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FINAL

SITE SCREENING PROCESS REPORT FOR SITE SCREENING AREAS 1, 6, 7, AND 15

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

CONTRACT TASK ORDER 0228

VOLUME I TEXT

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SITE SCREENING AREA (SSA) DECISION
SIGNATURE PAGE

SSA Name and Location

SSA 1 - Building 428 Teague Road Disposal Area
SSA 6 - Aviation Field and Environs
SSA 7 - Building 373 Rocket Plant/Group 18 Magazines/Main Road Disposal Area
SSA 15 - Sewage Treatment Plant#1/Sludge Drying Beds and Discharge Area

Naval Weapons Station Yorktown
Yorktown, Virginia

Decision Statement

The Site Screening Process (SSP) is a mechanism by which former Resource Conservation Recovery Act (RCRA) Solid Waste Management Units (SWMUs), RCRA Areas of Concern (AOCs) and Comprehensive Environmental Response, Compensation and Liability Act of 1980 as amended (CERCLA) sites can be addressed uniformly by the CERCLA process. The Federal Facilities Agreement (FFA) for WPNSTA Yorktown mandates that decisions concerning SSAs be made by respective project managers to determine whether: 1) no further investigation of the SSA is necessary (i.e., no further action) or; 2) the SSA should be included as a site under the Department of Defense (DoD) Installation Restoration (IR) Program. SSAs included as sites will be numbered in ascending order in the Site Management Plan (SMP) for WPNSTA Yorktown, ranked using the DoD's Relative Risk Ranking (R^3)Program and scheduled for further investigation. The SSP Report provides the basis for SSA decision making by a review of environmental conditions, analytical data obtained at each SSA and risk screening for both potential human and ecological receptors.

The Department of the Navy (DoN) has obtained concurrence from the Commonwealth of Virginia and the United States Environmental Protection Agency (USEPA) Region III on the decisions for SSAs 1, 6, 7 and 15. These decisions are summarized below.

SSA 1 - Due to the presence of Polynuclear Aromatic Hydrocarbons (PAH) in surface soils and potential ecological impacts associated with inorganic contaminants in the unnamed ditch, this SSA will be retained for remedial investigation. The Remedial Investigation (RI) will focus on the vertical extent of PAH contamination in soils and potential ecological impacts from the unnamed ditch.

SSA 6 - Polychlorinated Biphenyls (PCBs) detected in subsurface soils samples in the vicinity of the helo-pad require further investigation. SSA 6 will, therefore, be retained as a site for further RI work to determine the extent of subsurface soil contamination specific to the helo-pad area and potential local affects on shallow groundwater.

SSA 7 - Groundwater in the vicinity of the wastewater UST has been impacted by chlorinated volatiles including 1,1,1-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene and trichloroethene (TCE). A removal action is scheduled for the summer of 1996 at SSA 7. The UST will be removed and confirmational soil samples will be obtained from surrounding subsurface soils. The area around the UST will be retained for further RI work because of the impact on shallow groundwater from past activities and to determine the efficacy of the removal action.

SSA 15 - No further investigation is recommended for this SSA because potential human health risks and ecological affects for contaminants associated with sludge drying beds (derived using the risk screening approach) fall within acceptable ranges. Surface water concentrations of TCE detected in one side gradient surface water sample is associated with an upgradient groundwater source emanating from the industrial area. The upgradient source of TCE to SSA 15 surface waters and potential impacts of this contamination on Ballard Creek will be addressed in the Site 12 Record of Decision (ROD).

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LIST OF ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
ATV	All-Terrain Vehicle
AWQC	Ambient Water Quality Criteria
ARAR	Applicable Relevant and Appropriate Requirement
Baker	Baker Environmental, Inc.
BCF	Biological Concentration Factor
bgs	Below Ground Surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLP	Contract Laboratory Program
CO	Carbon Monoxide
COC	Chain-of-Custody
COC Values	Chemical of Concern Screening Concentrations
COPC	Chemical of Potential Concern
CRAVE	Carcinogen Risk Assessment Verification Endeavor
CRQL	Contract Required Quantitation Limit
CSF	Carcinogenic Slope Factor
CWA	Clean Water Act
°F	Degrees Fahrenheit
DoN	United States Department of the Navy
EQ	Ecological Quotient
ECAO	Environmental Criteria and Assessment Office
ECOC	Ecological Chemicals of Concern
EE/CA	Engineering Evaluation/Cost Analysis
EI	Ecological Index
EM	Electromagnetic Induction
ER-L	Effects Range - Low
ER-M	Effects Range - Median
ESQD	Explosive Safety Quantity Distance
FFA	Federal Facilities Agreement
FSP	Field Sampling Plan
GPR	Ground Penetrating Radar
HASP	Health and Safety Plan
HEAST	Health Effects Assessment Summary Table
HI	Hazard Index
HQ	Hazard Quotient

