

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN
SITE/AREA: Site 6
CTO NO.: 0319

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
						Continued from Sheet __	
31	S15	75%	9 11				
32	S16	1.5/2.0 75%	9 7 5		0.2/0.2	SHELL FRAGMENTS, little silty clay, trace sand, light brown, slight orange staining, medium dense, wet	
33			12				4217
4						Boring terminated at 33' bgs	
5						Note: Temporary piezometer w/10 ft screen installed from 23 to 33' bgs. Collected sample 6HP06-01	
6							
7							
8							
9							
0							
1							
2							
3							
4							
5							
6							
7							
8							
9							
0						Match to Sheet ___	

DRILLING CO.: HARDIN-HUBER, INC.
BAKER REP.: M. Taube
DRILLER: K. Callender
BORING NO.: 6HP/SB06
SHEET 3 OF 3

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 6HP/SB07

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 6
COORDINATES: NORTH: 344803.57, EAST: 2559955.91
SURFACE ELEVATION: 29.65

RIG: Mobile B-57 ATV	SPLIT SPOON	AUGERS	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)			7-27-94	21.0	Overcast 85°F	15
LENGTH						
TYPE						
HAMMER WT.		--				
FALL		--				

REMARKS: * = 3 inch diameter split spoon

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
NA = not Applicable
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
1	A-N						
2	S1	NA	NA	6SB07-01	0.4 / 0.4	Coarse to fine SAND, little silt, trace gravel, brown, dense, damp	
3						3.0	26.65
4	S2	0.4 / 2.0	4 5 7 7		0.2 / 0.2	Sandy CLAY, little silt, trace gravel Shell fragments, brown, stiff, damp	
5						5.0	24.65
6	S3	0.2 / 2.0	2 2 2 3		0.2 / 0.2	fine SAND and shell fragments, little silt, yellow brown, loose, damp	
7							
8	S4	0.5 / 2.0	1 1 2 4		0.2 / 0.2		
9						8.7	20.95
10	S5	2.0 / 2.0	2* 8 10 13	6SB07-05	0.2 / 0.2	SHELL FRAGMENTS, little sand, trace silt, clay, yellow brown, medium dense, damp	

Match to Sheet 2

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube
DRILLER: K. Callender BORING NO.: 6 HP/SB07 SHEET 1 OF 2

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 6HP/SB07

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 6

SAMPLE TYPE
S = Split Spoon, A = Auger, T = Shelby Tube, W = Wash, R = Air Rotary, C = Core, D = Denison, P = Piston, N = No Sample

ACRONYMS
BG = Background, PID = Photoionization Detector, HSA = Hollow Stem Augers, ppm = parts per million, ID = Inside Diameter, SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5'), WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
11	S5					Continued from Sheet 1	
12	S6	2.0/2.0 100%	7* 8 6 7		0.2/0.2	SHELL FRAGMENTS, little sand, silty clay, light yellow brown, medium dense, moist	
13							
14	S7	2.0/2.0 100%	13* 16 18 14	6SB07-07	0.2/0.2	Same except light brown gray, dense	
15						15.0	14.65
16	S8	2.0/2.0 100%	11 11 9 12	6SB07-08	0.2/0.2	Same except little shell cementation, medium dense, wet	
17							
18	S9	2.0/2.0 100%	5 11 7 8		0.2/0.2	Same	
19							
20	S10	2.0/2.0 100%	8 9 11 7		0.2/0.2	medium to fine SAND, some silty clay, shell fragments, medium brown w/red staining, medium dense, wet	
21						21.0	8.65
22						Boring Terminated at 21'	
23							
24						Note: Installed temporary Piezometer at 20' bgs with 10' screen. Collected sample 6HP07-01.	
25							
26							
27							
28							
29							
30						Match to Sheet 3	

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube
DRILLER: K. Callender BORING NO.: 6HP/SB07 SHEET 2 OF 2

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 6HP/SB08

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 6
COORDINATES: NORTH: 345135.97, EAST: 2559202.16
SURFACE ELEVATION: 5.72

RIG: NA	SPLIT SPOON	AUGERS	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	—	3.0"	8-19-94	14.5	Partly Sunny 85°F	
LENGTH	—	0.5'				
TYPE	—	HAND				
HAMMER WT.	—	--				
FALL	—	--				

REMARKS: Borehole advanced with hand Auger

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
						GRASS TOPSOIL	
1	H1			6SB08-01	0.2/0.2	Silty CLAY, little sand, light brown, damp	
2	H2				0.2/0.2		
3	H3			6SB08-02		SAME except trace sand, moist	
4	H4				0.2/90	Silty CLAY, trace decayed roots, light brown w/ orange & gray mottling, moist	
5	H5			6SB08-03	0.2/150	same except green gray	
6	H6				0.2/150	6.0	-0.28
7	H7				0.2/100	SILT, little sand, trace clay, green, moist 6.5	-0.78
8	H8				0.2/175	Organic SILT, trace sand, clay, decayed wood, dark brown, moist	
9	H9				0.2/10	same very soft 9.0	-3.28
10	H10				0.2/1.0	same except wet	
						Match to Sheet 2	

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube
DRILLER: NA BORING NO.: 6HP/SB08 SHEET 1 OF 2

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 6HP/SB08

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 6

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
						Continued from Sheet 1	
11	H11				0.2/3.0	Organic SILT, little sand, trace clay, wood, wet, yellow brown	
12	H12				0.2/3.0		
13	H13				0.2/3.0	13.5	-7.74
14	H14				0.2/1.0	fine SAND, some silt, trace clay, yellow brown, wet 14.5	-8.74
15						Boring terminated at 14.5 bgs	
16						Note: Temporary Piezometer installed at 12.0' bgs; Sample 6HP08-01 collected	
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30						Match to Sheet 3	

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube

DRILLER: NA BORING NO.: 6HP/SB08 SHEET 2 OF 2

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 6HP/5B09

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 6
COORDINATES: NORTH: 345148.72, EAST: 2559502.75
SURFACE ELEVATION: 11.50

RIG: Mobile B-80	SPLIT SPOON	AUGERS	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	1 3/8"	4¼ ID	10-21-94	11.0	Partly Cloudy 65°	5.0
LENGTH	2.0	5.0				
TYPE	STD	HSA				
HAMMER WT.	140#	--				
FALL	30"	--				

REMARKS:

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
1						GRASS TOPSOIL	
2	S1	0.7/2.0 35%	4 5 8 8		0.3/0.3	silty CLAY, little shell fragments (coarse to fine), sand, trace root material, brown, stiff, damp	
3							
4	S2	1.3/2.0 65%	4 3 3 3		0.3/0.3	Same except damp to moist	
5							
6	S3	2.0/2.0 100%	3 4 4 8		0.3/0.3	fine SAND, some shell fragments (coarse to fine), little clay, silt, brown to olive-brown, loose, wet	
7							
8	S4	1.5/2.0 75%	2 3 4 7		0.3/0.3	SAME	
9							
10	S5	1.8/2.0	3 4		0.3/0.3	SAME except medium dense	

Match to Sheet 2

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube
DRILLER: M. Corcon BORING NO.: 6HP/5B09 SHEET 1 OF 2

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 6HP/SB09

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA:

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
11	S5	90%	9 7			Continued from Sheet 1	
12						Boring terminated at 11.0'	
13						Note: Temporary Piezometer	
14						installed at 9.7' bgs.	
15						Collected sample 6HP09-01	
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30						Match to Sheet 3	

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Trobe

DRILLER: M. Corron BORING NO.: 6HP/SB09 SHEET 2 OF 2

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 6GW01A

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 6
COORDINATES: NORTH: 345079.25, EAST: 2559217.07
ELEVATIONS: SURFACE: 12.10

RIG: Mobile B-80	SPLIT SPOON	AUGERS	SURFACE CASING	REAMING TOOL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	1 3/8	4-1/4" ID	--	--	9-9-94	64	Partly Cloudy 80°	13
LENGTH	2.0'	5.0'	--	--				
TYPE	Std.	HSA	--	--				
HAMMER WT.	140#	--	--	--				
FALL	30"	--	--	--				

REMARKS:

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

Well Information	Diam.	Type	Top Depth (ft.)	Bottom Depth (ft.)
Well Riser	2"	Sch. 40 PVC, Threaded	-2.09 Stickup	48.0
Well Screen	2"	No. 10 Slot Sch. 40 PVC, Threaded	48.0	63.0

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
1	A-N					GRASS TOPSOIL		
2	S1	1.6/2.0 80%	5 5 5 6		0.4/0.4	silty CLAY, little sand, trace roots, brown, stiff, damp	Cement Bentonite grout	
3						Clay, little silt, sand, trace fine gravel, orange brown, stiff, damp		
4	S2	1.3/2.0 65%	1 2 1 1		0.4/0.4	silty CLAY, trace sand, roots, mottled orange & gray, soft, moist		
5						5.0	Top of Bentonite Slurry 5.0	7.1
6	S3	1.4/2.0 70%	1 1 1 5		0.4/0.4	sandy SILT, olive, soft, moist		
7						6.5 organic SILT, trace sand, roots, dark brown, medium stiff, wet 7.0		5.6 5.1
8	S4	1.3/2.0 65%	2 1 2 1		0.3/0.3	medium to fine SAND, gray, very loose, wet 8.0		4.1
9						organic SILT, trace sand, roots, dark brown, soft, moist		
10	S5	2.0/2.0 100%	WOH 1.0 1 1		0.3/0.3	SAME except very soft		

Match to Sheet 2

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube
DRILLER: M. Corron WELL/BORING NO.: 6GW01A SHEET 1 OF 4

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 6GW01A

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 6

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
11						Continued from Sheet 1 organic SILT, trace sand, roots, olive-brown, soft, moist		
11.5						11.5		0.6
12	S6	2.0/2.0	1 1 1 1		0.3/0.3	SILT and clay, little sand, trace wood fragments, olive-brown to blue-gray, very soft, moist		
13		100%				13.0		-0.9
14	S7	2.0/2.0	1 2 3 4		0.3/0.3	silty fine SAND, light greenish-gray loose, wet		
15		100%						
16	S8	2.0/2.0	3 3 4 4		0.2/0.2	SAME except orange to light orange brown	Bentonite Slurry	
17		100%						
18	S9	2.0/2.0	WOH/1.5 3		0.2/0.2	SAME except little coarse to fine shell fragments		
19		100%						
20	S10	2.0/2.0	2 5 5 6		0.2/0.2	silty medium to fine SAND, trace coarse to fine shell fragments, light orange-brown to olive, medium dense, wet		
21		100%					PVC Riser	
22	S11	1.8/2.0	5 10 13 15		0.2/0.2	fine SAND, little silt, little coarse to fine shell fragments, olive to dark green-gray, medium dense, wet		
23		90%						
24	S12	2.0/2.0	2 2 3 5		0.2/0.2	SAME except and silt, dark gray, loose		
25		100%						
26	S13	2.0/2.0	2 3 5 6		0.2/0.2	SAME		
27		100%						
28	S14	2.0/2.0	3 6 6 7		0.2/0.2	silty fine SAND, trace medium to fine shell fragments, dark green gray, medium dense, wet		
29		100%						
30	S15	2.0/2.0	4 5		0.2/0.2	SAME Match to Sheet 3		

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube
DRILLER: M. Coron WELL/BORING NO.: 6GW01A SHEET 2 OF 4

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 6GW01A

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 6

SAMPLE TYPE

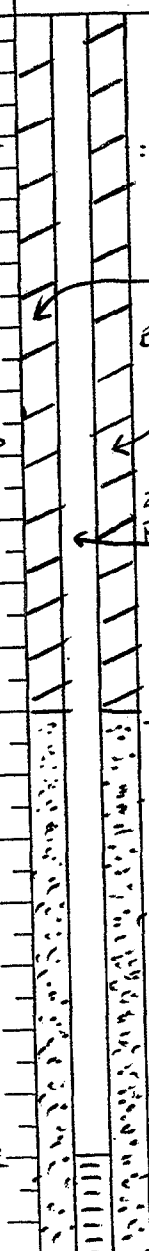
S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments
						Continued from Sheet 2
31	S15	100%	5 6			silty fine SAND, trace fine shell fragments, dark green-gray, loose, wet
32	S16	2.0/2.0 100%	2 4 5 6		0.2/0.2	32.5 sandy SILT, little clay, little coarse to fine shells, dark green-gray, medium stiff moist.
33						
34	S17	2.0/2.0 100%	2 3 4 4		0.2/0.2	SAME except little sand, trace shell fragments, moist to wet
35						
	S18	2.0/2.0 100%	1 3 4 4		0.2/0.2	sandy SILT, trace clay, shell fragments, dark green-gray medium dense, wet
37						37.0 silty fine SAND, some coarse to fine shell fragments, green-gray, medium dense, wet
38	S19	2.0/2.0 100%	2 5 7 10		0.2/0.2	
39						
40	S20	2.0/2.0 100%	10 5 7 11		0.2/0.2	SAME except trace shell fragments, green
41						
42	S21	2.0/2.0 100%	3 3 6 10		0.2/0.2	SAME except little silt
43						
44	S22	2.0/2.0 100%	5 7 9 10		0.2/0.2	SAME
45						
46	S23	2.0/2.0 100%	1 4 5 7		0.2/0.2	SAME except silty SAND, 1/2" sand nodule present, loose
47						
48	S24	2.0/2.0 100%	1 3 5 8		0.2/0.2	Silty fine SAND, little coarse to fine shell fragments, dark green, loose, wet
9						
50	S25	2.0/2.0	3 3		0.2/0.2	SAME except trace shells, clay

Well Installation Detail



Elevation (ft.): -20.4 (32.5); -24.9 (37.0); -28.9 (41.0); -35.9 (48.0)

Match to Sheet 4

DRILLING CO.: HARDIN-HUBER, INC.
DRILLER: M. Corron
BAKER REP.: M. Taube
WELL/BORING NO.: 6GW01A
SHEET 3 OF 4

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 6GW01A

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 6

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
						Continued from Sheet 3		
51	S25	100%	11 19					
52	S26	2.0/2.0	4 5 9		0.2/0.2	silty SAND, trace medium to fine shell fragments, dark green, medium dense, wet		
53		100%	14					
54	S27	2.0/2.0	4 8 8		0.2/0.2	SAME except little shells		
55		100%	12				0.10 slot screen	
56	S28	2.0/2.0	5 6 9	6GW01A -28	0.2/0.2	SAME		
57		100%	9				#1 qtz sand	
58	S29	2.0/2.0	5 6 7		0.2/0.2	SAME except trace shell fragments		
59		100%	8					
60	S30	2.0/2.0	2 5 6		0.2/0.2	silt, SAND, dark green, medium dense, wet		
61		100%	10					
62	S31	2.0/2.0	3 4 5		0.2/0.2	silty SAND, trace shell fragments (medium to fine), trace clay, dark green, loose, wet.	Bottom of screen 61.9	-49.8
63		100%	5				63.0 Bottom of well	-50.9
64	A-N	100%						-51.9
5						Boring Terminated at 64' bgs	Bottom of borehole	
6								
7								
8								
9								
0						Match to Sheet		

DRILLING CO.: HARDIN-HUBER, INC.
DRILLER: M. Corron
BAKER REP.: M. Taube
WELL/BORING NO.: 6GW01A
SHEET 4 OF 4

Baker

Baker Environmental, Inc.

WELL/BORING NO.: 6GW02

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319

SITE/AREA: Site 6

COORDINATES: NORTH: 344819.89 EAST: 2558566.45

ELEVATIONS: SURFACE: 35.97

RIG: B-80 mobile	SPLIT SPOON	AUGERS	SURFACE CASING	REAMING TOOL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	1 3/8	4-1/4" ID			9.20.94	25	Clear, 80°	
LENGTH	2.0'	5.0'		--	9.21.94	to 47'	Overcast, 70°s	38'
TYPE	Std.	HSA			9.23.94	to 57'	Clear, Cool, 60°s	
HAMMER WT.	140#	--	--	--				
FALL	30"	--	--	--				

REMARKS:

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

Well Information	Diam.	Type	Top Depth (ft.)	Bottom Depth (ft.)
Well Riser	2"	Sch. 40 PVC, Threaded	-2.55 stick up	40.0
Well Screen	2"	No. 10 Slot Sch. 40 PVC, Threaded	40.0	55.0

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
1, 2, 3	S1	1.0/2.0 50%	2 4 5 5		0.2 — 0.2	TOP SOIL fine to coarse SAND, little silt, trace clay, trace root hairs, brown, loose, damp	Bentonite-Cement grout	
4, 5	S2	1.0/2.0 50%	4 5 5 4		0.2 — 0.2	fine to coarse SAND, trace silt, trace clay, trace fine gravel, trace roots, yellow brown, loose, damp	10" ø STEEL CASING	
6, 7	S3	1.2/2.0 60%	2 3 3 4		0.2 — 0.2	fine to coarse SAND (predominantly fine), little clay, little silt, brown, loose, damp		28.97
8, 9	S4	0.3/2.0 40%	5 7 9 11		0.6 — 0.2	CLAY, some sand, little silt, yellow brown with dark brown mottling, stiff, damp		27.27
						SHELLS (mostly cemented oyster shells), little silty clay, trace sand, white, stiff, damp		26.97
10	S5	1.2/2.0 60%	3 5 6 8		0.4 — 0.4	SILTY CLAY, little fine fragments (shells) with a soft, dark-brown and gray, stiff, damp		

Match to Sheet 2

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube

DRILLER: M. Corran WELL/BORING NO.: 6GW02 SHEET 1 OF 4

Baker

Baker Environmental, Inc.

WELL/BORING NO.: 6GW02

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319

SITE/AREA:

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
						Continued from Sheet 1		
11								
12	S6	2.0/2.0 100%	3 3 4 5		0.2/0.2	SILTY CLAY and clayey silt, [illegible] laminated, trace sand, orange-brown and grey, medium stiff, damp	Bentonite pellets	
13								
14	S7	2.0/2.0 100%	2 4 3 4		0.3/0.2	SILTY CLAY, trace cemented shell nodules, trace sand, trace root hairs, brown with green mottling, medium stiff, damp to moist	Bentonite slurry	
15								
16	S8	2.0/2.0 100%	3 4 8 8		0.2/0.2	SILTY CLAY, trace sand, brown with grey mottling, stiff, damp to moist; fine to coarse SHELLS, trace to and silty CLAY, brn. with grey mottling, med. stiff, damp to moist		19.4
17								18.97
18	S9	2.0/2.0 100%	3 4 6 4		0.2/0.2	SILTY CLAY, trace sand, brown and grey, soft, moist; fine to medium SHELL FRAGMENTS, trace to and silty clay, brown/grey, stiff, moist to wet; SILTY CLAY, trace sand, brown/grey, soft, damp to moist		18.47
19							10" ϕ STEEL CASING	17.47
20	S10	2.0/2.0 100%	2 3 3 4		0.2/0.2	SILTY CLAY, little fine shell fragments, brown, medium stiff, moist to damp; SILTY CLAY, trace fine shell laminae, dark grey, medium stiff, moist to damp		
21								
22	S11	2.0/2.0 100%	2 3 4 7		0.2/0.2	SILTY CLAY, dark grey, soft, moist to damp; SILT, little clay, little fine sand, dk. grey, stiff, moist to damp; SILTY CLAY, trace fine sand, dk. grey, stiff, moist to damp		14.47
23								13.97
24	S12	2.0/2.0 100%	3 2 5 6		0.2/0.2	SILTY CLAY, trace fine sand/shell laminae, dk. grey, med. stiff, damp to moist; SILT, little sand, trace clay, dk. grey, med. stiff, damp		
25								11.27
26	S13	2.0/2.0 100%	3 4 5 8		0.3/0.3	SILTY CLAY, trace fine sand laminations, greenish grey, stiff, damp to moist		
27								
28	S14	2.0/2.0 100%	3 4 4 7		0.3/0.3	SAME, but medium stiff		
29								
30	S15	2.0/2.0	3 6		0.3/0.3	SILTY CLAY with trace to some silty sand laminae to interbeds, trace fine shell frag., increasing sand with depth, Match to Sheet 3		

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: [illegible]

DRILLER: M. Coxon WELL/BORING NO.: 6GW02 SHEET 2 OF 4

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 6GW02

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA:

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
31			7 13			greenish grey, stiff, Continued from Sheet 2 damp to moist	Bentonite Slurry	
32	S16	2.0/2.0 100%	7 7 8 12		0.3/0.3	SILTY CLAY with some sandy silt interbeds, trace shell frag.s, greenish grey, stiff, damp to moist		
33						SILTY CLAY, trace fine sand laminae, trace fine shell frags, greenish grey, very stiff, damp to moist		
34	S17	2.0/2.0 100%	4 6 8 9		0.3/0.3	SAME but no shell fragments and stiff		
35						SAME but hard and moist		
37	S18	2.0/2.0 100%	11 19 15 23		0.3/0.3	fine to med, SILTY SAND, little fine to coarse shell frag.s, trace clays, olive and orange, very stiff, moist	Top of sand 37	-0.33 -1.03 -1.53
38	S19	1.3/2.0 65%	6 11 11 16		0.3/0.3	SILTY CLAY, trace fine sand laminations, greenish grey to brown, med. stiff, moist to wet SILTY SAND, little fine to coarse shells, frag.s, reddish brown oxidation staining med. dense, moist to wet		
40	S20	2.0/2.0 100%	6 10 10 18		0.3/0.3	SILTY SAND, little fine to medium shell frag.s, olive brown, medium dense, moist to wet	TOP OF Screen 40	
42	S21	2.0/2.0 100%	6 10 13 15		0.3/0.3	SAME but brown and grey and wet		-7.03
44	S22	2.0/2.0 100%	14 10 12 19		0.3/0.3	fine SAND, some shell fragments, little silt, olive-brown, medium dense, wet		
46	S23	2.0/2.0 100%	7 8 12 20		0.3/0.3	fine SAND, little silt, little to trace shell fragments, olive brown, medium dense, wet		
47						SAME but dark green grey		
48	S24	1.3/2.0 65%	8 22 35 47		0.5/0.5	fine grained SAND, little silt, some shell fragments, dk. greenish grey & white, very dense, wet		
9						SAME but no shell fragments		
50	S25	1.5/2.0	10 25			SAME but some shell fragments [illegible] Match to Sheet		

DRILLING CO.: HARDIN-HUBER, INC.
DRILLER: M. Corron

BAKER REP.: [illegible] (9.20-9.21.99) JE ZIMMER (9.23.9
WELL/BORING NO.: [illegible]
SHEET 3 OF 4

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 6GW02

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA:

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
						Continued from Sheet 3		
51		75%	28 23		0.5/0.5		Quartz sand	
52	S26	1.5/2.0	6 11 12		0.5/0.5	SAME but occasional shells throughout, medium dense		
53		75%	17					
54	S27	1.7/2.0	5 4 6		0.5/0.5	SAME but with shell material throughout	Bottom of screen → 55	
55		85%	9					
56	S28	1.9/2.0	2 3 7		0.5/0.5	SAME, but with only occasional shell material throughout	→ 56' Bottom of PVC well	
57		95%	14					
8						Boring terminated at 57' bgs		
9								
0								
1								
2								
3								
4								
5								
6								
7								
8								
9								
0						Match to Sheet		

DRILLING CO.: HARDIN-HUBER, INC.
DRILLER: M. Corron

BAKER REP.: JEZIMMERMAN
WELL/BORING NO.: 6GW02 SHEET 4 OF 4

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 6GW03

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 6
COORDINATES: NORTH: 345777.73, EAST: 2559237.11
ELEVATIONS: SURFACE: 28.31

RIG: Mobile B-80

	SPLIT SPOON	AUGERS	SURFACE CASING	REAMING TOOL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	1 3/8"	4-1/4" ID	10"	13"	9-23-94	23	Partly Cloudy 80°	— —
LENGTH	2.0'	5.0'	10'	--	10-20-94	26	Partly Cloudy 75°	29'
TYPE	Std.	HSA	steel	drag				
HAMMER WT.	140#	--	--	--				
FALL	30"	--	--	--				

REMARKS:

SAMPLE TYPE
S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston
N = No Sample

Well Information	Diam.	Type	Top Depth (ft.)	Bottom Depth (ft.)
Well Riser	2"	Sch. 40 PVC, Threaded	-2.36 stick-up	37.9
Well Screen	2"	No. 10 Slot Sch. 40 PVC, Threaded	37.9	48.0

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
1	A-N						
2–3	S1	1.4/2.0 70%	4 5 10 12		0.3/0.3	silty fine SAND, trace clay, brown to yellow brown, medium dense, damp	
4–5	S2	1.0/2.0 50%	7 7 8 11		0.3/0.9	SAME except no clay	
6–7	S3	1.1/2.0 55%	4 5 6 7		0.3/0.3	SAME except trace clay, orange to reddish brown staining 7.0	22.31 / 21.31
8–9	S4	1.5/2.0 75%	3 4 5 7		0.3/0.3	CLAY, trace silt, fine sand, yellow brown w/orange staining, stiff, damp 9.0	19.31
10	S5	1.5/2.0 75%	3 3 3 5		0.3/0.3	fine SAND and silt, some clay, yellow brown w/red staining, loose, damp Match to Sheet 2	

Well Installation Detail: cement-bentonite grout; 10" steel casing; Top of bentonite slurry 6.0

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: J. Zimmerman / M. Taube
DRILLER: M. Corron WELL/BORING NO.: 6GW03 SHEET 1 OF 3

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 6GW03

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 6

SAMPLE TYPE

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T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
						Continued from Sheet 1		
11								
12	S6	1.6/2.0 80%	4 4 4 4		0.3/0.3	fine SAND, some silt, little clay, brown to light gray w/ orange-red staining, loose, damp.		
13								
14	S7	1.6/2.0 80%	2 2 3 3		0.3/0.3	Same except damp to moist	10" Steel casing	
15						15.0		13.31
16	S8	1.8/2.0 90%	3 3 4 5		0.3/0.3	silty CLAY, brown w/red staining, medium stiff, damp 16.0		12.31
17						fine SAND, trace silt, dark gray w/red staining, loose, moist		
18	S9	2.0/2.0 100%	1 1 3 3		0.3/0.3	Same except very loose 18.3		10.01
19						CLAY, trace silt, dark green-gray, medium stiff, moist		
20	S10	2.0/2.0 100%	3 3 6 9		0.3/0.3	SAME except stiff		
21								
22	S11	2.0/2.0 100%	3 3 5 10		0.3/0.3	SAME	Bottom of 10" Steel casing 23.0'	
23								5.31
24	S12	2.0/2.0 100%	3 6 9 12		0.3/0.3	SAME		
25								3.61
26	S13	1.0/2.0 50%	7 13 14 20		0.2/0.2	fine SAND, trace shell fragments, silt dark green-gray, medium dense, moist SAME except, some clay, little silt, shell fragments		
27								
28	S14	1.7/2.0 85%	8 10 9 12		0.2/0.2	fine SAND, little shell fragments (coarse to fine) little silt, trace clay, green-gray, medium dense, moist to wet 28.5		-0.19
29								
30	S15	1.5/2.0	8 14		0.2/0.2	SAME except shells medium to fine grained Match to Sheet 3		

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: J. Zimmerman / M. Taube
DRILLER: M. Corron WELL/BORING NO.: 6GW03 SHEET 2 OF 3

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 6GW03

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 6

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
						Continued from Sheet _	Bentonite Slurry	
31	S15	75%	11 12					
32	S16	1.7/2.0 85%	5 9 15 16		0.2/0.2	fine SAND, little shell fragments (medium to fine), silt, trace clay green-gray, medium dense, wet.	Top of #1 quartz sand 33.0	-4.69
33								
34	S17	2.0/2.0 100%	8 11 17 18		0.2/0.2	SAME except trace shell fragments		
35								
	S18	1.5/2.0 75%	6 9 10 17		0.2/0.2	SAME		
37							Top of screen 37.9	-9.59
38	S19	1.7/2.0 85%	8 13 15 17		0.2/0.2	SAME except little coarse to fine shell fragments	#1 Quartz SAND	
39								
40	S20	1.3/2.0 65%	9 19 12 17		0.2/0.2	SAME except dense	0.10 slot pvc screen	
41								
42	S21	1.6/2.0 80%	9 8 9 8		0.2/0.2	fine SAND, some silt, trace shell fragments, clay, green-gray, medium dense, wet		
43								
44	S22	1.8/2.0 90%	6 6 7 9		0.2/0.2	SAME		
45								
46	S23	2.0/2.0 100%	6 9 5 11		0.2/0.2	SAME	Bottom of screen 46.9	-18.59
47								
48	S24	2.0/2.0 100%	6 5 8 11		0.2/0.2	SAME	Bottom of pvc well 48.9	-19.69
9								-20.69
0						Boring terminated at 49.0 bgs Match to Sheet _		

DRILLING CO.: HARDIN-HUBER, INC.
DRILLER: M. Corron
BAKER REP.: M. Taube
WELL/BORING NO.: 6GW03 SHEET 3 OF 3

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT:	Remedial Investigation - Groundwater Operable Unit I		
PROJ. NO.:	CTO-213	BORING NO.:	6GW05B
COORDINATES	NORTHING: 345,203.46	EASTING:	2,558,990.33
ELEVATION:	GROUND SURFA 6.83	TOP OF PVC CASING:	8.59

Rig: CME-55 ATV	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	1 3/8"	--	4.25"	--	9/14/2004	15	Overcast, 70s°	6
Length (FT)	2.0		5.0					
Type	STD		HAS					
Hammer Wt.	140#							
Fall								

Remarks:

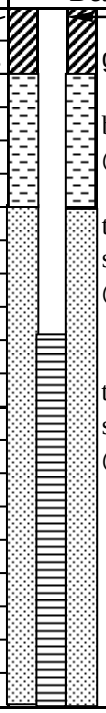
SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

WELL INFORMATION

Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Sch. 40 PVC Riser	2"	0	5
Sch. 40 PVC (0.010 in.) screen	2"	5	15

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description
1, 2	S-1	1.1 55%	W-O-H 1 2 2			Topsoil; Damp, brown SILT, some clay, tr. organics; Damp, light gray and orange mottled CLAY, some silt, trace organic material
3, 4	S-2	1.7 85%	2 2 3 2			-trace fine sand in partings (3.8-4.0 ft)
5, 6	S-3	2 100%	W-O-H 1 2 2			Moist to wet, light blue gray CLAY, some silt, trace fine sand in partings
7, 8	S-4	0.7 35%	1 2 2 3			Wet, light yellow brown, fine SAND, some silt, trace clay; water @ 6-ft
9, 10	A-N					No sample collected 8-12 ft.



DRILLING CO.	Parrott-Wolff, Inc.	BAKER REP.:	David Martin
DRILLER:	Gary Ellingworth	BORING NO.:	6GW05B SHEET 1 OF 2

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 6GW05B

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
11	A-N					No sample collected 8-12 ft.	No. 1 Qtz sand	
12								
13	S-5	1.8 90%	1 1 2 2			Wet, light yellow- brown, fine SAND, some silt, trace clay	0.10 slot PVC screen	
14							Bottom of screen @ 15'	
15	A-N							
16						EOB @ 15-ft		
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 6GW05B SHEET 2 OF 2

Baker

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Yorktown Naval Weapon Station - Well Installation, Site 6

CTO NO.: 62470-394 BORING NO.: 6GW06

COORDINATES: EAST: NORTH:

ELEVATION: SURFACE: TOP OF PVC CASING:

Rig: Truck								
	Split Spoon	**Casing**	**Augers**	**Core Barrel**	**Date**	**Progress (Ft.)**	**Weather**	**Depth to Water (Ft.)**
Size (ID)	1.375		4.25		5/12/2000	0.0 - 18.0	Sunny, 80	8
Length	2.0		5.0					
Type	STD		HSA					
Hammer Wt.	140							
Fall	30"							

Remarks:

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston
N = No Sample H=Hand Spoon

WELL INFORMATION

Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Sch 40 Riser	2"	0	8
Sch 40 .010 Slot Screen	2"	8	18

Depth (feet)	Sample Type & No.	Sample Rec. (feet)	SPT	Lab ID	PID (ppm) BG/PS	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1	S-1	1.5	2-4-4-5			CLAY and silt, trace very fine sand, brown, damp	cement bentonite grout	
2								
3								
4	S-2	1.5	3-4-4-6			CLAY, little silt, trace very fine		
5						sand, sand increase to little at bottom 2", red/brown mottled	Bent. Chips	
6						moist		
7							Sand pack	
8						Groundwater level		
9	S-3	1.3	1-1-1-1			Zone 1 - Same	Top of screen	
10						Zone 2 - SAND, fine, some silt, little organics (roots), gray, wet		
						Match to Sheet 2		

DRILLING CO.: Parrot Wolfe BAKER REP.: David Martin

DRILLER: Jim Lansing BORING NO.: 6GW06 SHEET 1 OF 2

Baker

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Yorktown Naval Weapon Station - Well Installation, Site 6

CTO NO.: 62470-394 BORING NO.: 6GW06

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BG/PS = Background/Point Source

Depth (feet)	Sample Type & No.	Sample Rec. (feet)	SPT	Lab ID	PID (ppm) BG/PS	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
11						Continued from Sheet 1		
12								
13								
14	S-4	2.0	1-1-1-1			SAND, very fine, some silt, some shell fragments, light brown, wet		
15								
16	S-5	1	1-1-1-1			Same		
17								
18						EOH = 18' bgs		
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: Parrot Wolfe BAKER REP.: David Martin

DRILLER: Jim Lansing BORING NO.: 6GW06 SHEET 2 OF 2

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT:	Remedial Investigation - Groundwater Operable Unit I		
PROJ. NO.:	CTO-213	BORING NO.:	6GW06B
COORDINATES	NORTHING: 345,391.17	EASTING:	2,559,034.28
ELEVATION:	GROUND SURFA 9.20	TOP OF PVC CASING:	11.46

Rig: CME-55 ATV

	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	1 3/8"	--	4.25"	--	9/18/2004	38	Rain, 70^0	**8
Length (FT)	2.0		5.0					
Type	STD		HSA					
Hammer Wt.	140#							
Fall								

Remarks: *Offset from existing well 6GW06, then drilled to 18 ft (end of boring for 6GW06). See 6GW06 boring log for soil profile from 0-18 ft.
**Estimated depth from 6GW06 soil boring profile.

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

WELL INFORMATION

Type	Dam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Sch. 40 PVC Riser	2"	0	28
Sch. 40 PVC (0.010 in.) screen	2"	28	38

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1								
2							Sch. 40 PVC riser	
3								
4								
5	A-N						cement bentonite grout to surface	
6								
7								
8						water @ ~8-ft		
9								
10						Match to Sheet 2		

DRILLING CO.:	Parrott-Wolff, Inc.	BAKER REP.:	David Martin
DRILLER:	Gary Ellingworth	BORING NO.:	6GW06B SHEET 1 OF 3

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 6GW06B

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
11								
12								
	Sch. 40							
13							PVC Riser	
14								
15	A-N							
16								
17							cement	
18							bentonite	
19	S-1	1.5 75%	3 7			Wet, brown, fine SAND, some silt, trace clay to 19.3 ft	grout	
20			14 17			Wet, brown-gray fine SAND, some silt, trace clay, shells to 20 ft		
21	A-N							
22								
23								
24	S-2	2 100%	4 4			Wet, gray fine SAND and silt, trace clay and shells	top of bentonite @ 24'	
25			3 3					
26	A-N						top of sand @ 26'	
27								
28							top of screen @ 28'	
29	S-3	2 100%	3 5			Wet, gray, very fine SAND and silt trace clay, shells		
30			6 7					

Match to Sheet 3

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 6GW06B SHEET 2 OF 3

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 6GW06B

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
31							No. 1 Qtz sand	
32						A-N		
33								
34	S-4	2 100%	3 3 3 6			Wet, gray, very fine SAND and silt trace clay and shells	Sch. 40 PVC 0.010 in screen	
35								
36	A-N							
37							Bottom of screen @ 38'	
38						EOB @ 38		
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								
49								
50								

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 6GW06B SHEET 3 OF 3

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT:	Remedial Investigation - Groundwater Operable Unit I		
PROJ. NO.:	CTO-213	BORING NO.:	6GW07
COORDINATES	NORTHING: 345,164.31	EASTING:	2,558,662.31
ELEVATION:	GROUND SURFAC 6.84	TOP OF PVC CASING:	8.66

Rig: CME-55 ATV

	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	1 3/8"	--	4.25"	--	9/14/2004	18	Sunny, 70°s	9.6
Length (FT)	2.0		5.0					
Type	STD		HSA					
Hammer Wt.	140#							
Fall								

Remarks:

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

WELL INFORMATION

Type	Dam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Sch. 40 PVC Riser	2"	0	8
Sch. 40 PVC (0.010 in.) screen	2"	5	18

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1, 2	S-1	1.6 80%	W-O-H W-O-H 2 4			Topsoil; Damp, dark brown to light brown SILT, some clay, organics(plant material) trace fine sand	sch. 40 PVC riser; grout to surface	
3, 4	S-2	1.8 90%	3 4 5 5			Damp to moist, yellow brown and gray, CLAY,some silt, trace organic material	top of bentonite @ 2'	
5, 6	S-3	2 100%	W-O-H 2 2 3			Moist, blue gray and orange mottled CLAY, some silt, trace fine sand in partings		
7, 8	S-4	0.4 20%	W-O-H W-O-H W-O-H W-O-H			same	top of sand @ 6'	
9, 10	S-5	2 100%	W-O-H 2 3 5			Moist, blue gray and orange-brown mottled CLAY, some silt, trace fine sand in partings alternating with clay layers; Wet, light brown, fine SAND, some silt, trace clay water '@ 9.6-ft	top of screen @ 8'	

DRILLING CO.:	Parrott-Wolff, Inc.	BAKER REP.:	David Martin
DRILLER:	Gary Ellingworth	BORING NO.:	6GW07 SHEET 1 OF 2

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 6GW07

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
11	S-6		W-O-H W-O-H 3			Wet, light brown, fine SAND, some silt, trace clay		
12								
13	S-7	2 100%				Wet, yellow- brown, fine SAND, some silt, little clay	No. 1 Qtz sand	
14								
15	S-8	2 100%	W-O-H 2 2 3			same	0.10 slot PVC screen	
16								
17	S-9	2 100%	1 2 3 10			Wet, yellow- brown, fine SAND, some silt, little clay, trace shell fragments @ 17.8' - 18.0'	Bottom of screen @ 18'	
18								
						EOB @ 18-ft		
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 6GW07 SHEET 2 OF 2

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT:	Remedial Investigation - Groundwater Operable Unit I		
PROJ. NO.:	CTO-213	BORING NO.:	6GW08
COORDINATES:	NORTHING: 345,340.93	EASTING:	2,558,786.21
ELEVATION:	GROUND SURFACE 3.07	TOP OF PVC CASING:	5.61

Rig:	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	1 3/8"	4"		--	9/21/2004	24	Sunny, 70°s	
Length (FT)	2.0	18			9/22/2004	12	Sunny, 70°s	32
Type	STD	PVC						
Hammer Wt.	140#							
Fall								

Remarks: Monitoring well installed with 4-inch outer casing to 18-ft bgs. The monitoring well was inserted through the 4" casing and installed to a depth of 36-ft bgs

SAMPLE TYPE

S = Split Spoon A = Hand Auger (6-inch length)
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

WELL INFORMATION

Type	Diameter	Top Depth (Ft.)	Bottom Depth (Ft.)
Sch. 40 PVC Riser	1.5"	0	31
Sch. 40 PVC (0.01 in.) prepacked screen	1.5"	31	36

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1	S-1	1 50%	W-O-H W-O-H W-O-H W-O-H			Very wet, dark gray CLAY and SILT, some organics, swamp odor	Sch. 40 PVC riser	
2								
3	A-1	0.5 100%				same		
4	A-2	0.5 100%						
5	A-3	0.5 100%						
6	A-4	0.5 100%					cement bentonite grout to surface	
7	A-5	0.5 100%						
8	A-6	0.5 100%					4" PVC casing	
9	A-7	0.5 100%						
10	S-2	1.5 75%	1			Wet, dark gray CLAY and SILT, trace organic wood fragments Match to Sheet 2		

DRILLING CO.	Parrott-Wolff, Inc.	BAKER REP.:	David Martin
DRILLER:	Gary Ellingworth	BORING NO.:	6GW08

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 6GW08

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
11	S-3	1 50%	2 2 3				cement bentonite grout	
12								
13	S-4	1.5 75%	1 1 2 1			same		
14								
15	S-5	1.5 75%	3 2 1 3			same		
16								
17	S-6	1 50%	4 3 3 2			Wet, gray CLAY and SILT, trace fine sand	Top of bentonite @ 16' Bottom of 4" PVC casing @18'	
18								
19	S-7	1.5 75%	2 2 2 3			Wet/moist, gray CLAY and SILT, trace shells		
20								
21	S-8	0.75 38%	3 4 7 9			Moist, gray CLAY and SILT	Sch. 40 PVC Riser	
22								
23	S-9	1 50%	8 9 10 12					
24								
25	S-10	1 50%	7 9 10 11			Moist to damp, gray CLAY and SILT		
26								
27	S-11	1 50%	8 9 12 15			Damp, green/brown-gray CLAY and SILT stiff clay		
28								
29	S-12	1.2 60%	3 5 6 7			same		
30								
	S-13		3			Match to Sheet 3	Top of sand @ 30'	

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 6GW08 SHEET 2 OF 3

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 6GW08

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
31	S-11	1.2 60%	2 2 4			same to 31.7', except clay less stiff	Top of screen @ 31'	
32						Moist, green-gray SILT & CLAY, trace fine		
33	S-12	0.7 35%	1 2 2 3			Wet, gray and brown SILT and fine sand, little shells, trace clay	Sch. 40 PVC 0.010 in. prepacked (w/ sand) screen	
34								
35	S-13	0.2 10%	1 1 2 2			Wet, gray fine sand and silt, trace clay	Bottom of screen @ 36'	
36						EOB @ 36-ft		
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								
49								
50								

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 6GW08 SHEET 3 OF 3

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

PROJ. NO.: CTO-213 BORING NO.: 6GW09

COORDINATE NORTHING: 345,555.40 EASTING: 2,558,631.51

ELEVATION: GROUND SURFA 11.83 TOP OF PVC CASING: 14.38

Rig: CME-55 ATV	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	1 3/8"	--	4.25"	--	9/17/2004	30	Overcast, humid, 73-84°	*21.75
Length (FT)	2.0		5.0					
Type	STD		HSA					
Hammer Wt.	140#							
Fall								

Remarks:

*Estimated depth from 6GW09B soil profile. **Note:** Soil descriptions from soil boring for 6GW09B.

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

WELL INFORMATION

Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Sch. 40 PVC Riser	2"	0	20
Sch. 40 PVC (0.010 in.) screen	2"	20	30

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1						Topsoil Damp, gray brown SILT, some clay, trace organics, fine sand		
2								
3						Damp, brown and orange mottled CLAY,some silt, trace organic material	Sch. 40 PVC riser	
4								
5	A-N					Moist, gray, brown, and orange mottled CLAY, some silt, trace fine sand		
6							cement bentonite grout ot surface	
7								
8								
9						Moist, blue gray and orange-brown mottled CLAY, some silt, trace fine sand in partings alternating with clay layers		
10						Match to Sheet 2		

DRILLING CO. Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 6GW09 SHEET 1 OF 2

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 6GW09

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
11						Damp, blue gray and orange-brown mottled CLAY, some silt, trace fine sand		
12								
	in partings alternating with clay layers							
13								
14						Damp, blue gray, gray, and gray, CLAY, some silt, trace very fine sand in partings	cement bentonite grout	
15						Same except gray to light blue gray		
16								
17							top of bentonite @ 16'	
18								
19	A-N					Moist, brown, CLAY,some silt, little fine sand, trace to little marine shells	top of sand @ 18'	
20								
21						Wet, gray and brown, fine SAND, and silt, trace clay, trace shells	top of screen @ 20'	
22	▼					water @ ~21.75-ft		
23						Wet, gray and brown, fine SAND, and silt, trace clay, little shells	No. 1 Qtz sand	
24								
25						Wet, gray-brown, fine SAND, some silt, trace clay, shells		
26								
27						same except and silt		
28								
29						Wet, gray-brown, fine SAND and silt, trace clay, shells		
30								
						EOB @ 30-ft		

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 6GW09 SHEET 2 OF 2

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

PROJ. NO.: CTO-213 BORING NO.: 6GW09A

COORDINATES NORTHING: 345,556.73 EASTING: 2,558,624.52

ELEVATION: GROUND SURFA 12.76 TOP OF PVC CASING: 15.17

Rig: CME-55 ATV	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	1 3/8"	--	4.25"	--	9/16&17/200	50	Sunny, 80°	*21.75
Length (FT)	2.0		5.0					
Type	STD		HSA					
Hammer Wt.	140#							
Fall								

Remarks:

*Estimated depth from 6GW09B soil profile. **Note:** Soil descriptions from soil boring for 6GW09B.

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

WELL INFORMATION

Type	Dam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Sch. 40 PVC Riser	2"	0	40
Sch. 40 PVC (0.010 in.) screen	2"	40	50

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1						Topsoil Damp, gray brown SILT, some clay, trace organics, fine sand		
2								
3						Damp, brown and orange mottled CLAY,some silt, trace organic material	Sch. 40 PVC riser	
4								
5	A-N					Moist, gray, brown, and orange mottled CLAY, some silt, trace fine sand		
6							cement bentonite grout to surface	
7								
8								
9						Moist, blue gray and orange-brown mottled CLAY, some silt, trace fine sand in partings alternating with clay layers		
10								

Match to Sheet 2

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 6GW09A SHEET 1 OF 3

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 6GW09A

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
11						Damp, blue gray and orange-brown mottled CLAY, some silt, trace fine sand		
12								
	in partings alternating with clay layers							
13								
						Damp, blue gray, gray, and gray, CLAY,		
14						some silt, trace very fine sand in partings		
15						Same except gray to light blue gray		
16								
17								
18								
						Moist, brown, CLAY,some silt, little fine		
19	A-N					sand, trace to little marine shells		
20								
21						Wet, gray and brown, fine SAND, and silt, trace clay, trace shells		
22	▼					water @ ~21.75-ft		
						Wet, gray and brown, fine SAND, and	Sch. 40	
23						silt, trace clay, little shells	PVC Riser	
24								
						Wet, gray-brown, fine SAND, some	cement	
25						silt, trace clay, shells	bentonite	
							grout	
26								
						same except and silt		
27								
28								
						Wet, gray-brown, fine SAND and		
29						silt, trace clay, shells		
30								
						Match to Sheet 3		

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 6GW09A SHEET 2 OF 3

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 6GW09A

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
31						Wet, gray-brown, fine SAND and silt, trace clay, shells	Sch. 40	
32								
	Wet, gray-brown to blue SILT and							
33						Wet, blue gray very fine SAND and silt, little clay, trace shells	cement bentonite grout	
34								
						Wet, gray-brown to blue SILT and very fine sand, little clay, trace shells		
35								
36								
						Wet, blue gray very fine SAND and silt, little clay, trace shells	top of bentonite @ 36'	
37								
38								
	A-N						top of sand @ 38'	
39								
40								
						Wet, blue gray very fine SAND, some silt, little clay, shells	top of screen @ 40'	
41								
42								
43								
44							No. 1 Qtz sand	
						Same except gray		
45								
46							Sch. 40 PVC 0.010 in screen	
47								
48								
						Wet, gray fine SAND, some silt, trace shells		
49							Bottom of screen @ 50'	
50								
						EOB @ 50-ft		

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 6GW09A SHEET 3 OF 3

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT:	Remedial Investigation - Groundwater Operable Unit I		
PROJ. NO.:	CTO-213	BORING NO.:	6GW09B
COORDINATES	NORTHING: 345,557.55	EASTING:	2,558,619.56
ELEVATION:	GROUND SURFA 13.53	TOP OF PVC CASING:	15.11

Rig: CME-55 ATV	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	1 3/8"	--	4.25"	--	9/15/2004	40	Overcast, rain, 70°s	21.75
Length (FT)	2.0		5.0		9/16/2004	36*	Overcast, 70°s	
Type	STD		HSA					
Hammer Wt.	140#							
Fall								

Remarks: *Split-spoon sampled to 76 foot depth. Drilled to 75 foot depth. Well set at 75 feet.

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

WELL INFORMATION

Type	Dam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Sch. 40 PVC Riser	2"	0	65
Sch. 40 PVC (0.010 in.) screen	2"	65	75

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
			W-O-H			Topsoil		
1	S-1	1.6 80%	1 2 4			Damp, gray brown SILT, some clay, trace organics, fine sand		
2								
3	S-2	1.2 60%	6 7 9 9			Damp, brown and orange mottled CLAY,some silt, trace organic material	Sch. 40 PVC riser	
4								
5	S-3	1.4 70%	3 3 6 10			Moist, gray, brown, and orange mottled CLAY, some silt, trace fine sand	cement bentonite grout to surface	
6								
7	S-4	1.7 85%	6 6 7 7					
8								
9	S-5	2 100%	3 3 5 8			Moist, blue gray and orange-brown mottled CLAY, some silt, trace fine sand in partings alternating with clay layers		
10								
		S-6	2			Match to Sheet 2		

DRILLING CO.:	Parrott-Wolff, Inc.	BAKER REP.:	David Martin
DRILLER:	Gary Ellingworth	BORING NO.:	6GW09B SHEET 1 OF 5

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 6GW09B

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
11	S-6	2 100%	4 5 7			Damp, blue gray and orange-brown mottled CLAY, some silt, trace fine sand in partings alternating with clay layers		
12								
13	S-7	2 100%	3 5 5 7			fine sand lense from 10.6-10.9' Damp, blue gray, gray, and gray, CLAY, some silt, trace very fine sand in partings		
14								
15	S-8	2 100%	W-O-H 1 1 2			Same except gray to light blue gray		
16								
17	S-9	2 100%	3 4 3 3					
18								
19	S-10	2 100%	W-O-H/12" 4 7			Moist, brown, CLAY,some silt, little fine sand, trace to little marine shells		
20								
21	S-11	1 50%	4 8 17 20			Wet, gray and brown, fine SAND, and silt, trace clay, trace shells		
22						water @ 21.75-ft		
23	S-12	2 100%	13 14 10 13			Wet, gray and brown, fine SAND, and silt, trace clay, little shells	Sch. 40 PVC Riser	
24								
25	S-13	2 100%	4 4 7 12			Wet, gray-brown, fine SAND, some silt, trace clay, shells	cement bentonite grout	
26								
27	S-14	2 100%	2 2 6 8			same except and silt		
28								
29	S-15	2 100%	6 7 9 11			Wet, gray-brown, fine SAND and silt, trace clay, shells		
30								
	S-16		2			Match to Sheet 3		

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 6GW09B SHEET 2 OF 5

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 6GW09B

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
31	S-16		4 7 8			Wet, gray-brown, fine SAND and silt, trace clay, shells		
32						Wet, gray-brown to blue SILT and very fine sand, little clay, trace shells		
33	S-17	2 100%	4 6 8 5			Wet, blue gray very fine SAND and silt, little clay, trace shells		
34								
35	S-18	2 100%	3 3 2 7			Wet, gray-brown to blue SILT and very fine sand, little clay, trace shells		
36								
37	S-19	2 100%	4 7 5 7			Wet, blue gray very fine SAND and silt, little clay, trace shells	Sch. 40 PVC Riser	
38								
39	S-20	2 100%	3 3 9 7				cement bentonite grout	
40								
41	S-21	1.6 80%	W-O-H 1 5 12			Wet, blue gray very fine SAND, some silt, little clay, shells		
42								
43	S-22	2 100%	5 12 17 19					
44								
45	S-23	2 100%	9 10 19 17			Same except gray		
46								
47	S-24	2 100%	9 17 19 20					
48								
49	S-25	2 100%	7 7 9 9			Wet, gray fine SAND, some silt, trace shells		
50								
	S-26		W-O-H			Match to Sheet 4		

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 6GW09B SHEET 3 OF 5

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 6GW09B

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
51	S-26	2 100%	1 1 2			Wet, gray fine SAND, some silt, trace clay, shells		
52								
53	S-27	2 100%	3 3 6 7				Sch. 40 PVC Riser	
54								
55	S-28	2 100%	4 7 9 12				cement bentonite grout	
56								
57	S-29	2 100%	7 12 13 16					
58								
59	S-30	2 100%	1 3 3 8					
60								
61	S-31	2 100%	2 3 3 7				top of bentonite @ 61'	
62								
63	S-32	2 100%	2 5 8 13				top of sand @ 63'	
64								
65	S-33	2 100%	2 4 4 7				top of screen @ 65'	
66								
67	S-34	2 100%	3 4 6 6			Wet, gray, SILT and fine sand, trace clay, shells		
68								
69	S-35	2 100%	3 4 7 9			Wet, gray, SILT and fine sand, trace clay, shells	No. 1 Qtz sand	
70								
	S-36		2			Match to Sheet 5		

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 6GW09B SHEET 4 OF 5

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 6GW09B

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
71	S-36	2 100%	4 6 8			Wet, gray, SILT and fine sand, trace clay, shells	0.10 slot PVC screen	
72								
73	S-37	2 100%	4 5 9 9			Wet to moist, gray, SILT, some fine sand, little clay	No. 1 Qtz sand	
74								
75	S-38	2 100%	9 6 8 13				Bottom of screen @ 75'	
76						EOB @ 76-ft		
77								
78								
79								
80								
81								
82								
83								
84								
85								
86								
87								
88								
89								
90								

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 6GW09B SHEET 5 OF 5

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT:	Remedial Investigation - Groundwater Operable Unit I		
PROJ. NO.:	CTO-213	BORING NO.:	6GW10
COORDINATES	NORTHING: 345,452.33	EASTING:	2,558,721.34
ELEVATION:	GROUND SURFA 13.30	TOP OF PVC CASING:	15.52

Rig: CME-55 ATV

	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	1 3/8"	--	4.25"	--	9/18/2004	22	Overcast, slight rain, 70°	*15.3
Length (FT)	2.0		5.0					
Type	STD		HSA					
Hammer Wt.	140#							
Fall								

Remarks:

*Estimated depth from 6GW10A soil profile. **Note:** Soil descriptions from soil boring for 6GW10A.

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

WELL INFORMATION

Type	Dam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Sch. 40 PVC Riser	2"	0	12
Sch. 40 PVC (0.010 in.) screen	2"	12	22

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1							Sch. 40 PVC riser	
2								
3							cement bentonite grout to surface	
4								
5	A-N					Damp, yellow brown CLAY, some silt, trace fine sand		
6						Dry, light brown, SILT, some clay, little fine sand		
7						Damp, gray, CLAY, some silt, trace fine sand in partings (oxidized stain)		
8							top of bentonite @ 8'	
9								
10						Match to Sheet 2	top of sand @ 10'	

DRILLING CO.:	Parrott-Wolff, Inc.	BAKER REP.:	David Martin
DRILLER:	Gary Ellingworth	BORING NO.:	6GW10 SHEET 1 OF 2

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 6GW10

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
11						same		
12	top of							
13							screen @ 12'	
14								
15						Damp, gray, CLAY, some silt, trace medium to fine sand in partings		
16	A-N					Wet, brown-gray, CLAY and coarse to fine sand sized shell fragments, some silt		
17						water @ ~15.3-ft	0.10 slot PVC screen	
18								
19								
20						Wet, light brown, fine SAND, some silt, little shell fragments, trace clay		
21						same	Bottom of screen @ 22'	
22								
						EOB @ 22'		
23								
24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 6GW10 SHEET 2 OF 2

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT:	Remedial Investigation - Groundwater Operable Unit I		
PROJ. NO.:	CTO-213	BORING NO.:	6GW10A
COORDINATES	NORTHING: 345,448.21	EASTING:	2,558,725.19
ELEVATION:	GROUND SURF/ 13.43	TOP OF PVC CASING:	15.66

Rig: CME-55 ATV	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	1 3/8"	--	4.25"	--	9/17/2004	40*	Overcast, humid, 73-84°	15.3
Length (FT)	2.0		5.0		9/18/2004	(well install)	Overcast, slight rain, 70°s	
Type	STD		HSA					
Hammer Wt.	140#							
Fall								

Remarks: *Split-spoon sample/drill in 5-foot increments until hit groundwater, then continuous split-spoon sampling to final depth.

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Direct Push P = Piston
N = No Sample

WELL INFORMATION

Type	Dam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Sch. 40 PVC Riser	2"	0	30
Sch. 40 PVC (0.010 in.) screen	2"	30	40

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1	A-N						Sch. 40 PVC riser	
2								
3								
4								
5						Damp, yellow brown CLAY, some silt, trace fine sand	cement bentonite grout to surface	
6	S-1	2.0 100%	4 5 5 6			Dry, light brown, SILT, some clay, little fine sand		
7						Damp, gray, CLAY, some silt, trace fine sand in partings (oxidized stain)		
8	A-N							
9								
10								
	S-2		2			Match to Sheet 2		

DRILLING CO.:	Parrott-Wolff, Inc.	BAKER REP.:	David Martin
DRILLER:	Gary Ellingworth	BORING NO.:	6GW10A SHEET 1 OF 3

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 6GW10A

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
11	S-2	2 100%	2 3			same		
12								
13	A-N					4		
14								
15						Damp, gray, CLAY, some silt, trace medium to fine sand in partings		
16	S-3	2 100%	8 6 6 8			Wet, brown-gray, CLAY and coarse to fine sand sized shell fragments, some silt	Sch. 40 PVC Riser	
17						water @ 15.3-ft		
18	A-N						cement bentonite grout	
19	S-4	2 100%	4 4 5 7			Wet, light brown, fine SAND, some silt, little shell fragments, trace clay		
20								
21	S-5	2 100%	W-O-H 5 5 6			same		
22								
23	S-6	2 100%	3 3 7 8			same		
24								
25	S-7	2 100%	4 8 8 7			same		
26								
27	S-8	2 100%	2 3 5 6			same	top of bentonite @ 26'	
28								
29	S-9	2 100%	3 1 4 5			same (to 28.5') Wet, light brown, fine SAND, some silt, little clay	top of sand @ 28'	
30								
	S-10		3			Match to Sheet 3	top of screen @ 30'	

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 6GW10A SHEET 2 OF 3

Baker

Michael Baker Jr., Inc.

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Remedial Investigation - Groundwater Operable Unit I

CTO NO.: CTO-213 BORING NO.: 6GW10A

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
31	S-10		2 6			same, except trace clay and shells		
32						6		
33	S-11	2 100%	3 3 5			same	No. 1 Qtz sand	
34								
35	S-12	2 100%	1 7 3 5			same (to 34.7') Wet, blue-gray SILT and very fine sand little clay		
36							0.10 slot PVC screen	
37	S-13	2 100%	3 7 3 3			Wet to moist, blue-gray SILT some very fine sand, little blue-gray clay		
38								
39	S-14	2 100%	1 3 4 7			same	Bottom of screen @ 40'	
40								
41						EOB '@40		
42								
43								
44								
45								
46								
47								
48								
49								
50								

DRILLING CO.: Parrott-Wolff, Inc. BAKER REP.: David Martin

DRILLER: Gary Ellingworth BORING NO.: 6GW10A SHEET 3 OF 3

BOREHOLE ID : 7HP01 SITE NAME/NO: WPNSTA YORKTOWN
BEGIN DATE : 06/25/92 END DATE : 06/25/92

LOGGER/COMPANY : H.G. BIENKOWSKI

BOREHOLE COMPLETED IN (<O>verburden <B>edrock) : O

TOTAL DEPTH : 23.00 DEPTH TO BEDROCK : 0.00

BOREHOLE DIAMETER #1: 8.00
INTERVAL: 0.00 ft. to 20.00 ft. BGS
METHOD : AUGER FLUID :
BOREHOLE DIAMETER #2:
INTERVAL:
METHOD : FLUID :
BOREHOLE DIAMETER #3:
INTERVAL:
METHOD : FLUID :

DRILLING COMPANY : HARDIN-HUBER
DRILLER : BRIAN SIWINSKI
DRILL RIG TYPE : MOBILE DRILL B66

	ESTIMATED	SURVEYED
SURFACE ELEVATION :	0.000	23.200
N. COORDINATE :	0.0000	344137.0000
E. COORDINATE :	0.0000	2559296.0000

WELL PERMIT.....(Y)es (N)o: N PERMIT # :

HOLE ABANDONED...(Y)es (N)o: Y
WELL INSTALLED...(Y)es (N)o: N
WELL CLUSTER.....(Y)es (N)o: N No. OF WELLS : 0
WELL NEST.....(Y)es (N)o: N No. OF WELLS : 0
PUMPS INSTALLED..(Y)es (N)o: N

	TYPE	DEPTH
PURGE :		0.00
SAMPLE :	19-23	0.00

BOREHOLE TESTING
BOREHOLE GEOPHYSICS.....(Y)es (N)o: N
SLUG TESTS.....(Y)es (N)o: N
PACKER TESTS.....(Y)es (N)o: N
PUMPING TESTS.....(Y)es (N)o: N

COMMENTS :

Borehole Log — *ROY F. WESTON, Inc.*

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 23.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: H.G. BIENKOWSKI
WELL ID	: 7HP01	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 344137.0000 surveyed	DRILLING RIG	: MOBILE DRILL B66
EASTING	: 2559296.0000 surveyed	DATE STARTED	: 06/25/92
ELEVATION	: 23.200 surveyed	DATE COMPLETED	: 06/25/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
			80	Fill	YELLOWISH BROWN	FRM	MST	3 5 5 6	OVA 0.0	Organics: roots.
22	1									
				No Sample Recovered						
21	2		100	Fill	YELLOWISH BROWN	SFT	MST	7 7 7 9	OVA 0.0	
20	3									
19	4		75	Fill	YELLOWISH BROWN	SFT	MST	6 9 10 13	OVA 0.0	Same as above.
				Fill	BROWNISH YELLOW		MST		OVA 0.0	Very fine grained sand.
18	5									
				No Sample Recovered						
17	6		95	Fill	LT YLLWISH BRN		MST	6 8 9 10	OVA 0.0	
16	7									
				No Sample Recovered						
15	8		85	Fill	YELLOWISH BROWN	SFT	MST	9 10 10 15	OVA 0.0	Very fine grained sand.
14	9									
				No Sample Recovered						
13	10		95	Fill	BROWNISH YELLOW	SFT	MST	2 3 5 7	OVA 0.0	Very fine grained sand.

Borehole Log

ROY F. WESTON, Inc.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 23.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: H.G. BIENKOWSKI
WELL ID	: 7HP01	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 344137.0000 surveyed	DRILLING RIG	: MOBILE DRILL B66
EASTING	: 2559296.0000 surveyed	DATE STARTED	: 06/25/92
ELEVATION	: 23.200 surveyed	DATE COMPLETED	: 06/25/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Fill	BROWNISH YELLOW	SFT	MST		OVA 0.0	Very fine grained sand.
12	11									
				No Sample Recovered						
11	12		90	Fill	BROWNISH YELLOW	SFT	MST	8 9 13 16	OVA 0.0	Same as above.
10	13									
				Clayey sand, SC	REDDISH BROWN	SFT	MST			Clay lenses in clayey sand.
				No Sample Recovered						
9	14		100	Elastic silt with sand, MH	DK YLLWISH BRN		MST	2 3 3	OVA 0.0	Very fine grained sand.
				Shelly hash	LT BROWNISH GRY	SFT	MST	6	OVA 0.0	Marine fossil fragments.
8	15									
7	16		55	Shelly hash	LT OLIVE BROWN	SFT	WET	3 4 4 3	OVA 0.0	Saturated at tip. Marine fossil fragments.
6	17									
				No Sample Recovered						
5	18		55	Shelly sand	LT OLIVE BROWN	LSE	SAT	2 1 1 1	OVA 0.0	V. fine grained quartzose sand in loose watery matrix. 15% is marine fossil frag. in fine gr.
4	19									
				No Sample Recovered						
3	20			Interval Not Sampled						Hydropunch set 18 to 23' bgs; screen open from 19 to 23 ft. bgs.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 23.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: H.G. BIENKOWSKI
WELL ID	: 7HP01	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 344137.0000 surveyed	DRILLING RIG	: MOBILE DRILL B66
EASTING	: 2559296.0000 surveyed	DATE STARTED	: 06/25/92
ELEVATION	: 23.200 surveyed	DATE COMPLETED	: 06/25/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Interval Not Sampled						Hydropunch set 18 to 23' bgs; screen open from 19 to 23 ft. bgs.
2	21									
1	22									
0	23									
0	24									
-1	25									
-2	26									
-3	27									
-4	28									
-5	29									
-6	30									

DATE: 12/08/92 **** LITHOLOGICAL DATA FOR - CLIENT ID: BAKER *** PAGE: 7

BOREHOLE /WELL ID	SMP NUM	LTH NUM	LITHOLOGY INT. (FT BGS)		SAMPLING METHOD	SIZE GRAVEL	GRAVEL PCT.	SIZE SAND	SAND PCT	SILT PCT	CLAY PCT	ORGANIC PCT	ROCK TYPE	PLAST	SORT	STRENGTH	MOISTURE	STRAT UNIT
7HP01	1	1	0.00	1.60	SPS	F	10	F	5	30	50	5		HGH		FRM	MST	
7HP01	1	2	1.60	2.00	SPS		0		0	0	0	0						
7HP01	2	1	2.00	4.00	SPS		0	MF	15	70	15	0		NON		SFT	MST	
7HP01	3	1	4.00	4.50	SPS		0	MF	15	70	15	0		NON		SFT	MST	
7HP01	3	2	4.50	5.50	SPS		0	F	10	50	40	0		LOW			MST	
7HP01	3	3	5.50	6.00	SPS		0		0	0	0	0						
7HP01	4	1	6.00	7.90	SPS		0		0	40	60	0		MOD			MST	
7HP01	4	2	7.90	8.00	SPS		0		0	0	0	0						
7HP01	5	1	8.00	9.70	SPS		0	F	5	30	65	0		HGH		SFT	MST	
7HP01	5	2	9.70	10.00	SPS		0		0	0	0	0						
7HP01	6	1	10.00	11.90	SPS		0	F	5	30	65	0		HGH		SFT	MST	
7HP01	6	2	11.90	12.00	SPS		0		0	0	0	0						
7HP01	7	1	12.00	13.20	SPS		0		5	30	65	0		HGH		SFT	MST	
7HP01	7	2	13.20	13.80	SPS		0	F	60	10	30	0			MOD	SFT	MST	
7HP01	7	3	13.80	14.00	SPS		0		0	0	0	0						
7HP01	8	1	14.00	14.40	SPS		0	F	20	40	40	0		MOD			MST	
7HP01	8	2	14.40	16.00	SPS	F	15	CMF	30	55	0	0		NON		SFT	MST	
7HP01	9	1	16.00	17.10	SPS	F	20		30	50	0	0		NON		SFT	WET	
7HP01	9	2	17.10	18.00	SPS		0		0	0	0	0						
7HP01	10	1	18.00	19.10	SPS	F	5	F	65	20	10	0			POR	LSE	SAT	
7HP01	10	2	19.10	20.00	SPS		0		0	0	0	0						
7HP01	11	1	20.00	23.00	NS		0		0	0	0	0						

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 7GW01

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7
COORDINATES: NORTH: 343887.35 EAST: 2559662.78
ELEVATIONS: SURFACE: 26.45

RIG: Mobile B-80

	SPLIT SPOON	AUGERS	SURFACE CASING	REAMING TOOL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	1 3/8	4-1/4" ID	--	--	9-8-94	35	Partly Cloudy 75°	23
LENGTH	2.0'	5.0'	--	--				
TYPE	Std.	HSA	--	--				
HAMMER WT.	140#	--	--	--				
FALL	30"	--	--	--				

REMARKS:

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

Well Information	Diam.	Type	Top Depth (ft.)	Bottom Depth (ft.)
Well Riser	2"	Sch. 40 PVC, Threaded	-2.27 Stick-up	19.9
Well Screen	2"	No. 10 Slot Sch. 40 PVC, Threaded	19.9	33.9

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
1	A-N					GRASS TOPSOIL		
2	S1	1.5/2.0 75%	6 7 8 10		0.1/0.1	silty CLAY, little sand, trace wood fragments, shell fragments, fine gravel, orange-brown, stiff, damp 2.0		24.45
3						coarse to fine SAND, little silty clay, orange brown, medium dense, damp	Cement bentonite grout	
4	S2	1.2/2.0 60%	3 3 3 3		0.1/0.1	Same except trace silt, clay, loose		
5						5.0		21.45
6	S3	1.0/2.0 50%	3 3 4 3		0.1/0.1	Silty CLAY, little medium to fine shell fragments (little calcite cementation), trace sand, orange brown - light brown, medium stiff, damp to moist.	2" diameter PVC Riser	
7						7.0		19.45
8	S4	1.5/2.0 75%	3 2 2 2		0.1/0.1	Coarse to fine SAND, little clay, silt, trace shell fragments, fine gravel, orange-brown, loose, moist to damp.		
9						9.0		17.45
10	S5	1.5/2.0 75%	2 2 3 2		0.1/0.1	SILT, some coarse to fine sand, little clay, trace shell fragments, orange brown, medium stiff, moist		

Match to Sheet 2

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube
DRILLER: M. Corron WELL/BORING NO.: 7GW01 SHEET 1 OF 3

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 7GW01

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
						Continued from Sheet 1		
11–13	S6	1.4/2.0 70%	2 2 3 4		0.1/0.1	SILT, some clay, little sand, trace shell fragments, orange-brown, medium stiff, moist	Cement Bentonite grout	
14–15	S7	1.5/2.0 75%	2 1 2 3		0.1/0.1	SAME except little clay, soft, orange brown to yellow brown, fine gravel sized sand nodule at 14' bgs		
						15.0		11.45
16–17	S8	1.7/2.0 85%	2 1 2 3		0.1/0.1	coarse to fine SAND, trace fine gravel, silt, orange brown, very loose, moist	Top of Bentonite 15.5	10.95
18–19	S9	1.5/2.0 75%	1 2 2 2		0.1/0.1	SAME	Top of SAND 18.0	8.45
20–21	S10	1.4/2.0 70%	1 1 1 1		0.1/0.1	SAME	Top of screen 19.9	6.55
21.5						21.5		4.95
22–23	S11	2.0/2.0 100%	1 1 1 3		0.1/0.1	Organic SILT, trace roots, dark brown, very soft, moist 22.0; clayey SILT, little sand, coarse to fine shell fragments, green, soft, wet		4.45
24–25	S12	2.0/2.0 100%	2 3 4 6		0.1/0.1	sandy SILT, some coarse to fine shell fragments, olive brown, medium stiff, wet		
26–27	S13	2.0/2.0 100%	3 7 9 11		0.1/0.1	SAME except stiff		
28–29	S14	2.0/2.0 100%	9 9 9 13		0.1/0.1	SAME except little shell fragments, very stiff		
						29.0		
30	S15	2.0/2.0	2 5	7GW01-15	0.1/0.1	fine SAND, some silt, trace medium to fine shell fragments, Match to Sheet 3		

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube
DRILLER: M. Corron WELL/BORING NO.: 7GW01 SHEET 2 OF 3

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 76W01

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
						Continued from Sheet 2		
31	S15	100%	8 11			light brown to orange brown, medium dense, wet	#1 quartz sand	
32	S16	2.0/2.0 100%	5 11 13 17		0.1/0.1	SAME		
33							Bottom of Screen 33.9	-7.45
34	S17	2.0/2.0 100%	5 10 12 13		0.1/0.1	fine SAND, some silt, trace medium to fine shell fragments, light orange-brown to light brown, medium dense, wet	Bottom of PVC well 35.0	-8.55
35						35.0		
						Bore hole terminated at 35' bgs		
7								
8								
9								
0								
1								
2								
3								
4								
5								
6								
7								
8								
9								
0						Match to Sheet		

DRILLING CO.: HARDIN-HUBER, INC.
DRILLER: M. Corron
BAKER REP.: M. Taube
WELL/BORING NO.: 76W01
SHEET 3 OF 3

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 76W02

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7
COORDINATES: NORTH: 344146.12, EAST: 2559255.01
ELEVATIONS: SURFACE: 22.65

RIG: Mobile B-80

	SPLIT SPOON	AUGERS	SURFACE CASING	REAMING TOOL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	1 3/8	4-1/4" ID	--	--	9-8-94	32.0	Partly Cloudy 75°	18
LENGTH	2.0'	5.0'	--	--				
TYPE	Std.	HSA	--	--				
HAMMER WT.	140#	--	--	--				
FALL	30"	--	--	--				

REMARKS:

SAMPLE TYPE
S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

Well Information	Diam.	Type	Top Depth (ft.)	Bottom Depth (ft.)
Well Riser	2"	Sch. 40 PVC, Threaded	-2.5 Stick-up	16.7
Well Screen	2"	No. 10 Slot Sch. 40 PVC, Threaded	16.7	31.3

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
1	A-N					0-0.3 grass top soil		
2–3	S1	1.5/2.0 75%	2 5 5 5		0.1/0.1	Silty clay, little sand, trace root material, FILL, yellow brown stiff, damp	CEMENT BENTONITE GROUT	
4–5	S2	0/2 0%	3 4 7 8		0.1/0.1	No Recovery	2" DIAMETER PVC RISER	
6–7	S3	0.7/2.0 35%	4 5 7 8		0.1/0.1	Silty CLAY, with sandy silt laminations, orange brown and gray (laminations), very stiff, damp.		
8–9	S4	1.5/2.0 75%	3 5 8 12		0.1/0.1	Same except trace sand		
10	S5	1.3/2.0 35%	4 5		0.1/0.1	Silty CLAY and silty sand (alternating laminations), very light brown gray to orange brown gray, stiff, damp Match to Sheet 2		

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube
DRILLER: M. Corron WELL/BORING NO.: 76W02 SHEET 1 OF 3

Baker

Baker Environmental, Inc.

WELL/BORING NO.: 76W02

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319

SITE/AREA: Site 7

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
						Continued from Sheet 1		
11	S5		10 10				Top of bentonite 11.2'	11.45
12 13	S6	1.5/2.0 75%	2 4 6 8		0.1/0.1	SAND, medium to fine grained, little shell fragments, trace silt, clay, very light brown medium dense, damp	Bentonite pellets; Top of #1 qtz. sand 13.7'	8.95
14 15	S7	1.5/2.0 75%	3 4 6 8		0.1/0.1	SHELL FRAGMENTS, and silty clay, little sand, brown, loose, damp to moist	15.0	7.65
16 17	S8	1.7/2.0 85%	3 4 6 8		0.1/0.1	SILT, and shell fragments, little sand, trace clay, brown, stiff, moist	Top of screen 16.7'	5.[illegible]
18 19	S9	1.1/2.0 55%	4 5 3 3		0.1/0.1	Same except moist to wet	▽ 18'	4.65
20 21	S10	1.4/2.0 70%	2 4 6 9		0.1/0.1	sandy SILT, and shell fragments, trace clay, olive-brown, stiff, wet.	21.0	1.65
22 23	S11	2.0/2.0 100%	4 6 9 10		0.1/0.1	silty SAND, some shell fragments, trace clay, olive-brown, loose, wet	#1 Quartz sand	
24 25	S12	2.0/2.0 100%	2 7 10 11		0.1/0.1	SAND, fine grained, some silt, little shell fragments, brown, medium dense, wet.		
26 27	S13	1.7/2.0 85%	1 7 8 12		0.1/0.1	Same except trace orange staining		
28 29	S14	1.0/2.0 50%	3 6 8 9		0.1/0.1	Same except more orange staining		
30	S15	1.7/2.0	3 5		0.1/0.1	Match to Sheet 3		

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube

DRILLER: M. Corron WELL/BORING NO.: 76W02 SHEET 2 OF 3

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 7GW02

TEST BORING AND TEMPORARY PIEZOMETER CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
						Continued from Sheet 2		
31	S15	85%	10 14			SAND, fine grained, some silt, little shell fragments, light brown w/orange staining, medium dense, wet	bottom of screen 30.7	-8.05
							31.3	-8.65
32	A-N						Bottom of well	-9.35
3						Boring Terminated @ 32'		
4								
5								
6								
7								
8								
9								
0								
1								
2								
3								
4								
5								
6								
7								
8								
9								
0						Match to Sheet		

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube
DRILLER: M. Corron WELL/BORING NO.: 7GW02 SHEET 3 OF 3

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 7GW03

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7
COORDINATES: NORTH: 344535.21, EAST: 2559140.56
ELEVATIONS: SURFACE: 38.62

RIG: Mobile B-80

	SPLIT SPOON	AUGERS	SURFACE CASING	REAMING TOOL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	1 3/8	4-1/4" ID	10"	14"	9-10-94	31.0'	Sunny 80°	25
LENGTH	2.0'	5.0'	10.0'	--	9-12-94	0'-installed steel casing	Sunny 85°	—
TYPE	Std.	HSA	Steel	Drag	9-13-94	24	Sunny 80°	39'
HAMMER WT.	140#	--	--	--				
FALL	30"	--	--	--				

REMARKS:

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

Well Information	Diam.	Type	Top Depth (ft.)	Bottom Depth (ft.)
Well Riser	2"	Sch. 40 PVC, Threaded	Flush mount 0.24	39
Well Screen	2"	No. 10 Slot Sch. 40 PVC, Threaded	39	54

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
1	A-N					— GRASS TOPSOIL —	10" Steel Casing	
2–3	S1	1.0/2.0 50%	3 6 7 8		0.2/0.2	coarse to fine SAND, trace medium to fine gravel, roots, yellow brown, medium dense, damp.	Cement bentonite grout	
4–5	S2	1.4/2.0 65%	2 3 4 4		0.2/0.2	fine SAND, little silt, trace fine gravel, yellow brown to orange brown, loose damp - FILL -		
6–7	S3	1.3/2.0 65%	3 3 4 4		0.2/0.2	Same except little clay. 7.0		31.62
8–9	S4	1.7/2.0 85%	2 3 6 5		0.2/0.2	silty CLAY, little sand, orange brown stiff, damp 9.0		29.62
10	S5	1.3/2.0 65%	2 3 5 5		0.2/0.2	clayey SILT, little sand, brown, stiff damp to moist		

Match to Sheet 2

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube
DRILLER: M. Corron WELL/BORING NO.: 7GW03 SHEET 1 OF 4

Baker

Baker Environmental, Inc.

WELL/BORING NO.: 76W03

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319

SITE/AREA: Site 7

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
10.5						Medium to fine SHELL FRAGMENTS, little clay, trace silt, sand, light brown, loose, moist 10.5		28.12
11								27.62
12	S6	2.0/2.0 100%	2 2 2 3		0.1/0.1	silty CLAY, some medium to fine shell fragments mottled light brown & orange, soft, moist 12.0		26.62
13						clayey SILT, little sand, mottled light & red-brown, medium stiff, moist 13.0		25.62
14	S7	2.0/2.0 100%	2 1 3 3		0.1/0.1	silty CLAY, trace sand, light brown with orange laminations, soft, moist	Cement bentonite grout	
15								
16	S8	2.0/2.0 100%	1 2 3 4		0.1/0.1	SAME except light brown and orange brown, medium dense		
17								
18	S9	2.0/2.0 100%	3 1 2 2		0.1/0.1	SAME except little sand, soft, moist to wet, brown	10" diameter steel casing	
19								
20	S10	2.0/2.0 100%	1 2 3 5		0.1/0.1	SAME		
20.5						20.5		18.12
21						silty CLAY, trace fine shell fragments in laminations, dark gray, medium dense, damp		
22	S11	2.0/2.0 100%	2 3 3 8		0.1/0.1	SAME except little clay, moist		
23								
24	S12	2.0/2.0 100%	3 3 9 8		0.1/0.1	CLAY, little silt, trace fine shell fragments in laminations, dark gray, stiff, moist 24.5		14.12
25						med-fine SHELL FRAGMENTS, brown, loose, wet 24.8; silty CLAY, brown, stiff, moist	25.0 Top of bentonite slurry	13.82 13.62
26	S13	2.0/2.0 100%	3 4 12 12		0.1/0.1	medium to fine SHELL FRAGMENTS and silty clay (interbedded), light brown, medium dense, wet		
27								
28	S14	2.0/2.0	2 4 5 9		0.1/0.1	CLAY, little silt, trace shell fragments, gray, stiff, damp		10.62
29								
30	S15	2.0/2.0	2 4		0.1/0.1	same except dark gray, damp to moist Match to Sheet 3		

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube

DRILLER: M. Corcoran WELL/BORING NO.: 76W03 SHEET 2 OF 4

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 76W03

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN
CTO NO.: 0319
SITE/AREA: Site 7

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments
						Continued from Sheet 2
31	S15	100%	5 13			
32	A-N					NOTE! 10" diameter steel casing installed at 31 ft bgs - resumed sampling at 33 ft bgs.
33						
34	S17	1.8/2.0 90%	3 10 9 15		0.2/0.2	CLAY and silt, trace sand, fine shell fragments, green-gray, very stiff, damp
35						
37	S18	1.8/2.0 90%	6 9 9 9		0.2/0.2	fine SAND, and silt, little shell fragments, trace clay, green-gray to orange brown, medium dense, moist to wet
38	S19	1.3/2.0 65%	2 13 13 12		0.2/0.2	CLAY, some silt, trace fine sand, shells, orange-brown, soft, moist; fine SAND and silt, little clay, trace shell fragments, orange-brown, medium dense, moist
39						
40	S20	1.5/2.0 75%	9 15 15 13		0.2/0.2	SAME except some silt, gray brown, wet
41						
42	S21	1.5/2.0 75%	10 12 17 15		0.2/0.2	SAME except dense
43						
44	S22	1.6/2.0 80%	12 16 20 20		0.2/0.2	SAME
45						
46	S23	1.6/2.0 80%	15 17 20 22		0.2/0.2	SAME except trace clay, gray-brown to green-gray
47						
48	S24	1.2/2.0 60%	10 22 24 25		0.2/0.2	fine SAND, some shell fragments, little silt, trace clay, green-gray, dense, wet
50	S25	1.3/2.0	9 14		0.2/0.2	SAME except some silt, little shells. Match to Sheet 4

Well Installation Detail

Elevation (ft.): 7.62; 3.62; 1.62; 1.22; -0.38

DRILLING CO.: HARDIN-HUBER, INC.
DRILLER: M. Corcoran
BAKER REP.: D. Martin
WELL/BORING NO.: 76W03
SHEET 3 OF 4

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 76W03

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
						Continued from Sheet _	#1 Quartz sand	
51	S25	65%	14 21					
52	S26	1.6/2.0 80%	11 26 20 38		0.2/0.2	fine SAND, little silt, trace shell fragments green-gray, dense wet	Bottom of screen 52.9	-14.28
53								
54	S27	1.4/2.0 70%	19 26 23 20		0.2/0.2	SAME except some silt	Bottom of PVC 54.0	-15.38
55								16.38
6						Boring terminated at 55' bgs		
7								
8								
9								
0								
1								
2								
3								
4								
5								
6								
7								
8								
9								
0						Match to Sheet _		

DRILLING CO.: HARDIN-HUBER, INC.
DRILLER: M. Corron
BAKER REP.: D. Martin
WELL/BORING NO.: 76W03
SHEET 4 OF 4

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 7GW04

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7
COORDINATES: NORTH: 34440458 EAST: 2560235.21
ELEVATIONS: SURFACE: 42.71

RIG: Mobile B-80

	SPLIT SPOON	AUGERS	SURFACE CASING	REAMING TOOL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	1 3/8	4-1/4" ID	—	—	9-11-94	23'	Clear, 80°	—
LENGTH	2.0'	5.0'	—	--	9-19-94	53'	Sunny, pthy cloudy 80°	~37'
TYPE	Std.	HSA	—	-				
HAMMER WT.	140#	--	--	--				
FALL	30"	--	--	--				

REMARKS:

SAMPLE TYPE
S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

Well Information	Diam.	Type	Top Depth (ft.)	Bottom Depth (ft.)
Well Riser	2"	Sch. 40 PVC, Threaded		36.9
Well Screen	2"	No. 10 Slot Sch. 40 PVC, Threaded	36.9	50.9

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
1	A-N					TOPSOIL, GRASS, MOIST		
2	S1	1.4/2.0 70%	8 8 6 7		0.2/0.2	CLAYEY SILT, little sand, trace roots, orangish brown, very stiff, dry		40.71
3						Fine to coarse SAND, some clayey silt, trace roots, orangish brown, medium dense, dry	2" diameter PVC riser	
4	S2	2.0/2.0 100%	3 4 8 5		0.2/0.2	medium SAND, trace silt, orangish brown, medium dense, damp	cement bentonite grout	
6	S3	1.6/2.0 80%	2 4 4 7		0.2/0.2	medium to coarse SAND, trace fine gravel, orangish brown to yellowish brown, loose, damp		
8	S4	1.4/2.0 70%	4 5 5 4		0.2/0.2	fine to coarse SAND, trace silt, yellowish brown, loose, damp	10" ϕ STEEL CASING	33.71
10	S5	1.4/2.0 70%	2 3 6 5		0.2/0.2	SILTY SAND, yellowish brown, loose, damp		

Match to Sheet 2

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: MGTaube
DRILLER: M. Corron WELL/BORING NO.: 7GW04 SHEET 1 OF 4

Baker

Baker Environmental, Inc.

WELL/BORING NO.: 7GW04

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319

SITE/AREA:

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
						Continued from Sheet 1		
11								
12	S6	1.4/2.0 70%	3 3 3 3		0.2 / 0.2	SILTY SAND, yellowish brown, loose, damp; SANDY SILT to silt little sand, little clay, yellowish brown, loose, damp	10" ID STEEL CASING	30.71
13								29.71
14	S7	1.0/2.0 50%	1 1 1 3		0.2 / 0.2	SILT, some fine to coarse shells, portion of shells cemented nodules, light brown, loose, moist		
15								27.71
16	S8	0.8/2.0 40%	WOH 1.5 1		0.2 / 0.2	fine to coarse SHELLS, portion cemented, some clayey silt, light brown, wet	cement-bentonite grout	
17								25.71
18	S9	2.0/2.0 100%	1 2 2 3		0.2 / 0.2	CLAYEY SILT, trace fine shells, brown with orange laminations, soft, moist		
19								
20	S10	2.0/2.0 100%	2 3 4 5		0.2 / 0.2	CLAYEY SILT, trace sand, light brown with orange lamination, medium stiff, moist to damp; SILTY CLAY, trace sand, dark grey, stiff, damp to moist	Top of Bentonite slurry ↳ 21'	22.71
21								
22	S11	2.0/2.0 100%	3 3 5 7		0.2 / 0.2	SILTY CLAY, trace silty sand layers, dark greenish grey, medium stiff, damp		
23								
24	S12	2.0/2.0 100%	3 4 4 8		0.2 / 0.2	SILTY CLAY, trace fine sand and laminations, dark greenish grey, medium stiff, damp to moist		
25								
26	S13	2.0/2.0 100%	7 6 6 7		0.2 / 0.2	SAME [illegible]		
27								
28	S14	2.0/2.0 100%	5 7 13 17		0.2 / 0.2	SILTY CLAY little to some fine shell fragments, trace fine sand, dark greenish grey, very stiff, damp to moist		
29								
30	S15	2.0/2.0	6 9		0.2 / 0.2	SILTY CLAY, some fine to coarse shell fragments, portion cemented		

Match to Sheet 3

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: N.G. Tonne

DRILLER: M. Corran WELL/BORING NO.: 7GW04 SHEET 2 OF 4

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 7GW04

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA:

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
31		100%	11 11			nodules, trace fine sand, grey, very stiff, moist (Continued from Sheet 2)	Bentonite	
32–33	S16	2.0/2.0 100%	6 10 11 16		0.2/0.2	SILTY CLAY, trace to some shell fragments, calcareous cemented nodules, trace sand, grey to dark greenish grey, very stiff, moist to wet to damp	Top of Sand 33'	▽
34–35	S17	2.0/2.0 100%	6 9 10 13		0.2/0.2	SAME, greenish grey, very stiff, wet with damp layers		
37	S18	2.0/2.0 100%	6 5 9 12		0.2/0.2	SILTY CLAY, little fine shell, little sand, greenish grey, stiff, wet with damp layers	Top of Screen 36.9'	5.71
38–39	S19	2.0/2.0 100%	5 6 8 12		0.2/0.2	fine SILTY SAND, some clay, little fine shells, dark greenish grey, stiff, moist to wet		3.71
40–41	S20	2.0/2.0 100%	7 5 7 10		0.2/0.2	fine SAND, little fine to coarse sand, portion cemented, little silt, dark grey, medium dense, moist to wet		
42–43	S21	2.0/2.0 100%	13 11 10 10		0.2/0.2	SAME, dark greenish grey, medium dense, wet		
44–45	S22	2.0/2.0 100%	8 7 9 16		0.2/0.2	SAME (no cementation)		
46–47	S23	2.0/2.0 100%	12 13 12 19		0.2/0.2	SAME (no cementation)		
48	S24	2.0/2.0 100%	9 12 14 18		0.2/0.2	fine SAND, little silt, trace fine to medium shells, dark greenish grey, medium dense, wet		
50	S25	1.5/2.0	5 10		0.2/0.2	SAME		

Match to Sheet

DRILLING CO.: HARDIN-HUBER, INC.
DRILLER: M. Corron
BAKER REP.: MG Tauce
WELL/BORING NO.: 7GW04 SHEET 3 OF 4

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 7GW04

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA:

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
						Continued from Sheet 3		
51		75%	14 17				Bottom of screen 50.9	
52	S26	2.0 / 2.0	9 10		0.2 /	fine SAND, little silt, trace to little fine to coarse shells, dark greenish grey, dense, wet	#1 Quartz sand	
53		100%	21 26		0.2		Bottom of well 52'	PVC
4						Borehole terminated at 53' bgs		
5								
6								
7								
8								
9								
0								
1								
2								
3								
4								
5								
6								
7								
8								
9								
0						Match to Sheet		

DRILLING CO.: HARDIN-HUBER, INC.
DRILLER: N Carron

BAKER REP.: NGTaube
WELL/BORING NO.: 7GW04 SHEET 4 OF 4

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 7SB02

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7
COORDINATES: NORTH: 344725.91, EAST: 2560338.94
SURFACE ELEVATION: 33.24

RIG: Mobile B-57 ATV	SPLIT SPOON	AUGERS	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	1 3/8	4¼ ID	7-26-94	61	Hot hazy, humid 90°F	17.5
LENGTH	2.0	5.0				
TYPE	STD	HSA				
HAMMER WT.	140#	--				
FALL	30"	--				

REMARKS: * = 3" ID split spoon

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
1	A-N						
2	S1	NA	NA	7SB02-01 7SB02-01D	0.2/0.2	Coarse to fine SAND, little gravel trace silt, dark brown, damp	
3							
4	S2	1.0/2.0 50%	4 5 6 7	7SB02-02	0.2/0.2	fine SAND, trace silt, light yellow brown, medium dense, damp	
5							
6	S3	1.2/2.0 60%	4 4 6 5		0.2/0.2		
7						6.5 silty CLAY, little sand, brown and gray mottled, stiff moist	26.74'
8	S4	2.0/2.0 100%	3* 6 8 11	7SB02-04	0.2/0.2	same	
9							
10	S5	2.0/2.0	2* 4		0.2/0.2	silty CLAY alternating within layers of clayey silt little sand, brown w/ gray mottling, medium stiff, moist	

Match to Sheet 2

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube
DRILLER: K. Callender BORING NO.: 7SB02 SHEET 1 OF 4

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 7SB02

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
11		100%	4 5			Continued from Sheet 1 — 11.0	22.24
12 13	S6	2.0/2.0 100%	3* 5 5 9		0.2/0.2	clayey SILT, little sand, brown to green gray, medium stiff, moist	
14 15	S7	2.0/2.0 100%	2* 6 5 8		0.2/0.2	Same except green gray, stiff	
16 17	S8	2.0/2.0 100%	3* 4 5 8	7SB02-08	0.2/0.2	Same except trace shell fragments, medium stiff	
17.5						17.5	15.74
18 19	S9	2.0/2.0 100%	10* 13 15 17		0.2/0.2	SHELL FRAGMENTS, little sand, silt, trace clay, yellow brown, medium dense, wet	
20 21	S10	2.0/2.0 100%	11 5 10 6		0.2/0.2	same except light brownish gray, loose	
22 23	S11	2.0/2.0 100%	6 7 11 14		0.2/0.2	Same except light yellow brown — 23.0	10.24
24 25	S12	2.0/2.0 100%	6 8 11 15		0.2/0.2	sandy CLAY, little shell fragments, silt, greenish gray stiff, wet — 25.0	8.24
26 27	S13	2.0/2.0 100%	4 8 12 10		0.2/0.2	medium to fine SAND, little shell fragments, clay, trace silt, dark green, medium dense, wet	
28 29	S14	2.0/2.0 100%	3 8 6 8		0.2/0.2	Clayey SAND, some shell fragments, trace silt, dark green, medium dense, wet	
30	S15	2.0/2.0	6 10		0.2/0.2	coarse to fine SAND, little shell fragments, trace, silt, clay, Match to Sheet 3	

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Toube

DRILLER: K. Callender BORING NO.: 7SB02 SHEET 2 OF 4

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 7SB02

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7

SAMPLE TYPE
S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston
N = No Sample

ACRONYMS
BG = Background PID = Photoionization Detector
HSA = Hollow Stem Augers ppm = parts per million
ID = Inside Diameter SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
31		100%	11 7			Continued from Sheet 2 dark green, medium dense, wet	
32 33	S16	2.0/2.0 100%	10 13 13 25		0.2/0.2	Coarse to fine SAND, some shell fragments trace silt, dark green, medium dense, wet	
34 35	S17	2.0/2.0 100%	7 13 20 30		0.2/0.2	Same except and shell fragments, trace clay, dense	
36 37	S18	2.0/2.0 100%	7 11 14 15		0.2/0.2	Same except, some shells, little clay medium dense	
38 39	S19	2.0/2.0 100%	3 4 15 22		0.2/0.2	Same except fine SAND, little shells trace clay	
40 41	S20	2.0/2.0 100%	9 12 14 24		0.2/0.2	Same	
42 43	S21	2.0/2.0 100%	9 12 20 21		0.2/0.2	Same except dense	
44 45	S22	2.0/2.0 100%	5 9 12 18		0.2/0.2	Same except medium dense	
46 47	S23	2.0/2.0 100%	5 9 18 21		0.2/0.2	Same except, little silt, trace shells	
48 49	S24	1.5/2.0 75%	6 10 5 18		0.2/0.2	Same	
50	S25		12 16		0.2/0.2	fine SAND, some shell fragments, little silt trace clay, dark green, Match to Sheet 4	

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube

DRILLER: K. Collender BORING NO.: 7SB02 SHEET 3 OF 4

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 7SB02

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
51	S25	100%	16 14			Continued from Sheet 3 dense, wet	
52 53	S26	2.0/2.0 100%	6 9 10 15		0.2/0.2	fine SAND, little shell fragments, little silt, clay, dark green, medium dense, wet.	
54 55	S27	2.0/2.0 100%	6 3 6 9		0.2/0.2	Medium to fine SAND, little shell fragments, little clay, silt, dark green, loose, wet	
56 57	S28	2.0/2.0 100%	3 4 5 6		0.2/0.2	SAME	
58 59	S29	2.0/2.0 100%	5 5 7 8		0.2/0.2	silty SAND, little clay, trace shell fragments, dark green, loose, wet	
60 61	S30	2.0/2.0 100%	3 7 9 21		0.2/0.2	fine SAND, some silt, little clay, trace shell fragments, dark green, medium dense, wet. 61.0	27.76
2 3 4 5 6 7 8 9 0						Boring Terminated @ 61' bgs	

Match to Sheet ___

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube

DRILLER: K. Callender BORING NO.: 7SB02 SHEET 4 OF 4

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 7SB/HP03

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7
COORDINATES: NORTH: 343909.59, EAST: 2559629.29
SURFACE ELEVATION: 26.79

RIG: Mobile B-61	SPLIT SPOON	AUGERS	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	1 3/8 ID	4 1/4 ID	7/11/97	25	Sunny 75°-95°	21'
LENGTH	2.0	5.0				
TYPE	STD	HSA				
HAMMER WT.	140#	--				
FALL	30"	--				

REMARKS:

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
1	S-1	NA	NA	7SB03-01	0.2/0.2	Silty CLAY, some sand, reddish brown	
2	H-N						
3							23.79
4	S2	1.7/2.0 85%	5 5 4 5		0.2/0.3	Coarse to fine SAND, some silt, trace clay, reddish brown, loose, moist	22.59
5						CLAY, little silt, trace fine sand, trace sea shell fragments, red-brown, soft, moist	
6	S3	1.5/2.0 75%	2 3 2 4		0.2/0.2	SAME	
7							19.79
8	S4	0.5/2.0 25%	2 3 3 3		0.2/0.2	coarse to fine SAND, little silt, trace clay, fine gravel, sea shell fragments, brown, loose, moist	
9							
10	S5	1.9/2.0 95%	3 5 4 5	7SB03-05	0.2/0.2	coarse to fine SAND, trace fine gravel, silt, clay, brown loose, moist	

Match to Sheet 2

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: DJ Martin
DRILLER: K. Callender BORING NO.: 7SB/HP03 SHEET 1 OF 2

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 7SB/HP03

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
11						Continued from Sheet 1	
12	S6	2.0/2.0 100%	2 3 3 4		0.2/0.2	SAME	
13							
14	S7	2.0/2.0 100%	3 4 4 4		0.2/0.2	SAME	
15							
16	S8	1.8/2.0 90%	5 4 5 5		0.2/0.2	SAME	
17							
18	S9	1.8/2.0 90%	5 5 5 7		0.2/0.2	SAME	8.99
						CLAY and SILT, trace fine sand, brown, medium stiff, moist	8.59
19						same, but no fine sand	7.79
20	S10	0.6/2.0 30%	5 5 5 5	7SB03-10	0.3/0.2	SILT and CLAY, 40% sea shell fragments, trace fine sand, fine gravel, sand, trace organic material, green, grey, medium stiff, moist	
21							5.79
22	S11	1.8/2.0 90%	3 3 6 7		0.2/0.2	fine SAND, some silt, trace clay, 70% sea shell fragments, loose, wet (water at 21')	
23							
24	S12	1.6/2.0 80%	4 3 5 7		0.2/0.2	SAME	
25							
26						Boring terminated at 25' bgs. Note: installed 5' temporary screen. Collect 7HP03-01.	
27							
28							
29							
30						Match to Sheet 3	

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: DJMartin

DRILLER: K. Callender BORING NO.: 7SB/HP03 SHEET 2 OF 2

Baker
Baker Environmental, Inc.

WELL/BORING NO.: 7HP/SB04

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7
COORDINATES: NORTH: 344296.39, EAST: 2559003.67
ELEVATIONS: SURFACE: 25.53

RIG: Mobile ATV B-57

	SPLIT SPOON	AUGERS	SURFACE CASING	REAMING TOOL	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)		4-1/4" ID			7-23-94	27	Overcast Humid	22
LENGTH	2.0'	5.0'		--			70°F	
TYPE	Std.	HSA						
HAMMER WT.	140#	--	--	--				
FALL	30"	--	--	--				

REMARKS:

SAMPLE TYPE
S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

Well Information	Diam.	Type	Top Depth (ft.)	Bottom Depth (ft.)
Well Riser	2"	Sch. 40 PVC, Threaded		
Well Screen	2"	No. 10 Slot Sch. 40 PVC, Threaded		

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
1	A-N							
2–3	S1	1.0/2.0 50%		7S804-01 7S804-01D	0.2/0.4	FILL- Clayey silt and sand, little (poss.) shells, hard, brown, damp		
4–5	S2	1.0/2.0 50%	5 11 15 16		0.2/0.2	FILL- Medium to fine Sand and silt, (poss.) orange brown, medium dense, damp		
6–7	S3	1.2/2.0 60%	2 11 15 15		0.2/0.2	Same		
8–9	S4	1.1/2.0 55%	6 20 27 19		0.2/0.8	Same except dense, and gray		
10	S5	1.2/2.0 60%	6 11	7S804-05	0.2/0.2	FILL- Coarse to fine Sand, trace gravel, (poss.) silt, clay, wood leaves, roots, brown medium dense, damp Match to Sheet 2		

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube
DRILLER: K. Callender WELL/BORING NO.: 7HP/SB04 SHEET 1 OF 2

Baker

Baker Environmental, Inc.

WELL/BORING NO.: 7HP/SB04

TEST BORING AND WELL CONSTRUCTION RECORD

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319

SITE/AREA: Site 7

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp	Visual Description/Comments	Well Installation Detail	Elevation (ft.)
			10 11			Continued from Sheet 1		
11							11.0	14.53
12	S6	2.0/2.0 100%	8 7 5 7		0.2/0.3	Coarse to fine SAND, trace silt, olive-brown, medium dense, moist		
13							13.0	12.53
14	S7	1.2/2.0 60%	3 4 8 9	7SB04-07	0.2/0.4	silt, CLAY, trace fine sand, root material, olive brown w/red mottling, stiff, moist		
15								
16	S8	1.1/2.0 55%	2 3 7 8		0.2/0.2	Same except brown and gray mottled, damp		
17							17.0	8.53
18	S9	1.7/2.0 85%	4 6 10 11	7SB04-09	0.2/0.4	SILT, little fine sand, clay, blue-gray and olive mottled, very stiff, damp		
19							19.0	6.53
20	S10	1.7/2.0 85%	4 5 5 4	7SB04-10	0.2/0.2	Coarse to fine SAND, and shell fragments, little clay, trace silt, yellow-brown to greenish brown, loose, moist		
21							Top of Piezometer screen	
22	S11	1.6/2.0 80%	4 5 7 5		0.2/0.2	Same except medium dense, moist to wet, greenish brown	22.0	3.53
23								
24	S12	2.0/2.0 100%	2 5 10 12		0.2/0.2	Same except wet		
25								
26	S13	2.0/2.0 100%	5 10 7 8		0.2/0.2	Coarse to fine SAND and shell fragments, little clay, trace silt, greenish-brown, medium dense wet		
27							27.0	-1.47
28						Boring Terminated @27'		
29						Note: Temporary Piezometer Installed at 27' w/ 5' screen. Collected 7HP04-01		
30						Match to Sheet 3		

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube

DRILLER: K. Callender WELL/BORING NO.: 7HP/SB04 SHEET 2 OF 2

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 7HP/SB05

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7
COORDINATES: NORTH: 344456.18, EAST: 2559532.06
SURFACE ELEVATION: 45.75

RIG: Mobile B-57 ATV	SPLIT SPOON	AUGERS	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	1 3/8", 3"	4¼ ID	7-24-94	35	overcast, breezy, humid 90°F	31'
LENGTH	2.0	5.0				
TYPE	STD	HSA				
HAMMER WT.	140	--				
FALL	30*	--				

REMARKS: * = 3" diameter splitspoon; Sample S2 collected w/ stainless steel spoon

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
NA - Not Applicable
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
						GRASS TOPSOIL 0.2	45.55
1	A-N	NA	NA	NA	NA		
2	S1			7SB05-01 7SB05-01D	0.2 / 0.2	coarse to fine SAND, trace silt, clay root material, brown, damp	
3		NA	NA				
4	S2	0.4 / 2.0	8 13		0.2 / 0.2	Same except medium to fine SAND, some silt, medium dense	
5		20%	17 12				
6	S3	1.0 / 2.0	2 5		0.2 / 0.2	Same except coarse to fine sand, loose	
7		50%	4 10				
8	S4	1.3 / 2.0	8 10	7SB05-04	0.2 / 0.2	Same except trace wood fragments, red-brown to dark brown	
9		65%	10 10				
10	S5	0.2 / 2.0	5* 5		0.2 / 5.0	coarse to fine SAND, trace med.-fine gravel, silt, wood fragments, orange-brown, turpentine order	
		10%	13 20			Match to Sheet 2	

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube
DRILLER: K. Callender BORING NO.: 7HP/SB05 SHEET 1 OF 3

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 7HP/SB05

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN
SITE/AREA: Site 7
CTO NO.: 0319

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
11						Continued from Sheet 1	
12	S6	0.4/2.0 20%	4* 8 14 18		0.2/3.0	coarse to fine SAND, trace silt, clay fine gravel, wood fragments, orange-brown, medium dense, damp, turpentine odor	
13							
14	S7	1.5/2.0 75%	8* 9 11 13	7SB05-07	0.2/0.2	Same except no odor	
15						15.0	30.75
16	S8	1.3/2.0 65%	11* 14 21 26		0.2/0.2	sandy CLAY, little silt, trace wood fragments, roots, peat, yellow brown to reddish brown, medium dense, damp	
17							
18	S9	0.5/2.0 25%	5* 16 20 21		0.2/0.2	Same	
19							
20	S10	1.7/2.0 85%	9* 12 16 20		0.2/0.2	silty CLAY, some fine sand, trace root material, brown, medium dense, damp	
21						21.0	24.75
22	S11	1.5/2.0 75%	5* 6 9 13		0.2/0.2	SILT, some fine sand, little clay, trace root material, yellow to olive to brown with red staining, stiff, damp	
23							
24	S12	2.0/2.0 100%	3* 5 7 9		0.2/0.2	Same except trace peat, olive-brown	
25							
26	S13	0.4/2.0 20%	4 4 6 9		0.2/0.2	Clayey SILT, with medium to fine sand laminea, olive-brown and reddish brown, medium stiff, damp	
27						27.0	18.75
28	S14	2.0/2.0 100%	4 6 7 9		0.2/0.2	silty CLAY, little fine sand, trace shell fragments	
29						29.0	16.75
30	S15	2.0/2.0	6 4	7SB05-15	0.2/0.2	interbedded silt, sand & clay, gray stiff, moist	

Match to Sheet 3

DRILLING CO.: HARDIN-HUBER, INC.
BAKER REP.: M. Taube
DRILLER: K. Callender
BORING NO.: 7HP/SB05
SHEET 2 OF 3

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 7HP/SB05

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
						Continued from Sheet ___ 30.5	15.25
31	S15	100%	12 20	7SB05 -15		course to fine SAND, and shell fragments, little clay trace silt, gray, med. dense, moist	14.75
32	S16	2.0/2.0 100%	11 12 10 12		0.2/0.2	SHELL FRAGMENTS, some sand, trace silt, clay, light brownish gray, medium dense, wet	
33							
34	S17	2.0/2.0 100%	4 8 6 5		0.2/0.2	course to fine SAND, and shell fragments, little clay, trace silt, light brownish olive-gray, loose, wet	
35							
6						Boring Terminated at 35' bgs	
7							
8						Note: Temporary Piezometer w/10' screen installed to depth of 35' bgs.	
9							
0						Collected 7HP05-01	
1							
2							
3							
4							
5							
6							
7							
8							
9							
0						Match to Sheet ___	

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube

DRILLER: K. Callender BORING NO.: 7HP/SB05 SHEET 3 OF 3

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 7HP/SB06

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7
COORDINATES: NORTH: 344461.14, EAST: 2560480.04
SURFACE ELEVATION: 38.8

RIG: Mobile B-57 ATV	SPLIT SPOON	AUGERS	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	1 3/8 & 3	4¼ ID	7-24-94	17.0	Partly Sunny 90°F	12
LENGTH	2.0	5.0				
TYPE	STD	HSA				
HAMMER WT.	140#	--				
FALL	30"	--				

REMARKS: * = 3 inch diameter split spoon.