LIST OF ACRONYMS AND ABBREVIATIONS
(continued)

IAS	Initial Assessment Study
ICR	Incremental Lifetime Cancer Risk
ID	Inside Diameter
IDW	Investigation Derived Waste
IRIS	Integrated Risk Information System
IRP	Installation Restoration Program
K_{oc}	Soil Adsorption Coefficient
K_{ow}	Octanol-Water Partition Coefficient
K_p	Permeability Constant
LANTDIV	Atlantic Division, Naval Engineering
LOAEL	Lowest-Observed-Adverse-Effect-Level
MCL	Maximum Contaminant Level
MF	Modifying Factor
MI	Mobility Index
msl	Mean Sea Level
$\mu g/m^3$	Microgram per Cubic Meter
$\mu g/kg$	Microgram per Kilogram
$\mu g/L$	Microgram per Liter
NEDED	Naval Explosives Development Engineering Department
NOAA	National Oceanic and Atmospheric Administration
NOAEL	No-Observed-Adverse-Effect-Level
NOEL	No-Observed-Effect-Level
NPL	National Priorities List
O_3	Ozone
OD	Outside Diameter
PAH	Polyaromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PID	Photoionization Detector
PM 10	Particulate Matter Smaller Than 10 Microns
PMCL	Primary Maximum Contaminant Level
PPE	Personal Protective Equipment
ppm	Parts Per Million
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
QC	Quality Control

LIST OF ACRONYMS AND ABBREVIATIONS
(continued)

RA	Risk Assessment
RAGS	Risk Assessment Guidance for Superfund
RBC	Risk-Based Concentration
RCRA	Resource Conservation and Recovery Act
RDX	Hexahydro-1,3,5-trinotro-1,3,5-triazine
RfD	Reference Dose
RI/FS	Remedial Investigation/Feasibility Study
S	Solubility
SCCRBS	Selecting Exposure Routes and Contaminants of Concern by Risk-Based Screening
SMP	Site Management Plan
SO_2	Sulfur Dioxide
SOP	Standard Operating Procedure
SSA	Site Screening Area
SSP	Site Screening Process
SSV	Sediment Screening Value
STP	Sewage Treatment Plant
SVOC	Semivolatile Organic Compound
SWMU	Solid Waste Management Unit
TAL	Target Analyte List
TCA	1,1,1-trichloroethane
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TSCA	Toxic Substance Control Act
TTO	Total Toxic Organics
UCL	Upper Confidence Limit
UF	Uncertainty Factor
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VDEQ	Virginia Department of Environmental Quality
VF	Volatilization Factor
VOC	Volatile Organic Compound
VP	Vapor Pressure
VR	Virginia Regulation
VWCB	Virginia State Water Control Board
VWQS	Virginia Water Quality Standard
WPNSTA Yorktown	Naval Weapons Station Yorktown

EXECUTIVE SUMMARY

The purpose of the Site Screening Process is to determine whether conditions at an SSA warrant initiation of the RI/FS process. Site Screening Process investigations were undertaken at SSAs 1, 6, 7, and 15 in late 1994, in accordance with the Final Work Plan (Baker, 1994b). This section presents the results and conclusions of Site Screening Process on an SSA basis and a recommendation for additional RI/FS activities or no action. Additional RI/FS activities could include additional sampling, removal actions or focused remedial investigations such as conducted for presumptive remedies. A recommendation of additional RI/FS activities does not necessarily mean that the SSA must be classified as an IR program site. If funding is available, the additional activities could be carried out in the short-term, circumventing potential DoD funding limitations on new investigative work.

SSA 1 - Building 428 Teague Road Disposal Area

A total of 64 surface soil, 39 subsurface soil, 9 groundwater (total and dissolved), 9 sediment (from 4 locations) and 5 surface water samples were collected and analyzed for TCL organics, nitramines/nitroaromatics (explosives) and TAL inorganics.

From a human health perspective, surface soils produced an unacceptable ICLR value (1.1×10^{-4}). The ILCR value was caused by the presence of cPAH and arsenic. Arsenic concentrations detected at SSA 1 were similar to those presented in the station-wide background study and are, therefore, not likely the result of past SSA 1 activities.