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
						GRASS TOPSOIL 0.2	38.6
1	A-N						
2	S1	NA	NA	7SB06-01	0.2 / 0.6	Coarse to fine SAND, trace silt, clay, brown, dense, damp	
3							
4	S2	1.0 / 2.0	6 9 7 6		0.2 / 0.2	Same except trace gravel, orange brown, medium dense	
5							
6	S3	2.0 / 2.0	4 7 7 6		0.2 / 0.6	fine SAND, trace silt, orange, medium dense, damp.	
7							
8	S4	1.5 / 2.0	5 6 6 5		0.2 / 0.2	Same except little silt, orange to orange brown w/ gray mottling, medium dense damp	
9						9.0	29.8
10	S5	1.4 / 2.0	2 5	7SB06-05	0.2 / 0.2	Silty CLAY, little fine sand, brown and gray mottled, stiff damp	
						Match to Sheet 2	

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube
DRILLER: K. Callender BORING NO.: 7HP/SB06 SHEET 1 OF 2

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 7HP/SB06

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
11		70%	5 5			Continued from Sheet 1	
12	S6	2.0* / 2.0	1 3 4	7SB06-06	0.2 / 0.2	Silty CLAY and shell fragments, light brown, soft moist 12.0	26.8
13		100%	3			SHELL FRAGMENTS, little sand, silt, trace clay, gray, loose, wet 13.0	25.8
14	S7	2.0 / 2.0	4 4 4		0.2 / 0.2	Clayey SILT, little fine sand, dark greenish gray, stiff moist	
15		100%	7				
16	S8	2.0 / 2.0	2 4 4		0.2 / 0.2	same	
17		100%	8			17.0	21.8
18						Boring Terminated at 17'	
19							
20						Note: Temporary piezometer w/10 ft screen installed at 17.0' bgs. Sample 7HP06-01 collected	
21							
22							
23							
24							
25							
26							
27							
28							
29							
30						Match to Sheet 3	

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube

DRILLER: K. Callender BORING NO.: 7HP/SB06 SHEET 2 OF 2

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 7HP/5B07

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN
CTO NO.: 0319
SITE/AREA: Site 7
COORDINATES: NORTH: 344125.75, EAST: 2559269.26
SURFACE ELEVATION: 18.65

RIG: Mobile B-57 ATV	SPLIT SPOON	AUGERS	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	1 3/8 & 3.0	4¼ ID	7-23 94	19.0	Overcast Humid 90°F	14'
LENGTH	2.0	5.0	7-25-94	24.0	Clear Humid 95°F	
TYPE	STD	HSA				
HAMMER WT.	140#	--				
FALL	30"	--				

REMARKS: * 3" diameter split spoon

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
NA = Not Applicable
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
						GRASS, TOP SOIL 0.2	18.45
1	A-N						
2	S1	NA	NA	7SB07-01 7SB07-01D	0.2/0.2	Coarse to fine SAND, trace silt, cinders root material, brown, damp FILL (POSS.)	
3							
4	S2	0.2/2.0 10%	4 7 9 2		0.2/0.2	silty SAND, little clay, organic material, brown, medium dense, damp. FILL (POSS.)	
5							
6	S3	0.1/2.0 5%	5 5 6 10		0.2/0.2	Silty CLAY, light brown to orange brown, stiff, damp FILL (POSS.)	
7							
8	S4	1.2/2.0 60%	2 5 9 12		0.2/0.2	Silty CLAY and silty sand, brown stiff, damp, FILL (POSS.)	
9							
10	S5	1.8/2.0	6* 12	7SB07-05	0.2/0.2	silty SAND, some clay, brown, medium dense, damp, FILL (POSS.) Match to Sheet 2	

DRILLING CO.: HARDIN-HUBER, INC.
BAKER REP.: M. Taube
DRILLER: K. Collender
BORING NO.: 7HP/5B07
SHEET 1 OF 3

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 7HP/SB07

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7

SAMPLE TYPE
S = Split Spoon, A = Auger, T = Shelby Tube, W = Wash, R = Air Rotary, C = Core, D = Denison, P = Piston, N = No Sample

ACRONYMS
BG = Background, PID = Photoionization Detector, HSA = Hollow Stem Augers, ppm = parts per million, ID = Inside Diameter, SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5'), WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
11		90%	16 24			Continued from Sheet 1 — 11.0	7.65
12 13	S6	2.0/2.0 100%	5 10 10 12	7S807 -06	0.2/0.2	coarse to fine SAND, some shell fragments, trace silt, clay, brown, medium dense, moist.	
14 15	S7	2.0/2.0 100%	3 3 3 4		0.2/0.2	Same except and shell fragments, little silt, loose, moist to wet, greenish brown — 14.0	4.65
16 17	S8	2.0/2.0 100%	3 4 7 9		0.2/0.2	same except wet, medium dense	
18 19	S9	2.0/2.0 100%	5 7 8 12		0.2/0.2	same except some shell fragments, brown and dark green	
20 21	S10	1.0/2.0 50%	8 11 11 13		0.2/0.2	Medium to fine SAND, little shell fragments, silt, olive-brown, medium dense, wet	
22 23	S11	2.0/2.0 100%	6 10 12 15		0.2/0.6	same except trace shell fragments	
24 25	S12	1.3/2.0 65%	4 8 10 10	7S807 -12	0.2/0.3	same except trace clay	
26 27	S13	1.5/2.0 75%	3 5 7 10		0.2/0.4	Same except coarse to fine sand	
28 29	S14	1.3/2.0 65%	6 7 6 10		0.2/0.4	medium to fine SAND, little silt, shell fragments, trace clay, olive-brown, medium dense wet	
30	S15	A-N	NA	NA	NA	Match to Sheet 3	

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube

DRILLER: K. Callender BORING NO.: 7HP/SB07 SHEET 2 OF 3

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 7HP/SB07

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
31						Continued from Sheet 2	
32–33	S16	A-N	NA	NA	NA	Note: collected HydroPunch, sample from 29.5' to 33' bgs. Augered to 33' bgs and resumed split spoon sampling	
34–35	S17	2.0/2.0 100%	17 20 15 12		0.2/0.2	medium to fine SAND, some shell fragments, little silt, trace clay, olive, dense, wet	
36–37	S18	2.0/2.0 100%	6 8 5 6		0.2/0.2	same	
38–39	S19	2.0/2.0 100%	4 5 5 8		0.2/0.2	silty SAND, little shell fragments, clay, medium dense, greenish-gray same 39.0	-20.35
40–41	S20	2.0/2.0 100%	4 5 6 7		0.2/0.2	sandy SILT, little clay, trace shell fragments, greenish gray, stiff, wet	
42–43	S21	2.0/2.0 100%	10/6"		0.2/0.2	same 43.0	-24.35
44–0						Boring terminated @ 43' Note: Collected HydroPunch Sample from 43.0 to 45.3' bgs. Collected samples 7HP07-01 and 7HP07-02 Match to Sheet ___	

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube
DRILLER: K. Callender BORING NO.: 7HP/SB07 SHEET 3 OF 3

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 7HP/SB08

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7
COORDINATES: NORTH: 344598.92, EAST: 2558417.51
SURFACE ELEVATION: 47.72

RIG: Mobile B-80	SPLIT SPOON	AUGERS	DATE	PROGRESS (FT.)	WEATHER	WATER DEPTH (FT.)
SIZE (DIAM.)	1 3/8	4 1/4	10-21-94	36'	Partly Cloudy 65°F	26'
LENGTH	2.0	5.0				
TYPE	STD	HSA				
HAMMER WT.	140#	--				
FALL	30"	--				

REMARKS:

SAMPLE TYPE
S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS
BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
1	S1	1.2/2.0 60%	6 2 11 23		0.3/0.3	GRASS TOPSOIL, coarse to fine SAND, little silt, clay, trace rock fragments, concrete fragments, brown, medium dense, damp	
2						2.0	45.72
3	S2	0.7/2.0 35%	8 10 10 9		0.3/0.3	silty CLAY, some coarse to fine sand, trace coarse gravel, shell fragments, brown, very stiff, damp	
4							
5	S3	1.0/2.0 50%	6 7 7 12		0.3/0.3	same except stiff	
						5.0	42.72
6						coarse to fine SAND, trace silt, clay, orange brown, medium dense, moist to wet (perched water zone)	
7							
8	A-N						
9							
10						10.0	37.72
	S4					SILT and clay interlaminated	

Match to Sheet 2

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube
DRILLER: M. Corron BORING NO.: 7HP/SB08 SHEET 1 OF 3

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 7HP/SB08

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7

SAMPLE TYPE
S = Split Spoon, A = Auger
T = Shelby Tube, W = Wash
R = Air Rotary, C = Core
D = Denison, P = Piston
N = No Sample

ACRONYMS
BG = Background, PID = Photoionization Detector
HSA = Hollow Stem Augers, ppm = parts per million
ID = Inside Diameter, SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
11–12	S4	1.2/2.0 60%	4 4 5 5		0.3/0.3	Continued from Sheet 1 SILT and clay interlaminated, little sand, trace tree structures, orange brown w/gray mottling, stiff, moist to damp	
13–15	A-N						
16–17	S5	1.7/2.0 85%	2 3 4 6		0.3/0.3	CLAY, little silt (silt also laminated), gray with orange staining, medium stiff, moist to damp.	
18–20	A-N						
21–22	S6	2.0/2.0 100%	2 3 3 3		0.3/0.3	SAME except trace orange mineralization/oxidation,	
23–25	A-N						
26	S7	2.0/2.0 100%	2 3 3 4		0.3/0.3	Same except moist to wet	
						26.5	21.22
27–30	A-N					CLAY, little silt, dark gray, medium stiff, wet. Note: 0.2' dark gray silt lense at 26.5' bgs. Match to Sheet 3	

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube
DRILLER: M. Corron BORING NO.: 7HP/SB08 SHEET 2 OF 3

Baker
Baker Environmental, Inc.

TEST BORING RECORD

BORING NO.: 7HP/SB08

INSTALLATION: NAVAL WEAPONS STATION YORKTOWN CTO NO.: 0319
SITE/AREA: Site 7

SAMPLE TYPE

S = Split Spoon
T = Shelby Tube
R = Air Rotary
D = Denison
A = Auger
W = Wash
C = Core
P = Piston
N = No Sample

ACRONYMS

BG = Background
HSA = Hollow Stem Augers
ID = Inside Diameter
PID = Photoionization Detector
ppm = parts per million
SPT = Standard Penetration Test (ASTM D-1586)(Blows/0.5')
WD = While Drilling

Depth (ft.)	Samp. Type and No.	Samp. Rec. ft./%	SPT	Lab Samp. Desig.	PID (ppm) BG/Samp.	Visual Description/Comments	Elevation (ft.)
						Continued from Sheet ___	
						CLAY, little silt, dark gray, stiff, wet 31.0	16.72
31	S8	2.0/2.0 100%	7 9 10 17		0.3/0.3	fine SAND little silt, little coarse to fine shell fragments, trace clay, light gray, medium dense, wet.	
32							
33	S9	2.0/2.0 100%	10 15 17 19		0.3/0.3	same except trace shell fragments	
34							
35	S10	2.0/2.0 100%	4 7 13 15		0.4/0.4	fine SAND, little silt, trace shell fragments, clay, light brown, medium dense, wet 36.0	11.72
36							
7						Boring Terminated at 36 bgs	
8						Note: Temporary Piezometer w/10' screen installed at 36 ft bgs. Sample 7HP08-01 collected	
9							
0							
1							
2							
3							
4							
5							
6							
7							
8							
9							
0						Match to Sheet ___	

DRILLING CO.: HARDIN-HUBER, INC. BAKER REP.: M. Taube

DRILLER: M. Corron BORING NO.: 7HP/SB08 SHEET 3 OF 3

BAKER

TEST BORING LOG

BOREHOLE NUMBER: 11-SB12

SHEET: 1 OF: 1

PROJECT NUMBER: 62470-0354
PROJECT NAME: YORKTOWN WEAPONS STATION
LOCATION: YORKTOWN, VIRGINIA
DRILLING COMPANY: PARRATT-WOLFF, INC.
RIG TYPE & NUMBER: TRUCK B-53
DRILLING METHOD: HOLLOW STEM AUGERS
WEATHER: CLEAR, COLD
GEOLOGIST: MARLENE IVESTER
ENV. SCIENTIST:
DATE BEGUN: 11/14/96 DATE COMPLETED: 11/14/96

GROUND SURFACE ELEVATION: 39.6
TOTAL DEPTH: 4 FT

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/6"	RECOVERY	PID (PPM) BG	PID (PPM) PS	LITHOLOGY	DESCRIPTION	DEPTH
39.00	0.0		S-1	SS	2 8 8 12	1.5	0	0		SAND -medium and SILT: 8" black fly ash matreial brown to orange, moist, loose	0.0
38.00	1.0										1.0
37.00	2.0		S-2	SS	11 9 12 13	1.7	0	0			2.0
36.00	3.0										3.0
35.00	4.0									Water at 4' bgs END OF BORING AT 4' BGS	4.0
34.00	5.0										5.0
33.00	6.0										6.0
32.00	7.0										7.0
31.00	8.0										8.0
30.00	9.0										9.0
29.00	10.0										10.0
28.00	11.0										11.0
27.00	12.0										12.0
26.00	13.0										13.0
25.00	14.0										14.0
24.00	15.0										15.0
23.00	16.0										16.0
22.00	17.0										17.0
21.00	18.0										18.0
20.00	19.0										19.0
19.00	20.0										20.0
18.00	21.0										21.0
17.00	22.0										22.0
16.00	23.0										23.0
15.00	24.0										24.0
14.00	25.0										25.0
13.00	26.0										26.0
12.00	27.0										27.0
	28.0										28.0

BAKER

TEST BORING LOG

BOREHOLE NUMBER: 11-SB13

SHEET: 1 OF: 1

PROJECT NUMBER: 62470-0354
PROJECT NAME: YORKTOWN WEAPONS STATION
LOCATION: YORKTOWN, VIRGINIA
DRILLING COMPANY: PARRATT-WOLFF, INC.
RIG TYPE & NUMBER: TRUCK B-53
DRILLING METHOD: HOLLOW STEM AUGERS
WEATHER: CLEAR, COLD
GEOLOGIST: MARLENE IVESTER
ENV. SCIENTIST:
DATE BEGUN: 11/14/96 DATE COMPLETED: 11/14/96

GROUND SURFACE ELEVATION: 39.6
TOTAL DEPTH: 4 Ft.

SAMPLE NO.	SAMPLE METHOD	BLOWS/6"	RECOVERY	PID (PPM) BG	PID (PPM) PS	DESCRIPTION
S-1	SS	1 7 13 15	1.5	0	0	SAND -medium and SILT: 6" black fly ash matreial brown to orange, moist, loose
S-2	SS	12 10 12 15	1.7	0	0	
						Water at 4' bgs
						END OF BORING AT 4' BGS

BAKER

TEST BORING LOG

BOREHOLE NUMBER: 11-SB14

SHEET: 1 OF: 1

PROJECT NUMBER: 62470-0354
PROJECT NAME: YORKTOWN WEAPONS STATION
LOCATION: YORKTOWN, VIRGINIA
DRILLING COMPANY: PARRATT-WOLFF, INC.
RIG TYPE & NUMBER: TRUCK B-53
DRILLING METHOD: HOLLOW STEM AUGERS
WEATHER: CLEAR, COLD
GEOLOGIST: MARLENE IVESTER
ENV. SCIENTIST:
DATE BEGUN: 11/14/96 DATE COMPLETED: 11/14/96

GROUND SURFACE ELEVATION: 39.8
TOTAL DEPTH: 4 Ft.

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/6"	RECOVERY	PID (PPM) BG	PID (PPM) PS	LITHOLOGY	DESCRIPTION	DEPTH
	0.0										0.0
39.00	1.0		S-1	SS	1 2 2 2	1.8	0	0		SAND -medium and SILT: 6" black fly ash matreial brown to orange, moist, loose	1.0
38.00	2.0										2.0
37.00	3.0		S-2	SS	2 3 4 3	1.8	0	0			3.0
36.00	4.0									Water at 4' bgs END OF BORING AT 4' BGS	4.0
35.00	5.0										5.0
34.00	6.0										6.0
33.00	7.0										7.0
32.00	8.0										8.0
31.00	9.0										9.0
30.00	10.0										10.0
29.00	11.0										11.0
28.00	12.0										12.0
27.00	13.0										13.0
26.00	14.0										14.0
25.00	15.0										15.0
24.00	16.0										16.0
23.00	17.0										17.0
22.00	18.0										18.0
21.00	19.0										19.0
20.00	20.0										20.0
19.00	21.0										21.0
18.00	22.0										22.0
17.00	23.0										23.0
16.00	24.0										24.0
15.00	25.0										25.0
14.00	26.0										26.0
13.00	27.0										27.0
12.00	28.0										28.0

BAKER

TEST BORING LOG

BOREHOLE NUMBER: 11-SB15

SHEET: 1 OF: 1

PROJECT NUMBER: 62470-0354
PROJECT NAME: YORKTOWN WEAPONS STATION
LOCATION: YORKTOWN, VIRGINIA
DRILLING COMPANY: PARRATT-WOLFF, INC.
RIG TYPE & NUMBER: TRUCK B-53
DRILLING METHOD: HOLLOW STEM AUGERS
WEATHER: CLEAR, COLD
GEOLOGIST: MARLENE IVESTER
ENV. SCIENTIST:
DATE BEGUN: 11/14/96 DATE COMPLETED: 11/14/96

GROUND SURFACE ELEVATION: 40.1
TOTAL DEPTH: 6 Ft.

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/6"	RECOVERY	PID (PPM) BG	PID (PPM) PS	LITHOLOGY	DESCRIPTION	DEPTH
40.00	0.0									SAND -medium and SILT:	0.0
39.00	1.0		S-1	SS	1 2 2 2	1.7	0	0		3" black fly ash matreial	1.0
38.00	2.0									brown\orange to gray, moist, loose	2.0
37.00	3.0		S-2	SS	2 3 4 3	1.8	0	0			3.0
36.00	4.0									Water at 4' bgs	4.0
35.00	5.0		S-3	SS	4 4 4 5	1.7	0	0			5.0
34.00	6.0									END OF BORING AT 6' BGS	6.0
33.00	7.0										7.0
32.00	8.0										8.0
31.00	9.0										
30.00	10.0										10.0
29.00	11.0										11.0
28.00	12.0										12.0
27.00	13.0										13.0
26.00	14.0										14.0
25.00	15.0										15.0
24.00	16.0										16.0
23.00	17.0										17.0
22.00	18.0										18.0
21.00	19.0										19.0
20.00	20.0										20.0
19.00	21.0										21.0
18.00	22.0										22.0
17.00	23.0										23.0
16.00	24.0										24.0
15.00	25.0										
14.00	26.0										
13.00	27.0										27.0
12.00	28.0										28.0

BAKER

TEST BORING LOG

BOREHOLE NUMBER: 11-SB16

SHEET: 1 OF: 1

PROJECT NUMBER: 62470-0354
PROJECT NAME: YORKTOWN WEAPONS STATION
LOCATION: YORKTOWN, VIRGINIA
DRILLING COMPANY: PARRATT-WOLFF, INC.
RIG TYPE & NUMBER: TRUCK B-53
DRILLING METHOD: HOLLOW STEM AUGERS
WEATHER: CLEAR, COLD
GEOLOGIST: MARLENE IVESTER
ENV SCIENTIST:
DATE BEGUN: 11/13/96 DATE COMPLETED: 11/13/96

GROUND SURFACE ELEVATION: 40.0
TOTAL DEPTH: 6 Ft.

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO	SAMPLE METHOD	BLOWS/6"	RECOVERY	PID (PPM) BG	PID (PPM) PS	LITHOLOGY	DESCRIPTION	DEPTH
40.00	0.0										0.0
39.00	1.0		S-1	SS	3 11 10 11	1.6	0	0		SAND -medium and SILT: 3" black fly ash matreial brown to geay, moist, loose	1.0
38.00	2.0										2.0
37.00	3.0		S-2	SS	10 8 8 7	1.7	0	0			3.0
36.00	4.0									Water at 4' bgs	4.0
35.00	5.0		S-3	SS	2 4 4 6	1.7	0	0			5.0
34.00	6.0									END OF BORING AT 6' BGS	6.0
33.00	7.0										7.0
32.00	8.0										8.0
31.00	9.0										9.0
30.00	10.0										10.0
29.00	11.0										11.0
28.00	12.0										12.0
27.00	13.0										13.0
26.00	14.0										14.0
25.00	15.0										15.0
24.00	16.0										16.0
23.00	17.0										17.0
22.00	18.0										18.0
21.00	19.0										19.0
20.00	20.0										20.0
19.00	21.0										21.0
18.00	22.0										22.0
17.00	23.0										23.0
16.00	24.0										24.0
15.00	25.0										25.0
14.00	26.0										26.0
13.00	27.0										27.0
12.00	28.0										28.0

BAKER

TEST BORING LOG

BOREHOLE NUMBER: 11-SB17

SHEET: 1 OF: 1

PROJECT NUMBER: 62470-0354
PROJECT NAME: YORKTOWN WEAPONS STATION
LOCATION: YORKTOWN, VIRGINIA
DRILLING COMPANY: PARRATT-WOLFF, INC
RIG TYPE & NUMBER: TRUCK B-53
DRILLING METHOD: HOLLOW STEM AUGERS
WEATHER: CLEAR, COLD
GEOLOGIST: MARLENE IVESTER
ENV. SCIENTIST:
DATE BEGUN: 11/14/96 DATE COMPLETED: 11/14/96

GROUND SURFACE ELEVATION: 40.3
TOTAL DEPTH: 4 Ft.

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/6"	RECOVERY	PID (PPM) BG	PID (PPM) PS	LITHOLOGY	DESCRIPTION	DEPTH
40.00	0.0									SAND -medium and SILT:	0.0
39.00	1.0		S-1	SS	1 2 9 12	1.7	0	0		6" black fly ash matreial	1.0
38.00	2.0									brown to orange, moist, med. dense	2.0
37.00	3.0		S-2	SS	12 13 9 12	1.7	0	0			3.0
36.00	4.0									Water at 4' bgs	4.0
										END OF BORING AT 4' BGS	
35.00	5.0										5.0
34.00	6.0										6.0
33.00	7.0										7.0
32.00	8.0										8.0
31.00	9.0										
30.00	10.0										10.0
29.00	11.0										11.0
28.00	12.0										12.0
27.00	13.0										13.0
26.00	14.0										14.0
25.00	15.0										15.0
24.00	16.0										16.0
23.00	17.0										17.0
22.00	18.0										18.0
21.00	19.0										19.0
20.00	20.0										20.0
19.00	21.0										21.0
18.00	22.0										22.0
17.00	23.0										23.0
16.00	24.0										24.0
15.00	25.0										
14.00	26.0										
13.00	27.0										27.0
12.00	28.0										28.0

BAKER

TEST BORING LOG

BOREHOLE NUMBER: 11-SB18

SHEET: 1 OF: 1

PROJECT NUMBER: 62470-0354
PROJECT NAME: YORKTOWN WEAPONS STATION
LOCATION: YORKTOWN, VIRGINIA
DRILLING COMPANY: PARRATT-WOLFF, INC.
RIG TYPE & NUMBER: TRUCK B-53
DRILLING METHOD: HOLLOW STEM AUGERS
WEATHER: CLEAR, COLD
GEOLOGIST: MARLENE IVESTER
ENV. SCIENTIST:
DATE BEGUN: 11/14/96 DATE COMPLETED: 11/14/96

GROUND SURFACE ELEVATION: UNKNOWN
TOTAL DEPTH:

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/6"	RECOVERY	PID (PPM) BG	PID (PPM) PS	LITHOLOGY	DESCRIPTION	DEPTH
0.00	0.0										0.0
-1.00	1.0		S-1	SS	1 1 6 13	1.7	0	0		SAND -medium and SILT: 6" black fly ash matreial brown to orange, moist, med. dense	1.0
-2.00	2.0										2.0
-3.00	3.0		S-2	SS	15 13 13 13	1.8	0	0			3.0
-4.00	4.0									Water at 4' bgs END OF BORING AT 4' BGS	4.0
-5.00	5.0										5.0
-6.00	6.0										6.0
-7.00	7.0										7.0
-8.00	8.0										8.0
-9.00	9.0										9.0
-10.00	10.0										10.0
-11.00	11.0										11.0
-12.00	12.0										12.0
-13.00	13.0										13.0
-14.00	14.0										14.0
-15.00	15.0										15.0
-16.00	16.0										16.0
-17.00	17.0										17.0
-18.00	18.0										18.0
-19.00	19.0										19.0
-20.00	20.0										20.0
-21.00	21.0										21.0
-22.00	22.0										22.0
-23.00	23.0										23.0
-24.00	24.0										24.0
-25.00	25.0										25.0
-26.00	26.0										26.0
-27.00	27.0										27.0
-28.00	28.0										28.0

Dames & Moore

LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
Drill to 17 feet push augers - collapse in complete Redrill 12-10-85	13542	LANTDIV - U.S. NAVY	NWS Yorktown VA

DRILLING METHOD: MC 45 H.S.A.	BORING NO. 116W03
SAMPLING METHOD: 24" split spoon	SHEET 1 OF 1
	DRILLING START / FINISH
WATER LEVEL	
TIME	TIME 15:30 / TIME 12:30
DATE	DATE 12-5-85 / DATE 12-10
CASING DEPTH	

DATUM ELEVATION

DRILLING CONTR. No. 28446

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	SURFACE CONDITIONS:
				1		0	OL	5" organic
				2				∇ water level
				3 (5)			SP	clean sorted, coarse sand, rounded grains, some fine gravel, loose
				5		2		
				7 (12)		3		well graded clean sand fine to coarse sand small fine gravel present, medium dense
				3				
				4				
				6 (10)		4		Top - med - coarse sand to small gravel
						5	SM	Lower sample - fine silty sand - brown orange - medium dense
						6		
						7		
						8		
						9		
				2		10		start green
				2		11	ML/SM	grey green glauconitic silt to fine sand clay probably present, medium stiff
				2 (4)		12		
						13		
						14		
				3		15		
				3		16	CL/ML	grey green clayey silt, medium stiff
				4 (7)		17		
						18		
						19		
						20		

BY ____ DATE ____ CHK'D BY ____

Dames & Moore

LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	13592	LANTDIV - US. NAVY	NWS Yorktown VA

DRILLING METHOD: MC 45 Hollow Stem Auger 7¼"

SAMPLING METHOD: 24" split spoon

BORING NO. NW 11GW09

SHEET 1 OF 2

WATER LEVEL	6'		-	
TIME	19:30			
DATE	12-10-85			
CASING DEPTH				

DRILLING

START	FINISH
TIME 13:30	TIME 15:00
DATE 12-10-85	DATE 12-10-85

DATUM ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	
				4		0		Brown, v. silty med SAND, ~~MEDIUM DENSE~~
				5		1	SM	
				5 (10)				
				3		2		orange brown clean med-coarse SAND moderately uniform (~~graded~~), LOOSE
				3 (6)		3	SP	
				5		4		orange-brown clean med to coarse SAND some pebbles - ~~graded~~, LOOSE
				5 (9)				
						5		
						6		
						7		
						8		
						9		
						10		
				3		11	SM	orange-brown - silty fine to med SAND, LOOSE
				3				
				5 (8)		12		
						13		
						14		
				3		15		
				4		16		
				4 (8)		17		
						18		
						19		
						20	ML CL	

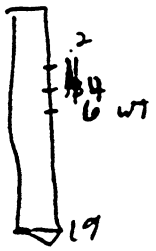
DRILLING CONTR. F&R Eng. Norfolk

No. 28447

BY Kolberg DATE 12-10-85 CHK'D BY

DBB.1 (3) (REV. 11-80)

Dames & Moore

LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	13542	LANTDIV - US NAVY	YORKTOWN, VA (NWS)

DRILLING METHOD:	MC 45 H.Avg.		BORING NO. 11GW09
SAMPLING METHOD:	24" split spoon		SHEET 2 OF 2
			DRILLING START TIME 13:30 DATE 12-10-85 / FINISH TIME 15:00 DATE 12-10-85

WATER LEVEL	6'			
TIME	14:30			
DATE	12-10-85			
CASING DEPTH				

DATUM ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	
				U		20		
				2		21	ML/CL	Dk blue-green gray glaucitic clayey silt, medium stiff
				3		22		
				5		3		
						4		
						5		
						6		
						7		
						8		
						9		
						0		
						1		
						2		
						3		
						4		
						5		
						6		
						7		
						8		
						9		
						0		

DRILLING CONTR. F&R Eng. Norfolk

No. C0440

BY Kolber DATE 12-10-85 CHK'D BY

028.1 (3) (REV. 11-80)

BOREHOLE ID : 11GW11 SITE NAME/NO: WPNSTA YORKTOWN
BEGIN DATE : 06/11/92 END DATE : 06/11/92

LOGGER/COMPANY : W. BREW/ROY F. WESTON

BOREHOLE COMPLETED IN (<O>verburden <B>edrock) :

TOTAL DEPTH : 12.00 DEPTH TO BEDROCK : 0.00

BOREHOLE DIAMETER #1: 0.00
INTERVAL: 0.00 ft. to 12.00 ft. BGS
METHOD : SSA FLUID : NONE
BOREHOLE DIAMETER #2:
INTERVAL:
METHOD : FLUID :
BOREHOLE DIAMETER #3:
INTERVAL:
METHOD : FLUID :

DRILLING COMPANY : HARDIN-HUBER
DRILLER : ROYCE KEENAN
DRILL RIG TYPE : NONE

	ESTIMATED	SURVEYED
SURFACE ELEVATION :	0.000	41.800
N. COORDINATE :	0.0000	343135.0000
E. COORDINATE :	0.0000	2562002.0000

WELL PERMIT.....(Y)es (N)o: N PERMIT # :

HOLE ABANDONED...(Y)es (N)o: N
WELL INSTALLED...(Y)es (N)o: Y
WELL CLUSTER.....(Y)es (N)o: Y No. OF WELLS : 2
WELL NEST.....(Y)es (N)o: N No. OF WELLS : 0
PUMPS INSTALLED..(Y)es (N)o: N TYPE DEPTH
PURGE : 0.00
SAMPLE : 0.00

BOREHOLE TESTING
BOREHOLE GEOPHYSICS.....(Y)es (N)o: N
SLUG TESTS.....(Y)es (N)o: Y
PACKER TESTS.....(Y)es (N)o: N
PUMPING TESTS.....(Y)es (N)o: N

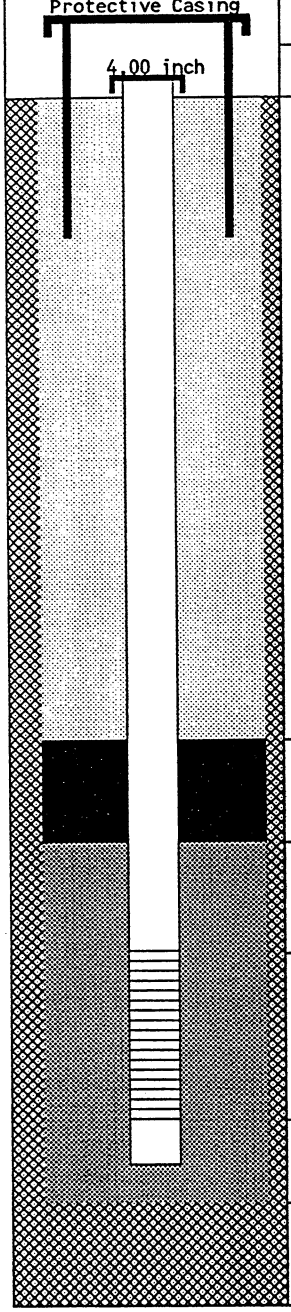
COMMENTS :

Well Completion Summary — *ROY F. WESTON, Inc.*

CLIENT	WPNSTA YORKTOWN	*DRILLING FIRM*	HARDIN-HUBER
SITE NAME	WPNSTA YORKTOWN	*INSPECTOR*	W. BREW

WELL ID	11GW11
START DATE	06/12/92
COMPLETION DATE	06/12/92

WATER LEVELS



DEPTH		*ELEV.*
2.50	*TC*	44.30
0.00	*GS*	41.80
2.00	*BN*	39.80
3.00	*SP*	38.80
4.00	*SC*	37.80
12.00	*BS*	29.80
12.00	*TD*	29.80

DRILLING SUMMARY

Driller ROYCE KEENAN
Drilling Fluid NONE
Well Type SINGLE CASED SCREENED

WELL DESIGN CONSTRUCTION

Casing #1 Diameter: 4.00 *inch* *Interval:* 0.00 to 4.00 *ft.*
Type : PVC SCH 40

Stick Up Inner Casing: 2.50 *ft.* *Protective Casing:* 0.00 *ft.*

Casing Grout: CEMT/BENT *Interval:* 0.00 to 2.00 *ft.*

Seal Type: BENTONITE *Interval:* 2.00 to 3.00 *ft.*

Sand Pack Type : #2 *Interval:* 3.00 to 12.00 *ft.*
Grain Size : UNIFORM *Median Diameter:* 2-3
Screen Diameter: 4.00 *Interval:* 4.00 to 12.00 *ft.*
Type : PVC *Slots:* .020 *inches*

Silt Trap Interval: 0.00 to 0.00 *ft.*
Backfill Type : *Interval:* 0.00 to 0.00 *ft.*

WELL DEVELOPMENT

Date / /
Method
Yield *Purged Volume*

COMMENTS

TC = Top of Casing
GS = Ground Surface
BN = Top Seal
SP = Top Sand Pack
SC = Top Screen
BS = Bottom Screen
TD = Total Depth
= Grout
= Seal
= Sand Pack
= Formation

Additional Comments:

NOTE: Well Diagram not to Scale *Elevations are feet above mean sea level*

01/06/93

Borehole Log

ROY F. WESTON, Inc.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 12.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW/ROY F. WESTON
WELL ID	: 11GW11	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343135.0000 surveyed	DRILLING RIG	: NONE
EASTING	: 2562002.0000 surveyed	DATE STARTED	: 06/11/92
ELEVATION	: 41.800 surveyed	DATE COMPLETED	: 06/11/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Interval Not Sampled						See boring 11GW11A for lithologic descriptions.
40	1									
39	2									
38	3									
37	4									
36	5									
35	6									
34	7									
33	8									
32	9									
31	10									

Borehole Log — *ROY F. WESTON, Inc.*

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 12.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW/ROY F. WESTON
WELL ID	: 11GW11	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343135.0000 surveyed	DRILLING RIG	: NONE
EASTING	: 2562002.0000 surveyed	DATE STARTED	: 06/11/92
ELEVATION	: 41.800 surveyed	DATE COMPLETED	: 06/11/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Interval Not Sampled						See boring 11GW11A for lithologic descriptions.
30	11									
29	12									
28	13									
27	14									
26	15									
25	16									
24	17									
23	18									
22	19									
21	20									

DATE: 12/08/92 **** LITHOLOGICAL DATA FOR - CLIENT ID: BAKER *** PAGE: 1

BOREHOLE /WELL ID	SMP NUM	LTH NUM	LITHOLOGY INT. (FT BGS)		SAMPLING METHOD	SIZE GRAVEL	GRAVEL PCT.	SIZE SAND	SAND PCT	SILT PCT	CLAY PCT	ORGANIC PCT	ROCK TYPE	PLAST	SORT	STRENGTH	MOISTURE	STRAT UNIT
11GW11	1	1	0.00	12.00	NS		0		0	0	0	0						

Borehole Location Data **ROY F. WESTON, Inc.**

BOREHOLE ID : 11GW11A SITE NAME/NO: WPNSTA YORKTOWN
BEGIN DATE : 06/11/92 END DATE : 06/11/92

LOGGER/COMPANY : W. BREW

BOREHOLE COMPLETED IN (<O>verburden <B>edrock) : O

TOTAL DEPTH : 52.00 DEPTH TO BEDROCK : 0.00

BOREHOLE DIAMETER #1: 9.00
INTERVAL: 0.00 ft. to 52.00 ft. BGS
METHOD : HSA FLUID : NONE
BOREHOLE DIAMETER #2:
INTERVAL:
METHOD : FLUID :
BOREHOLE DIAMETER #3:
INTERVAL:
METHOD : FLUID :

DRILLING COMPANY : HARDIN-HUBER
DRILLER : ROYCE KEENAN
DRILL RIG TYPE : NONE

	ESTIMATED	SURVEYED
SURFACE ELEVATION :	0.000	41.200
N. COORDINATE :	0.0000	343128.0000
E. COORDINATE :	0.0000	2562000.0000

WELL PERMIT.....(Y)es (N)o: N PERMIT # :

HOLE ABANDONED...(Y)es (N)o: N
WELL INSTALLED...(Y)es (N)o: Y
WELL CLUSTER.....(Y)es (N)o: Y No. OF WELLS : 2
WELL NEST.....(Y)es (N)o: N No. OF WELLS : 0
PUMPS INSTALLED..(Y)es (N)o: N TYPE DEPTH
PURGE : 0.00
SAMPLE : 0.00

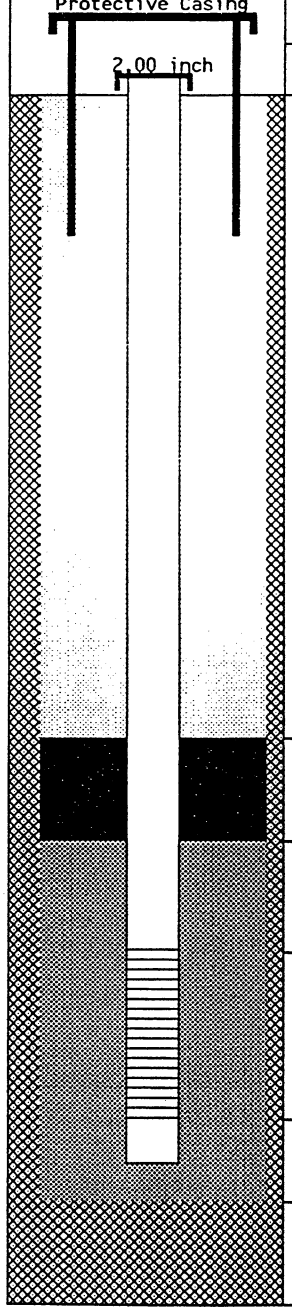
BOREHOLE TESTING
BOREHOLE GEOPHYSICS.....(Y)es (N)o: N
SLUG TESTS.....(Y)es (N)o: Y
PACKER TESTS.....(Y)es (N)o: N
PUMPING TESTS.....(Y)es (N)o: N

COMMENTS :

Well Completion Summary **ROY F. WESTON, Inc.**

CLIENT	WPNSTA YORKTOWN	*DRILLING FIRM*	HARDIN-HUBER
SITE NAME	WPNSTA YORKTOWN	*INSPECTOR*	W. BREW

WELL ID	11GW11A	*WATER LEVELS*
START DATE	06/11/92	
COMPLETION DATE	06/11/92	



DEPTH		ELEV.
2.00	TC	43.20
0.00	GS	41.20
43.00	BN	-1.80
44.00	SP	-2.80
46.00	SC	-4.80
51.00	BS	-9.80
52.00	TD	-10.80

DRILLING SUMMARY

Driller ROYCE KEENAN
Drilling Fluid
Well Type SINGLE CASED SCREENED

WELL DESIGN CONSTRUCTION

Casing #1 Diameter: 2.00 *inch* *Interval:* 0.00 to 46.00 *ft.*
Type : PVC SCH 40

Stick Up Inner Casing: 2.00 *ft.* *Protective Casing:* 0.00 *ft.*

Casing Grout: CEMT/BENT *Interval:* 0.00 to 43.00 *ft.*

Seal Type: BENTONITE *Interval:* 43.00 to 44.00 *ft.*

Sand Pack Type : #2 *Interval:* 44.00 to 52.00 *ft.*
Grain Size : UNIFORM *Median Diameter:* 2-3
Screen Diameter: 2.00 *Interval:* 46.00 to 51.00 *ft.*
Type : PVC *Slots:* .020 *inches*

Silt Trap Interval: 51.00 to 52.00 *ft.*
Backfill Type : *Interval:* 0.00 to 0.00 *ft.*

WELL DEVELOPMENT

Date / /
Method
Yield *Purged Volume*

COMMENTS

TC = Top of Casing
GS = Ground Surface
BN = Top Seal
SP = Top Sand Pack
SC = Top Screen
BS = Bottom Screen
TD = Total Depth
= Grout
= Seal
= Sand Pack
= Formation

Additional Comments:

NOTE: Well Diagram not to Scale *Elevations are feet above mean sea level*

01/06/93

Borehole Log

ROY F. WESTON, Inc.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 52.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 11GW11A	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343128.0000 surveyed	DRILLING RIG	: NONE
EASTING	: 2562000.0000 surveyed	DATE STARTED	: 06/11/92
ELEVATION	: 41.200 surveyed	DATE COMPLETED	: 06/11/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
			85	Poorly graded sand with silt, SP-SM	YELLOWISH BROWN	LSE	DRY	1 1 2 2	OVA 0.0	
40	1									
39	2		55	Poorly graded sand with silt, SP-SM	YELLOWISH BROWN	LSE	DRY	3 2 5 5	OVA 0.0	
38	3									
37	4		60	Poorly graded sand with silt, SP-SM	YELLOWISH BROWN	LSE	DRY	2 7 12 11	OVA 0.0	
36	5			Poorly graded sand with silt, SP-SM	YELLOWISH BROWN	SFT	WET		OVA 0.0	
35	6		85	Poorly graded sand with silt, SP-SM	YELLOWISH BROWN	SFT	WET	6 8 9 7	OVA 0.0	
34	7									
33	8			Poorly graded sand with silt, SP-SM	YELLOWISH BROWN	SFT	WET		OVA 0.0	
32	9									
31	10		85	Poorly graded sand with silt, SP-SM	YELLOWISH BROWN	SFT	WET	1 1 1 1	OVA 0.0	

Borehole Log

ROY F. WESTON, Inc.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 52.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 11GW11A	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343128.0000 surveyed	DRILLING RIG	: NONE
EASTING	: 2562000.0000 surveyed	DATE STARTED	: 06/11/92
ELEVATION	: 41.200 surveyed	DATE COMPLETED	: 06/11/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Poorly graded sand with silt, SP-SM	YELLOWISH BROWN	SFT	WET		OVA 0.0	
30	11			Lean clay, CL		FRM	MST			
29	12			Lean clay, CL		FRM	MST		OVA 0.0	
28	13		90	Lean clay, CL		FRM	MST	2 3 3 5	OVA 0.0	
27	14									
26	15		75	Lean clay, CL		FRM	MST	1 3 3 5	OVA 0.0	Fine sand lenses.
25	16									
24	17			Interval Not Sampled						
23	18									
22	19									
21	20		95	Lean clay, CL		FRM	MST	2 5 3 4	OVA 0.0	Silt lenses.

Borehole Log

ROY F. WESTON, Inc.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 52.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 11GW11A	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343128.0000 surveyed	DRILLING RIG	: NONE
EASTING	: 2562000.0000 surveyed	DATE STARTED	: 06/11/92
ELEVATION	: 41.200 surveyed	DATE COMPLETED	: 06/11/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Lean clay, CL		FRM	MST		OVA 0.0	Silt lenses.
20	21									
				Shelly clay		FRM	MST		OVA 0.0	Gravel = shells.
19	22			Interval Not Sampled						
18	23									
17	24									
16	25		95	Shelly Hash		FRM	MST	2 3 4 3	OVA 0.0	Shells.
15	26									
14	27			Interval Not Sampled						
13	28									
12	29									
11	30		95	Shelly Hash	GRAY	FRM	MST	2 2 5 9	OVA 0.0	

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 52.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 11GW11A	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343128.0000 surveyed	DRILLING RIG	: NONE
EASTING	: 2562000.0000 surveyed	DATE STARTED	: 06/11/92
ELEVATION	: 41.200 surveyed	DATE COMPLETED	: 06/11/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Shelly Hash	GRAY	FRM	MST		OVA 0.0	
10	31									
9	32			Interval Not Sampled						
8	33									
7	34									
6	35		100	Shelly Hash	GRAY	FRM	MST	1 1 3 5	OVA 0.0	
5	36									
4	37			Interval Not Sampled						
3	38									
2	39									
1	40		100	Shelly Clay	GRAY	SFT	MST	5 6 7 10	OVA 0.0	

Borehole Log

ROY F. WESTON, Inc.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 52.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 11GW11A	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343128.0000 surveyed	DRILLING RIG	: NONE
EASTING	: 2562000.0000 surveyed	DATE STARTED	: 06/11/92
ELEVATION	: 41.200 surveyed	DATE COMPLETED	: 06/11/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Shelly Clay	GRAY	SFT	MST		OVA 0.0	
0	41									
				Shell Hash	GRAY	FRM	WET			Gravel = shells
-1	42			Interval Not Sampled						
-2	43									
-3	44									
-4	45		90	Shell hash	GRAY	FRM	WET	1 5 7 9	OVA 0.0	Gravel = shells
-5	46									
-6	47			Interval Not Sampled						
-7	48									
-8	49									
-9	50		90	Shell Hash	GRAY	FRM	WET	1 2 1 3	OVA 0.0	Gravel = shells.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 52.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 11GW11A	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343128.0000 surveyed	DRILLING RIG	: NONE
EASTING	: 2562000.0000 surveyed	DATE STARTED	: 06/11/92
ELEVATION	: 41.200 surveyed	DATE COMPLETED	: 06/11/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Shell Hash	GRAY	FRM	WET		OVA 0.0	Gravel = shells.
-9	51									
-10	52									
-11	53									
-12	54									
-13	55									
-14	56									
-15	57									
-16	58									
-17	59									
-18	60									

DATE: 12/08/92 **** LITHOLOGICAL DATA FOR - CLIENT ID: BAKER *** PAGE: 2

BOREHOLE /WELL ID	SMP NUM	LTH NUM	LITHOLOGY INT. (FT BGS)		SAMPLING METHOD	SIZE GRAVEL	GRAVEL PCT.	SIZE SAND	SAND PCT	SILT PCT	CLAY PCT	ORGANIC PCT	ROCK TYPE	PLAST	SORT	STRENGTH	MOISTURE	STRAT UNIT
11GW11A	1	1	0.00	2.00	SPS	F	10	MF	80	10	0	0			MOD	LSE	DRY	
11GW11A	2	1	2.00	4.00	SPS	F	10	MF	80	10	0	0			MOD	LSE	DRY	
11GW11A	3	1	4.00	5.00	SPS	F	10	MF	80	10	0	0			MOD	LSE	DRY	
11GW11A	3	2	5.00	6.00	SPS		0	F	90	10	0	0			MOD	SFT	WET	
11GW11A	4	1	6.00	8.00	SPS		0	F	90	10	0	0			MOD	SFT	WET	
11GW11A	5	1	8.00	10.00	CUT		0	F	90	10	0	0			MOD	SFT	WET	
11GW11A	6	1	10.00	11.00	SPS		0	F	90	10	0	0			MOD	SFT	WET	
11GW11A	6	2	11.00	12.00	SPS		0	F	10	10	80	0		MOD		FRM	MST	
11GW11A	7	1	12.00	13.00	SPS		0	F	10	10	80	0		MOD		FRM	MST	
11GW11A	8	1	13.00	15.00	SPS		0		0	5	95	0		MOD		FRM	MST	
11GW11A	9	1	15.00	17.00	SPS		0		0	0	100	0		MOD		FRM	MST	
11GW11A	10	1	17.00	20.00	NS		0		0	0	0	0						
11GW11A	11	1	20.00	21.80	SPS		0		0	0	100	0		MOD		FRM	MST	
11GW11A	11	2	21.80	22.00	SPS	CMF	30		0	0	70	0		MOD	POR	FRM	MST	
11GW11A	12	1	22.00	25.00	NS		0		0	0	0	0						
11GW11A	13	1	25.00	27.00	SPS	CMF	40		0	60	0	0		MOD	POR	FRM	MST	
11GW11A	14	1	27.00	30.00	NS		0		0	0	0	0						
11GW11A	15	1	30.00	32.00	SPS	CMF	60		0	20	20	0		MOD	POR	FRM	MST	
11GW11A	16	1	32.00	35.00	NS		0		0	0	0	0						
11GW11A	17	1	35.00	37.00	SPS	CMF	60		0	20	20	0		MOD	POR	FRM	MST	
11GW11A	18	1	37.00	40.00	NS		0		0	0	0	0						
11GW11A	19	1	40.00	41.40	SPS		0	F	30	30	40	0		LOW	POR	SFT	MST	
11GW11A	19	2	41.40	42.00	SPS	M	20	F	60	20	0	0		LOW	POR	FRM	WET	
11GW11A	20	1	42.00	45.00	NS		0		0	0	0	0						
11GW11A	21	1	45.00	47.00	SPS	M	20	F	60	20	0	0		LOW	POR	FRM	WET	
11GW11A	22	1	47.00	50.00	NS		0		0	0	0	0						
11GW11A	23	1	50.00	52.00	SPS	M	20	F	60	20	0	0		LOW	POR	FRM	WET	

Dames & Moore

LOCATION OF BORING

JOB NO.	CLIENT	LOCATION
13542	LANTDIV, US. NAVY	NWS. Yorktown VA

DRILLING METHOD: MC 45 7¼ HSA.

BORING NO. NW 176-L

SHEET 1 OF 2

SAMPLING METHOD: 24" split spoon

WATER LEVEL	4.5-5 ft			
TIME				
DATE				
CASING DEPTH				

DRILLING

START	FINISH
TIME 9:00	TIME 11:30
DATE 12-9-85	DATE 12-9-85

DATUM

ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	
	18			2		0		Brown silty med to coarse SAND - mostly SAND rounded grains, LOOSE
				4		1	SM	
				(6)				
	18			4		2		Lt Brown to orange brown silty ~~fine~~ to SAND med and coarse sand - dominated by rounded coarse sand LOOSE
				4				
				2		3		
				(6)				
	18			1		4		SATURATED SAMPLE - ~~silty~~ fairly clean (little amount of fines) medium to coarse SAND, some gravel present, LOOSE
				4				
				5				
				(9)		5	SP	
						6		
						7		
						8		
						9		
						10		clean white fine to medium SAND
				2				orange brown fine SAND w/ silt
				3		11		
				3			SM	grey-green glaconitic (silty) fine SAND, LOOSE
				(6)		12		
						13		
						14		
				3		15	SC	shelly calcareous (shell frags) glaucontic clayey SANDS
				4				
				4		16	CL/ML	varved grey green (3-5 mm), brown + green (5-15 mm) clayey silt, SOFT
				(8)		17		
						18		
						19		
						20		

DRILLING CONTR. _____

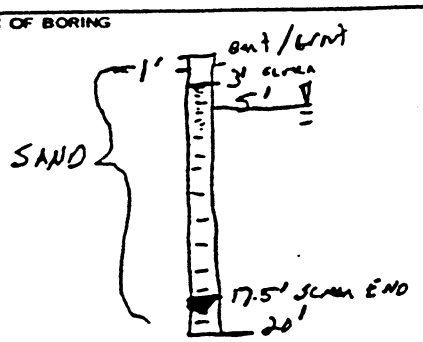
No. 28443

BY _____ DATE _____ CHK'D BY _____

828.1 (3) (REV. 11-80)

Dames & Moore

LOCATION OF BORING



JOB NO.	CLIENT	LOCATION
13542	LANTDIV, US. NAVY	NWS Yorktown, VA

DRILLING METHOD: MC 45 7¼ H.S.A MW

BORING NO. 17GW01

SHEET 2 OF 2

SAMPLING METHOD: 24" spl. sp

					DRILLING START TIME	DRILLING FINISH TIME
WATER LEVEL						
TIME						
DATE					DATE 12-9-85	DATE
CASING DEPTH						

DATUM ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	
				3		20		shelly glaconitic loose silty fine sands - green
				U 5		21	SM	grey-green clayey silts to fine SAND - ~~the~~ NO shell fragments present, much micaceous minerals present
						22		
						23		
						24		
						25		
						6		
						7		
						8		
						9		
						0		
						1		
						2		
						3		
						4		
						5		
						6		
						7		
						8		
						9		
						0		

DRILLING CONTR. _____ BY _____ DATE _____ CHK'D BY _____

828.1 (3) (REV. 11-80)

Dames & Moore

JOB NO.	CLIENT	LOCATION
13542	LANTDIV - US NAVY	NWS Yorktown, VA

BORING NO.	SHEET
17GW02	1 OF 1

DRILLING METHOD: MC 45 NW 7¼ HSA

SAMPLING METHOD: 24" split spoon 140 lbs Hammer

WATER LEVEL	1'			
TIME	13:30			
DATE	12-9-85			
CASING DEPTH				

DRILLING	START	FINISH
TIME	13:15	14:00
DATE	12-9-85	12-9-85

LOCATION OF BORING

ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	
						0	OL	13" of organic - old piece of decayed wood
				3		1	SM	→ saturated at 1-1.5' Tan silty sand (medium to coarse w/ large gravel - well rounded, LOOSE
				2 4	6	2		→ saturated → Tan silty coarse to fine sand w/ gravel present 2-5 mm well graded, MEDIUM DENSE
				4	11	3		
					6	4		Tan to orange brown very silty fine to mid sand - well graded, LOOSE
						5		
						6		
						7		
						8		
						9		
				3		0		grey v. silty (possible clay) fine to med SAND little coarse, much fine SAND, LOOSE
				2		1		
				3	5	2		
						3		
						4		
						5		
				2		6	ML	End of grey sand
				3	5	7		grey green glauconitic material fine silts to clays, MEDIUM STIFF
						8		Very micaceous
						9		
						0		

DATUM

CHK'D BY

DATE

BY

10.1 (8) (REV. 11-80)

BOREHOLE ID : 17GW10 *SITE NAME/NO:* WPNSTA YORKTOWN
BEGIN DATE : 06/06/92 *END DATE :* 06/06/92

LOGGER/COMPANY : J.H. GHENT

BOREHOLE COMPLETED IN (<O>verburden <B>edrock) : O

TOTAL DEPTH : 12.00 *DEPTH TO BEDROCK :* 0.00

BOREHOLE DIAMETER #1: 12.00
INTERVAL: 0.00 ft. to 14.00 ft. BGS
METHOD : HSA *FLUID :* NONE
BOREHOLE DIAMETER #2:
INTERVAL:
METHOD : *FLUID :*
BOREHOLE DIAMETER #3:
INTERVAL:
METHOD : *FLUID :*

DRILLING COMPANY : HARDIN-HUBER
DRILLER : ROYCE KEENAN
DRILL RIG TYPE : MOBILE B-47

	ESTIMATED	*SURVEYED*
SURFACE ELEVATION :	0.000	38.600
N. COORDINATE :	0.0000	343795.0000
E. COORDINATE :	0.0000	2561672.0000

WELL PERMIT.....(Y)es (N)o: N *PERMIT # :*

HOLE ABANDONED...(Y)es (N)o: N
WELL INSTALLED...(Y)es (N)o: Y
WELL CLUSTER.....(Y)es (N)o: N *No. OF WELLS :* 0
WELL NEST.....(Y)es (N)o: N *No. OF WELLS :* 0
PUMPS INSTALLED..(Y)es (N)o: N *TYPE* *DEPTH*
PURGE : 0.00
SAMPLE : 0.00

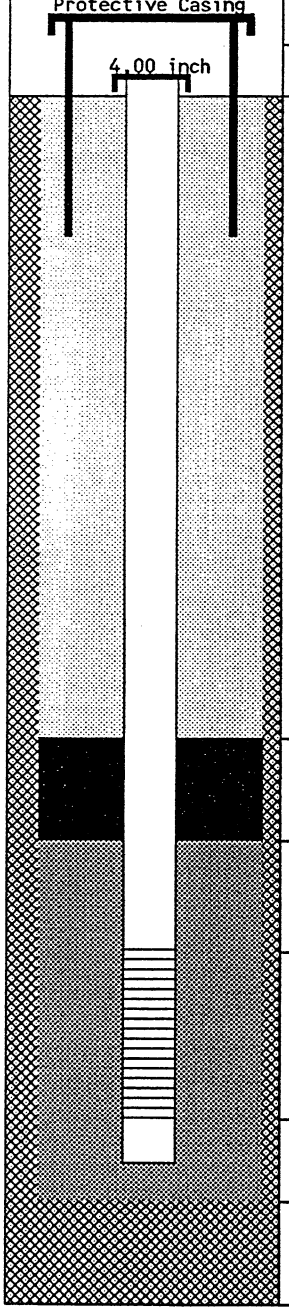
BOREHOLE TESTING
BOREHOLE GEOPHYSICS.....(Y)es (N)o: N
SLUG TESTS.....(Y)es (N)o: N
PACKER TESTS.....(Y)es (N)o: N
PUMPING TESTS.....(Y)es (N)o: N

COMMENTS :
Hole initially augered with 9 inch augers, overdrilled with 12 inch O.D. augers.

Well Completion Summary **ROY F. WESTON, Inc.**

CLIENT	WPNSTA YORKTOWN	*DRILLING FIRM*	HARDIN-HUBER
SITE NAME	WPNSTA YORKTOWN	*INSPECTOR*	J. WILLIAMS

WELL ID	17GW10	*WATER LEVELS*
START DATE	06/06/92	2.10 FT (TOC) ON 06/06/92
COMPLETION DATE	06/06/92	



DEPTH		ELEV.
2.10	TC	40.70
0.00	GS	38.60
1.00	BN	37.60
1.50	SP	37.10
2.00	SC	36.60
11.00	BS	27.60
11.00	TD	27.60

DRILLING SUMMARY

Driller ROYCE KEEMAN
Drilling Fluid NONE
Well Type SINGLE CASED SCREENED

WELL DESIGN CONSTRUCTION

Casing #1 Diameter: 4.00 *inch* *Interval:* 0.00 to 2.00 *ft.*
Type : PVC SCH 40

Stick Up Inner Casing: 2.10 *ft.* *Protective Casing:* 0.00 *ft.*

Casing Grout: CEMT/BENT *Interval:* 0.00 to 1.00 *ft.*

Seal Type: BENTONITE PELLETS *Interval:* 1.00 to 1.50 *ft.*

Sand Pack Type : #2 VA *Interval:* 1.50 to 11.00 *ft.*
Grain Size : UNIFORM *Median Diameter:* 2.4
Screen Diameter: 2.00 *Interval:* 2.00 to 11.00 *ft.*
Type : PVC *Slots:* 0.020 *inches*

Silt Trap Interval: 0.00 to 0.00 *ft.*
Backfill Type : *Interval:* 0.00 to 0.00 *ft.*

WELL DEVELOPMENT

Date / /
Method
Yield *Purged Volume*

COMMENTS

TC = Top of Casing
GS = Ground Surface
BN = Top Seal
SP = Top Sand Pack
SC = Top Screen
BS = Bottom Screen
TD = Total Depth
= Grout
= Seal
= Sand Pack
= Formation

Additional Comments:
9′ screen, 1 bucket pellets, lb bags #2 sand.

NOTE: Well Diagram not to Scale *Elevations are feet above mean sea level*

01/06/93

Borehole Log — *ROY F. WESTON, Inc.*

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 12.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: J.H. GHENT
WELL ID	: 17GW10	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343795.0000 surveyed	DRILLING RIG	: MOBILE B-47
EASTING	: 2561672.0000 surveyed	DATE STARTED	: 06/06/92
ELEVATION	: 38.600 surveyed	DATE COMPLETED	: 06/06/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
			97	Fill	BLACK/BROWN	LSE	MST	2 3 2 5	OVA 0.0	Sample time 0925, ceramic pipe fragments at 1' organics black soil & roots to 0.8'.
37	1									
				Poorly graded sand with silt, SP-SM	BROWNISH YELLOW	LSE	MST		OVA 0.0	
36	2		70	Silty sand, SM	STRONG BROWN	LSE	SAT	7 10 11 13	OVA 0.0	
				Silty sand, SM	REDDISH YELLOW	LSE	SAT		OVA 0.0	
35	3									
34	4		70	Poorly graded sand, SP	GRAY	FRM	WET	2 3 4 2	OVA 0.0	
33	5									
32	6		95	Poorly graded sand with silt, SP-SM	GRAY	SFT	SAT	4 2 3 2		
				Silt, ML	OLIVE GREEN	FRM	WET		OVA 0.0	
31	7									
				No Sample Recovered						
30	8		95	Elastic silt, MH	OLIVE GREY	FRM	WET	1 1 1 1		Laminated near bottom 5' of spoon, brown iron stained.
29	9									
				No Sample Recovered						
28	10									

Borehole Log

ROY F. WESTON, Inc.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 12.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: J.H. GHENT
WELL ID	: 17GW10	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343795.0000 surveyed	DRILLING RIG	: MOBILE B-47
EASTING	: 2561672.0000 surveyed	DATE STARTED	: 06/06/92
ELEVATION	: 38.600 surveyed	DATE COMPLETED	: 06/06/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
			100	Not Classified - Incomplete Data				1 2 2 3		
27	11			Shelly clay	GRAY	STF	MST		OVA 0.0	Shelly clay.
26	12		100	Lean clay, CL	GREENISH GREY	STF	MST	2 3 3 4	OVA 0.0	Iron staining apparent in upper portion. Time 0910.
25	13									
24	14									
23	15									
22	16									
21	17									
20	18									
19	19									
18	20									

DATE: 12/08/92 **** LITHOLOGICAL DATA FOR - CLIENT ID: BAKER *** PAGE: 7

BOREHOLE /WELL ID	SMP NUM	LTH NUM	LITHOLOGY INT. (FT BGS)		SAMPLING METHOD	SIZE GRAVEL	GRAVEL PCT.	SIZE SAND	SAND PCT	SILT PCT	CLAY PCT	ORGANIC PCT	ROCK TYPE	PLAST	SORT	STRENGTH	MOISTURE	STRAT UNIT
17GW10	1	1	0.00	1.50	SPS		10		50	20	5	15		NON	POR	LSE	MST	
17GW10	1	2	1.50	2.00	SPS	F	0		90	10	0	0		NON	WEL	LSE	MST	
17GW10	2	1	2.00	2.50	SPS	C	5	MF	70	10	5	10		NON	POR	LSE	SAT	
17GW10	2	2	2.50	4.00	SPS		0	MF	80	20	0	0		NON	MOD	LSE	SAT	
17GW10	3	1	4.00	6.00	SPS	F	5	MF	90	5	0	0		NON	MOD	FRM	WET	
17GW10	4	1	6.00	6.60	SPS		0	F	90	10	0	0		NON	WEL	SFT	SAT	
17GW10	4	2	6.60	7.90	SPS		0		0	50	50	0		LOW	WEL	FRM	WET	
17GW10	4	3	7.90	8.00	SPS		0		0	0	0	0						
17GW10	5	1	8.00	9.90	SPS		0		0	50	50	0		MOD		FRM	WET	
17GW10	5	2	9.90	10.00	SPS		0		0	0	0	0						
17GW10	6	1	10.00	10.80	SPS		0		0	0	0	0						
17GW10	6	2	10.80	12.00	SPS	F	0		0	15	80	5		MOD		STF	MST	
17GW10	7	1	12.00	14.00	SPS	F	0		0	5	85	10		MOD		STF	MST	

BOREHOLE ID : 17GW16 SITE NAME/NO: WPNSTA YORKTOWN
BEGIN DATE : 06/08/92 END DATE : 06/08/92

LOGGER/COMPANY : W. BREW

BOREHOLE COMPLETED IN (<O>verburden <B>edrock) : O

TOTAL DEPTH : 14.00 DEPTH TO BEDROCK : 0.00

BOREHOLE DIAMETER #1: 12.00
INTERVAL: 0.00 ft. to 14.00 ft. BGS
METHOD : HSA FLUID : NONE
BOREHOLE DIAMETER #2:
INTERVAL:
METHOD : FLUID :
BOREHOLE DIAMETER #3:
INTERVAL:
METHOD : FLUID :

DRILLING COMPANY : HARDIN-HUBER
DRILLER : ROYCE KEENAN
DRILL RIG TYPE :

	ESTIMATED	SURVEYED
SURFACE ELEVATION :	0.000	45.200
N. COORDINATE :	0.0000	343442.0000
E. COORDINATE :	0.0000	2561678.0000

WELL PERMIT.....(Y)es (N)o: N PERMIT # :

HOLE ABANDONED...(Y)es (N)o: N
WELL INSTALLED...(Y)es (N)o: Y
WELL CLUSTER.....(Y)es (N)o: N No. OF WELLS : 0
WELL NEST.....(Y)es (N)o: N No. OF WELLS : 0
PUMPS INSTALLED..(Y)es (N)o: N

	TYPE	DEPTH
PURGE :		0.00
SAMPLE :		0.00

BOREHOLE TESTING
BOREHOLE GEOPHYSICS.....(Y)es (N)o: N
SLUG TESTS.....(Y)es (N)o: N
PACKER TESTS.....(Y)es (N)o: N
PUMPING TESTS.....(Y)es (N)o: N

COMMENTS :
Overdrilling hole w/12 inch o.d. to install well.

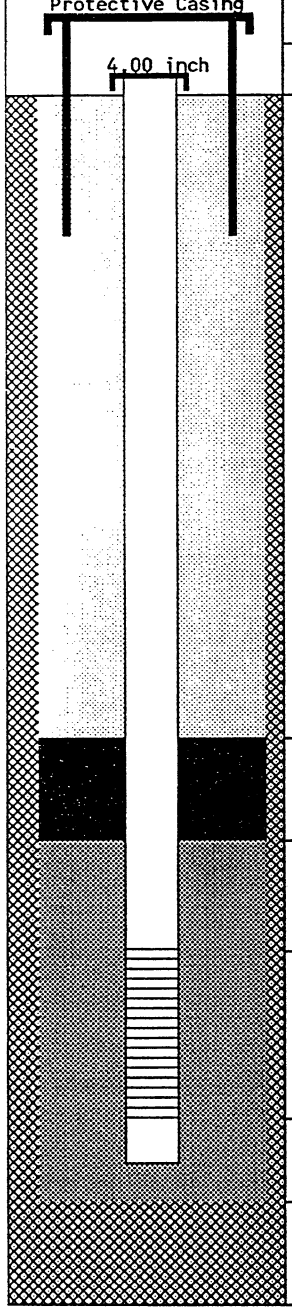
Well Completion Summary

ROY F. WESTON, Inc.

CLIENT	WPNSTA YORKTOWN	*DRILLING FIRM*	HARDIN-HUBER
SITE NAME	WPNSTA YORKTOWN	*INSPECTOR*	W. BREW

WELL ID	17GW16
START DATE	06/08/92
COMPLETION DATE	06/08/92

WATER LEVELS



DEPTH		ELEV.
2.50	TC	47.70
0.00	GS	45.20
1.00	BN	44.20
2.00	SP	43.20
3.00	SC	42.20
13.00	BS	32.20
13.00	TD	32.20

DRILLING SUMMARY

Driller ROYCE KEEMAN
Drilling Fluid
Well Type SINGLE CASED SCREENED

WELL DESIGN CONSTRUCTION

Casing #1 Diameter: 4.00 *inch* *Interval:* 0.00 to 3.00 *ft.*
Type : PVC SCH 40

Stick Up Inner Casing: 2.50 *ft.* *Protective Casing:* 0.00 *ft.*

Casing Grout: CEMT/BENT *Interval:* 0.00 to 1.00 *ft.*

Seal Type: BENTONITE *Interval:* 1.00 to 2.00 *ft.*

Sand Pack Type : #2 SAND *Interval:* 2.00 to 13.00 *ft.*
Grain Size : UNIFORM *Median Diameter:*
Screen Diameter: 4.00 *Interval:* 3.00 to 13.00 *ft.*
Type : PVC *Slots:* .020 *inches*

Silt Trap Interval: 0.00 to 0.00 *ft.*
Backfill Type : *Interval:* 0.00 to 0.00 *ft.*

WELL DEVELOPMENT

Date / /
Method
Yield *Purged Volume*

COMMENTS

TC = Top of Casing
GS = Ground Surface
BN = Top Seal
SP = Top Sand Pack
SC = Top Screen
BS = Bottom Screen
TD = Total Depth
= Grout
= Seal
= Sand Pack
= Formation

Additional Comments:

NOTE: Well Diagram not to Scale

Elevations are feet above mean sea level

01/06/93

Borehole Log — *ROY F. WESTON, Inc.*

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 14.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 17GW16	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343442.0000 surveyed	DRILLING RIG	:
EASTING	: 2561678.0000 surveyed	DATE STARTED	: 06/08/92
ELEVATION	: 45.200 surveyed	DATE COMPLETED	: 06/08/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
			75	Silty sand, SM	DARK BROWN	FRM	MST	5 6 6 5	OVA 0.0	
44	1									
43	2		75	Silty sand, SM	DARK BROWN	FRM	MST		OVA 0.0	
42	3									
				Poorly graded sand with silt, SP-SM	LT YLLWISH BRN	LSE	DRY		OVA 0.0	
41	4		60	Poorly graded sand with silt, SP-SM	LT YLLWISH BRN	LSE	DRY	2 4 3 4	OVA 0.0	
40	5									
				Poorly graded sand with silt, SP-SM		LSE	WET		OVA 0.0	
39	6		60	Poorly graded sand with silt, SP-SM		LSE	WET	3 3 4 5	OVA 0.0	
38	7			Well-graded sand, SW	DK YLLWISH BRN	SFT	WET		OVA 0.0	
37	8		70	Well-graded sand, SW	DK YLLWISH BRN	SFT	WET	2 3 2 3	OVA 0.0	
36	9			Poorly graded sand, SP	YELLOWISH BROWN	SFT	WET		OVA 0.0	
35	10		65	Poorly graded sand, SP	YELLOWISH BROWN	SFT	WET	3 3 3 3	OVA 0.0	

Borehole Log

ROY F. WESTON, Inc.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 14.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: W. BREW
WELL ID	: 17GW16	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343442.0000 surveyed	DRILLING RIG	:
EASTING	: 2561678.0000 surveyed	DATE STARTED	: 06/08/92
ELEVATION	: 45.200 surveyed	DATE COMPLETED	: 06/08/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
				Poorly graded sand, SP	YELLOWISH BROWN	SFT	WET		OVA 0.0	
34	11			Poorly graded sand, SP	LT BRWNSH GRY	LSE	WET		OVA 0.0	
33	12		55	Poorly graded sand, SP	LT BRWNSH GRY	LSE	WET	1 1 1 1	OVA 0.0	
32	13									
				Lean clay with sand, CL	V DK GRYSH BRN	FRM	WET		OVA 0.0	
31	14									
30	15									
29	16									
28	17									
27	18									
26	19									
25	20									

DATE: 12/08/92 **** LITHOLOGICAL DATA FOR - CLIENT ID: BAKER *** PAGE: 8

BOREHOLE /WELL ID	SMP NUM	LTH NUM	LITHOLOGY INT. (FT BGS)		SAMPLING METHOD	SIZE GRAVEL	GRAVEL PCT.	SIZE SAND	SAND PCT	SILT PCT	CLAY PCT	ORGANIC PCT	ROCK TYPE	PLAST	SORT	STRENGTH	MOISTURE	STRAT UNIT
17GW16	1	1	0.00	2.00	SPS		0		80	15	5	0		LOW	POR	FRM	MST	
17GW16	2	1	2.00	3.30	SPS		0		80	15	5	0		LOW	POR	FRM	MST	
17GW16	2	2	3.30	4.00	SPS	F	0		90	10	0	0			WEL	LSE	DRY	
17GW16	3	1	4.00	5.50	SPS		0	F	90	10	0	0			WEL	LSE	DRY	
17GW16	3	2	5.50	6.00	SPS		0	M	90	10	0	0			MOD	LSE	WET	
17GW16	4	1	6.00	7.00	SPS		0	M	90	10	0	0			MOD	LSE	WET	
17GW16	4	2	7.00	8.00	SPS	M	10	MF	85	5	0	0			POR	SFT	WET	
17GW16	5	1	8.00	8.80	SPS	M	10	MF	85	5	0	0			POR	SFT	WET	
17GW16	5	2	8.80	10.00	SPS		0		95	5	0	0			MOD	SFT	WET	
17GW16	6	1	10.00	11.00	SPS		0		95	5	0	0			MOD	SFT	WET	
17GW16	6	2	11.00	12.00	SPS		0	F	95	5	0	0			MOD	LSE	WET	
17GW16	7	1	12.00	13.30	SPS		0	F	95	5	0	0			MOD	LSE	WET	
17GW16	7	2	13.30	14.00	SPS		0	F	15	10	75	0		MOD		FRM	WET	

Borehole Location Data **ROY F. WESTON, Inc.**

BOREHOLE ID : 17HP01 SITE NAME/NO: WPNSTA YORKTOWN
BEGIN DATE : 06/23/92 END DATE : 06/23/92

LOGGER/COMPANY : H.G. BIENKOWSKI

BOREHOLE COMPLETED IN (<O>verburden <B>edrock) : O

TOTAL DEPTH : 10.00 DEPTH TO BEDROCK : 0.00

BOREHOLE DIAMETER #1: 3.00
INTERVAL: 0.00 ft. to 6.00 ft. BGS
METHOD : SPLIT SPOON FLUID : NONE
BOREHOLE DIAMETER #2:
INTERVAL:
METHOD : FLUID :
BOREHOLE DIAMETER #3:
INTERVAL:
METHOD : FLUID :

DRILLING COMPANY : HARDIN-HUBER
DRILLER : BRIAN SIWINSKI
DRILL RIG TYPE : MOBILE DRILL B61

	ESTIMATED	SURVEYED
SURFACE ELEVATION :	0.000	44.300
N. COORDINATE :	0.0000	343599.0000
E. COORDINATE :	0.0000	2561497.0000

WELL PERMIT.....(Y)es (N)o: N PERMIT # :

HOLE ABANDONED...(Y)es (N)o: Y
WELL INSTALLED...(Y)es (N)o: N
WELL CLUSTER.....(Y)es (N)o: N No. OF WELLS : 0
WELL NEST.....(Y)es (N)o: N No. OF WELLS : 0
PUMPS INSTALLED..(Y)es (N)o: N

	TYPE	DEPTH
PURGE :		0.00
SAMPLE :		0.00

BOREHOLE TESTING
BOREHOLE GEOPHYSICS.....(Y)es (N)o: N
SLUG TESTS.....(Y)es (N)o: N
PACKER TESTS.....(Y)es (N)o: N
PUMPING TESTS.....(Y)es (N)o: N

COMMENTS :
Split-spoon sampled to 6 ft. Drove a hydropunch from 5 to 10 ft. Borehole grouted to surface.

Borehole Log

ROY F. WESTON, Inc.

CLIENT	: WPNSTA YORKTOWN	TOTAL DEPTH	: 10.00
SITE NAME	: WPNSTA YORKTOWN	LOGGER	: H.G. BIENKOWSKI
WELL ID	: 17HP01	DRILLING COMPANY	: HARDIN-HUBER
NORTHING	: 343599.0000 surveyed	DRILLING RIG	: MOBILE DRILL B61
EASTING	: 2561497.0000 surveyed	DATE STARTED	: 06/23/92
ELEVATION	: 44.300 surveyed	DATE COMPLETED	: 06/23/92

ELEVATION	DEPTH	MATERIAL	% RECOVERY	CLASSIFICATION	COLOR	STRENGTH	MOISTURE	BLOW COUNT	FIELD INSTRUMENT READING	COMMENTS
			100	Sandy silt, ML	BROWN	SFT	MST	3 3 1 3	OVA 0.0	
				Silty sand, SM	YELLOWISH BROWN	SFT	WET		OVA 0.0	
43	1									
42	2		95	Silty sand, SM	YELLOWISH BROWN	SFT	WET	6 6 4 6	OVA 0.0	
41	3									
40	4			No Sample Recovered						
			62	Silty sand, SM	YELLOWISH BROWN	SFT	SAT	8 8 6 8	OVA 0.0	Saturated below 4.6 ft, wet above.
39	5									
				No Sample Recovered						
38	6			Interval Not Sampled						Hydropunch set 5-10 ft. Note screen open from 6-10 ft. below surface.
37	7									
36	8									
35	9									
34	10									

DATE: 12/08/92 **** LITHOLOGICAL DATA FOR - CLIENT ID: BAKER *** PAGE: 9

BOREHOLE /WELL ID	SMP NUM	LTH NUM	LITHOLOGY INT. (FT BGS)		SAMPLING METHOD	SIZE GRAVEL	GRAVEL PCT.	SIZE SAND	SAND PCT	SILT PCT	CLAY PCT	ORGANIC PCT	ROCK TYPE	PLAST	SORT	STRENGTH	MOISTURE	STRAT UNIT
17HP01	1	1	0.00	0.50	SPS		0	MF	30	50	0	20		NA	NA	SFT	MST	
17HP01	1	2	0.50	2.00	SPS		0	CMF	70	15	15	0		NA	POR	SFT	WET	
17HP01	2	1	2.00	3.90	SPS		0	CMF	80	20	0	0		NA	POR	SFT	WET	
17HP01	2	2	3.90	4.00	SPS		0		0	0	0	0						
17HP01	3	1	4.00	5.25	SPS	F	5	CMF	80	15	0	0		NA	MOD	SFT	SAT	
17HP01	3	2	5.25	6.00	SPS		0		0	0	0	0						
17HP01	4	1	6.00	10.00	NS		0		0	0	0	0						

BAKER

WELL CONSTRUCTION LOG

BOREHOLE NUMBER: 25GW01

SHEET: 1 OF: 2

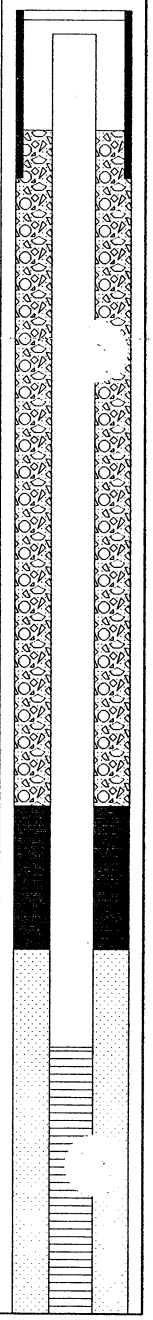
PROJECT NUMBER: 26007-035
PROJECT NAME: Site 25 - Building 373 Rocket Plant
LOCATION: Naval Weapons Station, Yorktown, Va.
DRILLING COMPANY: Parrott-Wolff, Inc.
RIG TYPE & NUMBER: Truck Rig IR-A300
DRILLING METHOD: Hollow Stem Augers
WEATHER: Sunny
GEOLOGIST: Kenneth A. Tua
ENV. SCIENTIST: none
DATE BEGUN: 9-14-97 DATE COMPLETED: 9-14-97

GROUND SURFACE ELEVATION: 22.22 msl
TOP OF PVC CASING ELEVATION: 24.29 msl

WELL DETAILS (FT)

STICKUP	2.0
LENGTH OF RISER (2"I.D.):	21
LENGTH OF SCREEN (2"I.D.):	10
THICKNESS OF GROUT:	
THICKNESS OF SEAL:	3
THICKNESS OF SAND PACK:	12

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/0.5'	RECOVERY (ft.)	PID (PPM) BG	PID (PPM) PS	LITHOLOGY	DESCRIPTION	DEPTH	WELL INSTALLATION
			S-1	SS	2 4 6 8	2.0	0	0		SAND: fine to med, trace silt, brown, dry, med. dense		
			S-3	SS	5 5 5 5	2.0	0	0		SAND and CLAY orange, damp, med dense		
			S-6*	SS	12 15 17 23	2.0	0	0		SAND: -fine, some silt, little cemented shells, brown to green damp to wet, med dense		
			S-8	SS	7 9 12 40	1.5	0	0				
			S-10*	SS	4 4 4 4	0.4	0	0				
			S-11	SS	6 6 7 9	2.0	0	0				
			S-12	SS	8 9 7 7	2.0	0	0				



BAKER

WELL CONSTRUCTION LOG

BOREHOLE NUMBER: 25GW01

SHEET: 2 OF: 2

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO	SAMPLE METHOD	BLOWS/0.5'	RECOVERY (Ft.)	PID (PPM) BG	PID (PPM) PS	LITHOLOGY	DESCRIPTION	DEPTH	WELL INSTALLATION
-2.00	24.0										24.0	
-3.00	25.0									SAND: -fine, some silt, little cemented shells, brown to green damp to wet, med. dense	25.0	
-4.00	26.0										26.0	
-5.00	27.0										27.0	
-6.00	28.0		S-14	SS	5 6 7 9	2.0	0	0			28.0	
-7.00	29.0									END OF BORING AT 29' BGS	29.0	
-8.00	30.0									Notes: For complete lithology details, refer to 25GW02A log for this site. * indicates laboratory sample interval	30.0	
-9.00	31.0										31.0	
-10.00	32.0										32.0	
-11.00	33.0										33.0	
-12.00	34.0										34.0	
-13.00	35.0										35.0	
-14.00	36.0										36.0	
-15.00	37.0										37.0	
-16.00	38.0										38.0	
-17.00	39.0										39.0	
-18.00	40.0										40.0	
-19.00	41.0										41.0	
-20.00	42.0										42.0	
-21.00	43.0										43.0	
-22.00	44.0										44.0	
-23.00	45.0										45.0	
-24.00	46.0										46.0	
-25.00	47.0										47.0	
-26.00	48.0										48.0	
-27.00	49.0										49.0	
-28.00	50.0										50.0	
-29.00	51.0										51.0	
-30.00	52.0										52.0	
-31.00	53.0										53.0	
-32.00	54.0										54.0	
-33.00	55.0										55.0	
-34.00	56.0										56.0	

BAKER

WELL CONSTRUCTION LOG

BOREHOLE NUMBER: 25GW02

SHEET: 1 OF: 2

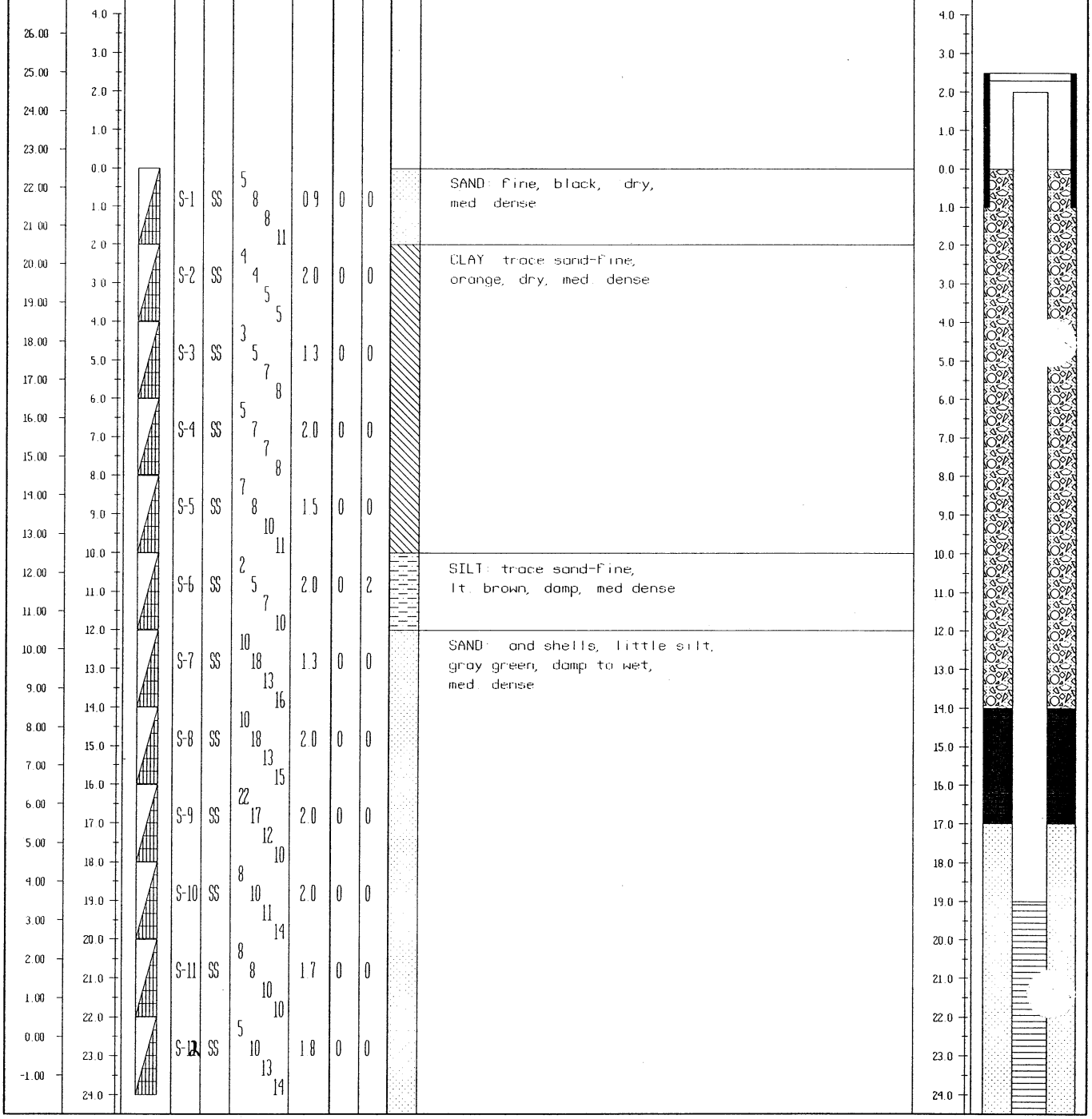
PROJECT NUMBER: 26007-035
PROJECT NAME: Site 25 - Building 373 Rocket Plant
LOCATION: Naval Weapons Station, Yorktown, Va.
DRILLING COMPANY: Parratt-Wolff, Inc.
RIG TYPE & NUMBER: Truck Rig IR-A300
DRILLING METHOD: Hollow Stem Augers
WEATHER: Sunny
GEOLOGIST: Kenneth A. Tua
ENV. SCIENTIST: none
DATE BEGUN: 9-13-97 DATE COMPLETED: 9-13-97

GROUND SURFACE ELEVATION: 22.51 msl
TOP OF PVC CASING ELEVATION: 24.55 msl

WELL DETAILS (FT)

STICKUP:	2.0
LENGTH OF RISER (2"I.D.):	21
LENGTH OF SCREEN (2"I.D.):	10
THICKNESS OF GROUT:	
THICKNESS OF SEAL:	3
THICKNESS OF SAND PACK:	12

SAMPLE NO	SAMPLE METHOD	BLOWS/0.5'	RECOVERY (Ft.)	PID (PPM) BG	PID (PPM) PS	LITHOLOGY	DESCRIPTION
S-1	SS	5 8 8 11	0.9	0	0		SAND: fine, black, dry, med. dense
S-2	SS	4 4 5 5	2.0	0	0		CLAY: trace sand-fine, orange, dry, med. dense
S-3	SS	3 5 7 8	1.3	0	0		
S-4	SS	5 7 7 8	2.0	0	0		
S-5	SS	7 8 10 11	1.5	0	0		
S-6	SS	2 5 7 10	2.0	0	2		SILT: trace sand-fine, lt. brown, damp, med dense
S-7	SS	10 18 13 16	1.3	0	0		SAND: and shells, little silt, gray green, damp to wet, med. dense
S-8	SS	10 18 13 15	2.0	0	0		
S-9	SS	22 17 12 10	2.0	0	0		
S-10	SS	8 10 11 14	2.0	0	0		
S-11	SS	8 8 10 10	1.7	0	0		
S-12	SS	5 10 13 14	1.8	0	0		



BAKER

WELL CONSTRUCTION LOG

BOREHOLE NUMBER: 25GW02

SHEET: 2 OF: 2

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/0.5'	RECOVERY (ft.)	PID (PPM) BG	PID (PPM) PS	LITHOLOGY	DESCRIPTION	DEPTH	WELL INSTALLATION
	24.0										24.0	
-2.00										SILT: trace sand-fine, and shells, brown, wet, med dense		
-3.00	25.0										25.0	
-4.00	26.0		S-13	SS	5 7 11 19	2.0	0	0			26.0	
-5.00	27.0										27.0	
-6.00	28.0										28.0	
-7.00	29.0									END OF BORING AT 29' BGS	29.0	
-8.00	30.0										30.0	
-9.00	31.0										31.0	
-10.00	32.0										32.0	
-11.00	33.0										33.0	
-12.00	34.0										34.0	
-13.00	35.0										35.0	
-14.00	36.0										36.0	
-15.00	37.0										37.0	
-16.00	38.0										38.0	
-17.00	39.0										39.0	
-18.00	40.0										40.0	
-19.00	41.0										41.0	
-20.00	42.0										42.0	
-21.00	43.0										43.0	
-22.00	44.0										44.0	
-23.00	45.0										45.0	
-24.00	46.0										46.0	
-25.00	47.0										47.0	
-26.00	48.0										48.0	
-27.00	49.0										49.0	
-28.00	50.0										50.0	
-29.00	51.0										51.0	
-30.00	52.0										52.0	
-31.00	53.0										53.0	
-32.00	54.0										54.0	
-33.00	55.0										55.0	
	56.0										56.0	

BAKER

WELL CONSTRUCTION LOG

BOREHOLE NUMBER: 25GW02A

SHEET: 1 OF: 3

PROJECT NUMBER: 26007-035
PROJECT NAME: Site 25 - Building 373 Rocket Plant
LOCATION: Naval Weapons Station, Yorktown, Va
DRILLING COMPANY: Parratt-Wolff, Inc.
RIG TYPE & NUMBER: Truck Rig IR-A300
DRILLING METHOD: Hollow Stem Augers
WEATHER: Partly Sunny
GEOLOGIST: Kenneth A. Tua
ENV. SCIENTIST: none
DATE BEGUN: 9-12-97 DATE COMPLETED: 9-12-97

GROUND SURFACE ELEVATION: 22.45 msl
TOP OF PVC CASING ELEVATION: 24.41 msl

WELL DETAILS (FT)

STICKUP: 2.0
LENGTH OF RISER (2"I.D.): 61
LENGTH OF SCREEN (2"I.D.): 10
THICKNESS OF GROUT:
THICKNESS OF SEAL: 3
THICKNESS OF SAND PACK: 12

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/0.5'	RECOVERY (ft.)	PID (PPM) BG	PID (PPM) PS	LITHOLOGY	DESCRIPTION	DEPTH	WELL INSTALLATION
26.00, 25.00, 24.00, 23.00, 22.00, 21.00, 20.00, 19.00, 18.00, 17.00, 16.00, 15.00, 14.00, 13.00, 12.00, 11.00, 10.00, 9.00, 8.00, 7.00, 6.00, 5.00, 4.00, 3.00, 2.00, 1.00, 0.00, -1.00, -2.00	4.0, 3.0, 2.0, 1.0, 0.0, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0, 16.0, 17.0, 18.0, 19.0, 20.0, 21.0, 22.0, 23.0, 24.0		S-1	SS	5 8 8 11	0.9	0	0		SAND: fine, black, dry, med. dense		
			S-2	SS	4 4 5 5	2.0	0	0		CLAY: trace sand-fine, orange, dry, med. dense		
			S-3	SS	3 5 7 8	1.3	0	0				
			S-4	SS	5 7 7 8	2.0	0	0				
			S-5	SS	7 8 10 11	1.5	0	0				
			S-6*	SS	2 5 7 10	2.0	0	2		SILT: trace sand-fine, lt. brown, damp, med dense		
			S-7	SS	10 18 13 16	1.3	0	0		SAND: and shells, little silt, gray green, damp to wet, med. dense		
			S-8	SS	10 18 13 15	2.0	0	0				
			S-9	SS	22 17 12 10	2.0	0	0				
			S-10	SS	8 10 11 14	2.0	0	0				
			S-11*	SS	10 11 13 9	2.0	0	9				

BAKER

WELL CONSTRUCTION LOG

BOREHOLE NUMBER: 25GW02A

SHEET: 2 OF: 3

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO	SAMPLE METHOD	BLOWS/0.5'	RECOVERY (ft)	PID (PPM) BG	PID (PPM) PS	LITHOLOGY	DESCRIPTION
-2.00	24.0									SILT: trace sand-fine, and shells, brown, wet, med dense
-3.00	25.0									
-4.00	26.0		S-14	SS	5 7 11 19	2.0	0	0		
-5.00	27.0									
-6.00	28.0									
-7.00	29.0									
-8.00	30.0									
-9.00	31.0		S-16	SS	5 2 4 13	2.0	0	0		
-10.00	32.0									
-11.00	33.0		S-17	SS	5 2 43 14	2.0	0	0		SAND and SILT: little shells, brown to green, wet, med dense
-12.00	34.0									
-13.00	35.0		S-18	SS	4 4 4 5	2.0	0	0		
-14.00	36.0									
-15.00	37.0		S-19	SS	5 5 7 9	1.5	0	0		
-16.00	38.0									
-17.00	39.0		S-20	SS	4 7 7 7	2.0	0	0		
-18.00	40.0									
-19.00	41.0									
-20.00	42.0									
-21.00	43.0									
-22.00	44.0									
-23.00	45.0									
-24.00	46.0		S-23	SS	10 10 10 10	2.0	0	0		
-25.00	47.0									
-26.00	48.0									
-27.00	49.0									
-28.00	50.0									
-29.00	51.0		S-26	SS	8 9 8 15	2.0	0	0		
-30.00	52.0									
-31.00	53.0									
-32.00	54.0									
-33.00	55.0									
-34.00	56.0		S-28	SS	4 7 7	2.0	0	0		

DEPTH

WELL INSTALLATION

BAKER

WELL CONSTRUCTION LOG

BOREHOLE NUMBER: 25GW02A

SHEET 3 OF 3

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/0.5'	RECOVERY (Ft.)	PID (PPM) BG	PID (PPM) PS	LITHOLOGY	DESCRIPTION	DEPTH	WELL INSTALLAT
-34.00	56.0									SAND and SILT little shells, brown to green, wet, med. dense	56.0	
-35.00	57.0										57.0	
-36.00	58.0										58.0	
-37.00	59.0										59.0	
-38.00	60.0				4						60.0	
-39.00	61.0		S-31	SS	4 8 13	2.0	0	0			61.0	
-40.00	62.0										62.0	
-41.00	63.0										63.0	
-42.00	64.0										64.0	
-43.00	65.0										65.0	
-44.00	66.0										66.0	
-45.00	67.0				4						67.0	
-46.00	68.0		S-34	SS	5 7 7	2.0	0	0			68.0	
-47.00	69.0									END OF BORING AT 69' BGS	69.0	
-48.00	70.0									Notes:	70.0	
-49.00	71.0									* indicates laboratory sample interval	71.0	
-50.00	72.0										72.0	
-51.00	73.0										73.0	
-52.00	74.0										74.0	
-53.00	75.0										75.0	
-54.00	76.0										76.0	
-55.00	77.0										77.0	
-56.00	78.0										78.0	
-57.00	79.0										79.0	
-58.00	80.0										80.0	
-59.00	81.0										81.0	
-60.00	82.0										82.0	
-61.00	83.0										83.0	
-62.00	84.0										84.0	
-63.00	85.0										85.0	
-64.00	86.0										86.0	
-65.00	87.0										87.0	
-66.00	88.0										88.0	

BAKER

WELL CONSTRUCTION LOG

BOREHOLE NUMBER: 25GW03

SHEET: 1 OF: 2

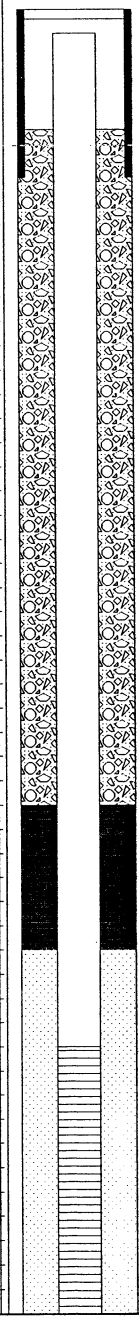
PROJECT NUMBER: 26007-035
PROJECT NAME: Site 25 - Building 373 Rocket Plant
LOCATION: Naval Weapons Station, Yorktown, Va.
DRILLING COMPANY: Parratt-Wolff, Inc.
RIG TYPE & NUMBER: Truck Rig IR-A300
DRILLING METHOD: Hollow Stem Augers
WEATHER: Sunny
GEOLOGIST: Kenneth A. Tua
ENV. SCIENTIST: none
DATE BEGUN: 9-14-97 DATE COMPLETED: 9-14-97

GROUND SURFACE ELEVATION: 21.71 msl
TOP OF PVC CASING ELEVATION: 23.87 msl

WELL DETAILS (FT)

STICKUP:	2.0
LENGTH OF RISER (2"I.D.):	21
LENGTH OF SCREEN (2"I.D.):	10
THICKNESS OF GROUT:	
THICKNESS OF SEAL:	3
THICKNESS OF SAND PACK:	12

SAMPLE NO.	SAMPLE METHOD	BLOWS/0.5'	RECOVERY (ft.)	PID (PPM) BG	PID (PPM) PS	DESCRIPTION
S-1	SS	3 4 7 9	1.4	0	0	SILT: trace sand-fine to med, lt. brown, dry, med. dense
S-3	SS	8 8 6 6	1.3	0	0	SAND: some clay, orange, damp, med dense
S-6*	SS	4 5 9 13	2.0	0	0	
S-8	SS	10 10 10 10	1.0	0	0	SAND: -fine, some silt, little shells, gray green, moist to wet, med. dense
S-10*	SS	2 6 4 4	2.0	0	0	
S-11	SS	6 5 5 5	2.0	0	0	SILT and SAND: and shells, green, wet, loose



BAKER

WELL CONSTRUCTION LOG

BOREHOLE NUMBER: 25GW03

SHEET: 2 OF: 2

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/0.5'	RECOVERY (Ft.)	PID (PPM) BG	PID (PPM) PS	LITHOLOGY	DESCRIPTION	DEPTH	WELL INSTALLF
	24.0									SILT and SAND: and shells, green, wet, loose	24.0	
-3.00	25.0										25.0	
-4.00	26.0										26.0	
-5.00	27.0										27.0	
-6.00	28.0		S-14	SS	5 4 4 8	2.0	0	0			28.0	
-7.00	29.0									END OF BORING AT 29' BGS	29.0	
-8.00	30.0									Notes:	30.0	
-9.00	31.0									For complete lithology details, refer to 25GW02A log for this site.	31.0	
-10.00	32.0									* indicates laboratory sample interval	32.0	
-11.00	33.0										33.0	
-12.00	34.0										34.0	
-13.00	35.0										35.0	
-14.00	36.0										36.0	
-15.00	37.0										37.0	
-16.00	38.0										38.0	
-17.00	39.0										39.0	
-18.00	40.0										40.0	
-19.00	41.0										41.0	
-20.00	42.0										42.0	
-21.00	43.0										43.0	
-22.00	44.0										44.0	
-23.00	45.0										45.0	
-24.00	46.0										46.0	
-25.00	47.0										47.0	
-26.00	48.0										48.0	
-27.00	49.0										49.0	
-28.00	50.0										50.0	
-29.00	51.0										51.0	
-30.00	52.0										52.0	
-31.00	53.0										53.0	
-32.00	54.0										54.0	
-33.00	55.0										55.0	
-34.00	56.0										56.0	

BAKER

WELL CONSTRUCTION LOG

BOREHOLE NUMBER: 25GW04

SHEET: 1 OF: 2

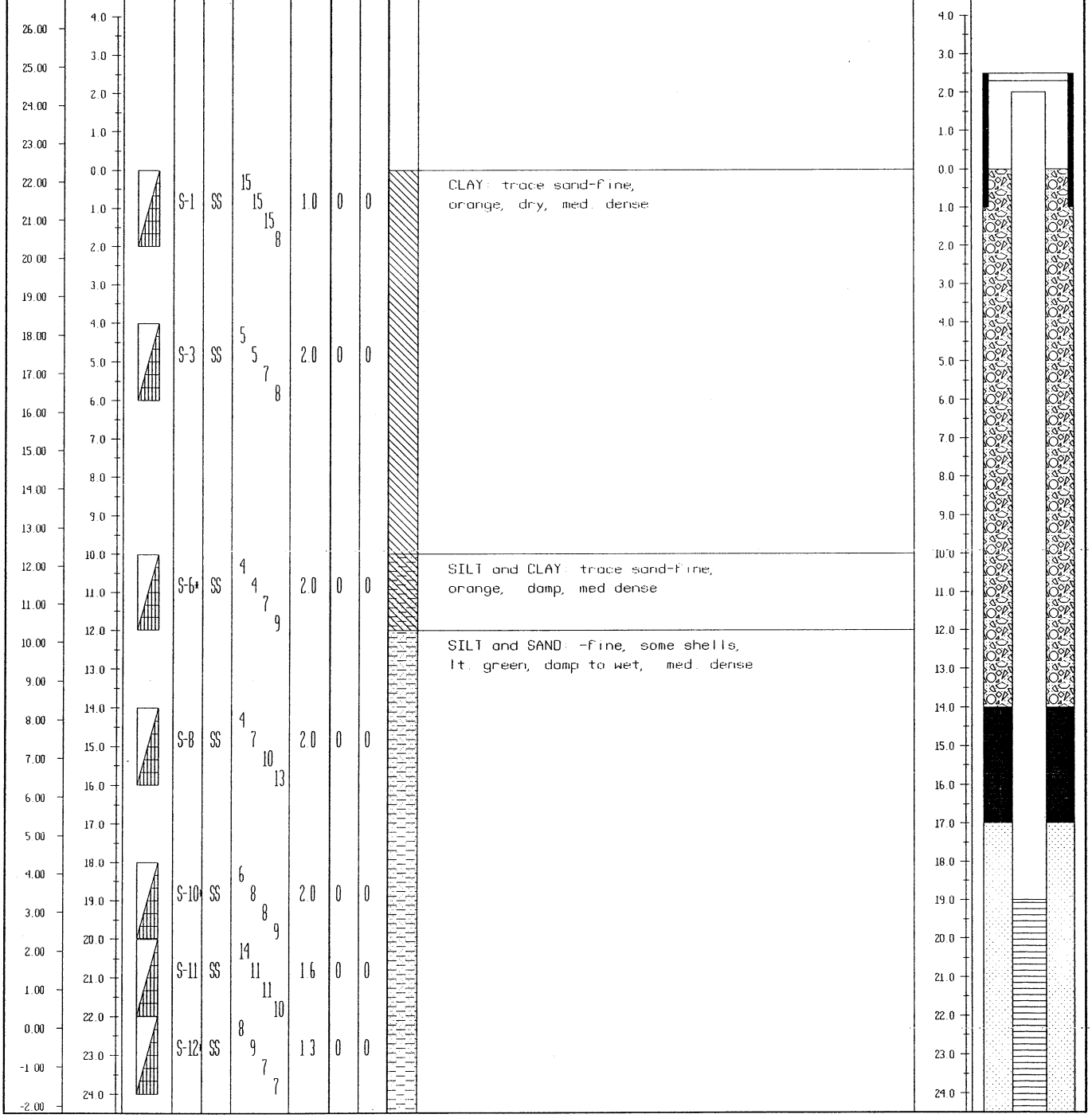
PROJECT NUMBER: 26007-035
PROJECT NAME: Site 25 - Building 373 Rocket Plant
LOCATION: Naval Weapons Station, Yorktown, Va
DRILLING COMPANY: Parratt-Wolff, Inc.
RIG TYPE & NUMBER: Truck Rig IR-A300
DRILLING METHOD: Hollow Stem Augers
WEATHER: Sunny
GEOLOGIST: Kenneth A. Tua
ENV. SCIENTIST: none
DATE BEGUN: 9-13-97 DATE COMPLETED: 9-13-97

GROUND SURFACE ELEVATION: 22.31 msl
TOP OF PVC CASING ELEVATION: 24.18 msl

WELL DETAILS (FT)

STICKUP:	2.0
LENGTH OF RISER (2"I.D.):	21
LENGTH OF SCREEN (2"I.D.):	10
THICKNESS OF GROUT:	
THICKNESS OF SEAL:	3
THICKNESS OF SAND PACK:	12

SAMPLE NO.	SAMPLE METHOD	BLOWS/0.5'	RECOVERY (ft.)	PID (PPM) BG	PID (PPM) PS	DESCRIPTION
S-1	SS	15 15 15 8	1.0	0	0	CLAY: trace sand-fine, orange, dry, med. dense
S-3	SS	5 5 7 8	2.0	0	0	
S-6*	SS	4 4 7 9	2.0	0	0	SILT and CLAY: trace sand-fine, orange, damp, med dense
S-8	SS	4 7 10 13	2.0	0	0	SILT and SAND: -fine, some shells, lt. green, damp to wet, med. dense
S-10*	SS	6 8 8 9	2.0	0	0	
S-11	SS	14 11 11 10	1.6	0	0	
S-12*	SS	8 9 7 7	1.3	0	0	



BAKER

WELL CONSTRUCTION LOG

BOREHOLE NUMBER: 25GW04

SHEET: 2 OF: 2

ELEVATION	DEPTH	SOIL SAMPLES	SAMPLE NO.	SAMPLE METHOD	BLOWS/0.5'	RECOVERY (ft.)	PID (PPM) BG	PID (PPM) PS	LITHOLOGY	DESCRIPTION	DEPTH	WELL INSTALLATION
38.00	24.0										24.0	
37.00	25.0									SILT and SAND: -fine, some shells, lt. green, damp to wet, med. dense	25.0	
36.00	26.0										26.0	
35.00	27.0										27.0	
34.00	28.0		S-14	SS	9 11 11 18	2.0	0	0			28.0	
33.00	29.0									END OF BORING AT 29' BGS	29.0	
32.00	30.0									Notes:	30.0	
31.00	31.0									For complete lithology details, refer to 25GW02A log for this site.	31.0	
30.00	32.0									* indicates laboratory sample interval	32.0	
29.00	33.0										33.0	
28.00	34.0										34.0	
27.00	35.0										35.0	
26.00	36.0										36.0	
25.00	37.0										37.0	
24.00	38.0										38.0	
23.00	39.0										39.0	
22.00	40.0										40.0	
21.00	41.0										41.0	
20.00	42.0										42.0	
19.00	43.0										43.0	
18.00	44.0										44.0	
17.00	45.0										45.0	
16.00	46.0										46.0	
15.00	47.0										47.0	
14.00	48.0										48.0	
13.00	49.0										49.0	
12.00	50.0										50.0	
11.00	51.0										51.0	
10.00	52.0										52.0	
9.00	53.0										53.0	
8.00	54.0										54.0	
7.00	55.0										55.0	
6.00	56.0										56.0	

Appendix B: Field Notes

Statzs (continued) Side 1/3 staff gauges also 10/12/04

WELL	TIME	SWL			
1GW14	1350	9.60	3ST01	1535	dry: reading 0.30 in mud.
1GW18	1352	11.52	low water is approx. 3" below mud level. may need to shift position		
1GW12	1358	9.08			
1GW12A	1357	30.68	3GW20A	1538	26.27
1GW12B	1354	28.68	3GW19	1539	33.74
1GW21	1400	20.20	3GW19A	1540	33.61
1GW20	1402	11.23	3GW15	1547	23.40
1GW19	1410	8.09	3GW15A	1544	23.46
1GW04	1417	5.73			
1GW04A	1418	3.35			
1ST01	1420	0.34/3.34	low tide in stream channel measurement of stream flow		
note: mud line at 1.60/3.34 suggesting high tide mark					
1GW05	1443	3.95			
1GW05A	1440	32.25			
1GW13	1447	8.69			
1GW13A	1448	35.74			
1GW17	1458	5.82			
3GW18	1513	35.34			
3GW06	1518	35.09			
3GW07	1525	21.90			
3GW08A	1528	22.56			
3GW08B	1529	22.47			
3GW20	1534	26.23			

1.80 high mark

Projects (continued)

DAVE MARTIN - PROJECT FIELD GEOLOGIST

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LOG BOOK

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speciall
water re

DT-06

9/12/04

(1)

1100 - Leave Pittsburgh to drive to Va Beach

1830 - Arrive at VA Beach
- load equip & Coolers in truck

1900 - Eat dinner

2100 - leave for New Port News

2200 - Arrive at hotel

9 hrs

DSG

9/13/04 Monday

0730- Arrive at Pass office
0815- Arrive at Baker Trailer.
0915- Marlene arrives after getting hot works permit

- organize coolers

1100- lunch
1230- At pass office - meet DSL
- relocate to Site 6 staging

- help unload drilling supplies

1430- Drillers at pass office - can not get badges
- relocate to pass office
- Drillers get badges

- relocate to Site 6 with rig

- show drillers well locations around impound mud

1730- relocate to trailer
- drillers get water

9/13/04 (3)

1800- off site

DJM

(4)

9/14/00 Tuesday

0645 - At pass office
- 3rd driller get pass

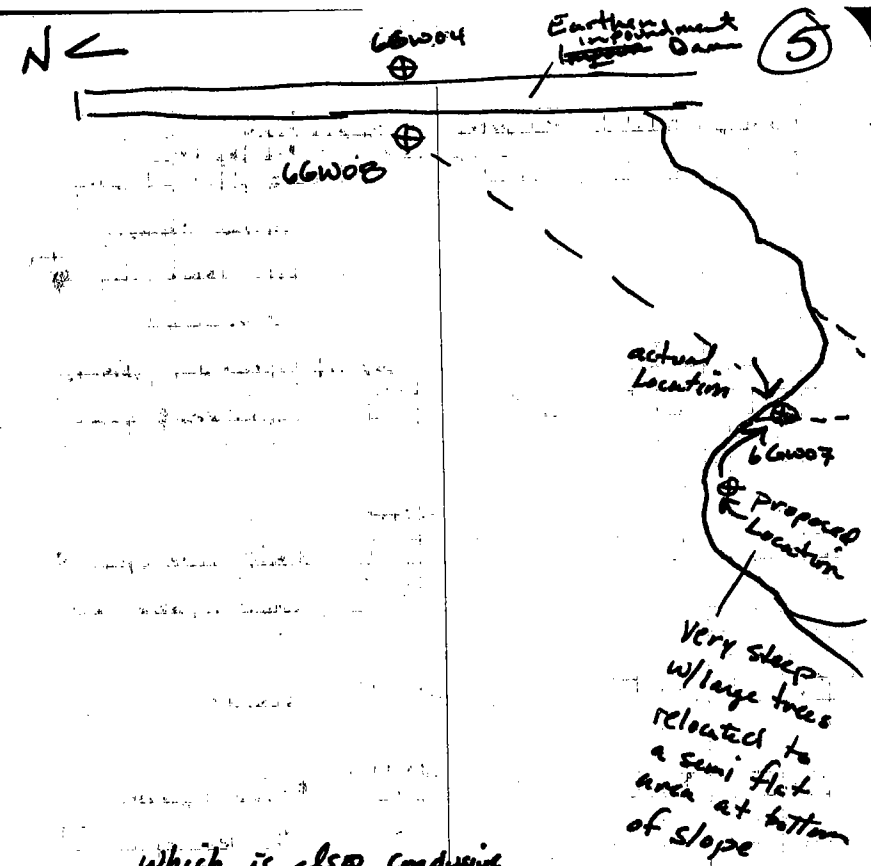
- relocate backhoe & support vehicles to Site 6
- unload supplies

815 - begin relocating to 6MW07 and 6MW08 via 6GW02 & woods

- we discussed installing 6GW07 first in order to proceed to 6GW08 to set 10" casing, leave the rig overnight, then drill through casing to set well the next day. Proceeding this way so that there will be only one trip to 6GW08 & 1 trip back. Can not drive rig out on the marsh considering times because the rig will get stuck

1100 - Setting Rig up for drilling 4 1/2 pneumatic hammer. ~~No blow counter~~

(5)



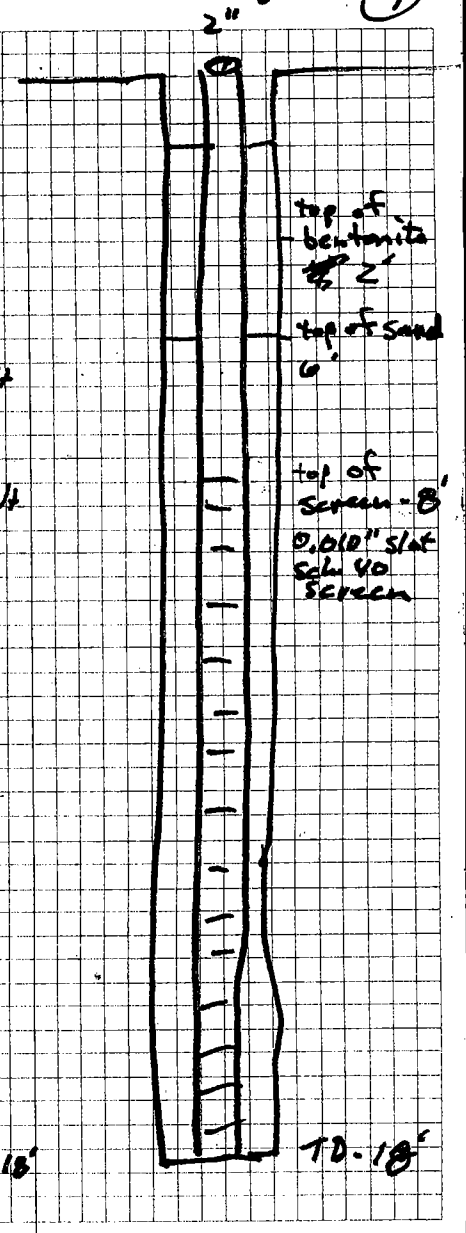
which is also conducive in having the rig drive directly out through Marsh to 6GW08 location

(6)

GGW07

Sample	depth	Recovery	Description	
S-1	0-2	1.6	WOH, 2, 4	0.2 topsoil 0.2-1.3 - Dk brn -lt. brn, damp, organic silt, some clay, roots etc tr. f. sand,
S-2	2-4	1.8	1.3-1.6 3-4 5-5	yellow brn, damp yellow brn & gray
S-3	4-6	2.0	~~WOH~~ ~~4-4~~ ~~5-5~~ WOH, 2 2-3	Moist, olive gray w/ trace f. sand - also clay, some silt, some silt trace organic material mottled, moist, clay, some silt trace organic material orange mottling, CLAY, some silt in partings, organics
S-4	6-8	0.4	WOH	Same
S-5	8-10	2.0	WOH-2 3-5	8-9.6' - same well developed 1/4" clay layers (damp)
water @ 9.6'				
S-6	10-12	0.5	WOH (1.5') 3	9.6-10 - Wet, lt brn sand f. sand, some silt, tr. clay
S-7 (DNR)	12-14	2.0		Wet, yellow brn, f. sand, some silt, little clay
S-8	14-16	2.0	WOH-2 2-3	Same
S-9	16-18	2.0	1-2 3-50	Same except trace shells at tip 17.8-18'

Well Diagram (7)



(8) 9/13/04

1220. begin constructing 6GW07 at a depth of 18' bgs w/ sch. 40 PVC riser & 0.010' slot 10' screen backfilled with #1 grade sand

1338. Well construction Complete
1 drum 3/4 full of soil

1400. 1750. Attempt to relocate to 6GW08 the rig sinks into the marsh
- spend time getting rig unstuck
- spend time relocating to 6GW05 which was knocked over by Shaw
- the well is proposed for sampling & the new MW will be deeper ≈ 18' bgs and logged for lithology. the original 6GW05 was a drive point and it was suspect if the screen penetrated to the groundwater and was the ~~SW~~ well sealed from SW infiltration.

1.5 hrs of attempting to gain access to 6GW08

9/14/04 slight rain (9)

1800- begin sampling 6GW05
- sample to 8' - gw encountered @ 6'
to set well @ 15'

1900 - leave site

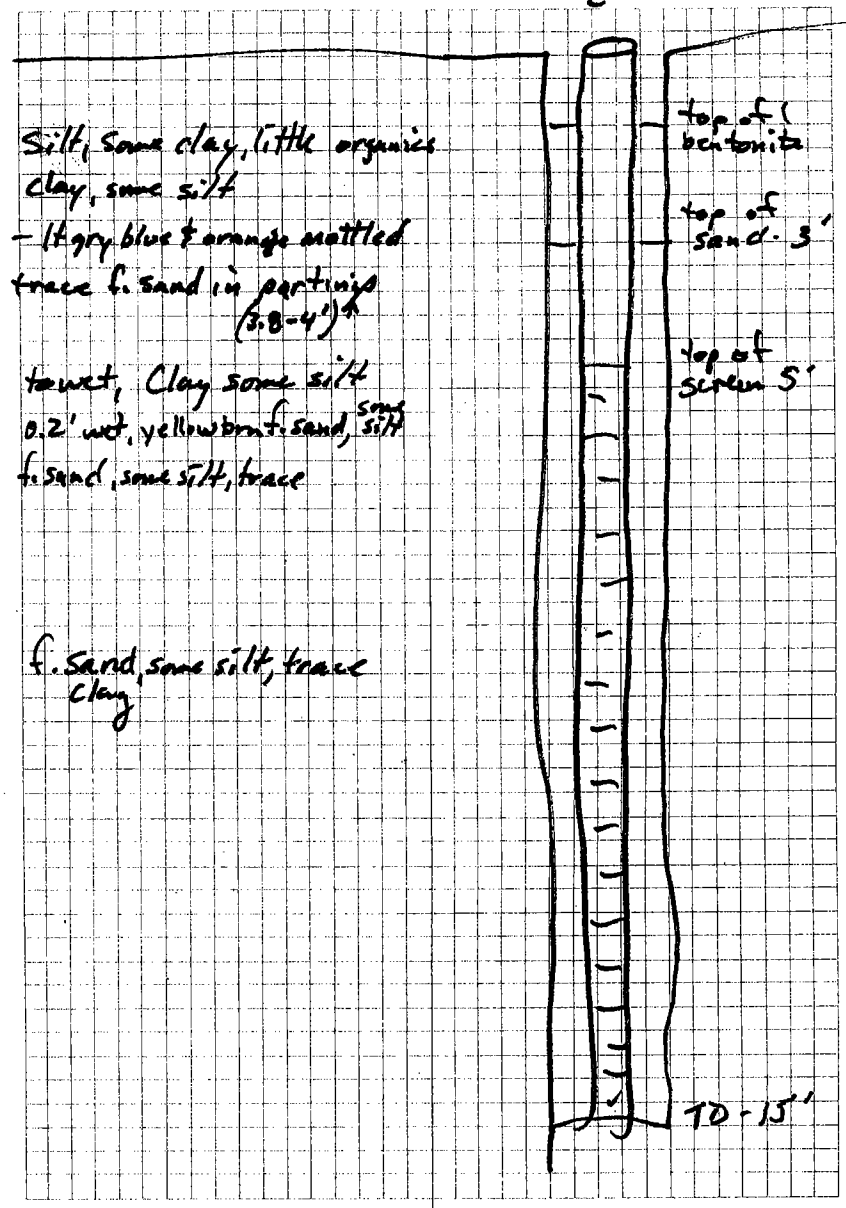
DJh

(10)

6GW05B

Sample	Depth	recovery	blow Count	Description
S-1	0-2	1.0	W-1 2-2	.1 topsoil .1-1.0 brn, damp 0.1-Yellow brn, damp
S-2	2-4	1.7	2-2 3-2	lt gry & orange mottled clay, some silt,
S-3	4-6	2.0	WOH-1 2-2	lt. blue gry, moist little fine sand-
water @ 6'				
S-4	6-8	0.7		wet, lt yellow brn clay
A-N	8-12	1.8		Same
S-5	12-14	1.0	1-1 2-2	wet, lt. yellow brn

GGWOO well diagram (11)



9/15/04 Wednesday Rain

0700- Arrive at Site
- fill rig up with fuel
continue augering 6GW05
going to collect 1 sample (12 .4')
toward the bottom of screened interval

0930- Well complete - relocate to
staging area for decon
- Thunder Storm approaching

1015- Relocated at Bldg 109
- Thunder Storm
- want to see if it continues
1100- drillers off to lunch
- Call D. Hope about redi-flow/generator
problem - he said to check to
be sure all wires are hooked up
→ Thunder Storm - 2hrs downtime
1200- Drillers begin decon

9/15/04 (13)

1230-1430
- Hero Class - Haz. of E. Mag. Radiation to Ordnance
Mark White
EED - electromag Explosive Device EEOs
1-757- 887-4661 Bill Snow

- got cell phone registered

- relocate to 6GW09
- Drillers cleared to well location - 1hr
1450- At 6GW09

1500- begin sampling to 80' depth

1830- stop sampling at 40' depth
- relocate to staging area
- secure area
1900 - off site

DJM

6GW09B

Sample Depth	Depth	Blow count	Recovery	Description	
S-1	0-2	WOH-1 2-4	1.6	0-0.9 Damp gray-brn	Silt, some clay, trace f. sand, organic material
				0.9-1.6 Damp brn Clay	some Silt -
S-2	2-4	6-7 4-4	1.2	Same except brn	w/orange mottling
S-3	4-6	3-3 6-10	1.4	Same gray ~~brn~~ & (OJM)	orange brn laminations (4-5.2')
S-4	6-8	4-6 7-7	1.7	Damp, gry & orange	brn mottled Clay, some silt, trace f. sand
S-5	8-10	3-3 5-8	2.0	Damp, gray & ora	~~gray & blk~~ blue Clay ~~some~~ silt, with little v.f. sand sand is interbedded w/clay as partings (trace orange oxidation staining)
S-6	10-12	2-4 5-7	2.0	Same except	f. sand lense from 10.6-10.7
S-7	12-14	3-5 5-7	2.0	damp, blue, blue gry	~~&~~ gry Clay, some silt, trace (<5%) of v.f. sand in partings trace oxidation staining (oxid. stain?)
S-8	14-16	WOH-1 1-2	2.0 ~~3-4~~ ~~2-3~~ OJM	Same except	gray to lt. blue gry
S-9	16-18	3-4 3-3	2.0	Same	
S-10	18-20	WOH/12" 4-7	2.0	18-19.2 moist, brn	Clay, some silt, little f. sand
				19.2-19.8 moist, gry	brn & white, Clay, some silt little f. sand 30% shells
			1.0 (OJM)	19.8-20 Dry gry	Clay, little silt 10% shells
S-11 water @ 21.75'	20-22	4-8 17-20	~~1.7~~	moist-wet	brn gry f. sand and silt, trace shells 10%
S-12	22-24	12-14 10-13	2.0	Wet gry brn	fine sand and silt, (little ~~trace~~ shells 30% 23-24' only)

(110) 6GW09B (17)

Sample	Depth	Blow count	recovery	Description	
S-13	24-26	4-4 7-12	2.0	wet, gry brn,	f. sand, some silt, trace clay, shells
S-14	26-28	2-2 6-8	2.0	wet, gry brn,	f. sand and silt, trace shells
				27.8-28 wet, brn	v.f. sand and silt, trace shells
S-15	28-30	6-7 9-11	2.0	wet, gry brn	v.f. sand and silt, little clay, trace shells (<1%)
S-16	30-32	2-4 7-8	2.0	wet. gry brn	f. sand & silt, little clay trace shells
			31.6-32	wet gry brn - blue	(2') Silt and f. sand little clay
S-17	32-34	4-6 8-5	32-34	wet blue gray	v.f. sand and silt, little clay
S-18	34-36	3-3 2-7	2.0	wet dk blue gry	Silt & v.f. sand, little clay trace shells
S-19	36-38	4-7 5-7	2.0	same except	v.f. sand and silt
S-20	38-40	3-3 9-7	2.0	Same	
S-21	40-42	WOH-1 5-12	~~wash~~ 1.6 ~~5-12~~	wet, dk blue gry	f. sand some silt, little shells
S-22	42-44	5-12 17-19	2.0	same except	trace shells
S-23	44-46	9-10 19-27	2.0	same except	gray
S-24	46-48	9-17 19-20	2.0	Same	

(18) 8/16/04 Thursday overcast

0655- Arrive at Staging area
- Collect supplies for well installation
- relocate to 6GW09B
0740- begin sampling 40-42'

1125- end boring at 76' - augered to 76' trend the formation gradually became cohesive (silt). Ended boring because it appeared that a well set at 80' would produce less water than one at 76'.

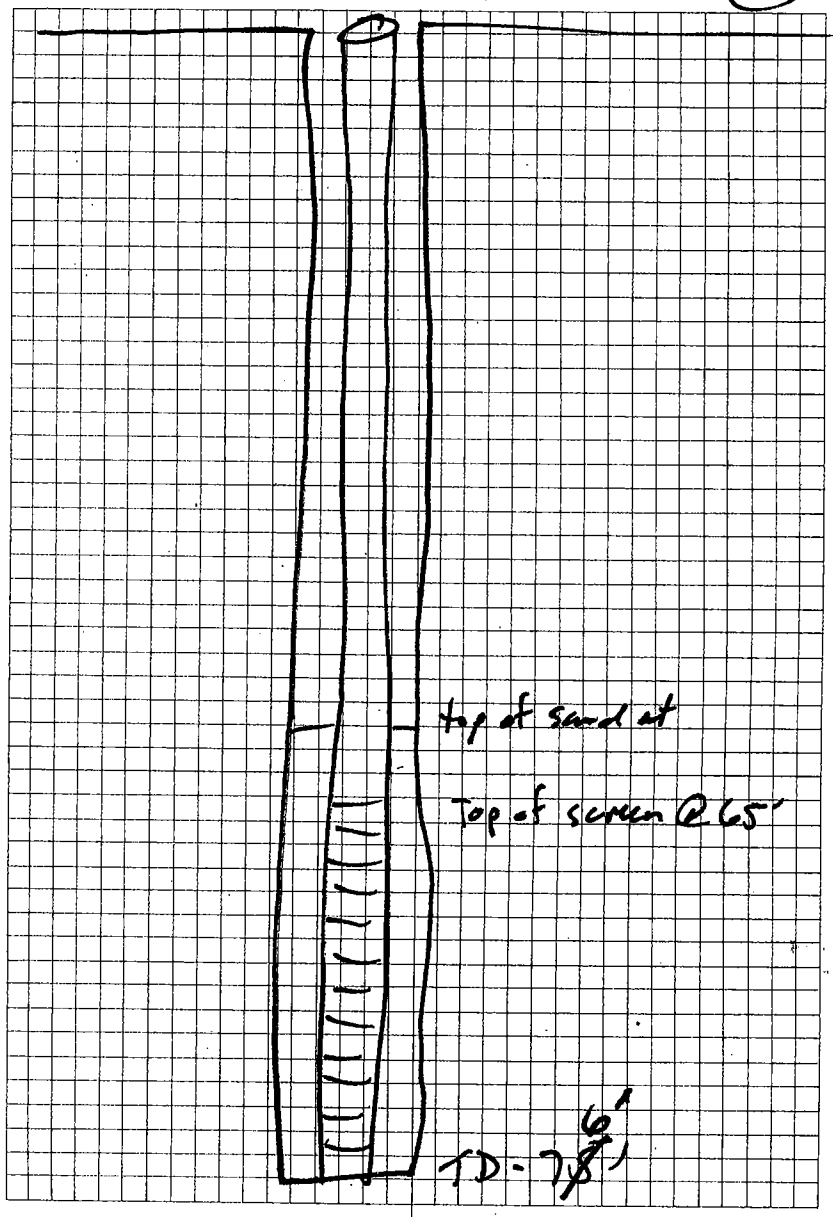
- begin well construction

1600- Complete well construction for 6GW09B

- offset 8' & begin augering to 50' for the installation of 6GW09A

1730- Complete augering to 50'
begin well construction
-

8/16/04 6GW09B (19)



6GW0915

Sample	Depth	Blow counts	Description
S-25	48-50	7-7 9-9	wet, gray, f. sand, some silt, trace (10%) shells
S-26	50-52	WOH-1 1-2	Same except trace clay & 5% shells
S-27	52-54	3-3 6-7	Same
S-28	54-56	4-7 9-12	Same
S-29	56-58	7-12 13-16	Same
S-30	58-60	1-3 3-8	Same
S-31	60-62	2-3 3-7	Same
S-32	62-64	2-5 8-13	wet gray f. sand & silt trace clay shells
S-33	64-66	2-4 4-7	Same except Silt and f. sand
S-34	66-68	3-4 6-6	Same
S-35	68-70	3-4 7-9	Same
S-36	70-72	2-4 6-8	
S-37	72-74	4-6 9-9	wet, pale gray Silt, some fine sand, little clay

6GW04B

Sample	Depth	Blow counts	Description
S-38	74-76	9-6 8-13	moist/wet, gray Silt, little f. sand, clay

EOH @ 76'

4/17/04 (24) Friday overcast humid 73-84

0700. Arrive at site
- drillers get supplies to construct well 6GW09A
- relocate to well location
- begin well construction

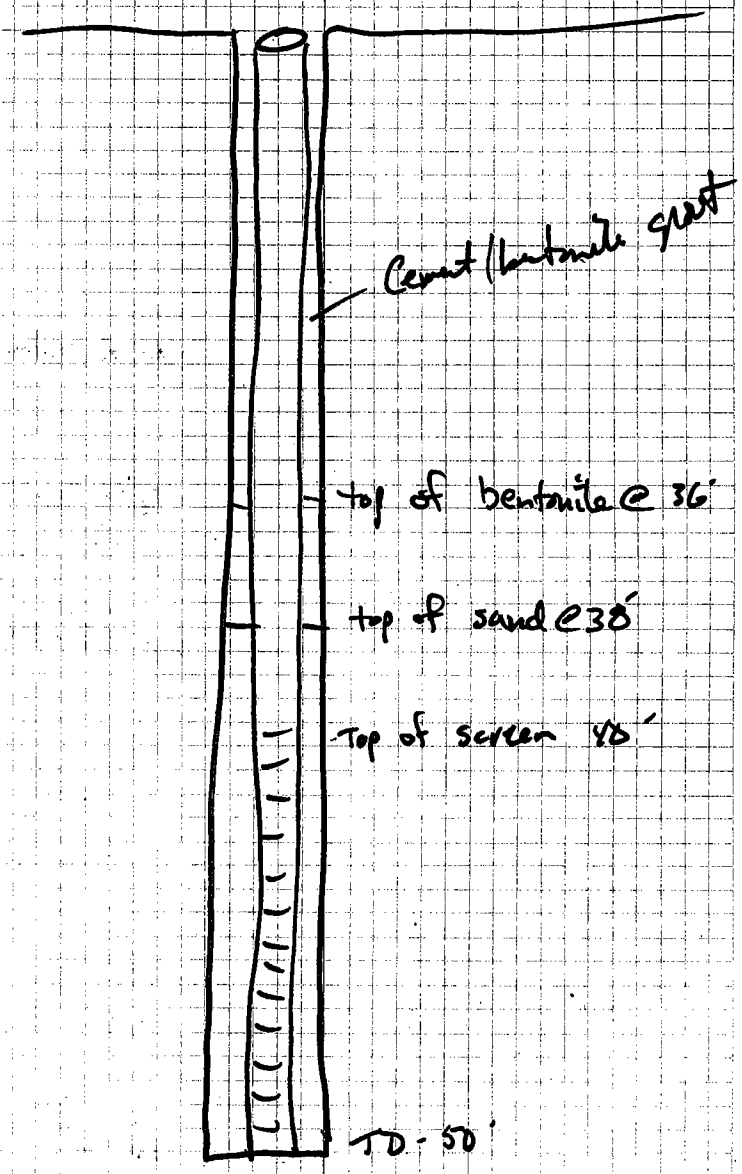
0930. Complete well construction
relocate to 6GW09
- Auger to 30' for well installation

1100. At depth of 30'
- relocate to staging area to get well supplies
begin well construction

1430- Well construction complete
Relocate to staging area for decon

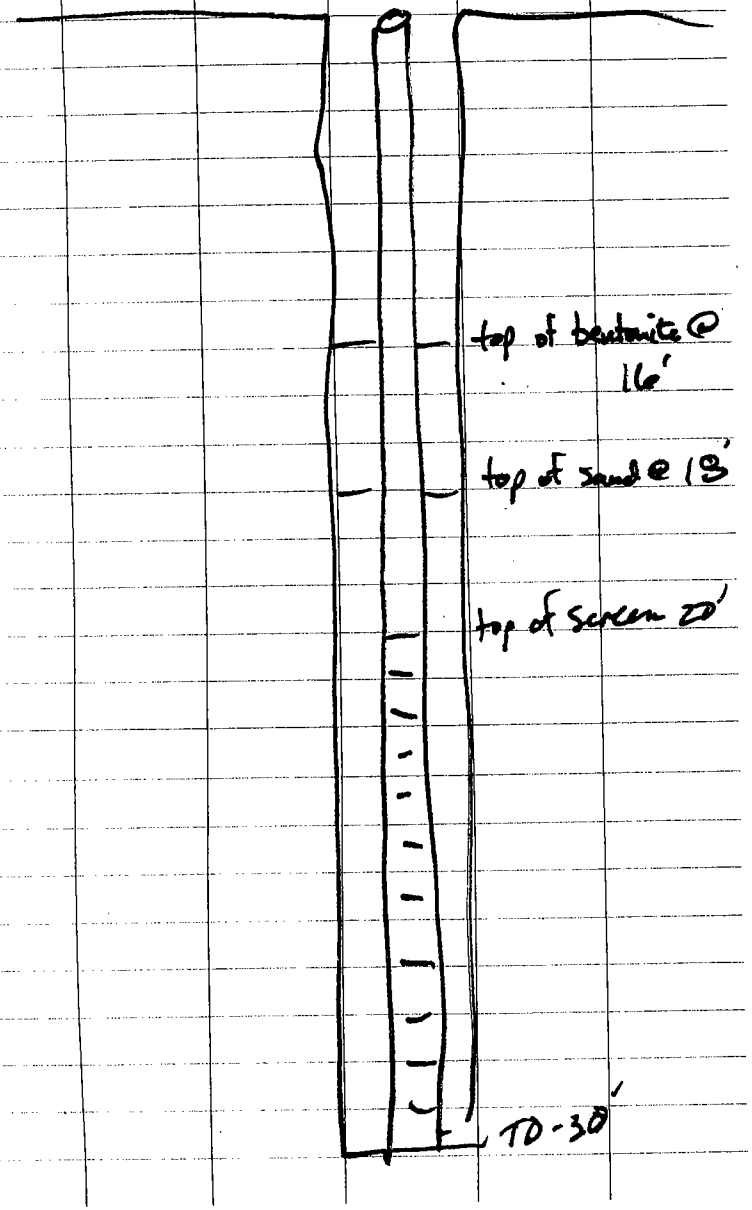
1600- relocate to well location 6GW10A
1630- begin sampling 5' centers to gw then continuous to final depth

6GW09A (25)



(26)

6GW09



(27)

Intentionally Blank

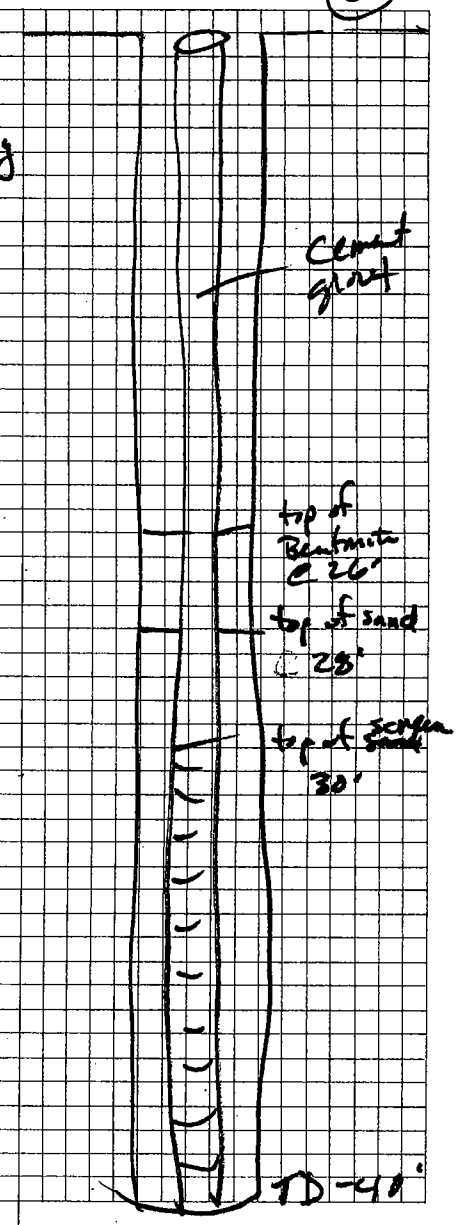
6 GW 10A

Sample Depth	Depth	Blow counts	Recovery	Description	
	0-5				
S-1	5-7	4-5 5-6	2.0	5-5.7 Yellow brn,	damp Clay, some silt, trace f. sand
				5.7-6.6 lt. brn, dry	SILT, some clay little f. sand
A-N	7-10			6.6-7.0 gray, damp	Clay, some silt trace f. sand in partings (acid. stain)
S-2	10-12	2-2 3-4	2.0	Same except	m-f sand in partings
A-N	10-15				
S-3	15-17	8-6 6-8	2.0	15.0-15.3 - Same	
	water @ 15.3'		2.0	15.3-17.0 wet, brn	gry Clay and C-F sand, Some silt, trace f. gravel sand & gravel are angulare shell fragments
A-N	17-18				
S-4	18-20	4-4 5-7	2.0	18-18.9 Same	
				18.9-20 wet, lt brn	f. Sand, some silt, little C-M Sand, trace f. gravel, clay C-M sand & gravel angulare shell fragments
S-5	20-22	WOW-5 5-6	2.0	Same	
S-6	22-24	3-3 7-8	2.0	Same except	shell frag mat <5%
S-7	24-26	4-8 8-7	2.0	Same	
S-8	26-28	2-3 5-4	2.0	Same except	shell frags

(30) 6GW10A

Sample	Depth	Blow Counts	Recovery	Description	
S-9	28-30	3-1 4-5	2.0	28-28.5	Same
				28.5-30	lt. brn, f sand some silt, little clay
S-10	30-32	3-2 6-6	2.0	Same except trace clay, shells	
S-11	32-34	1-3 3-5	2.0	Same	
S-12	34-36	1-3 3-5	2.0	Same	34-34.7
				34.7-36	wet blue gray, silt, some v.f. sand little clay
S-13	36-38	3-3 3-3	2.0	~~36-36.5 Dry~~	~~Same~~
				36.5-38	wet/moist silt, some v.f. sand little clay blue gray
S-14	38-40	1-3 4-7	2.0		

(31)



(32) 9/10/04 Saturday Overcast slight rain

0200 - Arrive at site
- collect supplies proceed to 6GW10A to construct well

- begin well construction

0900 - Complete well construction

Off set 8' to auger down to 22' to install 6GW10

1025 - begin well construction

1235 - Complete well construction & relocating to Staging area

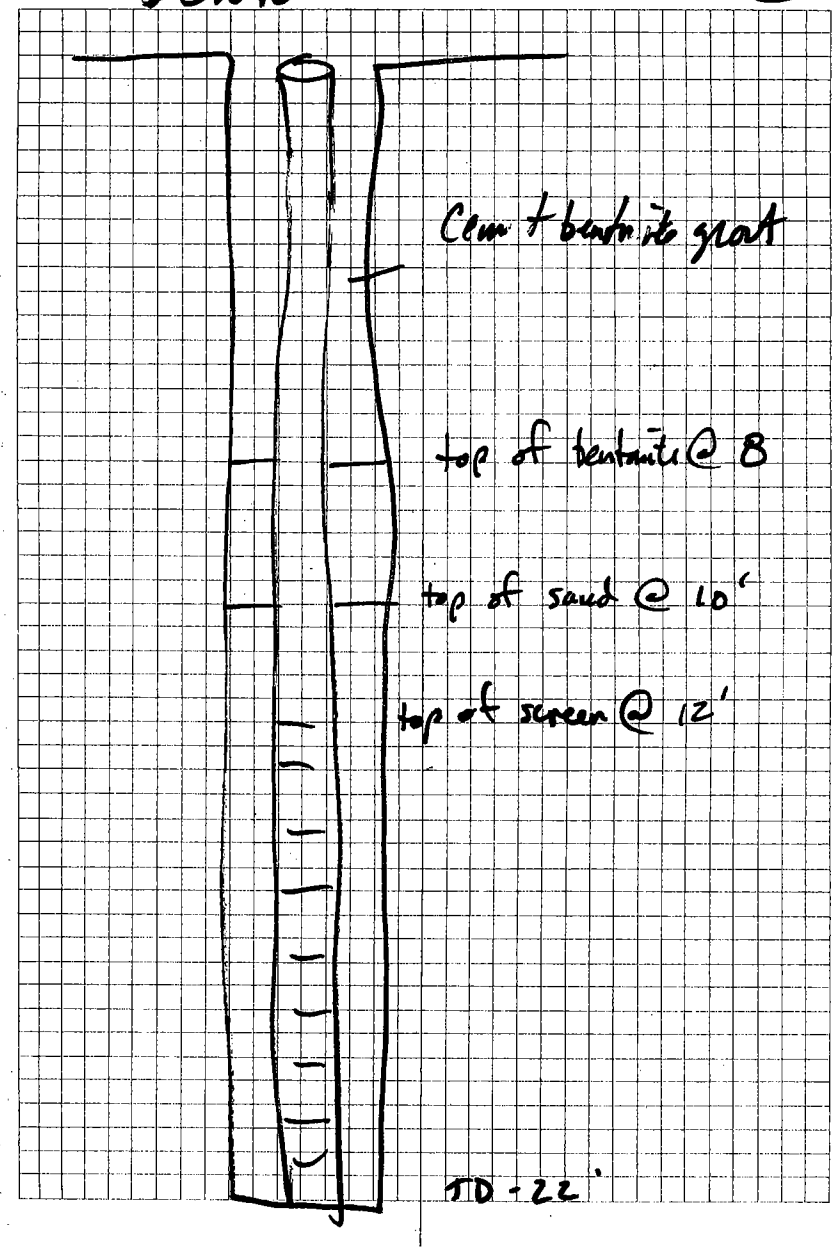
- Decon augers, etc.
- collect supplies f... 6GW06KB

1400 relocate to 6GW06KB
→ 2 hrs of tree clearing to gain access

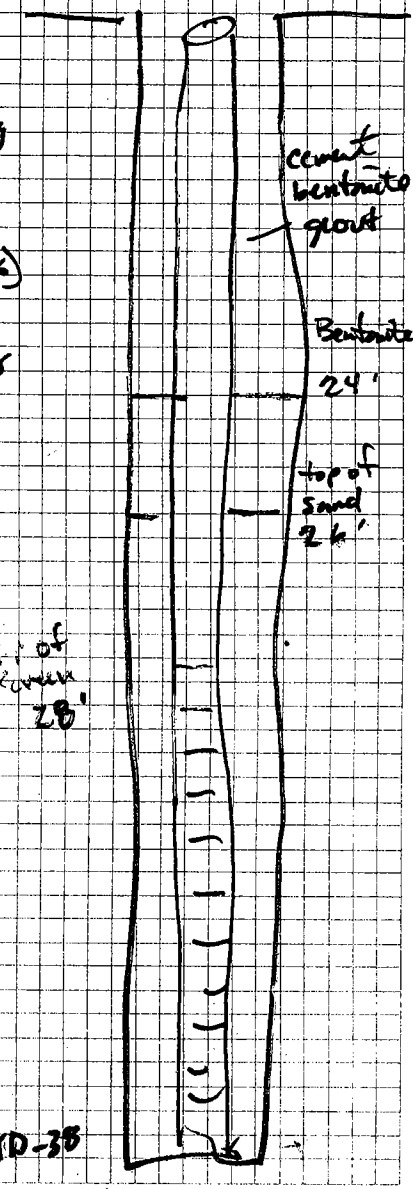
- begin augers!

(33)

6GW10



Sample	Depth	Blow counts	Recovery	Description
0-18	See	6GW06	for lithologic descriptions	
~~18-20~~ S-1	18-20	3-7 14-17	1.5	18-19.3 Wet brn f. sand some silt, trace clay
				19.3-20 wet, brn gray, f. sand, some silt, trace clay, shells
A-N	20-23			
S-2	23-25	4-4 3-3	2.0	Wet gray f. sand and silt, trace clay, shells (1%)
A-N	25-28			
S-3	28-30	3-5 6-7	2.0	Wet gray V.f Sand and silt, trace clay, shells
A-N	31-33			
S-4	33-35	3-3 3-6	2.0	Wet/moist gray Vf. sand & silt, trace clay, shells



9/19/04 Sunday Sunny 60-75

0655 - Arrive at Site 6 staging area
- collect supplies & H_2O to grout 6GW06A & add grout to 6GW10

0949 - At staging area for decon
1100 - collect supplies for well install. at Site 3
1115 - at Site 3 - 36W08 to check what the obstruction is in the well - flush with H_2O via tremie
- determine that the casing was compromised during the RA. (soil around the well was excavated ≈5 feet & the pad & bollards were supported in the air by the PVC & grout column)
the well is obstructed by soil will have to install a new MW.

- drillers off to lunch - go help Marlene & Mary with 16W04 - transporting samples & sampling equipment up hill to truck
1300 - drillers arrive back at site 3 - relocate to 36W08A location and begin

augering to a depth of 80'
Achieved a depth of 65' end of sampling for the day - drillers need to get supplies from Cleveland in Williamsburg.
- help Marlene & Mary with sampling site 3

1200 hrs - off site

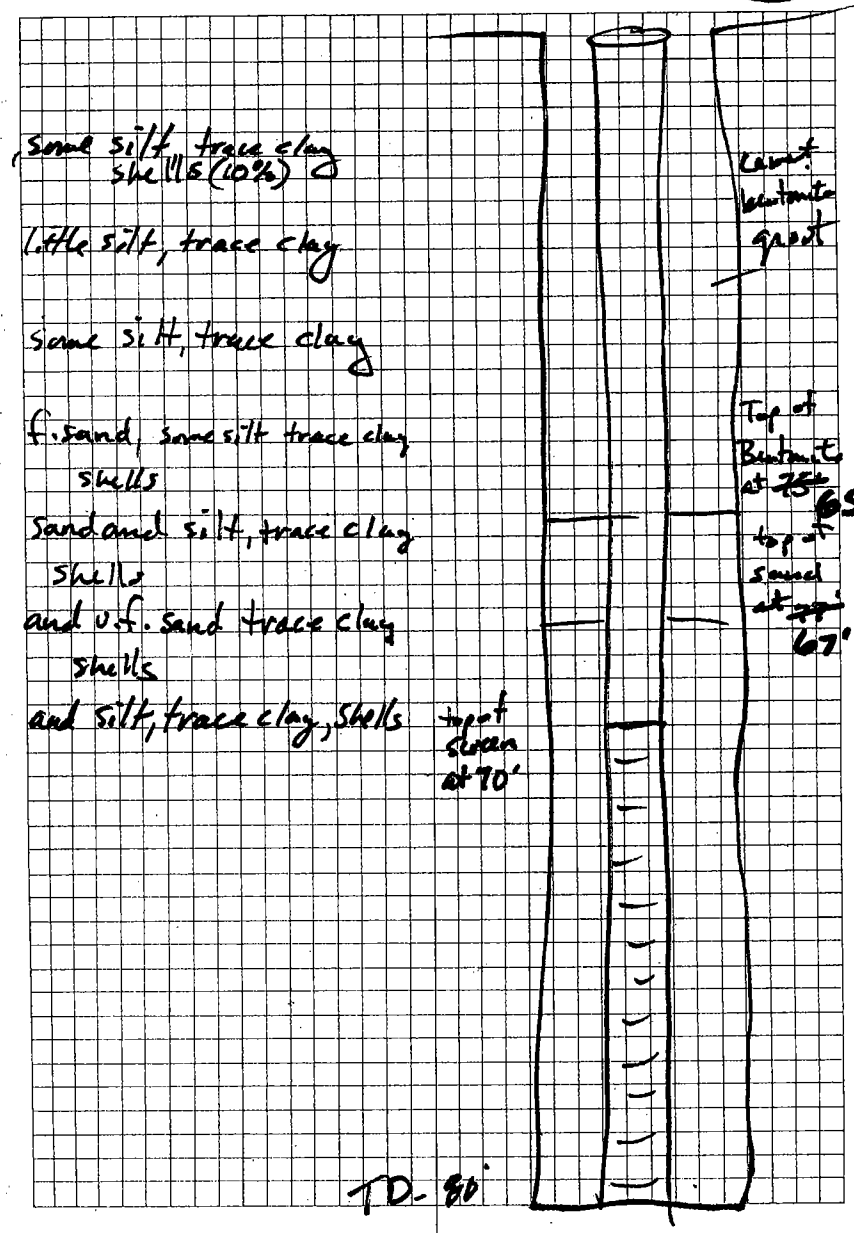
JH

3GW20A

Sample	Depth	Blow counts	Recovery	Description
A-N	0-30			water @ ≈ 27'
S-1	30-32	4-5 11-10	1.2	Wet lt. brn f. sand
S-2	35-37	WOH-1 3-3	2.0	wet, lt. brn f. sand
S-3	40-42	5-10 13-20	2.0	Same except
S-4	45-47	5-9 7-10	2.0	wet, lt gray,
S-5	50-52	3-6 8-10	2.0	wet, gray, v.f.
S-6	55-57	2-2 2-4	1.2	wet gray silt
S-7	60-62	2-4 7-11	1.8	wet gray f. sand
S-8	65-67	7-9 10-18	2.0	Same
S-9	70-72	3-6 6-6	2.0	Same
S-10	75-77	4-7 12-17	2.0	Same
A-N	75-80			

Augered to 86' to set well

3GW20A (39)



9/20/04 (40) Monday Sunny Clear 60-78°

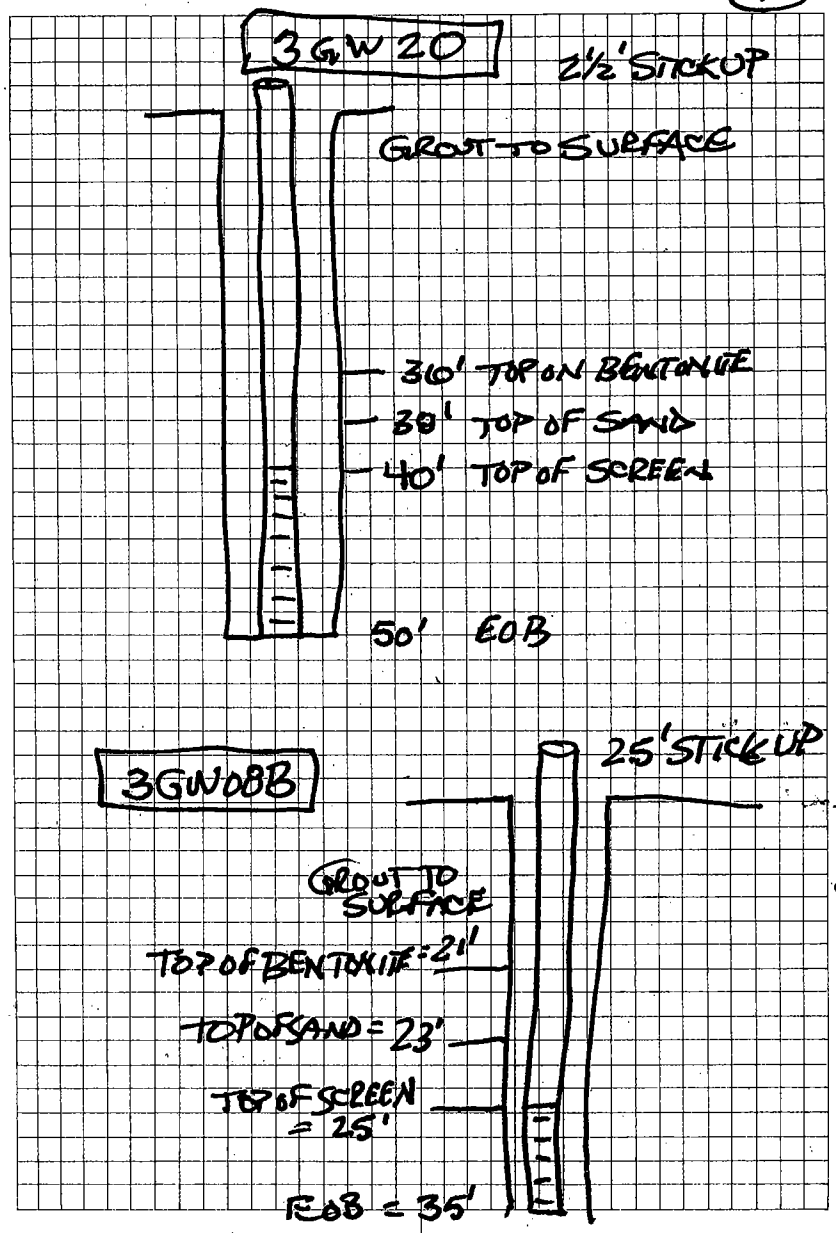
0700 - Arrive on Station
collect supplies & complete
3GW20A

0900 - At 80' depth prepare to
construct well

1100 - Well construction complete
- off set 6' and prepare to
auger to 50' for the installation
of 3GW20

1400 - Augering complete begin well
construction

(41)



NOT TO SCALE

9/24/04 (42) GGWO 8

(43)

Sample	Depth	blow count WOH/24	recovery	Description	
S-1	0-2		—	Very wet, Dk gray	black silt and clay, some organics - swamp odor
	2-9			Same	
	9-16			Wet, dk gray	Clay and silt, trace organic wood
	16-18				
	~~16-18~~			wet/moist, gray	clay & silt, trace f sand at tip.
	18-20	2-2-3		wet moist gray	clay & silt, trace shells
	20-22	3-4-9	0.75	moist, gray	clay & silt
	22-24	8-9 10-12	1.0		
9/24/04	24-26		1.0	moist/damp	clay & silt
	26-28		1.0	Stiff, ~~moist~~/damp	green & brn, gray Clay & silt
	28-30		1.2	Same	
	30-32		1.2	30-31.7 Same except	moist less stiff
				31.7-32 Moist, green gray	silt and clay trace f sand
	32-34		0.7	wet, gray & brn,	Silt & f sand, little shells, trace clay
	34-36		0.2	wet, gray-f sand	and silt, trace clay

9/21/04 (44)

0700 - Arrive at Station
prepare for sampling bGW08
in Marsh

0800 - 930 - tree clearing for MW access
at Site 1

930 - 1130 - relocating tripod & drilling
supplies to the earthen dam of
the Site 6 impoundment

- Sample via hand auger to 9'
- drive 4" ~~shell~~ casing to 8'
- clean out casing w/hand auger the
best we can, pressure keeps sucking
the material back down the casing
- begin split spoon sampling to 18'
still in wet/moist clay & silt
- determine that we need more casing
get 20' of 4" PVC casing. drive
to 18'
- continue sampling to 26' the clay
becomes stiff damp @ 22'
- We need to go deeper than the 29'
- ~~[illegible]~~ of casing that we have to get

(45)

out of the clay and set MW in the underlying
aquifer
PW leaves to get more casing & well supplies
to be able to set well @ 35' depth
before transporting H_2O tank & pump system
to location in order to cut & wash so
that deeper depth can be attained
without the need for casing.
At this point we will have to
determine if this will occur.

1830 - off Site

8/22/04 Wednesday

(40)

0200 - At Station
- collect supplies for drilling 66W08
- get H_2O for decon

0820 - Continue sampling 24-26' 66W08
advance through the clay @ 31.7'
to a less stiff moist/wet silt and clay.
trace fine sand

continued sampling to 36'. Could not
sample deeper because that is the
total depth that the Geoprobe (3")
steel casing could be driven - which
is used to ream the borehole created
via split spoon sampling.

- will install 5' prepacked (w/sand) screen
with 35' of riser.

- begin well installation
0-ft - add (1½" sch 40) pvc riser to geoprobe
riser

(47)

Intentionally Blank

1/23/04 (48) Thursday

0700 - Arrive at site & prep for GW sampling

~~1GW07~~

3GW19

TD 45

SWL 33.31

1.9 well vol.

1GW05A

TD - 72'

SWL - 31.92'

Well vol 6.5 gal

- pumping well @ ≈ 0.25 gpm

Temp.	Cond. µS/cm	pH	turbidity	Vol/gal ~~Comments~~	comments time
17.86	211	7.12	29.4	0/0	initial 0920
18.53	211	7.57	16.3	1/6.5	0950
18.50	210	7.55	8.56	2/13	0920
18.54	211	7.56	2.31	3/	1050

sampled @ 1050 for VOCs, SVOCs pest/PCBs, Total & dissolved inorganics, Cyanide

Staff gauge

1STO1 - top reading 3.34

1/23 0.4 reading

1120 Ar

(49)

25GW02A-001

Nitramines (2 ambers)

Total (1 liter - HNO_3)

Dissolved (1 liter - HNO_3)

CN (1 liter NaOH)

Duplicate

MS

MSD

TD - 71.61'

SWL - 20.48

8.3 gal/vol

TIME	VOL/GAL	pH	COND µS/cm	TEMP °C	TURB
	—	BEGIN	PURGE		
1340	1/8.3	10.11	664	21.65	124
	~~2/16.6~~				
*1405	—	10.65	675	21.74	19.5
1420	—	10.81	647	21.37	16.3
1428	—	10.87	650	21.77	15.0

1430 BEGIN COLLECTION OF 25GW02A-001, -0010, MS/MSD

* NOTE: THE PURGE ON THIS WELL IS EXTREMELY SLOW, MEANING RECHARGE IS ALSO SLOW. OBVIOUS THAT THE H_2O IN THE PVC HAS BEEN PURGED. THEREFORE WILL COLLECT READINGS BASED ON 15-MIN INTERVALS (RANDOM CHOSEN INTERVAL) INSTEAD OF BY VOLUME. JMC

4/28/04 (50) NOTES BY MKI

0906 BEGIN DRILLING FOR 12GW20
↳ WILL DRILL DOWN TO ~ 40', THEN COLLECT SPLIT-SPOONS TO FIND CONFINING UNIT

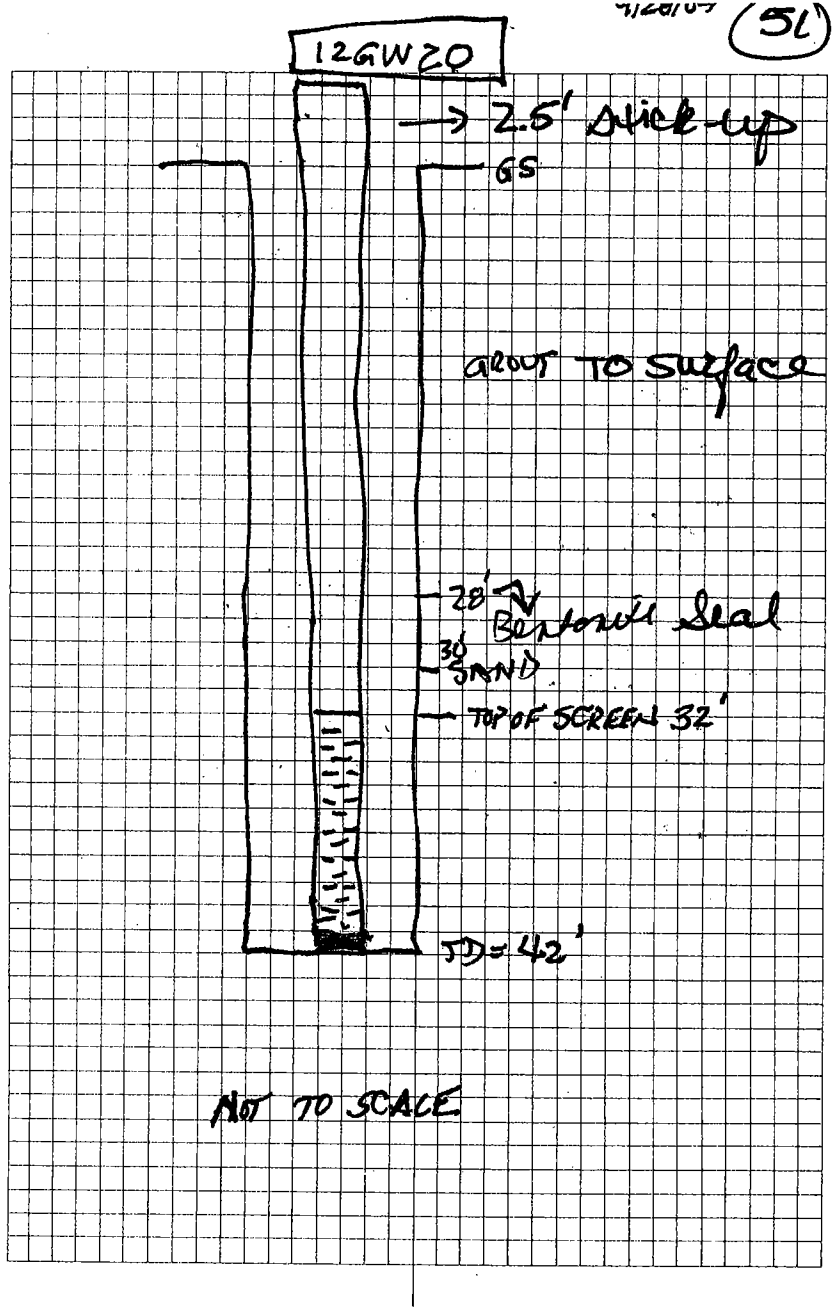
TIME/ SAMPLE	DEPTH	BLOWS	RECOVERY	DESCRIPTION
1005/ S-1	~40-42'	6.6 2.2	.65 (BOTTOM 6")	*"JUNK" IN TOP 18" OF SPOON. LAST 6" IS THE + BLUE-GRAY SILT W/ LITTLE CLAY AND LITTLE TO TRACE V. FINE SHELL FRAGMENTS AND TRACE FINE SAND, DAMP

* NOTE: "JUNK" IN SPOON INCLUDED PIECES OF GRAVEL, WHICH EXPLAINS HARDER DRILLING AROUND 15-20' bgs. WE ARE NEAR WOOD DEBRIS PILE. FILL NOT OUT OF THE QUESTION.

1015 WILL DRILL TO 42' bgs, THEN SET WELL
1045 WELL CONSTRUCTION BEGINS

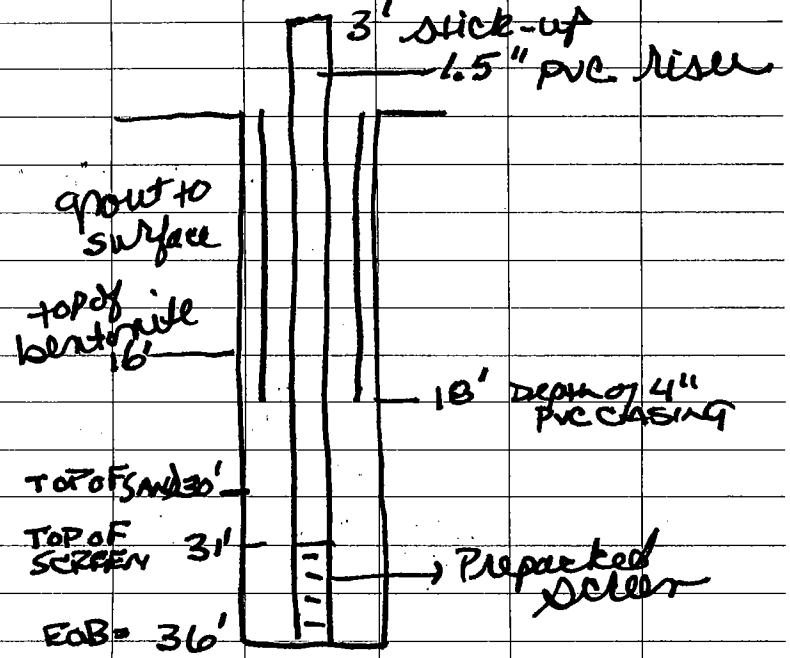
+ SILT LOOKED MORE BLUE THAN GREEN, BUT THIS IS THE YORKTOWN CONFINING UNIT

4/28/04 (51)



GW08

ACTUAL DESIGN – NOT TO SCALE



Dave
Ok w/ revised butter on top of bentonite. Didn't write down a number.
THX,
Dolly M
10/3/04

33.44

16.1

0 Survey 1GW094 + 05A

"Outdoor writing products for outdoor writing people."

@ Sharpening Size

5.18

66.20

17.35
7.02

1458 3P.15

HOTLINE BASEL SPING

1095

13 12/24 11.73

1.91 gal

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CTO 0002
JOB # 4D03-007
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Mike's cell 287-9565

13SEP04

0710 ARR PASS AND ID
↳ GET VEHICLE PASS
0800 RELOCATE TO SITE 6 TO MEET
FIRE AND SAFETY TO GET HOT
WORKS PERMITS
0900 RELOCATE TO FIELD TRAILER
TO UNLOAD/ORGANIZE EQUIP
1220 RELOCATE TO PASS AND ID TO
WAIT FOR DRILLERS
↳ DSI HERE w/ WELL SUPPLIES
↳ ARRANGE AND ASSIST w/
DELIVERY TO SITE 6
1430 RELOCATE TO PASS AND ID
↳ DRILLERS HERE
↳ ASSIST w/ BADGES
↳ ESCORT TO SITE 6
1520 ARR SITE 6
↳ DRILLERS STAGE EQUIP
1600 SCOPE SITE 6 WELL LOCATIONS
w/ DRILLERS FOR ACCESSABILITY.
1815 DPT SITE FOR THE DAY

FOR TUESDAY:
BRING GENERATOR
GET GAS FOR GENERATOR
ICE
DS H_2O

CHANNING - DIG PERMIT
ODD HRS

14SEP04

0630 ERRANDS → CITGO (GAS)
→ FOOD LION (ICE, DS H_2O)

0815 ~~DRA~~ CHANNING BLACKWELL'S OFC
↳ NOT IN

0900 ~~RA~~ RELOCATE TO SITE 6 TO
START GW SAMPLING.

1845 DPT SITE FOR THE DAY,

6GW01A

TD: 64.20
SWL: 5.18
59.02 x .163
= 9.6 gal/vol

TIME	VOL/GAL	pH	µS/cm COND	°C TEMP	TURB
1255	0 —	BEGIN	PURGE	—	—
1335	1/9.6	7.09	440	17.08	18.1
1410	2/19.2	7.17	460	16.80	8.58
1450	3/28.8	7.22	460	17.07	7.29

1500 COLLECT 6GW01A-002
1530 FINISH SAMPLE COLLECTION
↳ BREAK DOWN AND RELOCATE
TO 6GW01

14 SEP 04

6GW01

(4" WELL)

24.65
5.99
18.66 x .652
= 12.2 gal/vol

TIME	VOL/GAL	pH	µS/µM COND	°C TEMP	TURB
1550	0/—	BEGIN	PURGE	—	—
1645	1/12.2	6.86	519	17.14	11.0
1750	2/24.4	6.85	512	16.87	7.83
*0925	3/36.6	6.86	505	17.16	6.34

* CONTINUED ON 9/15/04 @ 0810
0930 COLLECT 6GW01-002 on 9/15/04

6GW04

8.64
2.00
6.64 x .163
= 1.0 gal

15SEP04

STEADY RAIN
T-STORMS
70s

0700 ARR WPNSTA YORKTOWN, ENVIRONMENTAL OFC. MEET SHANA CONLEY HERE.

0715 RELOCATE TO SITE 6 TO FINISH 6GW01

1010 RELOCATE TO SITE 17 - EASIER TO SAMPLE HERE CONSIDERING THE WEATHER

1130 RAIN CLEARING

1830 DEPT SITE FOR THE DAY.

17GW01

TD= 19.35
SWL= 7.62
11.73 x .163
= 1.91 gal/vol

TIME	VOL/GAL	pH	µS/cm COND	°C TEMP	TURB
1030	1/2	5.52	168	22.02	6.31
1043	↓	↓	↓	↓	↓
1050	2/4	5.29	161	21.87	6.94
1103	3/6	5.23	158	21.80	5.57

1030 BEGIN PURGE
1110 COLLECT 17GW01-001

17GW10

TD = 13.4
SWL = 3.15
10.25 X .652
= 6.68 gal/vol

TIME	VOL/GAL	pH	NS/cm COND	°C TEMP	TURB
1210	—	BEGIN	PURGE	—	—
1240	1/6.7	6.52	1064	22.05	6.36
*1340	2/13.4	6.50	1080	22.54	6.24
1410	3/20.1	6.50	1079	22.23	5.97

1415 COLLECT 17GW10-001

*@ 1250 let well purge while go show drillers where to set up for 6GW09 while Dave in HERO class, when return @ 1330, battery had died + volume 2 not yet complete.

6SB/GW09

TIME	INTERVAL	DEPTH	BLOWS	DESCRIPTION

(see DJM's book)

MED

17GW16

15.34'
7.76'
7.58 X .652
= 4.94

TIME	VOL/GAL	pH	NS/cm COND	°C TEMP	TURB
1520	BEGIN	PURGE	—	—	—
1548	1/5.0	6.00	103	24.35	14.0
1603	2/10.0	5.94	95	23.97	14.8
1623	3/15.0	5.97	94	24.42	16.5

1625 COLLECT 17GW16-001

15 SEP04

taken 9/15/04

17GW02

14.93
5.19
9.74 x .163
= 1.58 gal/vol

TIME	VOL/GAL	pH	µS/cm COND	°C TEMP	TURB
0843	—	BEGIN	PURGE	—	—
0853	1/1.6	5.23	97	22.29	7.19
0912	2/3.2	5.08	89	22.25	8.32
0923	3/4.8	5.17	89	22.40	7.30

0925 collect 17GW02-001 ON 9/16

15 SEP04

11GW03

16.43
4.23
12.20 x .163
= 1.99 gal/vol

Time	Vol/gal	pH	cond	temp	turb
1055	—	Begin	Purge	—	—
1112	1/1.99	5.17	62	21.67	19.7
1122	2/3.98	5.18	61	21.48	16.7
1132	3/4.95	5.25	61	21.51	16.1
1142	4/5.92	5.50	60	21.42	16.6

1145 collect 11GW03-001

 16Sep04

11GW09

13.7
10.6
3.1 × .163
= 0.50 gal/vol

Time	Vol/gal	pH	Cond	Temp	turb
1345	—	begin	purge	—	—
1350	110.5	4.23	83	20.10	7.05
1400	211	4.16	88	19.70	6.36
1410	311.5	4.16	90	19.77	6.28

1415 COLLECT 11GW09-001

~~11GW10~~ 11GW11

15.20
8.32
6.88 × .652
= 4.5 gal

Time	Vol/gal	pH	Cond	Temp	Turb
1444	—	begin	purge	—	—
1507	114.5	4.63	74	19.65	9.07
1528	219	5.06	72	19.86	7.32
1545	313.5	4.84	72	19.55	6.75

1550 COLLECT 11GW11-001

11GW11A

52.40
24.97
27.43 x .163
= 4.5 gal/vol

Time	vol/gal	pH	cond	temp	turb
1527	—	BEGIN	PURGE	—	—
1550	1/4.5	6.44	159	16.45	255
*1610	1.5/6.75	—	—	—	90.6
**0845	2/9.0	6.67	161	16.94	29.5
0915	2.5/11.25	—	—	—	21.8
0930	3/13.5	7.44	164	17.00	9.7

*NEED TO PACK SAMPLES. WILL FINISH WELL TOMORROW.

**0820 START / CONTINUE PURGE
0930 COLLECT 11GW11A - 001 OR 9/17

0700 ARR ON-SITE W/SHANA CONCEY. MEET MARY SMITH (MES) HERE.
↳ CONTINUE GW SAMPLING.
0900 - 1130 ESD MTG W/ NAVFAC AND CNRMA. SHANA AND MARY CONTINUE SAMPLING
1145 REJOIN GW SAMPLING
1620 RECOCATE TO FIELD TRAILER TO PACK SAMPLES
1705 DPT SITE
1730 ARR FEDEX
1745 DPT FEDEX

NMP

0700 ARR ON-SITE W/ SHANA CONLEY.
MEET MARY SMITH @ SITE 6
↳ GET EQUIP.
↳ GO FINISH PURGING & SAMPLING 11GW11A
↳ SHANA AND MARY GO TO SITE 25
0945 DPT SITE 11 W/ DAVE MARTIN (DJM)
TO GO GET BOOSTER PHOTOGRAPHER
FOR ARTICLE AND PICS FOR
WPNSTA IR PROGRAM UPDATE
1130 RELOCATE TO CHANNING'S OFC
↳ GET ODD HRS STUFF, ETC.
1215 RELOCATE TO SHAW FIELD
TRAILER TO DISCUSS SITE 6
TREATMENT CELL
↳ SINCE SO MUDDY AND HARD
TO GET TO, WE WILL DRUM
SOIL AND H_2O AND WILL
DISPOSE INSTEAD OF PUTTING
IN TREATMENT CELL.
1250 RELOCATE TO SITE 6 - DROP OFF DJM,
THEN JOIN SHANA AND MARY AT
SITE 25.
1340 DPT SITE 25 TO GO "TROUBLE-SHOOT"
PUMP (REDI-FLOW) CONTROLLER.
↳ TRY TO RUN W/ DRILLER'S GENERATOR

↳ CALL GEOTECH
↳ CALL DARRIN HUPE (BAKER)
1430 TALK TO CHANNING RE: LTM
RPT FOR SITE 12
↳ HE COMMENTS THAT
WELL SCREEN INTERVAL
SHOULD BE ADDED TO REPORT
1450 RELOCATE TO BLDG 109 TO
SECURE LOOSE ITEMS B/C
OF POSSIBLE BAD
WEATHER INCOMING
1535 RELOCATE TO SITE 7 TO JOIN
SHANA AND MARY
1630 RELOCATE TO SHAW FIELD
TRAILER TO PACK SAMPLES
1740 DPT SITE FOR THE DAY
1815 ARR FED EX
1830 DPT FED EX

18 SEP04 STEADY RAIN BREEZY

0800 ARR ON-SITE
↳ ARRANGE HOT WORKS PERMIT FOR WEEKEND
↳ CONSULT w/ DJM RE: DRILLING PROGRESS.
0900 DPT SITE.
0920 ARR LOWE'S
↳ GET FIELD SUPPLIES
1000 DPT LOWE'S
1020 ARR HOME IN SUFFOLK
↳ CONSULT w/ GAB RE: SAMPLES DELIVERED THUS FAR
1100 GO OVER PAPERWORK FOR TOMORROW.
1200 EMAIL UPDATE TO CH2M HILL PM AND BAKER ACTIVITY MGR.
1220 FINISHED FOR DAY.

01GW05A

TD = 72.00
SWL = 31.92
40.08
x .163
6.5 gal

TIME	VOL/GAL	pH	COND	TEMP	TURB
* 1048	BEGIN PURGE				
** 1105	PURGE ENDS FOR NOW				

(↳ SEE NOTES ON 9/23/04)

* TRYING TO DO DEEP WELL w/ PERISTALTIC PUMP AS CONTROLLER FOR SUBMERSIBLE NOT WORKING.

** PERISTALTIC CANNOT PULL H_2O FM THIS DEPTH AS DISCHARGE CEASES. WILL NEED TO COME BACK w/ SUBMERSIBLE

19SEP04

IGW05

TD= 17.72
SWL= 2.23
15.49 x .163
=2.5 gal/vol

TIME	VOL/GAL	pH	COND	TEMP	TURB
1040	—	BEGIN	PURGE	—	—
1050	1/2.5	5.08	592	19.53	13.9
1105	2/5.0	4.84	558	19.79	3.23
1125	3/7.5	4.83	529	19.61	3.86

1140 COLLECT IGW05-001, -001D, MS/MSD (AND EEI LTM VIC IGW05-002)
1245 FINISH SAMPLE COLLECTION. PACK-UP.

SUNNY, 70s
WINDY

19SEP04

0800 ARR ON-SITE. MEET MES HERE. WILL CONTINUE GW SAMPLING.
1630 DPT SITE 3 AND RELOCATE TO BLDG 109 TO CONTAIN IDW, CLEAN-UP, etc.
1700 DPT SITE FOR THE DAY
2000 GO OVER PAPERWORK FOR TOMORROW. (COCs, SAMPLING PLAN, LABELS, etc.)
2100 FINISH w/ PAPERWORK FOR DAY.

3GW08A

TD = 77.00
SWL = 21.92
55.08 X .163
= 8.97

TIME	VOL/GAL	pH	COND	°C TEMP	TURB ~~GAL~~
1410	—	BEGIN	PURGE	—	—
1455	1/9.0	6.38	512	15.59	16.8
1540	2/18.0	6.65	495	15.69	7.66
1618	3/27.0	6.80	498	15.84	6.96

1620 COLLECT 3GW08A-002, -002D, MS/MSD
(FOR LTM ONLY)

0730 ARR ON-SITE.
↳ SUM w/ DRILLERS
↳ I WILL CONTINUE GW SAMPLING
0945 RELOCATE TO PASS AND ID TO MEET JC DOUGLASS
↳ JC GETS BADGE AND WILL ASSIST W/ GW SAMPLING
1055 RELOCATE TO SITE 6 TO CONTINUE SAMPLING/PURGING @ 6GW06.
1300 FINISH SAMPLE COLLECTION @ 6GW06 → MANY, MANY CONTAINERS (QA/QC).
1320 RELOCATE TO SITE 7 TO CONTINUE GW SAMPLING.
1600 RELOCATE TO SHAW TRAILER TO PACK SAMPLES
1800 DPT STA.
1830 ARR FEDEX
1900 DPT FEDEX

6GW06

TD = 19.80
SWL = 8.35
11.45 x .163
= 1.86 gal

TIME	VOL/GAL	pH	COND (µS/cm)	TEMP	TURB
0900	~~1/2~~	BEGIN	PURGE	—	—
~~0~~	1/2	—	—	—	—
0920	2/4	6.51	928	17.03	9.52
0933	3/6	6.71	839	16.71	10.84
1140	~~4~~ 15/30	6.82	709	16.94	6.43

1145 COLLECT 6GW06-002 AND -002D PLUS MS/MSD THE VOC PORTION ONLY.

7GW02

TD = 32.0
SWL = 18.2
13.8 x .163
= 2.25 gal

TIME	VOL/GAL	pH	COND (µS/cm)	TEMP	TURB
1400	—	BEGIN	PURGE	—	—
1420	2.25	6.72	662	17.33	19.1
1440	4.50	6.68	666	17.02	12.4
1500	6.75	6.74	655	16.89	10.10

1500 COLLECT 7GW02-002 AND -002D PLUS FULL MS/MSD

 21 SEP 04

0700 ARR ~~GATE~~ PASS AND ID. MEET JIM MADSEN FM REEI. HEAD TO SITE 6.

0718 ARR SITE 6.

↳ CONSULT w/ DJM RE: DRILLING STATUS

↳ JC DOUGLAS ARR

↳ PACK-UP AND HEAD TO SITE 1 TO CONTINUE GW SAMPLING AND BEGIN SW/SD ~~&~~ SAMPLING (FOR LTM).

↳ AT SITE 1, NEED TO DO A LOT OF BRUSH AND TREE ~~&~~ FM DOWNED HURRICANE ISABEL) REMOVAL. DRILLERS HELP w/ CHAINSAW.

1630 RELOCATE TO BLDG 109 (SITE 6) TO UNLOAD AND GET READY FOR TOMORROW'S SAMPLING

1715 JCD AND JIM MADSON DPT. RELOCATE TO 6GW08 TO CONSULT w/ DJM AND DRILLERS.

1800 DPT SITE FOR THE DAY.

MKD

IGW04A

TD = 43.15
SWL = 3.13
40.02 x .163
= 6.5 gal

TIME	VOL/GAL	pH	µS/cm COND	TURB	TEMP °C
1016	—	BEGIN	PURGE	—	—
1047	1/6.5	7.08	169	35.9	~~35.9~~ 15.72
1110	2/13.0	7.04	169	12.4	~~12.4~~ 15.62
1145	3/19.5	7.28	174	3.56	15.78

1150 COLLECT IGW04A-001 (plus IGW04A-002 LTM)

 21SEP04

IGW04

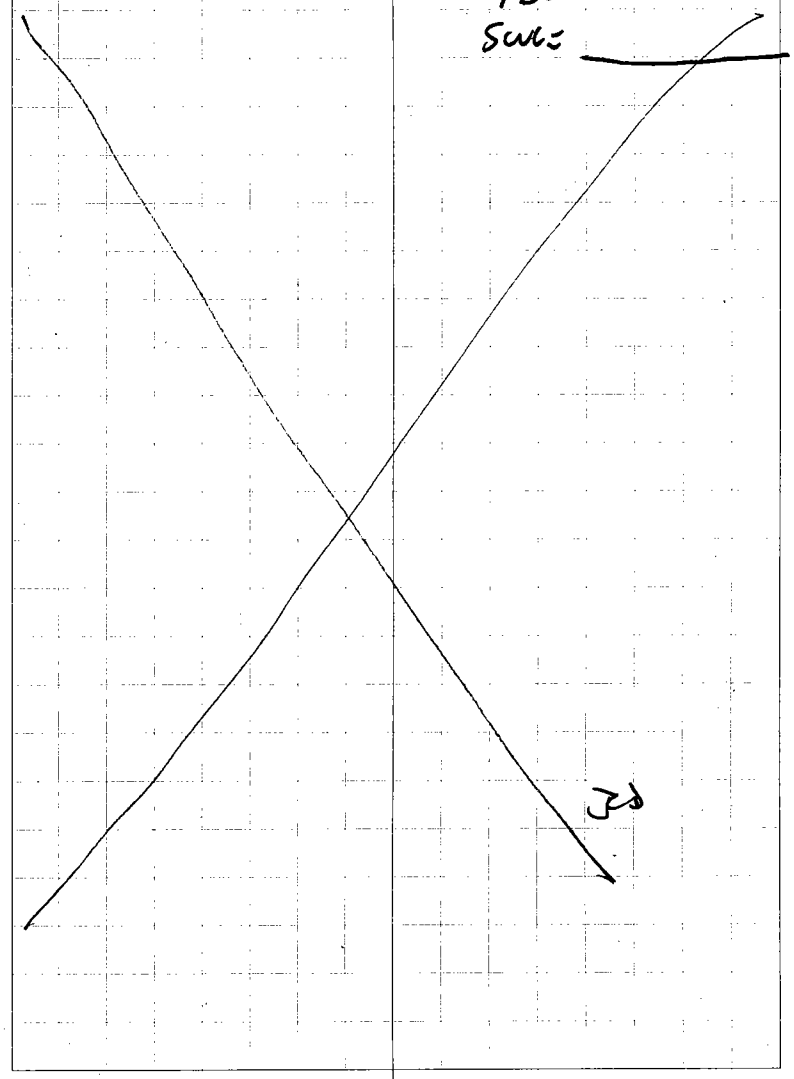
TD= 19.60
SWL= 5.47
14.13 x .163
= 2.3 gal

TIME	VOL/GAL	pH	µS/cm COND	°C TEMP	TURB
1020	—	BEGIN	PURGE	—	—
1040	1/2.3	6.71	388	17.80	169
1050	2/4.6	6.84	413	18.15	8.45
1114	3/6.9	6.73	533	18.08	3.41

1120 COLLECT IGW04-001
(AND IGW04-002 VOC FIELTM)

IGW12

TD=
SWL=



21SEP04

1GW12B

TD= 30.50
SWL= 28.43

TIME	VOL/GAL	pH	COND	TEMP	TURB
1450	start	—	—	—	—
1455	well pumped dry immediately - no recovery. possibility that the well is failed or screen compromised.				

1330 COLLECT SAMPLE w/ BAILER. LITTLE H_2O, WILL TAKE AWHILE - WILL NEED TO COLLECT, ALLOW RECHARGE, THEN CONTINUE COLLECTION
~~12GW~~
1GW12B-001
1GW12B-002 (VOC FOR LTM)

1GW12

Note: 4" well diameter well
TD = 16.35
SWL = 8.58
Volume = (7.79)(0.53) = 5.0 gal

TIME	VOL/GAL	pH	COND	TEMP	TURB
1500	start	—	—	—	—
1524	1/5.0	5.48	473	19.36	5.12
1543	2/10.0	5.26	467	19.13	3.32
1607	3/15.0	5.29	476	19.10	4.05

COLLECT 1610 1GW12-001
-002 (LTM)

21SEP04

1GW20

TD= 12.22
SWL= 11.03
1.19 x .163
= 0.19 gal.

TIME	VOL/GAL	pH	COND	TEMP	TURB
1515	begin	—	—	—	—
1517	1/0.2	6.39	251	21.01	40.0
1519	2/0.4	6.29	247	20.86	30.0
1520	~~3/0.6~~	well dry - stopped pump to allow recharge			
1523	~~3/0.6~~	attempt to pump - <100 ml water retrieved			
~~1525~~	~~4/0.8~~	Sampled to avoid well drying out -			
~~1528~~	~~3/0.6~~	3 volumes received - sample to be taken when well recharge			
1529	3/0.6	6.34	247	21.25	137*

*due to stop/start pump and recharge. allow 15 minutes for recharge

NOTE: ALLOWED TO RECHARGE OVERNIGHT AND SAMPLE COLLECTED @ 1215 ON 9/22/04
1GW20-002 (VOC FOR LTM)

0700 ARR ON-SITE, SHAW TRAILER
↳ MEET JIM MADSON AND JCD
0720 RELOCATE TO SITE 6 / BLDG 109
↳ JIM AND JCD w/ COLLECT SW/SD @ SITE 7, WHILE I SET UP TO PURGE AND SAMPLE 7GW03
0815 RELOCATE TO CEARNING'S OFC TO ARRANGE A HOT WORKS PERMIT FOR SITE 25
0915 RELOCATE TO 7GW03 AND START SET-UP. WILL NEED SUBMERSIBLE PUMP HERE - DECON, LOTS OF SET-UP
1220 RELOCATE TO SITE 6 / BLDG 109
↳ UNLOAD UNNEEDED EQUIP, etc.
1300 GO GET ICE
1330 RELOCATE TO SITE 1. JIM AND JCD HERE SAMPLING 1GW12B ~~1GW00~~
1340 RELOCATE TO SITE 3
↳ JCD TO FINISH SW/SD
↳ JIM AND I TO SAMPLE GW
1730 RELOCATE TO BLDG 109 TO UNLOAD
1800 DPT SITE FOR THE DAY

MCD

 22SEP04

7GW03

TD = 54.00
SWL = 30.47
23.53
= 3.84 gal

TIME	VOL/GAL	pH	µS/cm COND	°C TEMP	TURB
1025	—	BEGIN	PURGE	—	—
1045	1/4	6.76	537	19.77	22.60
1113	2/8	7.38	552	19.92	14.90
1140	3/12	7.40	552	20.63	9.04

1145 COLLECT 7GW03-002 (FOR LTM)

22SEP04

36W19A

SWL = 33.09
TD = 81.00
47.91 (.163) 2"
= 7.80 gal

TIME	VOL/GAL	pH	(µS/cm) COND	°C TEMP	TURB
1425	—	BEGIN	PURGE	—	—
* 1455	1/8	6.37	422	19.47	> 1000
1555	2/16	7.26	428	20.04	136
** 1640	3/24	7.34	425	20.32	50.6

1650 COLLECT 36W19A-001
↳ (AND 36W19A-002 FOR LTM)

* TURN DOWN FLOWRATE AS V. TURBID
** WILL COLLECT MET IN 1L AMBERS AND DECANT.

23SEP04

3GW19

TD = 45.00
SWL = 33.31
11.69 (0.163)2"
= 1.90 gal

TIME	VOL/GAL	pH	COND	TEMP	TURB
	—	BEGIN	PURGE		
	1/2				
	2/4				
	3/6				

MCD

0700 ARR ON-SITE.
↳ DJM AND JIM MADSON TO CONTINUE GW SAMPLING
↳ JCD TO GPS SW/SD LOCS AND PLACE STAFF GAUGES, THEN ASSIST W/ GW SAMPLING
↳ I PREPARE FOR SAMPLE SHIPMENT (CHECK COCs, SEPARATE SAMPLES BTWN BOTH JOBS, etc.) AND END OF WEEK WRAP-UP.
1530 RELOCATE TO SHAW TRAILER W/ JCD TO PACK SAMPLES
1800 DPT SITE
1820 ARR FED EX.
1830 DPT FED EX.

MCD

27SEP04

WARM, OVERCAST
ON AND OFF SHOWERS

0900 ARR ON-SITE, WAIT FOR DRILLERS TO ARR TO CONTINUE DRILLING PORTION → INSTALL 6GW08, DRILL AND INSTALL 12GW20, CONSTRUCT WELL PADS, CLEAN-UP SITE, DEVELOP WELLS.

1020 DRILLERS ARR.
↳ I'LL DEVELOP 6GW07 AND 6GW05 WHILE DRILLERS FINISH 6GW08 INSTALL

1830 LOCK BLDG 109 GATE AND DPT SITE FOR THE DAY

1900 ARR LOWE'S TO GET TUBING

1920 DPT LOWE'S

1935 ARR FOOD LION TO GET FIELD SUPPLIES (DS H_2O, P. TOWELS, GARBAGE BAGS)

1950 DPT FOOD LION.

2000 ARR HOME.

6GW07

TD = 19.39
SWL = 4.17
15.22 x .163
≈ 2.5 gal

TIME	VOL/GAL	pH	USEM COND	°C TEMP	
1220	—	BEGIN	DEVELOPMENT		BEIGE
1225	2/5.0	6.30	813	16.65	ORANGE "
* 1230	4/10.0	6.13	857	15.65	"
1235	6/15.0	6.17	902	15.70	"
1240	8/20.0	6.22	897	15.46	"
** 1255	14/35.0	6.48	912	15.50	**
1300	16/40.0	6.40	971	15.50	**
1305	18/45.0	6.48	995	15.52	**

* IN BTWN 5 gal, SURGE PUMP W/IN NC.
** A BEGINNING OF VOL, PRETTY TURBID B/C OF SURGE, BUT CLEARS UP FAIRLY WELL AND QUICKLY, STILL SOMEWHAT TURBID, THOUGH

NICE RECHARGE.

27 SEP 04

66W05B

TD = 16.85
SWL = 4.3
12.55 X .163
= 2.0 gal

TIME	VOL/GAL	pH	µS/cm COND	°C TEMP	COMMENT(S)
13.50	—	BEGIN	DEVELOPMENT		BEIGE-ORANGE THICK
*1403	5/10.0	6.30	624	17.51	BEIGE-ORANGE LIGHTER
1412	8/16.0	6.32	613	16.70	"
1415	10/20.0	6.16	612	16.66	"
1418	12/24.0	6.23	610	16.70	"
1421	14/28.0	6.31	608	16.68	**

* CAN HEAR PUMP AND SEE FLOW RATE DECREASE AS PUMP IS PUMPING FASTER THAN RECHARGE, BUT NOT BY MUCH. GETTING MUCH OF THE FINES OUT OF THE BOTTOM OF THE WELL. H_2O CLEARING

** H_2O STAYS PRETTY CLEAR EVEN AFTER SURGING

GOOD RECHARGE IF FLOW ~~NOT~~ DOESN'T OVERWHELM IT

27 SEP 04

66W09

TD = 33.44
SWL = 10.98
22.46 x .163
= 3.66 gal

TIME	VOL/GAL	pH	µS/cm COND	°C TEMP	COMMENT(S)
1600	—	BEGIN	DEVELOPMENT		
1608	1/~~3.7~~ 4	6.80	1216	17.15	* BROWN
1614	2/8	6.29	2088	16.46	**
1620	3/12	6.43	2334	15.97	**
1627	4/16	6.49	2465	15.93	**
1632	5/20	6.52	2508	16.05	***
1637	6/24	6.69	2537	16.05	***
1643	7/28	6.55	2703 ?	16.17	***

* BEFORE FIRST VOL FINISHED PURGING, H_2O WENT CLEAR; SURGE PUMP BTWN VOLS.

** AFTER SURGE w/ PUMP, H_2O TURB'D, THEN CLEARS RAPIDLY

*** EVEN AFTER SURGING, H_2O REMAINS FAIRLY CLEAR

NICE RECHARGE

27 SEP 04

6GW10

TD = 25.24
SWL = 12.52
12.72
x .163 = 2.0

TIME	VOL/GAL	pH	COND (mS/cm)	TEMP (°C)	COMMENT
17/1533	—	BEGIN DEVELOPMENT			
17/1539	2/4	6.61	832	16.68	BEIGE ORANGE
17/1546	4/8	6.32	824	16.37	*
17/1552	6/12	6.30	825	16.09	*
17/1558	8/16	6.30	824	16.25	*
1805	10/20	6.47	823	16.03	*

* TURBID AFTER SURGING, THEN CLEARS UP FAIRLY QUICK (SURGE PUMP BTWN VOLS)
NICE RECHARGE

WARM, HUMID 28SEP04
OVERCAST
TD JEANNE TO PASS OVER TODAY

0700 ARR ON-SITE, BLDG 109
0710 DRILLERS ARR
0725 DPT BLDG 109 AND HEAD FOR SITE 12 TO DRILL AND INSTALL 12GW20
0735 ARR SITE 12. DRILLERS LEAVE TO GO GET RIG.
0817 DRILLERS ARR W/ RIG.
↳ NOTE: SEE DJM'S BOOK FOR 12GW20 LOG
1030 COLLECT FIELD BLANK (FBRIG) FM RIG H_2O TANK.
1215 TAKE SWL FM 6GW08 DURING HIGH TIDE SWL = 1.45'
↳ MARSH INFLUENCE?
1330 WAS GOING TO SET-UP ON 6GW09A, BUT SKY GETTING QUITE DARK, AS TROPICAL DEPRESSION JEANNE COMING THROUGH TODAY. DECIDE SUSPEND DEVELOPING FOR TODAY
1345 AT BLDG 109. DRILLERS TO CLEAN RIG AND AUGERS, THEN DONE FOR DAY.
1400 RELOCATE TO FIELD TRAILER TO PACK SAMPLES.
1450 DPT SITE
1520 ARR FEDEX
1525 DPT FEDEX
(CONT ON 47)

28SEP04

6GW10A

TD= 42.57'
SWL= 11.74'
30.83 x .163
=5.0 gal

TIME	VOL/GAL	pH	µS/cm COND	°C TEMP	COMMENT(S)
1158	—	BEGIN DEVELOPMENT			TAN OR THICK
1205	1/5	5.83	741	18.66	*
1220	2/10	6.09	736	18.67	*
1240	3/15	6.15	725	18.75	*
1300	4/20	6.25	738	19.20	*
1319	5/25	6.30	723	18.15	*

* STILL PRETTY THICK AFTER SURGE W/ PUMP
SEE A LOT OF FINE SAND IN TUBING
HOWEVER, AFTER ~2 GAL PURGE, H_2O IS
VERY CLEAR FLOW RATE IS DOWN, AS
PUMP PROB CLOGGED W/ FINE SAND

NICE RECHARGE. CLEARS UP QUICK

28SEP04

6GW09A

TD=
SWL=
JMCD

(FM 45)
1540 ARR LOWE'S
↳ GET MORE TUBING
1600 DPT LOWE'S
1600 - 1700 ——
1700 - 1900 PAPERWORK → BOTTLE INVENTORY,
FIGURE WHAT LEFT TO SAMPLE
→ CONTAINERS NEEDED;
→ EMAIL - COORD. W/ LAB
AND UPDATES

JMCD

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MK1

2 OF 2

0700 ARR ON-SITE, BLDG 107
↳ I WILL CONTINUE WELL DEVELOPMENT
↳ DRILLERS TO BEGIN WELL PAD CONSTRUCTION

1000 6GW09B → TD = 77.0'
SWL = 11.7'
WHALE PUMP I'M USING TO DEVELOP ONLY REACHES TO 70'
∴ WILL DEVELOP THIS WELL W/ A BAILER, ALONG W/ DEEP WELL @ SITE 3 (3GW20A)

1300 RELOCATE TO SITE 3

1325 BATTERIES FOR PUMPS STAGED AT 3GW20/20A AND 3GW08B. TOO LATE TO START ANOTHER WELL AS MUST LEAVE AT 1400 FOR DOCTOR'S APPT. WILL START AT SITE 3 FIRST THING TOMORROW.
RELOCATE TO BLDG 107

1330 CONSULT W/ KEVIN WHITE (DRILLER)
RE: 6GW08 (MARSH WELL)
SWL = 1. (SAME AS YESTERDAY, ONLY LOW TIDE). WILL SEAL OFF TOP W/ WELL PAD, THEN PURGE WELL.

1430 DPT SITE FOR THE DAY. DRILLERS STAY TO CONTINUE PAD INSTALLS.

MEO

6GW09A

TD = 51.55
SWL = 11.67
39.83 x .163
= 6.5 gal

TIME	VOL/GAL	pH	µS/CM COND	°C TEMP	COMMENTS
0820	—	BEGIN	DEVELOPMENT		MED GRAY THICK
*0920	1/6.5	6.65	739	16.49	"
0931	2/13	6.46	794	16.38	" (LOT OF FINE GRAY SAND)
0942	3/19.5	6.48	818	16.38	", CLEARING
0954	4/26	6.54	843	16.36	LT GRAY, CONTINUES TO CLEAR
1000	5/32.5	6.59	870	16.42	"

* NOTE: AFTER FIRST VOL PURGED, TUBING TOO SHORT AND FELL DOWN INTO DWC. TOOK A WHILE TO FISH IT OUT. DEVELOPMENT RESUMED @ 0920

NICE RECHARGE.

6GW06B

TD = 40.75
SWL = 6.85
33.9 X.163
= 5.5 gal

TIME	VOL/GAL	pH	µS/cm COND	°C TEMP	COMMENTS
1150	—	BEGIN	DEVELOP	MENT	MED GRAY-BROWN THICK
1155	1/5.5	6.62	602	17.25	*
1200	2/11.0	6.25	606	16.59	*
1210	3/16.5	6.21	609	16.19	**
1220	4/22.0	6.27	605	16.20	**
1230	5/27.5	6.32	605	16.46	**

* TOWARDS END OF FIRST VOL, H_2O CLEARS FAIRLY WELL. SURGE PUMP AND IT'S TURBID AGAIN, BUT ONLY FOR 1/2 to 1 gal. GETTING OUT LOTS OF FINE GRAY SAND

** EVEN AFTER SURGING, STAYS FAIRLY CLEAR – A LOT OF FINES REMOVED. FLOW RATE HAS SLOWED A BIT → MAYBE BATTERY. BY END OF VOL., H_2O NOT VERY TURBID LOOKS GOOD.

NICE RECHARGE

0730 ARR ON-SITE, SITE 3

0745 KEVIN WHITE STOPS BY TO DISCUSS SWITCHING HIMSELF OUT W/ ANOTHER GUY SO HE CAN GO DO SOME DRILLING AT CANNON AFB

0855 NOT GETTING CELL COVERAGE, SO RELOCATE TO ENVIRO. OFC TO CALL PASS AND ID RE: PROCEDURE FOR A DAY PASS

0810 SPEAK W/ LT. WILLIAMS AT PASS AND ID. HE SAYS NO PROBLEM AND WILL LEAVE AT FRONT DESK. DPT ENVIRO OFC AND RELOCATE TO BLDG 109 TO TELL KEVIN WHITE.

0830 RELOCATE TO SITE 3 TO CONTINUE WELL DEVELOPMENT

1120 KEVIN WHITE ARR. HIS REPLACEMENT, DAVE WATERS, IS HERE. RELOCATE TO PASS AND ID

1245 RELOCATE TO SITE 12 TO DEVELOP NEW WELL.

1435 BACK BLDG 109. WILL TRY TO DEVELOP 6GW08 – PVC IS 1.5" ∴ WHALE PUMP IS TOO BIG. WILL TRY W/ ~~PERISTALTIC PUMP~~ MKY BAILER

MKP

3GW20

TD = 52.42
SWL = 26.00
26.42 x .163
= 4.3 gal

TIME	VOL/GAL	pH	µS/cm COND	°C TEMP	COMMENTS
0844	—	BEGIN	DEVEL	OPMENT	OLIVE GREEN THICK
0855	1/4.5	6.42	455	16.35	v. TURBID AFTER SURGE BUT CLEARS FAIRLY QUICK (within 2 gal)
0903	2/9.0	6.43	467	16.11	
0912	3/13.5	6.59	465	16.03	*
0917	4/18.0	6.64	465	16.15	*
0927	5/22.5	6.74	458	16.30	*

* LIGHTER OLIVE-GREEN, EVEN AFTER SURGING. GOT OUT A LOT OF FINE SAND. AFTER ABOUT 2 GAL, CLEARER YET.

NICE RECHARGE. CLEARS WELL.

3GW08B

TD = 37.80
SWL = 21.85
15.95 x .163
= 2.6 gal

TIME	VOL/GAL	pH	µS/cm COND	°C TEMP	COMMENTS
1025	~~1~~ mL	BEGIN	DEVELOPMENT		ORANGE BROWN THICK
1029	1/2.6	6.78	533	16.46	"
1034	3/7.8	6.62	607	15.88	LIGHTER ORANGE CLEARING
1040	4/10.4	6.43	586	15.40	*
1046	6/15.6	6.58	584	16.11	*
1055	8/23.4	6.67	583	16.49	**

* PRETTY TURBID AFTER SURGE. BY 2.5 gal PURGED, SOME CLEARING

** A LOT LESS TURBID AFTER SURGE. BY 3.0 gal FAIRLY CLEAR

FAIRLY GOOD RECHARGE. CAN SOMETIMES HEAR PUMP RUNNING INSIDE PVC AS FLOW RATE ~~COME~~ AT TIMES FASTER THAN RECHARGE RATE

30 SEP 04

12GW20

(Stick-up = 3.4')

TD = 46.30'
SWL = 33.56'
12.74 x .163
= 2.0 gal

TIME	VOL/GAL	pH	NS/CM COND	TEMP	COMMENT
1310	—	BEGIN	DEVELOP	MENT	MED BROWN
1314	3/6.0	5.74	1093	18.32	", THICK
1320	*	—	—	—	—
1328	5/10.0	6.43	1051	20.68	same as ② 3 vol
1330	**	—	—	—	—

* H_2O IN TUBING, BUT LITTLE DISCHARGE. RECHARGE MIGHT BE SLOWER THAN PUMP RATE

** PUMP RATE FASTER THAN RECHARGE. KEEPS POINT DRY. WILL COME BACK W/ A BAILER, LATER.

~~30 SEP 04~~ 01 OCT 04

6GW08

TD = 38.6
SWL = 1.6
37 x .163
= 6.0 gal

② 1500 LOW TIDE → TIDE GOING OUT

(NOTE: H_2O INSIDE 4" CASING IS GONE NOW THAT PAD (IN)

TIME	VOL/GAL	pH	NS/CM COND	°C TEMP	COMMENTS
*0735	—	BEGIN	DEVELOP	MENT	
**0815	.5/3.0	6.02	693	16.88	LT GRAY CLEARING
0830	1/6.0	6.38	703	16.67	"
+0845	1.5/9.0	6.53	704	16.55	"

TIDE LOW

* INITIALLY PULLED OUT GRAY, THICK H_2O. HARD FOR PUMP AT FIRST

** BATTERY DIED AND HAD TO GO OUT TO TRUCK TO GET ANOTHER ONE. ALTHOUGH WELL VOL TAKE 6.0 gal, WILL TAKE ½ VOL READINGS AS TAKES A LONG TIME TO PULL 6.0 gal w/ a P. PUMP, PLUS H_2O IS CLEARING FAIRLY WELL. USE TUBING TO DISTURB BOTTOM REGULARLY TO GET "MUCK" OUT

+ NO LONGER GETTING THICK, TURBID H_2O. PRETTY CLEAR COMPARED TO INITIAL.

1510 BAILER WON'T FIT INSIDE PVC RISER OF 6GW08, ∴ WILL HAVE TO COME BACK LATER W/ PERISTALTIC PUMP → NOT ENOUGH P. PUMP TUBING TO DO TODAY.

WILL GO BAIL/DEVELOP 6GW09B AS TOO DEEP TO USE WHALE PUMP

1525 DECIDE TO GO TO SITE 3 (3GW20A) INSTEAD AS DRILLERS WILL BE INSTALLING PAD FOR 6GW09B. FIRST, GO LOCK UP SITE 12 GATE.

1555 ARR SITE 3

1648 DRILLERS ARR SITE 3 TO INSTALL WELL PADS. AFTER DISCUSSING WELL LOCATIONS, I DEPART

1703 ARR SITE 6, 6GW09B. SINCE BAILER TOO TEDIOUS, WILL DEVELOP WELL W/ WHALE PUMP. PUMP WON'T REACH V. BOTTOM, BUT WILL BE CLOSE. I'LL SURGE MORE OFTEN HERE.

1710 TAKE READINGS BUT CAN'T SET-UP PUMP AS BOX OF TUBING LABELED WRONG AND TOO LARGE TO FIT PUMP, WILL NEED TO GET AD APTER AND DO TOMORROW.

3GW20A

TD = 80.10
SWL = 26.27
53.8 X .163
= 8.7 gal

DEVELOPED W/ BAILER AS TOO DEEP FOR WHALE PUMP

TIME	VOL (GAL)	PH	COND	TEMP	COMMENTS
1615	—	BEGIN	DEVELOPMENT		OLIVE GREEN THICK
1632	*				

INTO

* AFTER 15 MIN, 1/2 A VOL REMOVED. THE BAILER IS TOO TEDIOUS. WILL COME BACK NEXT WEEK W/ A SUBMERSIBLE PUMP TO DEVELOP ~~THEM~~ ME.

30SEP04

1720 AT BLDG 109. DECON WHALE PUMP. TAKE CARE OF GARBAGE. TALK TO DRILLERS RE: PROGRESS AND WHAT'S LEFT.

1810 DPT SITE FOR THE DAY.

01OCT04

GW023

TD = 75.95
SWL = 11.3
64.7 X .163
= 10.5 gal

TIME	ml/GAL	pH	NS/CM COND	°C TEMP	COMMENTS
0928	—	BEGIN DEVELOPMENT			DK GREEN GRAY THICK
0944	1/10.0	6.42	1073	17.36	"

0950 H_2O FLOW STOPS, H_2O LEVEL MUST HAVE FALLEN BELOW PUMP. WAIT FOR RECHARGE.

0955 GET FLOW AGAIN, THEN LOSE IT AT 1000, WILL NEED TO COME BACK w/ A BAILER OR SUBMERSIBLE PUMP.

(see also page 34)

0700 ARR ON SITE, BLDG 109.
↳ WILL DEVELOP 6GW08 (SEE Pg 9)

0848 6GW08 LOOKS GOOD. WILL BREAK DOWN PUMP AND RELOCATE TO 6GW09B (TIDE COMING BACK IN)

1005 POINTLESS TO CONTINUE TRYING TO DEVELOP WHEN PUMP CAN'T REACH BOTTOM (NOT DESIGNED TO GO BEYOND 70'). ∴ CLEAN-UP AND HEAD BACK TO BLDG 109.

1035 BACK AT 109. DRILLERS CLEANING UP AND PREPARING TO DPT.

1200 LOCK-UP AND DPT BLDG 109 AREA
↳ DRILLERS LEAVE

1220 STOP BY CHANNING'S OFC TO DISCUSS STATUS (JOB, RUTS ETC.)

1300 DPT SITE FOR THE DAY

MKC

0800 ARR YORKTOWN PASS AND ID. WAIT FOR JCD TO ARR (@ 0830). CATCH-UP ON PAPERWORK.

0900 DPT YORKTOWN W/ JCD TO GO TO LOWE'S FOR TUBING

1023 ARR YORKTOWN, BLDG 109
↳ PACK-UP EQUIP. TO BEGIN/CONTINUE GW SAMPLING

1830 DPT SITE FOR THE DAY

MKC

10/4/04 6-GW04

note: meter 5080 reading 12.6 on 10.0 std

static water level : 2.0
depth : 8.64
volume : 1.0 gal

begin 1110

TIME	VOL/GAL	TEMP	µS/cm COND	pH	TURB
1115	0.5	19.74	19849	6.57	137
1120	1.0	20.10	19400	6.69	205
1125	1.5	20.10	19503	6.72	*

* Well went dry at 1.5 gallons - no turbidity reading

Collected @ 1220 on 10/5/04
& see note @ 1220 on 10/5/04
(page 21)

10/4/04 6-GW05B

meter 5080 on std 10 = 12.6

static : 4.28
depth : 16.85
volume : 2.0

arrive 1130

TIME	VOL/GAL	TEMP	COND	pH	TURB
1140	—	Begin ~~Development~~			PURGE
1150	1/2.0	17.14	615	6.41	16.4
1215	2/4.0	17.07	611	6.33	11.8
1225	3/6.0	16.93	610	6.33	10.23

1230 COLLECT 6GW05B-001, MS, AND MSD

04OCT04

6GW10

TD: 25.24
SWL: 11.96
13.3 X .163
= 2.2 gal

TIME	VOL/GAL	pH	COND	TEMP	TURB
1603	—	BEGIN	~~DEVELOPMENT~~		PURGE
1616	1/2	6.06	~~16.44~~ 812	16.52	40.6
1630	2/4	6.35	814	16.51	16.4
1640	3/6	6.46	818	16.26	12.0

1645 COLLECT 6GW10-001

6GW10A

TD = 42.57'
SWL = 11.8'
30.77 X .163
= 5.0 gal

TIME	VOL/GAL	pH	COND	TEMP	TURB
1702	—	BEGIN	~~DEVELOPMENT~~ PURGE		—
1726	1/5	6.67	723	16.29	21.0
1750	2/10.0	6.69	710	16.37	13.3
*resumed pumping at 0900 10/5/04 (1.0 gal in bucket)					
0930	3/15.0	6.58	710	16.28	12.0

Sampled at 0935 6GW10A-001 on 10/5/04 for VOC, SVOC, Pest/PCB, 8330, Metals/Ions and Cyanide

10/5/04 **6GW08-**

SWL = 1.7

DEPTH = 38.85

VOLUME = (37.15)(0.163) = 6.06 gallon

Note: used 0.163 for 1.5" diam well, vol is overest.

Note: used battery #5 (fully charged)

1.5" diam well

TIME	VOL/GAL	pH	COND (µs/cm)	TEMP (°C)	TURB
1012	begin pumping		—	—	—
1035	/5.0	6.29	690	16.23	67.9
1055	/10.0	6.33	685	16.00	59.2
1115	/15.0	6.39	685	15.97	36.1
1130	3/18.0	6.42	684	16.05	40.7*
1135	/19.0	—	—	—	25.7
1140	/20.0	—	—	—	22.9
1145	/21.0	—	—	—	21.9

sampled at 1200 6GW08-001

for VOC, SVOC, TEPP/PCB, 8330, Metals/diss, cyanide

- metals sampled last to optimize turbidity

* slowed pump speed to 3/4 to reduce turbidity

1150	/22.0	—	—	—	18.2
1155	/23.0	—	—	—	16.6
1200	/24.00	—	—	—	16.1

1115 ARR ON-SITE. (HAD PHYSICAL THERAPY THIS MORNING ON WRIST)
↳ JCD HERE, SAMPLING

1220 COLLECT 6GW04-001. WELL WAS PURGED DRY, SO ALLOWED TO RECHARGE OVERNIGHT. MANAGED TO GET VOC, 8330, ½ SVOC, AND ½ PEST/PCB BEFORE DRY AGAIN. WILL ALLOW RECHARGE AND RETURN.
↳ USED BATTERY #5 FOR ~ 20 MIN.

1530 FINISH COLLECTING 6GW09A-001, PACK-UP

1605 RELOCATE TO BLDG 109
↳ UNLOAD AND GET ORGANIZED FOR TOMORROW

1700 DPT YORKTOWN

1800-2000 → ERRANDS FOR FIELD SUPPLIES (LOWE'S, FOOD LION)

2100-2300 → PAPERWORK (LABELS, COCs, WHAT'S LEFT TO DO, etc.)

MKD

10/5/04

6GW09

TD = 33.44
SWL = 10.89 (0.163)
3.7 gal

TIME	VOL/GAL	pH	µS/cm COND	°C TEMP	TURB
1335	—	BEGIN	~~DEVELOPMENT~~ PURGE		—
*1402	1/3.7	6.37	2625	16.12	16.0
1420	2/7.4	6.57	+2696	15.91	**22.7
1444	3/11.1	6.58	++2705	15.88	11.6

*BATTERY DIED. NEEDED TO GO GET ANOTHER ONE.
** INCREASE PROB DUE TO SWITCHING BATTERIES AND RISE IN FLOWRATE.

+ SALINITY = 1.42
++ SALINITY = 1.41

1445 COLLECT 6GW09-001

6GW09A

TD : 51.55
SWL = 11.57 (0.163)
6.5 gal

TIME	VOL/GAL	pH	µS/cm COND	°C TEMP	TURB
1332	—	BEGIN	~~DEVELOPMENT~~		PURGE
1405	1/6.5	6.59	939	16.04	338
1430	2/13.0	6.77	946	16.00	110
1500	3/19.5	6.83	972	16.05	*108.2

* will collect metals portion in ambers + decant into preserved containers

1510 COLLECT 6GW09A-001

10/05/04 * (Development)

6GW09B

TD: 75.95
SWL: 11.62
64.3 (.163)
= 10.5 gal

*(NOTE: SINCE WHALE PUMP COULDN'T REACH BOTTOM AND BAILING SUCH A DEEP WELL WOULD BE TEDIOUS AND TIME CONSUMING (ESP. CONSIDERING SIZE OF WELL VOL) WILL ATTEMPT TO DEVELOP WELL W/ SUBMERSIBLE (REDI FLOW) PUMP.)

Resume to page 34

10/6/04 3GW19

TD: 45.00
SWL: 33.67
VOL: 2.0 gal

TIME	VOL/GAL	PH	COND	°C TEMP	TURB
1014	—	BEGIN	~~DEVELOPMENT~~	PURGE	
1030	1/2.0	6.83	833	16.82	21.3
1045	2/4.0	6.80	854	17.71	11.0
1100	3/6.0	6.75	853	17.64	9.37

1105 COLLECT 3GW19-002 VOC FOR CTM, PCUS MS/MSD AND 3GW19-001 SVOC, PEST/PCB, TOT AND DIS MET AND CN FOR GWOU I.

0730 ARR ON-SITE, PASS AND ID. MEET MATT SCHULZE FM EEI. HE'S HERE TO SEE THE CTM SITES AND HELP SAMPLE.

0745 RELOCATE TO BLDG 109
↳ LABEL SAMPLES FM MONDAY AND RE ICE SAMPLES

0905 COLLECT FIELD BLANK "FBDI" FM DI H_2O FOR CTO23

1620 RELOCATE TO FIELD TRAILER TO PACK SAMPLES

1800 DPT SITE

1820 BAD ACCIDENT 64E TAKE JEFFERSON

1856 ARR FEDEX

1905 DPT FEDEX – WHEW! ALMOST TO AIRPORT

MKD

3GW20

TD = 52.42
SWL = 26.17
.163
= 4.0 gal

TIME	VOL/GAL	pH	COND µS/cm	TEMP °C	TURB
1044	—	BEGIN ~~DEVELOPMENT~~ PURGE			
1125	1/4	7.29	417	16.23	9.92
1150	2/8	7.30	417	15.91	6.40
1230	3/12	7.39	417	15.69	5.07

1235 COLLECT 3GW20-002 FOR VOC FOR CTM

3GW20A

TD = 80.10
SWL = 26.37
(.163)
= 8.75 gal

TIME	VOL/GAL	pH	µS/cm COND	°C TEMP	TURB
1357	—	* BEGIN ~~DEVELOPMENT~~ PURGING			
**1426	10 gal	—	—	—	—
1450	~~2.16~~ 1.5 gal	7.52	369	16.75	721
1503	2/~~16~~ 17.6	7.45	364	16.65	575
1530	3/26.4	7.44	357	16.62	+221

1535 COLLECT 3GW20A-002 FOR VOC FOR LTM

* NOTE: ATTEMPTED TO DEVELOP W/ BAILER ON 9/30/04 AND 4.5 gal REMOVED. BAILER TEDIOUS AND NOT VERY EFFECTIVE. THEREFORE, WILL PULL WELL HARD FOR 1/2 HR OR SO TO REMOVE MORE OF THE FINES, THEN AFTER IT CLEARS WILL SAMPLE.

** H2O CLEARING, WILL START WELL VOL READINGS AFTER NEXT VOL.

+ collect in amber & will decant in 40ml vials tomorrow

0915 ARR ON-SITE, CHANNING'S OFC
↳ TELL HIM PROJECT STATUS
0930 RELOCATE TO SITE 6. JCD AND MATT SCHULZE HERE PURGING AND SAMPLING 6GW09B AND 6GW06B
1010 RELOCATE TO 6GW09B FM 6GW06B TO SEE HOW MATT'S PROGRESSING. WELL DRY. THEREFORE, ALLOW RECHARGE AND WILL SAMPLE.
1215 RELOCATE TO PASS AND ID TO DROP MATT OFF AT HIS TRUCK. HE DPTS. I GET ICE AND RETURN TO BLDG 109.
1255 BACK AT BLDG 109. CLEAN OUT VEHICLES AND GET READY TO FINISH UP. JCD @ 6GW07 - LAST WELL TO SAMPLE.
1400 ~~1300~~ COLLECT FBDS
1415 MK COLLECT LTM RD2RS1 FOR LTM
1430 COLLECT RB01
1515 RELOCATE TO FIELD TRAILER TO PACK SAMPLES.
1710 DPT SITE.
1735 ARR FEDEX
1745 DPT FEDEX

MKC

10/7/04

6GW09B

75.95
14.45
VOL: 10.02 gal

TIME	VOL/GAL	pH	COND	TEMP	TURB
0825	BEGIN DEVELOP/PURGE; SPEED 130.5 - DREW DOWN QUICKLY, LOTS OF SE FINES IN H_2O, LOW FLOW.				
0830	STOPPED PURGING, ALLOW RECHARGE				
0905	RESUME PURGE @ SPEED 128.5				
0910	.5/5.0	—	—	—	—
0957	1.5/15.0	WELL GOES DRY*			

* WELL DRY BEFORE ANY READINGS COLLECTED AS ALLOWING FOR V. TURBID H_2O DISCHARGE AS PART OF DEVELOPMENT.

1120 COLLECT 6GW09B-001
↳ TURBIDITY > 500. ∴ COLLECT IN AMBERS AND WILL DECANT FOR TOT AND DIS MET AND VOCs.

0700 ARR ON-SITE.
↳ CLEAN-UP EQUIP AND DISPOSABLES IN BLDG 109 → FRONT SIDE OF BLDG, AT OVERHEAD DOOR
0830 SOIL ↳ COLLECT AND SECURE
0940 H_2O IDW
1200 RELOCATE TO CHANNING'S OFC TO UPDATE HIM ON FIELD STATUS
1230 DPT SITE.
1250 ARR FEDEX
1300 DPT FEDEX
1320 ARR HOME
↳ CHECK EMAIL
↳ CONTACT LAB
↳ UNLOAD TRUCK
1400 FINISHED FOR THE DAY.

12 OCT 04

1000 - ARR ON-SITE TO OVERSEE RUT FIX BY DRILLERS AT SITE 3 AND WOODS NE OF SITE 6 IMPOUNDMENT AREA.

↳ JCD HERE TO COLLECT SWL'S ACROSS WHOLE GWOU I

1230 - DRILLERS FINISHED AND DPT.

↳ I WILL JOIN JCD

1600 - FINISH SWL'S. RELOCATE TO FIELD TRAILER TO ~~TO~~ PACK/SHIP UNUSED COOLERS.

1800 DPT SITE FOR THE DAY.

MCP

SUNNY, COLD 40s 15MAR05

0800 ARR PASS-ID. MEET DAVE VACHET HERE. WE WILL BE REDEVELOPING 6GW08 TODAY. (NOTE: 6GW08 HAD A HIGH TCE HIT COMPARED TO OTHER SITE 6 WELLS. THEREFORE, WILL REDEVELOP AND RESAMPLE WELL TO CONFIRM RESULT FOR INCLUSION IN GWOU I RI.)

0830 TOLD ONE-DAY PASSES NO LONGER ALLOWED. THEREFORE, DAVE LEAVES. WILL WORK ALONE.

0900 MEET SAFETY AND FIRE DEPT. @ BLDG 109 FOR HOT WORKS PERMIT.

0910 RELOCATE TO MAIN RD NEAR WOODS ENTRANCE TO 6GW08

↳ BEGIN EQUIP STAGING AND SET-UP

1200 DEVELOPMENT FINISHED. BEGIN EQUIP BREAKDOWN AND PACK UP

1245 EQUIP PACK-UP COMPLETE. RELOCATE TO FIELD TRAILER.

1310 ARR FIELD TRAILER

1330 DPT SITE FOR THE DAY.

MCP

15 MAR 05

REDEVELOPMENT

6GW08

(1.5" WELL
w/5.0' PREPACKED SCREEN)

TD = 38.85
SWL = 2.08
X.163
= 5.99 gal

TIME	VOL/GAL	pH	ms/cm COND	°C TEMP	TURB
1030	—	BEGIN	DEVELOPMENT*		
1045	1/6	5.82	0.646	14.45	TURBID*2
1057	2/12	6.08	0.637	14.42	167.0
*3 1110	3/18	6.05	0.637	14.81	122.0
1132	4/24	6.07	0.632	14.90	72.0
*4 1147	5/30	6.10	0.638	14.71	54.9
*5 1158	5.5/33	6.19	0.638	15.14	74.0
1200	←	END DEVELOPMENT			—

* PUMP @ NEARLY MAX SPEED, APPROX. 1' OFF BOTTOM

*2 DIDN'T TAKE READING AS VERY TURBID. DK GRAY COLOR. H_2O HAS A SWEET ODOR, HINT OF SULFUR

*3 @ START OF VOL 3 PUMP SPEED SAME, APPROX 2' OFF OF BOTTOM

*4 @ START OF VOL 5, SAME SPEED, APPROX 3' OFF OF BOTTOM

*5 PUT BACK TO 1/2 FOOT OFF OF BOTTOM. SLIGHT RISE IN TURBIDTY, BUT OTHERWISE, READINGS FINE.

MKD

17 MAR 05

RESAMPLE

6GW08

TD = 38.85
2.04
36.81 x .163
= 6.00 gal

TIME	VOL/GAL	pH	mS/cm COND	°C TEMP	TURB
0925	1/6	5.82	0.644	12.96	*25.5
0958	2/12	6.11	0.639	14.38	*17.8
1035	3/18	6.20	0.641	14.00	*16.4
1125	—	BEFORE	METALS	COLLECTION	*12
1140	—	AFTER	"	"	*10

* DEDUCT 3 UNITS FM EACH OF THESE READINGS AS METER CALIBRATION CHECKED AFTER SAMPLING WAS READING '13' INSTEAD OF '10' (STANDARD)

1035 COLLECT 6GW08-001a AND 6GW08-001Fa TO INCLUDE A DUPLICATE, MS, MSD, (RINSATE, AND FIELD BLANK) SAMPLES.

1140 FINISH COLLECTING SAMPLES @ WELL. PACKUP & RELOCATE TO BLDG 109 TO PACK.

17MAR05

OVERCAST, COLD, 30s, RAIN → SNOW
WET

0800 ARR 7-11. GET ICE FOR SAMPLES
0815 ARR SITE TRAILER. GET BUCKETS.
0830 RELOCATE TO SITE 6 AREA
AND BEGIN SET-UP TO RESAMPLE
6GW08
0852 BEGIN PURGE.
1035 END PURGE. START SAMPLE
COLLECTION.
1140 SAMPLE COLLECTION COMPLETE
& BREAK DOWN EQUIP AND
RELOCATE TO BLDG 109
TO ~~&~~ PACK SAMPLES

OVERHANG AREA, NOT INSIDE

1225 COLLECT FBDI 2F
1240 COLLECT RB02F
1240 ALSO MAKE TRIP BLANK (TRIP06)
FM LABGRADE DI B/C CANNOT
FIND TRIPS FM LAB
1400 RELOCATE TO FIELD TRAILER
1410 RELOCATE TO SITE 2 TO SHOW
SHAW TRENCHING AREA
1430 RELOCATE TO 7-11 FOR MORE ICE TO
FINISH PACKING
1510 ARR FED EX
1600 DPT FED EX AND FINISHED

MCD

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SEPT 2004

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GWOUI

MES & JCD

17 SEP 04

25GW03

31.25
17.41
13.84 x .163
= 2.3 gal

Time	Vol	pH	Cond	temp	turb
0830	begin purge				
0815	1/2.3	6.94	577	23.32	7.68
0900	2/4.6	6.98	489	22.98	4.74
0916	3/6.9	6.92	488	23.02	3.45
0930	4/9.2	6.93	486	23.12	2.51

0935 25GW03-001 Sampled

25GW02

30.69
18.55
12.14 x .163
1.98 gal

Time	Vol	pH	Cond	temp	turb
1325	begin purge				
1340	1/2	6.33	702	19.25	5.29
1353	2/4	6.78	644	19.28	4.02
1410	3/6	6.93	639	19.27	3.83

1420 25GW02-001 Collected

25GW02A

71.61
20.48
51.13 × .163 =
8.33 gal

Time	vol	pH	cond	temp	turb
1330	begin purge				

25GW01

· static water level only - 20.72ft

~~20.72~~ ES

25GW04

30.94
21.20
9.74 × .163 =
1.56

Time	vol	pH	cond	temp	turb
0950		Begin purge			
1005	1/1.56	6.47	684	20.65	23.1
1015	2/3.12	6.60	588	19.67	6.92
1025	3/4.68	6.53	588	19.47	4.89
1035	4/6.24	6.68	588	19.62	4.11

1040 25GW04-001 sampled

17 SEP 04

7GW01

34.92
18.32
16.6X.163=
2.71 gal

Time	vol	pH	Cond	temp	turb
1530	Begin purge				
1547	1/2.7	6.75	677	18.14	5.90
1600	2/5.4	6.81	549	17.59	4.01
1615	3/8.1	6.69	546	17.45	4.21

1620 - 7GW01-001 collected

9/21/04 → SITE 1 WPNSTA Yorktown

Surface water / sediment sampling

1 SW/SD 23 (near mouth of stream into marsh)

sample located at stream channel / marsh interface. stream channel = sand / silt, tan
marsh = brown, dk brown sandy w/ muck w/ and silt
high amount of organic matter at surface / organic debris

1SW23 sampled 1043
no standing water in marsh; low tide
sample taken from stream channel at marsh edge. water fairly clear.