EI values for ecological receptors potentially exposed to ECOCs detected in surface water and sediments of the unnamed stream. The unnamed stream is intermittent in nature and frequently goes dry, therefore, no comparison to background freshwater stream data was conducted. Exceedances of freshwater criteria were most significant at location A01SW04. Cadmium, copper, lead, mercury and zinc were detected at their highest concentrations at this location and contributed better than 60 percent of the EI value of 110. The presence of benzo(b)fluoranthene, 4,4'-DDT and mercury in SSA 1 sediments accounted for the EI value of 3.0.

SSA 1 is recommended for additional RI/FS efforts. Areas of Concern (AOC) for surface soils are located at the western and eastern portion of the SSA. In addition, an ecological AOC was determined for the creek at the northeast portion of the SSA. A limited number of additional samples (focused on filling data gaps) should be obtained to define the extent of cPAH contamination in select surface subsurface soils throughout the SSA. Also, a habitat evaluation of the unnamed stream should be conducted to better define the nature of this surface water feature and identify potential exposure pathways and ecological receptors. As part of the habitat evaluation the groundwater/surface water interaction will be determined through the use of staff gauges and groundwater measurements.

Because inorganics and nitramines/nitroaromatics were detected in groundwater samples at concentrations which do not cause human health concerns, and the conservative nature of obtaining groundwater samples from temporary piezometers versus monitoring wells (i.e., higher turbidity), further groundwater investigation is not recommended as part of the additional RI/FS effort.

SSA 6 - Aviation Field and Environs

A total of 31 surface soil, 42 subsurface soil borings, 16 subsurface test pit and 10 groundwater (total and dissolved) samples were obtained from SSA 6. These samples were analyzed for TCL organics, nitramines/nitroaromatics and TAL inorganics.

PCB-1254 and PCB-1260 detected at test pit locations 2, 3, 4, and 5 account for approximately 90 percent of the ILCR value (1.9×10^{-4}) for subsurface soils. Arsenic accounts for approximately 9 percent of the remaining ICLR.

ICLR values were also elevated for unfiltered groundwater (3.8×10^{-3}) because of the presence of arsenic and beryllium. Arsenic was not detected in filtered groundwater which produced an ICR value of 1.4×10^{-5}. In addition, there are no surface water bodies at SSA 6 (the closest is the York River approximately 500 ft. north) that would be recharged by groundwater.

The central portion of the SSA encomposing the Helo Pad Landing area is to be subjected to additional RI/FS activities for subsurface soil and groundwater. Subsurface soil samples will be

collected in the vicinity of test pits 2 and 3 (area south of helo pad) to characterize the nature and extent of subsurface PCB contamination. In addition, nitroaromatics detected in subsurface soils and groundwater warrant investigative sampling to the north of the Helo Pad area. The groundwater data obtained at SSA 6 may be helpful in evaluation of the groundwater characteristics at Sites 6 and 7 located south of the ssa.

Although organic and inorganic constituents were detected in soil and groundwater at the sludge disposal area and the current storage area, the concentrations were not excessive and did not produce an unacceptable risk to human health. Therefore, additional RI/FS efforts are not recommended for these areas.

SSA 7 - Building 373 Rocket Plant/Group 18 Magazines/Main Road Disposal Area

A total of 5 surface soil, 30 subsurface soil (18 from soil borings, 6 from hand augers and 6 from test pits) groundwater, 3 surface water and 9 sediment samples were collected at SSA 7.

Both filtered and unfiltered groundwater samples produced ILCR values exceeding USEPAs generally acceptable risk range (3×10^{-3} and 2.4×10^{-2}, respectively). The presence of 1,1-dichloroethene is responsible for an individual ILCR value of 2.5×10^{-3}. The presence of 1,1-dichlorothene and other chlorinated volatiles (trichloroethene, 1,1-dichloroethane and 1,1,1-trichloroethane is associated with the wastewater UST located just west of Building 373.

The area around the wastewater UST system was determined to be an AOC by the site screening process. Despite the proximity of the wastewater UST to Felgates Creek, organic constituents were not detected in surface water samples suggesting that organic contaminants are localized in the vicinity of the UST. Organic contaminants detected in Felgates Creek sediments do not appear to be related exclusively to SSA 7 activities (i.e., no volatile organics). EI values indicate that the potential ecological affect on receptors in the surface water and sediment of Felgates Creek are limited.