1SD23 sampled 1051
dark brown / tan sand w/ silt, muck, organic matter. very wet.

samples taken for VOCs
DUP/MS/MSD taken SD & SW

1 SW/SD 22

1 SW22 sampled 1115 for VOCs
standing water in marsh; some silt

1SD22 sampled 1120 for VOCs
dark brown silty muck, high OM content
very wet
within 5 feet of shoreline

9/21/04

1 SW/SD 21

1SW21 sampled 1145 for VOC
pooled water by downed tree; some silt

1SD21 sampled 1155 for VOC
black/dark brown muck silt, high OM, very wet
within 5 feet of shoreline

1 SW/SD20

1SW20 sampled ~~1155~~ 1550 for VOC
TIDE IN, CLEAR

1SD21 SAMPLED 1555 for VOC
MED BROWN SILT W/ LITTLE MEDGRAIN SAND AND SOME ORGANICS ON TOP
w/in 5 feet of shoreline, SAT'D

1 SW/SD19

1SW19 sampled 1610 for VOC
TIDE IN, CLEAR, TRACE "FLOATERS" by ORGANICS

1SD19 sampled 1615 for VOC
DK BROWN SILT W/SOME FINE SAND, LITTLE FINE ORGANICS, TRACE CLAY, WET. W/IN 5' OF SHORE.

9/22/04 SITE 7 sediment/surface water

7LTMSW03-001/F taken at 0915
sampled for VOC, TAL metals/dissolved, Cyanide, 8330

7LTMSD03-001 taken at 0920
sampled for VOC, TAL metals, cyanide

7LTMSW02-001/F taken at 0930
sampled for VOC, TAL metals/dissolved, Cyanide, 8330

7LTMSD02-001 taken at 0935
sampled for VOC, TAL metals, cyanide

7LTMSW01-001/F taken at 0950
sampled for VOC, TAL metals/dissolved, cyanide, 8330
Dup/MS/MSD

7LTMSD01-001 taken at 1000
sampled for VOC, TAL metals, cyanide
Dup/MS/MSD

Note: stakes set 5 feet from channel, perpendicular, samples taken directly in channel, due SW from stakes

SITE 3 SW/SD

9/22/04

3SW/SD 24

3SW24 sampled at 1500 for VOC
note sheen on water, likely organic decay.
sample taken near high side

3SD24 sampled at 1505 for VOC
dark brown silty/clayey muck w/
grey sand, high OM/plant debris

3SW/SD 25

3SW25 sampled at 1515 for VOC
fairly clear, slightly grey water.
~~sampled~~

3SD25 sampled @ 1520 for VOC
dark brown silty/clayey muck
high OM content, plant debris

9/22/04

3SW/SD 27

3SW27 sampled at 1540 for VOC
- note sheen on water, likely organic decay
also light red film on bottom. turbid.

3SD27 sampled at 1545 for VOC
- tan/grey sand w/ black muck and
clay portions. high organic content. very wet.
- note red film covering portion of
bottom, is oozing from base of
rip-rap containment wall on drainage
rip-rap wall is 15 feet upslope

3SW/SD26

3SW26 sampled at 1600 for VOC
- grey murky water, turbid

3SD26 sampled at 1605 for VOC
- sample taken in marsh below gullery.
silt fence old and damaged 10 feet upslope
no drainage apparent. fully vegetated.
- dark grey sand/black muck (silty clay).
very wet. high organic content/plant debris

9/23/04 GPS

- Trimble XRS unit
  minimum 5 satellites
  1 sec logging interval, 20 intervals/loc stored
  separate GPS files/site

Site 3 - 4 positions taken, all within 10 feet of bank
Site 11 - 5 positions taken, all within 5 feet of bank
Site 7 - 3 positions taken. actual sample points are approx. 3 feet to center of channel. Flags are placed on bank within 5 feet of stream bank

9/23/04 Staff gauges; installation

Yorktown low tide at 1100 approximately

Visible from 15MW(SD)23

SITE 1 15T01

Total Staff gauge height = 3.34 feet
installed in stream channel; sandy bottom (near mouth of stream into marsh)
reading at time of installation = 0.40 feet
≈ 3" of water flowing steadily in creek

at 1100 approaching low tide (tide goes out)

Visible from 3MW20

SITE 3 3ST01

staff ht = 3.34 feet
reading = 0.58 feet at 1430 (tide comes in)
down hill from 3MW20 (new installs)
installed in muck at ≈ 1 foot of water

10/6/04 3GW08B [redacted]

TD : 37.8
SWL : 22.23
VOL : 2.5 gal

Battery #1 used (died at vol #2 use Battery #5)
Meter 5080 used
Meter 5046 used

TIME	VOL/GAL	pH	COND (µS/cm)	TEMP (°C)	TURB
1113	begin purging →				
1128	1/2.5	6.32	635	15.68	19.4
1146	2/5.0	6.29	637	15.83	11.9
1215	3/8.0	6.55	625	15.85	10.35

Sampled at 1220 & VOC

10/7/04 **6GW09B**

TD : 75.95
SWL : 14.45
VOL : 10.02 gal

arrive at site 0800. pump line tangled.

TIME	VOL/GAL	PH	COND	TEMP	TURB
0825	Begin develop/purge ; speed 130.5 - drew down quickly, lots of sediment in water, low flow,				
0830	stopped purging to allow recharge				
0905	resume pumping at 128.5				
0910	/5.0	—	—	—	—

(see KKI's book 2 of 2, pg 34)

10/7/04 **6-GW06B**

TD : 40.75
SWL : 7.21
VOL : 5.47 gal

meters 5080/5046
battery #4 (died)
battery #5

TIME	VOL/GAL	PH	COND	TEMP	TURB
0935	begin purging ; pump full speed, battery lower				
1000	battery #4 died (4.0 gallons). - switch to 5 @ 3/4 speed				
1005	increased to 7/8 speed				
1010	1/5.5	6.53	599	15.95	30.0
1040	2/11.0	6.77	603	15.82	320.0
1050	/13.5	6.68	603	15.82	95.0
1105	3/16.5	6.68	602	15.90	75.0
1115	/18.0	—	—	—	50.0
1120	/20.0	-	-	—	45.0
1125	/21.0	-	-	—	* 35.0

Sampled @ 1125 for VOC, SVOC, PEST/PCB, 8330, metals/dis, cyanide

* COLLECT TOT MET IN AMBER AND DECANT AFTER FINES SETTLE.

10/7/04 6GW07

TD : 20.19
SWL : 4.46
VOC : 2.56

battery #4

TIME	VOC/GAL	PH	COND	TEMP	TURB
1312	begin purging well				
1320	1/2.5	6.60	985	16.22	18
1335	2/5.0	6.47	987	16.06	14
1350	3/7.5	6.48	984	15.96	13

sampled at 1355 for VOC, SVOC, PEST/PCB, cyanide, metals (dzg), 8330

10/12/04

OU #1 Static Water Levels & Site Clean Up

- arrive at base 0745, obtain key sets from ENV office unlock Sites 1,3,6. coordinate activities w/ Parratt-Wolff
- 0915 arrive at Site 17 to begin statics

SWLs Sites 17, 11, 6, 7, 25

WELL	TIME	SWL (ft)	WELL	TIME	SWL (ft)
17GW01	0920	8.33	6GW08	1108	1.74
17GW10	0925	4.00	7GW04	1129	27.44
17GW02	0930	5.55	7GW03	1145	30.81
17GW16	0950	8.22	6GW02	1155	34.09
11GW03	0955	8.35	6GW07	1200	4.38
11GW09	1005	11.18	6GW05	1202	4.36
11GW11	1010	9.02	7GW01	1235	19.27
6GW03	1025	19.09	7GW02	1240	19.09
6GW06B	1030	7.12	25GW01	1250	21.06
6GW06	1032	8.54	25GW03	1252	17.84
6GW10	1048	12.27	25GW02	1255	18.84
6GW10A	1050	12.08	25GW02A	1256	20.45
6GW09	1055	11.10	25GW04	1258	21.48
6GW09A	1056	11.71	6GW01	1328	6.3
6GW09B	1057	11.60	6GW01A	1330	5.66
6GW04	1105	13.35	11GW11A	1340	25.59

Appendix C: Chains of Custody

profile 10916 ① 17

COMPUCHEM
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501 Madison Avenue
Cary, NC 27513
1-800-833-5097

CHAIN-OF-CUSTODY RECORD

No. 65280

Project Name: CTO 213	Client Address: BAKER ENVIRO 770 LYNNHAVEN PKWY VA BEACH, VA	Point-of-Contact: MARLENE JUESTER
Carrier: FEDEX		Telephone No.: (757) 650-4924
Airbill No.:		Sampling complete? Y or N (see Note 1)
Sampler Name:	Sampler Signature: [signature]	Project-specific (PS) or Batch (B) QC?

BOX #1	BOX #2	BOX #3	Box #4	Box #5
1. Surface Water	A. HCl + Ice	F. Filtered	H. High	C. CLP 3/90
2. Ground Water	B. HNO3 + Ice	U. Unfiltered	M. Medium	S. SW-846
3. Leachate	C. NaOH + Ice		L. Low	W. CWA 600-series
4. Rinsate	D. H2SO4 + Ice			O. Other
5. Soil / Sediment / Sludge	E. Unpreserved			T. TCLP
6. Trip Blank	F. Ice Only			
7. Oil	G. Other			
8. Waste	H. NaHSO4 + Ice			
9. Other	I. ZnAc+NaOH + Ice			

Sample ID (9 characters maximum)	Date:Year 2004	Time	Matrix	Box #1	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	8330				Remarks / Comments (see Notes 2 & 3)
all metal pHs <2																								
all cyanide pHs >12																								
6GW01-002	09/15	~~0810~~ 0930		2	A,B,C				11		Y	Y	X	Y		Y	X			X				TOT MET *+ 8330 438901
6GW01A-002	09/14	1500			A,B,C				11		Y	X	X	X		Y	X			X				TOT MET *+ 8330 438902
6GW01-002F	09/15	~~0810~~ 0930			B	F			1							X								DIS MET 439201
6GW01A-002F	09/14	1500			B	F			1							X								DIS MET 439202
11GW11-001	09/16	1550			B,C				4							X	X			X				439001
11GW11-001F	09/16	1550			B	F			1							X								439203
~~11GW11A-001~~	~~09/16~~	:			~~MKI~~																			~~MKI~~
~~11GW11A-001F~~	~~09/16~~	:			~~MKI~~																			~~MKI~~
11GW03-001	09/16	1145			B,C				4							X	X			X				439002
11GW03-001F	09/16	1145			B	F			1							X								439204

Temperature 2.6 3.8, 3.1 2.8°C

Clients Special Instructions:

Lab: Received in Good Condition? Y or N Describe Problems, If any:

#1 Relinquished By: (Sig) [signature]	Date: 9/16/04	#2 Relinquished By: (Sig)	Date:	#3 Relinquished By: (Sig)	Date:
Company Name: BAKER ENVIRO	Time: 1800	Company Name:	Time:	Company Name:	Time:
#1 Received By: (Sig) [signature]	Date: 9/17/04	#2 Received By: (Sig)	Date:	#3 Received By: (Sig)	Date:
Company Name: CompuChem	Time: 10:30	Company Name:	Time:	Company Name:	Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

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CHAIN-OF-CUSTODY RECORD

No. 066660

Project Name : CTD213	Client Address : BAKER	Point-of-Contact : MARLENE IVESTER
Carrier :		Telephone No. : (757) 480-4924
Airbill No. :		Sampling complete? Y or N (see Note 1)
Sampler Name :	Sampler Signature :	Project-specific (PS) or Batch (B) QC ? ____

BOX #1	BOX #2	BOX #3	Box #4	Box #5
1. Surface Water	A. HCl + Ice	F. Filtered	H. High	C. CLP 3/90
2. Ground Water	B. HNO3 + Ice	U. Unfiltered	M. Medium	S. SW-846
3. Leachate	C. NaOH + Ice		L. Low	W. CWA 600-series
4. Rinsate	D. H2SO4 + Ice			O. Other____
5. Soil / Sediment / Sludge	E. Unpreserved			T. TCLP
6. Trip Blank	F. Ice Only			
7. Oil	G. Other____			
8. Waste	H. NaHSO4 + Ice			
9. Other____	I. ZnAc+NaOH + Ice			

Sample ID (9 characters maximum)	Date:Year: 2004	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	8330				Remarks / Comments (see Notes 2, & 3)
117GW09-001	09/16	1415	2	B,C				4							X	X			X				all metal pH's <2 all cyanide pH's >12 (except 117GW16-001) 9/16/04 spoke w/ Marlene * should be PCB OLM04.3
117GW09-001F	09/16	1415		B	F			1							X								439003
117GW01-001	09/15	1110		B,C				4				X*			X	X							439205 439101 439004
117GW01-001F	09/15	1110		B	F			1							X								439206
117GW16-001	09/15	1415		B,C				4				X*			X	X							439102 439005
117GW16-001F	09/15	1415		B	F			1							X								439207 439103
117GW16-001	09/15	1625		B,C				4				X*			X	X							ambers filled from ~½ full 439006
117GW16-001F	09/15	1625		B	F			1							X								439208
117GW02-001	09/16	0925		B,C				4				X*			X	X							439104 439007
117GW02-001F	09/16	0925	↓	B	F			1							X								439209

Clients Special Instructions:

Temperature 4.4 °C

Lab: Received in Good Condition? Y or N Describe Problems, if any:

#1 Relinquished By: (Sig)	Date: 9/16/04	#2 Relinquished By: (Sig)	Date:	#3 Relinquished By: (Sig)	Date:
Company Name: BAKER ENVIRO.	Time: 1800	Company Name:	Time:	Company Name:	Time:
#1 Received By: (Sig)	Date: 9/17/04	#2 Received By: (Sig)	Date:	#3 Received By: (Sig)	Date:
Company Name: CompuChem	Time: 10:30	Company Name:	Time:	Company Name:	Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

(3)

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CHAIN-OF-CUSTODY RECORD

No. 066661

Project Name : CTO 213	Client Address : BAKER	Point-of-Contact : MARLENE JUFSTER
Carrier :		Telephone No. : (757) 622-4924
Airbill No. :		Sampling complete? Y or N (see Note 1)
Sampler Name :	Sampler Signature :	Project-specific (PS) or Batch (B) QC ? ____

BOX #1	BOX #2	BOX #3	Box #4	Box #5
1. Surface Water	A. HCl + Ice	F. Filtered	H. High	C. CLP 3/90
2. Ground Water	B. HNO3 + Ice	U. Unfiltered	M. Medium	S. SW-846
3. Leachate	C. NaOH + Ice		L. Low	W. CWA 600-series
4. Rinsate	D. H2SO4 + Ice			O. Other____
5. Soil / Sediment / Sludge	E. Unpreserved			T. TCLP
6. Trip Blank	F. Ice Only			
7. Oil	G. Other____			
8. Waste	H. NaHSO4 + Ice			
9. Other____	I. ZnAc+NaOH + Ice			

Sample ID (9 characters maximum)	Date:Year 2004	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH					Remarks / Comments (see Notes 2 & 3)
TR1P01	9/16	—	6	A				2		V													438903
	/	:																					
	/	:																	438904				VHBLKXE (H_2O storage blank)
	/	:																					
	/	:																					
	/	:																					
	/	:																					
	/	:																					
	/	:																					
	/	:																					
	/	:																					

Clients Special Instructions:

2.6, 3.8, 3.1, 2.3, 4.4 °C Temperature ____ °C

Lab: Received in Good Condition? Y or N Describe Problems, if any:

#1 Relinquished By: (Sig)	Date: 9/16/04	#2 Relinquished By: (Sig)	Date:	#3 Relinquished By: (Sig)	Date:
Company Name: BAKER	Time: 1800	Company Name:	Time:	Company Name:	Time:
#1 Received By: (Sig)	Date: 9/17/04	#2 Received By: (Sig)	Date:	#3 Received By: (Sig)	Date:
Company Name: CompuChem	Time: 10:30	Company Name:	Time:	Company Name:	Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

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CHAIN-OF-CUSTODY RECORD

No. 066662

Project Name: CTO 213/GWOUT	Client Address: BAKER ENVIRO 770 LYNNHAVEN PKWY VA BEACH, VA 23452	Point-of-Contact: MARLENE IVESTER
Carrier: FEDEX		Telephone No.: (757) 650-4924
Airbill No.: 8483441382 94		Sampling complete? Y or N (see Note 1)
Sampler Name:	Sampler Signature:	Project-specific (PS) or Batch (B) QC? ____

BOX #1	1. Surface Water	6. Trip Blank	BOX #2	A. HCl + Ice	F. Ice Only	BOX #3	F. Filtered	Box #4	H. High	Box #5	C. CLP 3/90	T. TCLP
	2. Ground Water	7. Oil		B. HNO3 + Ice	G. Other____		U. Unfiltered		M. Medium		S. SW-846	
	3. Leachate	8. Waste		C. NaOH + Ice	H. NaHSO4 + Ice				L. Low		W. CWA 600-series	
	4. Rinsate	9. Other____		D. H2SO4 + Ice	I. ZnAc+NaOH + Ice						O. Other____	
	5. Soil / Sediment / Sludge			E. Unpreserved								

Sample ID (9 characters maximum)	Date:Year 2004	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	8330				Remarks / Comments (see Notes 2 & 3)
																							all metal pHs <2 all cyanide pHs >12
11GW11A-001	09/17	0930	2	B,C				4							X	X			X				439008
11GW11A-001F	09/17	0930		B	F			1							X								439210
25GW02-001	09/17	1420		B,C				4							X	X			X				439009
25GW02-001F	09/17	1420		B	F			1							X								439211
25GW03-001	09/17	0935		B,C				4							X	X			X				439010
25GW03-001F	09/17	0935		B	F			1							X								439212
25GW04-001	09/17	1040		B,C				4							X	X			X				439011
25GW04-001F	09/17	1040		B	F			1							X								439213
7GW01-001	09/17	1620		B,C				4							X	X			X				439012
7GW01-001F	09/17	1620	↓	B	F			1							X								439214

Clients Special Instructions:

Temperature 2.7 °C 2.9°C

Lab: Received in Good Condition? Y or N Describe Problems, if any:

#1 Relinquished By: (Sig) [signature]	Date: 9/17/04	#2 Relinquished By: (Sig)	Date:	#3 Relinquished By: (Sig)	Date:
Company Name: BAKER ENVIRO.	Time: 1800	Company Name:	Time:	Company Name:	Time:
#1 Received By: (Sig) [signature]	Date: 9/18/04	#2 Received By: (Sig)	Date:	#3 Received By: (Sig)	Date:
Company Name: CompuChem	Time: 9:50	Company Name:	Time:	Company Name:	Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

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CHAIN-OF-CUSTODY RECORD

profile 10916 **No. 066665** (5) 21

Project Name: CTO 213 / GWOU I	Client Address: BAKER ENVIRO 770 LYNNHAVEN PKWY VA BEACH, VA 23452	Point-of-Contact: MARLENE TVESTER
Carrier: FEDEX		Telephone No.: (757) 650-4924
Airbill No.: 848344138310		Sampling complete? Y or N (see Note 1)
Sampler Name:	Sampler Signature:	Project-specific (PS) or Batch (B) QC? ____

BOX #1	BOX #2	BOX #3	Box #4	Box #5
1. Surface Water	A. HCl + Ice	F. Filtered	H. High	C. CLP 3/90
2. Ground Water	B. HNO3 + Ice	U. Unfiltered	M. Medium	T. TCLP
3. Leachate	C. NaOH + Ice		L. Low	S. SW-846
4. Rinsate	D. H2SO4 + Ice			W. CWA 600-series
5. Soil / Sediment / Sludge	E. Unpreserved			O. Other____
6. Trip Blank	F. Ice Only			
7. Oil	G. Other____			
8. Waste	H. NaHSO4 + Ice			
9. Other____	I. ZnAc+NaOH + Ice			

all metal pH's <2
all cyanide pH's >12
[illegible] 9/21/04

Sample ID (9 characters maximum)	Date: Year 2004	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	6330				Remarks / Comments (see Notes 2 & 3)
1GW05-001	09/19	1140	2	B,C				6			X	X	X		X	X							438907
1GW05-001D	09/19	1140		B,C				6	X		X	X	X		X	X							DUP 438908
1GW05-001	09/19	1140		B,C				12	X		X	X	X		X	X							MS/MSD 438907
1GW05-001F	09/19	1140		B	F			1							X								439215 DIS MET
1GW05-001DF	09/19	1140		B	F			1	X						X								(FD) DUP 439216 DIS MET
1GW05-001F	09/19	1140		B	F			2	X						X								MS/MSD 439215 DIS MET
6GW06-002	09/20	1145		A,B,C				11		X	X	X	X		X	X			X				438905
6GW06-002D	09/20	1145		A,B,C				11	X	X	X	X	X		X	X			X				DUP 438906
6GW06-002F	09/20	1145		B	F			1							X								439217 DIS MET
6GW06-002DF	09/20	1145	↓	B	F			1							X								DUP 439218 DIS MET

Clients Special Instructions:

Temperature 4.9, 2.6 °C 3.4, 3.1 °C

Lab: Received in Good Condition? Y or N **Describe Problems, If any:**

#1 Relinquished By: (Sig) [signature]	Date: 9/20/04	#2 Relinquished By: (Sig)	Date:	#3 Relinquished By: (Sig)	Date:
Company Name: BAKER ENVIRO.	Time: 1800	Company Name:	Time:	Company Name:	Time:
#1 Received By: (Sig) [signature]	Date: 9/21/04	#2 Received By: (Sig)	Date:	#3 Received By: (Sig)	Date:
Company Name: COMPUCHEM	Time: 1030	Company Name:	Time:	Company Name:	Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

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CHAIN-OF-CUSTODY RECORD

No. 066666

(6) 22

Project Name: CTO 213 / GWOU I	Client Address: BAKER ENVIRO 7700 LYNNHAVEN PKWY VA BEACH, VA 23452	Point-of-Contact: MARLENE IVESTER
Carrier: FED EX		Telephone No.: (757) 650-4924
Airbill No.:		Sampling complete? Y or N (see Note 1)
Sampler Name:	Sampler Signature:	Project-specific (PS) or Batch (B) QC ? ____

BOX #1	BOX #2	BOX #3	Box #4	Box #5
1. Surface Water	A. HCl + Ice	F. Filtered	H. High	C. CLP 3/90
2. Ground Water	B. HNO3 + Ice	U. Unfiltered	M. Medium	T. TCLP
3. Leachate	C. NaOH + Ice		L. Low	S. SW-846
4. Rinsate	D. H2SO4 + Ice			W. CWA 600-series
5. Soil / Sediment / Sludge	E. Unpreserved			O. Other____
6. Trip Blank	F. Ice Only			
7. Oil	G. Other____			
8. Waste	H. NaHSO4 + Ice			
9. Other____	I. ZnAc+NaOH + Ice			

Sample ID (9 characters maximum)	Date:Year: 2004	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	8330				Remarks / Comments (see Notes 2 & 3)
6GW06-002	09/20	1145	2	A,B,C				2	9/21/04	X	X	X	X		X	X			X	VOA only			438905
~~6GW06-002F~~	~~09/20~~	~~1145~~	~~2~~	~~B~~	~~F~~			~~2~~	~~X~~											~~Cancel~~			~~MS/MSD DKS MET~~
TRIP02	09/20	—	6	A				2		X													438909
	/	:																					
	/	:																					
	/	:																					
	/	:																					
	/	:																					
	/	:																					
	/	:																					

Clients Special Instructions:

Temperature 4.9, 2.6 °C ~~3.1, 3.1~~ °C

Lab: Received in Good Condition? Y or N Describe Problems, if any:

#1 Relinquished By: (Sig) Marlene Ivester	Date: 9/21/04	#2 Relinquished By: (Sig)	Date:	#3 Relinquished By: (Sig)	Date:
Company Name: BAKER ENVIRO	Time: 1500	Company Name:	Time:	Company Name:	Time:
#1 Received By: (Sig) [illegible]	Date: 9/21/04	#2 Received By: (Sig)	Date:	#3 Received By: (Sig)	Date:
Company Name: CompuChem	Time: 1030	Company Name:	Time:	Company Name:	Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

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CHAIN-OF-CUSTODY RECORD

No. 066652

Project Name: CTO 213 / GVOU I
Carrier: FEDEX
Airbill No.: 848 344138331
Sampler Name:

Client Address: BAKER
770 LYNNHAVEN PKWY STE 120
VA BEACH, VA 23452
Sampler Signature:

Point-of-Contact: MARENE JUESTER
Telephone No.: (757) 650-4924
Sampling complete? Y or N (see Note 1)
Project-specific (PS) or Batch (B) QC ? ____

BOX #1: 1. Surface Water, 2. Ground Water, 3. Leachate, 4. Rinsate, 5. Soil / Sediment / Sludge, 6. Trip Blank, 7. Oil, 8. Waste, 9. Other____

BOX #2: A. HCl + Ice, B. HNO3 + Ice, C. NaOH + Ice, D. H2SO4 + Ice, E. Unpreserved, F. Ice Only, G. Other____, H. NaHSO4 + Ice, I. ZnAc+NaOH + Ice

BOX #3: F. Filtered, U. Unfiltered

Box #4: H. High, M. Medium, L. Low

Box #5: C. CLP 3/90, S. SW-846, W. CWA 600-series, O. Other____, T. TCLP

all metal pH's <2
all cyanide pH's >12
(CBG) 9/24/04

Sample ID (9 characters maximum)	Date: Year: 2004	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH					Remarks / Comments (see Notes 2 & 3)	
1GW04-001	09/21	1120	2	B,C				6			X	X	X		X	X							438910	
1GW04-001F	09/21	1120		B	F			1							X								439219	DIS MET
1GW04A-001	09/21	1150		B,C				6			X	X	X		X	X							438911	
1GW04A-001F	09/21	1150		B	F			1							X								439220	DIS MET
1GW05A-001	09/23	1050		B,C				6			X	X	X		X	X							438912	
1GW05A-001F	09/23	1050		B	F			1							X								447201	DIS MET
1GW12-001	09/21	1610		B,C				6			X	X	X		X	X							438913	
1GW12-001F	09/21	1610		B	F			1							X								447202	DIS MET
1GW12B-001	09/22	1330		B,C				6			X	X	X		X	X							438914	
1GW12B-001F	09/22	1330	↓	B	F			1							X								447203	DIS MET

Clients Special Instructions: 2,3,1,9,3,9,3,8,2,9 Temperature ____ °C

Lab: Received in Good Condition? Y or N Describe Problems, if any:

#1 Relinquished By: (Sig) Marlene Juester	Date: 9/23/04	#2 Relinquished By: (Sig)	Date:	#3 Relinquished By: (Sig)	Date:
Company Name: BAKER ENVIRO.	Time: 1800	Company Name:	Time:	Company Name:	Time:
#1 Received By: (Sig) Melissa [illegible]	Date: 9/24/04	#2 Received By: (Sig)	Date:	#3 Received By: (Sig)	Date:
Company Name: CompuChem	Time: 9:10	Company Name:	Time:	Company Name:	Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

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CHAIN-OF-CUSTODY RECORD

No. 066653

Project Name: CTO 213/GWOU I	Client Address: BAKER 770 LYNNHAVEN PKWY STE 120 VA BEACH, VA 23452	Point-of-Contact: MARLENE IVESTER
Carrier: FED EX		Telephone No.: (757) 650-4924
Airbill No.: 848344138331		Sampling complete? Y or N (see Note 1)
Sampler Name:	Sampler Signature:	Project-specific (PS) or Batch (B) QC? ____

BOX #1	BOX #2	BOX #3	Box #4	Box #5
1. Surface Water	A. HCl + Ice	F. Filtered	H. High	C. CLP 3/90
2. Ground Water	B. HNO3 + Ice	U. Unfiltered	M. Medium	T. TCLP
3. Leachate	C. NaOH + Ice		L. Low	S. SW-846
4. Rinsate	D. H2SO4 + Ice			W. CWA 600-series
5. Soil / Sediment / Sludge	E. Unpreserved			O. Other____
6. Trip Blank	F. Ice Only			
7. Oil	G. Other____			
8. Waste	H. NaHSO4 + Ice			
9. Other____	I. ZnAc+NaOH + Ice			

Sample ID (9 characters maximum)	Date:Year: 2004	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	8330/NITRAMINES				Remarks / Comments (see Notes 2 & 3)
																							all metal pH's <2 all cyanide pH's >12
~~3GW19-001~~	~~09/23~~	:	~~2~~	~~B,C~~				~~6~~			~~X~~	~~X~~	~~X~~		~~X~~	~~X~~							~~MD~~
~~3GW19-001F~~	~~09/23~~	:		~~B~~	~~F~~			~~1~~							~~X~~								~~MD~~ ~~DISMET~~
3GW19A-001	09/22	1650	2	B,C				6			X	X	X		X	X							438915
3GW19A-001F	09/22	1650		B	F			1							X								447204 DISMET
25GW02A-001	09/23	1430		B,C				~~8~~4							X	X		X					(NO O&G/TPH) 439013
25GW02A-001F	09/23	1430		B	F			1							X								447205 DISMET
25GW02A-001D	09/23	1430		B,C				4	X						X	X			X				DUP 439014
25GW02A-001FD	09/23	1430		B	F			1	X						X								DUP 447206 DISMET
25GW02A-001	09/23	1430		B,C				8	X						X	X			X				MS/MSD 439013
25GW02A-001F	09/23	1430	↓	B	F			2	X						X								MS/MSD 447206 DISMET

Clients Special Instructions: (3GW19-001 NOT COLLECTED YET)

Temperature °C 2.3°C, 1.9°C, 3.4°C, 3.8°C, 2.1°C

Lab: Received in Good Condition? Y or N Describe Problems, If any:

#1 Relinquished By: (Sig) Marlene Ivester	Date: 9/23/04	#2 Relinquished By: (Sig)	Date:	#3 Relinquished By: (Sig)	Date:
Company Name: BAKER ENVIRO.	Time: 800	Company Name:	Time:	Company Name:	Time:
#1 Received By: (Sig) Melissa Stoe	Date: 9/24/04	#2 Received By: (Sig)	Date:	#3 Received By: (Sig)	Date:
Company Name: CompuChem	Time: 9:10	Company Name:	Time:	Company Name:	Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

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CHAIN-OF-CUSTODY RECORD

No. 067788

Project Name: CTO213	Client Address: BAKER ENVIRO 770 LYNN-HAVEN PKWY STE 240 VA BEACH, VA 23452	Point-of-Contact: MARLENE IVESTER 120
Carrier: FED EX		Telephone No.: (757) 650-4924
Airbill No.: 848344138353		Sampling complete? Y or (N) (see Note 1) *
Sampler Name: M. IVESTER	Sampler Signature: [signature]	Project-specific (PS) or Batch (B) QC?

BOX #1	1. Surface Water 2. Ground Water 3. Leachate 4. Rinsate 5. Soil / Sediment / Sludge 6. Trip Blank 7. Oil 8. Waste 9. Other FIELD BLANK	BOX #2	A. HCl + Ice B. HNO3 + Ice C. NaOH + Ice D. H2SO4 + Ice E. Unpreserved F. Ice Only G. Other_____ H. NaHSO4 + Ice I. ZnAc+NaOH + Ice	BOX #3	F. Filtered U. Unfiltered L-AL PL < 2 PL > 12
Box #4	H. High M. Medium L. Low	Box #5	C. CLP 3/90 S. SW-846 W. CWA 600-series O. Other_____ T. TCLP		

Sample ID (9 characters maximum)	Date:Year: 2004	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA 40 ml	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	8330				Remarks / Comments (see Notes 2 & 3)
FBRIG	09/28	1030	9	A,B,C				11		X	X	X	X		X	X			X				TOT MET 438916
FBRIGF	09/28	1030	9	B	F			1							X								DIS MET 447207
TRIP03	09/28	—	6	A				2		X													438917
	/	:																					
	/	:																					
	/	:																					
	/	:																					
	/	:																					
	/	:																					
	/	:																					

Clients Special Instructions: *GO AHEAD AND CLOSE GW SDG, AS GW SAMPLING WON'T CONTINUE UNTIL NEXT WEEK Temperature 8.3 °C

Lab: Received in Good Condition? Y or N Describe Problems, If any:

#1 Relinquished By: (Sig) [signature]	Date: 9/28/04	#2 Relinquished By: (Sig)	Date:	#3 Relinquished By: (Sig)	Date:
Company Name: BAKER ENVIRO	Time: 1800	Company Name:	Time:	Company Name:	Time:
#1 Received By: (Sig) [signature]	Date: 9/29/04	#2 Received By: (Sig)	Date:	#3 Received By: (Sig)	Date:
Company Name: Compuchem	Time: 9:00	Company Name:	Time:	Company Name:	Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

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CHAIN-OF-CUSTODY RECORD

No. 067787

(10)

16

Project Name: CTO 213	Client Address: BAKER ENVIRO 700 LYNNHAVEN PKWY STE 120 VA BEACH, VA 23452	Point-of-Contact: MARLENE JUESTER
Carrier: FED EX		Telephone No.: (757) 650-4924
Airbill No.: 8483441383 86		Sampling complete? Y or N (see Note 1)
Sampler Name:	Sampler Signature:	Project-specific (PS) or Batch (B) QC ?

BOX #1	BOX #2	BOX #3	Box #4	Box #5
1. Surface Water 2. Ground Water 3. Leachate 4. Rinsate 5. Soil / Sediment / Sludge 6. Trip Blank 7. Oil 8. Waste 9. Other_____	A. HCl + Ice B. HNO3 + Ice C. NaOH + Ice D. H2SO4 + Ice E. Unpreserved F. Ice Only G. Other_____ H. NaHSO4 + Ice I. ZnAc+NaOH + Ice	F. Filtered U. Unfiltered	H. High M. Medium L. Low	C. CLP 3/90 S. SW-846 W. CWA 600-series O. Other_____ T. TCLP

Sample ID (9 characters maximum)	Date:Year: 2004	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	B330 / ALL TARGET ANALYTES				Remarks / Comments (see Notes 2 & 3)
																							all metal pH < 2; except for 6GW04-001F (see QA notice) CC Day 10/7/04
6GW04-001	10/05	1220	2	A,B,C				11		X	X	X	X		X	X			X				all cyanide pHs >12 except for 6GW04-001
6GW04-001F	10/05	1220		B	F			1							X								461701
6GW05B-001	10/04	1230		A,B,C				11		X	X	X	X		X	X			X				461801 DIS MET
6GW05B-001F	10/04	1230		B	F			1							X								461702
6GW05B-001	10/04	1230		A,B,C				22	X	X	X	X	X		X	X			X				461802 DIS MET
6GW05B-001F	10/04	1230		B	F			2	X						X								MS/MSD 461702
6GW08-001	10/05	1200		A,B,C				11		X	X	X	X		X	X			X				461802 MS/MSD DIS MET
6GW08-001F	10/05	1200		B	F			1							X								461703
6GW09-001	10/05	1445		A,B,C				11		X	X	X	X		X	X			X				461803 DIS MET
6GW09-001F	10/05	1445	↓	B	F			1							X								461704
																							461804 DIS MET

Clients Special Instructions: Temperature _____ °C

Lab: Received in Good Condition? Y or N **Describe Problems, If any:**

#1 Relinquished By: (Sig) Marlene Juester	Date: 10/6/04	#2 Relinquished By: (Sig)	Date:	#3 Relinquished By: (Sig)	Date:
Company Name: BAKER ENVIRO	Time: 1800	Company Name:	Time:	Company Name:	Time:
#1 Received By: (Sig) [illegible]	Date: 10/7/04	#2 Received By: (Sig)	Date:	#3 Received By: (Sig)	Date:
Company Name: CompuChem	Time: 8:45	Company Name:	Time:	Company Name:	Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

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CHAIN-OF-CUSTODY RECORD

No. 067789

(11) 17

Project Name: CTO 213	Client Address: BAKER ENVIRO, 770 LYNNHAVEN PKWY STE # 120 VA BEACH, VA 23452	Point-of-Contact: MARLENE IVESTER
Carrier: FED EX		Telephone No.: (757) 650-4924
Airbill No.: 848 344 138 386		Sampling complete? Y or (N) (see Note 1)
Sampler Name:	Sampler Signature:	Project-specific (PS) or Batch (B) QC ?

BOX #1: 1. Surface Water 2. Ground Water 3. Leachate 4. Rinsate 5. Soil / Sediment / Sludge 6. Trip Blank 7. Oil 8. Waste 9. Other_____

BOX #2: A. HCl + Ice B. HNO3 + Ice C. NaOH + Ice D. H2SO4 + Ice E. Unpreserved F. Ice Only G. Other_____ H. NaHSO4 + Ice I. ZnAc+NaOH + Ice

BOX #3: F. Filtered U. Unfiltered

Box #4: H. High M. Medium L. Low

Box #5: C. CLP 3/90 S. SW-846 W. CWA 600-series O. Other_____ T. TCLP

storage blk VHBCKXK → 461711
all metal pHs <2

Sample ID (9 characters maximum)	Date:Year: 2004	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	8330 / N TRAMINES				Remarks / Comments (see Notes 2 & 3)
6GW09A-001	10/05	1510	Z	A,B,C				11		Y	Y	Y	Y		Y	Y			X				461705
6GW09A-001F	10/05	1510		B	F			1							X								461805 DS MET
6GW10-001	10/04	1645		A,B,C				11		Y	Y	Y	Y		Y	Y			X				461706
6GW10-001F	10/04	1645		B	F			1							X								461806 DS MET
6GW10A-001	10/05	0935		A,B,C				11		Y	Y	Y	Y		Y	Y			X				461707
6GW10A-001F	10/05	0935		B	F			1							X								461807 DS MET
3GW19-001	10/06	1105		B,C				6			X	X	X		X	X							461709
3GW19-001F	10/06	1105	V	B	F			1							X								461808 DS MET
TRIP04	10/06	—	6	A				2		X													461710

all cyanide pHs >12; except for 3GW19-001 see QA notice

Clients Special Instructions:

Temperature 6.8, 2.3, 4.9, 2.2, 2.7, 4.3, 3.1 °C

Lab: Received in Good Condition? Y or N Describe Problems, if any: 6GW10-001 Rec'd Broken

#1 Relinquished By: (Sig)	Date: 10/6/04	#2 Relinquished By: (Sig)	Date:	#3 Relinquished By: (Sig)	Date:
Company Name: BAKER ENVIRO	Time: 1800	Company Name:	Time:	Company Name:	Time:
#1 Received By: (Sig)	Date: 10/7/04	#2 Received By: (Sig)	Date:	#3 Received By: (Sig)	Date:
Company Name: Compuchem	Time: 8:45	Company Name:	Time:	Company Name:	Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

(12)

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CHAIN-OF-CUSTODY RECORD

No. 067790

Project Name: CTO 213	Client Address: BAKER 770 LYNNHAVEN PKWY STE 120 VA BEACH, VA 23452	Point-of-Contact: MARLENE IVESTER
Carrier: FEDEX		Telephone No.: (757) 650-4924
Airbill No.: 8483241383 86		Sampling complete? Y or N (see Note 1)
Sampler Name:	Sampler Signature:	Project-specific (PS) or Batch (B) QC ? ____

BOX #1	BOX #2	BOX #3	Box #4	Box #5
1. Surface Water	A. HCl + Ice	F. Filtered	H. High	C. CLP 3/90
2. Ground Water	B. HNO3 + Ice	U. Unfiltered	M. Medium	S. SW-846
3. Leachate	C. NaOH + Ice		L. Low	W. CWA 600-series
4. Rinsate	D. H2SO4 + Ice			O. Other____
5. Soil / Sediment / Sludge	E. Unpreserved			T. TCLP
6. Trip Blank	F. Ice Only			
7. Oil	G. Other____			
8. Waste	H. NaHSO4 + Ice			
9. Other FIELD BLANK	I. ZnAc+NaOH + Ice			

Sample ID (9 characters maximum)	Date:Year 2004	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	8330/NITRAMINES				Remarks / Comments (see Notes 2 & 3)
FBDI	10/06	0905	~~A~~ 9	A,B,C					11	X	X	X	X		X	X			X				461708
FBDIF	10/06	0905	9B	B	F				1						X								461809 DIS MET
	/	:																					
	/	:																					
	/	:																					
	/	:																					
	/	:																					
	/	:																					
	/	:																					
	/	:																					

Clients Special Instructions:

Temperature ____ °C

Lab: Received in Good Condition? Y or N Describe Problems, if any:

#1 Relinquished By: (Sig)	Date: 10/6/04	#2 Relinquished By: (Sig)	Date:	#3 Relinquished By: (Sig)	Date:
Company Name: BAKER ENVIRO.	Time: 1800	Company Name:	Time:	Company Name:	Time:
#1 Received By: (Sig)	Date: 10/7/04	#2 Received By: (Sig)	Date:	#3 Received By: (Sig)	Date:
Company Name: CompuChem	Time: 8:45	Company Name:	Time:	Company Name:	Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

(13)

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CHAIN-OF-CUSTODY RECORD

No. 067802

Project Name: CTO 23
Carrier: FEDEX
Airbill No.: 8464 9780 1440
Sampler Name:

Client Address: BAKER
770 LYNNHAVEN PKWY
STE 120
VA BEACH, VA 23452
Sampler Signature: M Gerson

Point-of-Contact: MARLENE JUESTEL
Telephone No.: (757) 650-4924
Sampling complete? (Y) or N (see Note 1)
Project-specific (PS) or Batch (B) QC ?

BOX #1: 1. Surface Water, 2. Ground Water, 3. Leachate, 4. Rinsate, 5. Soil / Sediment / Sludge, 6. Trip Blank, 7. Oil, 8. Waste, 9. Other____

BOX #2: A. HCl + Ice, B. HNO3 + Ice, C. NaOH + Ice, D. H2SO4 + Ice, E. Unpreserved, F. Ice Only, G. Other____, H. NaHSO4 + Ice, I. ZnAc+NaOH + Ice

BOX #3: F. Filtered, U. Unfiltered

Box #4: H. High, M. Medium, L. Low

Box #5: C. CLP 3/90, S. SW-846, W. CWA 600-series, O. Other____, T. TCLP

all metal pHs <2
all cyanide pHs >12
10/8/04

Sample ID (9 characters maximum)	Date:Year 2004	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	8330/ NITRAMINES				Remarks / Comments (see Notes 2 & 3)
6GW06B-001	10/07	1125	2	A,B,C				11		X	X	X	X		X	X			X				461712
6GW07-001	10/07	1355	2	A,B,C				11		X	X	X	X		X	X			X				461713
6GW09B-001	10/07	1120	2	A,B,C				11		X	X	X	X		X	X			X				461714
6GW06B-001F	10/07	1125	2	B	F			1							X								DIS MET 461810
6GW07-001F	10/07	1355	2	B	F			1							X								DIS MET 461811
6GW09B-001F	10/07	1120	2	B	F			1							X								DIS MET 461812
FBDS	10/07	1400	9	A,B,C				11		X	X	X	X		X	X			X				461715
FBDSF	10/07	1400	9	B	F			1							X								DIS MET 461813
RB01	10/07	1430	4	A,B,C				11		X	X	X	X		X	X			X				461716
RB01F	10/07	1430	4	B	F			1							X								DIS MET 461814

Clients Special Instructions:

Temperature 2.8 °C

Lab: Received in Good Condition? Y or N Describe Problems, If any:

#1 Relinquished By: (Sig) M Gerson	Date: 10/7/04	#2 Relinquished By: (Sig)	Date:	#3 Relinquished By: (Sig)	Date:
Company Name: BAKER ENVIRO.	Time: 1800	Company Name:	Time:	Company Name:	Time:
#1 Received By: (Sig)	Date: 10/8/04	#2 Received By: (Sig)	Date:	#3 Received By: (Sig)	Date:
Company Name: CompuChem	Time: 9:00	Company Name:	Time:	Company Name:	Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

(14)

COMPUCHEM
a division of Liberty Analytical Corp.
501 Madison Avenue
Cary, NC 27513
1-800-833-5097

CHAIN-OF-CUSTODY RECORD

No. 067803

Project Name : CTO 213	Client Address : BAKER 770 LYNNHAVEN PKWY STE 120 VA BEACH, VA 23452	Point-of-Contact : MARLENE IVESTER
Carrier : FEDEX		Telephone No. : (757) 650-4924
Airbill No. : 8446 4 9780 1440		Sampling complete? Y or N (see Note 1)
Sampler Name :	Sampler Signature: [signature]	Project-specific (PS) or Batch (B) QC ?

BOX #1	BOX #2	BOX #3	Box #4	Box #5
1. Surface Water 2. Ground Water 3. Leachate 4. Rinsate 5. Soil / Sediment / Sludge 6. Trip Blank 7. Oil 8. Waste 9. Other_____	A. HCl + Ice B. HNO3 + Ice C. NaOH + Ice D. H2SO4 + Ice E. Unpreserved F. Ice Only G. Other_____ H. NaHSO4 + Ice I. ZnAc+NaOH + Ice	F. Filtered U. Unfiltered	H. High M. Medium L. Low	C. CLP 3/90 S. SW-846 W. CWA 600-series O. Other_____ T. TCLP

Sample ID (9 characters maximum)	Date:Year: 2004	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	Remarks / Comments (see Notes 2 & 3)
TRIP05	10/07	—	W	A				2		X									461717
	/	:																	
	/	:																	
	/	:																	
	/	:																	
	/	:																	
	/	:																	
	/	:																	
	/	:																	
	/	:																	

Clients Special Instructions:

Temperature 3.7, 3.6 °C 5.4, 2.8

Lab: Received in Good Condition? Y or N **Describe Problems, if any:**

#1 Relinquished By: (Sig) [signature]	Date: 10/7/04	#2 Relinquished By: (Sig)	Date:	#3 Relinquished By: (Sig)	Date:
Company Name: BAKER ENV'L	Time: 1800	Company Name:	Time:	Company Name:	Time:
#1 Received By: (Sig) [signature]	Date: 10/8/04	#2 Received By: (Sig)	Date:	#3 Received By: (Sig)	Date:
Company Name: CompuChem	Time: 0100	Company Name:	Time:	Company Name:	Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

(16)

COMPUCHEM
a division of Liberty Analytical Corp.
501 Madison Avenue
Cary, NC 27513
1-800-833-5097

CHAIN-OF-CUSTODY RECORD

No. 65999

Project Name: GWOU RESAMPLE CTO 213	Client Address: BAKER ENVIRO. 770 LYNNHAVEN PKWY, STE 240 VA BEACH, VA 23452	Point-of-Contact: MARLENE JVESTER
Carrier: FEDEX		Telephone No.: (757) 631-5462
Airbill No.:		Sampling complete? (Y) or N (see Note 1)
Sampler Name: M. JVESTER	Sampler Signature: M Jvester	Project-specific (PS) or Batch (B) QC ? ____

BOX #1: 1. Surface Water; 2. Ground Water; 3. Leachate; 4. Rinsate; 5. Soil / Sediment / Sludge; 6. Trip Blank; 7. Oil; 8. Waste; 9. Other FIELD BLANK

BOX #2: A. HCl + Ice; B. HNO3 + Ice; C. NaOH + Ice; D. H2SO4 + Ice; E. Unpreserved; F. Ice Only; G. Other____; H. NaHSO4 + Ice; I. ZnAc+NaOH + Ice

BOX #3: F. Filtered; U. Unfiltered

Box #4: H. High; M. Medium; L. Low

Box #5: C. CLP 3/90; S. SW-846; W. CWA 600-series; O. Other____; T. TCLP

Sample ID (9 characters maximum)	Date: Year: 2005	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury TOT	Cyanide	TOC / TOX	O&G / TPH	8330	DISSOLVED METALS			Remarks / Comments (see Notes 2 & 3)
6GW08-001a	03/17	1035	2	A,B,C				11		X	X	X	X		X	X			X				
6GW08-001aD	03/17	1035	2	A,B,C				11		X	X	X	X		X	X			X				
6GW08-001a	03/17	1035	2	A,B,C				11		X	X	X	X		X	X			X				
RB02	03/17	1240	4	A,B,C				11		X	X	X	X		X	X			X				
FBD02	03/17	1225	9	A,B,C				11		X	X	X	X		X	X			X				
TRIP06	03/17	1240	6	A				3		X													FIELD COLLECTED W/ DI H2O
6GW08-001Fa	03/17	1035	2	B	F			1												X			
6GW08-001FaD	03/17	1035	2	B	F			1												X			
6GW08-001Fa	03/17	1035	2	B	F			2												X			
RB02F	03/17	1240	4	B	F			1												X			

Clients Special Instructions: Temperature ____ °C

Lab: Received in Good Condition? Y or N **Describe Problems, If any:**

#1 Relinquished By: (Sig) M Jvester Date: 3/17/05	#2 Relinquished By: (Sig) Date:	#3 Relinquished By: (Sig) Date:
Company Name: BAKER ENVIRO. Time: 1600	Company Name: Time:	Company Name: Time:
#1 Received By: (Sig) Date:	#2 Received By: (Sig) Date:	#3 Received By: (Sig) Date:
Company Name: Time:	Company Name: Time:	Company Name: Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

(17)

COMPUCHEM
a division of Liberty Analytical Corp.

501 Madison Avenue
Cary, NC 27513
1-800-833-5097

CHAIN-OF-CUSTODY RECORD

No. 066000

Project Name: GWOU RESAMPLE CTO 213	Client Address: BAKER 7700 LYNNHAVEN PKWY STE 240 VA BEACH, VA 23452	Point-of-Contact: MARLENE JUESTER
Carrier: FED EX		Telephone No.: (757) 631-5462
Airbill No.:		Sampling complete? Y or N (see Note 1)
Sampler Name: M. JUESTER	Sampler Signature: [signature]	Project-specific (PS) or Batch (B) QC ? ____

BOX #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil / Sediment / Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other FIELD BLANK

BOX #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other____
H. NaHSO4 + Ice
I. ZnAc+NaOH + Ice

BOX #3
F. Filtered
U. Unfiltered

Box #4
H. High
M. Medium
L. Low

Box #5
C. CLP 3/90
S. SW-846
W. CWA 600-series
O. Other____
T. TCLP

Sample ID (9 characters maximum)	Date: Year 2005	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	DISSOLVED METALS				Remarks / Comments (see Notes 2 & 3)
FBDI2F	03/17	1225	9	B	F			1											X				
	/	:																					
	/	:																					
	/	:																					
	/	:																					
	/	:																					
	/	:																					
	/	:																					
	/	:																					
	/	:																					

Clients Special Instructions:

Temperature ____ °C

Lab: Received in Good Condition? Y or N Describe Problems, If any:

#1 Relinquished By: (Sig) [signature] Date 3/17/05	#2 Relinquished By: (Sig) Date:	#3 Relinquished By: (Sig) Date:
Company Name: BAKER ENVIRO. Time: 1600	Company Name: Time:	Company Name: Time:
#1 Received By: (Sig) Date:	#2 Received By: (Sig) Date:	#3 Received By: (Sig) Date:
Company Name: Time:	Company Name: Time:	Company Name: Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

Appendix D: IDW Disposal Documentation

Mailing Address:P.O.Box 1779
Norfolk, VA 23501-1779
Shipping Address: 929 Professional Place
Chesapeake, VA 23320

24 Hours: (757) 436-3000
1-800-989-4467
Fax: (757) 436-5266

IMS
ENVIRONMENTAL SERVICES

December 15, 2004

Laura Cook
CH2M Hill - Virginia Beach Office
5700 Cleveland Street
Suite 101
Virginia Beach, VA 23462

Re: Disposal of IDW waste from Naval Weapons Station - Yorktown
Project #: CTO-213 for the Navy Clean Contract: # N62470-95-D-6007,
Navy Clean II, P.O.#: 905221
IMS Job Number: 351.3702.

Dear Ms. Cook:

Enclosed please find copies of the invoice, and documentation for the disposal of 22 drums of non-hazardous soil and 8 drums of non-hazardous water. The soil was remediated/ disposed of at SOILEX Corporation located at 416 Dominion Boulevard, Chesapeake, VA. The non-hazardous water was disposed of at the Industrial Marine Services facility located at 1301 Marsh Street in Norfolk, Virginia under Hampton Roads Sanitation District Permit Number 0054.

We suggest that you retain this information indefinitely. Should you have any questions please do not hesitate to contact me at (757) 436-3000.

Sincerely,
IMS Environmental Services

Douglas E. Macnab, CHMM
Senior Professional

DISTRIBUTION: WHITE AND YELLOW COPIES TO TANK FARM FOREMAN - BLUE COPY TO CUSTOMER - MANILA - DRIVERS BOOK

INDUSTRIAL MARINE SERVICES, INC. FORM #102 LIQUID
1301 MARSH STREET • P.O. BOX 1779
Norfolk, Virginia 23501 **41082 L**

EMERGENCY 24 HOUR telephone (757) 543-5718

DATE	TIME-IN	TIME OUT
1. 11/16/04		

NON-NEGOTIABLE TRUCK LOADING TICKET AND BILL OF LADING

This carrier certifies that the cargo tank supplied for this shipment is a proper container for the transportation of the commodity as described below.

The Shipper certifies the product is properly identified and labeled as indicated below in accordance with 49 CFR 172.101 and is not a hazardous waste according to 40 CFR 261 and VR672.10.1 (if cargo is HAZARDOUS WASTE contact HAZMAT Mgr. for Proper Manifest.)

2. JOB NUMBER	JOB NAME	JOB SUPERVISOR	TANK NO.
551-5408	CTO-073 Yorktown Weapons	D. Macomb	

3. CONSIGNED TO:
INDUSTRIAL MARINE SERVICES, INC.

4. CONSIGNEE	ADDRESS	STATE
1100 Executive Dr	Williamsburg,	VA

5 CARRIER NAME: IMS

(-) Provide Technical Name for n.o.s. Materials

6. PRODUCT	HM	GALLONS	PRODUCT	HM	GALLONS
[redacted] DEM	X		[redacted] DEM	X	
[redacted]	X		[redacted]	X	
[redacted]	X		[redacted]	X	
Non-haz Water		400			

7. RECEIVED BY	DATE	TIME	
Beeler	11/16/04		A.M. P.M.

8. **REMARKS:**

8 drums

9. METERED GALLONS

10. SHIPPER REPRESENTATIVE	DRIVER
Tyson Oliver (Print Name)	(Print Name)
Per (Signature)	Per (Signature)

SOILEX

PROJECT DOCUMENTS

TO: Mr. Doug Macnab

FROM: Jack Ruffin

PROJECT: Soil Disposal
Naval Weapons Station Yorktown

DATE: November 16, 2004

Please find enclosed all project documentation for the disposal of petroleum impacted materials from the above location. We suggest that you or your customers retain this information indefinitely.

Should you have any questions or require additional copies, please do not hesitate to contact our office.

Thank you again for the opportunity to be of service.

Enclosure

P. O. Box 1444, Chesapeake, Virginia 23327 Phone 757.549.8448 Fax 757.549.6668

Certification of Remediation and Recycling

Presented to

NAVAL WEAPONS STATION YORKTOWN

Hereinafter known as the "Generator" of NON-HAZARDOUS PETROLEUM CONTAMINATED MATERIAL, which originated from Building 109, Yorktown, Virginia.

As evidenced by the receipt of corresponding manifests, **22 drums** of material were delivered to the Chesapeake Facility for biological treatment and disposal at the SPSA Regional Landfill. Said material was received on November 15, 2004 and has been deemed acceptable for treatment according to all applicable Commonwealth of Virginia Department of Environmental Quality regulations.

The remediation and recycling activities are conducted in accordance with Commonwealth of Virginia Department of Environmental Quality Permit-by-Rule No. 510, which applies only to the remediation and recycling of non-hazardous materials.

Certification No. 24-7603
Presented this 16th day of November, 2004

SOILEX CORPORATION

Soilex Corporation
Post Office Box 62601
Virginia Beach, VA 23466
(757) 499-1177
FAX: (757) 499-3567 PO# 28354C

NON-HAZARDOUS SHIPPING MANIFEST

MANIFEST NO. 001

351.3702

GENERATOR

NAME Naval Weapons Station Yorktown
TELEPHONE 757-887-4076 14707
ADDRESS P.O. Drawer 160, Yorktown, Va 23691-0160
CITY Yorktown
STATE VA
SHIPMENT ORIGIN B.107
CITY
STATE
AUTHORIZED AGENT Carolyn W. Reece
FIRM Naval Weapons Station Yorktown
ADDRESS Same as above
OTHER IMS

MATERIAL CHARACTERIZATION

ACTIVITY GENERATING THIS MATERIAL: UST/AST REMOVAL _____ OTHER Drill Cuttings

PETROLEUM TYPE (S): VIRGIN PRODUCT _____ NON-VIRGIN PRODUCT _____

PHYSICAL STATE: STOCKPILED _____ EXCAVATING _____ DRUMS 22 OTHER _____

HANDLING INSTRUCTIONS: **Transport To Facility Designated Below**

FIRE OR SPILL INSTRUCTIONS: **Non-Flammable / Non-Hazardous**

DESTINATION: Soilex

I hereby certify, to the best of my knowledge, the material characterized above is non-hazardous as defined by the Virginia Hazardous Waste Management Regulations, Federal Regulations under Subtitle C – RCRA, U.S. Department of Transportation, or local/state of origin regulations.

Carolyn W. Reece
Signature of Generator / Agent

Printed Name / Date

TRANSPORTER

TRANSPORTER NAME John S. Holmes
TELEPHONE [illegible] TRUCK NO. 30

I certify that the materials described above were received by me for shipment and delivered to the designated facility.

Transporter Signature / Date

FACILITY

I certify that the materials described above were delivered to the facility and received by me.

ACCEPTED BY _____ DATE 11-15-04

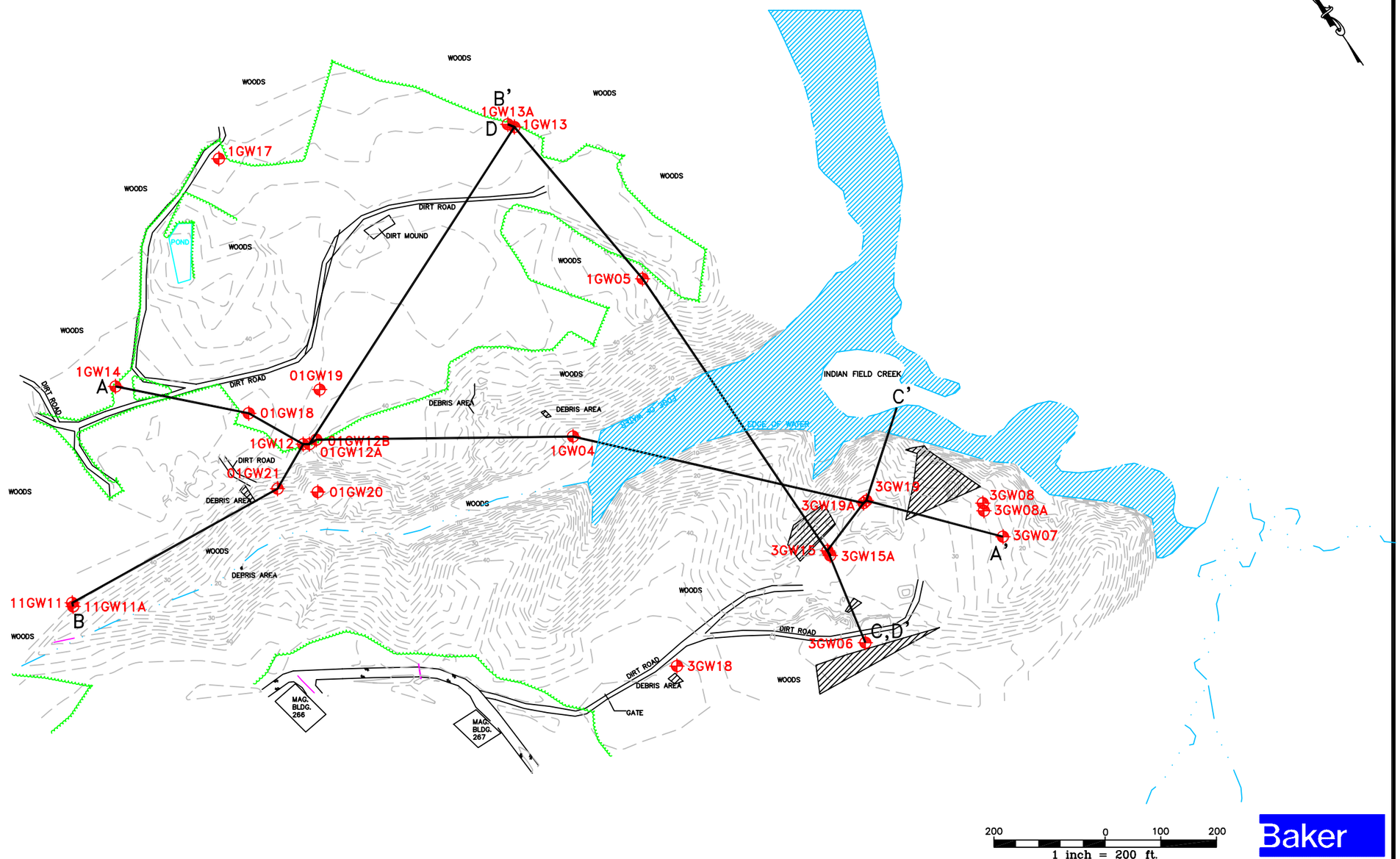
REASONS FOR REJECTION _____

Gross Weight
Tare Weight
Net Weight
Tons

GENERATOR

Appendix E: Geologic Cross-sections

k26007/213phase/Graphics/CAD/sites 1&3/ 2213001.dwg



Baker
Baker Environmental, Inc.

NOTES:

1. ELEVATIONS SHOWN WERE TAKEN FROM AN ALUMINUM RIVET LOCATED IN CONCRETE HEADWALL N. OF N. RD. TO AMMO OVERHAUL. BENCH MARK NUMBER MR-23 ELEVATION=44.11'

2. HORIZONTAL INFORMATION SHOWN WAS TAKEN FROM A DRAWING TITLED "HORIZONTAL SURVEYING CONTROL POINTS INDEX" BY TALBOT AND ASSOCIATES, LTD. CODE IDENT. NO. 80091 SHEET NUMBER I-7.

LEGEND

1GW17 — MONITORING WELL

A — A' — CROSS-SECTION TRAVERSE

TREELINE

BUILDING

DEBRIS AREA

SOURCE: PHR & A, AUGUST 1995.

FIGURE E-1

GEOLOGIC CROSS-SECTION
SITES 1 AND 3

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

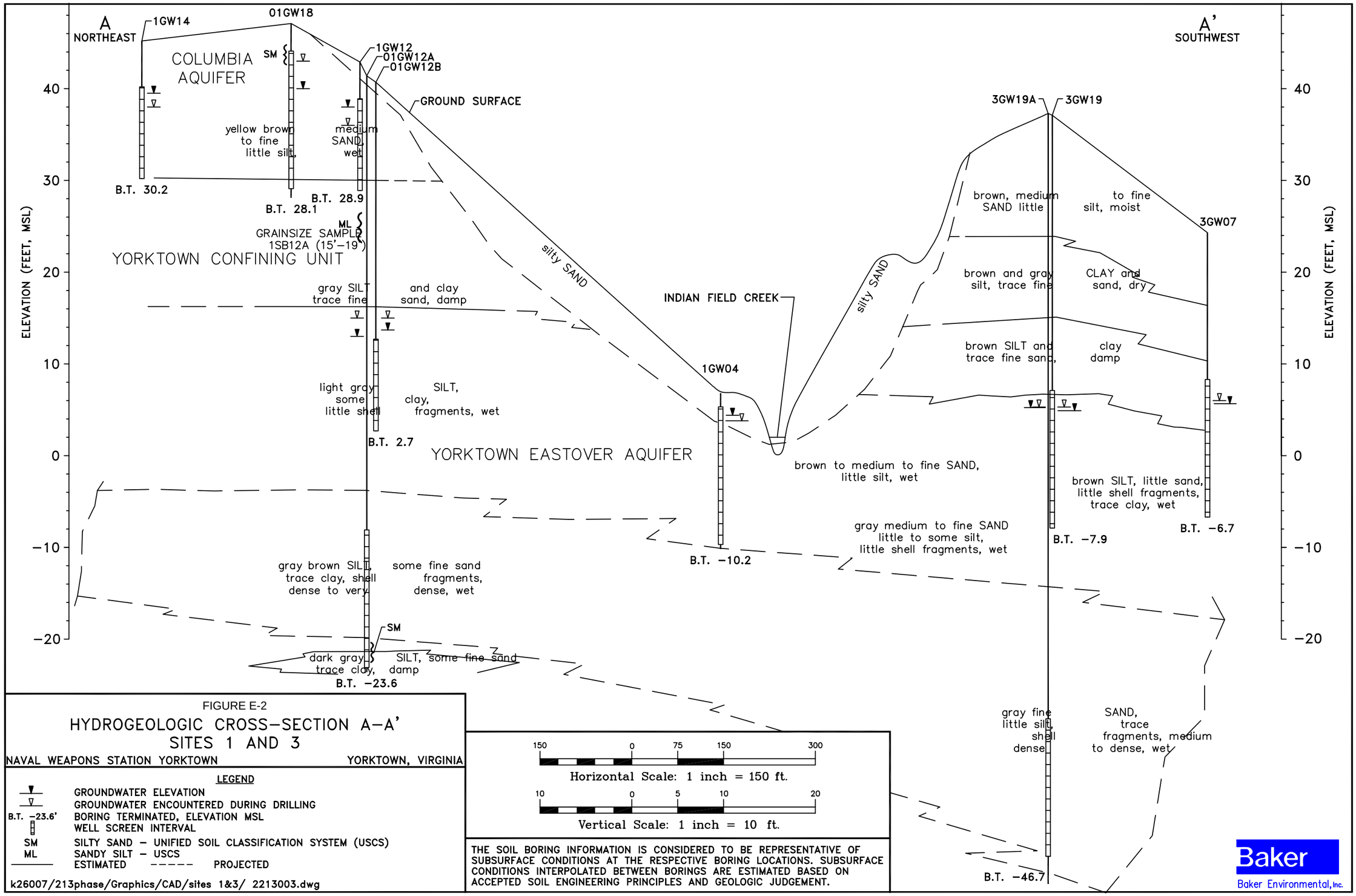


FIGURE E-2

HYDROGEOLOGIC CROSS–SECTION A–A'
SITES 1 AND 3

NAVAL WEAPONS STATION YORKTOWN — YORKTOWN, VIRGINIA

LEGEND

- GROUNDWATER ELEVATION
- GROUNDWATER ENCOUNTERED DURING DRILLING
- B.T. −23.6' BORING TERMINATED, ELEVATION MSL
- WELL SCREEN INTERVAL
- SM SILTY SAND – UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)
- ML SANDY SILT – USCS
- ESTIMATED ----- PROJECTED

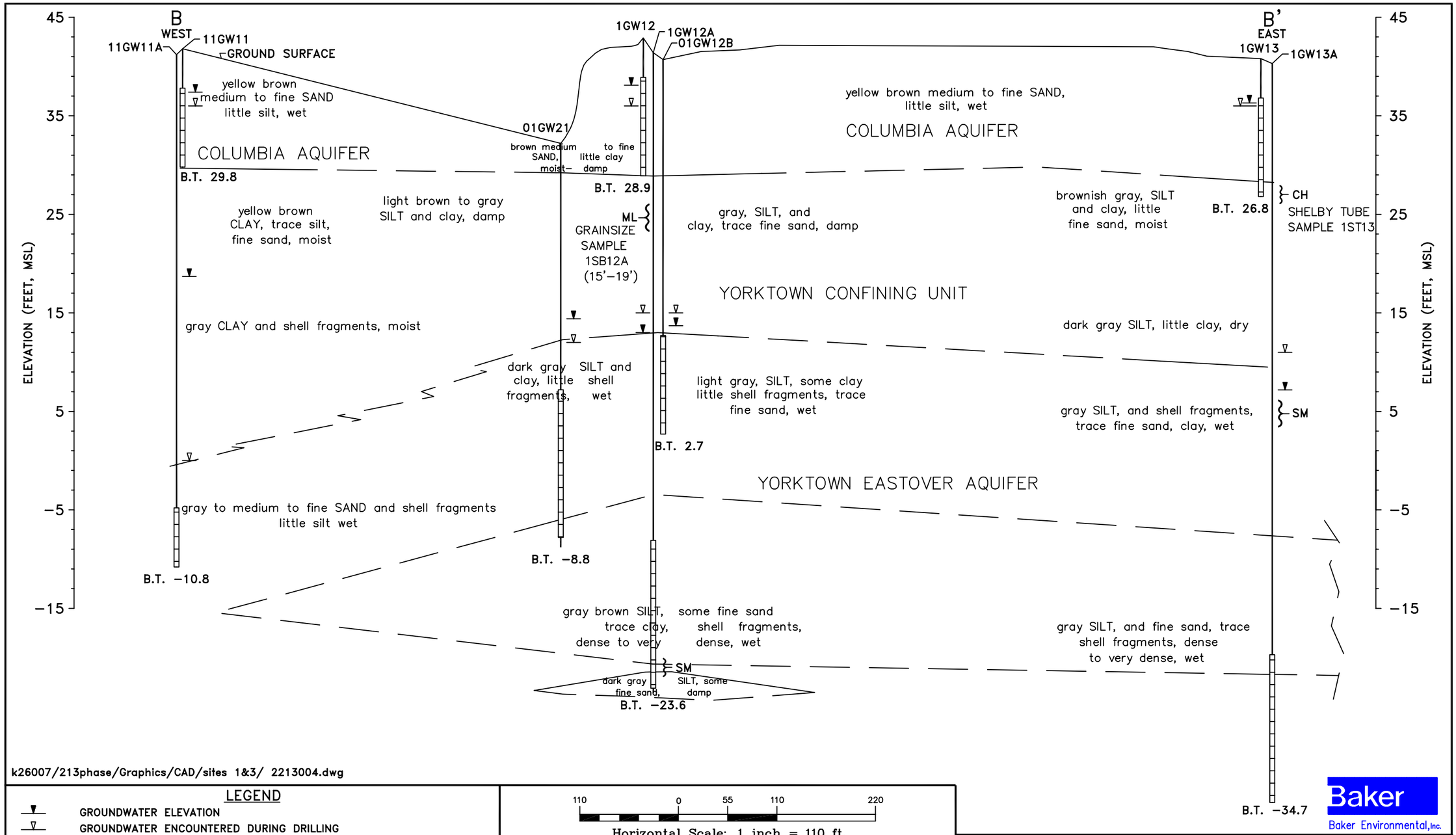
k26007/213phase/Graphics/CAD/sites 1&3/ 2213003.dwg

150 0 75 150 300
Horizontal Scale: 1 inch = 150 ft.

10 0 5 10 20
Vertical Scale: 1 inch = 10 ft.

THE SOIL BORING INFORMATION IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THE RESPECTIVE BORING LOCATIONS. SUBSURFACE CONDITIONS INTERPOLATED BETWEEN BORINGS ARE ESTIMATED BASED ON ACCEPTED SOIL ENGINEERING PRINCIPLES AND GEOLOGIC JUDGEMENT.

Baker
Baker Environmental, Inc.



k26007/213phase/Graphics/CAD/sites 1&3/ 2213004.dwg

LEGEND

▼	GROUNDWATER ELEVATION
▽	GROUNDWATER ENCOUNTERED DURING DRILLING
B.T. −10.8'	BORING TERMINATED, ELEVATION MSL
▯	WELL SCREEN INTERVAL
———	ESTIMATED — — — PROJECTED
CH	INORGANIC CLAY (USCS)
SM	SILTY SAND (USCS)
ML	SANDY SILT (USCS)

110 0 55 110 220

Horizontal Scale: 1 inch = 110 ft.

10 0 5 10 20

Vertical Scale: 1 inch = 10 ft.

THE SOIL BORING INFORMATION IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THE RESPECTIVE BORING LOCATIONS. SUBSURFACE CONDITIONS INTERPOLATED BETWEEN BORINGS ARE ESTIMATED BASED ON ACCEPTED SOIL ENGINEERING PRINCIPLES AND GEOLOGIC JUDGEMENT.

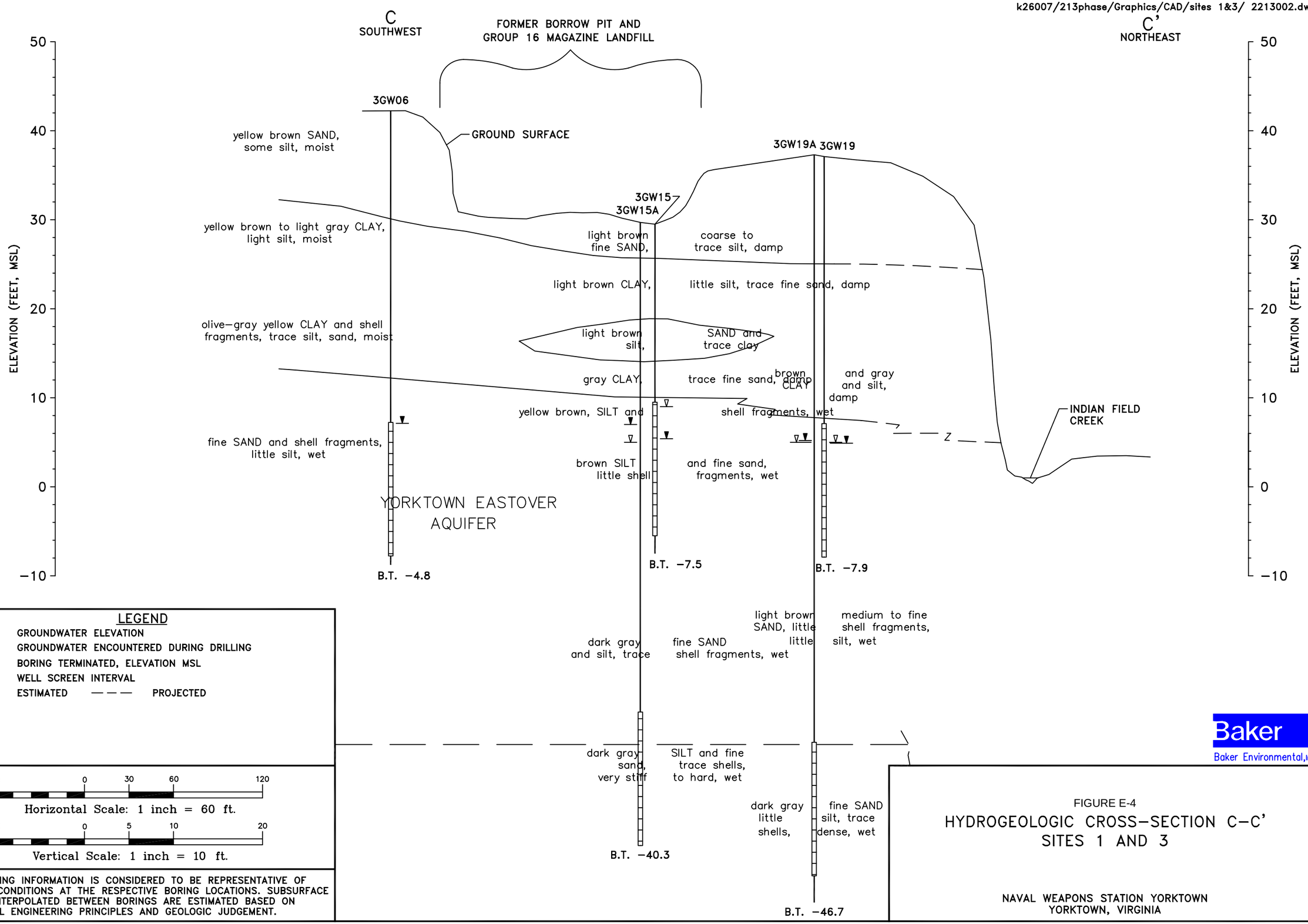
Baker
Baker Environmental, Inc.

FIGURE E-3

HYDROGEOLOGIC CROSS-SECTION B-B'
SITE 1

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

k26007/213phase/Graphics/CAD/sites 1&3/ 2213002.dwg



LEGEND

- GROUNDWATER ELEVATION
- GROUNDWATER ENCOUNTERED DURING DRILLING
- B.T. −4.8' BORING TERMINATED, ELEVATION MSL
- WELL SCREEN INTERVAL
- ESTIMATED — — — PROJECTED

60 0 30 60 120

Horizontal Scale: 1 inch = 60 ft.

10 0 5 10 20

Vertical Scale: 1 inch = 10 ft.

THE SOIL BORING INFORMATION IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THE RESPECTIVE BORING LOCATIONS. SUBSURFACE CONDITIONS INTERPOLATED BETWEEN BORINGS ARE ESTIMATED BASED ON ACCEPTED SOIL ENGINEERING PRINCIPLES AND GEOLOGIC JUDGEMENT.

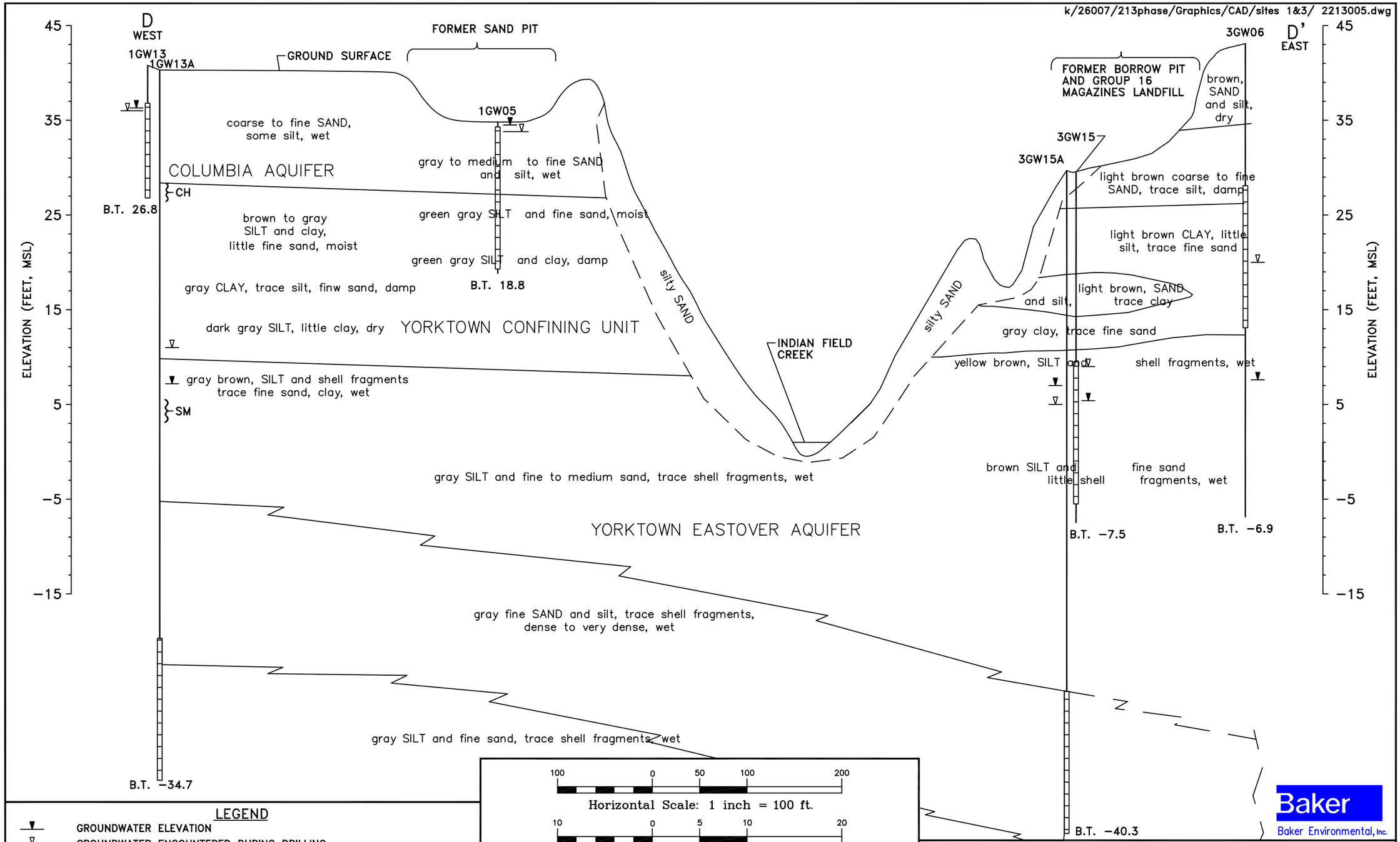
Baker
Baker Environmental, Inc.

FIGURE E-4

HYDROGEOLOGIC CROSS–SECTION C–C'
SITES 1 AND 3

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

k/26007/213phase/Graphics/CAD/sites 1&3/ 2213005.dwg



LEGEND

▼	GROUNDWATER ELEVATION
▽	GROUNDWATER ENCOUNTERED DURING DRILLING
B.T. −34.7'	BORING TERMINATED, ELEVATION MSL
▯	WELL SCREEN INTERVAL
———	ESTIMATED — — — PROJECTED
CH	INORGANIC CLAY (USCS)
SM	SILTY SAND (USCS)

100 0 50 100 200

Horizontal Scale: 1 inch = 100 ft.

10 0 5 10 20

Vertical Scale: 1 inch = 10 ft.

THE SOIL BORING INFORMATION IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THE RESPECTIVE BORING LOCATIONS. SUBSURFACE CONDITIONS INTERPOLATED BETWEEN BORINGS ARE ESTIMATED BASED ON ACCEPTED SOIL ENGINEERING PRINCIPLES AND GEOLOGIC JUDGEMENT.

Baker
Baker Environmental, Inc.

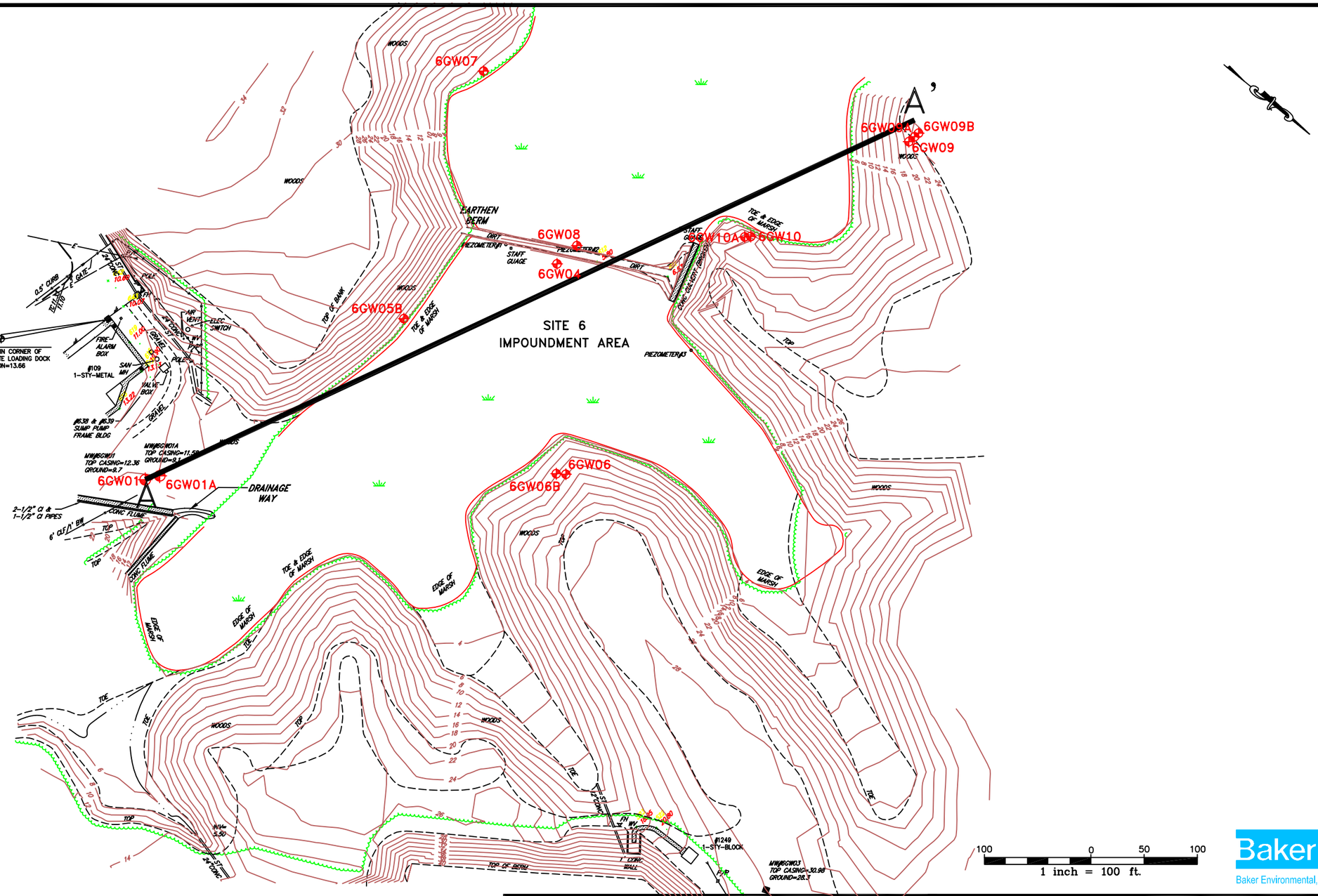
FIGURE E-5

HYDROGEOLOGIC CROSS-SECTION D-D'
SITES 1 AND 3

NAVAL WEAPONS STATION YORKTOWN

YORKTOWN, VIRGINIA

2213928W



Baker
Baker Environmental, Inc.

LEGEND

A —— A' – APPROXIMATE IMPOUNDMENT AREA BOUNDARY

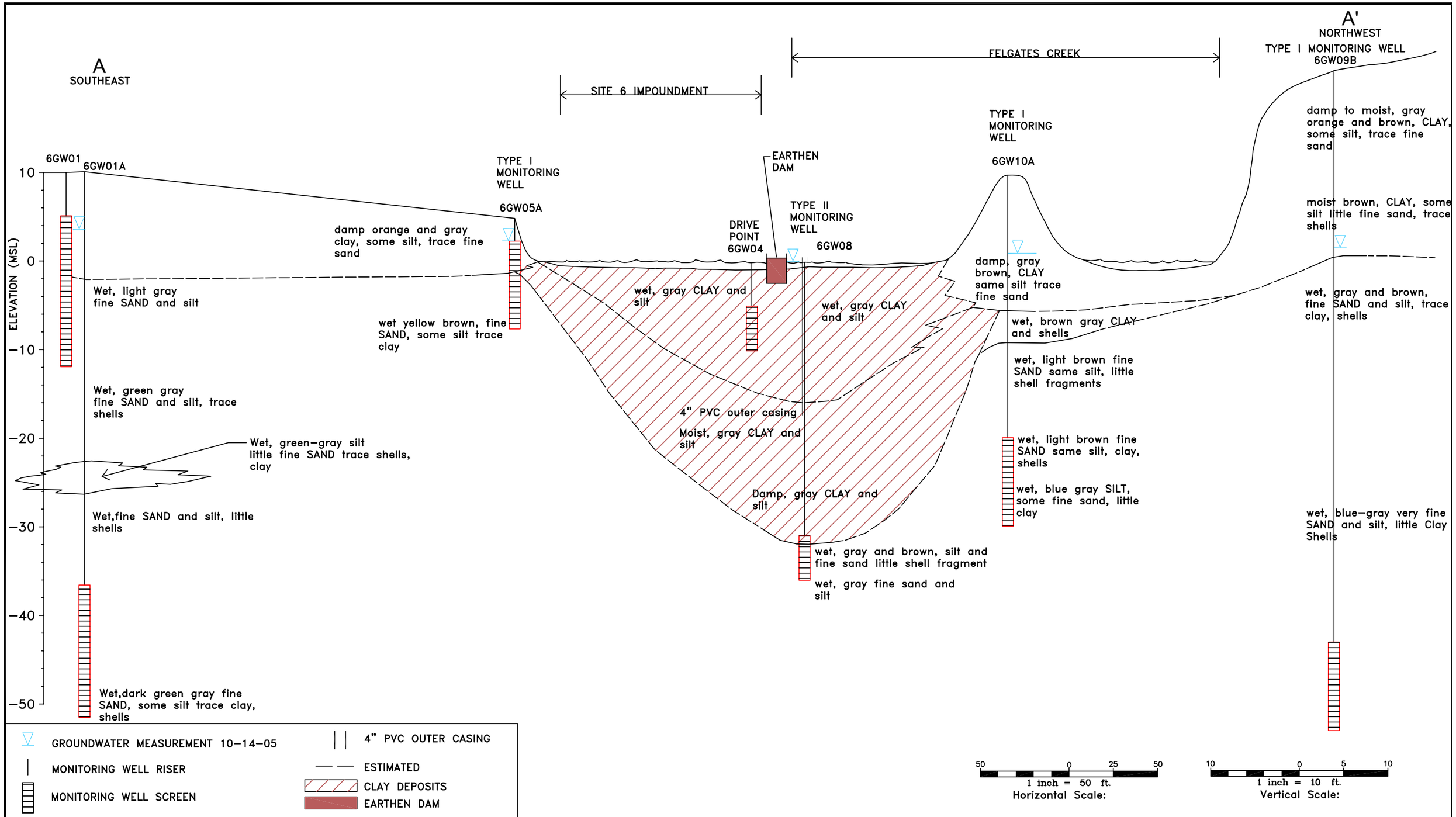
⊕ – MONITORING WELL

SOURCE: MILLER-STEPHENSON AND ASSOCIATES, JAN. 1996.

FIGURE E-6

CROSS SECTION LOCATION MAP
SITE 6

NAVAL WEAPONS STATION YORKTOWN YORKTOWN, VIRGINIA



SCALE:	AS SHOWN	DATE:	JAN 2005
S.O. NO.:	24604	FILE:	2213526W
DSN/DWN:	DMG/RRR	CHK:	RMS/JSC

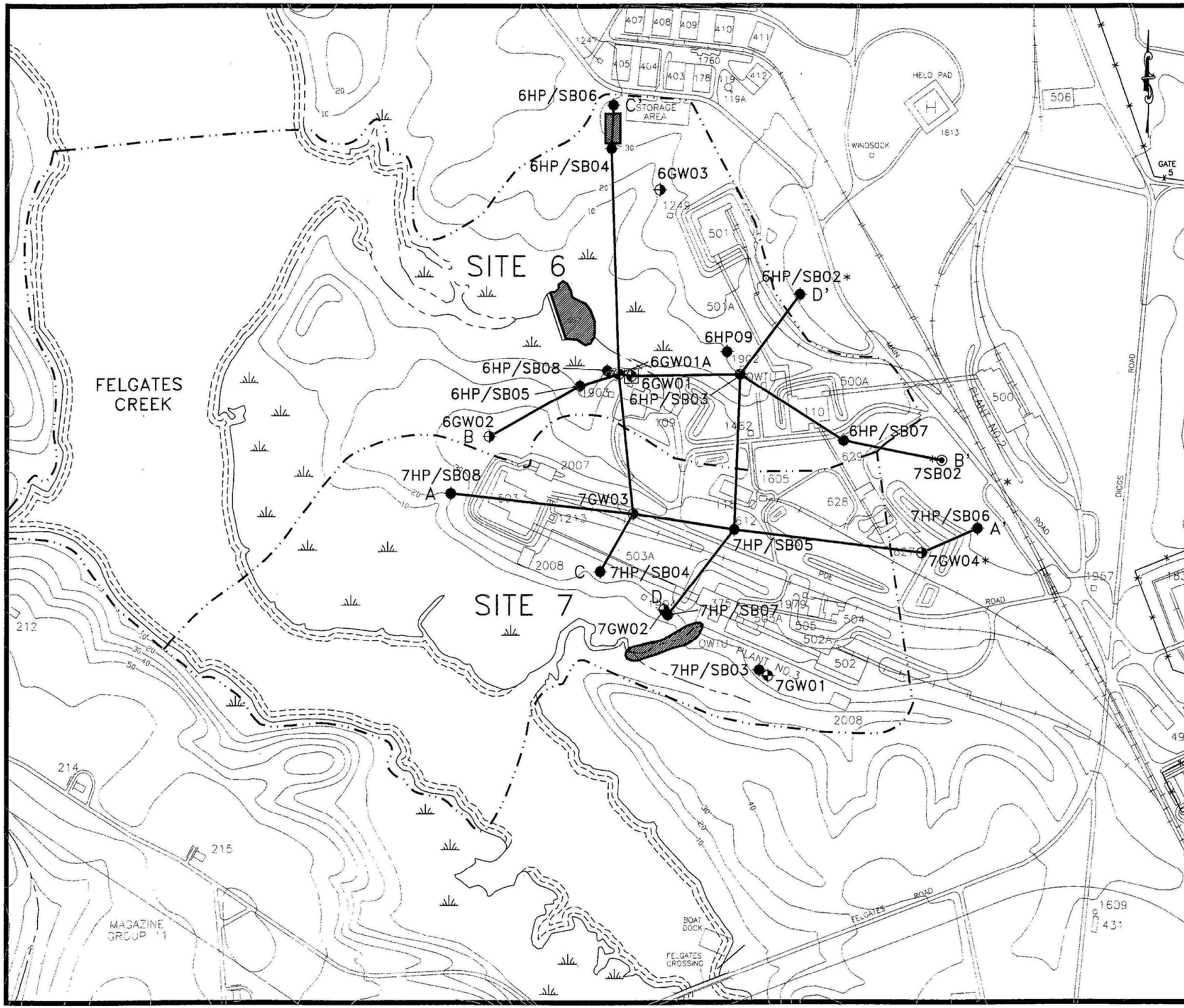
Baker
Baker Environmental, Inc.

APPENDIX E-7

CROSS-SECTION A-A'
SITE 6

NAVAL WEAPONS STATION YORKTOWN

YORKTOWN, VIRGINIA



Baker

Baker Environmental, Inc.

400 0 200 400

1 inch = 400 ft.

- DRAINAGE
- MARSH
- RAILROAD
- FENCE
- TREE LINE
- APPROXIMATE LIMIT OF STUDY AREA
- EDGE OF PAVEMENT
- 506 STRUCTURE/BUILDING WITH NUMBER
- REMEDIAL INVESTIGATION AREA
- SURFACE WATER BODY
- 10 GROUND SURFACE ELEVATION CONTOUR (FEET, ABOVE MEAN SEA LEVEL)

7SB02 SOIL BORING LOCATION

7HP/SB04 HYDROPUNCH OR TEMPORARY PIEZOMETER WITH SOIL BORING LOCATION

6GW01 ROUND ONE RI SHALLOW MONITORING WELL LOCATION

7GW01 TYPE II MONITORING WELL LOCATION

6GW03 TYPE III MONITORING WELL LOCATION

* INDICATES SITE SPECIFIC BACKGROUND SAMPLE LOCATION

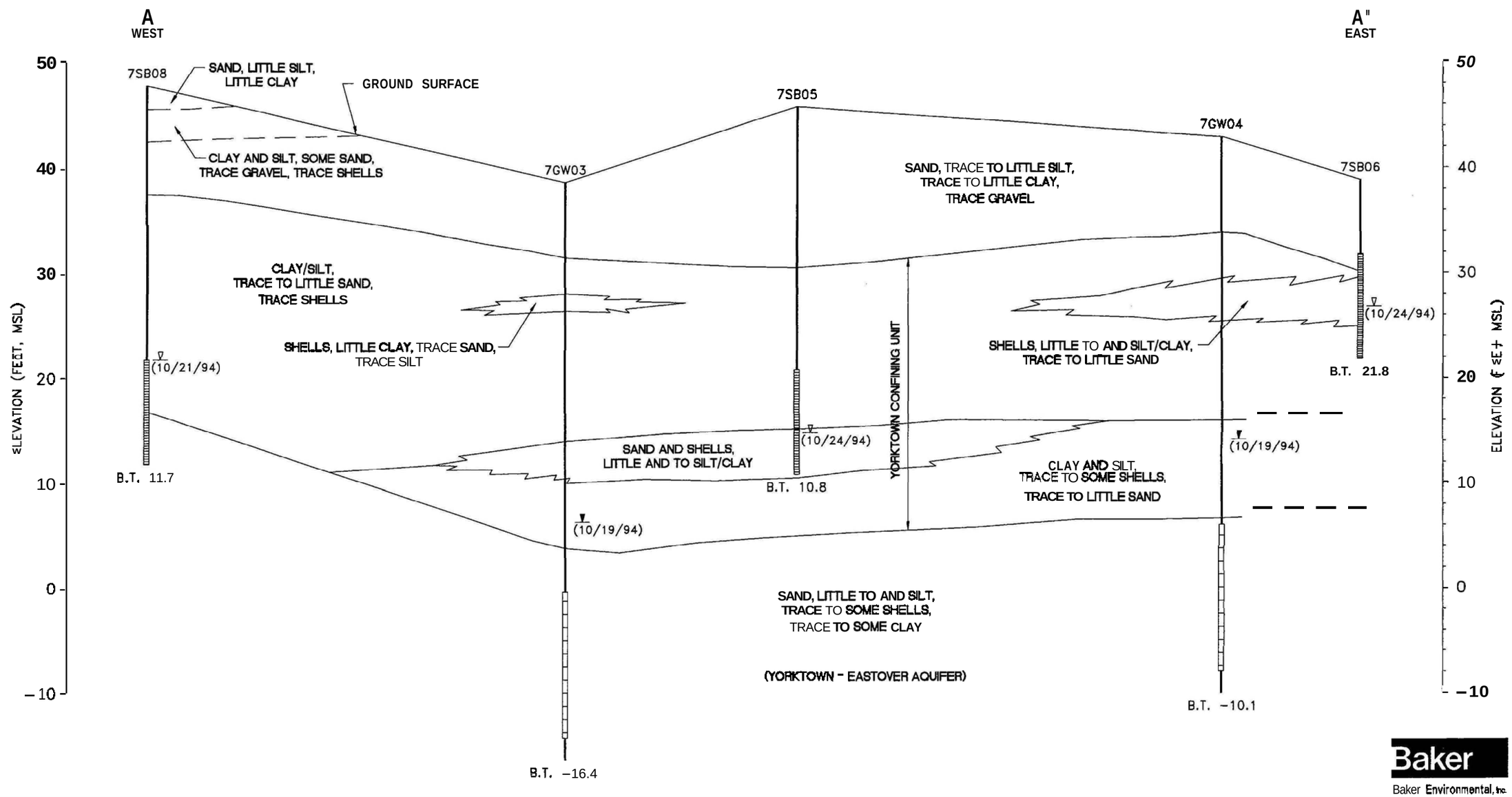
319108RI

FIGURE E-8

CROSS-SECTION LOCATIONS SITES 6 AND 7

NAVAL WEAPONS STATION YORKTOWN YORKTOWN, VIRGINIA

319109RI



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LEGEND

- GROUNDWATER LEVEL IN MONITORING WELL
- GROUNDWATER ENCOUNTERED DURING DRILLING
- B.T. 11.7 — BORING TERMINATED, ELEVATION MSL
- MONITORING WELL SCREEN INTERVAL
- HYDROPUNCH OR TEMPORARY PIEZOMETER SCREEN INTERVAL
- ESTIMATED
- PROJECTED

NOTE: IDENTIFICATION OF HYDROGEOLOGIC UNITS IS BASED UPON INTERPRETATION OF REGIONAL, DATA. CONTACTS BETWEEN UNITS ARE FREQUENTLY GRADATIONAL. HYDROGEOLOGIC UNITS SHOWN ARE ESTIMATED.

180 0 90 180 360

Horizontal Scale: 1 inch = 180 ft.

10 0 5 10 20

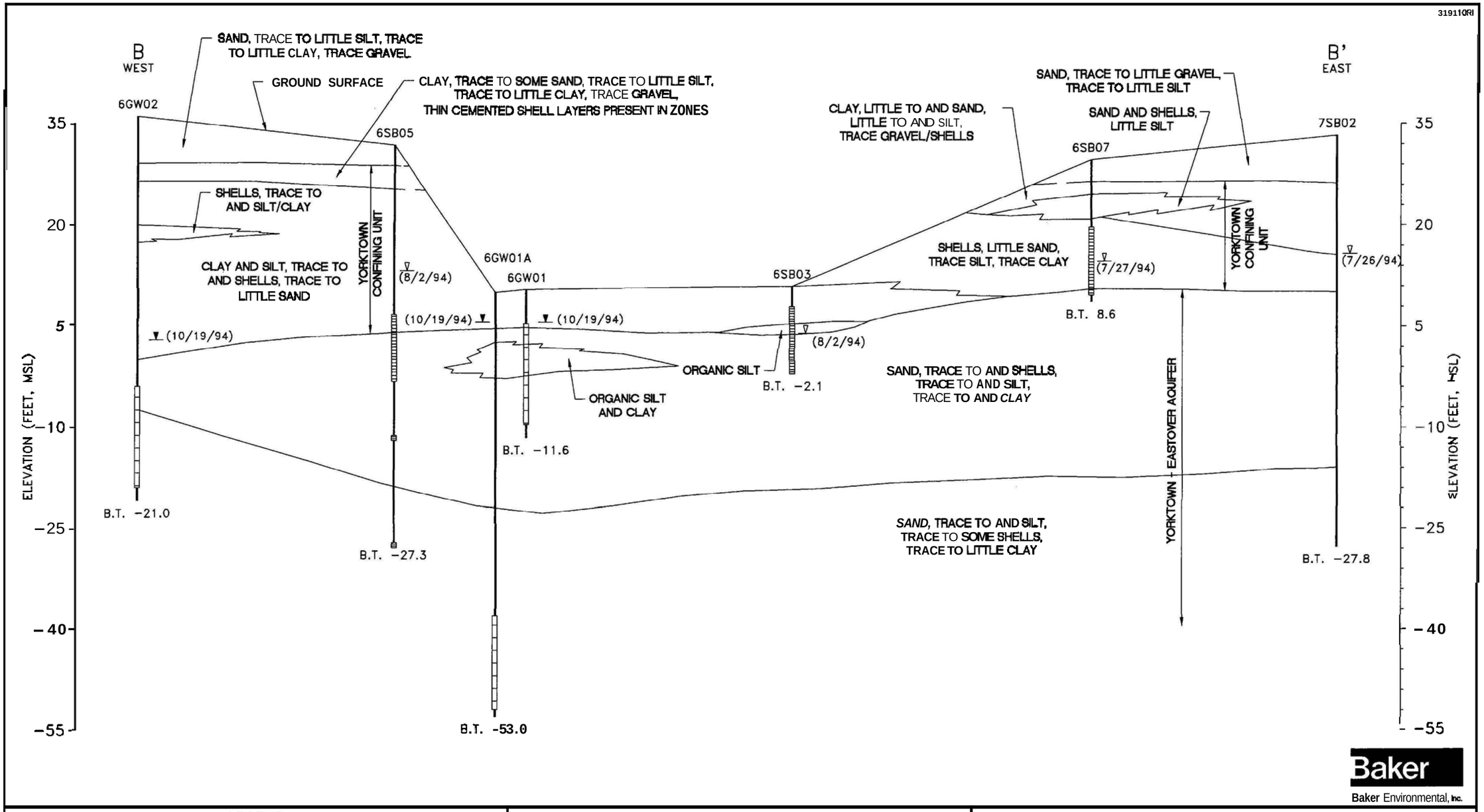
Vertical Scale: 1 inch = 10 ft.

THE SOIL BORING INFORMATION IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THE RESPECTIVE BORING LOCATIONS. SUBSURFACE CONDITIONS INTERPOLATED BETWEEN BORINGS ARE ESTIMATED BASED ON ACCEPTED SOIL ENGINEERING PRINCIPLES AND GEOLOGIC JUDGEMENT.

FIGURE E-9

GEOLOGIC CROSS-SECTION A-A'
SITES 6 AND 7

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



LEGEND

- GROUNDWATER LEVEL IN MONITORING WELL
- GROUNDWATER ENCOUNTERED DURING DRILLING
- B.T. X' — BORING TERMINATED. ELEVATION MSL
- MONITORING WELL SCREEN INTERVAL
- HYDROPUNCH OR TEMPORARY PIEZOMETER SCREEN INTERVAL
- ESTIMATED
- PROJECTED

NOTE: IDENTIFICATION OF HYDROGEOLOGIC UNITS IS BASED UPON INTERPRETATION OF REGIONAL DATA. CONTACTS BETWEEN UNITS ARE FREQUENTLY GRADATIONAL. HYDROGEOLOGIC UNITS SHOWN ARE ESTIMATED.

160 0 80 160 320

Horizontal Scale: 1 inch = 160 ft.

15 a 7.5 15 30

Vertical Scale: 1 inch = 15 ft.

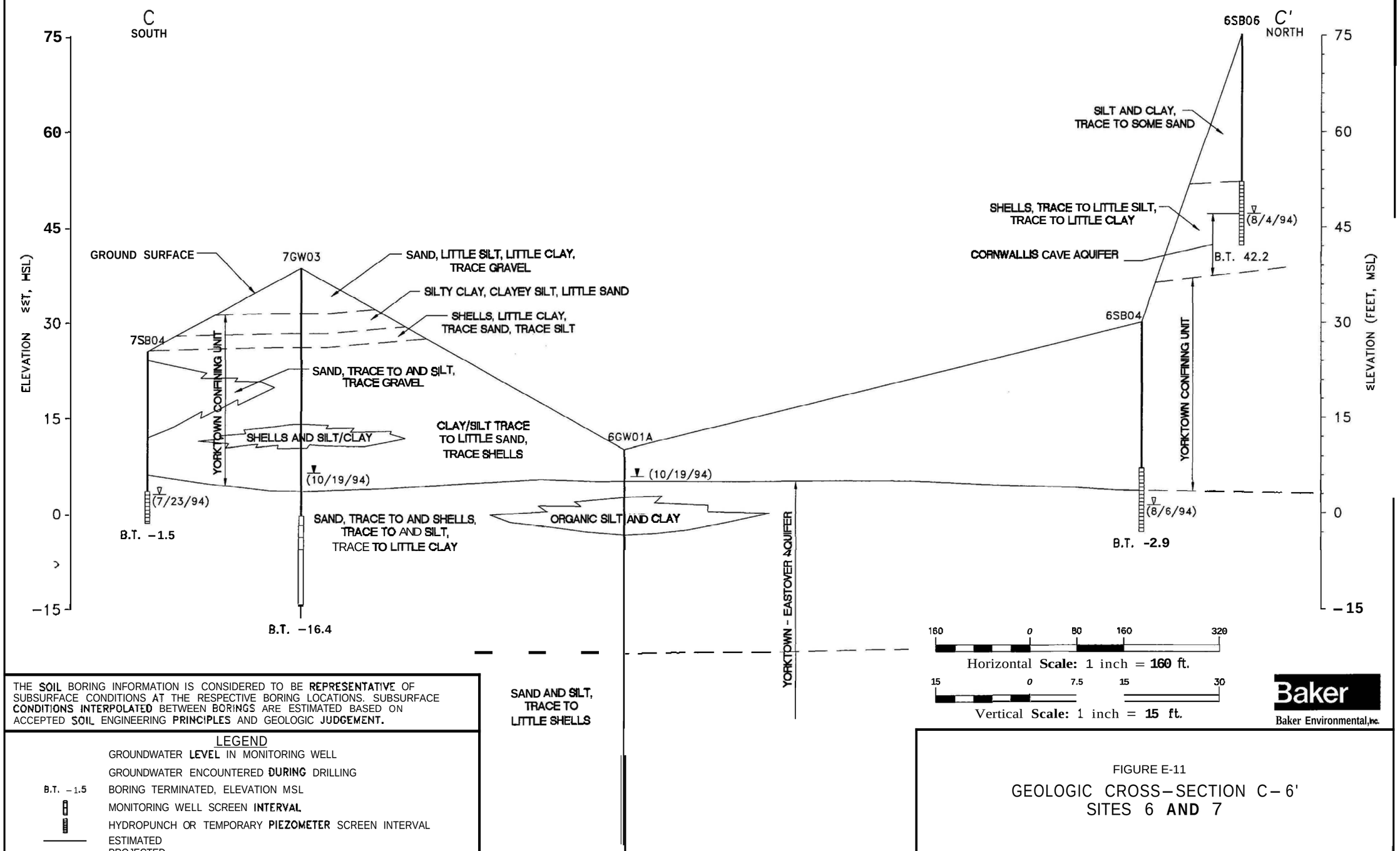
THE SOIL BORING INFORMATION IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THE RESPECTIVE BORING LOCATIONS. SUBSURFACE CONDITIONS INTERPOLATED BETWEEN BORINGS ARE ESTIMATED BASED ON ACCEPTED SOIL ENGINEERING PRINCIPLES AND GEOLOGIC JUDGEMENT.

FIGURE E-10

GEOLOGIC CROSS-SECTION B-B'
SITES 6 AND 7

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

319111RI



THE SOIL BORING INFORMATION IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THE RESPECTIVE BORING LOCATIONS. SUBSURFACE CONDITIONS INTERPOLATED BETWEEN BORINGS ARE ESTIMATED BASED ON ACCEPTED SOIL ENGINEERING PRINCIPLES AND GEOLOGIC JUDGEMENT.

LEGEND

- GROUNDWATER LEVEL IN MONITORING WELL
- GROUNDWATER ENCOUNTERED DURING DRILLING
- B.T. -1.5 BORING TERMINATED, ELEVATION MSL
- MONITORING WELL SCREEN INTERVAL
- HYDROPUNCH OR TEMPORARY PIEZOMETER SCREEN INTERVAL
- ESTIMATED
- PROJECTED

NOTE: IDENTIFICATION OF HYDROGEOLOGIC UNITS IS BASED UPON INTERPRETATION OF REGIONAL DATA. CONTACTS BETWEEN UNITS ARE FREQUENTLY GRADATIONAL HYDROGEOLOGIC UNITS SHOWN ARE ESTIMATED.

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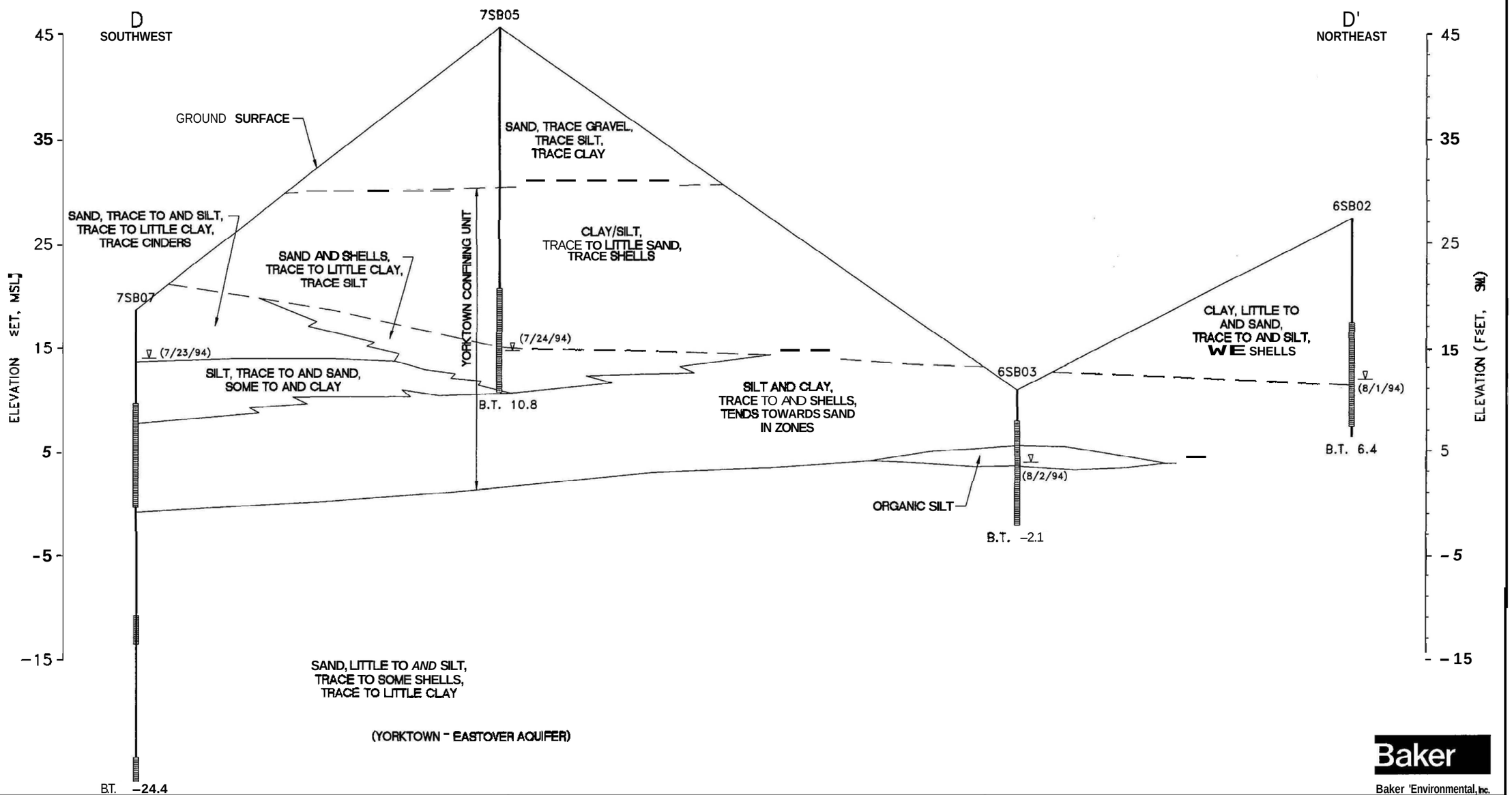
FIGURE E-11

GEOLOGIC CROSS-SECTION C-6'
SITES 6 AND 7

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

319112RI



LEGEND

- GROUNDWATER ENCOUNTERED DURING DRILLING
- B.T. X' — BORING TERMINATED, ELEVATION MSL
- HYDROPUNCH OR TEMPORARY PIEZOMETER SCREEN INTERVAL
- ESTIMATED
- PROJECTED

NOTE: IDENTIFICATION OF HYDROGEOLOGIC UNITS IS BASED UPON INTERPRETATION OF REGIONAL DATA. CONTACTS BETWEEN UNITS ARE FREQUENTLY GRADATIONAL. HYDROGEOLOGIC UNITS SHOWN ARE ESTIMATED.

120 0 60 120 240

Horizontal Scale: 1 inch = 120 ft.

10 0 5 10 20

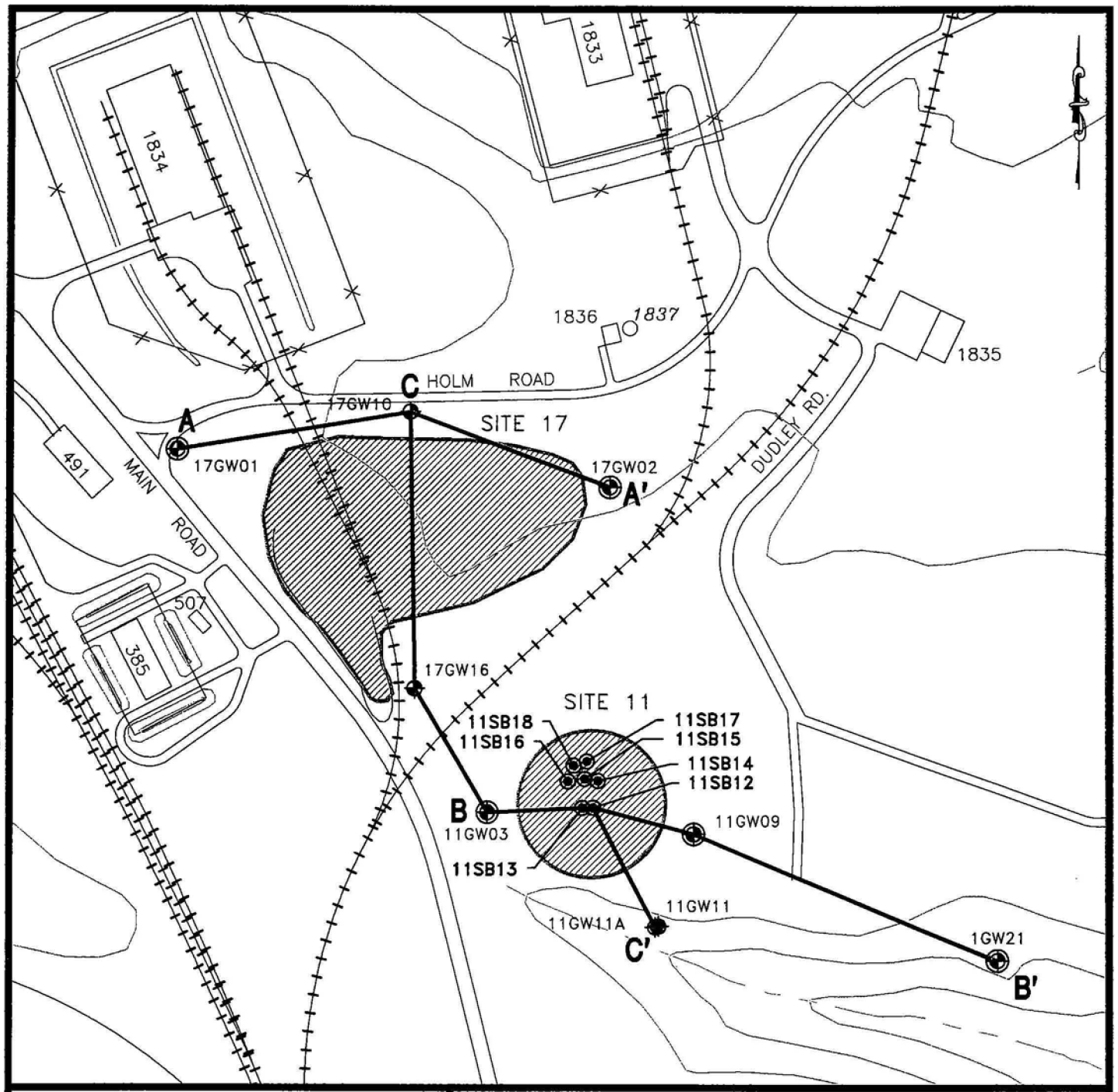
Vertical Scale: 1 inch = 10 ft.

THE SOIL BORING INFORMATION IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THE RESPECTIVE BORING LOCATIONS. SUBSURFACE CONDITIONS INTERPOLATED BETWEEN BORINGS ARE ESTIMATED BASED ACCEPTED SOIL ENGINEERING PRINCIPLES AND GEOLOGIC JUDGEMENT. ON

FIGURE E-12

GEOLOGIC CROSS-SECTION D-0'
SITES 6 AND 7

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



200 0 100 200

1 inch = 200 ft.

DRAINAGE
EDGE OF PAVEMENT
RAILROAD
FENCE
BUILDING
REMEDIAL INVESTIGATION SITE

11GW11A DEEP MONITORING WELL LOCATION (WESTON, 1992)

11GW09 SHALLOW MONITORING WELL LOCATION (DAMES AND MOORE, 1986)

17GW10 SHALLOW MONITORING WELL LOCATION (WESTON, 1992)

16W21 SHALLOW MONITORING WELL LOCATION (BAKER, 1996)

11SB14 SUBSURFACE SOIL SAMPLE LOCATION

B—B' CROSS-SECTION TRAVERSE LOCATION

354101RI

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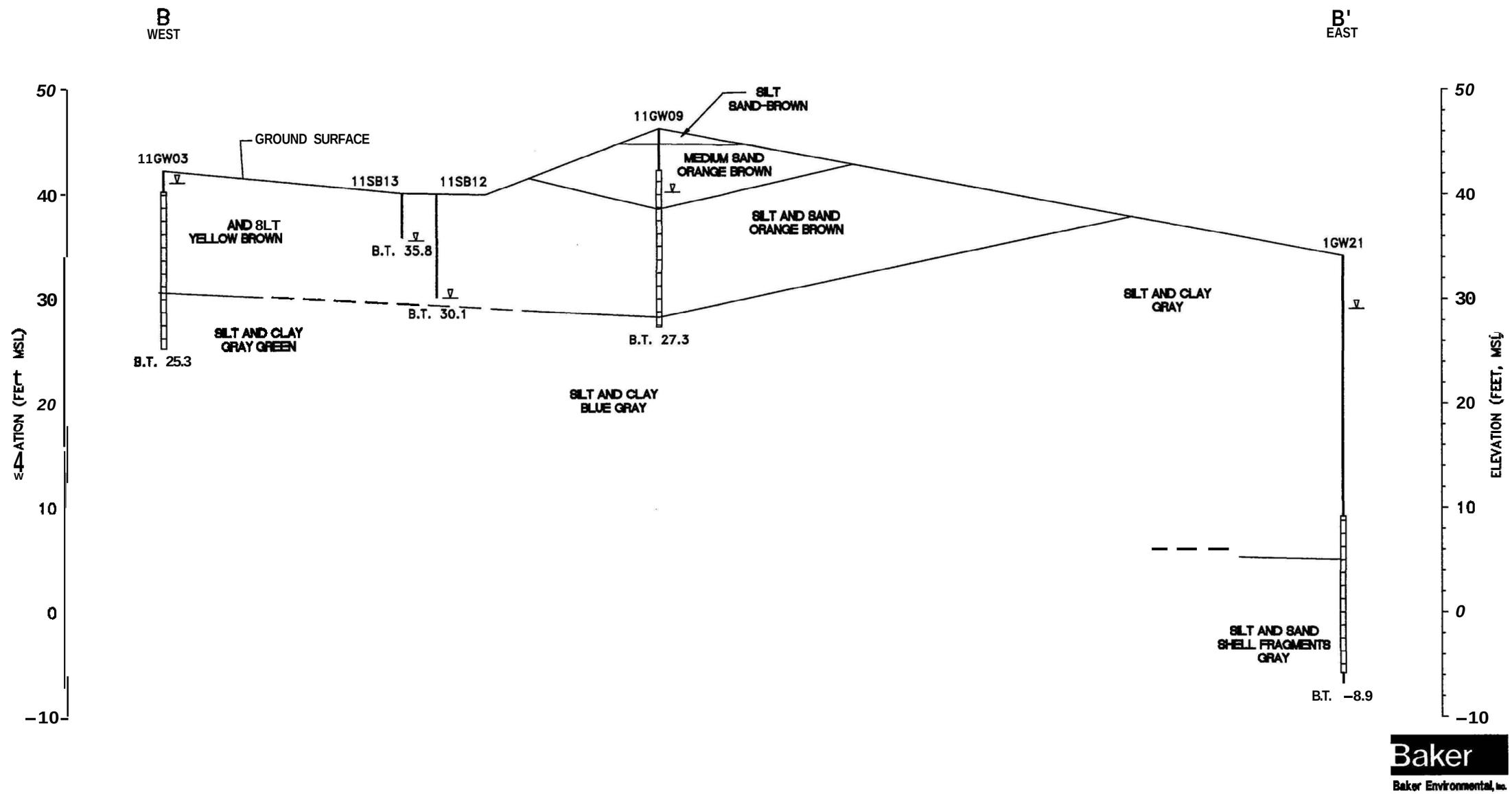
FIGURE E-13

HYDROGEOLOGIC CROSS-SECTION LOCATION MAP SITES 11 AND 17

NAVAL WEAPONS STATION YORKTOWN

YORKTOWN, VIRGINIA

35410 fRI



Baker
Baker Environmental, Inc.

LEGEND

GROUNDWATER ENCOUNTERED DURING DRILLING

B.T. 25.3 BORING TERMINATED, ELEVATION MSL

WELL SCREEN INTERVAL

ESTIMATED — — — PROJECTED

60 0 30 60 120

Horizontal Scale: 1 inch = 60 ft.

10 0 5 10 20

Vertical Scale: 1 inch = 10 ft.

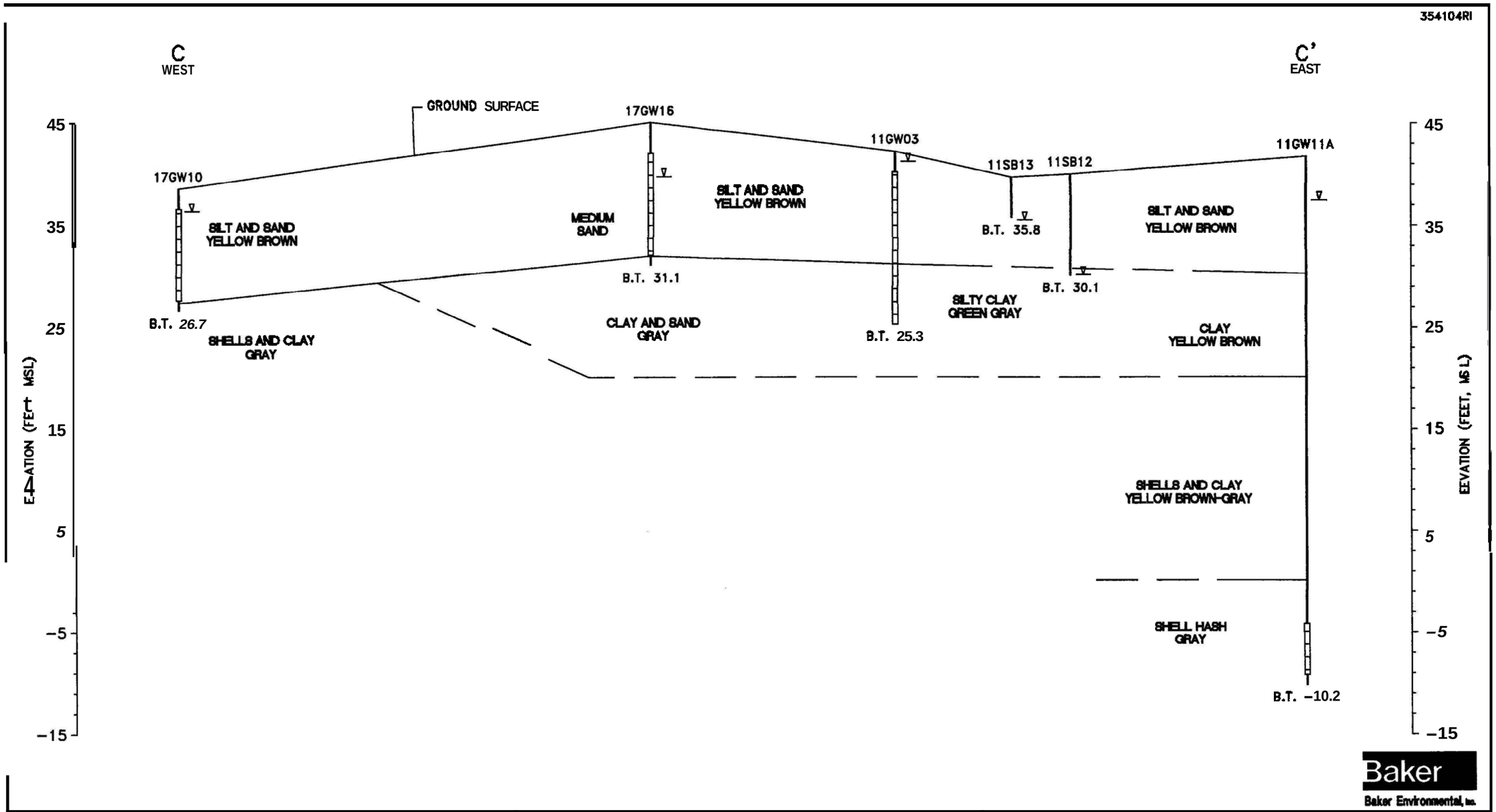
THE SOIL BORING INFORMATION IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THE RESPECTIVE BORING LOCATIONS. SUBSURFACE CONDITIONS INTERPOLATED BETWEEN BORINGS ARE ESTIMATED BASED ON ACCEPTED SOIL ENGINEERING PRINCIPLES AND GEOLOGIC JUDGEMENT.

FIGURE E-15

HYDROGEOLOGIC CROSS-SECTION B-B'
SITES 1 AND 11

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

354104RI



LEGEND

- ▽ GROUNDWATER ENCOUNTERED DURING DRILLING
- B.T. 2k7 BORING TERMINATED, ELEVATION MSL
- WELL SCREEN INTERVAL
- ESTIMATED — — — PROJECTED

80 0 40 80 160

Horizontal Scale: 1 inch = 80 ft.

10 0 5 10 20

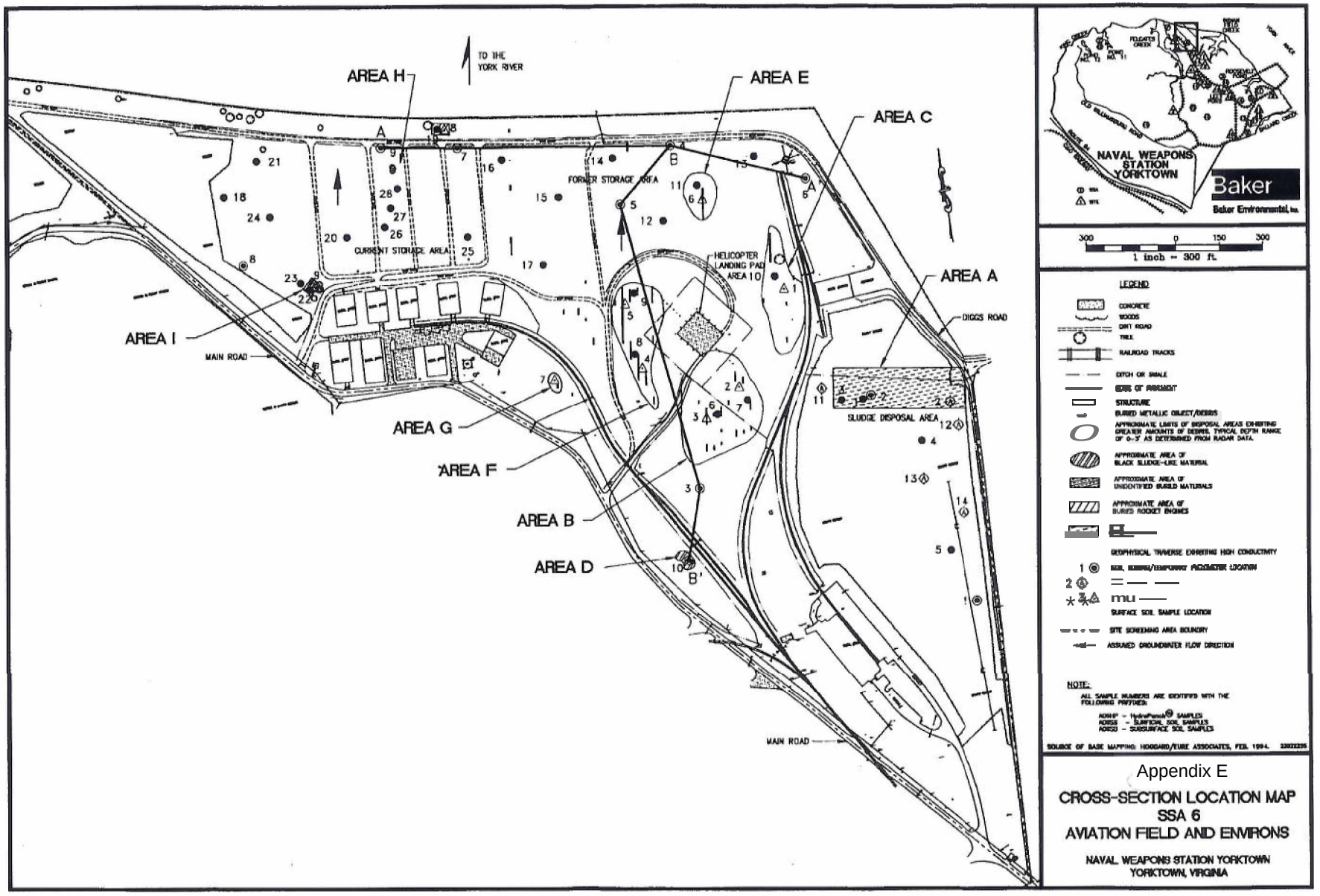
Vertical Scale: 1 inch = 10 ft.

THE SOIL BORING INFORMATION IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THE RESPECTIVE BORING LOCATIONS. SUBSURFACE CONDITIONS INTERPOLATED BETWEEN BORINGS ARE ESTIMATED BASED ON ACCEPTED SOIL ENGINEERING PRINCIPLES AND GEOLOGIC JUDGEMENT.

FIGURE E-16

HYDROGEOLOGIC CROSS-SECTION C-C'
SITES 11 AND 17

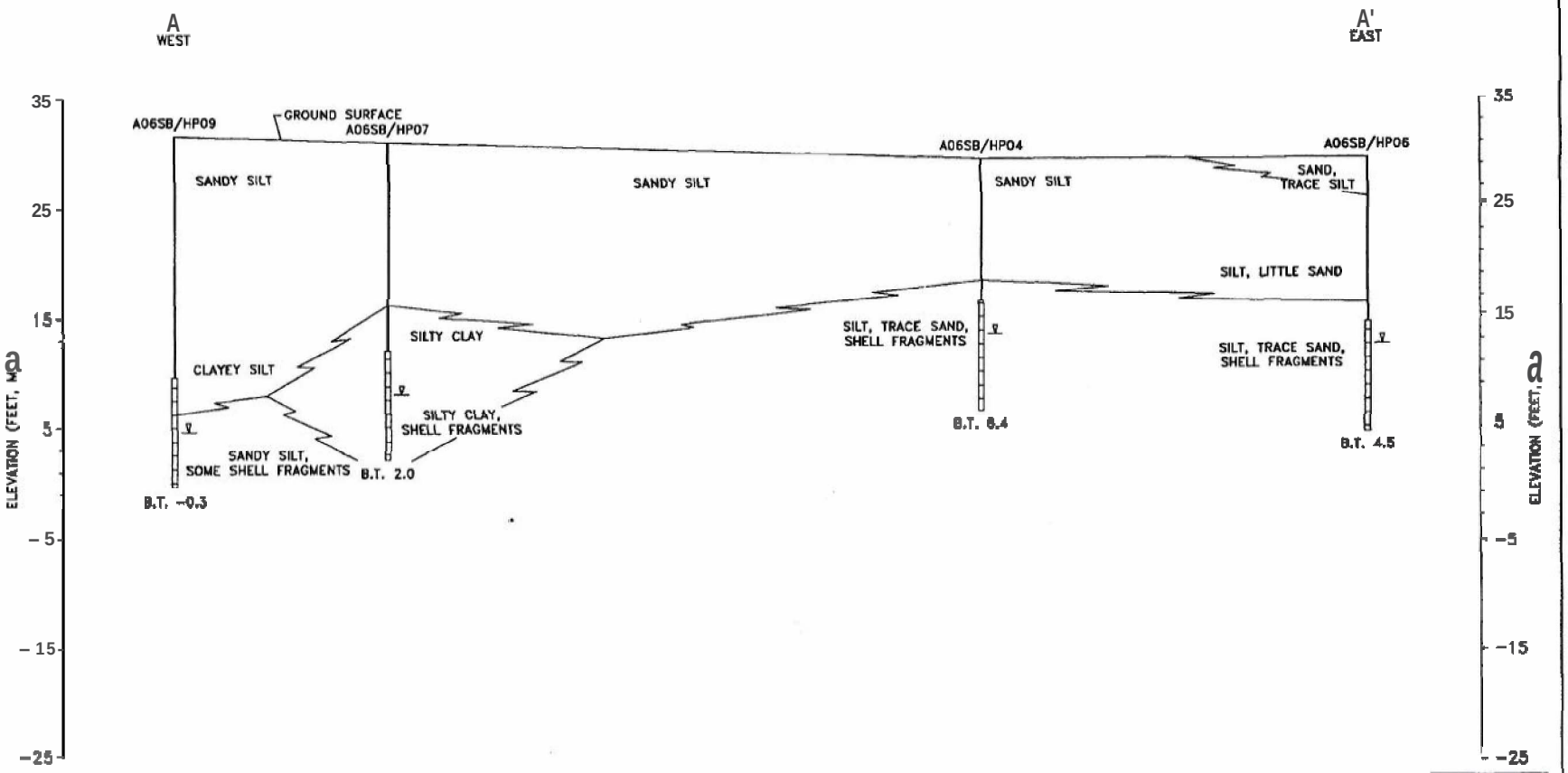
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



Appendix E

CROSS-SECTION LOCATION MAP
SSA 6
AVIATION FIELD AND ENVIRONS

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



Baker
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LEGEND

- GROUNDWATER ENCOUNTERED DURING DRILLING
- 2.0' BORING TERMINATED, ELEVATION MSL
- TEMPORARY PIEZOMETER SCREEN INTERVAL
- ESTIMATED

130 0 65 130 260
Horizontal Scale: 1 inch = 130 ft.

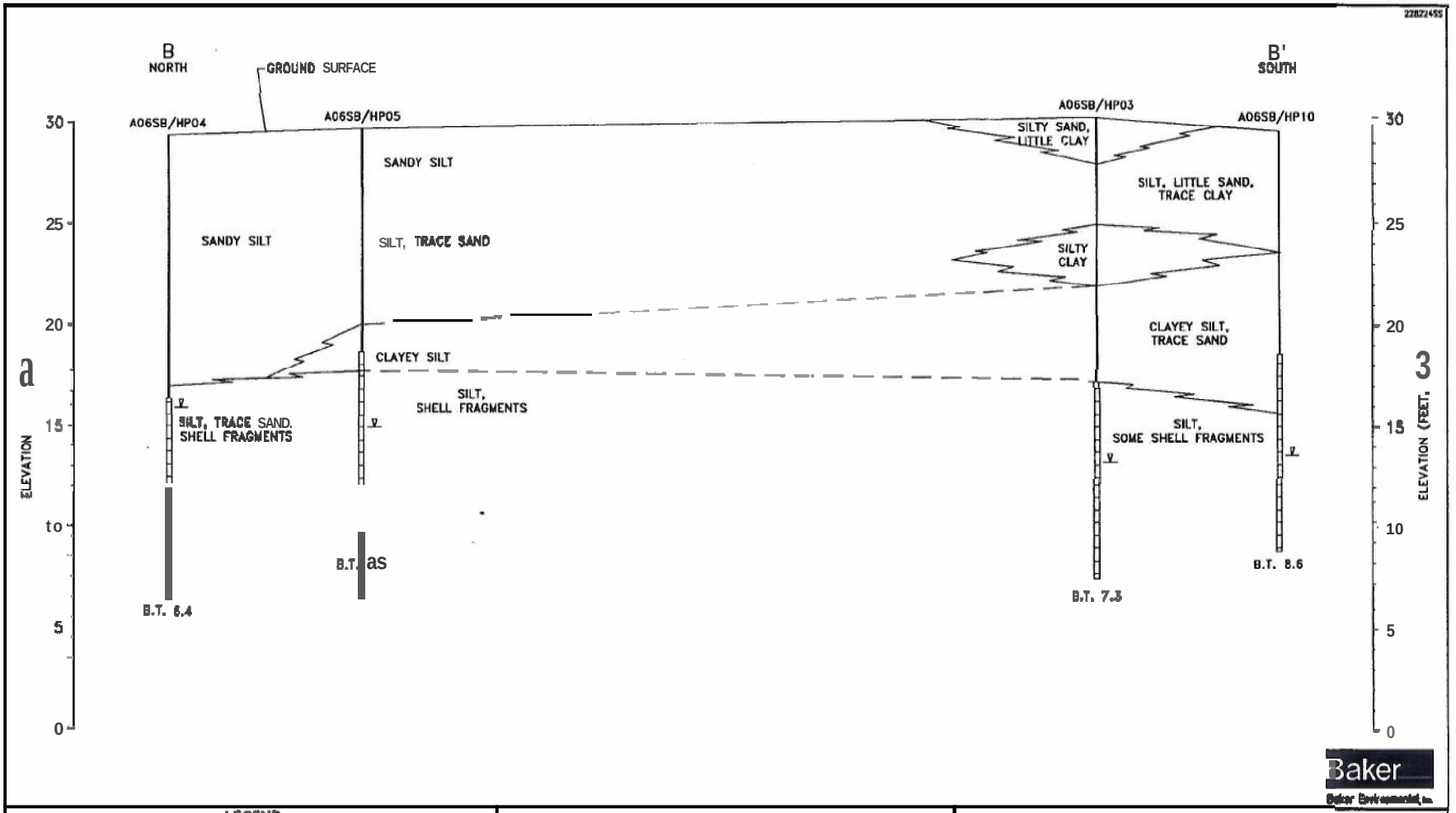
10 5 0 5 10 W
Vertical Scale: 1 inch = 10 ft.

THE SOIL BORING INFORMATION IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THE RESPECTIVE BORING LOCATIONS. SUBSURFACE CONDITIONS INTERPOLATED BETWEEN BORINGS ARE ESTIMATED BASED ON ACCEPTED SOIL ENGINEERING PRINCIPLES AND GEOLOGIC JUDGEMENT.

Appendix E

HYDROGEOLOGIC CROSS-SECTION A-A'
SSA-6 AVIATION FIELD
AND ENVIRONS

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



Baker
Baker Environmental, Inc.

LEGEND

GROUNDWATER ENCOUNTERED DURING DRILLING

6.4' BORING TERMINATED, ELEVATION MSL

TEMPORARY PIEZOMETER SCREEN INTERVAL

ESTIMATED — — — PROJECTED

130 0 65 130 260

Horizontal Scale: 1 inch = 130 ft.

5 0 2.5 5 10

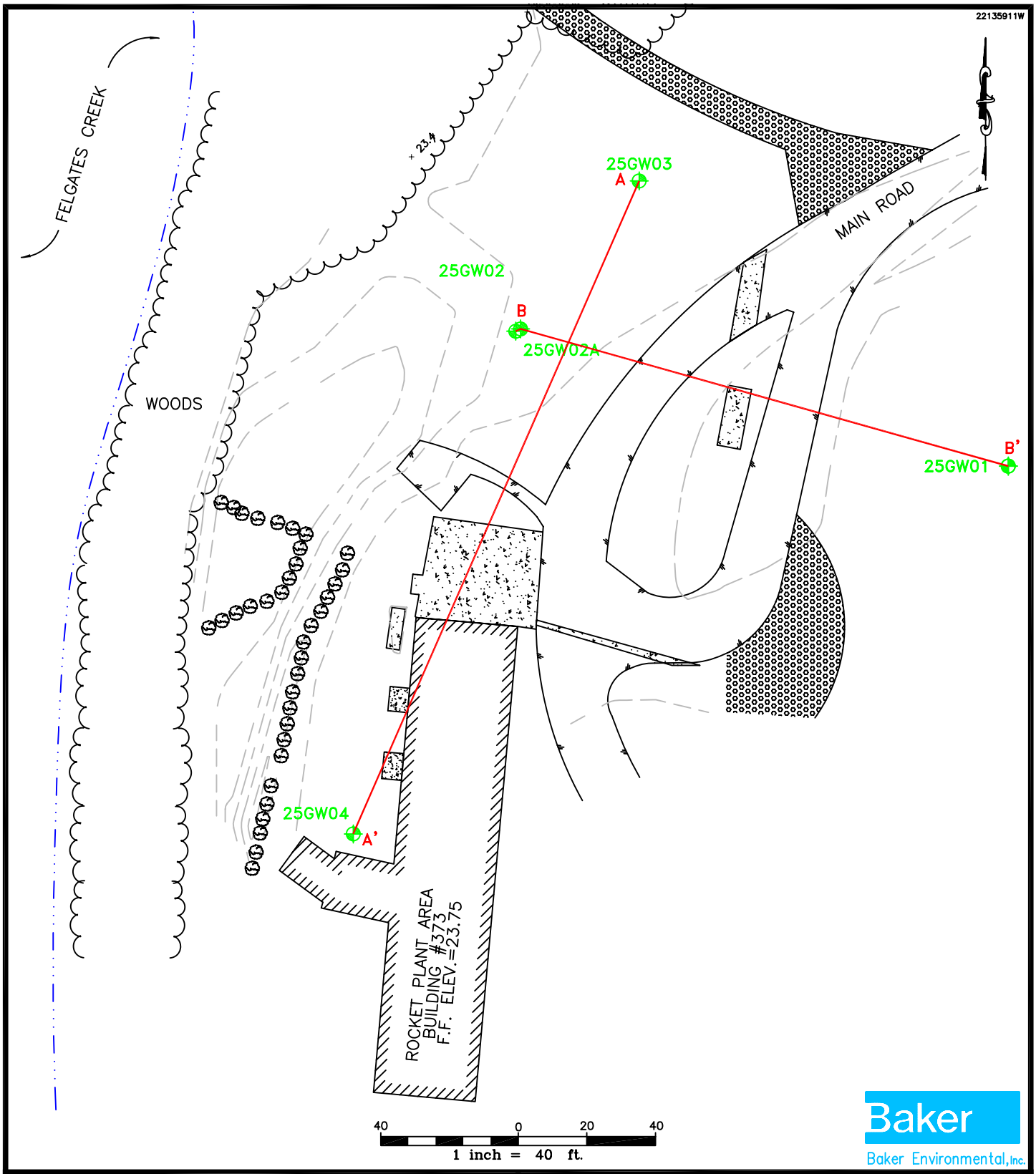
Vertical Scale: 1 inch = 5 ft.

THE SOIL BORING INFORMATION IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THE RESPECTIVE BORING LOCATIONS. SUBSURFACE CONDITIONS INTERPOLATED BETWEEN BORINGS ARE ESTIMATED BASED ON ACCEPTED SOIL ENGINEERING PRINCIPLES AND GEOLOGIC JUDGEMENT.

Appendix E

HYDROGEOLOGIC CROSS-SECTION B-B'
SSA-6 AVIATION FIELD
AND ENVIRONS

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



LEGEND

BUILDING
CONCRETE
GRAVEL
ASPHALT
CONTOUR ELEVATION
TREELINE
SHRUB
GROUNDWATER MONITORING WELL
CROSS SECTION TRAVERSE A–A'

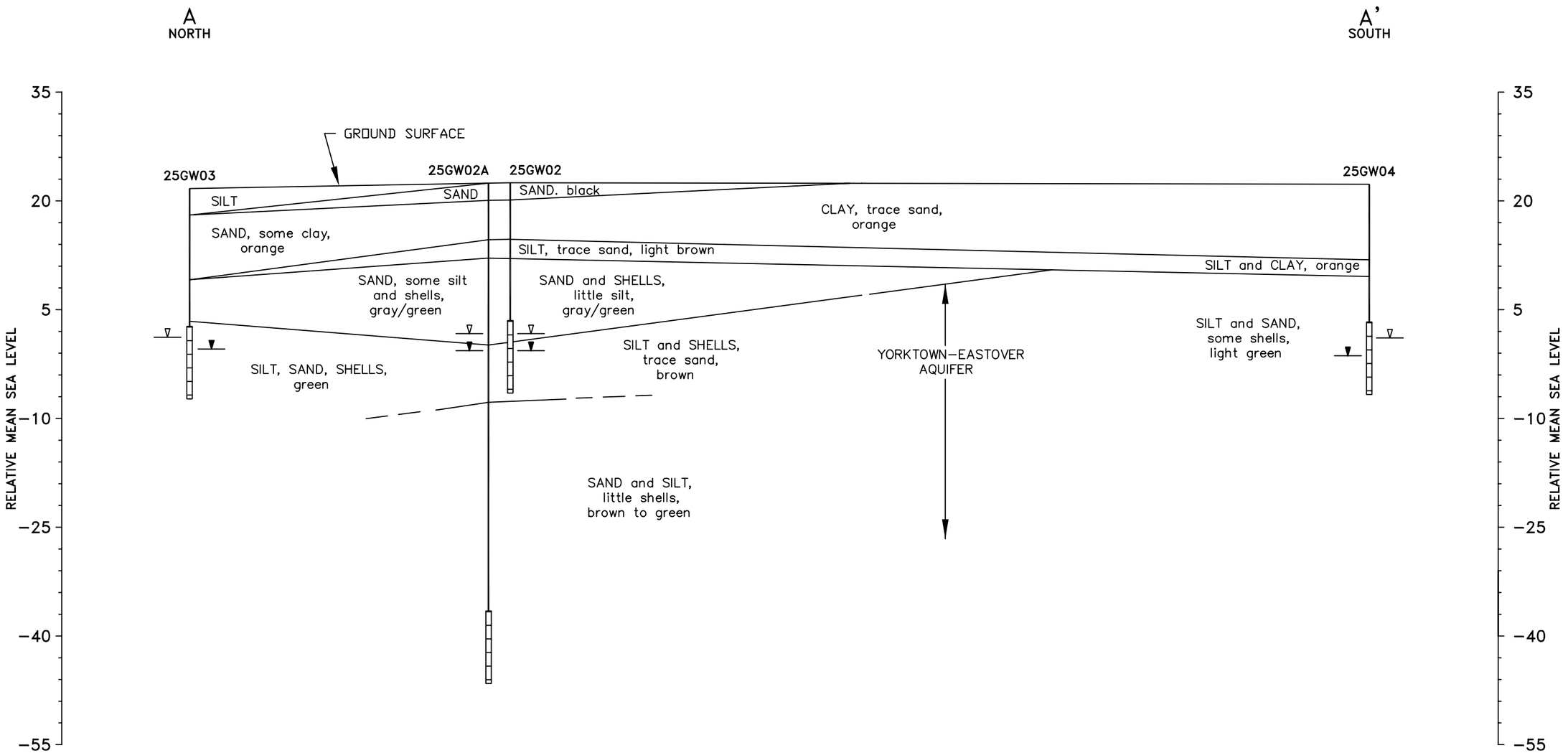
SOURCE OF BASE MAPPING: P.H.R. & A., MARCH 1995.

FIGURE E-17

HYDROGEOLOGIC CROSS–SECTION LOCATION MAP
SITE 25
YORKTOWN–EASTOVER AQUIFER

NAVAL WEAPONS STATION YORKTOWN YORKTOWN, VIRGINIA

K\213phase\Graphics\cad\ 2213905W



Baker
Baker Environmental, Inc.

LEGEND

- GROUNDWATER ENCOUNTERED DURING DRILLING
- GROUNDWATER ELEVATION MEASURED ON 10–25–97
- WELL SCREEN INTERVAL
- ESTIMATED — — — PROJECTED

20 0 10 20 40
Horizontal Scale: 1 inch = 20 ft.

15 0 7.5 15 30
Vertical Scale: 1 inch = 15 ft.

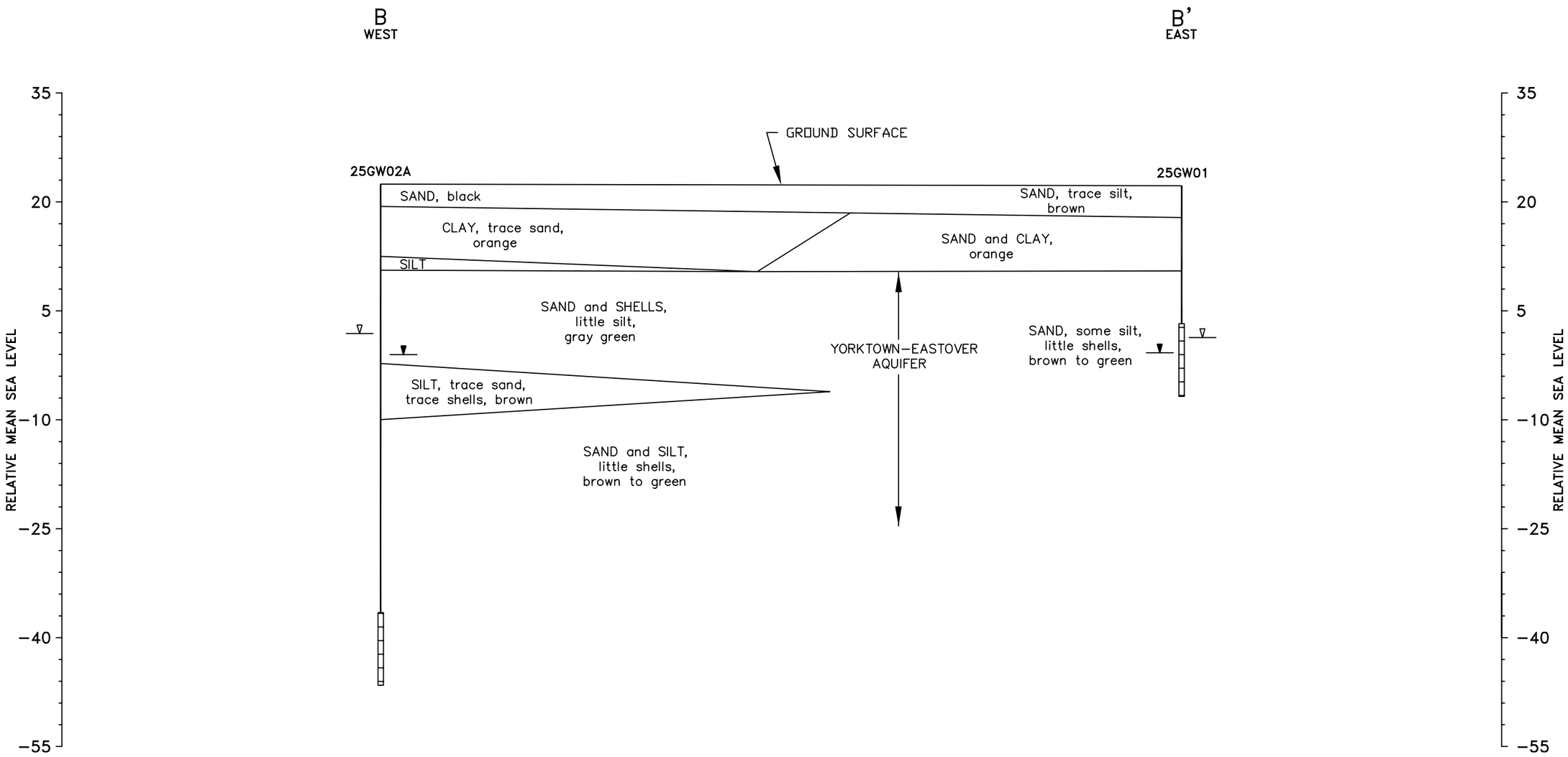
THE SOIL BORING INFORMATION IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THE RESPECTIVE BORING LOCATIONS. SUBSURFACE CONDITIONS INTERPOLATED BETWEEN BORINGS ARE ESTIMATED BASED ON ACCEPTED SOIL ENGINEERING PRINCIPLES AND GEOLOGIC JUDGEMENT.

FIGURE E-18

HYDROGEOLOGIC CROSS–SECTION A–A'
SITE 25

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

K\213phase\Graphics\cad\ 2213906W



Baker
Baker Environmental, Inc.

LEGEND

- GROUNDWATER ENCOUNTERED DURING DRILLING
- GROUNDWATER ELEVATION MEASURED ON 10–25–97
- WELL SCREEN INTERVAL
- ESTIMATED — — — PROJECTED

20 0 10 20 40
Horizontal Scale: 1 inch = 20 ft.

15 0 7.5 15 30
Vertical Scale: 1 inch = 15 ft.

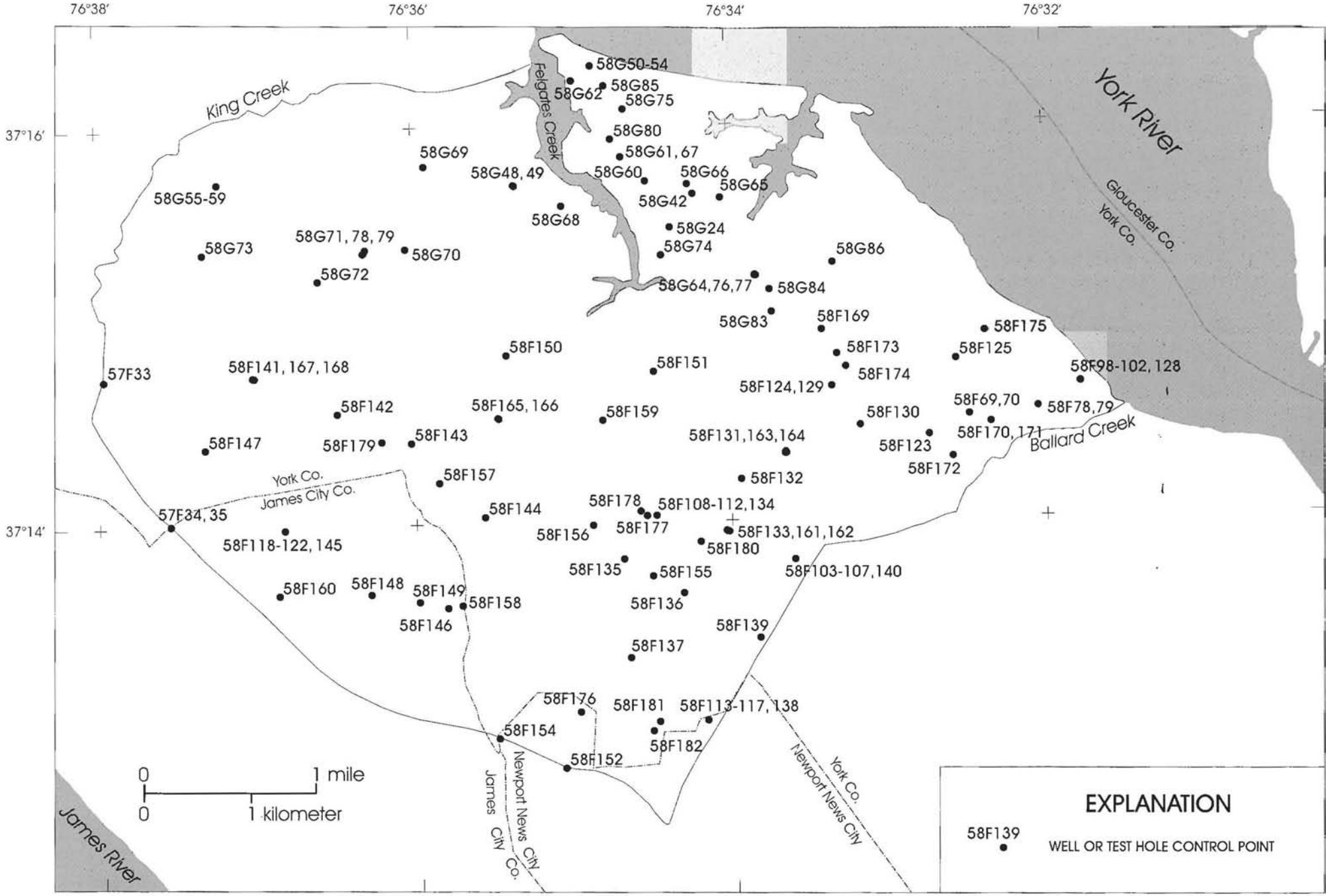
THE SOIL BORING INFORMATION IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THE RESPECTIVE BORING LOCATIONS. SUBSURFACE CONDITIONS INTERPOLATED BETWEEN BORINGS ARE ESTIMATED BASED ON ACCEPTED SOIL ENGINEERING PRINCIPLES AND GEOLOGIC JUDGEMENT.

FIGURE E-19

HYDROGEOLOGIC CROSS–SECTION B–B'
SITE 25

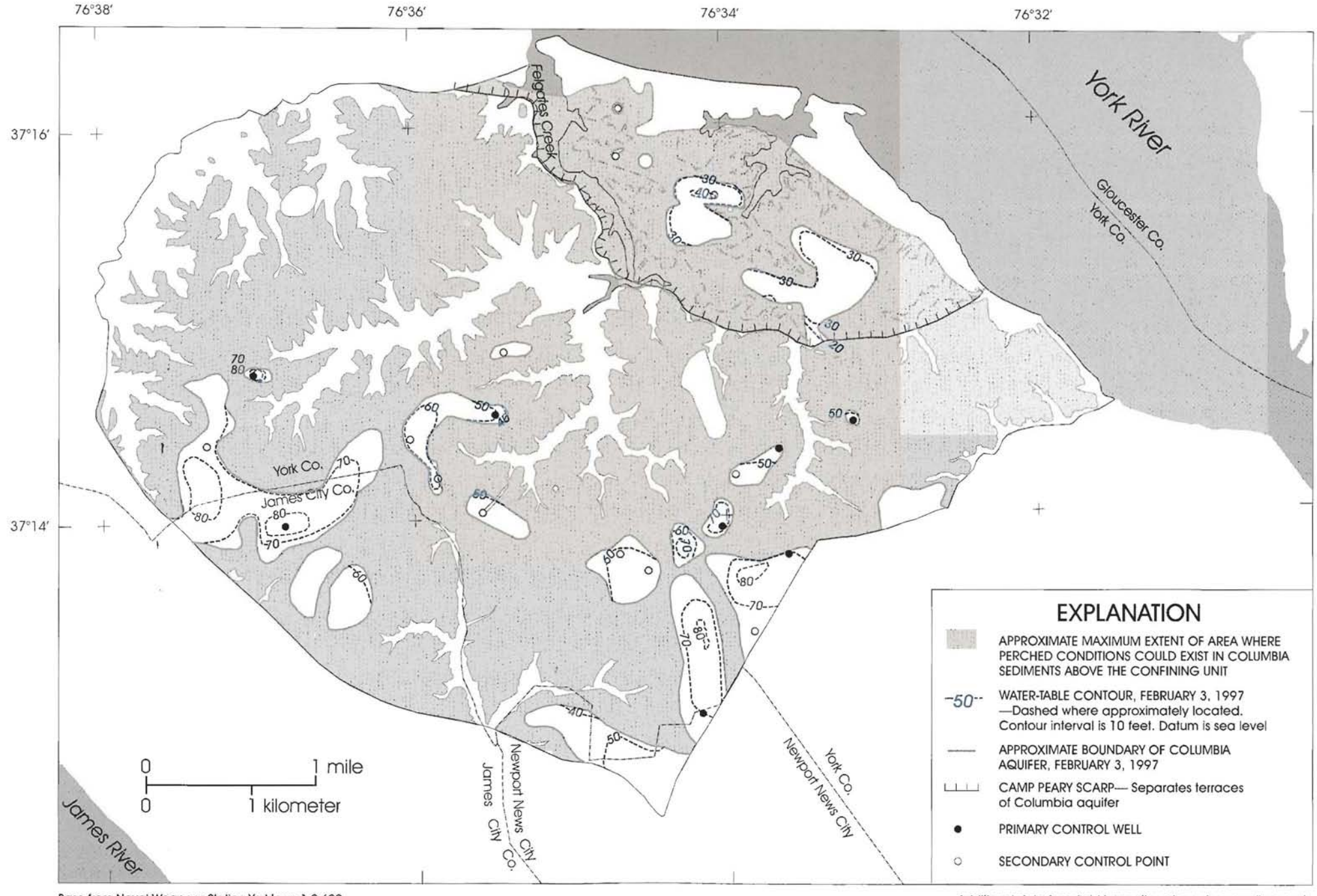
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Appendix F: Hydrogeologic Units



Base from Naval Weapons Station Yorktown 1:9,600

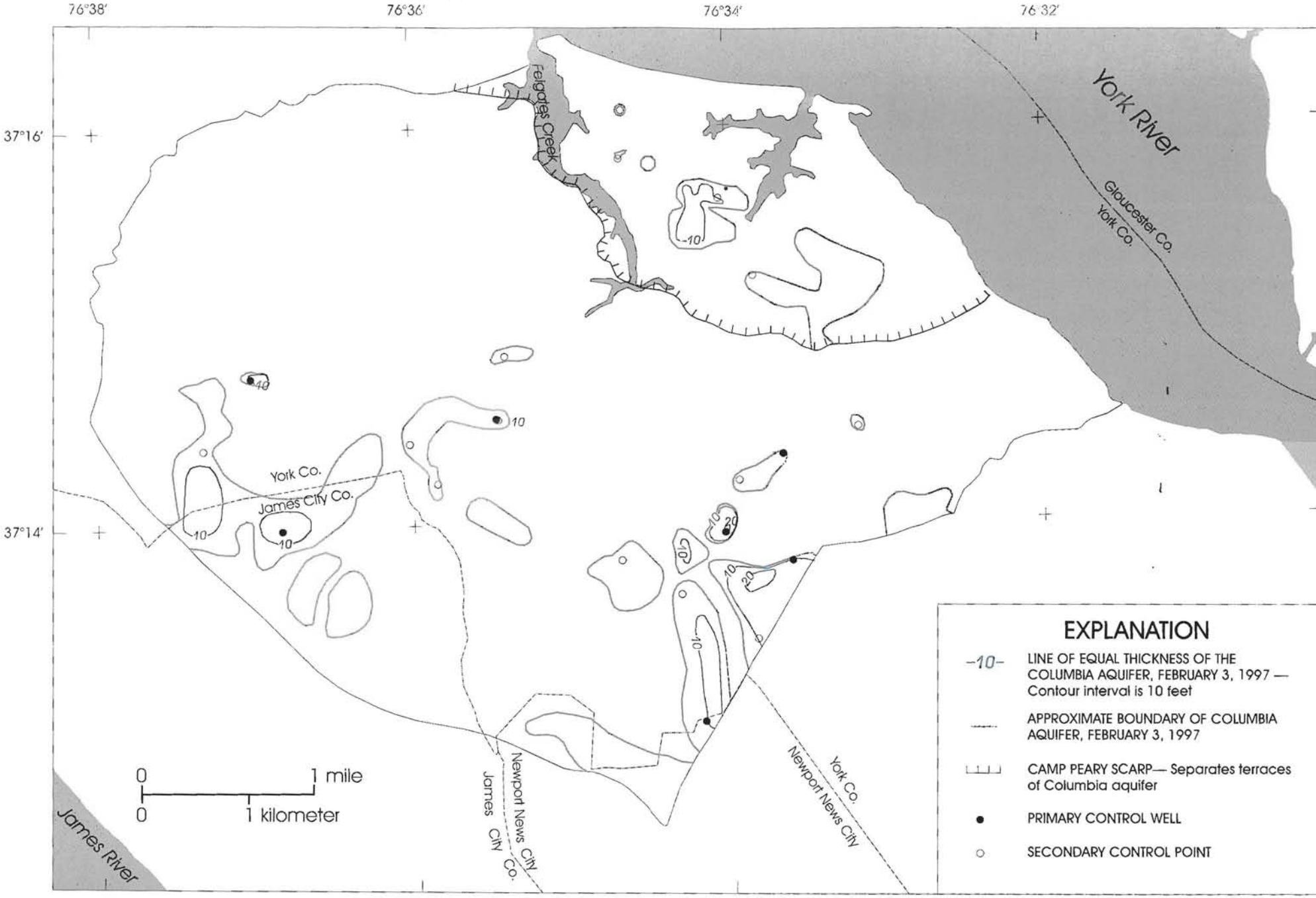
Figure 2. Location of well and test-hole control points at the Naval Weapons Station Yorktown.



Base from Naval Weapons Station Yorktown 1:9,600

Figure 6. Altitude of the water table in the Columbia aquifer.

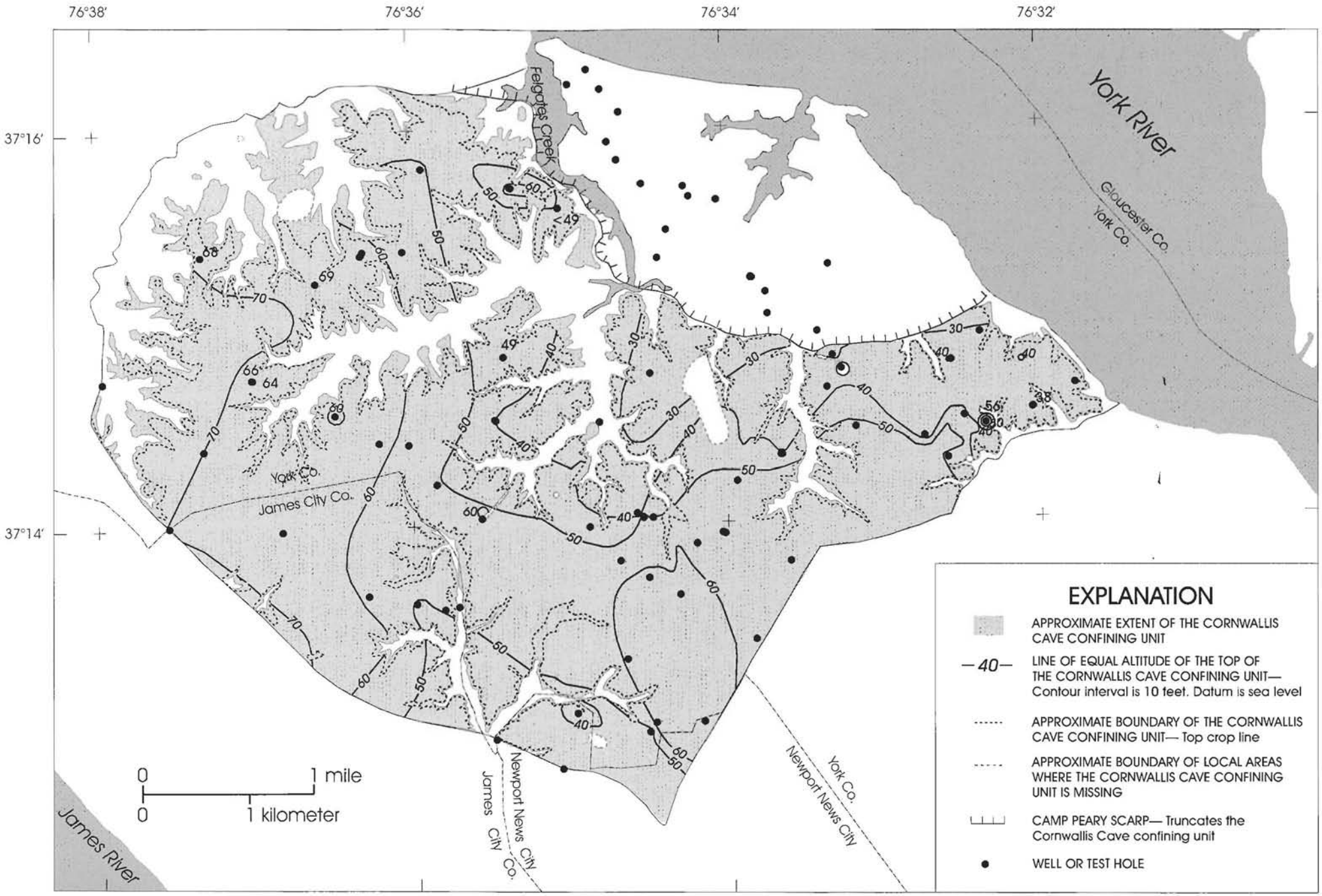
Additional data from field inspection along stream valleys and scattered borings were used for contour construction.



Base from Naval Weapons Station Yorktown 1:9,600

Figure 7. Thickness of the Columbia aquifer.

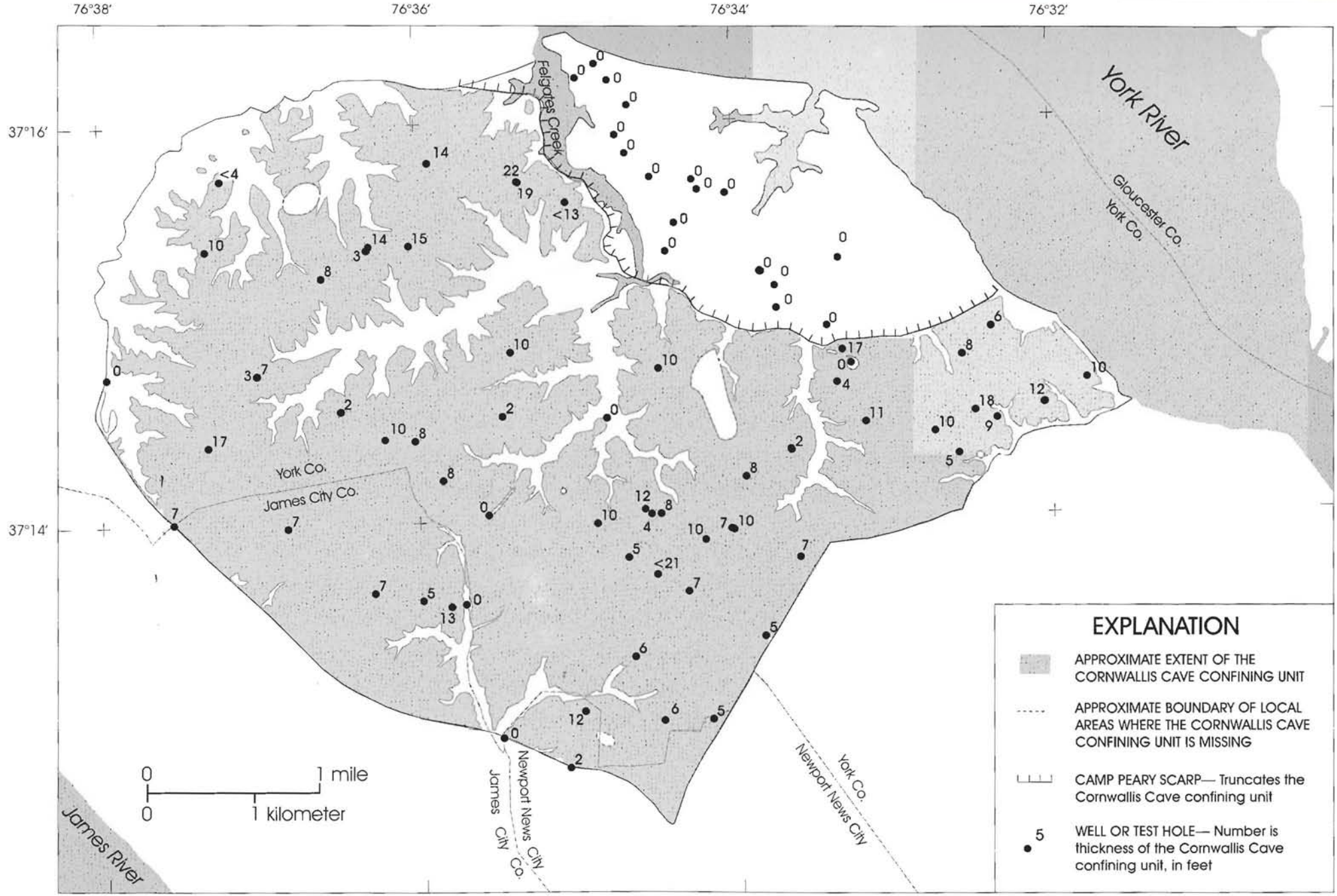
Additional data from field inspection along stream valleys and scattered borings were used for contour construction.



Base from Naval Weapons Station Yorktown 1:9,600

Figure 8. Altitude of the top of the Cornwallis Cave confining unit.

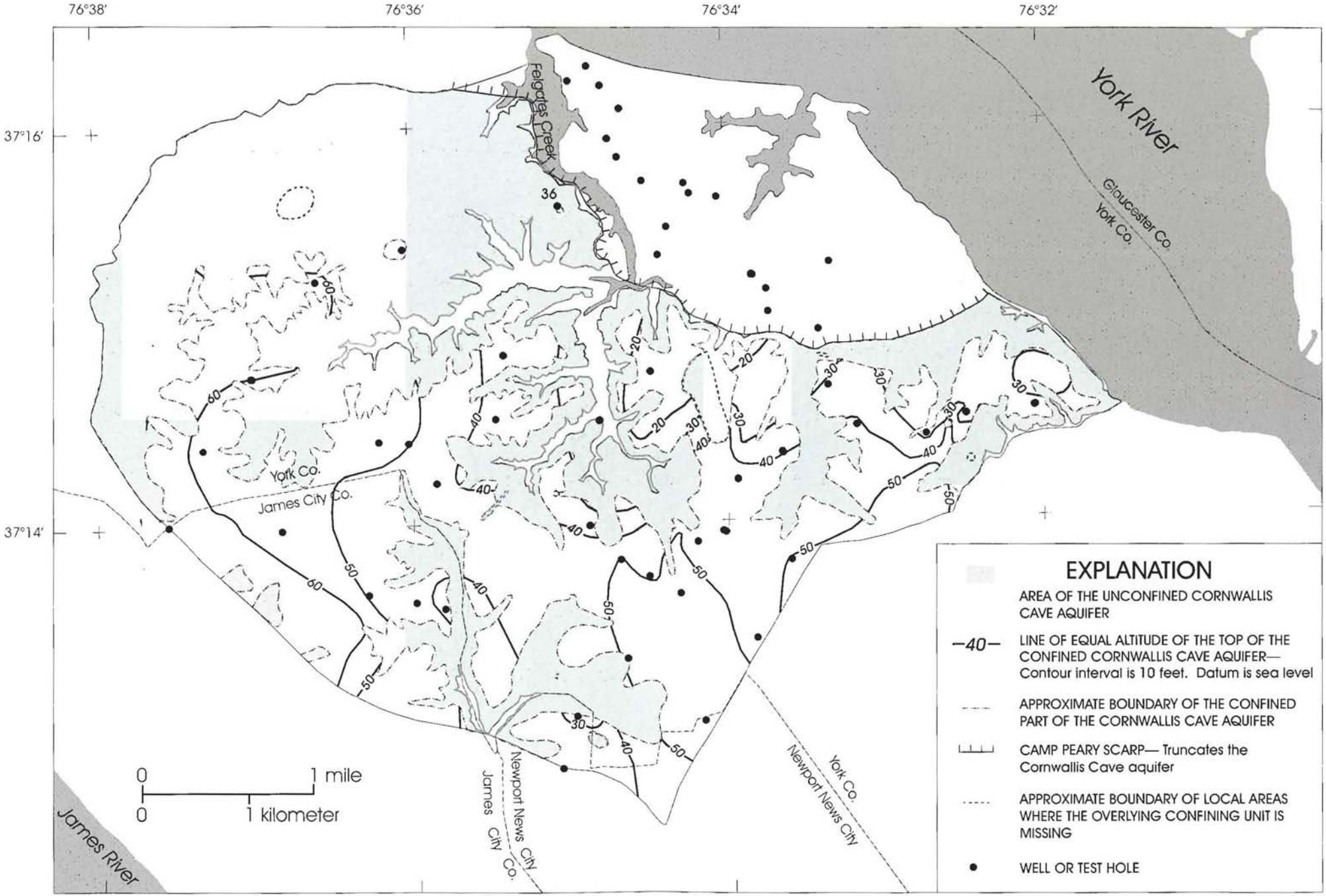
Additional data from field inspection along stream valleys and scattered borings were used for contour construction.



Base from Naval Weapons Station Yorktown 1:9,600

Figure 9. Thickness of the Cornwallis Cave confining unit.

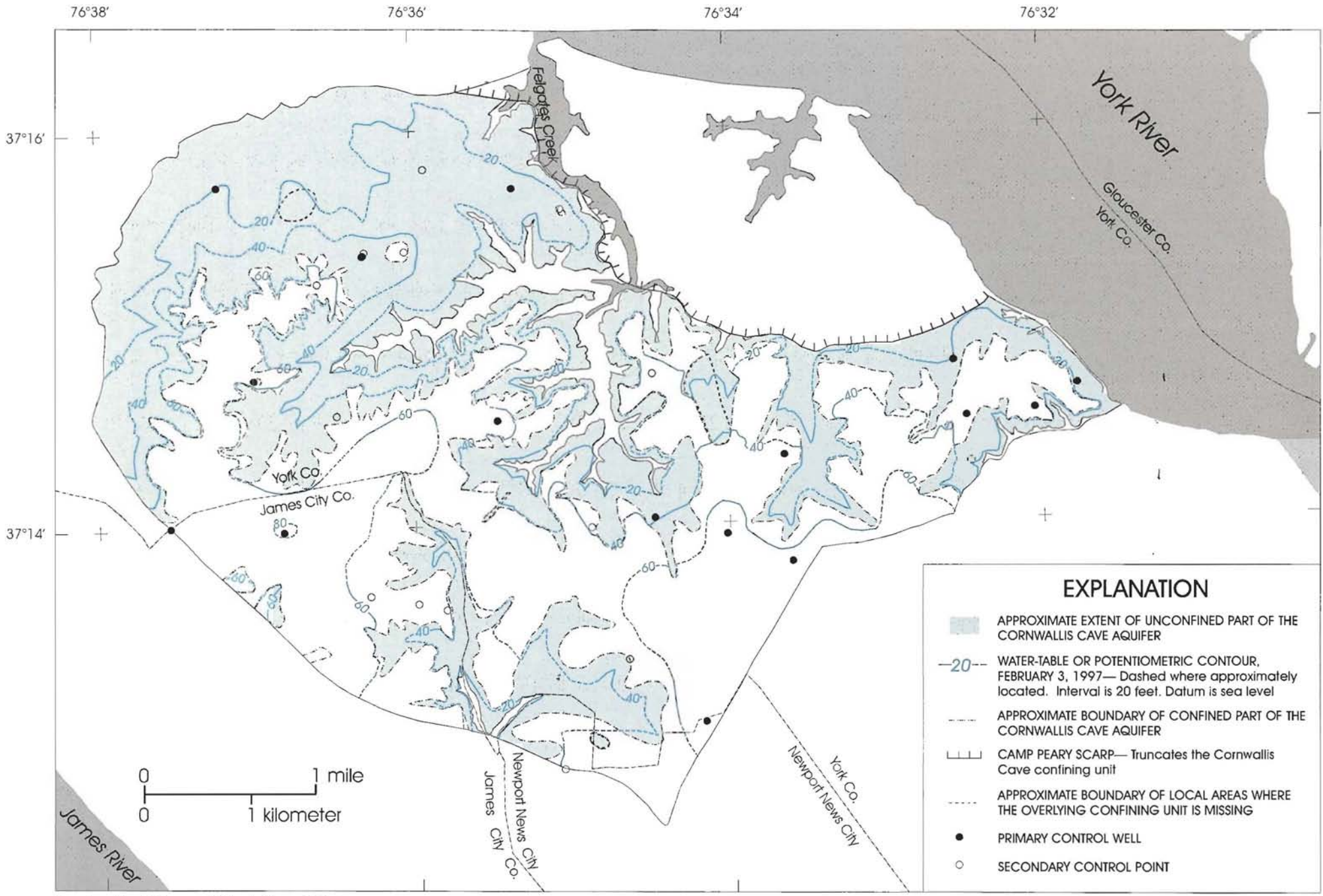
Additional data from field inspection along stream valleys and scattered borings were used for contour construction.



Base from Naval Weapons Station Yorktown 1:9,600

Figure 10. Altitude of the top of the confined Cornwallis Cave aquifer.

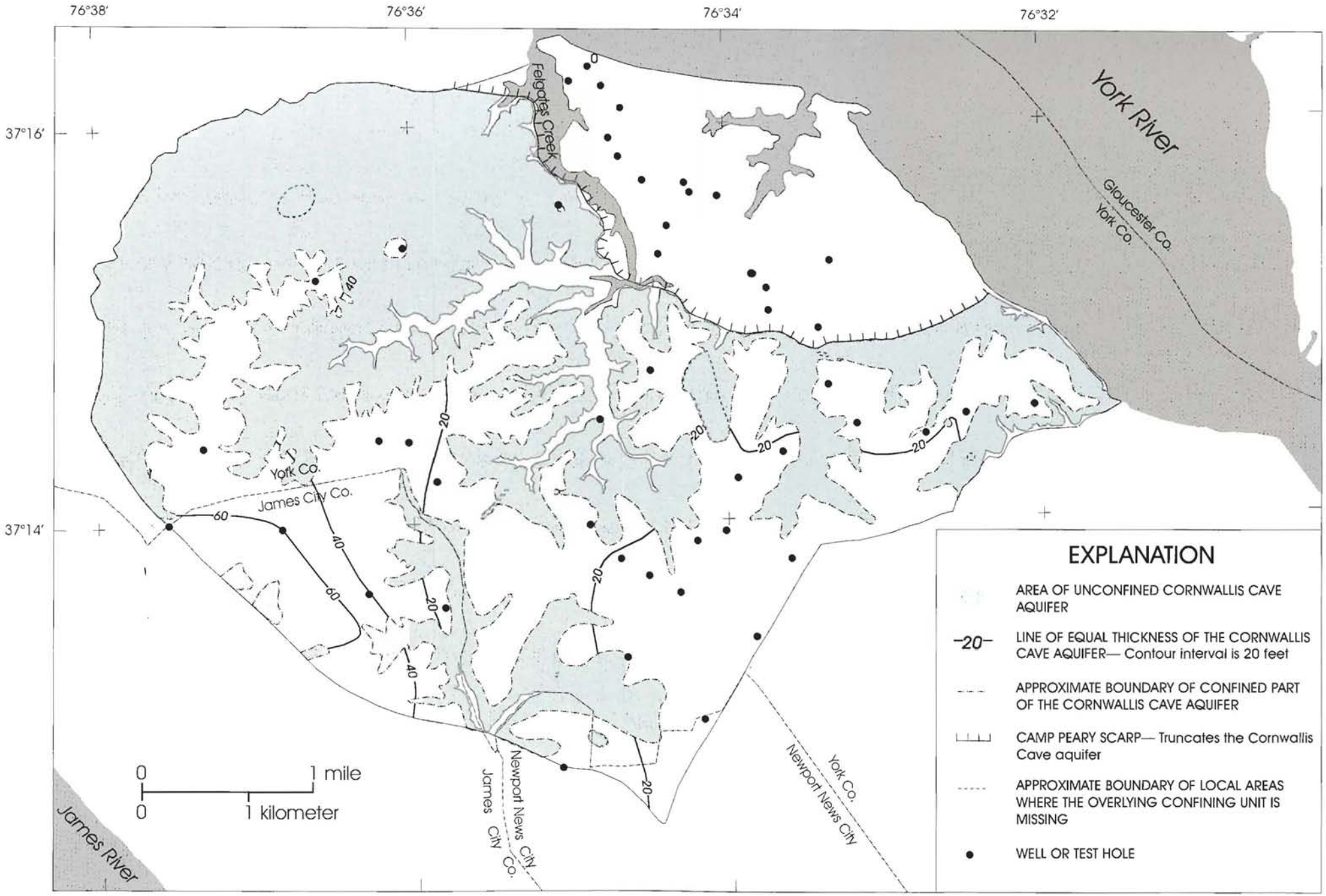
Additional data from field inspection along stream valleys and scattered borings were used for contour construction.



Base from Naval Weapons Station Yorktown 1:9,600

Figure 11. Altitude of the water table and potentiometric surface of the Cornwallis Cave aquifer.

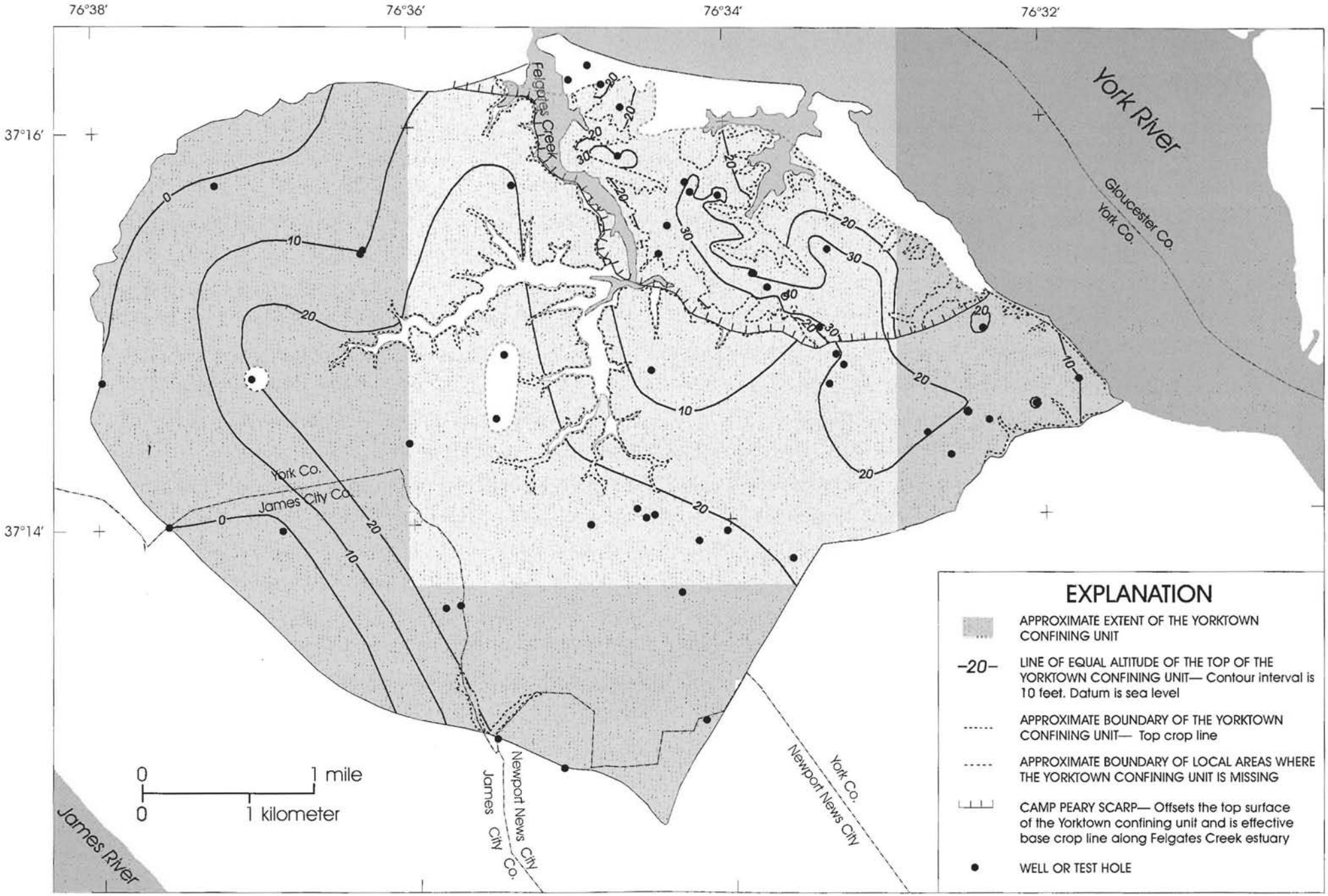
Additional data from field inspection along stream valleys and scattered borings were used for contour construction.



Base from Naval Weapons Station Yorktown 1:9,600

Figure 12. Thickness of the Cornwallis Cave aquifer.

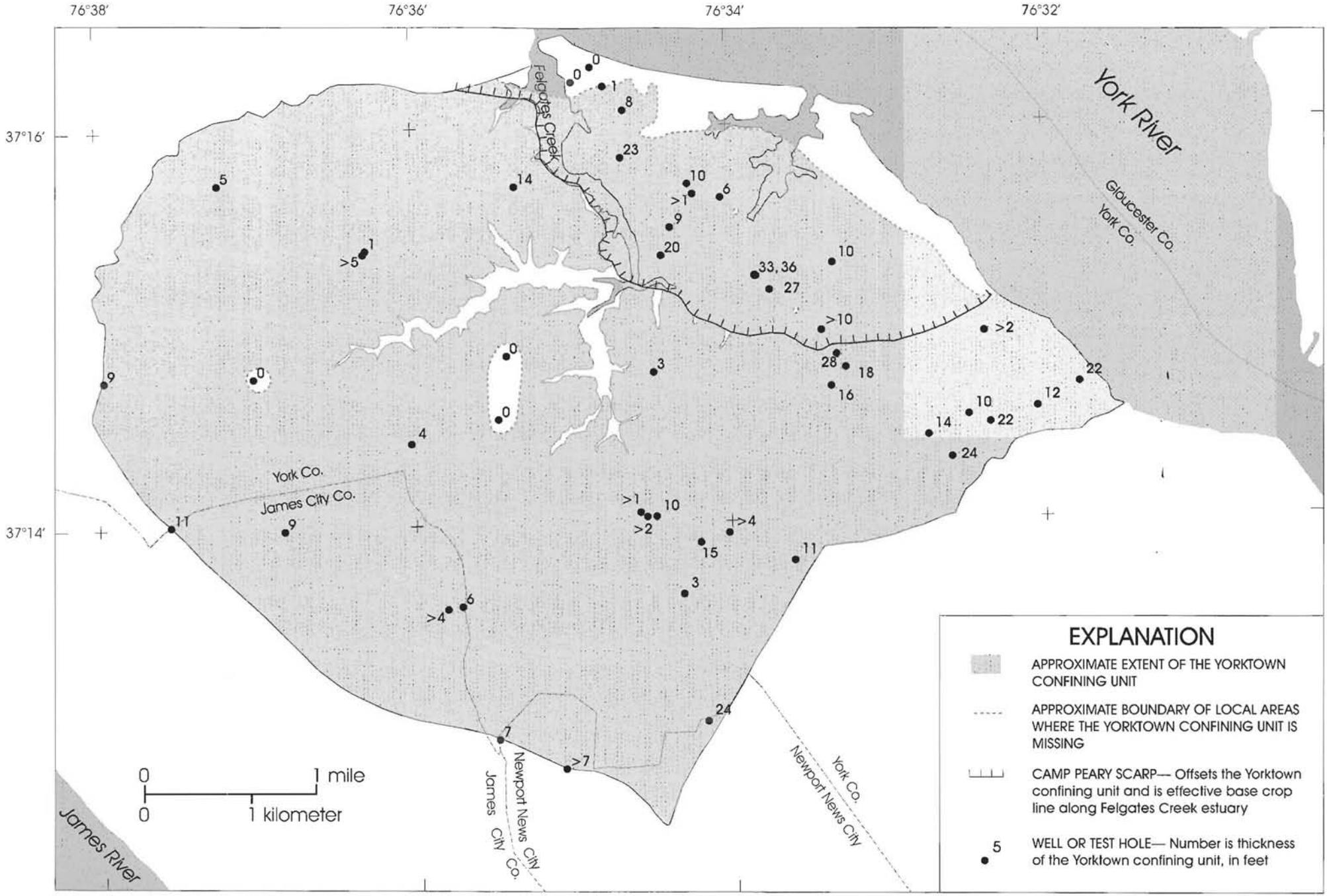
Additional data from field inspection along stream valleys and scattered borings were used for contour construction.



Base from Naval Weapons Station Yorktown 1:9,600

Figure 13. Altitude of the top of the Yorktown confining unit.

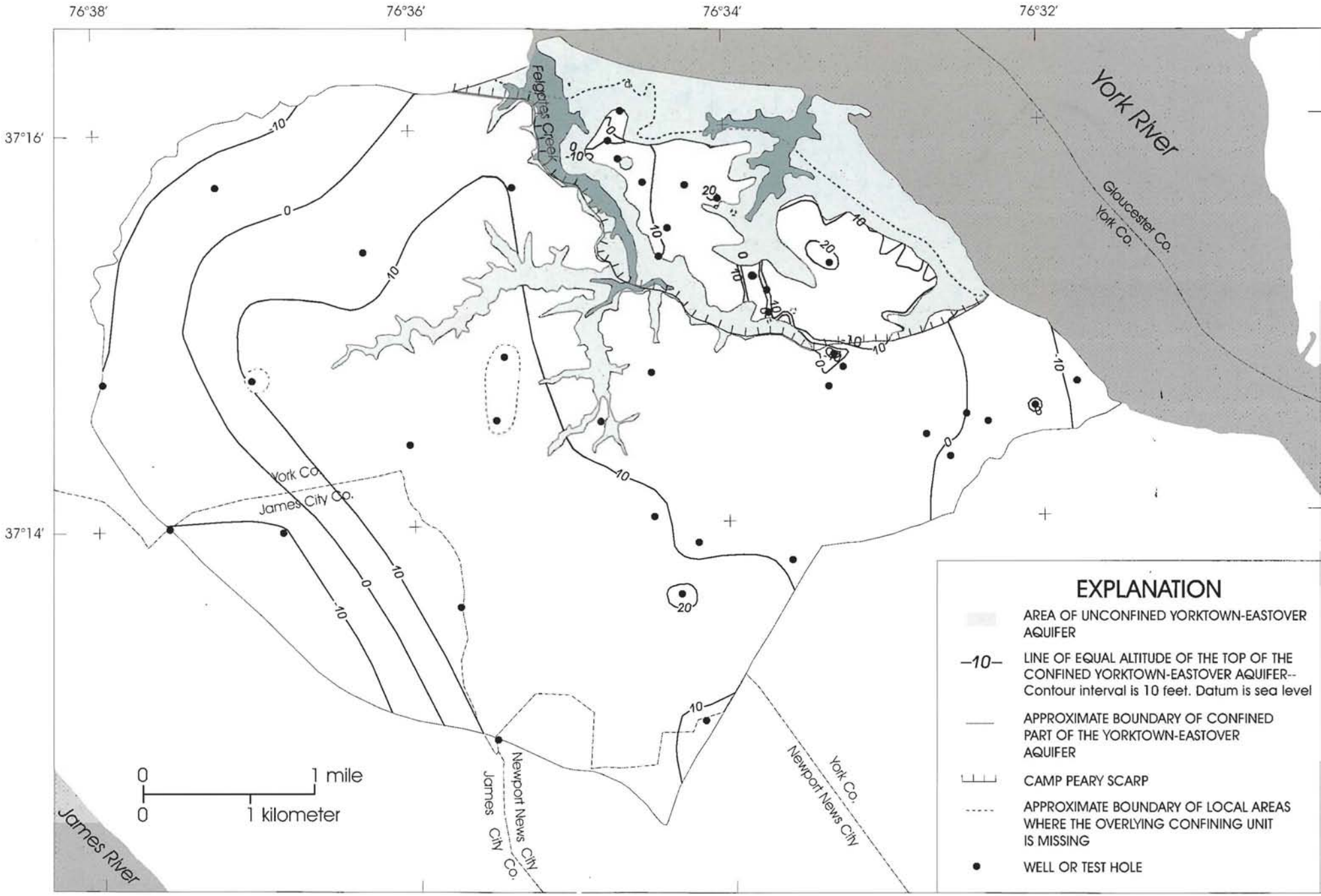
Additional data from field inspection along stream valleys and scattered borings were used for contour construction.



Base from Naval Weapons Station Yorktown 1:9,600

Figure 14. Thickness of the Yorktown confining unit.

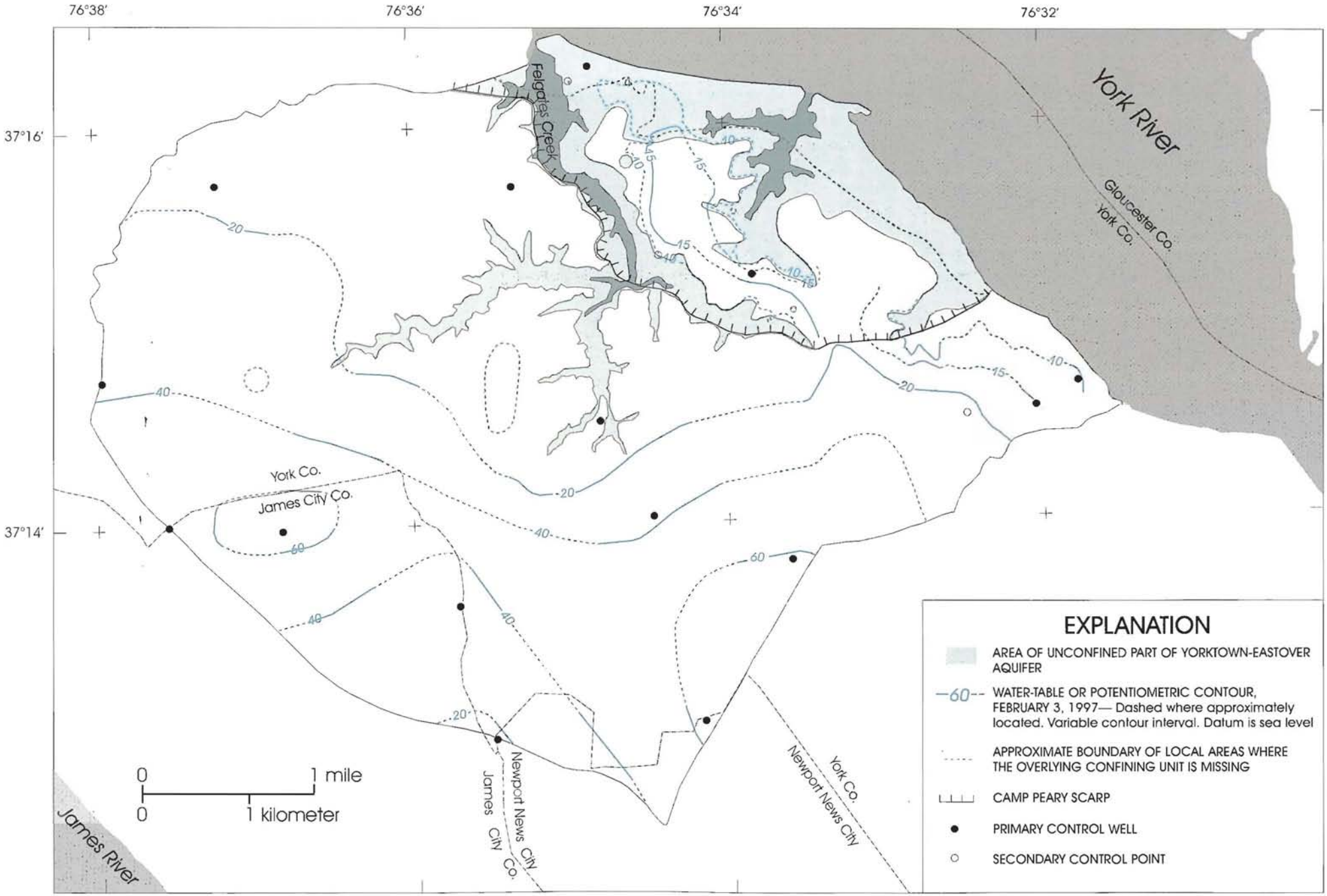
Additional data from field inspection along stream valleys and scattered borings were used for contour construction.



Base from Naval Weapons Station Yorktown 1:9,600

Figure 15. Altitude of the top of the confined Yorktown-Eastover aquifer.

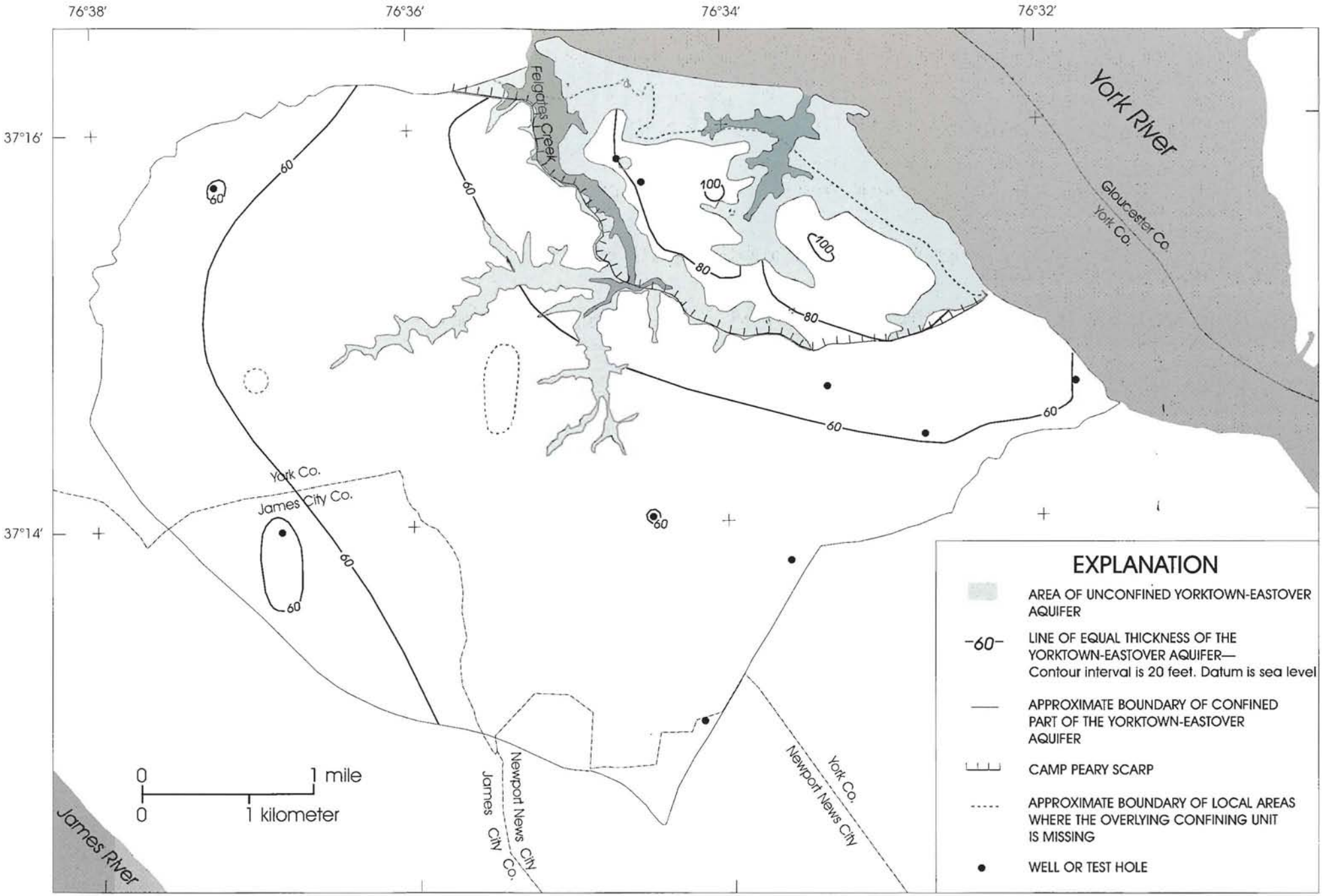
Additional data from field inspection along stream valleys and scattered borings were used for contour construction.



Base from Naval Weapons Station Yorktown 1:9,600

Figure 16. Altitude of the water table and potentiometric surface of the Yorktown-Eastover aquifer.

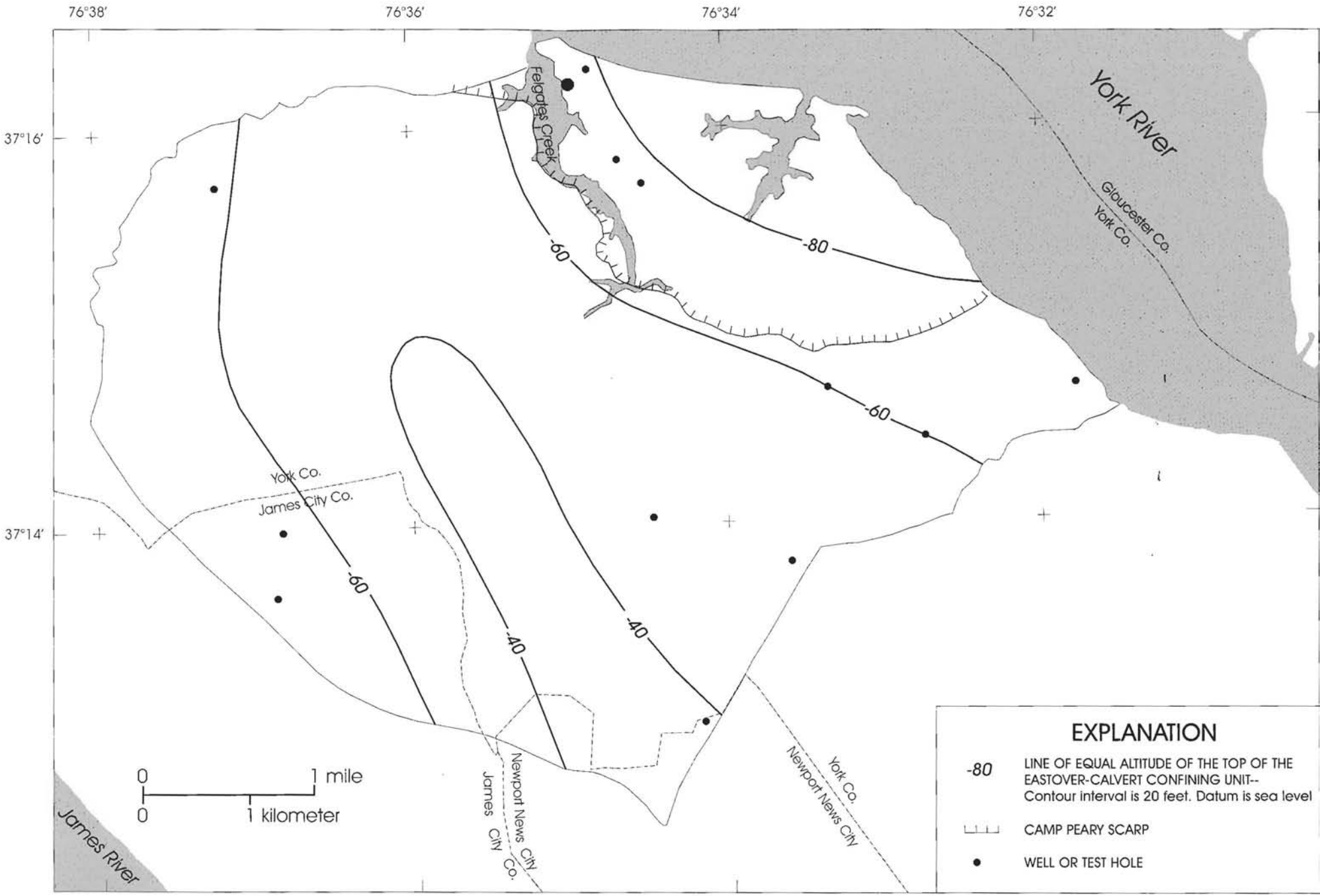
Additional data from field inspection along stream valleys and scattered borings were used for contour construction.



Base from Naval Weapons Station Yorktown 1:9,600

Figure 18. Thickness of the Yorktown-Eastover aquifer.

Additional data from field inspection along stream valleys and scattered borings were used for contour construction.



Base from Naval Weapons Station Yorktown 1:9,600

Figure 19. Altitude of the top of the Eastover-Calvert confining unit.