Additional RI/FS activities are proposed for subsurface soil and groundwater in the vicinity of the wastewater UST. Included in these activities is additional surface water and sediment samples

within Felgates Creek adjacent to the area of the wastewater UST to access the ecological impact of past discharges.

The UST system is subject to a removal action in Fiscal Year 97. This removal action will be conducted in accordance with the Final RAC Design Package for the Removal Action at SSA 7. (Baker, 1995) As part of the removal action, confirmation samples will be collected from the bottoms and side walls of the excavation. A minimum of 5 grab samples will be collected at the bottom and sidewalls of the UST excavation and one grab sample for every 20 linear feet of pipe trench to the UST. The samples will be collected from 0 to 6 inches of depth from the bottom and sidewalls of the excavation. All sampling will be conducted according to USEPA Region III SOPs. A copy of the transmittal letter for the RAC Design package is presented in Appendix O.

SSA 15 Sewage Treatment Plan #1/Sludge Drying Beds and Discharge Area

A total of 6 surface soil, 14 subsurface, 4 groundwater (plus one duplicate), 3 surface water and 5 sediment samples were obtained from SSA 15.

Subsurface soils obtained from SSA 15 produce an HI value of 2.0 which suggests that systemic health effects could occur if subsurface soils are ingested by residents. Manganese (HQ - 1.1) and Arsenic (HQ = 0.65) are responsible for the HI value. Concentrations of arsenic and manganese and arsenic are similar to station-wide background and are likely not related to SSA 15 activities.

EI values for SSA 15 sediments and surface waters are 99.0 and 0.3, respectively. The sediment EI value occurs because of the presence of DDT series pesticides and chlordane. The past legal application of these compounds for insect control at WPNSTA Yorktown was common. The occurrence of these pesticides are, therefore, not specific to activities at SSA 15. Furthermore, pesticides such as DDT and chlordane are relatively immobile and are not likely to affect Ballard Creek which ultimately receives runoff from SSA 15 surface water features. Flow in these tributaries is intermittent and relatively slow when water is present. Although the surface water EI value does not exceed 1.0, the most significant contamination was observed in a surface water sample (A15SW02) obtained approximately 100 feet south of SSA 15. The sample contained

relatively high concentrations of trichloroethene (500 μg/L) and other chlorinated volatiles including vinyl chloride (2 μg/L) and c-1,2-dichloroethene (77 μg/L).

Environmental media (i.e., groundwater, surface soils) investigated at SSA 15 do not appear to be responsible for these elevated concentrations of contaminants in surface water, suggesting that another source of contamination may be present in the area such as the industrial area located approximately 1,000 feet to the west of SSA 15.

Because SSA 15 does not appear to be the source of contamination to adjacent surface waters and sediments, RI/FS activities are not recommended. Additional sampling at SSA 15 will be conducted in association with continued investigative activities at Site 12, located to the north of the ssa. As part of this investigation groundwater will be further assessed and surface water samples will be collected in the intermittent streams to the west and south of the ssa. This additional data will assist in decision making at Site 12 and evaluate the potential for other sources of contamination in the area.

1.0 INTRODUCTION

The environmental condition of Naval Weapons Station Yorktown (WPNSTA Yorktown), Yorktown, Virginia, has been investigated through the Department of Defense's Installation Restoration Program (IRP). On October 15, 1992, WPNSTA Yorktown was finalized for inclusion on the National Priorities List (NPL), primarily due to the facility's proximity to wetlands and the potential impact on the surrounding environment. As part of the Federal Facilities Agreement (FFA) development and by mutual consent of the United States Department of the Navy (DoN), the United States Environmental Protection Agency (USEPA) Region III, and the Virginia Department of Environmental Quality (VDEQ), several Resource Conservation and Recovery Act (RCRA) Solid Waste Management Units (SWMUs) were included for investigation and evaluation under the FFA. The primary purpose of the FFA is to ensure that environmental impacts associated with past and present activities at WPNSTA Yorktown are thoroughly investigated and appropriate Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) response/RCRA corrective actions are developed and implemented as necessary to protect public health and the environment.

This document presents the scope and results of activities accomplished for the Site Screening Process (SSP) for SSAs 1, 6, 7, and 15. The field activities conducted during this investigation followed the Master Project Plans (Baker, 1994a) for WPNSTA Yorktown in conjunction with the Site-Specific Work Plan (Baker, 1994b). The purpose of this SSP for SSAs 1, 6, 7, and 15 is to identify whether these areas should be included in the RI/FS program, propose additional activities to mitigate potential human health/ecological affects or suggest no additional action at the SSA.