Appendix G: Raw Data Tables

Aquifer	Columbia							Yorktown-Eastover				
Station ID	YS01-GW004							YS01-GW004A				
Sample ID	YS01-MW004-0792	YS01-MW004-0296	YS01-MW004P-0296	YS01-MW004-0904	YS01-MW004-0205	YS01-MW004-0505	YS01-MW004-0805	YS01-MW004A-0600	YS01-MW004A-0904	YS01-MW004A-0205	YS01-MW004A-0505	YS01-MW004AP-0505
Sample Date	07/20/92	02/10/96	02/10/96	09/21/04	02/10/05	05/04/05	08/04/05	06/16/00	09/21/04	02/10/05	05/04/05	05/04/05
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data
Chemical Name												
Volatile Organic Compounds (UG/L)												
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromo-3-chloropropane	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	10 R	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U
Carbon tetrachloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane (Freon-12)	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl acetate	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl-tert-butyl ether (MTBE)	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	10 U	10 U	10 U	10 U	10 U	37	10 U	2 B	10 U	10 U	42	45
Styrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane(Freon-11)	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Xylene, total	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	NA	NA	NA	20	23	22	22	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
isopropylbenzene	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Aquifer	Columbia							Yorktown-Eastover				
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Sample Date	07/20/92	02/10/96	02/10/96	09/21/04	02/10/05	05/04/05	08/04/05	06/16/00	09/21/04	02/10/05	05/04/05	05/04/05
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data
Chemical Name												
Semi-volatile Organic Compounds (UG/L)												
1,1-Biphenyl	NA	NA	NA	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
1,2,4-Trichlorobenzene	11 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	11 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	11 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	11 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2'-oxybis(1-chloropropane)	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
2,4,5-Trichlorophenol	27 U	24 U	25 U	25 U	NA	NA	NA	NA	25 U	NA	NA	NA
2,4,6-Trichlorophenol	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
2,4-Dichlorophenol	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
2,4-Dimethylphenol	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
2,4-Dinitrophenol	27 U	24 U	25 U	25 U	NA	NA	NA	NA	25 U	NA	NA	NA
2,4-Dinitrotoluene	NA	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
2,6-Dinitrotoluene	NA	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
2-Chloronaphthalene	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
2-Chlorophenol	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
2-Methylnaphthalene	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
2-Methylphenol	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
2-Nitroaniline	11 U	24 U	25 U	25 U	NA	NA	NA	NA	25 U	NA	NA	NA
2-Nitrophenol	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
3,3'-Dichlorobenzidine	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
3-Nitroaniline	27 U	24 U	25 U	25 U	NA	NA	NA	NA	25 U	NA	NA	NA
4,6-Dinitro-2-methylphenol	27 U	24 U	25 U	25 U	NA	NA	NA	NA	25 U	NA	NA	NA
4-Bromophenyl-phenylether	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
4-Chloro-3-methylphenol	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
4-Chloroaniline	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
4-Chlorophenyl-phenylether	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
4-Methylphenol	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
4-Nitroaniline	27 U	24 U	25 U	25 U	NA	NA	NA	NA	25 U	NA	NA	NA
4-Nitrophenol	27 U	24 U	25 U	25 U	NA	NA	NA	NA	25 U	NA	NA	NA
Acenaphthene	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Acenaphthylene	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Acetophenone	NA	NA	NA	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Anthracene	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Atrazine	NA	NA	NA	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Benzaldehyde	NA	NA	NA	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Benzo(a)anthracene	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Benzo(a)pyrene	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Benzo(b)fluoranthene	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Benzo(g,h,i)perylene	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Benzo(k)fluoranthene	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Butylbenzylphthalate	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Caprolactam	NA	NA	NA	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Carbazole	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Chrysene	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Di-n-butylphthalate	11 U	10 U	10 U	0.08 B	NA	NA	NA	NA	10 U	NA	NA	NA
Di-n-octylphthalate	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Dibenz(a,h)anthracene	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Dibenzofuran	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Diethylphthalate	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Dimethyl phthalate	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Fluoranthene	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA

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Sample Date	07/20/92	02/10/96	02/10/96	09/21/04	02/10/05	05/04/05	08/04/05	06/16/00	09/21/04	02/10/05	05/04/05	05/04/05
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data
Chemical Name												
Fluorene	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Hexachlorobenzene	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Hexachlorobutadiene	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Hexachlorocyclopentadiene	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Hexachloroethane	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Indeno(1,2,3-cd)pyrene	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Isophorone	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Naphthalene	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Nitrobenzene	NA	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Pentachlorophenol	27 U	24 U	25 U	25 U	NA	NA	NA	NA	25 U	NA	NA	NA
Phenanthrene	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Phenol	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Pyrene	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
bis(2-Chloroethoxy)methane	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
bis(2-Chloroethyl)ether	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
bis(2-Ethylhexyl)phthalate	11 U	2 B	10 U	0.4 B	NA	NA	NA	NA	0.8 B	NA	NA	NA
n-Nitroso-di-n-propylamine	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
n-Nitrosodiphenylamine	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/L)												
4,4'-DDD	NA	0.097 UJ	0.097 UJ	0.1 U	NA	NA	NA	NA	0.1 U	NA	NA	NA
4,4'-DDE	NA	0.097 UJ	0.097 UJ	0.1 U	NA	NA	NA	NA	0.1 U	NA	NA	NA
4,4'-DDT	NA	0.097 UJ	0.097 UJ	0.1 U	NA	NA	NA	NA	0.1 U	NA	NA	NA
Aldrin	NA	0.048 UJ	0.048 UJ	0.05 U	NA	NA	NA	NA	0.05 U	NA	NA	NA
Aroclor-1016	NA	0.97 UJ	0.97 UJ	1 U	NA	NA	NA	NA	1 U	NA	NA	NA
Aroclor-1221	NA	1.9 UJ	1.9 UJ	2 U	NA	NA	NA	NA	2 U	NA	NA	NA
Aroclor-1232	NA	0.97 UJ	0.97 UJ	1 U	NA	NA	NA	NA	1 U	NA	NA	NA
Aroclor-1242	NA	0.97 UJ	0.97 UJ	1 U	NA	NA	NA	NA	1 U	NA	NA	NA
Aroclor-1248	NA	0.97 UJ	0.97 UJ	1 U	NA	NA	NA	NA	1 U	NA	NA	NA
Aroclor-1254	NA	0.97 UJ	0.97 UJ	1 U	NA	NA	NA	NA	1 U	NA	NA	NA
Aroclor-1260	NA	0.97 UJ	0.97 UJ	1 U	NA	NA	NA	NA	1 U	NA	NA	NA
Dieldrin	NA	0.097 UJ	0.097 UJ	0.1 U	NA	NA	NA	NA	0.1 U	NA	NA	NA
Endosulfan I	NA	0.048 UJ	0.048 UJ	0.05 U	NA	NA	NA	NA	0.05 U	NA	NA	NA
Endosulfan II	NA	0.097 UJ	0.097 UJ	0.1 U	NA	NA	NA	NA	0.1 U	NA	NA	NA
Endosulfan sulfate	NA	0.097 UJ	0.097 UJ	0.1 U	NA	NA	NA	NA	0.1 U	NA	NA	NA
Endrin	NA	0.097 UJ	0.097 UJ	0.1 U	NA	NA	NA	NA	0.1 U	NA	NA	NA
Endrin aldehyde	NA	0.097 UJ	0.097 UJ	0.1 U	NA	NA	NA	NA	0.1 U	NA	NA	NA
Endrin ketone	NA	0.097 UJ	0.097 UJ	0.1 U	NA	NA	NA	NA	0.1 U	NA	NA	NA
Heptachlor	NA	0.048 UJ	0.048 UJ	0.05 U	NA	NA	NA	NA	0.05 U	NA	NA	NA
Heptachlor epoxide	NA	0.048 UJ	0.048 UJ	0.05 U	NA	NA	NA	NA	0.05 U	NA	NA	NA
Methoxychlor	NA	0.48 UJ	0.48 UJ	0.5 U	NA	NA	NA	NA	0.5 U	NA	NA	NA
Toxaphene	NA	4.8 UJ	4.8 UJ	5 U	NA	NA	NA	NA	5 U	NA	NA	NA
alpha-BHC	NA	0.048 UJ	0.048 UJ	0.05 U	NA	NA	NA	NA	0.05 U	NA	NA	NA
alpha-Chlordane	NA	0.048 UJ	0.048 UJ	0.05 U	NA	NA	NA	NA	0.05 U	NA	NA	NA
beta-BHC	NA	0.048 UJ	0.048 UJ	0.05 U	NA	NA	NA	NA	0.05 U	NA	NA	NA
delta-BHC	NA	0.048 UJ	0.048 UJ	0.05 U	NA	NA	NA	NA	0.05 U	NA	NA	NA
gamma-BHC (Lindane)	NA	0.048 UJ	0.048 UJ	0.05 U	NA	NA	NA	NA	0.05 U	NA	NA	NA
gamma-Chlordane	NA	0.048 UJ	0.048 UJ	0.022 B	NA	NA	NA	NA	0.05 U	NA	NA	NA
Explosives (UG/L)												
1,3,5-Trinitrobenzene	1.3 U	0.22 U	0.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dinitrobenzene	0.31 U	0.2 U	0.18 U	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Sample Date	07/20/92	02/10/96	02/10/96	09/21/04	02/10/05	05/04/05	08/04/05	06/16/00	09/21/04	02/10/05	05/04/05	05/04/05
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data
Chemical Name												
2,4,6-Trinitrotoluene	1.3 U	0.21 U	0.19 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	0.31 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	0.31 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrotoluene	NA	0.84 U	0.77 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitrotoluene	NA	0.84 U	0.77 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrotoluene	NA	2.5 U	2.3 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aminodinitrotoluenes	NA	0.34 U	0.31 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dinitrotoluene mixture	NA	0.34 U	0.31 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
HMX	0.63 U	1.8 U	1.7 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	0.31 U	0.35 U	0.32 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
RDX	0.63 U	0.91 U	0.83 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetryl	3.1 U	0.64 U	0.58 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Metals (UG/L)												
Aluminum	6,430 J	716	1,080	80.7 U	NA	NA	NA	NA	80.7 U	NA	NA	NA
Antimony	44 U	19.8 U	19.8 U	1.9 U	NA	NA	NA	NA	1.9 U	NA	NA	NA
Arsenic	5.5 J	1.7 L	2.1 L	6 B	NA	NA	NA	NA	2.1 U	NA	NA	NA
Barium	78.4	39.8	39.9	45.1 B	NA	NA	NA	NA	7.9 B	NA	NA	NA
Beryllium	1 U	0.8 U	0.8 U	0.1 U	NA	NA	NA	NA	0.1 U	NA	NA	NA
Cadmium	4 U	2.2 U	2.2 U	0.2 U	NA	NA	NA	NA	0.2 U	NA	NA	NA
Calcium	80,600	103,000	99,800	105,000	NA	NA	NA	NA	25,300	NA	NA	NA
Chromium	16.4	2.4 U	2.4 U	0.9 U	NA	NA	NA	NA	0.9 U	NA	NA	NA
Cobalt	6 U	3 U	3 U	0.5 U	NA	NA	NA	NA	0.5 U	NA	NA	NA
Copper	5.4	2 U	2 U	0.6 U	NA	NA	NA	NA	0.6 U	NA	NA	NA
Cyanide	NA	10 UL	10 UL	1.1 U	NA	NA	NA	NA	1.7 B	NA	NA	NA
Iron	17,900 J	1,600	1,990	1,330	NA	NA	NA	NA	72.8 B	NA	NA	NA
Lead	8.5 J	1.5	0.8 U	1.1 U	NA	NA	NA	NA	1.1 U	NA	NA	NA
Magnesium	3,480 J	5,540	5,390	3,020 J	NA	NA	NA	NA	379 J	NA	NA	NA
Manganese	114	29	27.4	93.4	NA	NA	NA	NA	21.7	NA	NA	NA
Mercury	0.1 U	0.1 U	0.1 U	0.1 UJ	NA	NA	NA	NA	0.1 UJ	NA	NA	NA
Nickel	18 U	11.3 U	11.3 U	0.6 U	NA	NA	NA	NA	0.6 U	NA	NA	NA
Potassium	1,910	2,540 L	2,550 L	1,230 J	NA	NA	NA	NA	898 J	NA	NA	NA
Selenium	2 UJ	1.3 U	1.3 U	2.4 U	NA	NA	NA	NA	2.4 U	NA	NA	NA
Silver	6 U	3.1 U	3.1 U	0.8 U	NA	NA	NA	NA	0.8 U	NA	NA	NA
Sodium	7,750 J	10,900	10,600	7,670	NA	NA	NA	NA	5,640	NA	NA	NA
Thallium	2 UJ	0.9 U	0.9 U	2.8 U	NA	NA	NA	NA	2.8 U	NA	NA	NA
Vanadium	22.2	3.4	4.1	0.6 U	NA	NA	NA	NA	0.6 U	NA	NA	NA
Zinc	42.8	3.6 UL	5.4 L	4.1 U	NA	NA	NA	NA	4.1 U	NA	NA	NA
Dissolved Metals (UG/L)												
Aluminum	35 U	23.3 U	23.3 U	80.7 U	NA	NA	NA	NA	80.7 U	NA	NA	NA
Antimony	44 U	19.8 U	19.8 U	1.9 U	NA	NA	NA	NA	1.9 U	NA	NA	NA
Arsenic	4.3 J	0.9 UL	1.2 L	2.1 U	NA	NA	NA	NA	3.1 B	NA	NA	NA
Barium	29.3	34.4	35	7.4 B	NA	NA	NA	NA	44.5 B	NA	NA	NA
Beryllium	1 U	0.8 U	0.8 U	0.12 B	NA	NA	NA	NA	0.12 B	NA	NA	NA
Cadmium	4 U	2.2 U	2.2 U	0.2 U	NA	NA	NA	NA	0.2 U	NA	NA	NA
Calcium	70,900	94,700	96,600	24,000	NA	NA	NA	NA	104,000	NA	NA	NA
Chromium	8 U	2.4 U	2.4 U	0.9 U	NA	NA	NA	NA	0.9 U	NA	NA	NA
Cobalt	6 U	3 U	3 U	4.3 B	NA	NA	NA	NA	0.5 U	NA	NA	NA
Copper	5 U	2 U	2 U	0.6 U	NA	NA	NA	NA	0.6 U	NA	NA	NA
Iron	474 J	108	101	54.9 B	NA	NA	NA	NA	1,180	NA	NA	NA
Lead	2 UJ	0.8 U	1.1	1.1 U	NA	NA	NA	NA	1.1 U	NA	NA	NA

Aquifer	Columbia							Yorktown-Eastover				
Station ID	YS01-GW004							YS01-GW004A				
Sample ID	YS01-MW004-0792	YS01-MW004-0296	YS01-MW004P-0296	YS01-MW004-0904	YS01-MW004-0205	YS01-MW004-0505	YS01-MW004-0805	YS01-MW004A-0600	YS01-MW004A-0904	YS01-MW004A-0205	YS01-MW004A-0505	YS01-MW004AP-0505
Sample Date	07/20/92	02/10/96	02/10/96	09/21/04	02/10/05	05/04/05	08/04/05	06/16/00	09/21/04	02/10/05	05/04/05	05/04/05
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data
Chemical Name												
Magnesium	3,850 J	4,880	5,050	366 J	NA	NA	NA	NA	3,040 J	NA	NA	NA
Manganese	68.2	24.6	23.6	25.2	NA	NA	NA	NA	95.9	NA	NA	NA
Mercury	0.1 U	0.1 U	0.1 U	0.1 UJ	NA	NA	NA	NA	0.1 UJ	NA	NA	NA
Nickel	18 U	11.3 U	11.3 U	0.72 J	NA	NA	NA	NA	0.6 U	NA	NA	NA
Potassium	1,720	1,390 L	1,780 L	888 J	NA	NA	NA	NA	1,300 J	NA	NA	NA
Selenium	2 UJ	1.3 U	1.3 U	2.4 U	NA	NA	NA	NA	2.4 U	NA	NA	NA
Silver	6 U	3.1 U	3.1 U	0.8 U	NA	NA	NA	NA	0.8 U	NA	NA	NA
Sodium	7,530 J	10,100	10,400	5,720	NA	NA	NA	NA	8,220	NA	NA	NA
Thallium	2 U	0.9 U	0.9 U	2.8 U	NA	NA	NA	NA	2.8 U	NA	NA	NA
Vanadium	8.9	2.4 UL	2.4 U	0.6 U	NA	NA	NA	NA	0.6 U	NA	NA	NA
Zinc	8.1 U	3.6 U	3.6 UL	4.1 U	NA	NA	NA	NA	4.1 U	NA	NA	NA
Wet Chemistry (MG/L)												
Nitrate	0.1 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Shaded values indicate the analyte was detected
LTM = Long Term Monitoring
RI = Remedial Investigation
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

Appendix G
Groundwater Analytical Results at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	Yorktown-Eastover	Columbia							Yorktown-Eastover			
Station ID	YS01-GW004A	YS01-GW005							YS01-GW005A			
Sample ID	YS01-MW004A-0805	YS01-MW005-0792	YS01-MW005-0296	YS01-MW005-0904	YS01-MW005P-0904	YS01-MW005-0205	YS01-MW005-0505	YS01-MW005-0805	YS01-MW005A-0600	YS01-MW005A-0904	YS01-MW005A-0205	YS01-MW005A-0505
Sample Date	08/04/05	07/20/92	02/10/96	09/19/04	09/19/04	02/10/05	05/04/05	08/04/05	06/15/00	09/23/04	02/10/05	05/04/05
Investigation	LTM Data	Historical Data	Historical Data	GW RI Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	GW RI Data	LTM Data	LTM Data
Chemical Name												
Volatile Organic Compounds (UG/L)												
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	10 U	NA	NA	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10 U	NA	NA	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromo-3-chloropropane	10 U	NA	NA	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	10 U	NA	NA	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	NA	NA	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	NA	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10 U	NA	NA	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	10 U	NA	NA	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	10 U	10 R	10 U	10 UJ	NA	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 B	2 B	10 U	10 U	10 U
Benzene	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	10 U	10 U	10 U	10 U	NA	10 UJ	10 U	10 U	10 UJ	10 U	10 UJ	10 U
Carbon tetrachloride	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloromethane	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	10 U	NA	NA	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane (Freon-12)	10 U	NA	NA	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl acetate	10 U	NA	NA	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl-tert-butyl ether (MTBE)	10 U	NA	NA	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	10 U	NA	NA	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	10 U	10 U	10 U	10 U	NA	10 U	63	10 U	2 B	10 U	10 U	66
Styrene	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	10 U	10 U	10 U	10 U	NA	3 B	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	10 U	10 U	10 U	10 U	NA	1 J	10 U	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane(Freon-11)	10 U	NA	NA	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Xylene, total	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	10 U	NA	NA	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
isopropylbenzene	10 U	NA	NA	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	10 U	NA	NA	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Aquifer	Yorktown-Eastover	Columbia							Yorktown-Eastover			
Station ID	YS01-GW004A	YS01-GW005							YS01-GW005A			
Sample ID	YS01-MW004A-0805	YS01-MW005-0792	YS01-MW005-0296	YS01-MW005-0904	YS01-MW005P-0904	YS01-MW005-0205	YS01-MW005-0505	YS01-MW005-0805	YS01-MW005A-0600	YS01-MW005A-0904	YS01-MW005A-0205	YS01-MW005A-0505
Sample Date	08/04/05	07/20/92	02/10/96	09/19/04	09/19/04	02/10/05	05/04/05	08/04/05	06/15/00	09/23/04	02/10/05	05/04/05
Investigation	LTM Data	Historical Data	Historical Data	GW RI Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	GW RI Data	LTM Data	LTM Data
Chemical Name												
Semi-volatile Organic Compounds (UG/L)												
1,1-Biphenyl	NA	NA	NA	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
1,2,4-Trichlorobenzene	NA	11 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	11 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	NA	11 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	11 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2'-oxybis(1-chloropropane)	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
2,4,5-Trichlorophenol	NA	28 U	24 U	25 U	25 U	NA	NA	NA	NA	25 U	NA	NA
2,4,6-Trichlorophenol	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
2,4-Dichlorophenol	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
2,4-Dimethylphenol	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
2,4-Dinitrophenol	NA	28 U	24 U	25 U	25 U	NA	NA	NA	NA	25 U	NA	NA
2,4-Dinitrotoluene	NA	NA	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
2,6-Dinitrotoluene	NA	NA	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
2-Chloronaphthalene	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
2-Chlorophenol	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
2-Methylnaphthalene	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
2-Methylphenol	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
2-Nitroaniline	NA	28 U	24 U	25 U	25 U	NA	NA	NA	NA	25 U	NA	NA
2-Nitrophenol	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
3,3'-Dichlorobenzidine	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
3-Nitroaniline	NA	11 R	24 U	25 U	25 U	NA	NA	NA	NA	25 U	NA	NA
4,6-Dinitro-2-methylphenol	NA	28 U	24 U	25 U	25 U	NA	NA	NA	NA	25 U	NA	NA
4-Bromophenyl-phenylether	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
4-Chloro-3-methylphenol	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
4-Chloroaniline	NA	11 UJ	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
4-Chlorophenyl-phenylether	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
4-Methylphenol	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
4-Nitroaniline	NA	28 U	24 U	25 U	25 U	NA	NA	NA	NA	25 U	NA	NA
4-Nitrophenol	NA	28 U	24 U	25 U	25 U	NA	NA	NA	NA	25 U	NA	NA
Acenaphthene	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Acenaphthylene	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Acetophenone	NA	NA	NA	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Anthracene	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Atrazine	NA	NA	NA	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Benzaldehyde	NA	NA	NA	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Benzo(a)anthracene	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Benzo(a)pyrene	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Benzo(b)fluoranthene	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Benzo(g,h,i)perylene	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Benzo(k)fluoranthene	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Butylbenzylphthalate	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Caprolactam	NA	NA	NA	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Carbazole	NA	11 UJ	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Chrysene	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Di-n-butylphthalate	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Di-n-octylphthalate	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Dibenz(a,h)anthracene	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Dibenzofuran	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Diethylphthalate	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Dimethyl phthalate	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Fluoranthene	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA

Aquifer	Yorktown-Eastover	Columbia							Yorktown-Eastover			
Station ID	YS01-GW004A	YS01-GW005							YS01-GW005A			
Sample ID	YS01-MW004A-0805	YS01-MW005-0792	YS01-MW005-0296	YS01-MW005-0904	YS01-MW005P-0904	YS01-MW005-0205	YS01-MW005-0505	YS01-MW005-0805	YS01-MW005A-0600	YS01-MW005A-0904	YS01-MW005A-0205	YS01-MW005A-0505
Sample Date	08/04/05	07/20/92	02/10/96	09/19/04	09/19/04	02/10/05	05/04/05	08/04/05	06/15/00	09/23/04	02/10/05	05/04/05
Investigation	LTM Data	Historical Data	Historical Data	GW RI Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	GW RI Data	LTM Data	LTM Data
Chemical Name												
Fluorene	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Hexachlorobenzene	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Hexachlorobutadiene	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Hexachlorocyclopentadiene	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Hexachloroethane	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Indeno(1,2,3-cd)pyrene	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Isophorone	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Naphthalene	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Nitrobenzene	NA	NA	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Pentachlorophenol	NA	28 U	24 U	25 U	25 U	NA	NA	NA	NA	25 U	NA	NA
Phenanthrene	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Phenol	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Pyrene	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
bis(2-Chloroethoxy)methane	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
bis(2-Chloroethyl)ether	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
bis(2-Ethylhexyl)phthalate	NA	16 U	10 U	13 B	10 U	NA	NA	NA	NA	10 U	NA	NA
n-Nitroso-di-n-propylamine	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
n-Nitrosodiphenylamine	NA	11 U	10 U	10 U	10 U	NA	NA	NA	NA	10 U	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/L)												
4,4'-DDD	NA	NA	0.096 UJ	0.1 U	0.1 U	NA	NA	NA	NA	0.1 U	NA	NA
4,4'-DDE	NA	NA	0.096 UJ	0.1 U	0.1 U	NA	NA	NA	NA	0.1 U	NA	NA
4,4'-DDT	NA	NA	0.096 UJ	0.1 U	0.1 U	NA	NA	NA	NA	0.1 U	NA	NA
Aldrin	NA	NA	0.048 UJ	0.05 U	0.051 U	NA	NA	NA	NA	0.05 U	NA	NA
Aroclor-1016	NA	NA	0.96 UJ	1 U	1 U	NA	NA	NA	NA	1 U	NA	NA
Aroclor-1221	NA	NA	1.9 UJ	2 U	2.1 U	NA	NA	NA	NA	2 U	NA	NA
Aroclor-1232	NA	NA	0.96 UJ	1 U	1 U	NA	NA	NA	NA	1 U	NA	NA
Aroclor-1242	NA	NA	0.96 UJ	1 U	1 U	NA	NA	NA	NA	1 U	NA	NA
Aroclor-1248	NA	NA	0.96 UJ	1 U	1 U	NA	NA	NA	NA	1 U	NA	NA
Aroclor-1254	NA	NA	0.96 UJ	1 U	1 U	NA	NA	NA	NA	1 U	NA	NA
Aroclor-1260	NA	NA	0.96 UJ	1 U	1 U	NA	NA	NA	NA	1 U	NA	NA
Dieldrin	NA	NA	0.096 UJ	0.1 U	0.1 U	NA	NA	NA	NA	0.1 U	NA	NA
Endosulfan I	NA	NA	0.048 UJ	0.05 U	0.051 U	NA	NA	NA	NA	0.05 U	NA	NA
Endosulfan II	NA	NA	0.096 UJ	0.1 U	0.1 U	NA	NA	NA	NA	0.1 U	NA	NA
Endosulfan sulfate	NA	NA	0.096 UJ	0.1 U	0.1 U	NA	NA	NA	NA	0.1 U	NA	NA
Endrin	NA	NA	0.096 UJ	0.1 U	0.1 U	NA	NA	NA	NA	0.1 U	NA	NA
Endrin aldehyde	NA	NA	0.096 UJ	0.1 U	0.1 U	NA	NA	NA	NA	0.1 U	NA	NA
Endrin ketone	NA	NA	0.096 UJ	0.1 U	0.1 U	NA	NA	NA	NA	0.1 U	NA	NA
Heptachlor	NA	NA	0.048 UJ	0.05 U	0.051 U	NA	NA	NA	NA	0.05 U	NA	NA
Heptachlor epoxide	NA	NA	0.048 UJ	0.05 U	0.051 U	NA	NA	NA	NA	0.05 U	NA	NA
Methoxychlor	NA	NA	0.48 UJ	0.5 U	0.51 U	NA	NA	NA	NA	0.5 U	NA	NA
Toxaphene	NA	NA	4.8 UJ	5 U	5.1 U	NA	NA	NA	NA	5 U	NA	NA
alpha-BHC	NA	NA	0.048 UJ	0.05 U	0.051 U	NA	NA	NA	NA	0.05 U	NA	NA
alpha-Chlordane	NA	NA	0.048 UJ	0.05 U	0.051 U	NA	NA	NA	NA	0.05 U	NA	NA
beta-BHC	NA	NA	0.048 UJ	0.05 U	0.051 U	NA	NA	NA	NA	0.05 U	NA	NA
delta-BHC	NA	NA	0.048 UJ	0.05 U	0.051 U	NA	NA	NA	NA	0.05 U	NA	NA
gamma-BHC (Lindane)	NA	NA	0.048 UJ	0.05 U	0.051 U	NA	NA	NA	NA	0.05 U	NA	NA
gamma-Chlordane	NA	NA	0.048 UJ	0.05 U	0.051 U	NA	NA	NA	NA	0.05 U	NA	NA
Explosives (UG/L)												
1,3,5-Trinitrobenzene	NA	1.3 U	0.23 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dinitrobenzene	NA	0.31 U	0.21 U	NA	NA	NA	NA	NA	NA	NA	NA	NA

Aquifer	Yorktown-Eastover	Columbia							Yorktown-Eastover			
Station ID	YS01-GW004A	YS01-GW005							YS01-GW005A			
Sample ID	YS01-MW004A-0805	YS01-MW005-0792	YS01-MW005-0296	YS01-MW005-0904	YS01-MW005P-0904	YS01-MW005-0205	YS01-MW005-0505	YS01-MW005-0805	YS01-MW005A-0600	YS01-MW005A-0904	YS01-MW005A-0205	YS01-MW005A-0505
Sample Date	08/04/05	07/20/92	02/10/96	09/19/04	09/19/04	02/10/05	05/04/05	08/04/05	06/15/00	09/23/04	02/10/05	05/04/05
Investigation	LTM Data	Historical Data	Historical Data	GW RI Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	GW RI Data	LTM Data	LTM Data
Chemical Name												
2,4,6-Trinitrotoluene	NA	1.3 U	0.22 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	0.31 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	0.31 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrotoluene	NA	NA	0.87 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitrotoluene	NA	NA	0.87 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrotoluene	NA	NA	2.6 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aminodinitrotoluenes	NA	NA	0.35 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dinitrotoluene mixture	NA	NA	0.35 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
HMX	NA	0.63 U	1.9 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	NA	0.31 U	0.36 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
RDX	NA	0.63 U	0.94 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetryl	NA	3.1 U	0.66 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Metals (UG/L)												
Aluminum	NA	10,500 J	652	388	321	NA	NA	NA	NA	80.7 U	NA	NA
Antimony	NA	44 U	19.8 U	2 B	1.9 U	NA	NA	NA	NA	1.9 U	NA	NA
Arsenic	NA	6.7 J	1.3 L	12.1 B	12 B	NA	NA	NA	NA	2.1 U	NA	NA
Barium	NA	52.7	14.2	26.6 B	26.9 B	NA	NA	NA	NA	9.7 B	NA	NA
Beryllium	NA	2	0.8 U	0.42 B	0.39 B	NA	NA	NA	NA	0.1 U	NA	NA
Cadmium	NA	4 U	2.2 U	0.2 U	0.2 U	NA	NA	NA	NA	0.2 U	NA	NA
Calcium	NA	41,400	24,200	32,300	32,800	NA	NA	NA	NA	34,500	NA	NA
Chromium	NA	20	2.4 U	0.9 U	0.9 U	NA	NA	NA	NA	0.9 U	NA	NA
Cobalt	NA	34	9.3	14.5 B	14.5 B	NA	NA	NA	NA	0.5 U	NA	NA
Copper	NA	7.8	2 U	0.6 U	0.6 U	NA	NA	NA	NA	0.6 U	NA	NA
Cyanide	NA	NA	10 UL	4.5 B	4.6 B	NA	NA	NA	NA	1.1 U	NA	NA
Iron	NA	29,100 J	5,060	22,500	22,800	NA	NA	NA	NA	92.7 B	NA	NA
Lead	NA	5.1 J	1.6	1.1 U	1.1 U	NA	NA	NA	NA	1.1 U	NA	NA
Magnesium	NA	29,400 J	13,500	15,600	15,800	NA	NA	NA	NA	565 J	NA	NA
Manganese	NA	355	99.5	96.6	97.6	NA	NA	NA	NA	38	NA	NA
Mercury	NA	0.1 U	0.1 U	0.1 UJ	0.1 UJ	NA	NA	NA	NA	0.1 UJ	NA	NA
Nickel	NA	26.6	11.3 U	6.3 J	6.3 J	NA	NA	NA	NA	0.6 U	NA	NA
Potassium	NA	3,720	1,420 L	1,140 J	1,140 J	NA	NA	NA	NA	571 J	NA	NA
Selenium	NA	2 U	1.3 U	2.4 U	2.4 U	NA	NA	NA	NA	2.4 U	NA	NA
Silver	NA	6 U	3.1 U	0.8 U	0.8 U	NA	NA	NA	NA	0.8 U	NA	NA
Sodium	NA	19,600 J	7,940	14,500	14,500	NA	NA	NA	NA	4,120 J	NA	NA
Thallium	NA	2 UJ	0.9 U	2.8 U	2.8 U	NA	NA	NA	NA	2.8 U	NA	NA
Vanadium	NA	22.1	3.3	2.7 B	2.7 B	NA	NA	NA	NA	0.6 U	NA	NA
Zinc	NA	72.9	3.6 UL	10.5 B	10.8 B	NA	NA	NA	NA	7.5 B	NA	NA
Dissolved Metals (UG/L)												
Aluminum	NA	834 J	432	270	254	NA	NA	NA	NA	4.4 U	NA	NA
Antimony	NA	44 U	19.8 U	2.9 B	1.9 U	NA	NA	NA	NA	2 U	NA	NA
Arsenic	NA	2 UJ	1.8 L	11.3 B	11.2 B	NA	NA	NA	NA	1.8 U	NA	NA
Barium	NA	30	12.3	25.1 B	23.8 B	NA	NA	NA	NA	10.6 B	NA	NA
Beryllium	NA	1.4	0.8 U	0.37 B	0.39 B	NA	NA	NA	NA	0.1 U	NA	NA
Cadmium	NA	4 U	2.2 U	0.2 U	0.2 U	NA	NA	NA	NA	0.2 U	NA	NA
Calcium	NA	42,300	24,100	32,300	30,000	NA	NA	NA	NA	39,600	NA	NA
Chromium	NA	8 U	2.4 U	0.9 U	0.9 U	NA	NA	NA	NA	0.5 U	NA	NA
Cobalt	NA	27.9	9	13.8 B	12.7 B	NA	NA	NA	NA	1.1 B	NA	NA
Copper	NA	5 U	2 U	0.6 U	0.6 U	NA	NA	NA	NA	0.5 U	NA	NA
Iron	NA	1,770 J	4,760	21,400	20,200	NA	NA	NA	NA	12.6 B	NA	NA
Lead	NA	20 UJ	0.8 U	1.1 U	1.1 U	NA	NA	NA	NA	0.9 U	NA	NA

Aquifer	Yorktown-Eastover	Columbia							Yorktown-Eastover			
Station ID	YS01-GW004A	YS01-GW005							YS01-GW005A			
Sample ID	YS01-MW004A-0805	YS01-MW005-0792	YS01-MW005-0296	YS01-MW005-0904	YS01-MW005P-0904	YS01-MW005-0205	YS01-MW005-0505	YS01-MW005-0805	YS01-MW005A-0600	YS01-MW005A-0904	YS01-MW005A-0205	YS01-MW005A-0505
Sample Date	08/04/05	07/20/92	02/10/96	09/19/04	09/19/04	02/10/05	05/04/05	08/04/05	06/15/00	09/23/04	02/10/05	05/04/05
Investigation	LTM Data	Historical Data	Historical Data	GW RI Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	GW RI Data	LTM Data	LTM Data
Chemical Name												
Magnesium	NA	28,600 J	13,500	15,200	14,200	NA	NA	NA	NA	644 J	NA	NA
Manganese	NA	254	102	94.4	88.7	NA	NA	NA	NA	41.5	NA	NA
Mercury	NA	0.1 U	0.1 U	0.1 UJ	0.1 UJ	NA	NA	NA	NA	0.1 UJ	NA	NA
Nickel	NA	18 U	12.2	7.3 J	6.9 J	NA	NA	NA	NA	0.82 J	NA	NA
Potassium	NA	2,840	932 L	1,210 J	1,120 J	NA	NA	NA	NA	624 J	NA	NA
Selenium	NA	2 UJ	1.3 U	2.4 U	2.5 J	NA	NA	NA	NA	2.6 U	NA	NA
Silver	NA	6 U	3.1 U	0.8 U	0.8 U	NA	NA	NA	NA	0.7 U	NA	NA
Sodium	NA	20,000 J	7,930	14,600	13,600	NA	NA	NA	NA	5,530	NA	NA
Thallium	NA	2 U	0.9 U	2.8 U	2.8 U	NA	NA	NA	NA	1.9 U	NA	NA
Vanadium	NA	8.3	2.4 U	2.4 B	2.3 B	NA	NA	NA	NA	0.4 U	NA	NA
Zinc	NA	70.6	4.4 L	20.7 B	12.7 B	NA	NA	NA	NA	9 B	NA	NA
Wet Chemistry (MG/L)												
Nitrate	NA	0.1 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Shaded values indicate the analyte was detected
LTM = Long Term Monitoring
RI = Remedial Investigation
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level repo
J = Analyte present. Reported value may or may n
K = Analyte present. Reported value may be biase
L = Analyte present. Reported value may be biase
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccu
UL = Not detected, quantitation limit is probably hig

Appendix G
Groundwater Analytical Results at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	Yorktown-Eastover	Columbia								Yorktown-Eastover	Yorktown-Eastover	
Station ID	YS01-GW005A	YS01-GW012								YS01-GW012A	YS01-GW012B	
Sample ID	YS01-MW005A-0805	YS01-MW012-0792	YS01-MW012-0296	YS01-MW012-0600	YS01-MW012-0904	YS01-MW012-0205	YS01-MW012-0505	YS01-MW012P-0505	YS01-MW012-0805	YS01-MW012A-0296	YS01-MW012B-0296	YS01-MW012B-0600
Sample Date	08/04/05	07/20/92	02/09/96	06/16/00	09/21/04	02/09/05	05/03/05	05/03/05	08/03/05	02/10/96	02/10/96	06/22/00
Investigation	LTM Data	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data	Historical Data
Chemical Name												
Volatile Organic Compounds (UG/L)												
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	10 U	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	17 U
1,1,2-Trichloroethane	10 U	28	10 U	1 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
1,1-Dichloroethene	10 U	10 U	10 U	1 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
1,2,4-Trichlorobenzene	10 U	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	17 U
1,2-Dibromo-3-chloropropane	10 U	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	17 U
1,2-Dibromoethane	10 U	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	17 U
1,2-Dichlorobenzene	10 U	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	17 U
1,2-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
1,2-Dichloroethene (total)	NA	1,000 J	40 B	NA	NA	NA	NA	NA	NA	5 B	32 B	NA
1,2-Dichloropropane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
1,3-Dichlorobenzene	10 U	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	17 U
1,4-Dichlorobenzene	10 U	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	17 U
2-Butanone	10 U	10 R	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	17 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	17 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
Acetone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	18	8 B
Benzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
Bromodichloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
Bromoform	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
Carbon disulfide	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
Carbon tetrachloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
Chlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 UJ
Chloroform	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
Cyclohexane	10 U	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	17 U
Dibromochloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
Dichlorodifluoromethane (Freon-12)	10 U	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	17 U
Ethylbenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
Methyl acetate	10 U	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	17 U
Methyl-tert-butyl ether (MTBE)	10 U	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	17 U
Methylcyclohexane	10 U	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	17 U
Methylene chloride	10 U	10 U	10 U	1 B	10 U	10 U	63	14 B	10 U	10 U	10 U	5 B
Styrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
Tetrachloroethene	10 U	7 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
Toluene	10 U	1 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
Trichloroethene	10 U	18,000	64 B	880	90	100	98	100	17	46 B	360	220
Trichlorofluoromethane(Freon-11)	10 U	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	17 U
Vinyl chloride	10 U	10 U	10 U	2 J	14	8 J	6 J	6 J	10 U	10 U	10 U	2 J
Xylene, total	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
cis-1,2-Dichloroethene	10 U	NA	NA	580	130	130	83	88	21	NA	NA	39
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U
isopropylbenzene	10 U	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	17 U
trans-1,2-Dichloroethene	10 U	NA	NA	1 J	10 U	10 U	10 U	10 U	10 U	NA	NA	17 U
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17 U

Aquifer	Yorktown-Eastover	Columbia								Yorktown-Eastover	Yorktown-Eastover	
Station ID	YS01-GW005A	YS01-GW012								YS01-GW012A	YS01-GW012B	
Sample ID	YS01-MW005A-0805	YS01-MW012-0792	YS01-MW012-0296	YS01-MW012-0600	YS01-MW012-0904	YS01-MW012-0205	YS01-MW012-0505	YS01-MW012P-0505	YS01-MW012-0805	YS01-MW012A-0296	YS01-MW012B-0296	YS01-MW012B-0600
Sample Date	08/04/05	07/20/92	02/09/96	06/16/00	09/21/04	02/09/05	05/03/05	05/03/05	08/03/05	02/10/96	02/10/96	06/22/00
Investigation	LTM Data	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data	Historical Data
Chemical Name												
Semi-volatile Organic Compounds (UG/L)												
1,1-Biphenyl	NA	NA	NA	NA	10 U	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	NA	11 U	10 U	NA	NA	NA	NA	NA	NA	10 U	10 U	NA
1,2-Dichlorobenzene	NA	11 U	10 U	NA	NA	NA	NA	NA	NA	10 U	10 U	NA
1,3-Dichlorobenzene	NA	11 U	10 U	NA	NA	NA	NA	NA	NA	10 U	10 U	NA
1,4-Dichlorobenzene	NA	11 U	10 U	NA	NA	NA	NA	NA	NA	10 U	10 U	NA
2,2'-oxybis(1-chloropropane)	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
2,4,5-Trichlorophenol	NA	27 U	24 U	NA	25 U	NA	NA	NA	NA	24 U	24 U	NA
2,4,6-Trichlorophenol	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
2,4-Dichlorophenol	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
2,4-Dimethylphenol	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
2,4-Dinitrophenol	NA	27 U	24 U	NA	25 U	NA	NA	NA	NA	24 U	24 U	NA
2,4-Dinitrotoluene	NA	NA	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
2,6-Dinitrotoluene	NA	NA	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
2-Chloronaphthalene	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
2-Chlorophenol	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
2-Methylnaphthalene	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
2-Methylphenol	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
2-Nitroaniline	NA	27 U	24 U	NA	25 U	NA	NA	NA	NA	24 U	24 U	NA
2-Nitrophenol	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
3,3'-Dichlorobenzidine	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
3-Nitroaniline	NA	27 R	24 U	NA	25 U	NA	NA	NA	NA	24 U	24 U	NA
4,6-Dinitro-2-methylphenol	NA	27 U	24 U	NA	25 U	NA	NA	NA	NA	24 UJ	24 U	NA
4-Bromophenyl-phenylether	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
4-Chloro-3-methylphenol	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
4-Chloroaniline	NA	11 UJ	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
4-Chlorophenyl-phenylether	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
4-Methylphenol	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
4-Nitroaniline	NA	27 U	24 U	NA	25 U	NA	NA	NA	NA	24 U	24 U	NA
4-Nitrophenol	NA	27 U	24 U	NA	25 U	NA	NA	NA	NA	24 U	24 U	NA
Acenaphthene	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Acenaphthylene	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Acetophenone	NA	NA	NA	NA	10 U	NA	NA	NA	NA	NA	NA	NA
Anthracene	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Atrazine	NA	NA	NA	NA	10 U	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	NA	NA	NA	NA	10 U	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Benzo(a)pyrene	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Benzo(b)fluoranthene	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Benzo(g,h,i)perylene	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Benzo(k)fluoranthene	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Butylbenzylphthalate	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Caprolactam	NA	NA	NA	NA	10 U	NA	NA	NA	NA	NA	NA	NA
Carbazole	NA	11 UJ	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Chrysene	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Di-n-butylphthalate	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Di-n-octylphthalate	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Dibenz(a,h)anthracene	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Dibenzofuran	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Diethylphthalate	NA	1 J	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Dimethyl phthalate	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Fluoranthene	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA

Aquifer	Yorktown-Eastover	Columbia								Yorktown-Eastover	Yorktown-Eastover	
Station ID	YS01-GW005A	YS01-GW012								YS01-GW012A	YS01-GW012B	
Sample ID	YS01-MW005A-0805	YS01-MW012-0792	YS01-MW012-0296	YS01-MW012-0600	YS01-MW012-0904	YS01-MW012-0205	YS01-MW012-0505	YS01-MW012P-0505	YS01-MW012-0805	YS01-MW012A-0296	YS01-MW012B-0296	YS01-MW012B-0600
Sample Date	08/04/05	07/20/92	02/09/96	06/16/00	09/21/04	02/09/05	05/03/05	05/03/05	08/03/05	02/10/96	02/10/96	06/22/00
Investigation	LTM Data	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data	Historical Data
Chemical Name												
Fluorene	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Hexachlorobenzene	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Hexachlorobutadiene	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Hexachlorocyclopentadiene	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Hexachloroethane	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Indeno(1,2,3-cd)pyrene	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Isophorone	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Naphthalene	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Nitrobenzene	NA	NA	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Pentachlorophenol	NA	27 U	24 U	NA	25 U	NA	NA	NA	NA	24 U	24 U	NA
Phenanthrene	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Phenol	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	130	NA
Pyrene	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
bis(2-Chloroethoxy)methane	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
bis(2-Chloroethyl)ether	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
bis(2-Ethylhexyl)phthalate	NA	12 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	2 B	NA
n-Nitroso-di-n-propylamine	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
n-Nitrosodiphenylamine	NA	11 U	10 U	NA	10 U	NA	NA	NA	NA	10 U	10 U	NA
Pesticide/Polychlorinated Biphenyls (UG/L)												
4,4'-DDD	NA	NA	0.11 U	NA	0.1 U	NA	NA	NA	NA	0.095 UJ	0.092 UJ	NA
4,4'-DDE	NA	NA	0.11 U	NA	0.1 U	NA	NA	NA	NA	0.095 UJ	0.092 UJ	NA
4,4'-DDT	NA	NA	0.11 U	NA	0.1 U	NA	NA	NA	NA	0.095 UJ	0.092 UJ	NA
Aldrin	NA	NA	0.053 U	NA	0.05 U	NA	NA	NA	NA	0.048 UJ	0.046 UJ	NA
Aroclor-1016	NA	NA	1.1 U	NA	1 U	NA	NA	NA	NA	0.95 UJ	0.92 UJ	NA
Aroclor-1221	NA	NA	2.1 U	NA	2 U	NA	NA	NA	NA	1.9 UJ	1.8 UJ	NA
Aroclor-1232	NA	NA	1.1 U	NA	1 U	NA	NA	NA	NA	0.95 UJ	0.92 UJ	NA
Aroclor-1242	NA	NA	1.1 U	NA	1 U	NA	NA	NA	NA	0.95 UJ	0.92 UJ	NA
Aroclor-1248	NA	NA	1.1 U	NA	1 U	NA	NA	NA	NA	0.95 UJ	0.92 UJ	NA
Aroclor-1254	NA	NA	1.1 U	NA	1 U	NA	NA	NA	NA	0.95 UJ	0.92 UJ	NA
Aroclor-1260	NA	NA	1.1 U	NA	1 U	NA	NA	NA	NA	0.95 UJ	0.92 UJ	NA
Dieldrin	NA	NA	0.11 U	NA	0.1 U	NA	NA	NA	NA	0.095 UJ	0.092 UJ	NA
Endosulfan I	NA	NA	0.053 U	NA	0.05 U	NA	NA	NA	NA	0.048 UJ	0.046 UJ	NA
Endosulfan II	NA	NA	0.11 U	NA	0.1 U	NA	NA	NA	NA	0.095 UJ	0.092 UJ	NA
Endosulfan sulfate	NA	NA	0.11 U	NA	0.1 U	NA	NA	NA	NA	0.095 UJ	0.092 UJ	NA
Endrin	NA	NA	0.11 U	NA	0.1 U	NA	NA	NA	NA	0.095 UJ	0.092 UJ	NA
Endrin aldehyde	NA	NA	0.11 U	NA	0.1 U	NA	NA	NA	NA	0.095 UJ	0.092 UJ	NA
Endrin ketone	NA	NA	0.11 U	NA	0.1 U	NA	NA	NA	NA	0.095 UJ	0.092 UJ	NA
Heptachlor	NA	NA	0.053 U	NA	0.05 U	NA	NA	NA	NA	0.048 UJ	0.046 UJ	NA
Heptachlor epoxide	NA	NA	0.053 U	NA	0.05 U	NA	NA	NA	NA	0.048 UJ	0.046 UJ	NA
Methoxychlor	NA	NA	0.53 U	NA	0.5 U	NA	NA	NA	NA	0.48 UJ	0.46 UJ	NA
Toxaphene	NA	NA	5.3 U	NA	5 U	NA	NA	NA	NA	4.8 UJ	4.6 UJ	NA
alpha-BHC	NA	NA	0.053 U	NA	0.05 U	NA	NA	NA	NA	0.048 UJ	0.046 UJ	NA
alpha-Chlordane	NA	NA	0.053 U	NA	0.05 U	NA	NA	NA	NA	0.048 UJ	0.046 UJ	NA
beta-BHC	NA	NA	0.053 U	NA	0.05 U	NA	NA	NA	NA	0.048 UJ	0.046 UJ	NA
delta-BHC	NA	NA	0.053 U	NA	0.05 U	NA	NA	NA	NA	0.048 UJ	0.046 UJ	NA
gamma-BHC (Lindane)	NA	NA	0.053 U	NA	0.05 U	NA	NA	NA	NA	0.048 UJ	0.046 UJ	NA
gamma-Chlordane	NA	NA	0.053 U	NA	0.05 U	NA	NA	NA	NA	0.048 UJ	0.046 UJ	NA
Explosives (UG/L)												
1,3,5-Trinitrobenzene	NA	1.3 U	0.17 U	NA	NA	NA	NA	NA	NA	0.16 U	0.18 U	NA
1,3-Dinitrobenzene	NA	0.31 U	0.16 U	NA	NA	NA	NA	NA	NA	0.15 U	0.16 U	NA

Aquifer	Yorktown-Eastover	Columbia								Yorktown-Eastover	Yorktown-Eastover	
Station ID	YS01-GW005A	YS01-GW012								YS01-GW012A	YS01-GW012B	
Sample ID	YS01-MW005A-0805	YS01-MW012-0792	YS01-MW012-0296	YS01-MW012-0600	YS01-MW012-0904	YS01-MW012-0205	YS01-MW012-0505	YS01-MW012P-0505	YS01-MW012-0805	YS01-MW012A-0296	YS01-MW012B-0296	YS01-MW012B-0600
Sample Date	08/04/05	07/20/92	02/09/96	06/16/00	09/21/04	02/09/05	05/03/05	05/03/05	08/03/05	02/10/96	02/10/96	06/22/00
Investigation	LTM Data	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data	Historical Data
Chemical Name												
2,4,6-Trinitrotoluene	NA	1.3 U	0.16 U	NA	NA	NA	NA	NA	NA	0.16 U	0.17 U	NA
2,4-Dinitrotoluene	NA	0.31 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	0.31 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrotoluene	NA	NA	0.65 U	NA	NA	NA	NA	NA	NA	0.64 U	0.68 U	NA
3-Nitrotoluene	NA	NA	0.65 U	NA	NA	NA	NA	NA	NA	0.64 U	0.68 U	NA
4-Nitrotoluene	NA	NA	1.9 U	NA	NA	NA	NA	NA	NA	1.9 U	2 U	NA
Aminodinitrotoluenes	NA	NA	0.26 U	NA	NA	NA	NA	NA	NA	0.25 U	0.27 U	NA
Dinitrotoluene mixture	NA	NA	0.26 U	NA	NA	NA	NA	NA	NA	0.25 U	0.27 U	NA
HMX	NA	0.63 U	1.4 U	NA	NA	NA	NA	NA	NA	1.4 U	1.5 U	NA
Nitrobenzene	NA	0.31 U	0.27 U	NA	NA	NA	NA	NA	NA	0.27 U	0.28 U	NA
RDX	NA	0.63 U	0.7 U	NA	NA	NA	NA	NA	NA	0.69 U	0.73 U	NA
Tetryl	NA	3.1 U	0.49 U	NA	NA	NA	NA	NA	NA	0.48 U	0.51 U	NA
Total Metals (UG/L)												
Aluminum	NA	389 J	47.8	NA	80.7 U	NA	NA	NA	NA	165	10,200	NA
Antimony	NA	44 U	19.8 U	NA	1.9 U	NA	NA	NA	NA	19.8 U	19.8 U	NA
Arsenic	NA	2 UJ	1.1 L	NA	2.6 B	NA	NA	NA	NA	1.6 L	4.2 L	NA
Barium	NA	67.4	98.8	NA	112 B	NA	NA	NA	NA	25.2	66.8	NA
Beryllium	NA	1 U	0.8 U	NA	0.1 U	NA	NA	NA	NA	0.8 U	0.99	NA
Cadmium	NA	5.9	8.6	NA	6.7	NA	NA	NA	NA	2.2 U	2.2 U	NA
Calcium	NA	28,300	81,500	NA	74,800	NA	NA	NA	NA	39,900	116,000	NA
Chromium	NA	8 U	2.4 U	NA	0.9 U	NA	NA	NA	NA	2.4 U	27.8	NA
Cobalt	NA	6 U	3 U	NA	2 B	NA	NA	NA	NA	3 U	3.4	NA
Copper	NA	5 U	8.6	NA	5.2 B	NA	NA	NA	NA	2 U	9.9	NA
Cyanide	NA	NA	10 UL	NA	1.8 B	NA	NA	NA	NA	10 UL	10 UL	NA
Iron	NA	1,390 J	909	NA	3,520	NA	NA	NA	NA	625	24,200	NA
Lead	NA	3.8 J	4.7	NA	1.1 B	NA	NA	NA	NA	0.8 U	7.6 K	NA
Magnesium	NA	4,970 J	6,920	NA	5,200	NA	NA	NA	NA	535	3,900	NA
Manganese	NA	127	821	NA	2,480	NA	NA	NA	NA	8.1	117	NA
Mercury	NA	0.1 U	0.1 U	NA	0.1 UJ	NA	NA	NA	NA	0.1 U	0.1 U	NA
Nickel	NA	18 U	11.3 U	NA	12.4 J	NA	NA	NA	NA	11.3 U	16.3	NA
Potassium	NA	3,590	2,960 L	NA	3,660 J	NA	NA	NA	NA	4,570	26,300	NA
Selenium	NA	2 U	1.3 U	NA	2.4 U	NA	NA	NA	NA	1.3 U	1.3 U	NA
Silver	NA	6 U	3.1 U	NA	0.8 U	NA	NA	NA	NA	3.1 U	3.1 U	NA
Sodium	NA	2,480 J	3,270	NA	2,790 J	NA	NA	NA	NA	8,900	38,300	NA
Thallium	NA	2 UJ	0.9 U	NA	2.8 U	NA	NA	NA	NA	0.9 U	0.9 U	NA
Vanadium	NA	6 U	2.4 U	NA	0.6 U	NA	NA	NA	NA	2.4 U	28.2	NA
Zinc	NA	1,650	2,960	NA	2,350	NA	NA	NA	NA	3.6 UL	44.4 L	NA
Dissolved Metals (UG/L)												
Aluminum	NA	61.4 J	23.3 U	NA	20.4 B	NA	NA	NA	NA	23.3 U	1,920	NA
Antimony	NA	44 U	19.8 U	NA	2 U	NA	NA	NA	NA	19.8 U	19.8 U	NA
Arsenic	NA	2 UJ	0.9 UL	NA	2.4 B	NA	NA	NA	NA	0.9 UL	1.5 L	NA
Barium	NA	68.8	94.1	NA	130 B	NA	NA	NA	NA	22.4	3.7	NA
Beryllium	NA	1 U	0.8 U	NA	0.1 U	NA	NA	NA	NA	0.8 U	0.8 U	NA
Cadmium	NA	4 U	9	NA	5.3	NA	NA	NA	NA	2.2 U	2.2 U	NA
Calcium	NA	29,100	79,000	NA	83,000	NA	NA	NA	NA	37,600	11,100	NA
Chromium	NA	8 U	2.4 U	NA	0.5 U	NA	NA	NA	NA	2.4 U	2.4 U	NA
Cobalt	NA	7.5	3 U	NA	4.3 B	NA	NA	NA	NA	3 U	3 U	NA
Copper	NA	5 U	4.6	NA	0.5 U	NA	NA	NA	NA	3.5	2 U	NA
Iron	NA	504 J	23.9	NA	7,500	NA	NA	NA	NA	23.1	60.2	NA
Lead	NA	2 UJ	0.8 U	NA	1.2 B	NA	NA	NA	NA	0.8 U	0.8 U	NA

Aquifer	Yorktown-Eastover	Columbia								Yorktown-Eastover	Yorktown-Eastover	
Station ID	YS01-GW005A	YS01-GW012								YS01-GW012A	YS01-GW012B	
Sample ID	YS01-MW005A-0805	YS01-MW012-0792	YS01-MW012-0296	YS01-MW012-0600	YS01-MW012-0904	YS01-MW012-0205	YS01-MW012-0505	YS01-MW012P-0505	YS01-MW012-0805	YS01-MW012A-0296	YS01-MW012B-0296	YS01-MW012B-0600
Sample Date	08/04/05	07/20/92	02/09/96	06/16/00	09/21/04	02/09/05	05/03/05	05/03/05	08/03/05	02/10/96	02/10/96	06/22/00
Investigation	LTM Data	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data	Historical Data
Chemical Name												
Magnesium	NA	5,220 J	6,660	NA	5,690	NA	NA	NA	NA	475	598	NA
Manganese	NA	141	803	NA	2,930	NA	NA	NA	NA	7	1.6 U	NA
Mercury	NA	0.1 U	0.1 U	NA	0.1 UJ	NA	NA	NA	NA	0.1 U	0.1 U	NA
Nickel	NA	18 U	11.3 U	NA	13.1 J	NA	NA	NA	NA	11.3 U	11.3 U	NA
Potassium	NA	3,450	2,710 L	NA	3,720 J	NA	NA	NA	NA	4,520	24,300	NA
Selenium	NA	2 UJ	1.3 U	NA	2.6 U	NA	NA	NA	NA	1.3 U	1.3 U	NA
Silver	NA	6 U	3.1 U	NA	0.7 U	NA	NA	NA	NA	3.1 U	3.1 U	NA
Sodium	NA	2,500 J	3,110	NA	3,220 J	NA	NA	NA	NA	8,620	37,300	NA
Thallium	NA	2 U	0.9 U	NA	1.9 U	NA	NA	NA	NA	0.9 U	0.9 U	NA
Vanadium	NA	6 U	2.4 U	NA	0.4 U	NA	NA	NA	NA	2.4 U	2.8	NA
Zinc	NA	1,080	2,850	NA	2,420	NA	NA	NA	NA	3.6 UL	3.6 UL	NA
Wet Chemistry (MG/L)												
Nitrate	NA	2.4 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Shaded values indicate the analyte was detected
LTM = Long Term Monitoring
RI = Remedial Investigation
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level repo
J = Analyte present. Reported value may or may n
K = Analyte present. Reported value may be biase
L = Analyte present. Reported value may be biase
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccu
UL = Not detected, quantitation limit is probably hig

Appendix G
Groundwater Analytical Results at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	Yorktown-Eastover			Columbia		Yorktown-Eastover		Columbia		Columbia		
Station ID	YS01-GW012B			YS01-GW013		YS01-GW013A		YS01-GW014		YS01-GW017		
Sample ID	YS01-MW012B-0904	YS01-MW012B-0205	YS01-MW012B-0505	YS01-MW013-0792	YS01-MW013-0296	YS01-MW013A-0296	YS01-MW013AP-0296	YS01-MW014-0792	YS01-MW014-0296	YS01-MW017-0792	YS01-MW017P-0792	YS01-MW017-0296
Sample Date	09/22/04	02/10/05	05/04/05	07/20/92	02/10/96	02/10/96	02/10/96	07/20/92	02/08/96	07/20/92	07/20/92	02/08/96
Investigation	GW RI Data	LTM Data	LTM Data	HIstorical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data
Chemical Name												
Volatile Organic Compounds (UG/L)												
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	4 J	4 J	5 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	10 U	10 U	10 U	10 R	10 U	10 U	10 U	10 UJ	10 U	10 R	10 UJ	10 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	10 U	17	6 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	30 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane (Freon-12)	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl acetate	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butyl ether (MTBE)	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	10 U	10 U	63	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	760	710	850 D	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane(Freon-11)	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	7 J	9 J	9 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Xylene, total	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	160	160	160	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
isopropylbenzene	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Aquifer	Yorktown-Eastover			Columbia		Yorktown-Eastover		Columbia		Columbia		
Station ID	YS01-GW012B			YS01-GW013		YS01-GW013A		YS01-GW014		YS01-GW017		
Sample ID	YS01-MW012B-0904	YS01-MW012B-0205	YS01-MW012B-0505	YS01-MW013-0792	YS01-MW013-0296	YS01-MW013A-0296	YS01-MW013AP-0296	YS01-MW014-0792	YS01-MW014-0296	YS01-MW017-0792	YS01-MW017P-0792	YS01-MW017-0296
Sample Date	09/22/04	02/10/05	05/04/05	07/20/92	02/10/96	02/10/96	02/10/96	07/20/92	02/08/96	07/20/92	07/20/92	02/08/96
Investigation	GW RI Data	LTM Data	LTM Data	HIstorical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data
Chemical Name												
Semi-volatile Organic Compounds (UG/L)												
1,1-Biphenyl	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	NA	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	NA	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	NA	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	NA	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
2,2'-oxybis(1-chloropropane)	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	25 U	NA	NA	28 U	25 U	26 U	26 U	27 U	24 U	26 U	26 U	24 U
2,4,6-Trichlorophenol	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	25 U	NA	NA	28 U	25 U	26 U	26 U	27 U	24 U	26 U	26 U	24 U
2,4-Dinitrotoluene	10 U	NA	NA	NA	10 U	10 U	10 U	NA	10 U	NA	NA	10 U
2,6-Dinitrotoluene	10 U	NA	NA	NA	10 U	10 U	10 U	NA	10 U	NA	NA	10 U
2-Chloronaphthalene	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
2-Chlorophenol	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
2-Methylphenol	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
2-Nitroaniline	25 U	NA	NA	28 U	25 U	26 U	26 U	27 U	24 U	26 U	26 U	24 U
2-Nitrophenol	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
3-Nitroaniline	25 U	NA	NA	28 R	25 U	26 U	26 U	27 R	24 U	26 R	26 R	24 U
4,6-Dinitro-2-methylphenol	25 U	NA	NA	28 U	25 U	26 U	26 U	27 U	24 U	26 U	26 U	24 U
4-Bromophenyl-phenylether	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
4-Chloroaniline	10 U	NA	NA	11 UJ	10 U	10 U	10 U	11 UJ	10 U	10 UJ	10 UJ	10 U
4-Chlorophenyl-phenylether	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
4-Methylphenol	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
4-Nitroaniline	25 U	NA	NA	28 U	25 U	26 U	26 U	27 U	24 U	26 U	26 U	24 U
4-Nitrophenol	25 U	NA	NA	28 U	25 U	26 U	26 U	27 U	24 U	26 U	26 U	24 U
Acenaphthene	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Acenaphthylene	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Acetophenone	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Atrazine	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Butylbenzylphthalate	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Caprolactam	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	10 U	NA	NA	11 UJ	10 U	10 U	10 U	11 UJ	10 U	10 UJ	10 UJ	10 U
Chrysene	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Di-n-butylphthalate	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Di-n-octylphthalate	10 U	NA	NA	11 U	10 U	4 J	10 U	11 U	10 U	10 U	10 U	10 U
Dibenz(a,h)anthracene	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Dibenzofuran	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Diethylphthalate	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Dimethyl phthalate	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Fluoranthene	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U

Aquifer	Yorktown-Eastover			Columbia		Yorktown-Eastover		Columbia		Columbia		
Station ID	YS01-GW012B			YS01-GW013		YS01-GW013A		YS01-GW014		YS01-GW017		
Sample ID	YS01-MW012B-0904	YS01-MW012B-0205	YS01-MW012B-0505	YS01-MW013-0792	YS01-MW013-0296	YS01-MW013A-0296	YS01-MW013AP-0296	YS01-MW014-0792	YS01-MW014-0296	YS01-MW017-0792	YS01-MW017P-0792	YS01-MW017-0296
Sample Date	09/22/04	02/10/05	05/04/05	07/20/92	02/10/96	02/10/96	02/10/96	07/20/92	02/08/96	07/20/92	07/20/92	02/08/96
Investigation	GW RI Data	LTM Data	LTM Data	HIstorical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data
Chemical Name												
Fluorene	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Hexachloroethane	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Isophorone	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Naphthalene	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Nitrobenzene	10 U	NA	NA	NA	10 U	10 U	10 U	NA	3 J	NA	NA	1 J
Pentachlorophenol	25 U	NA	NA	28 U	25 U	26 U	26 U	27 U	24 U	26 U	26 U	24 U
Phenanthrene	10 U	NA	NA	11 U	10 U	2 J	2 J	11 U	10 U	10 U	10 U	10 U
Phenol	21	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Pyrene	10 U	NA	NA	11 U	10 U	2 J	10 U	11 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)ether	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	10 U	NA	NA	12 U	1 B	10 B	5 B	24 U	1 B	15 U	12 U	1 B
n-Nitroso-di-n-propylamine	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
n-Nitrosodiphenylamine	10 U	NA	NA	11 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U
Pesticide/Polychlorinated Biphenyls (UG/L)												
4,4'-DDD	0.1 U	NA	NA	NA	0.098 UJ	0.1 UL	0.1 UL	NA	0.096 U	NA	NA	0.096 U
4,4'-DDE	0.1 U	NA	NA	NA	0.098 UJ	0.1 UL	0.1 UL	NA	0.096 U	NA	NA	0.096 U
4,4'-DDT	0.1 U	NA	NA	NA	0.098 UJ	0.1 UL	0.1 UL	NA	0.096 U	NA	NA	0.096 U
Aldrin	0.05 U	NA	NA	NA	0.049 UJ	0.052 UL	0.052 UL	NA	0.048 U	NA	NA	0.048 U
Aroclor-1016	1 U	NA	NA	NA	0.98 UJ	1 UL	1 UL	NA	0.96 U	NA	NA	0.96 U
Aroclor-1221	2 U	NA	NA	NA	2 UJ	2.1 UL	2.1 UL	NA	1.9 U	NA	NA	1.9 U
Aroclor-1232	1 U	NA	NA	NA	0.98 UJ	1 UL	1 UL	NA	0.96 U	NA	NA	0.96 U
Aroclor-1242	1 U	NA	NA	NA	0.98 UJ	1 UL	1 UL	NA	0.96 U	NA	NA	0.96 U
Aroclor-1248	1 U	NA	NA	NA	0.98 UJ	1 UL	1 UL	NA	0.96 U	NA	NA	0.96 U
Aroclor-1254	1 U	NA	NA	NA	0.98 UJ	1 UL	1 UL	NA	0.96 U	NA	NA	0.96 U
Aroclor-1260	1 U	NA	NA	NA	0.98 UJ	1 UL	1 UL	NA	0.96 U	NA	NA	0.96 U
Dieldrin	0.1 U	NA	NA	NA	0.098 UJ	0.1 UL	0.1 UL	NA	0.096 U	NA	NA	0.096 U
Endosulfan I	0.05 U	NA	NA	NA	0.049 UJ	0.052 UL	0.052 UL	NA	0.048 U	NA	NA	0.048 U
Endosulfan II	0.1 U	NA	NA	NA	0.098 UJ	0.1 UL	0.1 UL	NA	0.096 U	NA	NA	0.096 U
Endosulfan sulfate	0.1 U	NA	NA	NA	0.098 UJ	0.1 UL	0.1 UL	NA	0.096 U	NA	NA	0.096 U
Endrin	0.1 U	NA	NA	NA	0.098 UJ	0.1 UL	0.1 UL	NA	0.096 U	NA	NA	0.096 U
Endrin aldehyde	0.1 U	NA	NA	NA	0.098 UJ	0.1 UL	0.1 UL	NA	0.096 U	NA	NA	0.096 U
Endrin ketone	0.1 U	NA	NA	NA	0.098 UJ	0.1 UL	0.1 UL	NA	0.096 U	NA	NA	0.096 U
Heptachlor	0.05 U	NA	NA	NA	0.049 UJ	0.052 UL	0.052 UL	NA	0.048 U	NA	NA	0.048 U
Heptachlor epoxide	0.05 U	NA	NA	NA	0.049 UJ	0.052 UL	0.052 UL	NA	0.048 U	NA	NA	0.048 U
Methoxychlor	0.5 U	NA	NA	NA	0.49 UJ	0.52 UL	0.52 UL	NA	0.48 U	NA	NA	0.48 U
Toxaphene	5 U	NA	NA	NA	4.9 UJ	5.2 UL	5.2 UL	NA	4.8 U	NA	NA	4.8 U
alpha-BHC	0.05 U	NA	NA	NA	0.049 UJ	0.052 UL	0.052 UL	NA	0.048 U	NA	NA	0.048 U
alpha-Chlordane	0.01 B	NA	NA	NA	0.049 UJ	0.052 UL	0.052 UL	NA	0.048 U	NA	NA	0.048 U
beta-BHC	0.05 U	NA	NA	NA	0.049 UJ	0.052 UL	0.052 UL	NA	0.048 U	NA	NA	0.048 U
delta-BHC	0.05 U	NA	NA	NA	0.049 UJ	0.052 UL	0.052 UL	NA	0.048 U	NA	NA	0.048 U
gamma-BHC (Lindane)	0.05 U	NA	NA	NA	0.049 UJ	0.052 UL	0.052 UL	NA	0.048 U	NA	NA	0.048 U
gamma-Chlordane	0.05 U	NA	NA	NA	0.049 UJ	0.052 UL	0.052 UL	NA	0.048 U	NA	NA	0.048 U
Explosives (UG/L)												
1,3,5-Trinitrobenzene	NA	NA	NA	1.3 U	0.15 U	0.1 U	0.14 U	1.3 U	0.1 U	1.3 U	1.3 U	0.14 U
1,3-Dinitrobenzene	NA	NA	NA	0.31 U	0.14 U	0.094 U	0.12 U	0.31 U	0.097 U	0.31 U	0.31 U	0.13 U

Aquifer	Yorktown-Eastover			Columbia		Yorktown-Eastover		Columbia		Columbia		
Station ID	YS01-GW012B			YS01-GW013		YS01-GW013A		YS01-GW014		YS01-GW017		
Sample ID	YS01-MW012B-0904	YS01-MW012B-0205	YS01-MW012B-0505	YS01-MW013-0792	YS01-MW013-0296	YS01-MW013A-0296	YS01-MW013AP-0296	YS01-MW014-0792	YS01-MW014-0296	YS01-MW017-0792	YS01-MW017P-0792	YS01-MW017-0296
Sample Date	09/22/04	02/10/05	05/04/05	07/20/92	02/10/96	02/10/96	02/10/96	07/20/92	02/08/96	07/20/92	07/20/92	02/08/96
Investigation	GW RI Data	LTM Data	LTM Data	HIstorical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data
Chemical Name												
2,4,6-Trinitrotoluene	NA	NA	NA	1.3 U	0.15 U	0.097 U	0.13 U	1.3 U	0.1 U	1.3 U	1.3 U	0.13 U
2,4-Dinitrotoluene	NA	NA	NA	0.31 U	NA	NA	NA	0.31 U	NA	0.31 U	0.31 U	NA
2,6-Dinitrotoluene	NA	NA	NA	0.31 U	NA	NA	NA	0.31 U	NA	0.31 U	0.31 U	NA
2-Nitrotoluene	NA	NA	NA	NA	0.58 U	0.39 U	0.52 U	NA	0.4 U	NA	NA	0.53 U
3-Nitrotoluene	NA	NA	NA	NA	0.58 U	0.39 U	0.52 U	NA	0.4 U	NA	NA	0.53 U
4-Nitrotoluene	NA	NA	NA	NA	1.8 U	1.2 U	1.6 U	NA	1.2 U	NA	NA	1.6 U
Aminodinitrotoluenes	NA	NA	NA	NA	0.23 U	0.16 U	0.21 U	NA	0.16 U	NA	NA	0.21 U
Dinitrotoluene mixture	NA	NA	NA	NA	0.23 U	0.16 U	0.21 U	NA	0.16 U	NA	NA	0.21 U
HMX	NA	NA	NA	0.63 U	1.3 U	0.86 U	1.1 U	0.63 U	0.88 U	0.63 U	0.63 U	1.2 U
Nitrobenzene	NA	NA	NA	0.31 U	0.24 U	0.16 U	0.22 U	0.31 U	1.4	0.31 U	0.31 U	0.7
RDX	NA	NA	NA	0.63 U	0.63 U	0.42 U	0.56 U	0.63 U	0.43 U	0.63 U	0.63 U	0.58 U
Tetryl	NA	NA	NA	3.1 U	0.44 U	0.3 U	0.39 U	3.1 U	0.3 U	3.1 U	3.1 U	0.4 U
Total Metals (UG/L)												
Aluminum	1,420	NA	NA	377 J	449	25,900	18,100	401 J	1,310	1,400 J	1,140 J	968
Antimony	1.9 U	NA	NA	44 U	19.8 U	19.8 U	19.8 U	44 U	19.8 U	44 U	44 U	19.8 U
Arsenic	2.1 U	NA	NA	2 UJ	0.9 UL	24 L	18.1 L	2 U	0.9 U	2 U	2 U	0.9 U
Barium	25.2 B	NA	NA	61.6	40.7	105	81	38.8	67.5	25.2	28.1	16.2
Beryllium	0.1 B	NA	NA	1 U	0.8 U	1.1	2.1	1 U	0.9 B	1 U	1 U	0.8 U
Cadmium	0.2 U	NA	NA	4 U	2.2 U	3.3	2.4	4 U	2.2 U	4 U	4 U	2.2 U
Calcium	53,600	NA	NA	9,540	4,280	138,000	109,000	5,490	2,150	9,470	9,000	14,200
Chromium	0.9 U	NA	NA	8 U	2.4 U	154	112	8 U	2.4 U	8 U	8 U	2.4 U
Cobalt	0.5 U	NA	NA	6 U	3 U	12.6	9.6	17.9	11.2	6 U	6 U	3 U
Copper	8 B	NA	NA	5 U	6.3	44.2	32.6	5 U	2 U	5 U	5 U	2 U
Cyanide	1.1 U	NA	NA	NA	10 UL	10 UL	10 UL	NA	10 U	NA	NA	10 U
Iron	79.4 B	NA	NA	652 J	2,520	73,400	53,600	906 J	407	2,460 J	1,920 J	1,210
Lead	1.1 U	NA	NA	4.3 J	3.1	26.7	20.3	5.1 J	3.6	2.3 J	2.2 J	1
Magnesium	453 J	NA	NA	3,680 J	1,540	11,600	8,480	1,090 J	1,030	4,410 J	4,320 J	4,220
Manganese	0.35 B	NA	NA	84.7	73.9	334	253	30.7	47.9	164	163	90.6
Mercury	0.1 UJ	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	0.6 U	NA	NA	18 U	11.3 U	41.3	41.6	18 U	11.3 U	18 U	18 U	11.3 U
Potassium	6,540	NA	NA	1,470	1,260 L	12,800	10,100	970 U	828 U	2,930	2,380	1,250
Selenium	2.4 U	NA	NA	2 U	1.3 U	2.7	2.1	2 U	1.3 U	2 UJ	2 U	1.3 U
Silver	0.8 U	NA	NA	6 U	3.1 U	3.1 U	3.1 U	6 U	3.1 U	6 U	6 U	3.1 U
Sodium	8,190	NA	NA	2,550 J	2,070	5,650	5,810	2,610 J	3,530	1,880 J	1,810 J	3,470
Thallium	2.8 U	NA	NA	2 U	0.9 U	0.9 UL	0.9 U	2 U	0.9 U	2 U	2 U	0.9 U
Vanadium	2 B	NA	NA	6 U	2.4 U	104	75	6 U	2.7	6 U	6 U	4.3
Zinc	4.6 B	NA	NA	22.6	3.6 UL	156	117	28.2	11.9	20.1 U	16.6 U	3.6 U
Dissolved Metals (UG/L)												
Aluminum	2,670	NA	NA	67.2 J	53.6	68.8	23.3 U	111 J	966	345 J	296 J	255 B
Antimony	2 U	NA	NA	44 U	19.8 U	19.8 U	19.8 U	44 U	19.8 U	44 U	44 U	19.8 U
Arsenic	1.8 U	NA	NA	2 UJ	0.9 UL	1.4 L	1.1 L	2 UJ	0.9 U	2 UJ	2 UJ	0.9 U
Barium	33.5 B	NA	NA	63.2	39.1	18.6	19.8	35.3	66.1	21.2	21	13.4
Beryllium	0.1 U	NA	NA	1 U	0.8 U	0.8 U	0.8 U	1 U	0.96 B	1 U	1 U	0.8 U
Cadmium	0.2 U	NA	NA	4 U	2.2 U	2.2 U	2.2 U	4 U	2.2 U	4 U	4 U	2.2 U
Calcium	113,000	NA	NA	10,100	4,150	31,400	31,300	5,010	2,190	9,190	9,490	13,600
Chromium	0.5 U	NA	NA	8 U	2.4 U	2.4 U	2.4 U	8 U	2.4 U	8 U	8 U	2.4 U
Cobalt	0.3 U	NA	NA	6 U	3 U	3 U	3 U	16.4	14.2	6 U	6 U	4.7
Copper	1.1 B	NA	NA	5 U	2 U	2 U	2 U	5 U	2 U	5 U	5 U	2 U
Iron	10.7 U	NA	NA	19 U	853	178	74.5	443 J	31.6 B	43.5 J	39.4 J	95.9 B
Lead	0.9 U	NA	NA	2 UJ	0.93	0.8 U	0.8 U	2 U	1.6	2 UJ	2 UJ	0.8 U

Appendix G
Groundwater Analytical Results at Site 1
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	Yorktown-Eastover			Columbia		Yorktown-Eastover		Columbia		Columbia		
Station ID	YS01-GW012B			YS01-GW013		YS01-GW013A		YS01-GW014		YS01-GW017		
Sample ID	YS01-MW012B-0904	YS01-MW012B-0205	YS01-MW012B-0505	YS01-MW013-0792	YS01-MW013-0296	YS01-MW013A-0296	YS01-MW013AP-0296	YS01-MW014-0792	YS01-MW014-0296	YS01-MW017-0792	YS01-MW017P-0792	YS01-MW017-0296
Sample Date	09/22/04	02/10/05	05/04/05	07/20/92	02/10/96	02/10/96	02/10/96	07/20/92	02/08/96	07/20/92	07/20/92	02/08/96
Investigation	GW RI Data	LTM Data	LTM Data	HIstorical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data
Chemical Name												
Magnesium	19.5 B	NA	NA	4,240 J	1,500	744	697	1,120 UJ	1,000	4,370 J	4,430 J	4,060
Manganese	0.1 U	NA	NA	69.2	71.3	15.9	16.1	23.7	48.1	140	138	84.3
Mercury	0.1 UJ	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	0.5 U	NA	NA	18 U	11.3 U	11.3 U	11.3 U	18 U	11.3 U	18 U	18 U	11.3 U
Potassium	3,370 J	NA	NA	1,800	1,260 L	2,210 L	2,060 L	970 U	847	3,140	3,120 J	1,020
Selenium	2.6 U	NA	NA	2 UJ	1.3 U	1.3 U	1.3 U	2 UJ	1.3 U	2 UJ	2 UJ	1.3 U
Silver	0.7 U	NA	NA	6 U	3.1 U	3.1 U	3.1 U	6 U	3.1 U	6 U	6 U	3.1 U
Sodium	10,700	NA	NA	2,730 J	2,130	4,480	4,400	2,480 J	3,570	1,650 J	1,630 J	3,380
Thallium	1.9 U	NA	NA	2 U	0.9 U	0.9 U	0.9 U	2 U	0.9 U	2 U	2 U	0.9 U
Vanadium	1.8 B	NA	NA	6 U	2.4 U	2.4 U	2.4 U	6 U	2.4 U	6 U	6 U	2.4 U
Zinc	2.8 B	NA	NA	9.3 U	3.6 UL	3.6 UL	3.6 UL	39.4	11.9	9.2 U	10.6 U	3.6 U
Wet Chemistry (MG/L)												
Nitrate	NA	NA	NA	3.4 J	NA	NA	NA	0.15 J	NA	6.4 J	8.2 J	NA

Notes:
Shaded values indicate the analyte was detected
LTM = Long Term Monitoring
RI = Remedial Investigation
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level repo
J = Analyte present. Reported value may or may n
K = Analyte present. Reported value may be biase
L = Analyte present. Reported value may be biase
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccu
UL = Not detected, quantitation limit is probably hig

Aquifer	Columbia	Columbia	Columbia					Columbia
Station ID	YS01-GW018	YS01-GW019	YS01-GW020					YS01-GW021
Sample ID	YS01-MW018-0296	YS01-MW019-0296	YS01-MW020-0296	YS01-MW020-0904	YS01-MW020-0205	YS01-MW020-0505	YS01-MW020-0805	YS01-MW021-0296
Sample Date	02/09/96	02/09/96	02/10/96	09/22/04	02/10/05	05/04/05	08/04/05	02/10/96
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data
Chemical Name								
Volatile Organic Compounds (UG/L)								
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA	NA	NA	10 U	10 U	10 U	10 U	NA
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	NA	NA	NA	10 U	10 U	10 U	10 U	NA
1,2-Dibromo-3-chloropropane	NA	NA	NA	10 U	10 U	10 U	10 U	NA
1,2-Dibromoethane	NA	NA	NA	10 U	10 U	10 U	10 U	NA
1,2-Dichlorobenzene	NA	NA	NA	10 U	10 U	10 U	10 U	NA
1,2-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	10 U	10 U	52	NA	NA	NA	NA	10 U
1,2-Dichloropropane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	NA	NA	NA	10 U	10 U	10 U	10 U	NA
1,4-Dichlorobenzene	NA	NA	NA	10 U	10 U	10 U	10 U	NA
2-Butanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	10 U	10 U	10 U	10 U	5 J	10 U	6 B	10 U
Benzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	10 U	10 U	10 U	10 U	10 U	10 U	10 U	3 J
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	NA	NA	NA	10 U	10 U	10 U	10 U	NA
Dibromochloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane (Freon-12)	NA	NA	NA	10 U	10 U	10 U	10 U	NA
Ethylbenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl acetate	NA	NA	NA	10 U	10 U	10 U	10 U	NA
Methyl-tert-butyl ether (MTBE)	NA	NA	NA	10 U	10 U	10 U	10 U	NA
Methylcyclohexane	NA	NA	NA	10 U	10 U	10 U	10 U	NA
Methylene chloride	10 U	10 U	10 U	10 U	10 U	67	10 U	10 U
Styrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	10 U	4 J	190	3 J	3 J	1 J	10 U	2 J
Trichlorofluoromethane(Freon-11)	NA	NA	NA	10 U	10 U	10 U	10 U	NA
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Xylene, total	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	NA	NA	NA	10 U	2 J	10 U	10 U	NA
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
isopropylbenzene	NA	NA	NA	10 U	10 U	10 U	10 U	NA
trans-1,2-Dichloroethene	NA	NA	NA	10 U	10 U	10 U	10 U	NA
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Aquifer	Columbia	Columbia	Columbia					Columbia
Station ID	YS01-GW018	YS01-GW019	YS01-GW020					YS01-GW021
Sample ID	YS01-MW018-0296	YS01-MW019-0296	YS01-MW020-0296	YS01-MW020-0904	YS01-MW020-0205	YS01-MW020-0505	YS01-MW020-0805	YS01-MW021-0296
Sample Date	02/09/96	02/09/96	02/10/96	09/22/04	02/10/05	05/04/05	08/04/05	02/10/96
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data
Chemical Name								
Semi-volatile Organic Compounds (UG/L)								
1,1-Biphenyl	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
1,2-Dichlorobenzene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
1,3-Dichlorobenzene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
1,4-Dichlorobenzene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
2,2'-oxybis(1-chloropropane)	9 U	10 U	9 U	NA	NA	NA	NA	10 U
2,4,5-Trichlorophenol	24 U	25 U	24 U	NA	NA	NA	NA	24 U
2,4,6-Trichlorophenol	9 U	10 U	9 U	NA	NA	NA	NA	10 U
2,4-Dichlorophenol	9 U	10 U	9 U	NA	NA	NA	NA	10 U
2,4-Dimethylphenol	9 U	10 U	9 U	NA	NA	NA	NA	10 U
2,4-Dinitrophenol	24 U	25 U	24 U	NA	NA	NA	NA	24 U
2,4-Dinitrotoluene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
2,6-Dinitrotoluene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
2-Chloronaphthalene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
2-Chlorophenol	9 U	10 U	9 U	NA	NA	NA	NA	10 U
2-Methylnaphthalene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
2-Methylphenol	9 U	10 U	9 U	NA	NA	NA	NA	10 U
2-Nitroaniline	24 U	25 U	24 U	NA	NA	NA	NA	24 U
2-Nitrophenol	9 U	10 U	9 U	NA	NA	NA	NA	10 U
3,3'-Dichlorobenzidine	9 U	10 U	9 U	NA	NA	NA	NA	10 U
3-Nitroaniline	24 U	25 U	24 U	NA	NA	NA	NA	24 U
4,6-Dinitro-2-methylphenol	24 U	25 U	24 U	NA	NA	NA	NA	24 U
4-Bromophenyl-phenylether	9 U	10 U	9 U	NA	NA	NA	NA	10 U
4-Chloro-3-methylphenol	9 U	10 U	9 U	NA	NA	NA	NA	10 U
4-Chloroaniline	9 U	10 U	9 U	NA	NA	NA	NA	10 U
4-Chlorophenyl-phenylether	9 U	10 U	9 U	NA	NA	NA	NA	10 U
4-Methylphenol	9 U	10 U	9 U	NA	NA	NA	NA	10 U
4-Nitroaniline	24 U	25 U	24 U	NA	NA	NA	NA	24 U
4-Nitrophenol	24 U	25 U	24 U	NA	NA	NA	NA	24 U
Acenaphthene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Acenaphthylene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Acetophenone	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Atrazine	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Benzo(a)pyrene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Benzo(b)fluoranthene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Benzo(g,h,i)perylene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Benzo(k)fluoranthene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Butylbenzylphthalate	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Caprolactam	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Chrysene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Di-n-butylphthalate	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Di-n-octylphthalate	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Dibenz(a,h)anthracene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Dibenzofuran	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Diethylphthalate	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Dimethyl phthalate	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Fluoranthene	9 U	10 U	9 U	NA	NA	NA	NA	10 U

Aquifer	Columbia	Columbia	Columbia					Columbia
Station ID	YS01-GW018	YS01-GW019	YS01-GW020					YS01-GW021
Sample ID	YS01-MW018-0296	YS01-MW019-0296	YS01-MW020-0296	YS01-MW020-0904	YS01-MW020-0205	YS01-MW020-0505	YS01-MW020-0805	YS01-MW021-0296
Sample Date	02/09/96	02/09/96	02/10/96	09/22/04	02/10/05	05/04/05	08/04/05	02/10/96
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data
Chemical Name								
Fluorene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Hexachlorobenzene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Hexachlorobutadiene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Hexachlorocyclopentadiene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Hexachloroethane	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Indeno(1,2,3-cd)pyrene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Isophorone	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Naphthalene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Nitrobenzene	2 J	10 U	9 U	NA	NA	NA	NA	10 U
Pentachlorophenol	24 U	25 U	24 U	NA	NA	NA	NA	24 U
Phenanthrene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Phenol	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Pyrene	9 U	10 U	9 U	NA	NA	NA	NA	10 U
bis(2-Chloroethoxy)methane	9 U	10 U	9 U	NA	NA	NA	NA	10 U
bis(2-Chloroethyl)ether	9 U	10 U	9 U	NA	NA	NA	NA	10 U
bis(2-Ethylhexyl)phthalate	2 B	10 U	14 B	NA	NA	NA	NA	10 U
n-Nitroso-di-n-propylamine	9 U	10 U	9 U	NA	NA	NA	NA	10 U
n-Nitrosodiphenylamine	9 U	10 U	9 U	NA	NA	NA	NA	10 U
Pesticide/Polychlorinated Biphenyls (UG/L)								
4,4'-DDD	0.095 UJ	0.097 UJ	0.095 U	NA	NA	NA	NA	0.096 U
4,4'-DDE	0.095 UJ	0.097 UJ	0.095 U	NA	NA	NA	NA	0.096 U
4,4'-DDT	0.095 UJ	0.097 UJ	0.095 U	NA	NA	NA	NA	0.096 U
Aldrin	0.048 UJ	0.048 UJ	0.048 U	NA	NA	NA	NA	0.048 U
Aroclor-1016	0.95 UJ	0.97 UJ	0.95 U	NA	NA	NA	NA	0.96 U
Aroclor-1221	1.9 UJ	1.9 UJ	1.9 U	NA	NA	NA	NA	1.9 U
Aroclor-1232	0.95 UJ	0.97 UJ	0.95 U	NA	NA	NA	NA	0.96 U
Aroclor-1242	0.95 UJ	0.97 UJ	0.95 U	NA	NA	NA	NA	0.96 U
Aroclor-1248	0.95 UJ	0.97 UJ	0.95 U	NA	NA	NA	NA	0.96 U
Aroclor-1254	0.95 UJ	0.97 UJ	0.95 U	NA	NA	NA	NA	0.96 U
Aroclor-1260	0.95 UJ	0.97 UJ	0.95 U	NA	NA	NA	NA	0.96 U
Dieldrin	0.095 UJ	0.097 UJ	0.095 U	NA	NA	NA	NA	0.096 U
Endosulfan I	0.048 UJ	0.048 UJ	0.048 U	NA	NA	NA	NA	0.048 U
Endosulfan II	0.095 UJ	0.097 UJ	0.095 U	NA	NA	NA	NA	0.096 U
Endosulfan sulfate	0.095 UJ	0.097 UJ	0.095 U	NA	NA	NA	NA	0.096 U
Endrin	0.095 UJ	0.097 UJ	0.095 U	NA	NA	NA	NA	0.096 U
Endrin aldehyde	0.095 UJ	0.097 UJ	0.095 U	NA	NA	NA	NA	0.096 U
Endrin ketone	0.095 UJ	0.097 UJ	0.095 U	NA	NA	NA	NA	0.096 U
Heptachlor	0.048 UJ	0.048 UJ	0.048 U	NA	NA	NA	NA	0.048 U
Heptachlor epoxide	0.048 UJ	0.048 UJ	0.048 U	NA	NA	NA	NA	0.048 U
Methoxychlor	0.48 UJ	0.48 UJ	0.48 U	NA	NA	NA	NA	0.48 U
Toxaphene	4.8 UJ	4.8 UJ	4.8 U	NA	NA	NA	NA	4.8 U
alpha-BHC	0.048 UJ	0.048 UJ	0.048 U	NA	NA	NA	NA	0.048 U
alpha-Chlordane	0.048 UJ	0.048 UJ	0.048 U	NA	NA	NA	NA	0.048 U
beta-BHC	0.048 UJ	0.048 UJ	0.048 U	NA	NA	NA	NA	0.048 U
delta-BHC	0.048 UJ	0.048 UJ	0.048 U	NA	NA	NA	NA	0.048 U
gamma-BHC (Lindane)	0.048 UJ	0.048 UJ	0.048 U	NA	NA	NA	NA	0.048 U
gamma-Chlordane	0.048 UJ	0.048 UJ	0.048 U	NA	NA	NA	NA	0.048 U
Explosives (UG/L)								
1,3,5-Trinitrobenzene	0.14 U	0.14 U	0.098 U	NA	NA	NA	NA	0.2 U
1,3-Dinitrobenzene	0.13 U	0.13 U	0.09 U	NA	NA	NA	NA	0.18 U

Aquifer	Columbia	Columbia	Columbia					Columbia
Station ID	YS01-GW018	YS01-GW019	YS01-GW020					YS01-GW021
Sample ID	YS01-MW018-0296	YS01-MW019-0296	YS01-MW020-0296	YS01-MW020-0904	YS01-MW020-0205	YS01-MW020-0505	YS01-MW020-0805	YS01-MW021-0296
Sample Date	02/09/96	02/09/96	02/10/96	09/22/04	02/10/05	05/04/05	08/04/05	02/10/96
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data
Chemical Name								
2,4,6-Trinitrotoluene	0.14 U	0.13 U	0.094 U	NA	NA	NA	NA	0.19 U
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrotoluene	0.54 U	0.53 U	0.38 U	NA	NA	NA	NA	0.75 U
3-Nitrotoluene	0.54 U	0.53 U	0.38 U	NA	NA	NA	NA	0.75 U
4-Nitrotoluene	1.6 U	1.6 U	1.1 U	NA	NA	NA	NA	2.2 U
Aminodinitrotoluenes	0.22 U	0.21 U	0.15 U	NA	NA	NA	NA	0.3 U
Dinitrotoluene mixture	0.22 U	0.21 U	0.15 U	NA	NA	NA	NA	0.3 U
HMX	1.2 U	1.2 U	0.83 U	NA	NA	NA	NA	1.6 U
Nitrobenzene	1.3	0.22 U	0.16 U	NA	NA	NA	NA	0.32 U
RDX	0.59 U	0.58 U	0.41 U	NA	NA	NA	NA	0.81 U
Tetryl	0.41 U	0.4 U	0.29 U	NA	NA	NA	NA	0.57 U
Total Metals (UG/L)								
Aluminum	23.3 U	2,200	217 B	NA	NA	NA	NA	323
Antimony	19.8 U	19.8 U	19.8 U	NA	NA	NA	NA	19.8 U
Arsenic	3.5	3.9	0.9 U	NA	NA	NA	NA	0.9 U
Barium	97.1	52.7	25.4	NA	NA	NA	NA	15.9
Beryllium	0.8 U	0.8 U	0.8 U	NA	NA	NA	NA	0.8 U
Cadmium	2.2 U	2.2 U	2.2 U	NA	NA	NA	NA	2.2 U
Calcium	23,000	94,400	23,200	NA	NA	NA	NA	87,900
Chromium	2.4 U	6.4	2.4 U	NA	NA	NA	NA	2.4 U
Cobalt	3 U	3.4	3.3	NA	NA	NA	NA	4.1
Copper	2 U	2.8	2.6	NA	NA	NA	NA	2 U
Cyanide	10 U	10 U	10 U	NA	NA	NA	NA	10 U
Iron	55,300	3,840	304	NA	NA	NA	NA	730
Lead	1.1	2.3	0.86	NA	NA	NA	NA	0.95
Magnesium	3,580	5,350	4,620	NA	NA	NA	NA	2,520
Manganese	1,500	71.8	6.6 B	NA	NA	NA	NA	30.7
Mercury	0.1 U	0.1 U	0.1 U	NA	NA	NA	NA	0.1 U
Nickel	11.3 U	11.3 U	11.3 U	NA	NA	NA	NA	11.3 U
Potassium	1,370 L	3,010	2,910	NA	NA	NA	NA	1,120
Selenium	1.5	1.3 U	1.3 U	NA	NA	NA	NA	1.3 U
Silver	3.1 U	3.1 U	3.1 U	NA	NA	NA	NA	3.1 U
Sodium	2,240	2,480	4,430	NA	NA	NA	NA	6,890
Thallium	0.9 U	0.9 U	0.9 U	NA	NA	NA	NA	0.9 U
Vanadium	2.4 U	7.8	3.7	NA	NA	NA	NA	3.9
Zinc	6.1 L	30.1	10.1	NA	NA	NA	NA	3.6 U
Dissolved Metals (UG/L)								
Aluminum	383	29.4 B	51.6 B	NA	NA	NA	NA	23.3 U
Antimony	19.8 U	19.8 U	19.8 U	NA	NA	NA	NA	19.8 U
Arsenic	4.4 L	1.7	0.9 U	NA	NA	NA	NA	0.9 U
Barium	101	47.7	30.2	NA	NA	NA	NA	14.4
Beryllium	0.8 U	0.9 B	0.8 U	NA	NA	NA	NA	0.8 U
Cadmium	2.2 U	2.2 U	2.2 U	NA	NA	NA	NA	2.2 U
Calcium	23,700	94,400	20,800	NA	NA	NA	NA	85,600
Chromium	2.4 U	2.4 U	2.4 U	NA	NA	NA	NA	2.4 U
Cobalt	5.7	4.1	3.6	NA	NA	NA	NA	3 U
Copper	2 U	2.4	27.6	NA	NA	NA	NA	2 U
Iron	54,900	1,970	54.8 B	NA	NA	NA	NA	22 B
Lead	1.7 K	0.8 U	1.5 U	NA	NA	NA	NA	2.4

Aquifer	Columbia	Columbia	Columbia					Columbia
Station ID	YS01-GW018	YS01-GW019	YS01-GW020					YS01-GW021
Sample ID	YS01-MW018-0296	YS01-MW019-0296	YS01-MW020-0296	YS01-MW020-0904	YS01-MW020-0205	YS01-MW020-0505	YS01-MW020-0805	YS01-MW021-0296
Sample Date	02/09/96	02/09/96	02/10/96	09/22/04	02/10/05	05/04/05	08/04/05	02/10/96
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data
Chemical Name								
Magnesium	3,680	5,220	4,650	NA	NA	NA	NA	2,440
Manganese	1,530	64.8	10.3 B	NA	NA	NA	NA	29.4
Mercury	0.1 U	0.1 U	0.1 U	NA	NA	NA	NA	0.1 U
Nickel	11.3 U	11.3 U	11.3 U	NA	NA	NA	NA	11.3 U
Potassium	2,000	2,490	2,390	NA	NA	NA	NA	1,300
Selenium	1.3 U	1.3 U	1.3 U	NA	NA	NA	NA	1.3 U
Silver	3.1 U	3.1 U	3.1 U	NA	NA	NA	NA	3.1 U
Sodium	2,270	2,430	4,410	NA	NA	NA	NA	6,950
Thallium	0.9 U	0.9 U	0.9 U	NA	NA	NA	NA	0.9 U
Vanadium	2.4 U	2.4 U	2.4	NA	NA	NA	NA	2.4 U
Zinc	14.8	28.3	31.8	NA	NA	NA	NA	3.6 U
Wet Chemistry (MG/L)								
Nitrate	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Shaded values indicate the analyte was detected
LTM = Long Term Monitoring
RI = Remedial Investigation
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level repo
J = Analyte present. Reported value may or may n
K = Analyte present. Reported value may be biase
L = Analyte present. Reported value may be biase
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccu
UL = Not detected, quantitation limit is probably hig

Aquifer	Yorktown-Eastover			Yorktown-Eastover		Yorktown-Eastover		Yorktown-Eastover				
Station ID	YS03-GW006			YS03-GW007		YS03-GW008		YS03-GW008A				
Sample ID	YS03-MW006-0792	YS03-MW006-0296	YS03-MW006P-0296	YS03-MW007-0792	YS03-MW007-0296	YS03-MW008-0792	YS03-MW008-0296	YS03-MW008A-0296	YS03-MW008A-0600	YS03-MW008A-0904	YS03-MW008AP-0904	YS03-MW008A-0205
Sample Date	07/21/92	02/11/96	02/11/96	07/21/92	02/11/96	07/21/92	02/11/96	02/12/96	06/12/00	09/19/04	09/19/04	02/11/05
Investigation	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	GW RI Data	GW RI Data	LTM Data
Chemical Name												
Volatile Organic Compounds (UG/L)												
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U
1,2-Dibromo-3-chloropropane	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA	NA
1,2-Dichloropropane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U
2-Butanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ	10 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
Benzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U
Dibromochloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane (Freon-12)	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U
Ethylbenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl acetate	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U
Methyl-tert-butyl ether (MTBE)	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U
Methylcyclohexane	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U
Methylene chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	2 B	10 U	10 U	10 U
Styrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	2 B
Trichloroethene	3 J	3 J	10 U	9 J	3 J	16	10	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane(Freon-11)	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Xylene, total	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
isopropylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Aquifer	Yorktown-Eastover			Yorktown-Eastover		Yorktown-Eastover		Yorktown-Eastover				
Station ID	YS03-GW006			YS03-GW007		YS03-GW008		YS03-GW008A				
Sample ID	YS03-MW006-0792	YS03-MW006-0296	YS03-MW006P-0296	YS03-MW007-0792	YS03-MW007-0296	YS03-MW008-0792	YS03-MW008-0296	YS03-MW008A-0296	YS03-MW008A-0600	YS03-MW008A-0904	YS03-MW008AP-0904	YS03-MW008A-0205
Sample Date	07/21/92	02/11/96	02/11/96	07/21/92	02/11/96	07/21/92	02/11/96	02/12/96	06/12/00	09/19/04	09/19/04	02/11/05
Investigation	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	GW RI Data	GW RI Data	LTM Data
Chemical Name												
Semi-volatile Organic Compounds (UG/L)												
1,1-Biphenyl	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
1,2-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
1,3-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
1,4-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
2,2'-oxybis(1-chloropropane)	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
2,4,5-Trichlorophenol	26 U	25 U	25 U	26 U	25 U	30 U	24 U	26 U	NA	NA	NA	NA
2,4,6-Trichlorophenol	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
2,4-Dichlorophenol	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
2,4-Dimethylphenol	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
2,4-Dinitrophenol	26 U	25 UJ	25 UJ	26 U	25 U	30 U	24 UJ	26 UJ	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	10 U	10 U	NA	10 U	NA	10 U	10 U	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	10 U	10 U	NA	10 U	NA	10 U	10 U	NA	NA	NA	NA
2-Chloronaphthalene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
2-Chlorophenol	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
2-Methylnaphthalene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
2-Methylphenol	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
2-Nitroaniline	10 U	25 U	25 U	26 U	25 U	30 U	24 U	26 U	NA	NA	NA	NA
2-Nitrophenol	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
3,3'-Dichlorobenzidine	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
3-Nitroaniline	26 U	25 U	25 U	26 U	25 U	30 U	24 U	26 U	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	26 U	25 UJ	25 UJ	26 U	25 U	30 U	24 UJ	26 UJ	NA	NA	NA	NA
4-Bromophenyl-phenylether	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
4-Chloro-3-methylphenol	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
4-Chloroaniline	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
4-Chlorophenyl-phenylether	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
4-Methylphenol	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
4-Nitroaniline	26 U	25 U	25 U	26 U	25 U	30 U	24 U	26 U	NA	NA	NA	NA
4-Nitrophenol	26 U	25 U	25 U	26 U	25 U	30 U	24 U	26 U	NA	NA	NA	NA
Acenaphthene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Acenaphthylene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Acetophenone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Atrazine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Benzo(a)pyrene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Benzo(b)fluoranthene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Benzo(g,h,i)perylene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Benzo(k)fluoranthene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Butylbenzylphthalate	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Caprolactam	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Chrysene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Di-n-butylphthalate	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Di-n-octylphthalate	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Dibenz(a,h)anthracene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Dibenzofuran	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Diethylphthalate	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Dimethyl phthalate	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Fluoranthene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA

Aquifer	Yorktown-Eastover			Yorktown-Eastover		Yorktown-Eastover		Yorktown-Eastover				
Station ID	YS03-GW006			YS03-GW007		YS03-GW008		YS03-GW008A				
Sample ID	YS03-MW006-0792	YS03-MW006-0296	YS03-MW006P-0296	YS03-MW007-0792	YS03-MW007-0296	YS03-MW008-0792	YS03-MW008-0296	YS03-MW008A-0296	YS03-MW008A-0600	YS03-MW008A-0904	YS03-MW008AP-0904	YS03-MW008A-0205
Sample Date	07/21/92	02/11/96	02/11/96	07/21/92	02/11/96	07/21/92	02/11/96	02/12/96	06/12/00	09/19/04	09/19/04	02/11/05
Investigation	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	GW RI Data	GW RI Data	LTM Data
Chemical Name												
Fluorene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Hexachlorobenzene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Hexachlorobutadiene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Hexachlorocyclopentadiene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Hexachloroethane	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Isophorone	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Naphthalene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Nitrobenzene	NA	10 U	10 U	NA	10 U	NA	10 U	10 U	NA	NA	NA	NA
Pentachlorophenol	26 U	25 U	25 U	26 U	25 U	30 U	24 U	26 U	NA	NA	NA	NA
Phenanthrene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Phenol	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Pyrene	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
bis(2-Chloroethyl)ether	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	10 U	4 B	25 B	10 U	4 B	19 U	10 U	16 B	NA	NA	NA	NA
n-Nitroso-di-n-propylamine	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
n-Nitrosodiphenylamine	10 U	10 U	10 U	10 U	10 U	12 U	10 U	10 U	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/L)												
4,4'-DDD	NA	0.1 UJ	0.1 UL	NA	0.1 UL	NA	0.1 UJ	0.096 UJ	NA	NA	NA	NA
4,4'-DDE	NA	0.1 UJ	0.1 UL	NA	0.1 UL	NA	0.1 UJ	0.096 UJ	NA	NA	NA	NA
4,4'-DDT	NA	0.1 UJ	0.1 UL	NA	0.1 UL	NA	0.1 UJ	0.096 UJ	NA	NA	NA	NA
Aldrin	NA	0.052 UJ	0.05 UL	NA	0.05 UL	NA	0.05 UJ	0.048 UJ	NA	NA	NA	NA
Aroclor-1016	NA	1 UJ	1 UL	NA	1 UL	NA	1 UJ	0.96 UJ	NA	NA	NA	NA
Aroclor-1221	NA	2.1 UJ	2 UL	NA	2 UL	NA	2 UJ	1.9 UJ	NA	NA	NA	NA
Aroclor-1232	NA	1 UJ	1 UL	NA	1 UL	NA	1 UJ	0.96 UJ	NA	NA	NA	NA
Aroclor-1242	NA	1 UJ	1 UL	NA	1 UL	NA	1 UJ	0.96 UJ	NA	NA	NA	NA
Aroclor-1248	NA	1 UJ	1 UL	NA	1 UL	NA	1 UJ	0.96 UJ	NA	NA	NA	NA
Aroclor-1254	NA	1 UJ	1 UL	NA	1 UL	NA	1 UJ	0.96 UJ	NA	NA	NA	NA
Aroclor-1260	NA	1 UJ	1 UL	NA	1 UL	NA	1 UJ	0.96 UJ	NA	NA	NA	NA
Dieldrin	NA	0.1 UJ	0.1 UL	NA	0.1 UL	NA	0.1 UJ	0.096 UJ	NA	NA	NA	NA
Endosulfan I	NA	0.052 UJ	0.05 UL	NA	0.05 UL	NA	0.05 UJ	0.048 UJ	NA	NA	NA	NA
Endosulfan II	NA	0.1 UJ	0.1 UL	NA	0.1 UL	NA	0.1 UJ	0.096 UJ	NA	NA	NA	NA
Endosulfan sulfate	NA	0.1 UJ	0.1 UL	NA	0.1 UL	NA	0.1 UJ	0.096 UJ	NA	NA	NA	NA
Endrin	NA	0.1 UJ	0.1 UL	NA	0.1 UL	NA	0.1 UJ	0.096 UJ	NA	NA	NA	NA
Endrin aldehyde	NA	0.1 UJ	0.1 UL	NA	0.1 UL	NA	0.1 UJ	0.096 UJ	NA	NA	NA	NA
Endrin ketone	NA	0.1 UJ	0.1 UL	NA	0.1 UL	NA	0.1 UJ	0.096 UJ	NA	NA	NA	NA
Heptachlor	NA	0.052 UJ	0.05 UL	NA	0.05 UL	NA	0.05 UJ	0.048 UJ	NA	NA	NA	NA
Heptachlor epoxide	NA	0.052 UJ	0.05 UL	NA	0.05 UL	NA	0.05 UJ	0.048 UJ	NA	NA	NA	NA
Methoxychlor	NA	0.52 UJ	0.5 UL	NA	0.5 UL	NA	0.5 UJ	0.48 UJ	NA	NA	NA	NA
Toxaphene	NA	5.2 UJ	5 UL	NA	5 UL	NA	5 UJ	4.8 UJ	NA	NA	NA	NA
alpha-BHC	NA	0.052 UJ	0.05 UL	NA	0.05 UL	NA	0.05 UJ	0.048 UJ	NA	NA	NA	NA
alpha-Chlordane	NA	0.052 UJ	0.05 UL	NA	0.05 UL	NA	0.05 UJ	0.048 UJ	NA	NA	NA	NA
beta-BHC	NA	0.052 UJ	0.05 UL	NA	0.05 UL	NA	0.05 UJ	0.048 UJ	NA	NA	NA	NA
delta-BHC	NA	0.052 UJ	0.05 UL	NA	0.05 UL	NA	0.05 UJ	0.048 UJ	NA	NA	NA	NA
gamma-BHC (Lindane)	NA	0.052 UJ	0.05 UL	NA	0.05 UL	NA	0.05 UJ	0.048 UJ	NA	NA	NA	NA
gamma-Chlordane	NA	0.052 UJ	0.05 UL	NA	0.05 UL	NA	0.05 UJ	0.048 UJ	NA	NA	NA	NA
Explosives (UG/L)												
1,3,5-Trinitrobenzene	NA	0.16 U	0.18 U	NA	0.084 U	NA	0.14 U	0.22 U	NA	NA	NA	NA
1,3-Dinitrobenzene	NA	0.15 U	0.17 U	NA	0.078 U	NA	0.13 U	0.2 U	NA	NA	NA	NA

Aquifer	Yorktown-Eastover			Yorktown-Eastover		Yorktown-Eastover		Yorktown-Eastover				
Station ID	YS03-GW006			YS03-GW007		YS03-GW008		YS03-GW008A				
Sample ID	YS03-MW006-0792	YS03-MW006-0296	YS03-MW006P-0296	YS03-MW007-0792	YS03-MW007-0296	YS03-MW008-0792	YS03-MW008-0296	YS03-MW008A-0296	YS03-MW008A-0600	YS03-MW008A-0904	YS03-MW008AP-0904	YS03-MW008A-0205
Sample Date	07/21/92	02/11/96	02/11/96	07/21/92	02/11/96	07/21/92	02/11/96	02/12/96	06/12/00	09/19/04	09/19/04	02/11/05
Investigation	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	GW RI Data	GW RI Data	LTM Data
Chemical Name												
2,4,6-Trinitrotoluene	NA	0.16 U	0.18 U	NA	0.081 U	NA	0.14 U	0.21 U	NA	NA	NA	NA
2,4-Dinitrotoluene	10 U	NA	NA	10 U	NA	12 U	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	10 U	NA	NA	10 U	NA	12 U	NA	NA	NA	NA	NA	NA
2-Nitrotoluene	NA	0.64 U	0.7 U	NA	0.32 U	NA	0.56 U	0.84 U	NA	NA	NA	NA
3-Nitrotoluene	NA	0.64 U	0.7 U	NA	0.32 U	NA	0.56 U	0.84 U	NA	NA	NA	NA
4-Nitrotoluene	NA	1.9 U	2.1 U	NA	0.97 U	NA	1.7 U	2.5 U	NA	NA	NA	NA
Aminodinitrotoluenes	NA	0.25 U	0.28 U	NA	0.13 U	NA	0.22 U	0.34 U	NA	NA	NA	NA
Dinitrotoluene mixture	NA	0.25 U	0.28 U	NA	0.13 U	NA	0.22 U	0.34 U	NA	NA	NA	NA
HMX	NA	1.4 U	1.5 U	NA	0.71 U	NA	1.2 U	1.8 U	NA	NA	NA	NA
Nitrobenzene	10 U	0.27 U	0.29 U	10 U	0.14 U	12 U	0.23 U	0.35 U	NA	NA	NA	NA
RDX	NA	0.69 U	0.76 U	NA	0.35 U	NA	0.6 U	0.91 U	NA	NA	NA	NA
Tetryl	NA	0.48 U	0.53 U	NA	0.25 U	NA	0.42 U	0.64 U	NA	NA	NA	NA
Total Metals (UG/L)												
Aluminum	10,600 J	4,410 K	11,200 K	6,970 J	3,290 K	34,900 J	3,210 K	498 K	NA	NA	NA	NA
Antimony	44 U	19.8 U	19.8 U	44 U	19.8 U	44 U	19.8 U	19.8 U	NA	NA	NA	NA
Arsenic	20.4 J	13.6	24.6	13.6 J	11.3	17.8 J	9.8	0.9 U	NA	NA	NA	NA
Barium	88.5	39.9	61	69	47.8	163	39.4	25.8	NA	NA	NA	NA
Beryllium	1.6	0.8 U	0.8 U	1.1	0.8 U	4.7	0.8 U	0.8 U	NA	NA	NA	NA
Cadmium	4 U	2.2 UL	2.2 UL	4 U	2.2 U	8.4	2.2 U	2.2 UL	NA	NA	NA	NA
Calcium	140,000	105,000	130,000	171,000	138,000	370,000	131,000	88,900	NA	NA	NA	NA
Chromium	54.3	19.9	46.9	38.2	18.7	188	14.3	2.4 U	NA	NA	NA	NA
Cobalt	10.1	3 U	3.7	6 U	4.2	29.4	3 U	3 U	NA	NA	NA	NA
Copper	14.6	4.8	13.3	9.9	3.5	38.3	2.7	2 U	NA	NA	NA	NA
Cyanide	NA	10 U	10 U	NA	10 U	NA	10 U	10 U	NA	NA	NA	NA
Iron	44,600 J	12,200	28,000	22,900 J	8,830	107,000 J	6,520	1,740	NA	NA	NA	NA
Lead	15.2	3.4	9.8	10.3 U	2.6 K	118	1.8 K	0.8 U	NA	NA	NA	NA
Magnesium	7,130	3,190	5,460	5,480	3,680	15,900	3,890	1,720	NA	NA	NA	NA
Manganese	207	60.5	118	110	35	492	22.6	91.3	NA	NA	NA	NA
Mercury	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NA	NA	NA	NA
Nickel	21.3	11.3 U	11.3 U	18 U	11.3 U	84.1	11.3 U	11.3 U	NA	NA	NA	NA
Potassium	4,960	2,600	4,540	3,950	2,470 L	12,100	1,730 L	1,230	NA	NA	NA	NA
Selenium	2 UJ	1.4 L	1.7	2 UJ	1.3 U	20 UJ	1.3 U	1.3 U	NA	NA	NA	NA
Silver	6 U	3.1 U	3.1 U	6 U	3.1 U	7.3	3.1 U	3.1 U	NA	NA	NA	NA
Sodium	6,680	6,050	6,480	10,900	10,400	11,200	9,630	8,530	NA	NA	NA	NA
Thallium	2 UJ	0.9 U	0.9 U	20 U	0.9 U	2 U	0.9 U	0.9 U	NA	NA	NA	NA
Vanadium	49	26.2	54.1	56.5	23.5	204	19.1	5.9	NA	NA	NA	NA
Zinc	82.1 J	21.7	49	49.2 J	18	218 J	15.3	3.6	NA	NA	NA	NA
Dissolved Metals (UG/L)												
Aluminum	35 U	23.3 U	23.3 U	35 U	30 K	35 U	23.9 K	23.3 U	NA	NA	NA	NA
Antimony	44 U	19.8 U	19.8 U	44 U	19.8 U	44 U	19.8 U	19.8 U	NA	NA	NA	NA
Arsenic	2 UJ	1	1.2	2 UJ	0.9 U	2 UJ	1.4	0.9 U	NA	NA	NA	NA
Barium	25.3	20.6	20.9	34.8	34.1	28.8	27.6	23.9	NA	NA	NA	NA
Beryllium	1 U	0.8 U	0.8 U	1 U	0.8 U	1 U	0.8 U	0.8 U	NA	NA	NA	NA
Cadmium	4 U	2.2 UL	2.2 UL	4 U	2.2 U	4 U	2.9 K	2.2 UL	NA	NA	NA	NA
Calcium	90,500	77,500	80,200	132,000	119,000	138,000	118,000	83,800	NA	NA	NA	NA
Chromium	8 U	2.4 U	2.4 U	8 U	2.4 U	8 U	2.4 U	7.3	NA	NA	NA	NA
Cobalt	6 U	3 U	3 U	6 U	3 U	6 U	3 U	3 U	NA	NA	NA	NA
Copper	5 U	2 U	2 U	5 U	2 U	5 U	2 U	2 U	NA	NA	NA	NA
Iron	139 J	52.9	47.4	19 UJ	42.2	25.4 J	28.9	238	NA	NA	NA	NA
Lead	16.8	0.8 U	0.8 U	2 U	0.8 U	2 U	0.8 U	0.8 U	NA	NA	NA	NA

Aquifer	Yorktown-Eastover			Yorktown-Eastover		Yorktown-Eastover		Yorktown-Eastover				
Station ID	YS03-GW006			YS03-GW007		YS03-GW008		YS03-GW008A				
Sample ID	YS03-MW006-0792	YS03-MW006-0296	YS03-MW006P-0296	YS03-MW007-0792	YS03-MW007-0296	YS03-MW008-0792	YS03-MW008-0296	YS03-MW008A-0296	YS03-MW008A-0600	YS03-MW008A-0904	YS03-MW008AP-0904	YS03-MW008A-0205
Sample Date	07/21/92	02/11/96	02/11/96	07/21/92	02/11/96	07/21/92	02/11/96	02/12/96	06/12/00	09/19/04	09/19/04	02/11/05
Investigation	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	GW RI Data	GW RI Data	LTM Data
Chemical Name												
Magnesium	2,220	1,650	1,820	2,990	2,590	3,410	2,930	1,560	NA	NA	NA	NA
Manganese	22.2	14.4	14.8	2 U	1.6 U	6.3	2.1	88.3	NA	NA	NA	NA
Mercury	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NA	NA	NA	NA
Nickel	18 U	11.3 U	11.3 U	18 U	11.3 U	18 U	11.3 U	11.3 U	NA	NA	NA	NA
Potassium	1,160	828 U	1,390	970 U	948 L	970 U	828 UL	1,190	NA	NA	NA	NA
Selenium	2 UJ	1.3 U	1.3 U	2 UJ	1.3 U	2 UJ	1.3 U	1.3 U	NA	NA	NA	NA
Silver	6 U	3.1 U	3.1 U	6 U	3.1 U	6 U	3.1 U	3.1 U	NA	NA	NA	NA
Sodium	6,540	5,950	6,100	10,700	9,990	11,400	9,970	8,640	NA	NA	NA	NA
Thallium	2 UJ	0.9 U	0.9 U	2 U	0.9 U	2 U	0.9 U	0.9 U	NA	NA	NA	NA
Vanadium	11.6	2.4 U	2.7	15.2	2.4 U	16.8	2.4 U	5	NA	NA	NA	NA
Zinc	59.8 J	3.6 U	3.6 U	134 J	3.6 U	35.4 J	3.6 U	3.6 U	NA	NA	NA	NA
Wet Chemistry (MG/L)												
Nitrate	0.1 U	NA	NA	0.17	NA	0.1 U	NA	NA	NA	NA	NA	NA

Notes:

Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

Aquifer	Yorktown-Eastover		Yorktown-Eastover				Yorktown-Eastover		Yorktown-Eastover	Yorktown-Eastover		
Station ID	YS03-GW008A		YS03-GW008B				YS03-GW015		YS03-GW015A	YS03-GW018		
Sample ID	YS03-MW008A-0505	YS03-MW008A-0805	YS03-MW008B-1004	YS03-MW008B-0205	YS03-MW008B-0505	YS03-MW008B-0805	YS03-MW015-0792	YS03-MW015-0296	YS03-MW015A-0296	YS03-MW018-0792	YS03-MW018-0296	YS03-MW018P-0296
Sample Date	05/04/05	08/03/05	10/06/04	02/11/05	05/04/05	08/03/05	07/21/92	02/12/96	02/11/96	07/21/92	02/11/96	02/11/96
Investigation	LTM Data	LTM Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data
Chemical Name												
Volatile Organic Compounds (UG/L)												
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	61	110	12	10 U	10 U	10 U
1,2-Dichloropropane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA
2-Butanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	10 U	10 U	5 B	10 UJ	10 U	10 U	10 U	10 U	10 U	43 U	10 U	10 U
Benzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	10 U	10 U	1 J	10 U	10 U	10 U	29	10 U	10 U	10 U	10 U	10 U
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA
Dibromochloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane (Freon-12)	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA
Ethylbenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl acetate	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA
Methyl-tert-butyl ether (MTBE)	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA
Methylcyclohexane	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA
Methylene chloride	56	10 U	10 U	10 U	57	3 B	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	10 U	10 U	2 J	0.9 B	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	10 U	10 U	5 J	4 B	5 J	4 J	86	83 B	10	10 U	10 U	10 U
Trichlorofluoromethane(Freon-11)	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Xylene, total	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
isopropylbenzene	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Aquifer	Yorktown-Eastover		Yorktown-Eastover				Yorktown-Eastover		Yorktown-Eastover	Yorktown-Eastover		
Station ID	YS03-GW008A		YS03-GW008B				YS03-GW015		YS03-GW015A	YS03-GW018		
Sample ID	YS03-MW008A-0505	YS03-MW008A-0805	YS03-MW008B-1004	YS03-MW008B-0205	YS03-MW008B-0505	YS03-MW008B-0805	YS03-MW015-0792	YS03-MW015-0296	YS03-MW015A-0296	YS03-MW018-0792	YS03-MW018-0296	YS03-MW018P-0296
Sample Date	05/04/05	08/03/05	10/06/04	02/11/05	05/04/05	08/03/05	07/21/92	02/12/96	02/11/96	07/21/92	02/11/96	02/11/96
Investigation	LTM Data	LTM Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data
Chemical Name												
Semi-volatile Organic Compounds (UG/L)												
1,1-Biphenyl	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
2,2'-oxybis(1-chloropropane)	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA	28 U	24 U	24 U	26 U	25 U	26 U
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA	28 U	24 UJ	24 UJ	26 U	25 U	26 U
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	10 U	10 U
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	10 U	10 U
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	NA	NA	NA	NA	NA	NA	28 U	24 U	24 U	26 U	25 U	26 U
2-Nitrophenol	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline	NA	NA	NA	NA	NA	NA	28 U	24 U	24 U	26 U	25 U	26 U
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA	NA	NA	28 U	24 UJ	24 UJ	26 U	25 U	26 U
4-Bromophenyl-phenylether	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenylether	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	NA	NA	NA	NA	NA	NA	28 U	24 U	24 U	26 U	25 U	26 U
4-Nitrophenol	NA	NA	NA	NA	NA	NA	28 U	24 U	24 U	26 U	25 U	26 U
Acenaphthene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Acetophenone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Atrazine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Butylbenzylphthalate	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Caprolactam	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Chrysene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Di-n-butylphthalate	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Di-n-octylphthalate	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Dibenzofuran	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Dimethyl phthalate	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U

Aquifer	Yorktown-Eastover		Yorktown-Eastover				Yorktown-Eastover		Yorktown-Eastover	Yorktown-Eastover		
Station ID	YS03-GW008A		YS03-GW008B				YS03-GW015		YS03-GW015A	YS03-GW018		
Sample ID	YS03-MW008A-0505	YS03-MW008A-0805	YS03-MW008B-1004	YS03-MW008B-0205	YS03-MW008B-0505	YS03-MW008B-0805	YS03-MW015-0792	YS03-MW015-0296	YS03-MW015A-0296	YS03-MW018-0792	YS03-MW018-0296	YS03-MW018P-0296
Sample Date	05/04/05	08/03/05	10/06/04	02/11/05	05/04/05	08/03/05	07/21/92	02/12/96	02/11/96	07/21/92	02/11/96	02/11/96
Investigation	LTM Data	LTM Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data
Chemical Name												
Fluorene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Isophorone	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Naphthalene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Nitrobenzene	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	10 U	10 U
Pentachlorophenol	NA	NA	NA	NA	NA	NA	28 U	24 U	24 U	26 U	25 U	26 U
Phenanthrene	NA	NA	NA	NA	NA	NA	11 U	2 J	10 U	2 J	10 U	10 U
Phenol	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Pyrene	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)ether	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA	11 U	2 B	2 B	11 U	2 B	22 B
n-Nitroso-di-n-propylamine	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
n-Nitrosodiphenylamine	NA	NA	NA	NA	NA	NA	11 U	10 U	10 U	10 U	10 U	10 U
Pesticide/Polychlorinated Biphenyls (UG/L)												
4,4'-DDD	NA	NA	NA	NA	NA	NA	NA	0.096 UJ	0.11 UJ	NA	0.1 UL	0.1 UJ
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	0.096 UJ	0.11 UJ	NA	0.1 UL	0.1 UJ
4,4'-DDT	NA	NA	NA	NA	NA	NA	NA	0.096 UJ	0.11 UJ	NA	0.1 UL	0.1 UJ
Aldrin	NA	NA	NA	NA	NA	NA	NA	0.048 UJ	0.053 UJ	NA	0.051 UL	0.05 UJ
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	0.96 UJ	1.1 UJ	NA	1 UL	1 UJ
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	1.9 UJ	2.1 UJ	NA	2 UL	2 UJ
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	0.96 UJ	1.1 UJ	NA	1 UL	1 UJ
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	0.96 UJ	1.1 UJ	NA	1 UL	1 UJ
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	0.96 UJ	1.1 UJ	NA	1 UL	1 UJ
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	0.96 UJ	1.1 UJ	NA	1 UL	1 UJ
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	0.96 UJ	1.1 UJ	NA	1 UL	1 UJ
Dieldrin	NA	NA	NA	NA	NA	NA	NA	0.096 UJ	0.11 UJ	NA	0.1 UL	0.1 UJ
Endosulfan I	NA	NA	NA	NA	NA	NA	NA	0.048 UJ	0.053 UJ	NA	0.051 UL	0.05 UJ
Endosulfan II	NA	NA	NA	NA	NA	NA	NA	0.096 UJ	0.11 UJ	NA	0.1 UL	0.1 UJ
Endosulfan sulfate	NA	NA	NA	NA	NA	NA	NA	0.096 UJ	0.11 UJ	NA	0.1 UL	0.1 UJ
Endrin	NA	NA	NA	NA	NA	NA	NA	0.096 UJ	0.11 UJ	NA	0.1 UL	0.1 UJ
Endrin aldehyde	NA	NA	NA	NA	NA	NA	NA	0.096 UJ	0.11 UJ	NA	0.1 UL	0.1 UJ
Endrin ketone	NA	NA	NA	NA	NA	NA	NA	0.096 UJ	0.11 UJ	NA	0.1 UL	0.1 UJ
Heptachlor	NA	NA	NA	NA	NA	NA	NA	0.048 UJ	0.053 UJ	NA	0.051 UL	0.05 UJ
Heptachlor epoxide	NA	NA	NA	NA	NA	NA	NA	0.048 UJ	0.053 UJ	NA	0.051 UL	0.05 UJ
Methoxychlor	NA	NA	NA	NA	NA	NA	NA	0.48 UJ	0.53 UJ	NA	0.51 UL	0.5 UJ
Toxaphene	NA	NA	NA	NA	NA	NA	NA	4.8 UJ	5.3 UJ	NA	5.1 UL	5 UJ
alpha-BHC	NA	NA	NA	NA	NA	NA	NA	0.048 UJ	0.053 UJ	NA	0.051 UL	0.05 UJ
alpha-Chlordane	NA	NA	NA	NA	NA	NA	NA	0.048 UJ	0.053 UJ	NA	0.051 UL	0.05 UJ
beta-BHC	NA	NA	NA	NA	NA	NA	NA	0.048 UJ	0.053 UJ	NA	0.051 UL	0.05 UJ
delta-BHC	NA	NA	NA	NA	NA	NA	NA	0.048 UJ	0.053 UJ	NA	0.051 UL	0.05 UJ
gamma-BHC (Lindane)	NA	NA	NA	NA	NA	NA	NA	0.048 UJ	0.053 UJ	NA	0.051 UL	0.05 UJ
gamma-Chlordane	NA	NA	NA	NA	NA	NA	NA	0.048 UJ	0.053 UJ	NA	0.051 UL	0.05 UJ
Explosives (UG/L)												
1,3,5-Trinitrobenzene	NA	NA	NA	NA	NA	NA	NA	0.24 U	0.19 U	NA	0.24 U	0.18 U
1,3-Dinitrobenzene	NA	NA	NA	NA	NA	NA	NA	0.22 U	0.17 U	NA	0.22 U	0.16 U

Aquifer	Yorktown-Eastover		Yorktown-Eastover				Yorktown-Eastover		Yorktown-Eastover	Yorktown-Eastover		
Station ID	YS03-GW008A		YS03-GW008B				YS03-GW015		YS03-GW015A	YS03-GW018		
Sample ID	YS03-MW008A-0505	YS03-MW008A-0805	YS03-MW008B-1004	YS03-MW008B-0205	YS03-MW008B-0505	YS03-MW008B-0805	YS03-MW015-0792	YS03-MW015-0296	YS03-MW015A-0296	YS03-MW018-0792	YS03-MW018-0296	YS03-MW018P-0296
Sample Date	05/04/05	08/03/05	10/06/04	02/11/05	05/04/05	08/03/05	07/21/92	02/12/96	02/11/96	07/21/92	02/11/96	02/11/96
Investigation	LTM Data	LTM Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data
Chemical Name												
2,4,6-Trinitrotoluene	NA	NA	NA	NA	NA	NA	NA	0.23 U	0.18 U	NA	0.23 U	0.17 U
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA	11 U	NA	NA	10 U	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	11 U	NA	NA	10 U	NA	NA
2-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	0.91 U	0.73 U	NA	0.91 U	0.69 U
3-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	0.91 U	0.73 U	NA	0.91 U	0.69 U
4-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	2.7 U	2.2 U	NA	2.7 U	2.1 U
Aminodinitrotoluenes	NA	NA	NA	NA	NA	NA	NA	0.36 U	0.29 U	NA	0.36 U	0.28 U
Dinitrotoluene mixture	NA	NA	NA	NA	NA	NA	NA	0.36 U	0.29 U	NA	0.36 U	0.28 U
HMX	NA	NA	NA	NA	NA	NA	NA	2 U	1.6 U	NA	2 U	1.5 U
Nitrobenzene	NA	NA	NA	NA	NA	NA	11 U	0.38 U	0.3 U	10 U	0.38 U	0.29 U
RDX	NA	NA	NA	NA	NA	NA	NA	0.98 U	0.78 U	NA	0.98 U	0.74 U
Tetryl	NA	NA	NA	NA	NA	NA	NA	0.69 U	0.55 U	NA	0.69 U	0.52 U
Total Metals (UG/L)												
Aluminum	NA	NA	NA	NA	NA	NA	202,000 J	83.8 K	432 K	6,450 J	1,660 K	1,740 K
Antimony	NA	NA	NA	NA	NA	NA	44 U	19.8 U	19.8 U	44 U	19.8 U	19.8 U
Arsenic	NA	NA	NA	NA	NA	NA	4.1 J	0.9 U	0.9 U	2 UJ	4.8	4.5
Barium	NA	NA	NA	NA	NA	NA	1,220	34.8	26.7	96.4	37.9	40.5
Beryllium	NA	NA	NA	NA	NA	NA	23	0.8 U	0.8 U	1 U	0.8 U	0.8 U
Cadmium	NA	NA	NA	NA	NA	NA	29.7	2.2 UL	2.2 U	4 U	2.2 U	2.2 U
Calcium	NA	NA	NA	NA	NA	NA	232,000	105,000	86,500	310,000	77,800	83,500
Chromium	NA	NA	NA	NA	NA	NA	1,100	2.4 U	3.7	17	2.4 U	2.4 U
Cobalt	NA	NA	NA	NA	NA	NA	191	3 U	3 U	8	3.3	3 U
Copper	NA	NA	NA	NA	NA	NA	287	2 U	5.3	10.9	7.1	6.9
Cyanide	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	10 U	10 U
Iron	NA	NA	NA	NA	NA	NA	66,700 J	212	2,100	18,600 J	1,130	1,440
Lead	NA	NA	NA	NA	NA	NA	146 J	0.8 U	0.8 U	6.9 U	0.8 U	3.2
Magnesium	NA	NA	NA	NA	NA	NA	75,000	2,270	1,590	1,820	390	460
Manganese	NA	NA	NA	NA	NA	NA	4,810	73.4	106	75.4	3.6	5.6
Mercury	NA	NA	NA	NA	NA	NA	0.54	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	NA	NA	NA	NA	NA	NA	594	11.3 U	11.3 U	18 U	11.3 U	11.3 U
Potassium	NA	NA	NA	NA	NA	NA	46,400	4,240	2,470 L	18,100	4,090	3,540 L
Selenium	NA	NA	NA	NA	NA	NA	20 UJ	1.3 U	1.3 U	2 UJ	1.3 U	1.5
Silver	NA	NA	NA	NA	NA	NA	44.2	3.1 U	3.1 U	6 U	3.1 U	3.1 U
Sodium	NA	NA	NA	NA	NA	NA	23,300	11,200	7,880	25,500	11,300	11,300
Thallium	NA	NA	NA	NA	NA	NA	2 UJ	0.9 U	0.9 U	2 U	0.9 U	0.9 U
Vanadium	NA	NA	NA	NA	NA	NA	498	2.4 U	2.4 U	42.3	9.5	6.6
Zinc	NA	NA	NA	NA	NA	NA	2,840 J	3.6 U	13.6	35.9 J	4.8	6.6
Dissolved Metals (UG/L)												
Aluminum	NA	NA	NA	NA	NA	NA	43.7 J	23.3 U	23.3 U	1,620 J	1,100 K	1,110 K
Antimony	NA	NA	NA	NA	NA	NA	44 U	19.8 U	19.8 U	44 U	19.8 U	19.8 U
Arsenic	NA	NA	NA	NA	NA	NA	2 UJ	0.9 U	0.9 U	2 UJ	2.5 K	2.7
Barium	NA	NA	NA	NA	NA	NA	35.8	33.8	23.9	74.7	34.7	35.1
Beryllium	NA	NA	NA	NA	NA	NA	1 U	0.8 U	0.8 U	1 U	0.8 U	0.8 U
Cadmium	NA	NA	NA	NA	NA	NA	4 U	2.2 UL	2.2 U	4 U	2.2 U	2.2 U
Calcium	NA	NA	NA	NA	NA	NA	134,000	106,000	78,200	325,000	66,100	68,300
Chromium	NA	NA	NA	NA	NA	NA	8 U	2.4 U	2.4 U	8 U	2.4 U	2.4 U
Cobalt	NA	NA	NA	NA	NA	NA	6 U	3 U	3 U	6 U	3 U	3 U
Copper	NA	NA	NA	NA	NA	NA	5 U	2 U	2 U	5.2	2 U	2 U
Iron	NA	NA	NA	NA	NA	NA	82.8 J	9.7 U	9.7 U	19 UJ	12.3	14
Lead	NA	NA	NA	NA	NA	NA	2.5 U	0.8 U	0.8 U	2 U	0.8 U	0.8 U

Aquifer	Yorktown-Eastover		Yorktown-Eastover				Yorktown-Eastover		Yorktown-Eastover	Yorktown-Eastover		
Station ID	YS03-GW008A		YS03-GW008B				YS03-GW015		YS03-GW015A	YS03-GW018		
Sample ID	YS03-MW008A-0505	YS03-MW008A-0805	YS03-MW008B-1004	YS03-MW008B-0205	YS03-MW008B-0505	YS03-MW008B-0805	YS03-MW015-0792	YS03-MW015-0296	YS03-MW015A-0296	YS03-MW018-0792	YS03-MW018-0296	YS03-MW018P-0296
Sample Date	05/04/05	08/03/05	10/06/04	02/11/05	05/04/05	08/03/05	07/21/92	02/12/96	02/11/96	07/21/92	02/11/96	02/11/96
Investigation	LTM Data	LTM Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data
Chemical Name												
Magnesium	NA	NA	NA	NA	NA	NA	3,230	2,220	1,400	266	26.9 U	30.4 B
Manganese	NA	NA	NA	NA	NA	NA	128	81.3	95.6	2 U	1.8	1.6 U
Mercury	NA	NA	NA	NA	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	NA	NA	NA	NA	NA	NA	18 U	11.3 U	11.3 U	18 U	11.3 U	11.3 U
Potassium	NA	NA	NA	NA	NA	NA	2,200	3,660	1,920 L	18,600	3,670 L	3,760 L
Selenium	NA	NA	NA	NA	NA	NA	2 UJ	1.3 U	1.3 U	2 UJ	1.3 U	1.3 U
Silver	NA	NA	NA	NA	NA	NA	6 U	3.1 U	3.1 U	6 U	3.1 U	3.1 U
Sodium	NA	NA	NA	NA	NA	NA	14,400	9,260	7,680	28,400	11,400	11,400
Thallium	NA	NA	NA	NA	NA	NA	20 U	0.9 U	0.9 U	2 U	0.9 U	0.9 U
Vanadium	NA	NA	NA	NA	NA	NA	13.9	2.8	2.4 U	26.6	5.5	5.5
Zinc	NA	NA	NA	NA	NA	NA	89.7 J	3.6 U	3.6 U	190 J	3.6 U	3.6 U
Wet Chemistry (MG/L)												
Nitrate	NA	NA	NA	NA	NA	NA	0.12	NA	NA	0.11	NA	NA

Notes:

Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level repo
J = Analyte present. Reported value may or may n
K = Analyte present. Reported value may be biase
L = Analyte present. Reported value may be biase
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccu
UL = Not detected, quantitation limit is probably hig

Appendix G
Groundwater Analytical Results at Site 3
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	Yorktown-Eastover									Yorktown-Eastover		
Station ID	YS03-GW019									YS03-GW019A		
Sample ID	YS03-MW019-0296	YS03-MW019-0600	YS03-MW019P-0600	YS03-MW019-1004	YS03-MW019-0205	YS03-MW019P-0205	YS03-MW019-0505	YS03-MW019-0805	YS03-MW019P-0805	YS03-MW019A-0296	YS03-MW019A-0600	YS03-MW019A-0904
Sample Date	02/11/96	06/12/00	06/12/00	10/06/04	02/08/05	02/08/05	05/05/05	08/03/05	08/03/05	02/11/96	06/12/00	09/22/04
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data	GW RI Data
Chemical Name												
Volatile Organic Compounds (UG/L)												
1,1,1-Trichloroethane	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	4 J	2 J	100 U	2 J	0.8 J	10 U	10 U	10 U	2 J	10 U	10 U	10 U
1,2,4-Trichlorobenzene	NA	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
1,2-Dibromo-3-chloropropane	NA	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
1,2-Dibromoethane	NA	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
1,2-Dichlorobenzene	NA	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
1,2-Dichloroethane	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	570	NA	NA	NA	NA	NA	NA	NA	NA	24	NA	NA
1,2-Dichloropropane	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	NA	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
1,4-Dichlorobenzene	NA	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
2-Butanone	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	10 U	10 U	100 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	10 U	1 B	100 U	10 U	10 U	10 U	10 U	10 U	4 B	10 U	10 U	10 U
Benzene	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10 U	10 U	100 U	1 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	4 B	10 U	100 U	10 U	10 U	10 U	1 J	10 U	10 U	4 B	10 U	10 U
Chloromethane	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	NA	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
Dibromochloromethane	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane (Freon-12)	NA	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
Ethylbenzene	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl acetate	NA	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
Methyl-tert-butyl ether (MTBE)	NA	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
Methylcyclohexane	NA	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
Methylene chloride	10 U	3 B	12 B	10 U	10 U	10 U	13 B	4 B	2 B	10 U	2 B	10 U
Styrene	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	3 J	10 U	10 U
Trichloroethene	860	510	480	120	160	150	190	140	140	24	5 J	6 J
Trichlorofluoromethane(Freon-11)	NA	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
Vinyl chloride	48	15	12 J	42	25	21	11	39	39	10 U	10 U	10 U
Xylene, total	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	NA	490	470	320	290	260	230	440	400	NA	7 J	6 J
cis-1,3-Dichloropropene	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
isopropylbenzene	NA	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
trans-1,2-Dichloroethene	NA	10 U	100 U	10 U	10 U	10 U	10 U	10 U	0.9 J	NA	10 U	10 U
trans-1,3-Dichloropropene	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Aquifer	Yorktown-Eastover									Yorktown-Eastover		
Station ID	YS03-GW019									YS03-GW019A		
Sample ID	YS03-MW019-0296	YS03-MW019-0600	YS03-MW019P-0600	YS03-MW019-1004	YS03-MW019-0205	YS03-MW019P-0205	YS03-MW019-0505	YS03-MW019-0805	YS03-MW019P-0805	YS03-MW019A-0296	YS03-MW019A-0600	YS03-MW019A-0904
Sample Date	02/11/96	06/12/00	06/12/00	10/06/04	02/08/05	02/08/05	05/05/05	08/03/05	08/03/05	02/11/96	06/12/00	09/22/04
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data	GW RI Data
Chemical Name												
Semi-volatile Organic Compounds (UG/L)												
1,1-Biphenyl	NA	NA	NA	10 U	NA	NA	NA	NA	NA	NA	NA	10 U
1,2,4-Trichlorobenzene	10 U	NA	NA	NA	NA	NA	NA	NA	NA	10 U	NA	NA
1,2-Dichlorobenzene	10 U	NA	NA	NA	NA	NA	NA	NA	NA	10 U	NA	NA
1,3-Dichlorobenzene	10 U	NA	NA	NA	NA	NA	NA	NA	NA	10 U	NA	NA
1,4-Dichlorobenzene	10 U	NA	NA	NA	NA	NA	NA	NA	NA	10 U	NA	NA
2,2'-oxybis(1-chloropropane)	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
2,4,5-Trichlorophenol	24 U	NA	NA	25 U	NA	NA	NA	NA	NA	24 U	NA	26 U
2,4,6-Trichlorophenol	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
2,4-Dichlorophenol	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
2,4-Dimethylphenol	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
2,4-Dinitrophenol	24 UJ	NA	NA	25 U	NA	NA	NA	NA	NA	24 UJ	NA	26 U
2,4-Dinitrotoluene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
2,6-Dinitrotoluene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
2-Chloronaphthalene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
2-Chlorophenol	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
2-Methylnaphthalene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
2-Methylphenol	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
2-Nitroaniline	24 U	NA	NA	25 U	NA	NA	NA	NA	NA	24 U	NA	26 U
2-Nitrophenol	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
3,3'-Dichlorobenzidine	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
3-Nitroaniline	24 U	NA	NA	25 U	NA	NA	NA	NA	NA	24 U	NA	26 U
4,6-Dinitro-2-methylphenol	24 UJ	NA	NA	25 U	NA	NA	NA	NA	NA	24 UJ	NA	26 U
4-Bromophenyl-phenylether	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
4-Chloro-3-methylphenol	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
4-Chloroaniline	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
4-Chlorophenyl-phenylether	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
4-Methylphenol	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
4-Nitroaniline	24 U	NA	NA	25 U	NA	NA	NA	NA	NA	24 U	NA	26 U
4-Nitrophenol	24 U	NA	NA	25 U	NA	NA	NA	NA	NA	24 U	NA	26 U
Acenaphthene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Acenaphthylene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Acetophenone	NA	NA	NA	10 U	NA	NA	NA	NA	NA	NA	NA	10 U
Anthracene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Atrazine	NA	NA	NA	10 U	NA	NA	NA	NA	NA	NA	NA	10 U
Benzaldehyde	NA	NA	NA	10 U	NA	NA	NA	NA	NA	NA	NA	10 U
Benzo(a)anthracene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Benzo(a)pyrene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Benzo(b)fluoranthene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Benzo(g,h,i)perylene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Benzo(k)fluoranthene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Butylbenzylphthalate	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Caprolactam	NA	NA	NA	10 U	NA	NA	NA	NA	NA	NA	NA	10 U
Carbazole	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Chrysene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Di-n-butylphthalate	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Di-n-octylphthalate	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	3 J	NA	10 U
Dibenz(a,h)anthracene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Dibenzofuran	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Diethylphthalate	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Dimethyl phthalate	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Fluoranthene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U

Aquifer	Yorktown-Eastover									Yorktown-Eastover		
Station ID	YS03-GW019									YS03-GW019A		
Sample ID	YS03-MW019-0296	YS03-MW019-0600	YS03-MW019P-0600	YS03-MW019-1004	YS03-MW019-0205	YS03-MW019P-0205	YS03-MW019-0505	YS03-MW019-0805	YS03-MW019P-0805	YS03-MW019A-0296	YS03-MW019A-0600	YS03-MW019A-0904
Sample Date	02/11/96	06/12/00	06/12/00	10/06/04	02/08/05	02/08/05	05/05/05	08/03/05	08/03/05	02/11/96	06/12/00	09/22/04
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data	GW RI Data
Chemical Name												
Fluorene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Hexachlorobenzene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Hexachlorobutadiene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Hexachlorocyclopentadiene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Hexachloroethane	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Indeno(1,2,3-cd)pyrene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Isophorone	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Naphthalene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Nitrobenzene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Pentachlorophenol	24 U	NA	NA	25 U	NA	NA	NA	NA	NA	24 U	NA	26 U
Phenanthrene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Phenol	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Pyrene	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
bis(2-Chloroethoxy)methane	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
bis(2-Chloroethyl)ether	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
bis(2-Ethylhexyl)phthalate	3 B	NA	NA	10 U	NA	NA	NA	NA	NA	2 B	NA	10 U
n-Nitroso-di-n-propylamine	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
n-Nitrosodiphenylamine	10 U	NA	NA	10 U	NA	NA	NA	NA	NA	10 U	NA	10 U
Pesticide/Polychlorinated Biphenyls (UG/L)												
4,4'-DDD	0.095 UJ	NA	NA	0.1 U	NA	NA	NA	NA	NA	0.095 UL	NA	0.1 U
4,4'-DDE	0.095 UJ	NA	NA	0.1 U	NA	NA	NA	NA	NA	0.095 UL	NA	0.1 U
4,4'-DDT	0.095 UJ	NA	NA	0.1 U	NA	NA	NA	NA	NA	0.095 UL	NA	0.1 U
Aldrin	0.048 UJ	NA	NA	0.05 U	NA	NA	NA	NA	NA	0.048 UL	NA	0.05 U
Aroclor-1016	0.95 UJ	NA	NA	1 U	NA	NA	NA	NA	NA	0.95 UL	NA	1 U
Aroclor-1221	1.9 UJ	NA	NA	2 U	NA	NA	NA	NA	NA	1.9 UL	NA	2 U
Aroclor-1232	0.95 UJ	NA	NA	1 U	NA	NA	NA	NA	NA	0.95 UL	NA	1 U
Aroclor-1242	0.95 UJ	NA	NA	1 U	NA	NA	NA	NA	NA	0.95 UL	NA	1 U
Aroclor-1248	0.95 UJ	NA	NA	1 U	NA	NA	NA	NA	NA	0.95 UL	NA	1 U
Aroclor-1254	0.95 UJ	NA	NA	1 U	NA	NA	NA	NA	NA	0.95 UL	NA	1 U
Aroclor-1260	0.95 UJ	NA	NA	1 U	NA	NA	NA	NA	NA	0.95 UL	NA	1 U
Dieldrin	0.095 UJ	NA	NA	0.1 U	NA	NA	NA	NA	NA	0.095 UL	NA	0.1 U
Endosulfan I	0.048 UJ	NA	NA	0.05 U	NA	NA	NA	NA	NA	0.048 UL	NA	0.05 U
Endosulfan II	0.095 UJ	NA	NA	0.1 U	NA	NA	NA	NA	NA	0.095 UL	NA	0.1 U
Endosulfan sulfate	0.095 UJ	NA	NA	0.1 U	NA	NA	NA	NA	NA	0.095 UL	NA	0.1 U
Endrin	0.095 UJ	NA	NA	0.1 U	NA	NA	NA	NA	NA	0.095 UL	NA	0.1 U
Endrin aldehyde	0.095 UJ	NA	NA	0.1 U	NA	NA	NA	NA	NA	0.095 UL	NA	0.1 U
Endrin ketone	0.095 UJ	NA	NA	0.1 U	NA	NA	NA	NA	NA	0.095 UL	NA	0.1 U
Heptachlor	0.048 UJ	NA	NA	0.05 U	NA	NA	NA	NA	NA	0.048 UL	NA	0.05 U
Heptachlor epoxide	0.048 UJ	NA	NA	0.023 B	NA	NA	NA	NA	NA	0.048 UL	NA	0.05 U
Methoxychlor	0.48 UJ	NA	NA	0.5 U	NA	NA	NA	NA	NA	0.48 UL	NA	0.5 U
Toxaphene	4.8 UJ	NA	NA	5 U	NA	NA	NA	NA	NA	4.8 UL	NA	5 U
alpha-BHC	0.048 UJ	NA	NA	0.05 U	NA	NA	NA	NA	NA	0.048 UL	NA	0.05 U
alpha-Chlordane	0.048 UJ	NA	NA	0.05 U	NA	NA	NA	NA	NA	0.048 UL	NA	0.05 U
beta-BHC	0.048 UJ	NA	NA	0.05 U	NA	NA	NA	NA	NA	0.048 UL	NA	0.05 U
delta-BHC	0.048 UJ	NA	NA	0.05 U	NA	NA	NA	NA	NA	0.048 UL	NA	0.05 U
gamma-BHC (Lindane)	0.048 UJ	NA	NA	0.05 U	NA	NA	NA	NA	NA	0.048 UL	NA	0.05 U
gamma-Chlordane	0.048 UJ	NA	NA	0.05 U	NA	NA	NA	NA	NA	0.048 UL	NA	0.05 U
Explosives (UG/L)												
1,3,5-Trinitrobenzene	0.13 U	NA	NA	NA	NA	NA	NA	NA	NA	0.18 U	NA	NA
1,3-Dinitrobenzene	0.12 U	NA	NA	NA	NA	NA	NA	NA	NA	0.17 U	NA	NA

Appendix G
Groundwater Analytical Results at Site 3
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	Yorktown-Eastover									Yorktown-Eastover		
Station ID	YS03-GW019									YS03-GW019A		
Sample ID	YS03-MW019-0296	YS03-MW019-0600	YS03-MW019P-0600	YS03-MW019-1004	YS03-MW019-0205	YS03-MW019P-0205	YS03-MW019-0505	YS03-MW019-0805	YS03-MW019P-0805	YS03-MW019A-0296	YS03-MW019A-0600	YS03-MW019A-0904
Sample Date	02/11/96	06/12/00	06/12/00	10/06/04	02/08/05	02/08/05	05/05/05	08/03/05	08/03/05	02/11/96	06/12/00	09/22/04
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data	GW RI Data
Chemical Name												
2,4,6-Trinitrotoluene	0.13 U	NA	NA	NA	NA	NA	NA	NA	NA	0.18 U	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrotoluene	0.51 U	NA	NA	NA	NA	NA	NA	NA	NA	0.7 U	NA	NA
3-Nitrotoluene	0.51 U	NA	NA	NA	NA	NA	NA	NA	NA	0.7 U	NA	NA
4-Nitrotoluene	1.5 U	NA	NA	NA	NA	NA	NA	NA	NA	2.1 U	NA	NA
Aminodinitrotoluenes	0.2 U	NA	NA	NA	NA	NA	NA	NA	NA	0.28 U	NA	NA
Dinitrotoluene mixture	0.2 U	NA	NA	NA	NA	NA	NA	NA	NA	0.28 U	NA	NA
HMX	1.1 U	NA	NA	NA	NA	NA	NA	NA	NA	1.5 U	NA	NA
Nitrobenzene	0.21 U	NA	NA	NA	NA	NA	NA	NA	NA	0.29 U	NA	NA
RDX	0.55 U	NA	NA	NA	NA	NA	NA	NA	NA	0.76 U	NA	NA
Tetryl	0.38 U	NA	NA	NA	NA	NA	NA	NA	NA	0.53 U	NA	NA
Total Metals (UG/L)												
Aluminum	32,300 K	NA	NA	140 B	NA	NA	NA	NA	NA	6,780 K	NA	316
Antimony	19.8 U	NA	NA	2 U	NA	NA	NA	NA	NA	19.8 U	NA	1.9 U
Arsenic	15.6	NA	NA	1.8 U	NA	NA	NA	NA	NA	10.6	NA	4.2 B
Barium	131	NA	NA	38.9 J	NA	NA	NA	NA	NA	41.4	NA	18.9 B
Beryllium	2.3	NA	NA	0.1 U	NA	NA	NA	NA	NA	0.8 U	NA	0.1 U
Cadmium	2.5 L	NA	NA	0.2 U	NA	NA	NA	NA	NA	2.2 UL	NA	0.2 U
Calcium	252,000	NA	NA	159,000	NA	NA	NA	NA	NA	108,000	NA	76,500
Chromium	177	NA	NA	2.2 B	NA	NA	NA	NA	NA	41.6	NA	1.7 B
Cobalt	13.5	NA	NA	0.47 B	NA	NA	NA	NA	NA	3 U	NA	0.5 U
Copper	31.5	NA	NA	0.64 B	NA	NA	NA	NA	NA	9	NA	0.61 B
Cyanide	10 U	NA	NA	1.6 U	NA	NA	NA	NA	NA	10 U	NA	1.1 U
Iron	91,100	NA	NA	417 B	NA	NA	NA	NA	NA	16,400	NA	560
Lead	22	NA	NA	0.9 U	NA	NA	NA	NA	NA	5.7	NA	1.1 U
Magnesium	14,200	NA	NA	4,660 J	NA	NA	NA	NA	NA	4,220	NA	1,150 J
Manganese	621	NA	NA	53.8	NA	NA	NA	NA	NA	119	NA	55.3
Mercury	0.1 U	NA	NA	0.1 UJ	NA	NA	NA	NA	NA	0.1 U	NA	0.1 UJ
Nickel	58.6	NA	NA	1.6 B	NA	NA	NA	NA	NA	11.3 U	NA	0.6 U
Potassium	11,800	NA	NA	604 J	NA	NA	NA	NA	NA	4,520	NA	987 J
Selenium	1.3 U	NA	NA	2.6 U	NA	NA	NA	NA	NA	1.3 U	NA	2.4 U
Silver	3.1 U	NA	NA	0.7 U	NA	NA	NA	NA	NA	3.1 U	NA	0.8 U
Sodium	9,880	NA	NA	11,600	NA	NA	NA	NA	NA	21,200	NA	5,530
Thallium	0.9 U	NA	NA	1.9 U	NA	NA	NA	NA	NA	0.9 U	NA	2.8 U
Vanadium	225	NA	NA	1.1 B	NA	NA	NA	NA	NA	32.1	NA	1.2 B
Zinc	180	NA	NA	5.7 B	NA	NA	NA	NA	NA	44.7	NA	20.2 B
Dissolved Metals (UG/L)												
Aluminum	23.3 U	NA	NA	4.8 B	NA	NA	NA	NA	NA	23.3 U	NA	4.4 U
Antimony	19.8 U	NA	NA	2 U	NA	NA	NA	NA	NA	19.8 U	NA	2 U
Arsenic	0.9 U	NA	NA	1.8 U	NA	NA	NA	NA	NA	0.9 U	NA	3.6 B
Barium	30.1	NA	NA	37.1 J	NA	NA	NA	NA	NA	23.6	NA	18.8 B
Beryllium	0.8 U	NA	NA	0.1 U	NA	NA	NA	NA	NA	0.8 U	NA	0.1 U
Cadmium	2.2 UL	NA	NA	0.2 U	NA	NA	NA	NA	NA	2.2 UL	NA	0.2 U
Calcium	127,000	NA	NA	157,000	NA	NA	NA	NA	NA	69,700	NA	81,900
Chromium	2.4 U	NA	NA	0.5 U	NA	NA	NA	NA	NA	2.4 U	NA	0.5 U
Cobalt	3 U	NA	NA	0.8 B	NA	NA	NA	NA	NA	3 U	NA	0.76 B
Copper	3.9	NA	NA	0.5 U	NA	NA	NA	NA	NA	2 U	NA	0.5 U
Iron	76.3	NA	NA	55.6 B	NA	NA	NA	NA	NA	9.7 U	NA	10.7 U
Lead	0.8 U	NA	NA	0.9 U	NA	NA	NA	NA	NA	0.8 U	NA	0.9 U

Appendix G
Groundwater Analytical Results at Site 3
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	Yorktown-Eastover									Yorktown-Eastover		
Station ID	YS03-GW019									YS03-GW019A		
Sample ID	YS03-MW019-0296	YS03-MW019-0600	YS03-MW019P-0600	YS03-MW019-1004	YS03-MW019-0205	YS03-MW019P-0205	YS03-MW019-0505	YS03-MW019-0805	YS03-MW019P-0805	YS03-MW019A-0296	YS03-MW019A-0600	YS03-MW019A-0904
Sample Date	02/11/96	06/12/00	06/12/00	10/06/04	02/08/05	02/08/05	05/05/05	08/03/05	08/03/05	02/11/96	06/12/00	09/22/04
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data	LTM Data	LTM Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data	GW RI Data
Chemical Name												
Magnesium	4,390	NA	NA	4,570 J	NA	NA	NA	NA	NA	1,510	NA	1,120 J
Manganese	204	NA	NA	53.5	NA	NA	NA	NA	NA	51.3	NA	57.6
Mercury	0.1 U	NA	NA	0.1 UJ	NA	NA	NA	NA	NA	0.1 U	NA	0.1 UJ
Nickel	11.3 U	NA	NA	0.5 U	NA	NA	NA	NA	NA	11.3 U	NA	0.5 U
Potassium	1,430	NA	NA	530 J	NA	NA	NA	NA	NA	2,390	NA	845 J
Selenium	1.3 U	NA	NA	2.6 U	NA	NA	NA	NA	NA	1.3 U	NA	2.6 U
Silver	3.1 U	NA	NA	0.7 U	NA	NA	NA	NA	NA	3.1 U	NA	0.7 U
Sodium	8,820	NA	NA	12,000	NA	NA	NA	NA	NA	20,600	NA	6,040
Thallium	0.9 U	NA	NA	1.9 U	NA	NA	NA	NA	NA	0.9 U	NA	1.9 U
Vanadium	2.4 U	NA	NA	0.4 U	NA	NA	NA	NA	NA	5.3	NA	0.4 U
Zinc	3.6 U	NA	NA	0.7 U	NA	NA	NA	NA	NA	3.6 U	NA	12.8 B
Wet Chemistry (MG/L)												
Nitrate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level repo
J = Analyte present. Reported value may or may n
K = Analyte present. Reported value may be biase
L = Analyte present. Reported value may be biase
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccu
UL = Not detected, quantitation limit is probably hig

Aquifer	Yorktown-Eastover			Yorktown-Eastover				Yorktown-Eastover			
Station ID	YS03-GW019A			YS03-GW020				YS03-GW020A			
Sample ID	YS03-MW019A-0205	YS03-MW019A-0505	YS03-MW019A-0805	YS03-MW020-1004	YS03-MW020-0205	YS03-MW020-0505	YS03-MW020-0805	YS03-MW020A-1004	YS03-MW020A-0205	YS03-MW020A-0505	YS03-MW020A-0805
Sample Date	02/08/05	05/05/05	08/03/05	10/06/04	02/08/05	05/05/05	08/02/05	10/06/04	02/08/05	05/05/05	08/02/05
Investigation	LTM Data	LTM Data	LTM Data	GW RI Data	LTM Data	LTM Data	LTM Data	GW RI Data	LTM Data	LTM Data	LTM Data
Chemical Name											
Volatile Organic Compounds (UG/L)											
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromo-3-chloropropane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	10 U	10 UJ	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	10 UJ	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane (Freon-12)	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl acetate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl-tert-butyl ether (MTBE)	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	10 U	13 B	3 B	10 U	10 U	14 B	4 B	10 U	10 U	13 B	3 B
Styrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	6 J	4 J	2 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane(Freon-11)	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U	4 J	10 U	10 U	10 U	1 J	10 U	10 U	10 U
Xylene, total	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	8 J	5 J	4 J	5 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
isopropylbenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Aquifer	Yorktown-Eastover			Yorktown-Eastover				Yorktown-Eastover			
Station ID	YS03-GW019A			YS03-GW020				YS03-GW020A			
Sample ID	YS03-MW019A-0205	YS03-MW019A-0505	YS03-MW019A-0805	YS03-MW020-1004	YS03-MW020-0205	YS03-MW020-0505	YS03-MW020-0805	YS03-MW020A-1004	YS03-MW020A-0205	YS03-MW020A-0505	YS03-MW020A-0805
Sample Date	02/08/05	05/05/05	08/03/05	10/06/04	02/08/05	05/05/05	08/02/05	10/06/04	02/08/05	05/05/05	08/02/05
Investigation	LTM Data	LTM Data	LTM Data	GW RI Data	LTM Data	LTM Data	LTM Data	GW RI Data	LTM Data	LTM Data	LTM Data
Chemical Name											
Semi-volatile Organic Compounds (UG/L)											
1,1-Biphenyl	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2'-oxybis(1-chloropropane)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Atrazine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Caprolactam	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Aquifer	Yorktown-Eastover			Yorktown-Eastover				Yorktown-Eastover			
Station ID	YS03-GW019A			YS03-GW020				YS03-GW020A			
Sample ID	YS03-MW019A-0205	YS03-MW019A-0505	YS03-MW019A-0805	YS03-MW020-1004	YS03-MW020-0205	YS03-MW020-0505	YS03-MW020-0805	YS03-MW020A-1004	YS03-MW020A-0205	YS03-MW020A-0505	YS03-MW020A-0805
Sample Date	02/08/05	05/05/05	08/03/05	10/06/04	02/08/05	05/05/05	08/02/05	10/06/04	02/08/05	05/05/05	08/02/05
Investigation	LTM Data	LTM Data	LTM Data	GW RI Data	LTM Data	LTM Data	LTM Data	GW RI Data	LTM Data	LTM Data	LTM Data
Chemical Name											
Fluorene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isophorone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethyl)ether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitroso-di-n-propylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodiphenylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/L)											
4,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aldrin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan I	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan II	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin aldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin ketone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toxaphene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
alpha-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
alpha-Chlordane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
gamma-BHC (Lindane)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
gamma-Chlordane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Explosives (UG/L)											
1,3,5-Trinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Aquifer	Yorktown-Eastover			Yorktown-Eastover				Yorktown-Eastover			
Station ID	YS03-GW019A			YS03-GW020				YS03-GW020A			
Sample ID	YS03-MW019A-0205	YS03-MW019A-0505	YS03-MW019A-0805	YS03-MW020-1004	YS03-MW020-0205	YS03-MW020-0505	YS03-MW020-0805	YS03-MW020A-1004	YS03-MW020A-0205	YS03-MW020A-0505	YS03-MW020A-0805
Sample Date	02/08/05	05/05/05	08/03/05	10/06/04	02/08/05	05/05/05	08/02/05	10/06/04	02/08/05	05/05/05	08/02/05
Investigation	LTM Data	LTM Data	LTM Data	GW RI Data	LTM Data	LTM Data	LTM Data	GW RI Data	LTM Data	LTM Data	LTM Data
Chemical Name											
2,4,6-Trinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aminodinitrotoluenes	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dinitrotoluene mixture	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HMX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RDX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetryl	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Metals (UG/L)											
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (UG/L)											
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Aquifer	Yorktown-Eastover			Yorktown-Eastover				Yorktown-Eastover			
Station ID	YS03-GW019A			YS03-GW020				YS03-GW020A			
Sample ID	YS03-MW019A-0205	YS03-MW019A-0505	YS03-MW019A-0805	YS03-MW020-1004	YS03-MW020-0205	YS03-MW020-0505	YS03-MW020-0805	YS03-MW020A-1004	YS03-MW020A-0205	YS03-MW020A-0505	YS03-MW020A-0805
Sample Date	02/08/05	05/05/05	08/03/05	10/06/04	02/08/05	05/05/05	08/02/05	10/06/04	02/08/05	05/05/05	08/02/05
Investigation	LTM Data	LTM Data	LTM Data	GW RI Data	LTM Data	LTM Data	LTM Data	GW RI Data	LTM Data	LTM Data	LTM Data
Chemical Name											
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry (MG/L)											
Nitrate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level repo
J = Analyte present. Reported value may or may n
K = Analyte present. Reported value may be biase
L = Analyte present. Reported value may be biase
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccu
UL = Not detected, quantitation limit is probably hig

Appendix G
Groundwater Analytical Results at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	Yorktown-Eastover					Yorktown-Eastover			Yorktown-Eastover		
Station ID	YS06-GW001					YS06-GW001A			YS06-GW002		
Sample ID	YS06-MW001-0994	YS06-MW001P-0994	YS06-MW001-0600	YS06-MW001P-0600	YS06-MW001-0904	YS06-MW001A-1094	YS06-MW001A-0600	YS06-MW001A-0904	YS06-MW002-1094	YS06-MW002-0600	YS06-MW002P-0600
Sample Date	09/11/94	09/11/94	06/19/00	06/19/00	09/15/04	10/12/94	06/19/00	09/14/04	10/10/94	06/21/00	06/21/00
Investigation	Historical Data	Historical Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	Historical Data
Chemical Name											
Volatile Organic Compounds (UG/L)											
1,1,1-Trichloroethane	13	14 J	1 J	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
1,1,2,2-Tetrachloroethane	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA	NA	10 U	NA	10 U	NA	10 U	10 U	NA	10 U	10 U
1,1,2-Trichloroethane	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
1,1-Dichloroethane	14	14 J	9 J	NA	3 J	1 U	10 U	10 U	1 U	10 U	10 U
1,1-Dichloroethene	36	45	22 J	NA	15	1 U	10 U	10 U	1 U	10 U	10 U
1,2,3-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	NA	NA	10 U	NA	10 U	NA	10 U	10 U	NA	10 U	10 U
1,2-Dibromo-3-chloropropane	1 R	25 R	10 U	NA	10 U	1 R	10 U	10 U	1 R	10 U	10 U
1,2-Dibromoethane	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
1,2-Dichlorobenzene	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
1,2-Dichloroethane	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
1,2-Dichloropropane	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
1,3-Dichlorobenzene	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
1,4-Dichlorobenzene	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
2-Butanone	5 R	120 R	10 U	NA	10 U	5 R	10 U	10 U	5 R	10 U	10 U
2-Hexanone	5 R	120 R	10 U	NA	10 U	5 R	10 U	10 U	5 R	10 U	10 U
4-Methyl-2-pentanone	5 U	120 U	10 U	NA	10 U	5 U	10 U	10 U	5 U	10 U	10 U
Acetone	5 R	120 R	1 B	NA	10 U	5 R	10 U	10 U	5 R	2 B	10 U
Benzene	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
Bromochloromethane	1 U	25 U	NA	NA	NA	1 U	NA	NA	1 U	NA	NA
Bromodichloromethane	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
Bromoform	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
Bromomethane	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
Carbon disulfide	1 U	25 U	10 UJ	NA	10 U	1 U	10 UJ	10 U	1 U	10 U	10 U
Carbon tetrachloride	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
Chlorobenzene	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
Chloroethane	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
Chloroform	2	25 U	10 U	NA	10 U	1 U	10 U	10 U	0.6 B	10 U	10 U
Chloromethane	1 U	25 U	10 U	NA	10 U	1 UJ	10 U	10 U	1 U	10 U	10 U
Cyclohexane	NA	NA	10 U	NA	10 U	NA	10 U	10 U	NA	10 U	10 U
Dibromochloromethane	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
Dichlorodifluoromethane (Freon-12)	NA	NA	10 U	NA	10 U	NA	10 U	10 U	NA	10 U	10 U
Ethylbenzene	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
Methyl acetate	NA	NA	10 U	NA	10 U	NA	10 U	10 U	NA	10 U	10 U
Methyl-tert-butyl ether (MTBE)	NA	NA	10 U	NA	10 U	NA	10 U	10 U	NA	10 U	10 U
Methylcyclohexane	NA	NA	10 U	NA	10 U	NA	10 U	10 U	NA	10 U	10 U
Methylene chloride	2 U	50 U	3 B	NA	10 U	0.6 B	2 B	10 U	1 B	2 B	3 B
Styrene	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
Tetrachloroethene	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
Toluene	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
Trichloroethene	320	350	120	NA	94	1 U	10 U	10 U	1 U	10 U	10 U
Trichlorofluoromethane(Freon-11)	NA	NA	10 U	NA	10 U	NA	10 U	10 U	NA	10 U	10 U
Vinyl chloride	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
Xylene, total	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
cis-1,2-Dichloroethene	110	98	56	NA	46	1 U	10 U	10 U	1 U	10 U	10 U
cis-1,3-Dichloropropene	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U
isopropylbenzene	NA	NA	10 U	NA	10 U	NA	10 U	10 U	NA	10 U	10 U
trans-1,2-Dichloroethene	1	25 U	10 U	NA	2 J	1 U	10 U	10 U	1 U	10 U	10 U
trans-1,3-Dichloropropene	1 U	25 U	10 U	NA	10 U	1 U	10 U	10 U	1 U	10 U	10 U

Aquifer	Yorktown-Eastover					Yorktown-Eastover			Yorktown-Eastover		
Station ID	YS06-GW001					YS06-GW001A			YS06-GW002		
Sample ID	YS06-MW001-0994	YS06-MW001P-0994	YS06-MW001-0600	YS06-MW001P-0600	YS06-MW001-0904	YS06-MW001A-1094	YS06-MW001A-0600	YS06-MW001A-0904	YS06-MW002-1094	YS06-MW002-0600	YS06-MW002P-0600
Sample Date	09/11/94	09/11/94	06/19/00	06/19/00	09/15/04	10/12/94	06/19/00	09/14/04	10/10/94	06/21/00	06/21/00
Investigation	Historical Data	Historical Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	Historical Data
Chemical Name											
Volatile Organic Compounds (UG/L)											
Semi-volatile Organic Compounds (UG/L)											
1,1-Biphenyl	NA	NA	NA	NA	11 U	NA	NA	10 U	NA	NA	NA
1,2,4-Trichlorobenzene	10 U	10 U	NA	NA	NA	10 U	NA	NA	10 U	NA	NA
1,2-Dichlorobenzene	10 U	10 U	NA	NA	NA	10 U	NA	NA	10 U	NA	NA
1,3-Dichlorobenzene	10 U	10 U	NA	NA	NA	10 U	NA	NA	10 U	NA	NA
1,4-Dichlorobenzene	10 U	10 U	NA	NA	NA	10 U	NA	NA	10 U	NA	NA
2,2'-oxybis(1-chloropropane)	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
2,4,5-Trichlorophenol	25 U	25 U	NA	NA	28 U	25 U	NA	25 U	25 U	NA	NA
2,4,6-Trichlorophenol	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
2,4-Dichlorophenol	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
2,4-Dimethylphenol	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
2,4-Dinitrophenol	25 U	25 U	NA	NA	28 U	25 U	NA	25 U	25 U	NA	NA
2,4-Dinitrotoluene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
2,6-Dinitrotoluene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
2-Chloronaphthalene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
2-Chlorophenol	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
2-Methylnaphthalene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
2-Methylphenol	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
2-Nitroaniline	25 U	25 U	NA	NA	28 U	25 U	NA	25 U	25 U	NA	NA
2-Nitrophenol	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
3,3'-Dichlorobenzidine	10 U	10 UJ	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
3-Nitroaniline	25 U	25 R	NA	NA	28 U	25 U	NA	25 U	25 U	NA	NA
4,6-Dinitro-2-methylphenol	25 U	25 U	NA	NA	28 U	25 U	NA	25 U	25 U	NA	NA
4-Bromophenyl-phenylether	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
4-Chloro-3-methylphenol	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
4-Chloroaniline	10 UJ	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
4-Chlorophenyl-phenylether	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
4-Methylphenol	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
4-Nitroaniline	25 U	25 U	NA	NA	28 U	25 U	NA	25 U	25 U	NA	NA
4-Nitrophenol	25 U	25 U	NA	NA	28 U	25 U	NA	25 U	25 U	NA	NA
Acenaphthene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Acenaphthylene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Acetophenone	NA	NA	NA	NA	11 U	NA	NA	10 U	NA	NA	NA
Anthracene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Atrazine	NA	NA	NA	NA	11 U	NA	NA	10 U	NA	NA	NA
Benzaldehyde	NA	NA	NA	NA	11 U	NA	NA	10 U	NA	NA	NA
Benzo(a)anthracene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Benzo(a)pyrene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Benzo(b)fluoranthene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Benzo(g,h,i)perylene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Benzo(k)fluoranthene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Butylbenzylphthalate	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Caprolactam	NA	NA	NA	NA	11 U	NA	NA	10 U	NA	NA	NA
Carbazole	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Chrysene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Di-n-butylphthalate	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	4 B	NA	NA
Di-n-octylphthalate	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Dibenz(a,h)anthracene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Dibenzofuran	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA

Aquifer	Yorktown-Eastover					Yorktown-Eastover			Yorktown-Eastover		
Station ID	YS06-GW001					YS06-GW001A			YS06-GW002		
Sample ID	YS06-MW001-0994	YS06-MW001P-0994	YS06-MW001-0600	YS06-MW001P-0600	YS06-MW001-0904	YS06-MW001A-1094	YS06-MW001A-0600	YS06-MW001A-0904	YS06-MW002-1094	YS06-MW002-0600	YS06-MW002P-0600
Sample Date	09/11/94	09/11/94	06/19/00	06/19/00	09/15/04	10/12/94	06/19/00	09/14/04	10/10/94	06/21/00	06/21/00
Investigation	Historical Data	Historical Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	Historical Data
Chemical Name											
Volatile Organic Compounds (UG/L)											
Diethylphthalate	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Dimethyl phthalate	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Fluoranthene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Fluorene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Hexachlorobenzene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Hexachlorobutadiene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Hexachlorocyclopentadiene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Hexachloroethane	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Indeno(1,2,3-cd)pyrene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Isophorone	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Naphthalene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Nitrobenzene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Pentachlorophenol	25 U	25 U	NA	NA	28 U	25 U	NA	25 U	25 U	NA	NA
Phenanthrene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Phenol	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Pyrene	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
bis(2-Chloroethoxy)methane	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
bis(2-Chloroethyl)ether	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
bis(2-Ethylhexyl)phthalate	10 U	10 U	NA	NA	11 U	1 J	NA	10 U	10 U	NA	NA
n-Nitroso-di-n-propylamine	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
n-Nitrosodiphenylamine	10 U	10 U	NA	NA	11 U	10 U	NA	10 U	10 U	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/L)											
4,4'-DDD	NA	NA	NA	NA	0.1 U	NA	NA	0.1 U	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	0.1 U	NA	NA	0.1 U	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	0.1 U	NA	NA	0.1 U	NA	NA	NA
Aldrin	NA	NA	NA	NA	0.051 U	NA	NA	0.05 U	NA	NA	NA
Aroclor-1016	NA	NA	NA	NA	1 U	NA	NA	1 U	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	2.1 U	NA	NA	2 U	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	1 U	NA	NA	1 U	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	1 U	NA	NA	1 U	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	1 U	NA	NA	1 U	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	1 U	NA	NA	1 U	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	1 U	NA	NA	1 U	NA	NA	NA
Dieldrin	NA	NA	NA	NA	0.1 U	NA	NA	0.1 U	NA	NA	NA
Endosulfan I	NA	NA	NA	NA	0.051 U	NA	NA	0.05 U	NA	NA	NA
Endosulfan II	NA	NA	NA	NA	0.1 U	NA	NA	0.1 U	NA	NA	NA
Endosulfan sulfate	NA	NA	NA	NA	0.1 U	NA	NA	0.1 U	NA	NA	NA
Endrin	NA	NA	NA	NA	0.1 U	NA	NA	0.1 U	NA	NA	NA
Endrin aldehyde	NA	NA	NA	NA	0.1 U	NA	NA	0.1 U	NA	NA	NA
Endrin ketone	NA	NA	NA	NA	0.1 U	NA	NA	0.1 U	NA	NA	NA
Heptachlor	NA	NA	NA	NA	0.051 U	NA	NA	0.05 U	NA	NA	NA
Heptachlor epoxide	NA	NA	NA	NA	0.21 B	NA	NA	0.05 U	NA	NA	NA
Methoxychlor	NA	NA	NA	NA	0.51 U	NA	NA	0.5 U	NA	NA	NA
Toxaphene	NA	NA	NA	NA	5.1 U	NA	NA	5 U	NA	NA	NA
alpha-BHC	NA	NA	NA	NA	0.051 U	NA	NA	0.05 U	NA	NA	NA
alpha-Chlordane	NA	NA	NA	NA	0.051 U	NA	NA	0.05 U	NA	NA	NA
beta-BHC	NA	NA	NA	NA	0.051 U	NA	NA	0.05 U	NA	NA	NA
delta-BHC	NA	NA	NA	NA	0.051 U	NA	NA	0.05 U	NA	NA	NA
gamma-BHC (Lindane)	NA	NA	NA	NA	0.051 U	NA	NA	0.05 U	NA	NA	NA

Appendix G
Groundwater Analytical Results at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	Yorktown-Eastover					Yorktown-Eastover			Yorktown-Eastover		
Station ID	YS06-GW001					YS06-GW001A			YS06-GW002		
Sample ID	YS06-MW001-0994	YS06-MW001P-0994	YS06-MW001-0600	YS06-MW001P-0600	YS06-MW001-0904	YS06-MW001A-1094	YS06-MW001A-0600	YS06-MW001A-0904	YS06-MW002-1094	YS06-MW002-0600	YS06-MW002P-0600
Sample Date	09/11/94	09/11/94	06/19/00	06/19/00	09/15/04	10/12/94	06/19/00	09/14/04	10/10/94	06/21/00	06/21/00
Investigation	Historical Data	Historical Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	Historical Data
Chemical Name											
Volatile Organic Compounds (UG/L)											
gamma-Chlordane	NA	NA	NA	NA	0.051 U	NA	NA	0.05 U	NA	NA	NA
Explosives (UG/L)											
1,3,5-Trinitrobenzene	0.66 U	0.66 U	0.8 UL	NA	2.5 U	0.66 U	1.6 U	2.5 U	0.66 U	2 U	1.3 U
1,3-Dinitrobenzene	1.1 U	1.1 U	0.8 UL	NA	2.5 U	1.1 U	1.6 U	2.5 U	1.1 U	2 U	1.3 U
2,4,6-Trinitrotoluene	0.62 U	0.62 U	1.6 UL	NA	2.5 U	0.62 U	3.2 U	2.5 U	0.62 U	4 U	2.6 U
2,4-Dinitrotoluene	1 U	1 U	2 UL	NA	2.5 U	1 U	4 U	2.5 U	1 U	5 U	3.25 U
2,6-Dinitrotoluene	1 U	1 U	2 UL	NA	5 U	1 U	4 U	5 U	1 U	5 U	3.25 U
2-Amino-4,6-dinitrotoluene	NA	NA	2.4 UL	NA	5 U	NA	4.8 U	5 U	NA	6 U	3.9 U
2-Nitrotoluene	0.75 U	0.75 U	2 UL	NA	5 U	0.75 U	4 U	5 U	0.75 U	5 U	3.25 U
3-Nitrotoluene	0.91 U	0.91 U	1.6 UL	NA	5 U	0.91 U	3.2 U	5 U	0.91 U	4 U	2.6 U
4-Amino-2,6-dinitrotoluene	1.2	1.4	1.6 UL	NA	5 U	1 U	3.2 U	5 U	1 U	4 U	2.6 U
4-Nitrotoluene	NA	NA	2 UL	NA	5 U	NA	4 U	5 U	NA	5 U	3.25 U
HMX	3.2	4.1	1.6 UL	NA	19	0.61 U	3.2 U	2.5 U	0.61 U	4 U	2.6 U
Nitrobenzene	0.73 U	0.73 U	1.2 UL	NA	2.5 U	0.73 U	2.4 U	2.5 U	0.73 U	3 U	1.95 U
RDX	63	80	39.6 L	NA	32	0.59 U	4 UJ	2.5 U	0.59 U	5 U	3.25 U
Tetryl	1 U	1 U	1.6 UL	NA	5 U	1 U	3.2 U	5 U	1 U	4 U	2.6 U
Total Metals (UG/L)											
Aluminum	466	666	37 U	37 U	80.7 U	233 J	38.4 J	80.7 U	1,510 J	248	250
Antimony	12.4 U	12.4 U	2.1 U	2.1 U	1.9 U	12.2 U	2.1 U	1.9 U	12.2 U	2.1 U	2.1 U
Arsenic	37.1	36.7	7.6 J	7.85 B	9.3 B	2.3 U	2.3 U	2.1 U	3.3	2.3 U	3.8 J
Barium	22.5	23	24.1 J	22.3 B	18 B	35.2	26.8 J	26.5 B	38.4	36.4 J	36.2 J
Beryllium	0.2 U	0.2 U	0.2 U	0.2 U	0.1 U	1 U	0.2 U	0.1 U	1 U	0.2 U	0.2 U
Cadmium	2.3 U	2.3 U	0.2 U	0.2 U	0.2 U	1.5 U	0.2 U	0.2 U	1.5 U	0.2 U	0.2 U
Calcium	94,000	93,200	93,700	91,532	81,800	71,200	70,700	74,000	83,300	88,100	88,700
Chromium	2	1.8	0.4 U	0.454 B	0.9 U	1.8 U	0.51 J	0.9 U	4.7	23.1	24
Cobalt	2.1 U	2.1 U	0.7 J	0.5 U	0.5 U	1.9 U	0.5 U	0.5 U	2.2	0.88 J	0.5 U
Copper	3.8	3.9	0.69 J	0.836 B	3.9 B	1.4 U	0.72 J	0.6 U	2.8	1.6 J	1.2 J
Cyanide	5 UL	5 UL	1 J	0.9 U	3.1 B	5 U	0.9 U	1.1 U	5 U	0.9 U	0.9 U
Iron	10,900	10,900	6,990	6,803	8,830	1,000	831	794	3,610	1,350	1,370
Lead	1.5 U	1.5 U	1.3 U	1.3 U	1.1 U	1.4 U	1.3 U	1.1 U	2 K	1.3	1.3 U
Magnesium	4,220	4,190	3,610 J	3,518 B	3,370 J	3,010	2,910 J	2,870 J	2,860	2,380 J	2,380 J
Manganese	240	239	161	157	180	25.8	24.2	23.8	79	44.2	43.5
Mercury	0.2 UL	0.2 UL	0.15 L	0.154 B	0.1 UJ	0.2 UL	0.15 L	0.1 UJ	0.2 UL	0.16 L	0.14 L
Nickel	5.2 U	5.2 U	0.88 J	1.63 B	0.6 U	4.3 U	1.3 B	0.6 U	4.3 U	17.7 B	17.9 J
Potassium	1,920	1,870	1,460 J	1,426 B	1,380 J	2,890	2,740 J	2,740 J	2,730	1,270 J	1,240 J
Selenium	2.4 U	4.4 K	2.7 B	2.2 U	2.4 U	2.6 U	2.2 U	2.4 U	2.6 U	2.2 U	2.2 U
Silver	1.7 U	1.7 U	0.6 U	0.6 U	0.8 U	2 UL	0.6 U	0.8 U	2 UL	0.6 U	0.6 U
Sodium	11,000	10,800	11,500	11,270	7,830	16,400	20,000	17,500	6,340	5,810	5,580
Thallium	6.8 B	5.7 U	6.7 B	4.39 B	2.8 U	4 UL	3.2 U	2.8 U	4 UL	3.2 U	3.2 U
Vanadium	5.2	5.6	1.1 J	0.644 B	0.6 U	1.4 U	0.6 J	0.6 U	6.9	0.56 J	0.66 J
Zinc	24.1 B	17.9 B	0.97 B	0.8 U	6.9 B	8.2 B	0.8 U	4.1 U	15.9 B	0.9 B	1.6 B
Dissolved Metals (UG/L)											
Aluminum	11.5 U	11.5 U	37 U	37 U	80.7 U	11 U	37 U	80.7 U	11 U	37 U	37 U
Antimony	20.6	17.1	2.1 U	2.1 U	1.9 U	12.2 U	2.1 U	1.9 U	12.2 U	2.1 U	2.1 U
Arsenic	12.6	11.8	8 J	7 B	7 B	3	2.3 U	2.1 U	2.3 U	4.1 J	3.2 J
Barium	13.6	13.4	19.9 J	20 B	17.5 B	32	27 J	25.1 B	32.7	33.3 J	33.7 J
Beryllium	0.2 U	0.2 U	0.2 U	0.2 U	0.1 U	1 U	0.2 U	0.1 U	1 U	0.2 U	0.2 U

Appendix G
Groundwater Analytical Results at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	Yorktown-Eastover					Yorktown-Eastover			Yorktown-Eastover		
Station ID	YS06-GW001					YS06-GW001A			YS06-GW002		
Sample ID	YS06-MW001-0994	YS06-MW001P-0994	YS06-MW001-0600	YS06-MW001P-0600	YS06-MW001-0904	YS06-MW001A-1094	YS06-MW001A-0600	YS06-MW001A-0904	YS06-MW002-1094	YS06-MW002-0600	YS06-MW002P-0600
Sample Date	09/11/94	09/11/94	06/19/00	06/19/00	09/15/04	10/12/94	06/19/00	09/14/04	10/10/94	06/21/00	06/21/00
Investigation	Historical Data	Historical Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	Historical Data
Chemical Name											
Volatile Organic Compounds (UG/L)											
Cadmium	2.3 U	2.3 U	0.2 U	0.2 U	0.2 U	1.5 UL	0.22 J	0.2 U	1.5 UL	0.2 U	0.2 U
Calcium	93,400	95,300	90,800	90,813	81,500	71,600	73,400	71,300	82,200	84,400	85,700
Chromium	1.5 U	1.5 U	0.4 U	0.4 U	0.9 U	1.8 U	0.4 U	0.9 U	1.8 U	1.1 J	0.4 U
Cobalt	2.1 U	2.1 U	0.5 U	0.5 U	0.5 U	1.9 U	0.5 U	0.5 U	1.9 U	0.5 U	0.5 U
Copper	3.9	2.9	1.2 J	0.6 U	0.6 U	1.4 U	1.3 J	0.6 U	1.4 U	1.9 J	1.7 J
Iron	509	329	5,270	5,282	8,450	231	262	627	153	58.9 J	14.3 U
Lead	1.5 U	1.5 U	1.3 U	1.3 U	1.1 U	1.4 U	1.3 U	1.1 U	1.4 U	1.3 U	1.3 U
Magnesium	4,070	4,130 B	3,450 J	3,453 B	3,260 J	2,790	3,060 J	2,750 J	2,330	2,220 J	2,250 J
Manganese	229	233	147	147	174	23	25	23	61.9	38.4	38.4
Mercury	0.2 UL	0.2 UL	NA	0.138 B	0.1 UJ	0.2 UL	0.15 L	0.1 UJ	0.2 UL	0.14 L	0.16 L
Nickel	5.2 U	5.2 U	1.8 B	0.7 U	0.6 U	4.3 U	0.98 B	0.7 J	4.3 U	10.6 J	10 J
Potassium	1,940	2,090	1,370 J	1,356 B	1,390 J	2,910	2,900 J	2,680 J	1,670	1,120 J	1,130 J
Selenium	2.4 U	2.4 U	2.2 U	2.2 U	2.4 U	2.6 UL	2.2 U	2.4 U	2.6 UL	2.2 U	2.2 U
Silver	1.7 U	1.7 U	0.6 U	0.6 U	0.8 U	2 U	0.6 U	0.8 U	2 U	0.6 U	0.6 U
Sodium	10,800	11,000	10,600	10,727	8,110	15,900	19,500	17,600	5,850	5,490	5,470
Thallium	5.7 U	6.3 K	3.9 J	4 B	2.8 U	4 UL	3.2 U	2.8 U	4 UL	3.2 U	3.2 U
Vanadium	1.8 U	2.5	0.53 J	0.61 B	0.6 U	1.4 U	0.4 U	0.6 U	1.4 U	0.4 U	0.4 U
Zinc	19.3 B	8.8 B	1.9 J	0.8 U	4.1 U	6.3 B	0.8 U	4.1 U	7.4 B	0.92 J	0.89 J
Wet Chemistry (MG/L)											
Nitrate/Nitrite	0.06	0.06	NA	NA	NA	0.02 U	NA	NA	0.05	NA	NA
Total dissolved solids (TDS)	330	330	NA	NA	NA	330	NA	NA	240	NA	NA
Total suspended solids (TSS)	46	51	NA	NA	NA	230	NA	NA	72	NA	NA

Notes:

Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

Appendix G
Groundwater Analytical Results at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	Yorktown-Eastover	Yorktown-Eastover		Yorktown-Eastover	Yorktown-Eastover		Yorktown-Eastover			Yorktown-Eastover	Yorktown-Eastover	Yorkt
Station ID	YS06-GW003	YS06-GW004		YS06-GW005	YS06-GW005B		YS06-GW006			YS06-GW006B	YS06-GW007	YS
Sample ID	YS06-MW003-1194	YS06-MW004-0600	YS06-MW004-1004	YS06-MW005-0600	YS06-MW005B-1004	YS06-MW005BP-1004	YS06-MW006-0600	YS06-MW006-0904	YS06-MW006P-0904	YS06-MW006B-1004	YS06-MW007-1004	YS06-MW008-10
Sample Date	11/09/94	06/23/00	10/05/04	06/22/00	10/04/04	10/04/04	06/23/00	09/20/04	09/20/04	10/07/04	10/07/04	10/05/04
Investigation	Historical Data	Historical Data	GW RI Data	Historical Data	GW RI Data	GW RI Data	Historical Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data
Chemical Name												
Volatile Organic Compounds (UG/L)												
1,1,1-Trichloroethane	1 U	10 U	10 U	10 U	10 U	NA	52	8 J	10	10 U	10 U	5,000
1,1,2,2-Tetrachloroethane	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
1,1,2-Trichloroethane	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
1,1-Dichloroethane	1 U	10 U	10 U	1 J	10 U	NA	39	16	19	10 U	10 U	5,000
1,1-Dichloroethene	1 U	10 U	10 U	1 J	2 J	NA	64	19	23	10 U	10 U	5,000
1,2,3-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	NA	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
1,2-Dibromo-3-chloropropane	1 R	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
1,2-Dibromoethane	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
1,2-Dichlorobenzene	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
1,2-Dichloroethane	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
1,2-Dichloropropane	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
1,3-Dichlorobenzene	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
1,4-Dichlorobenzene	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
2-Butanone	5 R	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
2-Hexanone	5 R	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
4-Methyl-2-pentanone	5 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
Acetone	5 R	8 B	10 U	5 B	10 U	NA	3 B	10 U	10 U	10 U	10 U	5,000
Benzene	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
Bromochloromethane	1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
Bromoform	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
Bromomethane	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
Carbon disulfide	52	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
Carbon tetrachloride	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
Chlorobenzene	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
Chloroethane	1 U	10 U	10 U	10 UJ	10 U	NA	10 UJ	10 U	10 U	10 U	10 U	5,000
Chloroform	0.6 J	10 U	10 U	10 U	10 U	NA	9 J	10 U	10 U	10 U	10 U	5,000
Chloromethane	1 UJ	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
Cyclohexane	NA	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
Dibromochloromethane	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
Dichlorodifluoromethane (Freon-12)	NA	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
Ethylbenzene	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
Methyl acetate	NA	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
Methyl-tert-butyl ether (MTBE)	NA	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
Methylcyclohexane	NA	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
Methylene chloride	2 U	3 B	10 U	3 B	2 J	NA	4 B	10 U	10 U	10 U	10 U	5,000
Styrene	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
Tetrachloroethene	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
Toluene	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
Trichloroethene	1 U	10 U	10 U	13	5 J	NA	10 U	10 U	10 U	10 U	3 J	36,000
Trichlorofluoromethane(Freon-11)	NA	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
Vinyl chloride	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
Xylene, total	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
cis-1,2-Dichloroethene	1 U	10 U	10 U	41	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
cis-1,3-Dichloropropene	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
isopropylbenzene	NA	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
trans-1,2-Dichloroethene	1 U	10 U	10 U	4 J	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000
trans-1,3-Dichloropropene	1 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	5,000

Appendix G
Groundwater Analytical Results at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	Yorktown-Eastover	Yorktown-Eastover		Yorktown-Eastover	Yorktown-Eastover		Yorktown-Eastover			Yorktown-Eastover	Yorktown-Eastover	Yorkt
Station ID	YS06-GW003	YS06-GW004		YS06-GW005	YS06-GW005B		YS06-GW006			YS06-GW006B	YS06-GW007	YS
Sample ID	YS06-MW003-1194	YS06-MW004-0600	YS06-MW004-1004	YS06-MW005-0600	YS06-MW005B-1004	YS06-MW005BP-1004	YS06-MW006-0600	YS06-MW006-0904	YS06-MW006P-0904	YS06-MW006B-1004	YS06-MW007-1004	YS06-MW008-10
Sample Date	11/09/94	06/23/00	10/05/04	06/22/00	10/04/04	10/04/04	06/23/00	09/20/04	09/20/04	10/07/04	10/07/04	10/05/04
Investigation	Historical Data	Historical Data	GW RI Data	Historical Data	GW RI Data	GW RI Data	Historical Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data
Chemical Name												
Volatile Organic Compounds (UG/L)												
Semi-volatile Organic Compounds (UG/L)												
1,1-Biphenyl	NA	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
1,2,4-Trichlorobenzene	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2'-oxybis(1-chloropropane)	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
2,4,5-Trichlorophenol	25 U	NA	49 U	NA	25 U	NA	NA	25 U	25 U	25 U	25 U	25
2,4,6-Trichlorophenol	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
2,4-Dichlorophenol	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
2,4-Dimethylphenol	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
2,4-Dinitrophenol	25 U	NA	49 U	NA	25 U	NA	NA	25 U	25 U	25 U	25 U	25
2,4-Dinitrotoluene	10 U	NA	11 J	NA	12	NA	NA	10 U	10 U	10 U	15	10
2,6-Dinitrotoluene	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
2-Chloronaphthalene	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
2-Chlorophenol	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
2-Methylnaphthalene	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
2-Methylphenol	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
2-Nitroaniline	25 U	NA	49 U	NA	25 U	NA	NA	25 U	25 U	25 U	25 U	25
2-Nitrophenol	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
3,3'-Dichlorobenzidine	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
3-Nitroaniline	25 U	NA	49 U	NA	25 U	NA	NA	25 U	25 U	25 U	25 U	25
4,6-Dinitro-2-methylphenol	25 U	NA	49 U	NA	25 U	NA	NA	25 U	25 U	25 U	25 U	25
4-Bromophenyl-phenylether	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
4-Chloro-3-methylphenol	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
4-Chloroaniline	10 UJ	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
4-Chlorophenyl-phenylether	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
4-Methylphenol	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
4-Nitroaniline	25 U	NA	49 U	NA	25 U	NA	NA	25 U	25 U	25 U	25 U	25
4-Nitrophenol	25 U	NA	49 U	NA	25 U	NA	NA	25 U	25 U	25 U	25 U	25
Acenaphthene	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Acenaphthylene	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Acetophenone	NA	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Anthracene	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Atrazine	NA	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Benzaldehyde	NA	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Benzo(a)anthracene	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Benzo(a)pyrene	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Benzo(b)fluoranthene	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Benzo(g,h,i)perylene	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Benzo(k)fluoranthene	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Butylbenzylphthalate	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Caprolactam	NA	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Carbazole	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Chrysene	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Di-n-butylphthalate	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Di-n-octylphthalate	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Dibenz(a,h)anthracene	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Dibenzofuran	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10

Aquifer	Yorktown-Eastover	Yorktown-Eastover		Yorktown-Eastover	Yorktown-Eastover		Yorktown-Eastover			Yorktown-Eastover	Yorktown-Eastover	Yorkt
Station ID	YS06-GW003	YS06-GW004		YS06-GW005	YS06-GW005B		YS06-GW006			YS06-GW006B	YS06-GW007	YS
Sample ID	YS06-MW003-1194	YS06-MW004-0600	YS06-MW004-1004	YS06-MW005-0600	YS06-MW005B-1004	YS06-MW005BP-1004	YS06-MW006-0600	YS06-MW006-0904	YS06-MW006P-0904	YS06-MW006B-1004	YS06-MW007-1004	YS06-MW008-10
Sample Date	11/09/94	06/23/00	10/05/04	06/22/00	10/04/04	10/04/04	06/23/00	09/20/04	09/20/04	10/07/04	10/07/04	10/05/04
Investigation	Historical Data	Historical Data	GW RI Data	Historical Data	GW RI Data	GW RI Data	Historical Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data
Chemical Name												
Volatile Organic Compounds (UG/L)												
Diethylphthalate	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Dimethyl phthalate	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Fluoranthene	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Fluorene	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Hexachlorobenzene	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Hexachlorobutadiene	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Hexachlorocyclopentadiene	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Hexachloroethane	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Indeno(1,2,3-cd)pyrene	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Isophorone	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Naphthalene	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Nitrobenzene	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Pentachlorophenol	25 U	NA	49 U	NA	25 U	NA	NA	25 U	25 U	25 U	25 U	25
Phenanthrene	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Phenol	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Pyrene	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
bis(2-Chloroethoxy)methane	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
bis(2-Chloroethyl)ether	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
bis(2-Ethylhexyl)phthalate	10 U	NA	20 U	NA	10 U	NA	NA	10 U	5 B	10 U	3 J	13
n-Nitroso-di-n-propylamine	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
n-Nitrosodiphenylamine	10 U	NA	20 U	NA	10 U	NA	NA	10 U	10 U	10 U	10 U	10
Pesticide/Polychlorinated Biphenyls (UG/L)												
4,4'-DDD	NA	NA	0.1 U	NA	0.1 U	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1
4,4'-DDE	NA	NA	0.038 J	NA	0.1 U	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1
4,4'-DDT	NA	NA	0.1 U	NA	0.1 U	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1
Aldrin	NA	NA	0.05 U	NA	0.05 U	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05
Aroclor-1016	NA	NA	1 U	NA	1 U	NA	NA	1 U	1 U	1 U	1 U	1
Aroclor-1221	NA	NA	2 U	NA	2 U	NA	NA	2 U	2 U	2 U	2 U	2
Aroclor-1232	NA	NA	1 U	NA	1 U	NA	NA	1 U	1 U	1 U	1 U	1
Aroclor-1242	NA	NA	1 U	NA	1 U	NA	NA	1 U	1 U	1 U	1 U	1
Aroclor-1248	NA	NA	1 U	NA	1 U	NA	NA	1 U	1 U	1 U	1 U	1
Aroclor-1254	NA	NA	1 U	NA	1 U	NA	NA	1 U	1 U	1 U	1 U	1
Aroclor-1260	NA	NA	1 U	NA	1 U	NA	NA	1 U	1 U	1 U	1 U	1
Dieldrin	NA	NA	0.1 U	NA	0.1 U	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1
Endosulfan I	NA	NA	0.05 U	NA	0.05 U	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05
Endosulfan II	NA	NA	0.1 U	NA	0.1 U	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1
Endosulfan sulfate	NA	NA	0.1 U	NA	0.1 U	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1
Endrin	NA	NA	0.1 U	NA	0.1 U	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1
Endrin aldehyde	NA	NA	0.1 U	NA	0.1 U	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1
Endrin ketone	NA	NA	0.1 U	NA	0.1 U	NA	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1
Heptachlor	NA	NA	0.05 U	NA	0.05 U	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05
Heptachlor epoxide	NA	NA	13	NA	0.59	NA	NA	0.05 U	0.05 U	0.05 U	0.029 B	0.05
Methoxychlor	NA	NA	0.5 U	NA	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5
Toxaphene	NA	NA	5 U	NA	5 U	NA	NA	5 U	5 U	5 U	5 U	5
alpha-BHC	NA	NA	0.05 U	NA	0.05 U	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05
alpha-Chlordane	NA	NA	0.05 U	NA	0.05 U	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05
beta-BHC	NA	NA	0.05 U	NA	0.063 J	NA	NA	0.05 U	0.05 U	0.013 J	0.036 J	0.05
delta-BHC	NA	NA	0.05 U	NA	0.05 U	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05
gamma-BHC (Lindane)	NA	NA	0.018 J	NA	0.05 U	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05

Appendix G
Groundwater Analytical Results at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	Yorktown-Eastover	Yorktown-Eastover		Yorktown-Eastover	Yorktown-Eastover		Yorktown-Eastover			Yorktown-Eastover	Yorktown-Eastover	Yorkt
Station ID	YS06-GW003	YS06-GW004		YS06-GW005	YS06-GW005B		YS06-GW006			YS06-GW006B	YS06-GW007	YS
Sample ID	YS06-MW003-1194	YS06-MW004-0600	YS06-MW004-1004	YS06-MW005-0600	YS06-MW005B-1004	YS06-MW005BP-1004	YS06-MW006-0600	YS06-MW006-0904	YS06-MW006P-0904	YS06-MW006B-1004	YS06-MW007-1004	YS06-MW008-10
Sample Date	11/09/94	06/23/00	10/05/04	06/22/00	10/04/04	10/04/04	06/23/00	09/20/04	09/20/04	10/07/04	10/07/04	10/05/04
Investigation	Historical Data	Historical Data	GW RI Data	Historical Data	GW RI Data	GW RI Data	Historical Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data
Chemical Name												
Volatile Organic Compounds (UG/L)												
gamma-Chlordane	NA	NA	0.05 U	NA	0.05 U	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.05
Explosives (UG/L)												
1,3,5-Trinitrobenzene	0.66 U	200 U	4	2 U	0.68 J	NA	1 UL	2.5 U	2.5 U	2.5 U	2.5 U	2.5
1,3-Dinitrobenzene	1.1 U	200 U	2.6	2 U	0.74 J	NA	1 UL	2.5 U	2.5 U	2.5 U	2.5 U	2.5
2,4,6-Trinitrotoluene	0.62 U	15,270 J	4,100	4 U	1.2 J	NA	2 UL	2.5 U	2.5 U	2.5 U	2.5 U	2.5
2,4-Dinitrotoluene	1 U	500 U	40	5 U	13	NA	2.5 UL	2.5 U	2.5 U	2.5 U	17	2.5
2,6-Dinitrotoluene	1 U	500 U	5 U	5 U	5 U	NA	2.5 UL	5 U	5 U	5 U	5 U	5
2-Amino-4,6-dinitrotoluene	NA	4,073	2,300	6 U	6.6	NA	3 UL	5 U	5 U	5 U	5 U	5
2-Nitrotoluene	0.75 U	500 U	17	5 U	5 U	NA	2.5 UL	5 U	5 U	5 U	5 U	5
3-Nitrotoluene	0.91 U	400 U	5 U	4 U	5 U	NA	2 UL	5 U	5 U	5 U	5 U	5
4-Amino-2,6-dinitrotoluene	1 U	2,797	1,900	4 U	9.1	NA	2 UL	5 U	5 U	5 U	5 U	5
4-Nitrotoluene	NA	500 U	5 U	5 U	5 U	NA	2.5 UL	5 U	5 U	5 U	5 U	5
HMX	0.61 U	665	2.5 U	2.74 J	8.2	NA	2 UL	2.5 U	2.5 U	2.5 U	2.5 U	2.5
Nitrobenzene	0.73 U	300 U	2.5 U	3 U	2.5 U	NA	1.5 UL	2.5 U	2.5 U	2.5 U	2.5 U	2.5
RDX	0.59 U	500 U	2.5 U	5 U	28	NA	2.5 UL	2.5 U	2.5 U	2.5 U	2.5 U	2.5
Tetryl	1 U	400 U	5 U	4 U	2.3 J	NA	2 UL	5 U	5 U	5 U	5 U	5
Total Metals (UG/L)												
Aluminum	794 J	869	154 B	133 J	18.6 B	21.5 B	1,080	80.7 U	80.7 U	600	56.9 B	226
Antimony	12.2 U	2.1 U	2 U	2.1 U	4.6 B	2 U	2.1 U	1.9 U	1.9 U	2.7 B	2.3 B	2.5
Arsenic	2.5	13.3	2.9 J	17.5	1.8 U	1.8 U	8.2 J	2.1 U	2.1 U	1.8 U	1.8 U	1.8
Barium	32.3	305 J	319	11.8 J	22.4 J	21.3 B	32.5 J	20.6 B	19.4 B	53.1 J	49.8 J	30.3
Beryllium	0.1 U	0.2 U	0.14 B	0.2 U	0.1 U	0.1 U	0.22 J	0.1 U	0.1 U	0.36 B	0.1 U	0.1
Cadmium	1.5 U	0.2 U	0.61 B	0.2 U	0.23 B	0.2 U	0.6 J	0.2 U	0.2 U	0.34 B	0.24 B	0.2
Calcium	91,800	174,000	158,000	73,700	108,000	108,213	136,000	117,000	112,000	111,000	161,000	96,100
Chromium	2.5	1.2 J	0.5 U	1.2 J	0.86 B	0.5 U	5.6 J	0.9 U	0.9 U	3.3 B	0.52 B	1.5
Cobalt	1.9 U	1.6 J	0.95 B	0.5 U	0.88 B	0.37 B	1.9 J	0.5 U	0.5 U	3.3 B	0.81 B	0.3
Copper	4.8	3.4 J	0.5 U	1.1 J	0.53 B	0.5 U	2.2 J	0.6 U	0.6 U	1.9 B	0.5 U	0.52
Cyanide	5 U	156	189	0.9 U	1.6 U	1.6 B	0.9 U	1.1 U	1.1 U	1.6 U	1.6 U	1.6
Iron	2,120 J	7,480	21,300	1,870	25.1 B	25.3 B	3,100	43 U	43 U	2,550	66.3 B	1,010
Lead	1.9 K	10.5	0.9 U	2.1 J	0.9 U	0.9 U	1.3 U	1.1 U	1.1 U	0.9 U	0.9 U	0.9
Magnesium	3,100	400,000	357,000	12,500	3,330 J	3,349 B	4,560 J	2,790 J	2,680 J	3,270 J	4,500 J	3,930
Manganese	86.2	223	200	119	64.4	64.9	306	220	207	45.4	169	58.4
Mercury	0.2 U	0.17 L	0.1 UJ	0.17 L	0.1 UJ	0.1 U	0.15 L	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1
Nickel	4.3 U	0.95 J	3 B	2.7 J	1.4 B	1.38 B	6.4 J	0.6 U	0.6 U	3.5 B	2.3 B	0.5
Potassium	3,690	203,000	162,000	4,540 J	742 J	743 B	1,850 J	556 J	524 J	1,960 J	1,280 J	2,670
Selenium	2.6 U	2.2 U	2.6 U	2.2 U	2.6 U	2.6 U	2.2 U	2.4 U	2.4 U	2.6 U	2.6 U	2.6
Silver	2 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U	0.6 U	0.8 U	0.8 U	0.7 U	0.7 U	0.7
Sodium	12,700	3,150,000	3,300,000	70,500	9,050	9,065	17,600	25,700	24,000	9,390	32,600	33,300
Thallium	4 U	3.2 U	1.9 U	3.2 U	1.9 U	1.9 U	3.2 U	2.8 U	2.8 U	1.9 U	1.9 U	1.9
Vanadium	4.4	3.6 J	0.62 B	1.3 J	0.87 B	0.59 B	8.8 J	0.6 U	0.6 U	5.3 J	0.71 B	0.8
Zinc	36 B	16,700	5,540	13,100	1.8 B	1.7 B	4.8 J	4.1 U	4.1 U	6.3 B	2.6 B	6
Dissolved Metals (UG/L)												
Aluminum	596 J	37 U	5.8 B	37 U	5.4 B	4.4 U	37 U	80.7 U	80.7 U	5.2 B	4.4 U	9.3
Antimony	12.2 U	2.1 U	2 U	2.1 U	2 U	2 U	2.1 U	1.9 U	1.9 U	2 U	2 U	2
Arsenic	2.3 U	3.7 J	5.3 J	15.8	1.8 U	1.81 B	3.3 J	2.1 U	2.1 U	1.8 U	1.8 U	1.8
Barium	30.9	280	332	10.2 J	21.8 J	21.2 B	27.5 J	18.5 B	18.7 B	38.3 J	50.6 J	30.4
Beryllium	0.1 U	0.2 U	0.15 B	0.2 U	0.1 U	0.1 U	0.2 U	0.1 U	0.1 B	0.1 U	0.1 U	0.1

Appendix G
Groundwater Analytical Results at Site 6
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	Yorktown-Eastover	Yorktown-Eastover		Yorktown-Eastover	Yorktown-Eastover		Yorktown-Eastover			Yorktown-Eastover	Yorktown-Eastover	Yorkt
Station ID	YS06-GW003	YS06-GW004		YS06-GW005	YS06-GW005B		YS06-GW006			YS06-GW006B	YS06-GW007	YS
Sample ID	YS06-MW003-1194	YS06-MW004-0600	YS06-MW004-1004	YS06-MW005-0600	YS06-MW005B-1004	YS06-MW005BP-1004	YS06-MW006-0600	YS06-MW006-0904	YS06-MW006P-0904	YS06-MW006B-1004	YS06-MW007-1004	YS06-MW008-10
Sample Date	11/09/94	06/23/00	10/05/04	06/22/00	10/04/04	10/04/04	06/23/00	09/20/04	09/20/04	10/07/04	10/07/04	10/05/04
Investigation	Historical Data	Historical Data	GW RI Data	Historical Data	GW RI Data	GW RI Data	Historical Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data
Chemical Name												
Volatile Organic Compounds (UG/L)												
Cadmium	1.5 U	1 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2
Calcium	90,100	180,000	170,000	81,000	108,000	108,554	142,000	109,000	109,000	108,000	164,000	99,600
Chromium	1.8 U	2.4 J	0.5 U	0.4 U	0.5 U	0.5 U	0.4 U	0.9 U	0.9 U	0.5 U	0.5 U	0.5
Cobalt	1.9 U	0.5 U	1.2 B	0.5 U	0.71 B	0.59 B	1.2 J	0.5 U	0.5 U	0.87 B	0.93 B	0.3
Copper	14.6	0.78 J	0.5 U	1.2 J	0.5 U	0.5 U	1.6 J	0.6 U	0.6 U	0.5 U	0.5 U	0.5
Iron	794 J	14.3 U	11,000	380	10.7 U	10.7 U	20.9 J	43 U	43 U	1,760	10.7 U	647
Lead	2.1 K	1.3 U	0.9 U	1.3 U	0.9 U	0.9 U	1.3 U	1.1 U	1.1 U	0.9 U	0.9 U	0.9
Magnesium	2,960	430,000	374,000	13,500	3,390 J	3,392 B	4,330 J	2,590 J	2,600 J	3,000 J	4,490 J	4,020
Manganese	110 J	206	187	126	56.2	55.9	298	199	201	42.9	157	59.2
Mercury	0.2 U	0.18 L	0.1 UJ	0.14 L	0.1 UJ	0.1 U	0.15 L	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1
Nickel	4.3 U	3.1 J	1.3 B	1.9 B	0.91 B	0.63 B	3.2 B	1.6 J	1.5 J	0.5 U	1.8 B	0.5
Potassium	3,600	202,000 J	176,000	4,500 J	712 J	723 B	1,460 J	522 J	533 J	1,670 J	1,400 J	2,730
Selenium	2.6 U	2.2 U	2.6 U	2.2 U	2.6 U	2.6 U	2.2 U	2.4 U	2.4 U	2.6 U	2.6 U	2.6
Silver	2 U	0.6 U	0.7 U	0.6 U	0.7 U	0.7 U	0.6 U	0.8 U	0.8 U	0.7 U	0.7 U	0.7
Sodium	13,000	3,240,000	3,530,000	72,100	9,220	9,355	17,100	24,100	24,500	9,400	32,400	35,600
Thallium	4 U	4.2 J	1.9 U	3.2 U	3 B	1.9 U	3.2 U	2.8 U	2.8 U	1.9 U	1.9 U	1.9
Vanadium	1.4 U	0.4 U	0.4 U	0.56 J	0.73 B	0.4 U	0.56 J	0.6 U	0.6 U	0.4 U	0.48 B	0.4
Zinc	1,740 J	20,000	1,980	13,300	0.7 U	0.7 U	53.5	4.1 U	4.1 U	0.7 U	0.7 U	0.7
Wet Chemistry (MG/L)												
Nitrate/Nitrite	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	250	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total suspended solids (TSS)	230	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level report
J = Analyte present. Reported value may or may no
K = Analyte present. Reported value may be biased
L = Analyte present. Reported value may be biased
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccura
UL = Not detected, quantitation limit is probably high

Aquifer	own-Eastover		Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover
Station ID	06-GW008		YS06-GW008	YS06-GW009	YS06-GW009A	YS06-GW009B	YS06-GW010	YS06-GW010A
Sample ID	04	YS06-MW008-0305	YS06-MW008P-0305	YS06-MW009-1004	YS06-MW009A-1004	YS06-MW009B-1004	YS06-MW010-1004	YS06-MW010A-1004
Sample Date		03/17/05	03/17/05	10/05/04	10/05/04	10/07/04	10/04/04	10/05/04
Investigation		GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data
Chemical Name								
Volatile Organic Compounds (UG/L)								
1,1,1-Trichloroethane	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	U	5.9 K	5.6 K	10 U	10 U	10 U	10 U	10 U
1,2,3-Trichlorobenzene		0.5 U	0.5 U	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromo-3-chloropropane	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	U	0.26 K	0.24 K	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	U	5 U	5 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	U	5 U	5 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	U	5 U	5 U	10 U	10 U	10 U	10 U	10 U
Acetone	U	5 U	5 U	10 U	10 U	10 U	10 U	10 U
Benzene	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
Bromochloromethane		0.5 U	0.5 U	NA	NA	NA	NA	NA
Bromodichloromethane	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
Bromoform	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	U	0.5 UJ	0.5 UJ	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	U	0.17 K	0.23 K	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
Chloroform	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
Chloromethane	U	0.5 U	0.17 K	10 U	10 U	10 U	10 U	10 U
Cyclohexane	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane (Freon-12)	U	0.5 UJ	0.5 UJ	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
Methyl acetate	U	0.5 UJ	0.5 UJ	10 U	10 U	10 U	10 U	10 U
Methyl-tert-butyl ether (MTBE)	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	U	0.34 B	0.31 B	10 U	3 J	10 U	3 J	10 U
Styrene	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
Toluene	U	0.17 B	0.16 B	10 U	10 U	10 U	10 U	10 U
Trichloroethene		17,000 J	19,000 J	10 U	3 J	10 U	1 J	10 U
Trichlorofluoromethane(Freon-11)	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	U	8 K	7.8 K	10 U	10 U	10 U	10 U	10 U
Xylene, total	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	U	550 J	530 J	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	U	0.15 K	0.17 B	10 U	10 U	10 U	10 U	10 U
isopropylbenzene	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	U	7.7 K	7.3 K	10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	U	0.5 U	0.5 U	10 U	10 U	10 U	10 U	10 U

Aquifer	own-Eastover		Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover
Station ID	06-GW008		YS06-GW008	YS06-GW009	YS06-GW009A	YS06-GW009B	YS06-GW010	YS06-GW010A
Sample ID	04	YS06-MW008-0305	YS06-MW008P-0305	YS06-MW009-1004	YS06-MW009A-1004	YS06-MW009B-1004	YS06-MW010-1004	YS06-MW010A-1004
Sample Date		03/17/05	03/17/05	10/05/04	10/05/04	10/07/04	10/04/04	10/05/04
Investigation		GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data
Chemical Name								
Volatile Organic Compounds (UG/L)								
Semi-volatile Organic Compounds (UG/L)								
1,1-Biphenyl	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene		NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene		NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene		NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene		NA	NA	NA	NA	NA	NA	NA
2,2'-oxybis(1-chloropropane)	U	10 UJ	10 UJ	18 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	U	25 U	25 U	45 U	25 U	25 U	25 U	25 U
2,4,6-Trichlorophenol	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	U	25 UJ	25 UJ	45 U	25 U	25 U	25 U	25 U
2,4-Dinitrotoluene	U	10 U	10 U	120	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
2-Chloronaphthalene	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
2-Chlorophenol	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
2-Methylphenol	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
2-Nitroaniline	U	25 U	25 U	45 U	25 U	25 U	25 U	25 U
2-Nitrophenol	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
3-Nitroaniline	U	25 U	25 U	45 U	25 U	25 U	25 U	25 U
4,6-Dinitro-2-methylphenol	U	25 U	25 U	45 U	25 U	25 U	25 U	25 U
4-Bromophenyl-phenylether	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
4-Chloroaniline	U	10 UJ	10 UJ	18 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenylether	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
4-Methylphenol	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
4-Nitroaniline	U	25 U	25 U	45 U	25 U	25 U	25 U	25 U
4-Nitrophenol	U	25 U	25 U	45 U	25 U	25 U	25 U	25 U
Acenaphthene	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Acenaphthylene	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Acetophenone	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Anthracene	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Atrazine	U	10 UJ	10 UJ	18 U	10 U	10 U	10 U	10 U
Benzaldehyde	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Benzo(a)anthracene	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Butylbenzylphthalate	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Caprolactam	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Carbazole	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Chrysene	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Di-n-butylphthalate	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Di-n-octylphthalate	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Dibenz(a,h)anthracene	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Dibenzofuran	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U

Aquifer	own-Eastover		Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover
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Sample ID	04	YS06-MW008-0305	YS06-MW008P-0305	YS06-MW009-1004	YS06-MW009A-1004	YS06-MW009B-1004	YS06-MW010-1004	YS06-MW010A-1004
Sample Date		03/17/05	03/17/05	10/05/04	10/05/04	10/07/04	10/04/04	10/05/04
Investigation		GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data
Chemical Name								
Volatile Organic Compounds (UG/L)								
Diethylphthalate	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Dimethyl phthalate	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Fluoranthene	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Fluorene	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	U	10 UJ	10 UJ	18 U	10 U	10 U	10 U	10 U
Hexachloroethane	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Isophorone	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Naphthalene	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Nitrobenzene	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Pentachlorophenol	U	25 UJ	25 UJ	45 U	25 U	25 U	25 U	25 U
Phenanthrene	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Phenol	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Pyrene	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)ether	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate		10 U	10 U	6 J	10 U	10 U	10 U	10 U
n-Nitroso-di-n-propylamine	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
n-Nitrosodiphenylamine	U	10 U	10 U	18 U	10 U	10 U	10 U	10 U
Pesticide/Polychlorinated Biphenyls (UG/L)								
4,4'-DDD	U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4,4'-DDE	U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4,4'-DDT	U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Aldrin	U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Aroclor-1016	U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1221	U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Aroclor-1232	U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1242	U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1248	U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1254	U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Aroclor-1260	U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dieldrin	U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Endosulfan I	U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Endosulfan II	U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Endosulfan sulfate	U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Endrin	U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Endrin aldehyde	U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Endrin ketone	U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Heptachlor	U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Heptachlor epoxide	U	0.05 U	0.05 U	1.2	0.05 U	0.05 U	0.062	0.05 U
Methoxychlor	U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toxaphene	U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
alpha-BHC	U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
alpha-Chlordane	U	0.05 U	0.05 U	0.036 B	0.05 U	0.05 U	0.05 U	0.05 U
beta-BHC	U	0.05 U	0.05 U	0.26 J	0.036 J	0.036 J	0.05 U	0.028 J
delta-BHC	U	0.05 U	0.05 U	0.016 J	0.05 U	0.05 U	0.05 U	0.05 U
gamma-BHC (Lindane)	U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U

Aquifer	own-Eastover		Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover
Station ID	06-GW008		YS06-GW008	YS06-GW009	YS06-GW009A	YS06-GW009B	YS06-GW010	YS06-GW010A
Sample ID	04	YS06-MW008-0305	YS06-MW008P-0305	YS06-MW009-1004	YS06-MW009A-1004	YS06-MW009B-1004	YS06-MW010-1004	YS06-MW010A-1004
Sample Date		03/17/05	03/17/05	10/05/04	10/05/04	10/07/04	10/04/04	10/05/04
Investigation		GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data
Chemical Name								
Volatile Organic Compounds (UG/L)								
gamma-Chlordane	U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Explosives (UG/L)								
1,3,5-Trinitrobenzene	U	2.5 U	2.5 U	1.9 J	2.5 U	2.5 U	2.5 U	2.5 U
1,3-Dinitrobenzene	U	2.5 U	2.5 U	57	2.5 U	2.5 U	2.5 U	2.5 U
2,4,6-Trinitrotoluene	U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	0.95 J	2.5 U
2,4-Dinitrotoluene	U	2.5 U	2.5 U	130	2.5 U	2.5 U	2.5 U	2.5 U
2,6-Dinitrotoluene	U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Amino-4,6-dinitrotoluene	U	5 U	5 U	16	5 U	5 U	5 U	5 U
2-Nitrotoluene	U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
3-Nitrotoluene	U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Amino-2,6-dinitrotoluene	U	5 U	5 U	17	5 U	5 U	5 U	5 U
4-Nitrotoluene	U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
HMX	U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Nitrobenzene	U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
RDX	U	2.5 U	2.5 U	84	2.5 U	2.5 U	2.5 U	2.5 U
Tetryl	U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Total Metals (UG/L)								
Aluminum		97.1 B	88.5 B	12.9 B	364	3,770	70.3 B	49.3 B
Antimony	B	3.9 B	2.1 U	2 U	2 U	2.3 B	2 U	2.1 B
Arsenic	U	2.1 U	2.1 U	1.8 U	1.8 U	2.9 J	1.8 U	1.8 U
Barium	J	26.6 B	27 B	57.7 J	59.4 J	33.1 J	29.4 J	24 J
Beryllium	U	0.1 U	0.1 U	0.1 U	0.1 U	0.28 B	0.1 U	0.1 U
Cadmium	U	0.3 U	0.3 U	0.23 B	0.2 U	0.23 B	0.2 U	0.2 U
Calcium		102,000	102,000	222,000	114,000	94,000	118,000	100,000
Chromium	B	0.63 B	0.6 U	0.5 U	2.5 B	18.9 B	0.68 B	0.5 U
Cobalt	U	0.6 U	0.6 U	1.6 B	0.38 B	3.2 B	0.3 U	0.38 B
Copper	B	0.4 U	0.4 U	0.5 U	0.5 U	1.9 B	0.5 U	0.5 U
Cyanide	U	0.8 U	0.8 U	2.4 B	1.6 U	1.6 U	1.6 U	1.6 U
Iron	B	700	689	10.7 U	822 B	6,320	147 B	923 B
Lead	U	1.3 U	1.3 U	0.9 U	0.9 U	1.1 B	0.9 U	0.9 U
Magnesium	J	3,810 J	3,860 J	13,400	5,360	11,600	5,230	7,940
Manganese		55.1	55.5	97	204	324	6.7 J	59.3
Mercury	UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Nickel	U	0.8 U	0.8 U	1.1 B	1 B	6.9 B	0.94 B	1.1 B
Potassium	J	2,770 J	2,820 J	3,410 J	4,240 J	9,150	1,910 J	2,680 J
Selenium	U	2.7 U	2.7 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U
Silver	U	0.8 U	0.8 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
Sodium		34,500	34,900	274,000	77,000	128,000	42,600	31,400
Thallium	U	3.6 B	3 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Vanadium	B	0.5 U	0.5 U	0.64 B	1.1 B	11.2 J	0.84 B	0.4 U
Zinc	B	1.6 B	1.5 B	2.9 B	5 B	39.6	2.1 B	3.4 B
Dissolved Metals (UG/L)								
Aluminum	B	29.1 B	24.3 U	20.1 B	8.2 B	7.5 B	8.7 B	6 B
Antimony	U	2.5 U	2.5 U	2 U	2 U	2 U	2 U	2 U
Arsenic	U	3.6 U	3.6 U	1.8 U	2 J	3 J	1.8 U	1.8 U
Barium	J	35.6 J	34 J	59 J	58.1 J	24.2 J	29.6 J	26.1 J
Beryllium	U	0.32 B	0.28 B	0.1 B	0.1 U	0.1 U	0.1 U	0.1 U

Aquifer		own-Eastover	Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover	Yorktown-Eastover
Station ID		06-GW008	YS06-GW008	YS06-GW009	YS06-GW009A	YS06-GW009B	YS06-GW010	YS06-GW010A
Sample ID		04 YS06-MW008-0305	YS06-MW008P-0305	YS06-MW009-1004	YS06-MW009A-1004	YS06-MW009B-1004	YS06-MW010-1004	YS06-MW010A-1004
Sample Date		03/17/05	03/17/05	10/05/04	10/05/04	10/07/04	10/04/04	10/05/04
Investigation		GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data	GW RI Data
Chemical Name								
Volatile Organic Compounds (UG/L)								
Cadmium	U	0.3 U	0.3 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Calcium		105,000	101,000	229,000	113,000	86,500	119,000	108,000
Chromium	U	0.9 U	0.9 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Cobalt	B	0.6 U	0.6 U	2 B	0.82 B	5.4 B	0.67 B	0.72 B
Copper	U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Iron	B	646	631	10.7 U	217 B	10.7 U	10.7 U	1,240
Lead	U	1.7 U	1.7 U	1.1 B	0.9 U	0.9 U	0.9 U	0.9 U
Magnesium	J	4,140 J	3,970 J	13,700	5,240	10,500	5,240	8,190
Manganese		56.1	54	103	200	287	7.1 J	72.3
Mercury	UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Nickel	U	1 U	1 U	0.86 B	0.5 U	1.8 B	0.5 U	0.89 B
Potassium	J	3,090 J	3,020 J	3,590 J	4,140 J	8,120	1,910 J	2,820 J
Selenium	U	3.9 U	3.9 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U
Silver	U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
Sodium		34,600	33,300	283,000	79,000	136,000	43,900	34,000
Thallium	U	6.2 U	6.2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Vanadium	U	0.4 U	0.4 U	0.79 B	0.4 U	0.4 U	0.59 B	0.4 U
Zinc	U	3.6 U	3.6 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
Wet Chemistry (MG/L)								
Nitrate/Nitrite		NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)		NA	NA	NA	NA	NA	NA	NA
Total suspended solids (TSS)		NA	NA	NA	NA	NA	NA	NA

Notes:
- Shaded values indicate the analyte was detected
- GW = Groundwater
- LTM = Long Term Monitoring
- RI = Remedial Investigation
- UG/L = Micrograms per Liter
- MG/L = Milligrams per Liter
- B = Not detected substantially above the level report
- J = Analyte present. Reported value may or may no
- K = Analyte present. Reported value may be biased
- L = Analyte present. Reported value may be biased
- NA = Not analyzed
- R = Unreliable result
- U = Not detected
- UJ = Not detected, quantitation limit may be inaccura
- UL = Not detected, quantitation limit is probably high

Appendix G
Groundwater Analytical Results at Site 7
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	Yorktown-Eastover		Yorktown-Eastover							Yorktown-Eastover		
Station ID	YS07-GW001		YS07-GW002							YS07-GW003		
Sample ID	YS07-MW001-1094	YS07-MW001-0904	YS07-MW002-1094	YS07-MW002-0600	YS07-MW002-0904	YS07-MW002P-0904	YS07-MW002-0205	YS07-MW002-0505	YS07-MW002-0805	YS07-MW003-1094	YS07-MW003-0600	YS07-MW003-0904
Sample Date	10/07/94	09/17/04	10/07/94	06/09/00	09/20/04	09/20/04	02/09/05	05/03/05	08/02/05	10/07/94	06/09/00	09/22/04
Investigation	Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data	GW RI Data
Chemical Name												
Volatile Organic Compounds (UG/L)												
1,1,1-Trichloroethane	2	NA	40	7 J	10 U	10 U	2 J	10 U	2 J	1 U	10 U	10 U
1,1,2,2-Tetrachloroethane	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
1,1,2-Trichloroethane	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
1,1-Dichloroethane	1 U	NA	16	6 J	10 U	10 U	2 J	2 J	2 J	1 U	10 U	10 U
1,1-Dichloroethene	1 U	NA	4	2 J	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
1,2,4-Trichlorobenzene	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
1,2-Dibromo-3-chloropropane	1 R	NA	1 R	10 U	10 U	10 U	10 U	10 U	10 U	1 R	10 U	10 U
1,2-Dibromoethane	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
1,2-Dichlorobenzene	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
1,2-Dichloroethane	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
1,2-Dichloropropane	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
1,3-Dichlorobenzene	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
1,4-Dichlorobenzene	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
2-Butanone	5 R	NA	5 R	10 U	10 UJ	10 UJ	9 B	10 U	10 U	5 R	10 U	10 UJ
2-Hexanone	5 R	NA	5 R	10 U	10 U	10 U	10 U	10 U	10 U	5 R	10 U	10 U
4-Methyl-2-pentanone	5 U	NA	5 U	10 U	10 U	10 U	10 U	10 U	10 U	5 U	10 U	10 U
Acetone	5 R	NA	5 R	2 B	10 U	10 U	10 U	10 U	10 U	5 R	2 B	10 U
Benzene	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
Bromochloromethane	1 U	NA	1 U	NA	NA	NA	NA	NA	NA	1 U	NA	NA
Bromodichloromethane	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
Bromoform	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
Bromomethane	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
Carbon disulfide	1 U	NA	1 U	10 UJ	10 U	10 U	10 U	10 U	10 U	1 U	10 UJ	10 U
Carbon tetrachloride	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
Chlorobenzene	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
Chloroethane	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
Chloroform	3 U	NA	2 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
Chloromethane	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
Cyclohexane	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
Dibromochloromethane	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
Dichlorodifluoromethane (Freon-12)	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
Ethylbenzene	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
Methyl acetate	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
Methyl-tert-butyl ether (MTBE)	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
Methylcyclohexane	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
Methylene chloride	2 U	NA	2 U	2 J	10 U	10 U	10 U	1 J	10 U	2 U	4 J	10 U
Styrene	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
Tetrachloroethene	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
Toluene	1 U	NA	1 U	10 U	10 U	10 U	10 U	5 J	10 U	1 U	10 U	10 U
Trichloroethene	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
Trichlorofluoromethane(Freon-11)	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
Vinyl chloride	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
Xylene, total	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
cis-1,2-Dichloroethene	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
cis-1,3-Dichloropropene	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
isopropylbenzene	NA	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U
trans-1,2-Dichloroethene	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
trans-1,3-Dichloropropene	1 U	NA	1 U	10 U	10 U	10 U	10 U	10 U	10 U	1 U	10 U	10 U
Semi-volatile Organic Compounds (UG/L)												

Aquifer	Yorktown-Eastover		Yorktown-Eastover							Yorktown-Eastover		
Station ID	YS07-GW001		YS07-GW002							YS07-GW003		
Sample ID	YS07-MW001-1094	YS07-MW001-0904	YS07-MW002-1094	YS07-MW002-0600	YS07-MW002-0904	YS07-MW002P-0904	YS07-MW002-0205	YS07-MW002-0505	YS07-MW002-0805	YS07-MW003-1094	YS07-MW003-0600	YS07-MW003-0904
Sample Date	10/07/94	09/17/04	10/07/94	06/09/00	09/20/04	09/20/04	02/09/05	05/03/05	08/02/05	10/07/94	06/09/00	09/22/04
Investigation	Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data	GW RI Data
Chemical Name												
1,2,4-Trichlorobenzene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
1,2-Dichlorobenzene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
1,3-Dichlorobenzene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
1,4-Dichlorobenzene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
2,2'-oxybis(1-chloropropane)	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
2,4,5-Trichlorophenol	25 U	NA	25 U	NA	NA	NA	NA	NA	NA	25 U	NA	NA
2,4,6-Trichlorophenol	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
2,4-Dichlorophenol	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
2,4-Dimethylphenol	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
2,4-Dinitrophenol	25 U	NA	25 U	NA	NA	NA	NA	NA	NA	25 U	NA	NA
2,4-Dinitrotoluene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
2,6-Dinitrotoluene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
2-Chloronaphthalene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
2-Chlorophenol	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
2-Methylnaphthalene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
2-Methylphenol	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
2-Nitroaniline	25 U	NA	25 U	NA	NA	NA	NA	NA	NA	25 U	NA	NA
2-Nitrophenol	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
3,3'-Dichlorobenzidine	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
3-Nitroaniline	25 U	NA	25 U	NA	NA	NA	NA	NA	NA	25 U	NA	NA
4,6-Dinitro-2-methylphenol	25 U	NA	25 U	NA	NA	NA	NA	NA	NA	25 U	NA	NA
4-Bromophenyl-phenylether	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
4-Chloro-3-methylphenol	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
4-Chloroaniline	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
4-Chlorophenyl-phenylether	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
4-Methylphenol	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
4-Nitroaniline	25 U	NA	25 U	NA	NA	NA	NA	NA	NA	25 U	NA	NA
4-Nitrophenol	25 U	NA	25 U	NA	NA	NA	NA	NA	NA	25 U	NA	NA
Acenaphthene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Acenaphthylene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Anthracene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Benzo(a)anthracene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Benzo(a)pyrene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Benzo(b)fluoranthene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Benzo(g,h,i)perylene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Benzo(k)fluoranthene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Butylbenzylphthalate	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Carbazole	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Chrysene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Di-n-butylphthalate	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Di-n-octylphthalate	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Dibenz(a,h)anthracene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Dibenzofuran	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Diethylphthalate	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Dimethyl phthalate	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Fluoranthene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Fluorene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Hexachlorobenzene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Hexachlorobutadiene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Hexachlorocyclopentadiene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Hexachloroethane	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Indeno(1,2,3-cd)pyrene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Isophorone	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA

Appendix G
Groundwater Analytical Results at Site 7
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	Yorktown-Eastover		Yorktown-Eastover							Yorktown-Eastover		
Station ID	YS07-GW001		YS07-GW002							YS07-GW003		
Sample ID	YS07-MW001-1094	YS07-MW001-0904	YS07-MW002-1094	YS07-MW002-0600	YS07-MW002-0904	YS07-MW002P-0904	YS07-MW002-0205	YS07-MW002-0505	YS07-MW002-0805	YS07-MW003-1094	YS07-MW003-0600	YS07-MW003-0904
Sample Date	10/07/94	09/17/04	10/07/94	06/09/00	09/20/04	09/20/04	02/09/05	05/03/05	08/02/05	10/07/94	06/09/00	09/22/04
Investigation	Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data	GW RI Data
Chemical Name												
Naphthalene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Nitrobenzene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Pentachlorophenol	25 U	NA	25 U	NA	NA	NA	NA	NA	NA	25 U	NA	NA
Phenanthrene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Phenol	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Pyrene	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
bis(2-Chloroethoxy)methane	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
bis(2-Chloroethyl)ether	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
bis(2-Ethylhexyl)phthalate	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
n-Nitroso-di-n-propylamine	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
n-Nitrosodiphenylamine	10 U	NA	10 U	NA	NA	NA	NA	NA	NA	10 U	NA	NA
Explosives (UG/L)												
1,3,5-Trinitrobenzene	0.66 U	2.5 U	0.66 U	1.2 U	5 U	5 U	2.5 U	2.5 U	2.5 U	0.66 U	1.6 U	2.5 U
1,3-Dinitrobenzene	1.1 U	2.5 U	1.1 U	1.2 U	5 U	5 U	2.5 U	2.5 U	2.5 U	1.1 U	1.6 U	2.5 U
2,4,6-Trinitrotoluene	0.62 U	2.5 U	0.62 U	2.4 U	5 U	5 U	2.5 U	2.5 U	2.5 U	0.62 U	3.2 U	2.5 U
2,4-Dinitrotoluene	1 U	2.5 U	1 U	3 U	5 U	5 U	2.5 U	5 U	5 U	1 U	4 U	2.5 U
2,6-Dinitrotoluene	1 U	5 U	1 U	3 U	10 U	10 U	5 U	5 U	5 U	1 U	4 U	5 U
2-Amino-4,6-dinitrotoluene	NA	2.2 J	NA	6.76	3.7 J	3.5 J	6	5.2	3.4 J	NA	4.8 U	5 U
2-Nitrotoluene	0.75 U	5 U	0.75 U	3 U	10 U	10 U	5 U	5 U	5 U	0.75 U	4 U	5 U
3-Nitrotoluene	0.91 U	5 U	0.91 U	2.4 U	10 U	10 U	5 U	5 U	5 U	0.91 U	3.2 U	5 U
4-Amino-2,6-dinitrotoluene	5.5	5 U	37	8.94	8.4 J	8.1 J	6.3	4.5 J	1.6 J	2.5	3.2 U	5 UJ
4-Nitrotoluene	NA	5 U	NA	3 U	10 U	10 U	5 U	5 U	5 U	NA	4 U	5 U
HMX	34	21	28	18.5	12	12	20	15	12 J	2.4	3.2 U	2.5 U
Nitrobenzene	0.73 U	2.5 U	0.73 U	1.8 U	5 U	5 U	2.5 U	2.5 U	2.5 U	0.73 U	2.4 U	2.5 U
RDX	34	13	180	96.4	67	64	84	69	38	13	4 U	2.5 U
Tetryl	1 U	5 U	1.6 U	2.4 U	10 U	10 U	5 U	5 U	5 U	1 U	3.2 U	5 U
Total Metals (UG/L)												
Aluminum	1,680 L	80.7 U	7,060 L	263	80.7 U	80.7 U	90.8 B	17.5 B	13 U	2,970 L	74 B	80.7 U
Antimony	12.4 U	1.9 U	13.8 K	2.1 U	1.9 U	1.9 U	2.8 B	1.3 U	3.7 U	14.2 K	2.1 U	1.9 U
Arsenic	7.6	2.1 U	35.9	2.3 U	2.1 U	2.1 U	2.1 U	1.6 U	3.7 U	4.9	2.3 U	2.1 U
Barium	32.6	14.4 B	53.1	25.4 B	23.3 J	22.6 J	17 B	24.1 B	22.4 J	25.5	27.2 B	25 J
Beryllium	0.2 U	0.1 U	0.56 B	0.2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.2 U	0.2 U	0.1 U
Cadmium	2.3 U	0.2 U	2.3 U	0.2 U	0.2 U	0.2 U	0.3 U	0.2 U	0.5 U	2.3 U	0.2 U	0.2 U
Calcium	120,000	98,400	164,000	125,000	126,000	124,000	135,000	130,000	123,000	80,600	92,800	97,600
Chromium	6.2 L	0.9 U	37.5 L	44.6	0.9 U	0.9 U	1.6 B	1.2 B	1.1 U	10.3 L	10.8	0.9 U
Cobalt	2.1 U	0.5 U	7.7	0.65 B	0.5 U	0.5 U	0.6 U	0.4 U	1.1 U	2.2	0.5 U	0.5 U
Copper	2.9	0.6 U	10.8	1.9 B	0.6 U	0.6 U	0.4 U	0.6 U	0.8 U	3.8	1.4 B	0.93 J
Cyanide	5 U	1.3 B	5 U	1.2 B	1.1 J	1.6 J	0.8 U	0.8 U	2.8 U	5 U	1.5 B	4.5 J
Iron	3,910	43 U	21,200	1,110	43 U	43 U	49 J	61.2 B	28 U	6,270	468	139 B
Lead	1.5 UL	1.1 U	4.2 L	1.3 U	1.1 UL	1.1 UL	1.3 U	1.2 U	1.6 U	1.5 UL	1.3 U	1.1 UL
Magnesium	2,960	2,000 J	4,990	2,510 B	2,310 J	2,290 J	2,520 J	2,540 B	2,580 J	1,980	2,320 B	2,280 J
Manganese	38.8	3.9 J	98.6	8.8 B	0.2 U	0.2 U	1.1 B	0.92 B	0.3 U	32.9	27.2	23.4
Mercury	0.2 U	0.1 UJ	0.2 U	0.15 B	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.2 U	0.14 B	0.1 U
Nickel	5.2 U	0.6 U	19.5	32.5 B	0.6 U	0.6 U	0.81 B	0.84 B	1.3 U	5.2 U	8.4 B	0.6 U
Potassium	1,880	669 J	3,980	929 B	691 J	679 J	677 J	721 B	675 J	3,440	1,160 B	910 J
Selenium	2.4 UL	2.4 U	2.4 UL	2.7 B	2.4 UL	2.4 UL	3.8 J	2.2 U	4.5 U	2.4 UL	2.2 B	2.4 UL
Silver	1.7 U	0.8 U	1.7 U	0.6 U	0.8 U	0.8 U	0.8 U	0.6 U	1.3 U	1.7 U	0.6 U	0.8 U
Sodium	6,880	4,840 J	9,970	11,000	9,600	9,620	9,870	9,180	9,060	7,560	7,520	6,810
Thallium	5.7 U	2.8 U	5.7 U	6.4 B	2.8 UL	2.8 UL	3 UL	2.8 U	4 UL	5.7 U	3.2 U	2.8 UL
Vanadium	10.7	0.6 U	57.4	3.2 B	0.6 U	0.6 U	0.5 U	0.56 B	0.8 U	21.5	1.4 B	0.6 U
Zinc	14.2 B	4.1 U	52.5 U	1.3 B	4.1 U	4.1 U	1.7 B	1.9 B	1.3 U	24.9 J	0.97 B	21.9

Appendix G
Groundwater Analytical Results at Site 7
Phase 1 Groundwater Remedial Investigation at Sites 1, 3, 6, 7, 11, 17, 24, 25
Naval Weapons Station Yorktown
Yorktown, Virginia

Aquifer	Yorktown-Eastover		Yorktown-Eastover							Yorktown-Eastover		
Station ID	YS07-GW001		YS07-GW002							YS07-GW003		
Sample ID	YS07-MW001-1094	YS07-MW001-0904	YS07-MW002-1094	YS07-MW002-0600	YS07-MW002-0904	YS07-MW002P-0904	YS07-MW002-0205	YS07-MW002-0505	YS07-MW002-0805	YS07-MW003-1094	YS07-MW003-0600	YS07-MW003-0904
Sample Date	10/07/94	09/17/04	10/07/94	06/09/00	09/20/04	09/20/04	02/09/05	05/03/05	08/02/05	10/07/94	06/09/00	09/22/04
Investigation	Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	GW RI Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data	GW RI Data
Chemical Name												
Dissolved Metals (UG/L)												
Aluminum	11.5 U	80.7 U	11.5 U	37 U	80.7 U	80.7 U	13.5 U	11.4 U	12.7 B	27.8	37 U	80.7 U
Antimony	12.4 U	1.9 U	12.4 U	2.1 U	1.9 U	1.9 U	2.9 B	1.3 U	1.7 U	13.7	2.1 U	1.9 U
Arsenic	2.3 UL	2.1 U	2.3 UL	2.3 U	2.1 U	2.1 U	2.1 U	1.6 U	1.9 U	2.3 UL	2.7 J	2.1 U
Barium	27.3	14 B	27.6	25.3 J	22.3 J	22.4 J	16 B	23 J	23.4 J	12.6	27.7 J	25.2 J
Beryllium	0.2 U	0.1 U	0.2 U	0.2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.13 B	0.2 U	0.2 U	0.1 U
Cadmium	2.3 U	0.2 U	2.3 U	0.2 U	0.2 U	0.2 U	0.3 U	0.2 U	0.2 U	2.3 U	0.2 U	0.2 U
Calcium	118,000	97,400	131,000	128,000	121,000	124,000	132,000	123,000	125,000	46,200	93,600	99,200
Chromium	1.5 UL	0.9 U	1.5 U	0.5 J	0.9 U	0.9 U	1.3 B	1.2 B	1.6 J	1.5 UL	0.4 U	0.9 U
Cobalt	2.1 U	0.5 U	2.3	0.5 U	0.5 U	0.5 U	0.6 U	0.7 B	0.6 U	2.1 U	0.5 U	0.82 J
Copper	1.1 U	0.6 U	1.1 U	1 J	0.6 U	0.6 U	0.4 U	1.1 B	0.5 U	1.5	1.3 J	0.6 U
Iron	3.8 B	43 U	1.9 U	19.2 J	43 U	43 U	11.2 U	10 U	13.1 U	11.1 B	15.6 J	43 U
Lead	1.4 UL	1.1 U	1.4 UL	1.3 U	1.1 UL	1.1 UL	1.3 U	1.2 U	1.4 UL	1.4 UL	1.3 U	1.1 UL
Magnesium	2,580	1,990 J	2,630	2,550 J	2,230 J	2,280 J	2,430 J	2,440 J	2,490 J	930	2,400 J	2,310 J
Manganese	21	0.72 B	1.8	6 J	0.2 U	0.2 U	0.74 B	2.5 B	0.26 B	0.9	26.7	24.7
Mercury	0.2 U	0.1 UJ	0.2 U	0.14 L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.2 U	0.14 L	0.1 U
Nickel	5.2 U	0.6 U	5.2 U	22.3 J	0.6 U	0.6 U	0.8 U	0.8 U	0.9 U	5.2 U	7 J	0.6 U
Potassium	1,100	709 J	1,200	847 J	652 J	654 J	629 J	774 B	735 J	2,160	1,140 J	903 J
Selenium	2.8 K	2.4 U	2.6 U	2.2 U	2.4 UL	2.4 UL	2.7 U	2.2 UL	3 U	2.6 U	2.2 U	2.4 UL
Silver	1.7 U	0.8 U	1.7 U	0.6 U	0.8 U	0.8 U	0.8 U	0.6 U	0.7 U	1.7 U	0.6 U	0.8 U
Sodium	6,600	5,150	10,000	11,100	9,130	9,380	9,540	9,040	8,620	7,020	7,600	6,730
Thallium	4 U	2.8 U	4 U	3.2 U	2.8 UL	2.8 UL	3 UL	2.8 UL	2.8 U	4 U	3.2 U	2.8 UL
Vanadium	1.8 U	0.6 U	2	0.41 J	0.6 U	0.6 U	0.5 U	0.3 B	0.5 U	8.6	0.73 J	0.6 U
Zinc	3.8 B	4.1 U	4 B	0.8 U	4.1 U	4.1 U	1.7 B	4.4 B	1.8 B	4.6 B	0.8 U	22.5
Wet Chemistry (MG/L)												
Nitrate/Nitrite	1.8	NA	2	NA	NA	NA	NA	NA	NA	0.03	NA	NA
Total dissolved solids (TDS)	250	NA	370	NA	NA	NA	NA	NA	NA	110	NA	NA
Total suspended solids (TSS)	63	NA	530	NA	NA	NA	NA	NA	NA	190	NA	NA

Notes:

Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

Aquifer	Yorktown-Eastover						Yorktown-Eastover	
Station ID	YS07-GW003						YS07-GW004	
Sample ID	YS07-MW003-0205	YS07-MW003P-0205	YS07-MW003-0505	YS07-MW003P-0505	YS07-MW003-0805	YS07-MW003P-0805	YS07-MW004-1094	YS07-MW004P-1094
Sample Date	02/11/05	02/11/05	05/05/05	05/05/05	08/04/05	08/04/05	10/08/94	10/08/94
Investigation	LTM Data	LTM Data	LTM Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data
Chemical Name								
Volatile Organic Compounds (UG/L)								
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
1,1-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
1,2,4-Trichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA
1,2-Dibromo-3-chloropropane	10 U	10 U	10 U	10 U	10 U	10 U	1 R	1 R
1,2-Dibromoethane	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
1,2-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
1,2-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
1,2-Dichloropropane	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
1,3-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
1,4-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
2-Butanone	10 U	10 U	10 U	10 U	10 U	10 U	5 R	5 R
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	5 R	5 R
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U	10 U	5 U	5 U
Acetone	10 U	10 UJ	10 U	10 U	10 U	10 U	5 R	5 R
Benzene	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
Bromochloromethane	NA	NA	NA	NA	NA	NA	1 U	1 U
Bromodichloromethane	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
Bromoform	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
Carbon disulfide	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
Carbon tetrachloride	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
Chlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
Chloroform	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
Cyclohexane	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA
Dibromochloromethane	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
Dichlorodifluoromethane (Freon-12)	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA
Ethylbenzene	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
Methyl acetate	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA
Methyl-tert-butyl ether (MTBE)	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA
Methylcyclohexane	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA
Methylene chloride	10 U	10 U	10 U	1 J	10 U	10 U	2 U	0.7 B
Styrene	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
Tetrachloroethene	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
Toluene	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
Trichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
Trichlorofluoromethane(Freon-11)	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
Xylene, total	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
cis-1,2-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
isopropylbenzene	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA
trans-1,2-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	1 U	1 U
Semi-volatile Organic Compounds (UG/L)								

Aquifer	Yorktown-Eastover						Yorktown-Eastover	
Station ID	YS07-GW003						YS07-GW004	
Sample ID	YS07-MW003-0205	YS07-MW003P-0205	YS07-MW003-0505	YS07-MW003P-0505	YS07-MW003-0805	YS07-MW003P-0805	YS07-MW004-1094	YS07-MW004P-1094
Sample Date	02/11/05	02/11/05	05/05/05	05/05/05	08/04/05	08/04/05	10/08/94	10/08/94
Investigation	LTM Data	LTM Data	LTM Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data
Chemical Name								
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	10 U	10 U
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	10 U	10 U
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	10 U	10 U
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	10 U	10 U
2,2'-oxybis(1-chloropropane)	NA	NA	NA	NA	NA	NA	10 U	10 U
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA	25 U	25 U
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA	10 U	10 U
2,4-Dichlorophenol	NA	NA	NA	NA	NA	NA	10 U	10 U
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA	10 U	10 U
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA	25 U	25 U
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA	10 U	10 U
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	10 U	10 U
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA	10 U	10 U
2-Chlorophenol	NA	NA	NA	NA	NA	NA	10 U	10 U
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	10 U	10 U
2-Methylphenol	NA	NA	NA	NA	NA	NA	10 U	10 U
2-Nitroaniline	NA	NA	NA	NA	NA	NA	25 U	25 U
2-Nitrophenol	NA	NA	NA	NA	NA	NA	10 U	10 U
3,3'-Dichlorobenzidine	NA	NA	NA	NA	NA	NA	10 U	10 U
3-Nitroaniline	NA	NA	NA	NA	NA	NA	25 U	25 U
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA	NA	NA	25 U	25 U
4-Bromophenyl-phenylether	NA	NA	NA	NA	NA	NA	10 U	10 U
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	NA	10 U	10 U
4-Chloroaniline	NA	NA	NA	NA	NA	NA	10 U	10 U
4-Chlorophenyl-phenylether	NA	NA	NA	NA	NA	NA	10 U	10 U
4-Methylphenol	NA	NA	NA	NA	NA	NA	10 U	10 U
4-Nitroaniline	NA	NA	NA	NA	NA	NA	25 U	25 U
4-Nitrophenol	NA	NA	NA	NA	NA	NA	25 U	25 U
Acenaphthene	NA	NA	NA	NA	NA	NA	10 U	10 U
Acenaphthylene	NA	NA	NA	NA	NA	NA	10 U	10 U
Anthracene	NA	NA	NA	NA	NA	NA	10 U	10 U
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	10 U	10 U
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	10 U	10 U
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	10 U	10 U
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	10 U	10 U
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	10 U	10 U
Butylbenzylphthalate	NA	NA	NA	NA	NA	NA	10 U	10 U
Carbazole	NA	NA	NA	NA	NA	NA	10 U	10 U
Chrysene	NA	NA	NA	NA	NA	NA	10 U	10 U
Di-n-butylphthalate	NA	NA	NA	NA	NA	NA	10 U	10 U
Di-n-octylphthalate	NA	NA	NA	NA	NA	NA	10 U	10 U
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	10 U	10 U
Dibenzofuran	NA	NA	NA	NA	NA	NA	10 U	10 U
Diethylphthalate	NA	NA	NA	NA	NA	NA	10 U	10 U
Dimethyl phthalate	NA	NA	NA	NA	NA	NA	10 U	10 U
Fluoranthene	NA	NA	NA	NA	NA	NA	10 U	10 U
Fluorene	NA	NA	NA	NA	NA	NA	10 U	10 U
Hexachlorobenzene	NA	NA	NA	NA	NA	NA	10 U	10 U
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA	10 U	10 U
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	10 U	10 U
Hexachloroethane	NA	NA	NA	NA	NA	NA	10 U	10 U
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	10 U	10 U
Isophorone	NA	NA	NA	NA	NA	NA	10 U	10 U

Aquifer	Yorktown-Eastover						Yorktown-Eastover	
Station ID	YS07-GW003						YS07-GW004	
Sample ID	YS07-MW003-0205	YS07-MW003P-0205	YS07-MW003-0505	YS07-MW003P-0505	YS07-MW003-0805	YS07-MW003P-0805	YS07-MW004-1094	YS07-MW004P-1094
Sample Date	02/11/05	02/11/05	05/05/05	05/05/05	08/04/05	08/04/05	10/08/94	10/08/94
Investigation	LTM Data	LTM Data	LTM Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data
Chemical Name								
Naphthalene	NA	NA	NA	NA	NA	NA	10 U	10 U
Nitrobenzene	NA	NA	NA	NA	NA	NA	10 U	10 U
Pentachlorophenol	NA	NA	NA	NA	NA	NA	25 U	25 U
Phenanthrene	NA	NA	NA	NA	NA	NA	10 U	10 U
Phenol	NA	NA	NA	NA	NA	NA	10 U	10 U
Pyrene	NA	NA	NA	NA	NA	NA	10 U	10 U
bis(2-Chloroethoxy)methane	NA	NA	NA	NA	NA	NA	10 U	10 U
bis(2-Chloroethyl)ether	NA	NA	NA	NA	NA	NA	10 U	10 U
bis(2-Ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA	10 U	10 U
n-Nitroso-di-n-propylamine	NA	NA	NA	NA	NA	NA	10 U	10 U
n-Nitrosodiphenylamine	NA	NA	NA	NA	NA	NA	10 U	10 U
Explosives (UG/L)								
1,3,5-Trinitrobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	0.66 U	0.66 U
1,3-Dinitrobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.1 U	1.1 U
2,4,6-Trinitrotoluene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	0.62 U	0.62 U
2,4-Dinitrotoluene	2.5 U	2.5 U	5 U	5 U	5 U	5 U	1 U	1 U
2,6-Dinitrotoluene	5 U	5 U	5 U	5 U	5 U	5 U	1 U	1 U
2-Amino-4,6-dinitrotoluene	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA
2-Nitrotoluene	5 U	5 U	5 U	5 U	5 U	5 U	0.75 U	0.75 U
3-Nitrotoluene	5 U	5 U	5 U	5 U	5 U	5 U	0.91 U	0.91 U
4-Amino-2,6-dinitrotoluene	5 U	5 U	5 U	5 U	5 U	5 U	1 U	1 U
4-Nitrotoluene	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA
HMX	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	0.61 U	0.61 U
Nitrobenzene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	0.73 U	0.73 U
RDX	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	0.59 U	0.59 U
Tetryl	5 U	5 U	5 U	5 U	5 U	5 U	1 U	1 U
Total Metals (UG/L)								
Aluminum	69.7 B	28.4 B	20.2 B	19.4 B	30.7 B	27.6 B	6,070 L	9,590 J
Antimony	2.1 B	2.1 U	1.8 B	1.3 U	3.7 U	3.7 U	14.4 K	12.2 U
Arsenic	2.1 U	2.1 U	1.6 U	1.6 U	3.7 U	3.7 U	14.3	15.9
Barium	21.9 B	20.4 B	30 B	30 B	27 J	25.9 J	51.6	62.6
Beryllium	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.61	1 U
Cadmium	0.3 U	0.3 U	0.2 U	0.2 U	0.5 U	0.5 U	2.3 U	1.5 U
Calcium	111,000	108,000	109,000	110,000	103,000	99,700	131,000	153,000
Chromium	0.77 B	0.65 B	1.5 B	1.5 B	1.1 J	1.1 U	23.7 L	36.2
Cobalt	1.4 J	1.1 J	1.6 B	1.4 B	1.2 J	1.1 U	5.3	7.8
Copper	0.4 U	0.4 U	1.3 B	0.96 B	0.8 U	0.8 U	8.5	9.8
Cyanide	1 B	0.8 U	0.8 U	0.8 U	2.8 U	2.8 U	5 U	5 U
Iron	255	171	211	214	177	153	20,100	29,600
Lead	1.3 U	1.3 U	1.2 U	1.2 U	1.6 U	1.6 U	2.7 L	8.3 K
Magnesium	2,610 J	2,510 J	2,640 B	2,690 B	2,620 J	2,550 J	4,470	5,970
Manganese	27.6	26.3	26.4	26.7	25.3 J	24.3 J	101	125
Mercury	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.2 U	0.2 UL
Nickel	0.93 B	0.8 U	1.9 B	1.3 B	1.3 U	1.3 U	11.7	12
Potassium	896 J	843 J	1,040 B	1,180 B	1,020 J	997 J	5,280	6,950
Selenium	2.7 U	2.7 U	2.2 U	2.2 U	4.5 U	4.5 U	2.4 UL	2.6 U
Silver	0.8 U	0.8 U	0.6 U	0.6 U	1.3 U	1.3 U	1.7 U	2 UL
Sodium	7,670	7,340	7,930	8,070	7,700	7,380	4,710	5,330
Thallium	3 UL	3 UL	2.8 U	2.8 U	4 UL	4 UL	5.7 U	4 UL
Vanadium	0.5 U	0.5 U	0.5 B	0.3 U	0.8 U	0.8 U	24.6	36.9
Zinc	14.8 J	79.1	2.7 B	4 B	1.3 U	1.3 U	47.6 J	52.7 J

Aquifer	Yorktown-Eastover						Yorktown-Eastover	
Station ID	YS07-GW003						YS07-GW004	
Sample ID	YS07-MW003-0205	YS07-MW003P-0205	YS07-MW003-0505	YS07-MW003P-0505	YS07-MW003-0805	YS07-MW003P-0805	YS07-MW004-1094	YS07-MW004P-1094
Sample Date	02/11/05	02/11/05	05/05/05	05/05/05	08/04/05	08/04/05	10/08/94	10/08/94
Investigation	LTM Data	LTM Data	LTM Data	LTM Data	LTM Data	LTM Data	Historical Data	Historical Data
Chemical Name								
Dissolved Metals (UG/L)								
Aluminum	13.5 U	13.5 U	11.4 U	11.4 U	11.7 U	19.4 B	11.5 U	11 U
Antimony	2.6 B	2.1 U	2.1 B	1.3 U	1.7 U	1.7 U	12.8	12.2 U
Arsenic	2.1 U	2.1 U	1.6 U	1.6 U	1.9 U	1.9 U	2.3 UL	2.3 U
Barium	21.6 B	21.4 B	28.9 J	28.3 J	27.4 J	27.5 J	29.3	28.8
Beryllium	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.17 B	0.2 U	1 U
Cadmium	0.3 U	0.3 U	0.2 U	0.2 U	0.2 U	0.2 U	2.3 U	1.5 UL
Calcium	110,000	111,000	106,000	103,000	101,000	101,000	62,000	63,100
Chromium	0.6 U	0.6 U	1.3 B	2.7 B	1.2 J	1.8 J	1.5 U	1.8 U
Cobalt	0.6 U	0.6 U	0.4 U	0.4 U	0.82 J	0.69 J	2.1 U	1.9 U
Copper	0.4 U	0.4 U	1.3 B	1.3 B	0.5 U	0.5 U	1.1 U	2
Iron	133	120	145	146	187	206	3.3 B	7 B
Lead	1.3 U	1.3 U	1.2 U	1.2 U	1.4 U	1.4 UL	1.4 UL	1.4 U
Magnesium	2,590 J	2,610 J	2,570 J	2,510 J	2,480 J	2,500 J	999	1,000
Manganese	26.5	26.8	26.7	25.6	25	25.8	26.5	26.3
Mercury	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.2 U	0.2 UL
Nickel	0.8 U	0.8 U	1.8 B	2.8 B	8.3 J	4.7 J	5.2 U	4.3 U
Potassium	881 J	872 J	1,090 B	1,060 B	1,060 J	1,060 J	1,370	1,490
Selenium	2.7 U	2.7 U	2.2 UL	2.2 UL	3 U	3 U	2.6 U	2.6 UL
Silver	0.8 U	0.8 U	0.6 U	0.6 U	0.7 U	0.7 U	1.7 U	2 U
Sodium	7,780	7,890	7,720	7,570	7,220	7,200	4,210	4,150
Thallium	3 UL	3 UL	3.7 B	2.8 UL	4.2 B	2.8 U	4 U	4 UL
Vanadium	0.5 U	0.5 U	0.3 U	0.3 U	0.5 U	0.5 U	1.8 U	1.4 U
Zinc	16.4 J	18.1 J	4.5 B	6.9 B	2.1 B	3.2 B	4.8 B	5.3 B
Wet Chemistry (MG/L)								
Nitrate/Nitrite	NA	NA	NA	NA	NA	NA	0.05	0.04
Total dissolved solids (TDS)	NA	NA	NA	NA	NA	NA	180	20
Total suspended solids (TSS)	NA	NA	NA	NA	NA	NA	620	500

Notes:

Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level repor
J = Analyte present. Reported value may or may nc
K = Analyte present. Reported value may be biasec
L = Analyte present. Reported value may be biasec
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccur
UL = Not detected, quantitation limit is probably higl

Aquifer	Columbia			Columbia			Columbia					
Station ID	YS11-GW003			YS11-GW009			YS11-GW011					
Sample ID	YS11-MW003-0792	YS11-MW003-1196	YS11-MW003-0904	YS11-MW009-0792	YS11-MW009-1196	YS11-MW009-0904	YS11-MW011-0792	YS11-MW011P-0792	YS11-MW011-0296	YS11-MW011-1196	YS11-MW011P-1196	YS11-MW011-0904
Sample Date	07/21/92	11/14/96	09/16/04	07/21/92	11/16/96	09/16/04	07/21/92	07/21/92	02/10/96	11/15/96	11/15/96	09/16/04
Investigation	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	GW RI Data
Chemical Name												
Volatile Organic Compounds (UG/L)												
1,1,1-Trichloroethane	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
1,1,2,2-Tetrachloroethane	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
1,1,2-Trichloroethane	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
1,1-Dichloroethane	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
1,1-Dichloroethene	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
1,2-Dichloroethane	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
1,2-Dichloroethene (total)	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
1,2-Dichloropropane	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
2-Butanone	10 UJ	10 U	NA	10 UJ	10 U	NA	10 UJ	10 UJ	10 U	10 U	10 U	NA
2-Hexanone	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
4-Methyl-2-pentanone	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
Acetone	10 U	10 U	NA	10 U	10 UJ	NA	10 U	10 U	10 U	10 U	10 U	NA
Benzene	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
Bromodichloromethane	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
Bromoform	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
Bromomethane	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
Carbon disulfide	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
Carbon tetrachloride	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
Chlorobenzene	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
Chloroethane	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
Chloroform	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
Chloromethane	10 U	3 J	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
Dibromochloromethane	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
Dimethyl phthalate	10 U	NA	NA	10 U	NA	NA	12 U	11 U	NA	NA	NA	NA
Ethylbenzene	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
Methylene chloride	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
Styrene	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
Tetrachloroethene	NA	10 U	NA	NA	10 U	NA	NA	NA	10 U	10 U	10 U	NA
Toluene	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
Trichloroethene	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
Vinyl chloride	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
Xylene, total	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
bis(2-Chloroethoxy)methane	10 U	NA	NA	10 U	NA	NA	12 U	11 U	NA	NA	NA	NA
cis-1,3-Dichloropropene	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
trans-1,3-Dichloropropene	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	NA
Semi-volatile Organic Compounds (UG/L)												
1,2,4-Trichlorobenzene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
1,2-Dichlorobenzene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
1,3-Dichlorobenzene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
1,4-Dichlorobenzene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
2,2'-oxybis(1-chloropropane)	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
2,4,5-Trichlorophenol	26 U	25 U	NA	26 U	25 U	NA	30 U	27 U	24 U	25 U	25 U	NA
2,4,6-Trichlorophenol	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
2,4-Dichlorophenol	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
2,4-Dimethylphenol	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
2,4-Dinitrophenol	26 U	25 U	NA	26 U	25 U	NA	30 U	27 U	24 U	25 U	25 U	NA
2,4-Dinitrotoluene	NA	10 U	NA	NA	10 U	NA	NA	NA	10 U	10 U	10 U	NA

Aquifer	Columbia			Columbia			Columbia					
Station ID	YS11-GW003			YS11-GW009			YS11-GW011					
Sample ID	YS11-MW003-0792	YS11-MW003-1196	YS11-MW003-0904	YS11-MW009-0792	YS11-MW009-1196	YS11-MW009-0904	YS11-MW011-0792	YS11-MW011P-0792	YS11-MW011-0296	YS11-MW011-1196	YS11-MW011P-1196	YS11-MW011-0904
Sample Date	07/21/92	11/14/96	09/16/04	07/21/92	11/16/96	09/16/04	07/21/92	07/21/92	02/10/96	11/15/96	11/15/96	09/16/04
Investigation	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	GW RI Data
Chemical Name												
2,6-Dinitrotoluene	NA	10 U	NA	NA	10 U	NA	NA	NA	10 U	10 U	10 U	NA
2-Chloronaphthalene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
2-Chlorophenol	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
2-Methylnaphthalene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
2-Methylphenol	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
2-Nitroaniline	10 U	25 U	NA	26 U	25 U	NA	30 U	27 U	24 U	25 U	25 U	NA
2-Nitrophenol	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
3,3'-Dichlorobenzidine	10 U	10 U	NA	10 U	10 U	NA	12 U	11 UJ	10 U	10 U	10 U	NA
3-Nitroaniline	26 U	25 U	NA	26 U	25 U	NA	30 U	27 U	24 U	25 U	25 U	NA
4,6-Dinitro-2-methylphenol	26 U	25 U	NA	26 U	25 U	NA	30 U	27 U	24 U	25 U	25 U	NA
4-Bromophenyl-phenylether	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
4-Chloro-3-methylphenol	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
4-Chloroaniline	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
4-Chlorophenyl-phenylether	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
4-Methylphenol	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
4-Nitroaniline	26 U	25 U	NA	26 U	25 U	NA	30 U	27 U	24 U	25 U	25 U	NA
4-Nitrophenol	26 U	25 U	NA	26 U	25 U	NA	30 U	27 U	24 U	25 U	25 U	NA
Acenaphthene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
Acenaphthylene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
Anthracene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
Benzo(a)anthracene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 UJ	10 U	10 U	10 U	NA
Benzo(a)pyrene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 UJ	10 U	10 U	10 U	NA
Benzo(b)fluoranthene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 UJ	10 U	10 U	10 U	NA
Benzo(g,h,i)perylene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 UJ	10 U	10 U	10 U	NA
Benzo(k)fluoranthene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 UJ	10 U	10 U	10 U	NA
Butylbenzylphthalate	10 U	10 U	NA	10 U	10 U	NA	12 U	11 UJ	10 U	10 U	10 U	NA
Carbazole	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
Chrysene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 UJ	10 U	10 U	10 U	NA
Di-n-butylphthalate	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
Di-n-octylphthalate	10 U	10 U	NA	10 U	10 U	NA	12 U	11 UJ	10 U	10 U	10 U	NA
Dibenz(a,h)anthracene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 UJ	10 U	10 U	10 U	NA
Dibenzofuran	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
Diethylphthalate	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
Dimethyl phthalate	NA	10 U	NA	NA	10 U	NA	NA	NA	10 U	10 U	10 U	NA
Fluoranthene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
Fluorene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
Hexachlorobenzene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
Hexachlorobutadiene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
Hexachlorocyclopentadiene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
Hexachloroethane	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
Indeno(1,2,3-cd)pyrene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 UJ	10 U	10 U	10 U	NA
Isophorone	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
Naphthalene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
Nitrobenzene	NA	10 U	NA	NA	10 U	NA	NA	NA	10 U	10 U	10 U	NA
Pentachlorophenol	26 U	25 U	NA	26 U	25 U	NA	30 U	27 U	1 J	25 U	25 U	NA
Phenanthrene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
Phenol	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
Pyrene	10 U	10 U	NA	10 U	10 U	NA	12 U	11 UJ	10 U	10 U	10 U	NA
bis(2-Chloroethoxy)methane	NA	10 U	NA	NA	10 U	NA	NA	NA	10 U	10 U	10 U	NA
bis(2-Chloroethyl)ether	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA

Aquifer	Columbia			Columbia			Columbia					
Station ID	YS11-GW003			YS11-GW009			YS11-GW011					
Sample ID	YS11-MW003-0792	YS11-MW003-1196	YS11-MW003-0904	YS11-MW009-0792	YS11-MW009-1196	YS11-MW009-0904	YS11-MW011-0792	YS11-MW011P-0792	YS11-MW011-0296	YS11-MW011-1196	YS11-MW011P-1196	YS11-MW011-0904
Sample Date	07/21/92	11/14/96	09/16/04	07/21/92	11/16/96	09/16/04	07/21/92	07/21/92	02/10/96	11/15/96	11/15/96	09/16/04
Investigation	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	GW RI Data
Chemical Name												
bis(2-Ethylhexyl)phthalate	12 U	10 U	NA	22 U	10 U	NA	12 U	11 UJ	1 B	10 U	10 U	NA
n-Nitroso-di-n-propylamine	10 U	NA	NA	10 U	NA	NA	12 U	11 U	10 U	NA	NA	NA
n-Nitrosodiphenylamine	10 U	10 U	NA	10 U	10 U	NA	12 U	11 U	10 U	10 U	10 U	NA
Pesticide/Polychlorinated Biphenyls (UG/L)												
4,4'-DDD	NA	0.1 U	NA	NA	0.1 U	NA	NA	NA	0.094 U	0.1 U	0.1 U	NA
4,4'-DDE	NA	0.1 U	NA	NA	0.1 U	NA	NA	NA	0.094 U	0.1 U	0.1 U	NA
4,4'-DDT	NA	0.1 U	NA	NA	0.1 U	NA	NA	NA	0.094 U	0.1 U	0.1 U	NA
Aldrin	NA	0.05 U	NA	NA	0.033 B	NA	NA	NA	0.047 U	0.05 U	0.05 U	NA
Aroclor-1016	NA	1 U	NA	NA	1 U	NA	NA	NA	0.94 U	1 U	1 U	NA
Aroclor-1221	NA	2 U	NA	NA	2 U	NA	NA	NA	1.9 U	2 U	2 U	NA
Aroclor-1232	NA	1 U	NA	NA	1 U	NA	NA	NA	0.94 U	1 U	1 U	NA
Aroclor-1242	NA	1 U	NA	NA	1 U	NA	NA	NA	0.94 U	1 U	1 U	NA
Aroclor-1248	NA	1 U	NA	NA	1 U	NA	NA	NA	0.94 U	1 U	1 U	NA
Aroclor-1254	NA	1 U	NA	NA	1 U	NA	NA	NA	0.94 U	1 U	1 U	NA
Aroclor-1260	NA	1 U	NA	NA	1 U	NA	NA	NA	0.94 U	1 U	1 U	NA
Dieldrin	NA	0.1 U	NA	NA	0.1 U	NA	NA	NA	0.094 U	0.1 U	0.1 U	NA
Endosulfan I	NA	0.05 U	NA	NA	0.05 U	NA	NA	NA	0.047 U	0.05 U	0.05 U	NA
Endosulfan II	NA	0.1 U	NA	NA	0.1 U	NA	NA	NA	0.094 U	0.1 U	0.1 U	NA
Endosulfan sulfate	NA	0.1 U	NA	NA	0.1 U	NA	NA	NA	0.094 U	0.1 U	0.1 U	NA
Endrin	NA	0.1 U	NA	NA	0.1 U	NA	NA	NA	0.094 U	0.1 U	0.1 U	NA
Endrin aldehyde	NA	0.1 U	NA	NA	0.1 U	NA	NA	NA	0.094 U	0.1 U	0.1 U	NA
Endrin ketone	NA	0.1 U	NA	NA	0.1 U	NA	NA	NA	0.094 U	0.1 U	0.1 U	NA
Heptachlor	NA	0.05 U	NA	NA	0.05 U	NA	NA	NA	0.047 U	0.05 U	0.05 U	NA
Heptachlor epoxide	NA	0.05 U	NA	NA	0.05 U	NA	NA	NA	0.047 U	0.05 U	0.05 U	NA
Methoxychlor	NA	0.5 U	NA	NA	0.5 U	NA	NA	NA	0.47 U	0.5 U	0.5 U	NA
Toxaphene	NA	5 U	NA	NA	5 U	NA	NA	NA	4.7 U	5 U	5 U	NA
alpha-BHC	NA	0.05 U	NA	NA	0.05 U	NA	NA	NA	0.047 U	0.05 U	0.05 U	NA
alpha-Chlordane	NA	0.05 U	NA	NA	0.05 U	NA	NA	NA	0.047 U	0.05 U	0.05 U	NA
beta-BHC	NA	0.05 U	NA	NA	0.05 U	NA	NA	NA	0.047 U	0.05 U	0.05 U	NA
delta-BHC	NA	0.05 U	NA	NA	0.05 U	NA	NA	NA	0.047 U	0.05 U	0.05 U	NA
gamma-BHC (Lindane)	NA	0.05 U	NA	NA	0.05 U	NA	NA	NA	0.047 U	0.05 U	0.05 U	NA
gamma-Chlordane	NA	0.05 U	NA	NA	0.05 U	NA	NA	NA	0.047 U	0.05 U	0.05 U	NA
Explosives (UG/L)												
1,3,5-Trinitrobenzene	1.3 U	200 U	2.5 U	1.3 U	200 U	2.5 U	1.3 U	1.3 U	0.088 U	400 U	200 U	2.5 U
1,3-Dinitrobenzene	0.31 U	200 U	2.5 U	0.31 U	200 U	2.5 U	0.31 U	0.31 U	0.081 U	400 U	200 U	2.5 U
2,4,6-Trinitrotoluene	1.3 U	200 U	2.5 U	1.3 U	200 U	2.5 U	1.3 U	1.3 U	0.084 U	400 U	200 U	2.5 U
2,4-Dinitrotoluene	0.31 U	NA	2.5 U	0.31 U	NA	2.5 U	0.31 U	0.31 U	NA	NA	NA	2.5 U
2,6-Dinitrotoluene	0.31 U	NA	5 U	0.31 U	NA	5 U	0.31 U	0.31 U	NA	NA	NA	5 U
2-Amino-4,6-dinitrotoluene	NA	NA	5 U	NA	NA	5 U	NA	NA	NA	NA	NA	5 U
2-Nitrotoluene	NA	200 U	5 U	NA	200 U	5 U	NA	NA	0.34 U	400 U	200 U	5 U
3-Nitrotoluene	NA	200 U	5 U	NA	200 U	5 U	NA	NA	0.34 U	400 U	200 U	5 U
4-Amino-2,6-dinitrotoluene	NA	NA	5 U	NA	NA	5 U	NA	NA	NA	NA	NA	5 U
4-Nitrotoluene	NA	NA	5 U	NA	NA	5 U	NA	NA	1 U	NA	NA	5 U
Aminodinitrotoluenes	NA	200 U	NA	NA	200 U	NA	NA	NA	0.14 U	1,100	1,400	NA
Dinitrotoluene mixture	NA	200 U	NA	NA	200 U	NA	NA	NA	0.14 U	400 U	500 U	NA
HMX	63 U	500 U	2.5 U	63 U	500 U	2.5 U	3	4.2	0.74 U	1,000 U	500 U	2.5 U
Nitrobenzene	0.31 U	200 U	2.5 U	0.31 U	200 U	2.5 U	0.31 U	0.31 U	0.14 U	400 U	200 U	2.5 U
RDX	63 U	500 U	2.5 U	63 U	500 U	2.5 U	20	28	0.36 U	6,200	5,100 J	2.5 U

Aquifer	Columbia			Columbia			Columbia					
Station ID	YS11-GW003			YS11-GW009			YS11-GW011					
Sample ID	YS11-MW003-0792	YS11-MW003-1196	YS11-MW003-0904	YS11-MW009-0792	YS11-MW009-1196	YS11-MW009-0904	YS11-MW011-0792	YS11-MW011P-0792	YS11-MW011-0296	YS11-MW011-1196	YS11-MW011P-1196	YS11-MW011-0904
Sample Date	07/21/92	11/14/96	09/16/04	07/21/92	11/16/96	09/16/04	07/21/92	07/21/92	02/10/96	11/15/96	11/15/96	09/16/04
Investigation	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	GW RI Data
Chemical Name												
Tetryl	3.1 U	200 U	5 U	3.1 U	200 U	5 U	3.1 U	3.1 U	0.26 U	400 U	200 U	5 U
Total Metals (UG/L)												
Aluminum	15,400 J	1,390	811	20,000 J	526	1,350	1,370 J	1,460 J	294 B	254	151 B	166 B
Antimony	44 J	3 U	1.9 U	44 U	3 U	1.9 U	44	44 U	19.8 U	3 U	3 U	1.9 U
Arsenic	7.5	11.4 B	2.4 B	13.7 J	3 U	2.1 U	2 U	2 UJ	0.9 U	3 U	3 U	2.1 U
Barium	82.9	12.7	12.1 B	152	73.2	107 B	66.9 B	69.5	58.4	43.7	43.1	128 B
Beryllium	1.1	1 U	0.1 U	152	1.1	0.68 B	1 U	1 U	0.8 U	1 U	1 U	1 B
Cadmium	4 U	1 U	0.2 U	4 U	1 U	0.2 U	4 U	4 U	2.2 U	1 U	1 U	0.2 U
Calcium	8,910	5,720	6,250	5,600	2,160	457 J	5,190	5,420	4,210	4,220	4,340	2,650 J
Chromium	36.6	1 UL	0.9 U	61.4	1 UL	0.9 U	8 U	14	2.4 U	1 UL	1 UL	0.9 U
Cobalt	11.7	2 U	0.88 B	19.3	3.9	4.3 B	7.3	7.3	6.6	4.4	4.4	5.4 B
Copper	18.6	2.9 B	0.6 U	19.2	1 U	0.6 U	6.2	5.9	2 U	2.7 B	1 U	0.6 U
Cyanide	NA	3 U	1.1 U	NA	3 U	1.1 U	NA	NA	10 U	3 U	3 U	1.3 B
Iron	31,300 J	5,710	2,580	457 J	2,000	622	2,710	2,990 J	229	1,230	1,250	3,130
Lead	15.7	2 U	1.1 U	19.5	2 U	1.1 U	6.9	2 U	0.95	2 U	2 U	1.1 U
Magnesium	2,010	333	290 J	5,000	970	495 J	1,970	2,050	772	1,210	1,290	866 J
Manganese	104	10.9	14.8 J	117	10.4	16.5	25.7	30.7	8.3 B	17.7	18.2	21.9
Mercury	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ
Nickel	18 U	2 U	0.6 U	30.1	5.3	1.7 J	18 U	18 U	11.3 U	10.8	4	1.9 J
Potassium	2,240	269 B	152 J	3,880	240 B	93.5 J	996	970 U	828 U	475	524	319 J
Selenium	2 UJ	3 UL	2.4 U	2 UJ	3 UL	2.4 U	2 U	2 UJ	1.3 U	3 UL	3 UL	2.4 U
Silver	6 U	1 U	0.8 U	6 U	1 U	0.8 U	6 U	6 U	3.1 U	1 U	1 UL	0.8 U
Sodium	2,000	2,770	2,250 J	6,450	5,360	4,250 J	3,700	3,870	2,390	3,080	3,230	3,920 J
Thallium	2 UJ	6 U	2.8 U	20 U	6 U	2.8 U	2 U	2 UJ	0.9 U	6 U	6 U	2.8 U
Vanadium	28.6	2.7	1.7 B	44.9	1 U	0.6 U	6 U	6 U	2.4 U	1 U	1 U	0.6 U
Zinc	56.7 J	15.1 B	4.1 U	104 J	15.6 B	4.1 U	33	28.6 UJ	4.8	12.2 B	8.7 B	7.7 B
Dissolved Metals (UG/L)												
Aluminum	38.3 J	759	178 B	765 J	437	1,330	108 J	77.3 J	160 B	136 B	103 B	146 B
Antimony	44 U	3 U	1.9 U	44 U	3 U	1.9 U	44 U	44 U	19.8 U	3 U	3 U	1.9 U
Arsenic	3.8 J	8.5 B	2.1 U	2 UJ	3.2 B	2.1 U	2 UJ	2 UJ	0.9 U	3 B	3 U	2.1 U
Barium	6.3	10	9.7 B	56.7	70.1	107 B	59.5	57.7	56.4	42.7	43.4	117 B
Beryllium	1 U	1 U	0.12 B	1 U	1 U	0.73 B	1 U	1 U	0.8 U	1 U	1 U	1 B
Cadmium	4 U	1 U	0.2 U	4 U	1 U	0.2 U	4 U	4 U	2.2 U	1 U	1 U	0.2 U
Calcium	6,940	5,230	6,110	3,600 B	2,230	459 J	5,730	5,880	4,210	4,490	4,540	3,250 J
Chromium	8 U	1 UL	0.9 U	8 U	1 UL	0.9 U	8 U	8 U	2.4 U	1 UL	1 UL	0.9 U
Cobalt	6 U	2 U	1.2 B	6 U	4.1	4.3 B	6.2	6 U	5.4	4.4	4.5	5.8 B
Copper	5 U	1 U	0.6 U	5 U	1 U	0.83 B	5 U	5 U	2	1 U	1 U	0.6 U
Iron	2,390 J	5,320	2,020	506 J	2,110	653	282 J	233 J	48.1 B	1,240	1,390	3,240
Lead	17.4	2 U	1.1 U	2 UJ	2 U	1.1 U	2.3 UJ	2 UJ	3.3	2 U	2 U	1.1 U
Magnesium	196	249	257 J	1,640	992	495 J	2,340	2,200	777	1,490	1,350	1,040 J
Manganese	30.1	9.8	15	22.2	11.2	17.1	18.9	21.3	8.5 B	18	18.5	24.7
Mercury	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ
Nickel	18 U	2 U	0.85 J	18 U	4.9	3.5 J	18 U	18 U	11.3 U	4.6	3.8	3.8 J
Potassium	970 U	179 B	132 J	970 U	249 B	100 J	970 U	970 U	828 U	507	532	371 J
Selenium	2 UJ	3 UL	2.4 U	2 UJ	3 UL	2.4 U	2 U	2 UJ	1.3 U	3.3 L	3 U	2.4 U
Silver	6 U	1 U	0.8 U	6 U	1 U	0.8 U	6 U	6 U	3.1 U	1 U	1 UL	0.8 U
Sodium	2,000	1,830	2,450 J	6,120	5,090	4,470 J	4,460	4,640	2,440	3,150	3,350	4,480 J
Thallium	2 UJ	6 U	2.8 U	2 U	6 U	2.8 U	2 UJ	2 U	0.9 U	6 U	6 U	2.8 U

Aquifer	Columbia			Columbia			Columbia					
Station ID	YS11-GW003			YS11-GW009			YS11-GW011					
Sample ID	YS11-MW003-0792	YS11-MW003-1196	YS11-MW003-0904	YS11-MW009-0792	YS11-MW009-1196	YS11-MW009-0904	YS11-MW011-0792	YS11-MW011P-0792	YS11-MW011-0296	YS11-MW011-1196	YS11-MW011P-1196	YS11-MW011-0904
Sample Date	07/21/92	11/14/96	09/16/04	07/21/92	11/16/96	09/16/04	07/21/92	07/21/92	02/10/96	11/15/96	11/15/96	09/16/04
Investigation	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	Historical Data	Historical Data	Historical Data	GW RI Data
Chemical Name												
Vanadium	6 U	1.2	0.62 B	6 U	1 U	0.6 U	6 U	6 U	2.4 U	1 U	1 U	0.6 U
Zinc	83.6 J	6.3 B	4.1 U	81.5 J	17.4 B	6.3 B	33.5 J	100 J	3.6 U	NA	12.3 B	9.5 B
Wet Chemistry (MG/L)												
Nitrate	0.4	NA	NA	0.22	NA	NA	0.12	0.35	NA	NA	NA	NA

Notes:

Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

Aquifer	Yorktown-Eastover			
Station ID	YS11-GW011A			
Sample ID	YS11-MW011A-0792	YS11-MW011A-0296	YS11-MW011A-1196	YS11-MW011A-0904
Sample Date	07/21/92	02/10/96	11/16/96	09/17/04
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data
Chemical Name				
Volatile Organic Compounds (UG/L)				
1,1,1-Trichloroethane	10 U	10 U	NA	NA
1,1,2,2-Tetrachloroethane	10 U	10 U	NA	NA
1,1,2-Trichloroethane	10 U	10 U	NA	NA
1,1-Dichloroethane	10 U	10 U	NA	NA
1,1-Dichloroethene	10 U	10 U	NA	NA
1,2-Dichloroethane	10 U	10 U	NA	NA
1,2-Dichloroethene (total)	10 U	10 U	NA	NA
1,2-Dichloropropane	10 U	10 U	NA	NA
2-Butanone	10 UJ	10 U	NA	NA
2-Hexanone	10 U	10 U	NA	NA
4-Methyl-2-pentanone	10 U	10 U	NA	NA
Acetone	11 U	10 U	NA	NA
Benzene	10 U	10 U	NA	NA
Bromodichloromethane	10 U	10 U	NA	NA
Bromoform	10 U	10 U	NA	NA
Bromomethane	10 U	10 U	NA	NA
Carbon disulfide	10 U	10 U	NA	NA
Carbon tetrachloride	10 U	10 U	NA	NA
Chlorobenzene	10 U	10 U	NA	NA
Chloroethane	10 U	10 U	NA	NA
Chloroform	10 U	10 U	NA	NA
Chloromethane	10 U	10 U	NA	NA
Dibromochloromethane	10 U	10 U	NA	NA
Dimethyl phthalate	10 U	NA	NA	NA
Ethylbenzene	10 U	10 U	NA	NA
Methylene chloride	10 U	10 U	NA	NA
Styrene	10 U	10 U	NA	NA
Tetrachloroethene	NA	10 U	NA	NA
Toluene	10 U	10 U	NA	NA
Trichloroethene	10 U	10 U	NA	NA
Vinyl chloride	10 U	10 U	NA	NA
Xylene, total	10 U	10 U	NA	NA
bis(2-Chloroethoxy)methane	10 U	NA	NA	NA
cis-1,3-Dichloropropene	10 U	10 U	NA	NA
trans-1,3-Dichloropropene	10 U	10 U	NA	NA
Semi-volatile Organic Compounds (UG/L)				
1,2,4-Trichlorobenzene	10 U	10 U	NA	NA
1,2-Dichlorobenzene	10 U	10 U	NA	NA
1,3-Dichlorobenzene	10 U	10 U	NA	NA
1,4-Dichlorobenzene	10 U	10 U	NA	NA
2,2'-oxybis(1-chloropropane)	10 U	10 U	NA	NA
2,4,5-Trichlorophenol	26 U	25 U	NA	NA
2,4,6-Trichlorophenol	10 U	10 U	NA	NA
2,4-Dichlorophenol	10 U	10 U	NA	NA
2,4-Dimethylphenol	10 U	10 U	NA	NA
2,4-Dinitrophenol	26 U	25 U	NA	NA
2,4-Dinitrotoluene	NA	10 U	NA	NA

Aquifer	Yorktown-Eastover			
Station ID	YS11-GW011A			
Sample ID	YS11-MW011A-0792	YS11-MW011A-0296	YS11-MW011A-1196	YS11-MW011A-0904
Sample Date	07/21/92	02/10/96	11/16/96	09/17/04
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data
Chemical Name				
2,6-Dinitrotoluene	NA	10 U	NA	NA
2-Chloronaphthalene	10 U	10 U	NA	NA
2-Chlorophenol	10 U	10 U	NA	NA
2-Methylnaphthalene	10 U	10 U	NA	NA
2-Methylphenol	10 U	10 U	NA	NA
2-Nitroaniline	26 U	25 U	NA	NA
2-Nitrophenol	10 U	10 U	NA	NA
3,3'-Dichlorobenzidine	10 U	10 U	NA	NA
3-Nitroaniline	26 U	25 U	NA	NA
4,6-Dinitro-2-methylphenol	26 U	25 U	NA	NA
4-Bromophenyl-phenylether	10 U	10 U	NA	NA
4-Chloro-3-methylphenol	10 U	10 U	NA	NA
4-Chloroaniline	10 U	10 U	NA	NA
4-Chlorophenyl-phenylether	10 U	10 U	NA	NA
4-Methylphenol	10 U	10 U	NA	NA
4-Nitroaniline	26 U	25 U	NA	NA
4-Nitrophenol	26 U	25 U	NA	NA
Acenaphthene	10 U	10 U	NA	NA
Acenaphthylene	26 U	10 U	NA	NA
Anthracene	10 U	10 U	NA	NA
Benzo(a)anthracene	10 U	10 U	NA	NA
Benzo(a)pyrene	10 U	10 U	NA	NA
Benzo(b)fluoranthene	10 U	10 U	NA	NA
Benzo(g,h,i)perylene	10 U	10 U	NA	NA
Benzo(k)fluoranthene	10 U	10 U	NA	NA
Butylbenzylphthalate	10 U	10 U	NA	NA
Carbazole	10 U	10 U	NA	NA
Chrysene	10 U	10 U	NA	NA
Di-n-butylphthalate	10 U	10 U	NA	NA
Di-n-octylphthalate	10 U	10 U	NA	NA
Dibenz(a,h)anthracene	10 U	10 U	NA	NA
Dibenzofuran	10 U	10 U	NA	NA
Diethylphthalate	1 J	10 U	NA	NA
Dimethyl phthalate	NA	10 U	NA	NA
Fluoranthene	10 U	10 U	NA	NA
Fluorene	10 U	10 U	NA	NA
Hexachlorobenzene	10 U	10 U	NA	NA
Hexachlorobutadiene	10 U	10 U	NA	NA
Hexachlorocyclopentadiene	10 U	10 U	NA	NA
Hexachloroethane	10 U	10 U	NA	NA
Indeno(1,2,3-cd)pyrene	10 U	10 U	NA	NA
Isophorone	10 U	10 U	NA	NA
Naphthalene	10 U	10 U	NA	NA
Nitrobenzene	NA	10 U	NA	NA
Pentachlorophenol	26 U	25 U	NA	NA
Phenanthrene	10 U	10 U	NA	NA
Phenol	10 U	10 U	NA	NA
Pyrene	10 U	10 U	NA	NA
bis(2-Chloroethoxy)methane	NA	10 U	NA	NA
bis(2-Chloroethyl)ether	10 U	10 U	NA	NA

Aquifer	Yorktown-Eastover			
Station ID	YS11-GW011A			
Sample ID	YS11-MW011A-0792	YS11-MW011A-0296	YS11-MW011A-1196	YS11-MW011A-0904
Sample Date	07/21/92	02/10/96	11/16/96	09/17/04
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data
Chemical Name				
bis(2-Ethylhexyl)phthalate	10 U	10 U	NA	NA
n-Nitroso-di-n-propylamine	10 U	10 U	NA	NA
n-Nitrosodiphenylamine	10 U	10 U	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/L)				
4,4'-DDD	NA	0.1 U	NA	NA
4,4'-DDE	NA	0.1 U	NA	NA
4,4'-DDT	NA	0.1 U	NA	NA
Aldrin	NA	0.05 U	NA	NA
Aroclor-1016	NA	1 U	NA	NA
Aroclor-1221	NA	2 U	NA	NA
Aroclor-1232	NA	1 U	NA	NA
Aroclor-1242	NA	1 U	NA	NA
Aroclor-1248	NA	1 U	NA	NA
Aroclor-1254	NA	1 U	NA	NA
Aroclor-1260	NA	1 U	NA	NA
Dieldrin	NA	0.1 U	NA	NA
Endosulfan I	NA	0.05 U	NA	NA
Endosulfan II	NA	0.1 U	NA	NA
Endosulfan sulfate	NA	0.1 U	NA	NA
Endrin	NA	0.1 U	NA	NA
Endrin aldehyde	NA	0.1 U	NA	NA
Endrin ketone	NA	0.1 U	NA	NA
Heptachlor	NA	0.05 U	NA	NA
Heptachlor epoxide	NA	0.05 U	NA	NA
Methoxychlor	NA	0.5 U	NA	NA
Toxaphene	NA	5 U	NA	NA
alpha-BHC	NA	0.05 U	NA	NA
alpha-Chlordane	NA	0.05 U	NA	NA
beta-BHC	NA	0.05 U	NA	NA
delta-BHC	NA	0.05 U	NA	NA
gamma-BHC (Lindane)	NA	0.05 U	NA	NA
gamma-Chlordane	NA	0.05 U	NA	NA
Explosives (UG/L)				
1,3,5-Trinitrobenzene	1.3 U	0.091 U	NA	2.5 U
1,3-Dinitrobenzene	0.31 U	0.084 U	NA	2.5 U
2,4,6-Trinitrotoluene	1.3 U	0.088 U	NA	2.5 U
2,4-Dinitrotoluene	0.31 U	NA	NA	2.5 U
2,6-Dinitrotoluene	0.31 U	NA	NA	5 U
2-Amino-4,6-dinitrotoluene	NA	NA	NA	5 U
2-Nitrotoluene	NA	0.35 U	NA	5 U
3-Nitrotoluene	NA	0.35 U	NA	5 U
4-Amino-2,6-dinitrotoluene	NA	NA	NA	5 U
4-Nitrotoluene	NA	1 U	NA	5 U
Aminodinitrotoluenes	NA	0.14 U	NA	NA
Dinitrotoluene mixture	NA	0.14 U	NA	NA
HMX	0.63 U	0.77 U	NA	2.5 U
Nitrobenzene	0.31 U	0.15 U	NA	2.5 U
RDX	0.63 U	0.38 U	NA	2.5 U

Aquifer	Yorktown-Eastover			
Station ID	YS11-GW011A			
Sample ID	YS11-MW011A-0792	YS11-MW011A-0296	YS11-MW011A-1196	YS11-MW011A-0904
Sample Date	07/21/92	02/10/96	11/16/96	09/17/04
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data
Chemical Name				
Tetryl	3.1 U	0.27 U	NA	5 U
Total Metals (UG/L)				
Aluminum	14,500 J	287 B	163,000	116 B
Antimony	44 U	19.8 U	17 B	1.9 U
Arsenic	90.3 J	0.9 U	501	2.1 U
Barium	89.6	11	534	7 B
Beryllium	2.2	0.8 U	8	0.1 U
Cadmium	10.3	2.2 U	39.9	0.2 U
Calcium	218,000	31,300	1,070,000	28,200
Chromium	88.2	2.4 U	782	0.9 U
Cobalt	15.8	3.9	77.6	0.5 U
Copper	30.1	2 U	5,090	1.7 B
Cyanide	NA	10 U	3 U	1.1 U
Iron	52,600 J	545	342,000	203 B
Lead	20.7	1.6	547	1.1 U
Magnesium	7,530	447	47,900	293 J
Manganese	206	5.2 B	965	5.5 J
Mercury	0.1 U	0.1 U	0.18 B	0.1 UJ
Nickel	59.2	11.3 U	382	0.6 U
Potassium	6,650	828 U	50,700	291 J
Selenium	2 J	1.3 U	40.1	2.4 U
Silver	6 U	3.1 U	1 U	0.8 U
Sodium	7,260	3,510	13,200	3,230 J
Thallium	2 U	0.9 U	16.5 K	2.8 U
Vanadium	127	2.6	1,260	0.95 B
Zinc	134 J	3.6 U	1,190	4.1 U
Dissolved Metals (UG/L)				
Aluminum	35 U	23.3 U	232	80.7 U
Antimony	44 U	19.8 U	5 B	1.9 U
Arsenic	3.4 J	0.9 U	9.9 B	2.1 U
Barium	7.5	9.2	20.8	5.9 B
Beryllium	1 U	0.8 U	1 U	0.11 B
Cadmium	4 U	2.2 U	1 U	0.2 U
Calcium	28,500	27,500	28,800	25,200
Chromium	8 U	2.4 U	1 UL	0.9 U
Cobalt	6 U	3 U	2 U	0.5 U
Copper	5 U	2 U	2.9 B	0.6 U
Iron	29.3 J	48 B	211	43 U
Lead	2 UJ	0.86	2 U	1.1 U
Magnesium	488	373	370	241 J
Manganese	2 U	4.8 B	3 B	5.3 J
Mercury	0.1 U	0.1 U	0.1 U	0.1 UJ
Nickel	18 U	11.3 U	2 U	0.6 U
Potassium	970 U	828 U	840	251 J
Selenium	2 UJ	1.3 U	3 UL	2.4 U
Silver	6 UJ	3.1 U	1 U	0.8 U
Sodium	6,130	3,520	3,550	3,260 J
Thallium	2 U	0.9 U	6 U	2.8 U

Aquifer	Yorktown-Eastover			
Station ID	YS11-GW011A			
Sample ID	YS11-MW011A-0792	YS11-MW011A-0296	YS11-MW011A-1196	YS11-MW011A-0904
Sample Date	07/21/92	02/10/96	11/16/96	09/17/04
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data
Chemical Name				
Vanadium	6 U	2.4 U	6.2	0.6 U
Zinc	85	3.6 U	12.5 B	4.1 U
Wet Chemistry (MG/L)				
Nitrate	0.1 U	NA	NA	NA

Notes:

Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level report
J = Analyte present. Reported value may or may no
K = Analyte present. Reported value may be biased
L = Analyte present. Reported value may be biased
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccura
UL = Not detected, quantitation limit is probably high

Aquifer	Columbia			Columbia			Columbia			Columbia			
Station ID	YS17-GW001			YS17-GW002			YS17-GW010			YS17-GW016			
Sample ID	YS17-MW001-0792	YS17-MW001-1196	YS17-MW001-0904	YS17-MW002-0792	YS17-MW002-1196	YS17-MW002-0904	YS17-MW010-0792	YS17-MW010-1196	YS17-MW010-0904	YS17-MW016-0792	YS17-MW016-1196	YS17-MW016P-1196	YS17-MW016-0904
Sample Date	07/21/92	11/15/96	09/15/04	07/21/92	11/15/96	09/16/04	07/21/92	11/15/96	09/15/04	07/21/92	11/15/96	11/15/96	09/15/04
Investigation	Historical Data	Historical data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	Historical Data	GW RI Data
Chemical Name													
Volatile Organic Compounds (UG/L)													
1,1,1-Trichloroethane	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
1,1,2,2-Tetrachloroethane	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
1,1,2-Trichloroethane	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
1,1-Dichloroethane	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
1,1-Dichloroethene	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
1,2-Dichloroethane	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
1,2-Dichloroethene (total)	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
1,2-Dichloropropane	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
2-Butanone	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
2-Hexanone	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
4-Methyl-2-pentanone	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
Acetone	10 U	10 U	NA	17 U	9 B	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
Benzene	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
Bromodichloromethane	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
Bromoform	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
Bromomethane	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
Carbon disulfide	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
Carbon tetrachloride	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
Chlorobenzene	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
Chloroethane	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
Chloroform	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
Chloromethane	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
Dibromochloromethane	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
Dimethyl phthalate	11 U	NA	NA	10 U	NA	NA	10 U	NA	NA	11 U	NA	NA	NA
Ethylbenzene	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
Methylene chloride	10 U	10 U	NA	17 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
Styrene	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
Tetrachloroethene	NA	10 U	NA	NA	10 U	NA	NA	10 U	NA	NA	10 U	10 U	NA
Toluene	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
Trichloroethene	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
Vinyl chloride	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
Xylene, total	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
bis(2-Chloroethoxy)methane	11 U	NA	NA	10 U	NA	NA	10 U	NA	NA	11 U	NA	NA	NA
cis-1,3-Dichloropropene	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
trans-1,3-Dichloropropene	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
Semi-volatile Organic Compounds (UG/L)													
1,2,4-Trichlorobenzene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
1,2-Dichlorobenzene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
1,3-Dichlorobenzene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
1,4-Dichlorobenzene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
2,2'-oxybis(1-chloropropane)	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
2,4,5-Trichlorophenol	27 U	25 U	NA	26 U	25 U	NA	26 U	25 U	NA	28 U	25 U	25 U	NA
2,4,6-Trichlorophenol	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
2,4-Dichlorophenol	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
2,4-Dimethylphenol	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
2,4-Dinitrophenol	27 U	25 U	NA	26 U	25 U	NA	26 U	25 U	NA	28 U	25 U	25 U	NA
2,4-Dinitrotoluene	NA	10 U	NA	NA	10 U	NA	NA	10 U	NA	NA	10 U	10 U	NA
2,6-Dinitrotoluene	NA	10 U	NA	NA	10 U	NA	NA	10 U	NA	NA	10 U	10 U	NA
2-Chloronaphthalene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
2-Chlorophenol	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
2-Methylnaphthalene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
2-Methylphenol	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
2-Nitroaniline	27 U	25 U	NA	26 U	25 U	NA	26 U	25 U	NA	28 U	25 U	25 U	NA

Aquifer	Columbia			Columbia			Columbia			Columbia			
Station ID	YS17-GW001			YS17-GW002			YS17-GW010			YS17-GW016			
Sample ID	YS17-MW001-0792	YS17-MW001-1196	YS17-MW001-0904	YS17-MW002-0792	YS17-MW002-1196	YS17-MW002-0904	YS17-MW010-0792	YS17-MW010-1196	YS17-MW010-0904	YS17-MW016-0792	YS17-MW016-1196	YS17-MW016P-1196	YS17-MW016-0904
Sample Date	07/21/92	11/15/96	09/15/04	07/21/92	11/15/96	09/16/04	07/21/92	11/15/96	09/15/04	07/21/92	11/15/96	11/15/96	09/15/04
Investigation	Historical Data	Historical data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	Historical Data	GW RI Data
Chemical Name													
2-Nitrophenol	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
3,3'-Dichlorobenzidine	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
3-Nitroaniline	27 U	25 U	NA	26 U	25 U	NA	26 U	25 U	NA	28 U	25 U	25 U	NA
4,6-Dinitro-2-methylphenol	27 U	25 U	NA	26 U	25 U	NA	26 U	25 U	NA	28 U	25 U	25 U	NA
4-Bromophenyl-phenylether	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
4-Chloro-3-methylphenol	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
4-Chloroaniline	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
4-Chlorophenyl-phenylether	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
4-Methylphenol	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
4-Nitroaniline	11 U	25 U	NA	10 U	25 U	NA	26 U	25 U	NA	28 U	25 U	25 U	NA
4-Nitrophenol	27 U	25 U	NA	26 U	25 U	NA	26 U	25 U	NA	28 U	25 U	25 U	NA
Acenaphthene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Acenaphthylene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Anthracene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Benzo(a)anthracene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Benzo(a)pyrene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Benzo(b)fluoranthene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Benzo(g,h,i)perylene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Benzo(k)fluoranthene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Butylbenzylphthalate	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Carbazole	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Chrysene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Di-n-butylphthalate	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Di-n-octylphthalate	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Dibenz(a,h)anthracene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Dibenzofuran	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
Diethylphthalate	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
Dimethyl phthalate	NA	10 U	NA	NA	10 U	NA	NA	10 U	NA	NA	10 U	10 U	NA
Fluoranthene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Fluorene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	10 U	10 U	10 U	NA
Hexachlorobenzene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Hexachlorobutadiene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Hexachlorocyclopentadiene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Hexachloroethane	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Indeno(1,2,3-cd)pyrene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Isophorone	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Naphthalene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Nitrobenzene	NA	10 U	NA	NA	10 U	NA	NA	10 U	NA	NA	10 U	10 U	NA
Pentachlorophenol	27 U	25 U	NA	26 U	25 U	NA	26 U	25 U	NA	28 U	25 U	25 U	NA
Phenanthrene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Phenol	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Pyrene	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
bis(2-Chloroethoxy)methane	NA	10 U	NA	NA	10 U	NA	NA	10 U	NA	NA	10 U	10 U	NA
bis(2-Chloroethyl)ether	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
bis(2-Ethylhexyl)phthalate	12 U	10 U	NA	12 U	10 U	NA	10 U	10 U	NA	13 U	10 U	10 U	NA
n-Nitroso-di-n-propylamine	11 U	NA	NA	10 U	NA	NA	10 U	NA	NA	11 U	NA	NA	NA
n-Nitrosodiphenylamine	11 U	10 U	NA	10 U	10 U	NA	10 U	10 U	NA	11 U	10 U	10 U	NA
Pesticide/Polychlorinated Biphenyls (UG/L)													
4,4'-DDD	0.1 U	0.1 U	NA	0.11 U	0.1 U	NA	0.11 U	0.1 U	NA	0.11 U	0.1 U	0.1 U	NA
4,4'-DDE	0.1 U	0.1 U	NA	0.11 U	0.1 U	NA	0.11 U	0.1 U	NA	0.11 U	0.1 U	0.1 U	NA
4,4'-DDT	0.1 U	0.1 U	NA	0.11 U	0.1 U	NA	0.11 U	0.1 U	NA	0.11 U	0.1 U	0.1 U	NA
Aldrin	0.05 U	0.05 U	NA	0.54 U	0.05 U	NA	0.54 U	0.05 U	NA	0.054 U	0.05 U	0.05 U	NA
Aroclor-1016	1 U	1 U	1.1 U	1.1 U	1 U	1 U	5.4 U	1 U	1 U	1.1 U	1 U	1 U	1 U
Aroclor-1221	2 U	2 U	2.1 U	2.2 U	1.2 J	2 U	2.2 U	2 U	2 U	2.2 U	2 U	2 U	2 U
Aroclor-1232	1 U	1 U	1.1 U	1.1 U	1 U	1 U	1.1 U	1 U	1 U	1.1 U	1 U	1 U	1 U

Aquifer	Columbia			Columbia			Columbia			Columbia			
Station ID	YS17-GW001			YS17-GW002			YS17-GW010			YS17-GW016			
Sample ID	YS17-MW001-0792	YS17-MW001-1196	YS17-MW001-0904	YS17-MW002-0792	YS17-MW002-1196	YS17-MW002-0904	YS17-MW010-0792	YS17-MW010-1196	YS17-MW010-0904	YS17-MW016-0792	YS17-MW016-1196	YS17-MW016P-1196	YS17-MW016-0904
Sample Date	07/21/92	11/15/96	09/15/04	07/21/92	11/15/96	09/16/04	07/21/92	11/15/96	09/15/04	07/21/92	11/15/96	11/15/96	09/15/04
Investigation	Historical Data	Historical data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	Historical Data	GW RI Data
Chemical Name													
Aroclor-1242	1 U	1 U	1.1 U	1.1 U	1 U	1 U	1.1 U	1 U	1 U	1.1 U	1 U	1 U	1 U
Aroclor-1248	1 U	1 U	1.1 U	1.1 U	1 U	1 U	1.1 U	1 U	1 U	1.1 UJ	1 U	1 U	1 U
Aroclor-1254	1 U	1 U	1.1 U	1.1 U	1 U	1 U	1.1 U	1 U	1 U	1.1 U	1 U	1 U	1 U
Aroclor-1260	1 U	1 U	1.1 U	1.1 U	1 U	1 U	1.1 U	1 U	1 U	1.1 UJ	1 U	1 U	1 U
Dieldrin	0.1 U	0.1 U	NA	0.11 U	0.1 U	NA	0.11 U	0.1 U	NA	0.11 U	0.1 U	0.1 U	NA
Endosulfan I	0.05 U	0.05 U	NA	0.54 U	0.05 U	NA	0.54 UJ	0.05 U	NA	0.054 U	0.05 U	0.05 U	NA
Endosulfan II	0.1 U	0.1 U	NA	0.11 U	0.1 U	NA	0.11 U	0.1 U	NA	0.11 U	0.1 U	0.1 U	NA
Endosulfan sulfate	0.1 U	0.1 U	NA	0.11 U	0.1 U	NA	0.11 U	0.1 U	NA	0.11 U	0.1 U	0.1 U	NA
Endrin	0.1 U	0.1 U	NA	0.11 U	0.1 U	NA	0.11 U	0.1 U	NA	0.11 U	0.1 U	0.1 U	NA
Endrin aldehyde	0.1 U	0.1 U	NA	0.11 U	0.1 U	NA	0.11 U	0.1 U	NA	0.11 U	0.1 U	0.1 U	NA
Endrin ketone	0.1 U	0.1 U	NA	0.11 U	0.1 U	NA	0.11 U	0.1 U	NA	0.11 U	0.1 U	0.1 U	NA
Heptachlor	0.05 U	0.05 U	NA	0.54 U	0.05 U	NA	0.54 U	0.05 U	NA	0.054 U	0.01 B	0.0032 B	NA
Heptachlor epoxide	0.05 U	0.05 U	NA	0.54 U	0.05 U	NA	0.11 UJ	0.05 U	NA	0.11 UJ	0.05 U	0.05 U	NA
Methoxychlor	0.5 U	0.5 U	NA	0.54 U	0.5 U	NA	0.54 U	0.5 U	NA	0.54 U	0.5 U	0.5 U	NA
Toxaphene	5 U	5 U	NA	5.4 U	5 U	NA	5.4 U	5 U	NA	5.4 U	5 U	5 U	NA
alpha-BHC	0.05 U	0.05 U	NA	0.54 U	0.05 U	NA	0.54 U	0.05 U	NA	0.054 U	0.05 U	0.05 U	NA
alpha-Chlordane	0.5 U	0.05 U	NA	0.54 U	0.05 U	NA	0.05 U	0.05 U	NA	0.054 U	0.05 U	0.05 U	NA
beta-BHC	0.05 U	0.05 U	NA	0.54 U	0.05 U	NA	0.54 U	0.05 U	NA	0.054 U	0.05 U	0.05 U	NA
delta-BHC	0.05 U	0.05 U	NA	0.54 U	0.05 U	NA	0.54 U	0.05 U	NA	0.054 U	0.05 U	0.05 U	NA
gamma-BHC (Lindane)	0.05 U	NA	NA	0.54 U	NA	NA	0.54 U	NA	NA	0.054 U	NA	NA	NA
gamma-Chlordane	0.5 U	0.05 U	NA	0.54 U	0.05 U	NA	0.05 U	0.05 U	NA	0.054 U	0.05 U	0.05 U	NA
Explosives (UG/L)													
1,3,5-Trinitrobenzene	NA	0.2 U	NA	NA	0.2 U	NA	NA	0.2 U	NA	NA	0.2 U	0.2 U	NA
1,3-Dinitrobenzene	NA	0.2 U	NA	NA	0.2 U	NA	NA	0.2 U	NA	NA	0.2 U	0.2 U	NA
2,4,6-Trinitrotoluene	NA	0.2 U	NA	NA	0.2 U	NA	NA	0.2 U	NA	NA	0.2 U	0.2 U	NA
2,4-Dinitrotoluene	11 U	NA	NA	10 U	NA	NA	10 U	NA	NA	10 U	NA	NA	NA
2,6-Dinitrotoluene	11 U	NA	NA	10 U	NA	NA	10 U	NA	NA	11 U	NA	NA	NA
2-Nitrotoluene	NA	0.2 U	NA	NA	0.2 U	NA	NA	0.2 U	NA	NA	0.2 U	0.2 U	NA
3-Nitrotoluene	NA	0.2 U	NA	NA	0.2 U	NA	NA	0.2 U	NA	NA	0.2 U	0.2 U	NA
Aminodinitrotoluenes	NA	0.2 U	NA	NA	0.2 U	NA	NA	0.2 U	NA	NA	1.3	1.2	NA
Dinitrotoluene mixture	NA	0.2 U	NA	NA	0.2 U	NA	NA	0.2 U	NA	NA	0.2 U	0.2 U	NA
HMX	NA	0.5 U	NA	NA	0.5 U	NA	NA	0.5 U	NA	NA	0.5 U	0.5 U	NA
Nitrobenzene	11 U	0.2 U	NA	10 U	0.2 U	NA	10 U	0.2 U	NA	11 U	0.2 U	0.2 U	NA
RDX	NA	0.5 U	NA	NA	0.5 U	NA	NA	0.5 U	NA	NA	0.5 U	0.5 U	NA
Tetryl	NA	0.2 U	NA	NA	0.2 U	NA	NA	0.2 U	NA	NA	0.2 U	0.2 U	NA
Total Metals (UG/L)													
Aluminum	3,840 J	76.1 B	80.7 U	12,100 J	182	80.7 U	728 J	102 B	80.7 U	6,400 J	413	398	1,030
Antimony	44 U	3 U	1.9 U	44 U	3 U	1.9 U	44 U	3 U	1.9 U	44 U	60 U	3 U	1.9 U
Arsenic	18.7 J	3 U	2.1 U	20.6 J	15.2	2.1 U	2 UJ	3 U	8.7 B	2.4 J	4 B	3.6 B	3.3 B
Barium	81.1	4.9	4 B	34.1	5.9	15 B	67.6	58.4	119 B	70.9	16.8	17.3	19.2 B
Beryllium	2.2	1 U	0.1 U	1 U	1 U	0.1 U	1 U	1 U	0.1 U	1 U	1 U	1 U	0.1 U
Cadmium	4 U	1 U	0.2 U	4 U	1 U	0.2 U	4 U	1 U	0.2 U	4 U	1 U	1 U	0.2 U
Calcium	94,400	17,800	15,800	7,890	9,910	11,100	92,800	181,000	199,000	11,500	12,800	13,400	12,400
Chromium	92.8	1 UL	0.9 U	32	1 UL	0.9 U	8 U	1 UL	0.9 U	17	1 UL	1 UL	0.9 U
Cobalt	17	2 U	0.5 U	6 U	2 U	0.5 U	6 U	2 U	1 B	8.7	2 U	2 U	1 B
Copper	18.6	1 U	0.6 U	9.9	1 U	0.6 U	5 U	1 U	0.6 U	7.9	1.4 B	1 U	0.76 B
Cyanide	NA	3 U	1.7 B	NA	3 U	1.9 B	NA	3 U	1.1 U	NA	3 U	3 U	2.5 B
Iron	50,600 J	40 B	43 U	17,400 J	3,680	53.8 B	3,970 J	698	7,390	8,360 J	222	229	1,370
Lead	22	2 U	1.1 U	10.7 U	2 U	1.1 U	4.9 UJ	2 U	1.1 U	7.7 UJ	2 U	2 U	1.1 U
Magnesium	5,520	324	337 J	1,460	407	333 J	5,820	8,410	8,570	1,680	1,410	1,560	995 J
Manganese	216	4.8 B	1.8 J	138	124	55	238	71	235	43.6	4.1 B	4.5 B	10.2 J
Mercury	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ
Nickel	23.2	2 U	0.6 U	18 U	2 U	0.6 U	18 U	2.2	0.6 U	18 U	2 U	2 U	0.6 U
Potassium	4,960	313	122 J	1,470	370	529 J	4,630	3,620	2,340 J	4,750	890	943	883 J

Aquifer	Columbia			Columbia			Columbia			Columbia			
Station ID	YS17-GW001			YS17-GW002			YS17-GW010			YS17-GW016			
Sample ID	YS17-MW001-0792	YS17-MW001-1196	YS17-MW001-0904	YS17-MW002-0792	YS17-MW002-1196	YS17-MW002-0904	YS17-MW010-0792	YS17-MW010-1196	YS17-MW010-0904	YS17-MW016-0792	YS17-MW016-1196	YS17-MW016P-1196	YS17-MW016-0904
Sample Date	07/21/92	11/15/96	09/15/04	07/21/92	11/15/96	09/16/04	07/21/92	11/15/96	09/15/04	07/21/92	11/15/96	11/15/96	09/15/04
Investigation	Historical Data	Historical data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	GW RI Data	Historical Data	Historical Data	Historical Data	GW RI Data
Chemical Name													
Selenium	2 UJ	3 UL	2.4 U	2 UJ	3 UL	2.4 U	2 UJ	3 UL	2.4 U	2 UJ	3 UL	3 UL	2.4 U
Silver	6 U	1 U	0.8 U	2 U	1 U	0.8 U	6 U	1 U	0.8 U	6 U	1 U	1 U	0.8 U
Sodium	9,650	6,030	8,740	2,340	1,700	1,980 J	26,400	14,200	12,800	2,060	1,280	1,290	1,720 J
Thallium	2 UJ	6 U	2.8 U	2 U	6 U	2.8 U	2 UJ	6 U	2.8 U	2 U	6 U	6 U	2.8 U
Vanadium	98.3	1 U	0.6 U	39.4	1.6	2 B	12.3	1 U	0.6 U	17.1	1.4	1	2.4 B
Zinc	84.9 J	7.2 B	4.1 U	40.2 J	8.3 B	4.1 U	25.4 J	6.3 B	4.1 U	33 J	8 B	12.6 B	5.7 B
Dissolved Metals (UG/L)													
Aluminum	35 U	28 B	80.7 U	35 U	160	80.7 U	35 U	26 B	80.7 U	35 U	85.7 B	63 B	182 B
Antimony	44 U	3 U	1.9 U	44 U	3 U	1.9 U	44 U	3 U	1.9 U	44 U	3 U	3 U	1.9 U
Arsenic	2 UJ	3 U	2.1 U	17 J	13.9 B	2.1 U	2 UJ	3 U	8.4 B	2 UJ	3.7 B	3 U	2.5 B
Barium	4.1	3.7	3.8 B	3 U	6.3	13.9 B	58.3	58.5	116 B	32.2	16.2	16.3	16.5 B
Beryllium	1 U	1 U	0.13 B	1 U	1 U	0.1 B	1 U	1 U	0.1 B	1 U	1 U	1 U	0.14 B
Cadmium	4 U	1 U	0.2 U	4 U	1 U	0.2 U	4 U	1 U	0.2 U	4 U	1 U	1 U	0.2 U
Calcium	38,100	16,500	15,700	7,370	9,720	11,100	90,900	184,000	193,000	9,640	12,800	13,600	12,300
Chromium	8 U	1 UL	0.9 U	8 U	1 UL	0.9 U	8 U	1 UL	0.9 U	8 U	1 UL	1 UL	0.9 U
Cobalt	6 U	2 U	0.5 U	6 U	2 U	0.53 B	6 U	2 U	5.4 B	8.6	2 U	2 U	1.1 B
Copper	5 U	1 U	0.6 U	5 U	1 U	0.6 U	5 U	1.8 B	0.6 U	5 U	1 U	1 U	0.63 B
Iron	19 UJ	10 U	43 U	5,460 J	3,620	43 U	2,250 J	529	7,370	131 J	43.3 B	36.5 B	759
Lead	12.9 U	2 U	1.1 U	2 UJ	2 U	1.1 U	2.9 UJ	2 U	1.1 U	2 UJ	2 U	2 U	1.1 U
Magnesium	621	296	339 J	513	404	335 J	5,710	8,510	8,320	1,440	1,390	1,450	959 J
Manganese	10.5	4.6 B	3 J	92.4	122	52.5	227	73.4	239	27.5	4.7 B	3.7 B	10 J
Mercury	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ
Nickel	18 U	2 U	0.68 J	18 U	2 U	0.89 J	18 U	2.7	1.7 J	18 U	2 U	2 U	1.2 J
Potassium	970 U	304	135 J	970 U	365	560 J	4,380	3,680	2,370 J	2,860	883	889	906 J
Selenium	2 UJ	3 UL	2.4 U	2 UJ	3 UL	2.4 U	2 UJ	3 UL	2.4 U	2 U	3 UL	3 UL	2.4 U
Silver	6 U	1 U	0.8 U	6 U	1 U	0.8 U	6 U	1 U	0.8 U	6 U	1 U	1 U	0.8 U
Sodium	9,660	5,970	8,830	2,580	1,660	2,080 J	25,600	14,000	13,100	2,490	1,330	1,310	1,990 J
Thallium	2 UJ	6 U	2.8 U	2 U	6 U	2.8 U	2 UJ	6 U	2.8 U	2 U	6 U	6 U	2.8 U
Vanadium	8	1 U	0.66 B	6 U	1.4	1.9 B	13.4	1 U	0.6 U	6 U	1 U	1 U	0.89 B
Zinc	29.9 J	5.3 B	4.1 U	51.3 J	6.5 B	4.1 U	62.8 J	16.2 B	4.1 U	80 J	8.8 B	7.1 B	4.3 B
Wet Chemistry (MG/L)													
Nitrate	1	NA	NA	0.68	NA	NA	0.25	NA	NA	2.3	NA	NA	NA
Total Petroleum Hydrocarbons (UG/L)													
Total petroleum hydrocarbons (TPH)	1 U	NA	NA	1 U	NA	NA	1 U	NA	NA	1 U	NA	NA	NA

Notes:

Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher

Aquifer	Yorktown-Eastover		Yorktown-Eastover		Yorktown-Eastover			Yorktown-Eastover		Yorktown-Eastover	
Station ID	YS25-GW001		YS25-GW002		YS25-GW002A			YS25-GW003		YS25-GW004	
Sample ID	YS25-MW001-1097	YS25-MW001P-1097	YS25-MW002-0997	YS25-MW002-0904	YS25-MW002A-1097	YS25-MW002A-0904	YS25-MW002AP-0904	YS25-MW003-1097	YS25-MW003-0904	YS25-MW004-1097	YS25-MW004-0904
Sample Date	10/08/97	10/08/97	09/27/97	09/17/04	10/08/97	09/23/04	09/23/04	10/08/97	09/17/04	10/08/97	09/17/04
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data	Historical Data	GW RI Data	GW RI Data	Historical Data	GW RI Data	Historical Data	GW RI Data
Chemical Name											
Volatile Organic Compounds (UG/L)											
1,1,1-Trichloroethane	2 J	2 J	110	NA	10 U	NA	NA	17	NA	3 J	NA
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
1,1,2-Trichloroethane	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
1,1-Dichloroethane	10 U	10 U	5 J	NA	10 U	NA	NA	10 U	NA	10 U	NA
1,1-Dichloroethene	10 U	10 U	20	NA	10 U	NA	NA	5 J	NA	4 J	NA
1,2-Dichloroethane	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
1,2-Dichloroethene (total)	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
1,2-Dichloropropane	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
2-Butanone	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
2-Hexanone	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
4-Methyl-2-pentanone	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Acetone	10 U	7 B	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Benzene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Bromodichloromethane	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	4 J	NA
Bromoform	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Bromomethane	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Carbon disulfide	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Carbon tetrachloride	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Chlorobenzene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Chloroethane	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Chloroform	4 J	4 J	5 J	NA	10 U	NA	NA	1 J	NA	37	NA
Chloromethane	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Dibromochloromethane	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Ethylbenzene	0.5 J	0.6 J	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Methylene chloride	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	0.4 B	NA
Styrene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Tetrachloroethene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Toluene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Trichloroethene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Vinyl chloride	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Xylene, total	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
cis-1,3-Dichloropropene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
trans-1,3-Dichloropropene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Semi-volatile Organic Compounds (UG/L)											
1,2,4-Trichlorobenzene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
1,2-Dichlorobenzene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
1,3-Dichlorobenzene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
1,4-Dichlorobenzene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
2,2'-oxybis(1-chloropropane)	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
2,4,5-Trichlorophenol	25 U	25 U	25 U	NA	25 U	NA	NA	25 U	NA	25 U	NA
2,4,6-Trichlorophenol	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
2,4-Dichlorophenol	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
2,4-Dimethylphenol	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
2,4-Dinitrophenol	25 U	25 U	25 U	NA	25 U	NA	NA	25 U	NA	25 U	NA
2,4-Dinitrotoluene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
2,6-Dinitrotoluene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
2-Chloronaphthalene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
2-Chlorophenol	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
2-Methylnaphthalene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA

Aquifer	Yorktown-Eastover		Yorktown-Eastover		Yorktown-Eastover			Yorktown-Eastover		Yorktown-Eastover	
Station ID	YS25-GW001		YS25-GW002		YS25-GW002A			YS25-GW003		YS25-GW004	
Sample ID	YS25-MW001-1097	YS25-MW001P-1097	YS25-MW002-0997	YS25-MW002-0904	YS25-MW002A-1097	YS25-MW002A-0904	YS25-MW002AP-0904	YS25-MW003-1097	YS25-MW003-0904	YS25-MW004-1097	YS25-MW004-0904
Sample Date	10/08/97	10/08/97	09/27/97	09/17/04	10/08/97	09/23/04	09/23/04	10/08/97	09/17/04	10/08/97	09/17/04
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data	Historical Data	GW RI Data	GW RI Data	Historical Data	GW RI Data	Historical Data	GW RI Data
Chemical Name											
2-Methylphenol	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
2-Nitroaniline	25 U	25 U	25 U	NA	25 U	NA	NA	25 U	NA	25 U	NA
2-Nitrophenol	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
3,3'-Dichlorobenzidine	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
3-Nitroaniline	25 U	25 U	25 U	NA	25 U	NA	NA	25 U	NA	25 U	NA
4,6-Dinitro-2-methylphenol	25 U	25 U	25 U	NA	25 U	NA	NA	25 U	NA	25 U	NA
4-Bromophenyl-phenylether	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
4-Chloro-3-methylphenol	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
4-Chloroaniline	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
4-Chlorophenyl-phenylether	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
4-Methylphenol	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
4-Nitroaniline	25 U	25 U	25 U	NA	25 U	NA	NA	25 U	NA	25 U	NA
4-Nitrophenol	25 U	25 U	25 U	NA	25 U	NA	NA	25 U	NA	25 U	NA
Acenaphthene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Acenaphthylene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Anthracene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Benzo(a)anthracene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Benzo(a)pyrene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Benzo(b)fluoranthene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Benzo(g,h,i)perylene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Benzo(k)fluoranthene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Butylbenzylphthalate	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Carbazole	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Chrysene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Di-n-butylphthalate	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Di-n-octylphthalate	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Dibenz(a,h)anthracene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Dibenzofuran	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Diethylphthalate	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Dimethyl phthalate	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Fluoranthene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Fluorene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Hexachlorobenzene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Hexachlorobutadiene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Hexachlorocyclopentadiene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Hexachloroethane	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Indeno(1,2,3-cd)pyrene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Isophorone	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Naphthalene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Nitrobenzene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Pentachlorophenol	25 U	25 U	25 U	NA	25 U	NA	NA	25 U	NA	25 U	NA
Phenanthrene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Phenol	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Pyrene	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
bis(2-Chloroethoxy)methane	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
bis(2-Chloroethyl)ether	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
bis(2-Ethylhexyl)phthalate	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
n-Nitroso-di-n-propylamine	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
n-Nitrosodiphenylamine	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	NA	10 U	NA
Pesticide/Polychlorinated Biphenyls (UG/L)											
4,4'-DDD	0.5 U	0.1 UJ	0.1 UJ	NA	0.5 U	NA	NA	0.1 UJ	NA	1 U	NA

Aquifer	Yorktown-Eastover		Yorktown-Eastover		Yorktown-Eastover			Yorktown-Eastover		Yorktown-Eastover	
Station ID	YS25-GW001		YS25-GW002		YS25-GW002A			YS25-GW003		YS25-GW004	
Sample ID	YS25-MW001-1097	YS25-MW001P-1097	YS25-MW002-0997	YS25-MW002-0904	YS25-MW002A-1097	YS25-MW002A-0904	YS25-MW002AP-0904	YS25-MW003-1097	YS25-MW003-0904	YS25-MW004-1097	YS25-MW004-0904
Sample Date	10/08/97	10/08/97	09/27/97	09/17/04	10/08/97	09/23/04	09/23/04	10/08/97	09/17/04	10/08/97	09/17/04
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data	Historical Data	GW RI Data	GW RI Data	Historical Data	GW RI Data	Historical Data	GW RI Data
Chemical Name											
4,4'-DDE	0.5 U	0.1 UJ	0.1 UJ	NA	0.5 U	NA	NA	0.1 UJ	NA	1 U	NA
4,4'-DDT	0.5 U	0.1 UJ	0.1 UJ	NA	0.5 U	NA	NA	0.1 UJ	NA	1 U	NA
Aldrin	0.25 U	0.05 UJ	0.05 UJ	NA	0.25 U	NA	NA	0.05 UJ	NA	0.5 U	NA
Aroclor-1016	5 U	1 UJ	1 UJ	NA	5 U	NA	NA	1 UJ	NA	10 U	NA
Aroclor-1221	10 U	2 UJ	2 UJ	NA	10 U	NA	NA	2 UJ	NA	20 U	NA
Aroclor-1232	5 U	1 UJ	1 UJ	NA	5 U	NA	NA	1 UJ	NA	10 U	NA
Aroclor-1242	5 U	1 UJ	1 UJ	NA	5 U	NA	NA	1 UJ	NA	10 U	NA
Aroclor-1248	5 U	1 UJ	1 UJ	NA	5 U	NA	NA	1 UJ	NA	10 U	NA
Aroclor-1254	5 U	1 UJ	1 UJ	NA	5 U	NA	NA	1 UJ	NA	10 U	NA
Aroclor-1260	5 U	1 UJ	1 UJ	NA	5 U	NA	NA	1 UJ	NA	10 U	NA
Dieldrin	0.5 U	0.1 UJ	0.1 UJ	NA	0.5 U	NA	NA	0.1 UJ	NA	1 U	NA
Endosulfan I	0.25 U	0.05 UJ	0.05 UJ	NA	0.25 U	NA	NA	0.05 UJ	NA	0.5 U	NA
Endosulfan II	0.5 U	0.1 UJ	0.1 UJ	NA	0.5 U	NA	NA	0.1 UJ	NA	1 U	NA
Endosulfan sulfate	0.5 U	0.1 UJ	0.1 UJ	NA	0.5 U	NA	NA	0.1 UJ	NA	1 U	NA
Endrin	0.5 U	0.1 UJ	0.1 UJ	NA	0.5 U	NA	NA	0.1 UJ	NA	1 U	NA
Endrin aldehyde	0.5 U	0.1 UJ	0.1 UJ	NA	0.5 U	NA	NA	0.1 UJ	NA	1 U	NA
Endrin ketone	0.5 U	0.1 UJ	0.1 UJ	NA	0.5 U	NA	NA	0.1 UJ	NA	1 U	NA
Heptachlor	0.25 U	0.05 UJ	0.05 UJ	NA	0.25 U	NA	NA	0.05 UJ	NA	0.5 U	NA
Heptachlor epoxide	0.25 U	0.05 UJ	0.05 UJ	NA	0.25 U	NA	NA	0.05 UJ	NA	0.5 U	NA
Methoxychlor	2.5 U	0.5 UJ	0.5 UJ	NA	2.5 U	NA	NA	0.5 UJ	NA	5 U	NA
Toxaphene	25 U	5 UJ	5 UJ	NA	25 U	NA	NA	5 UJ	NA	50 U	NA
alpha-BHC	0.25 U	0.05 UJ	0.05 UJ	NA	0.25 U	NA	NA	0.05 UJ	NA	0.5 U	NA
alpha-Chlordane	0.25 U	0.05 UJ	0.05 UJ	NA	0.25 U	NA	NA	0.05 UJ	NA	0.5 U	NA
beta-BHC	0.25 U	0.05 UJ	0.05 UJ	NA	0.25 U	NA	NA	0.05 UJ	NA	0.5 U	NA
delta-BHC	0.25 U	0.05 UJ	0.05 UJ	NA	0.25 U	NA	NA	0.05 UJ	NA	0.5 U	NA
gamma-BHC (Lindane)	0.25 U	0.05 UJ	0.05 UJ	NA	0.25 U	NA	NA	0.05 UJ	NA	0.5 U	NA
gamma-Chlordane	0.25 U	0.05 UJ	0.05 UJ	NA	0.25 U	NA	NA	0.05 UJ	NA	0.5 U	NA
Explosives (UG/L)											
1,3,5-Trinitrobenzene	0.2 U	0.2 U	2 U	2.5 U	0.2 U	2.5 U	2.5 U	0.2 U	2.5 U	0.2 U	2.5 U
1,3-Dinitrobenzene	0.2 U	0.2 U	2 U	2.5 U	0.2 U	2.5 U	2.5 U	0.2 U	2.5 U	0.2 U	2.5 U
2,4,6-Trinitrotoluene	0.2 U	0.2 U	2 U	2.5 U	0.2 U	2.5 U	2.5 U	0.2 U	2.5 U	0.2 U	2.5 U
2,4-Dinitrotoluene	0.2 U	0.2 U	2 U	2.5 U	0.2 U	2.5 U	2.5 U	0.2 U	2.5 U	0.2 U	2.5 U
2,6-Dinitrotoluene	0.2 U	0.2 U	2 U	5 U	0.2 U	5 U	5 U	0.2 U	5 U	0.2 U	5 U
2-Amino-4,6-dinitrotoluene	0.2 U	0.2 U	2 U	5 U	0.2 U	5 UJ	5 UJ	0.2 U	5 U	0.2 U	5 U
2-Nitrotoluene	0.2 U	0.2 U	2 U	5 U	0.2 U	5 U	5 U	0.2 U	5 U	0.2 U	5 U
3-Nitrotoluene	0.2 U	0.2 U	2 U	5 U	0.2 U	5 UJ	5 UJ	0.2 U	5 U	0.2 U	5 U
4-Amino-2,6-dinitrotoluene	0.2 U	0.2 U	2 U	5 U	0.2 U	5 U	5 U	0.2 U	5 U	0.2 U	5 U
4-Nitrotoluene	0.2 U	0.2 U	2 U	5 U	0.2 U	5 U	5 U	0.2 U	5 U	0.2 U	5 U
HMX	0.5 U	0.5 U	21 B	6.7 B	0.5 U	2.5 U	2.5 U	0.5 U	2.5 U	0.5 U	32
Nitrobenzene	0.2 U	0.2 U	2 U	2.5 U	0.2 U	2.5 UJ	2.5 UJ	0.2 U	2.5 U	0.2 U	2.5 U
RDX	0.5 U	0.5 U	22	2.5 U	0.5 U	2.5 U	2.5 U	0.5 U	2.5 U	0.5 U	35
Tetryl	0.2 U	0.2 U	2 U	5 U	0.2 U	5 U	5 U	0.2 U	5 U	0.2 U	5 U
Total Metals (UG/L)											
Aluminum	34,600 K	27,600 K	7,060 K	80.7 U	2,690 K	580	599	50,100 K	80.7 U	166,000 K	80.7 U
Antimony	5.8 B	6 B	3.8 UL	1.9 U	2.8 U	1.9 U	1.9 U	9.6 B	1.9 U	9.1 B	1.9 U
Arsenic	139	142	19.4	2.1 U	4.8 B	3.3 B	2.9 B	222	2.1 U	501	2.1 U
Barium	125 J	116 J	40.6 J	15.4 B	15.9 J	13.7 B	14.7 B	165 J	7.3 B	528	17.7 B
Beryllium	2.1 B	2 B	0.2 U	0.1 U	0.58 B	0.1 U	0.1 U	2.8 B	0.1 U	9.4 K	0.1 U
Cadmium	4 J	4.1 J	1 J	0.2 U	0.2 U	0.2 U	0.2 U	6.8	0.2 U	23.3	0.2 U
Calcium	231,000	232,000	130,000 J	91,600	64,000	44,200	46,500	250,000	80,100	592,000	106,000

Aquifer	Yorktown-Eastover		Yorktown-Eastover		Yorktown-Eastover			Yorktown-Eastover		Yorktown-Eastover	
Station ID	YS25-GW001		YS25-GW002		YS25-GW002A			YS25-GW003		YS25-GW004	
Sample ID	YS25-MW001-1097	YS25-MW001P-1097	YS25-MW002-0997	YS25-MW002-0904	YS25-MW002A-1097	YS25-MW002A-0904	YS25-MW002AP-0904	YS25-MW003-1097	YS25-MW003-0904	YS25-MW004-1097	YS25-MW004-0904
Sample Date	10/08/97	10/08/97	09/27/97	09/17/04	10/08/97	09/23/04	09/23/04	10/08/97	09/17/04	10/08/97	09/17/04
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data	Historical Data	GW RI Data	GW RI Data	Historical Data	GW RI Data	Historical Data	GW RI Data
Chemical Name											
Chromium	188	168	33.7	0.9 U	27.5	6.6 B	4.4 B	259	0.9 U	857	0.93 B
Cobalt	19.9 J	19 J	3.6 J	0.5 U	1.6 J	0.5 U	0.5 U	28.2 J	0.5 U	80.2	0.5 U
Copper	25.1	25 J	3.9 UL	0.6 U	3.9 B	0.6 U	0.65 B	37.4	0.6 U	120	0.6 U
Cyanide	10 R	10 R	2.9 J	2.9 B	10 R	1.1 U	1.5 B	10 R	2.5 B	10 R	3 B
Iron	83,000	78,800	13,300	43 U	5,440	61.7 B	73 B	113,000	43 U	349,000	56.8 B
Lead	30.1 J	27.5 J	4.7 J	1.1 U	2 UL	1.1 U	1.1 U	38.7 J	1.1 U	140 J	1.1 U
Magnesium	11,500	10,700	4,130 J	1,740 J	1,730 J	43.8 U	43.8 U	15,400	1,720 J	45,300	1,140 J
Manganese	298	293	81.3	0.2 U	27.1	0.68 B	0.85 B	401	0.2 U	1,180	0.4 B
Mercury	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 UJ	0.1 UJ	0.1 U	0.1 UJ	0.17 J	0.1 UJ
Nickel	63.2	59	10 J	0.6 U	3.9 J	7.7 J	3.7 J	103	0.6 U	301	0.6 U
Potassium	11,600	11,000	3,200 J	1,150 J	23,300	10,400	10,700	14,200	132 J	45,600	318 J
Selenium	3.2 U	5.5 K	4.1 UL	2.4 U	3.2 U	2.4 U	2.4 U	6.4 K	2.4 U	17.1	2.4 U
Silver	0.5 U	0.5 U	1 U	0.8 U	0.5 U	0.8 U	0.8 U	0.5 U	0.8 U	0.5 U	0.8 U
Sodium	8,220	8,680	6,300	35,800	25,400	16,900	17,600	5,270	10,900	14,600	6,320
Thallium	3.8 UL	3.8 UL	5.9 U	2.8 U	3.8 UL	2.8 U	2.8 U	3.8 UL	2.8 U	4.8 B	2.8 U
Vanadium	243	212	47 J	0.6 U	13.2 J	1.4 B	1.2 B	398	0.6 U	1,140	0.7 B
Zinc	162 J	160 J	32.6 J	4.1 U	16.8 B	4.1 U	4.1 U	251 J	4.1 U	707 J	4.3 B
Dissolved Metals (UG/L)											
Aluminum	85.1 B	22.7 B	52.3 U	80.7 U	731	674	657	32.9 B	80.7 U	41.6 B	80.7 U
Antimony	2.8 U	2.8 U	3.8 UL	1.9 U	2.8 U	2.3 B	2 U	2.8 U	1.9 U	2.8 U	1.9 B
Arsenic	5 B	3.7 B	4.4 U	2.1 U	4.4 B	2.5 B	2.6 B	3.2 U	2.1 U	3.9 B	2.1 U
Barium	14.9 J	12.5 J	17.7 J	14.8 B	2 B	15.7 B	15.3 B	12.1 J	7 B	10.2 J	17.4 B
Beryllium	0.41 B	0.36 B	0.2 U	0.1 U	0.32 B	0.1 U	0.1 U	0.45 B	0.1 U	0.45 B	0.1 U
Cadmium	0.2 B	0.2 U	0.3 U	0.2 U	0.2 U	0.2 U	0.2 U	0.22 J	0.2 U	0.2 U	0.2 U
Calcium	106,000	105,000	118,000 J	87,900	4,840 J	47,800	48,100	86,300	77,700	58,700	104,000
Chromium	0.6 U	0.6 U	1.8 U	0.9 U	0.6 U	0.5 U	1.8 B	0.6 U	0.9 U	0.6 U	1.6 B
Cobalt	1.4 U	1.4 U	1.2 U	3.9 B	1.4 U	0.3 U	0.3 U	1.4 U	0.5 U	1.4 U	0.5 U
Copper	1.6 J	1.2 U	3.9 UL	0.6 U	1.6 B	0.5 U	0.5 U	1.7 J	0.6 U	1.2 U	0.6 U
Iron	49.6 B	18.2 B	32.9 U	43 U	26.6 B	10.7 U	10.7 B	38 B	43 U	23.5 B	43 U
Lead	2 UL	2 UL	2.2 U	1.1 U	2 UL	0.9 U	0.9 U	2 UL	1.1 U	2 UL	1.1 U
Magnesium	1,930 J	1,870 J	2,470 J	1,680 J	879 J	4.9 U	4.9 U	1,890 J	1,590 J	722 J	1,120 J
Manganese	14.5 J	11.8 J	33.1	5.5 J	1.9 B	0.1 U	0.1 U	14.7 J	1 J	12.6 J	0.86 B
Mercury	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 UJ	0.1 UJ	0.1 U	0.1 UJ	0.1 U	0.1 UJ
Nickel	1.5 U	1.5 U	2.8 U	0.93 J	1.5 U	0.5 U	1.4 J	1.5 U	0.6 U	1.5 U	0.75 J
Potassium	1,310 J	1,280 J	1,020 J	1,190 J	20,700	11,300	11,300	598 J	132 J	646 J	326 J
Selenium	3.2 U	3.2 U	4.1 UL	2.4 U	3.2 U	2.6 U	2.6 U	3.2 U	2.4 U	3.2 U	2.4 U
Silver	0.5 U	0.5 U	1 U	0.8 U	0.5 U	0.7 U	0.7 U	0.5 U	0.8 U	0.5 U	0.8 U
Sodium	7,090 B	6,060 B	4,790 J	36,700	25,700	18,600	18,900	3,290 B	11,200	8,250	6,710
Thallium	4.6 B	3.8 UL	6.9 B	2.8 U	5.8 B	1.9 U	1.9 U	3.8 UL	2.8 U	3.8 UL	2.8 U
Vanadium	0.61 B	0.6 U	1 U	0.6 U	5.8 J	1.9 B	1.6 B	0.6 U	0.6 U	0.81 B	0.6 U
Zinc	6.3 B	6.3 B	12.7 J	6 B	2.7 B	3.5 B	8.2 B	6.4 B	4.1 U	58.7	4.1 U
Wet Chemistry (MG/L)											
Ammonia	1 U	NA	1 U	NA	1 U	NA	NA	1 U	NA	1 U	NA
Bromide	0.5 U	NA	0.5 U	NA	0.5 U	NA	NA	0.5 U	NA	0.5 U	NA
Chloride	3.9	NA	4.2	NA	8.4	NA	NA	2.6	NA	10.9	NA
Ethane	4.40E-07 U	NA	4.40E-07 U	NA	4.40E-07 U	NA	NA	4.40E-07 U	NA	4.40E-07 U	NA
Ethene	4.10E-07 U	NA	4.10E-07 U	NA	4.10E-07 U	NA	NA	4.10E-07 U	NA	4.10E-07 U	NA
Ferrous iron	0.05 U	NA	0.05 U	NA	0.05 U	NA	NA	0.05 U	NA	0.05 U	NA
Methane	2.00E-07	NA	5.00E-07	NA	3.00E-07	NA	NA	4.00E-07	NA	1.10E-06	NA
Orthophosphate	0.5 U	NA	0.5 U	NA	0.5 U	NA	NA	0.5 U	NA	0.5 U	NA

Aquifer	Yorktown-Eastover		Yorktown-Eastover		Yorktown-Eastover			Yorktown-Eastover		Yorktown-Eastover	
Station ID	YS25-GW001		YS25-GW002		YS25-GW002A			YS25-GW003		YS25-GW004	
Sample ID	YS25-MW001-1097	YS25-MW001P-1097	YS25-MW002-0997	YS25-MW002-0904	YS25-MW002A-1097	YS25-MW002A-0904	YS25-MW002AP-0904	YS25-MW003-1097	YS25-MW003-0904	YS25-MW004-1097	YS25-MW004-0904
Sample Date	10/08/97	10/08/97	09/27/97	09/17/04	10/08/97	09/23/04	09/23/04	10/08/97	09/17/04	10/08/97	09/17/04
Investigation	Historical Data	Historical Data	Historical Data	GW RI Data	Historical Data	GW RI Data	GW RI Data	Historical Data	GW RI Data	Historical Data	GW RI Data
Chemical Name											
Propane	6.40E-07 U	NA	6.40E-07 U	NA	6.40E-07 U	NA	NA	6.40E-07 U	NA	6.40E-07 U	NA
Sulfate	13.8	NA	12	NA	14	NA	NA	7.5	NA	27.5	NA
Sulfide	0.65	NA	1.5	NA	0.65	NA	NA	3.1	NA	0.5 U	NA
Total dissolved solids (TDS)	90	NA	320	NA	140	NA	NA	220	NA	65	NA
Total organic carbon (TOC)	0.005	NA	1.00E-03	NA	1.00E-03	NA	NA	0.002	NA	0.003	NA
Total suspended solids (TSS)	2,200	NA	700	NA	66	NA	NA	1,700	NA	5,100	NA

Notes:

Shaded values indicate the analyte was detected
GW = Groundwater
LTM = Long Term Monitoring
RI = Remedial Investigation
UG/L = Micrograms per Liter
MG/L = Milligrams per Liter
B = Not detected substantially above the level reported in laboratory or field blanks
J = Analyte present. Reported value may or may not be accurate or precise
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher
NA = Not analyzed
R = Unreliable result
U = Not detected
UJ = Not detected, quantitation limit may be inaccurate or imprecise
UL = Not detected, quantitation limit is probably higher