1.1 Report Organization

This document is organized into six additional sections. Section 2.0 summarizes the background information of the Station and SSAs including: descriptions, SSA histories, and previous sampling events.

Section 3.0 presents the physical features of the SSAs. This section discusses the surface features, surface water hydrology, geology, soil, hydrogeology, and demography.

Section 4.0 describes the field activities, sampling procedures, and sampling locations for all media investigated at SSAs 1, 6, 7, and 15. Figures are included to show sampling locations. This section also discusses quality control (QC) conducted during the sampling and the management of investigation derived wastes (IDW).

Section 5.0 presents the analytical results for each SSA. This section presents the results of the field sampling activities conducted as part of this SSP. The results are presented by media: surface and subsurface soil, groundwater, surface water, and sediment. This section also presents the nature and extent of contamination for the SSAs.

Section 6.0 presents the risk screening process and quantitative results of the risk screening. Uncertainties associated with risk screening are also presented herein.

Summary and conclusions are presented in Section 7.0. This section summarizes the results of the SSP, presents recommendations for additional RI/FS activities and identifies any remaining data limitations.

References are included at the end of each section.

1.2 References

Baker Environmental, Inc. 1995. Final Site Management Plan for Fiscal Years 1995-1996, Naval Weapons Station Yorktown, Yorktown, Virginia. February 1995.

Baker Environmental, Inc. 1994a. Final Master Project Plans, Naval Weapons Station Yorktown, Yorktown, Virginia. June 1994.

Baker Environmental, Inc. 1994b. Final Work Plan for Site Screening Areas 1, 6, 7, and 15, Naval Weapons Station Yorktown, Yorktown, Virginia. November 1994.

Baker Environmental, Inc. 1994c. Final Site Screening Process Guidelines, Naval Weapons Station Yorktown, Yorktown, Virginia. September 1994.

Section 5.0 presents the analytical results for each SSA. This section presents the results of the field sampling activities conducted as part of this SSP. The results are presented by media: surface and subsurface soil, groundwater, surface water, and sediment. This section also presents the nature and extent of contamination for the SSAs.

Section 6.0 presents the results of the risk screening.

A summary and conclusions are presented in Section 7.0. This section summarizes the nature and extent of contamination and the risk screening of the SSAs. In addition, the conclusions address any remaining data limitations.

References are included at the end of each section.

1.3 References

Baker Environmental, Inc. 1995. Final Site Management Plan for Fiscal Years 1995-1996, Naval Weapons Station Yorktown, Yorktown, Virginia. February 1995.

Baker Environmental, Inc. 1994a. Final Master Project Plans, Naval Weapons Station Yorktown, Yorktown, Virginia. June 1994.

Baker Environmental, Inc. 1994b. Final Work Plan for Site Screening Areas 1, 6, 7, and 15, Naval Weapons Station Yorktown, Yorktown, Virginia. November 1994.

2.0 SITE HISTORY AND RESULTS OF PREVIOUS INVESTIGATIONS

Most of the information presented herein has been gathered from the USEPA Region III's RCRA "Solid Waste Management Unit Investigation," (December 1993), the "Study Area Analysis, Yorktown Naval Weapons Station, Yorktown, Virginia," Volume I (November 1992), and visits to the Station in September 1993 and January 1994.

2.1 Site History and Background Information

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 (Figure 2-1). The facility is bounded on the northwest by the Naval Supply Center Cheatham Annex, the Virginia Emergency Fuel Farm, and the future community of Whittaker's Mill; 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 community of Lackey. The locations of sites and SSAs at WPNSTA are presented on Figure 2-2.

The following subsections provide descriptions of SSAs 1, 6, 7, and 15.

2.1.1 SSA 1 - Building 428, Teague Road Disposal Area

SSA 1 is approximately 7.2 acres in size and is located north of Building 428, in the northeast portion of the installation along the facility boundary. As shown in Figure 2-3, the York River is to the north and Roosevelt Pond is to the west/northwest of SSA 1. The area is wooded and is bisected by a railroad track. The railroad was constructed in 1919 and was in operation until 1989. Disposal activities reportedly began in 1940 and ceased in 1960. A pier fire occurred in the mid-1950s and debris from this fire may have been disposed in this area (1955 to 1957). Aerial photography suggests past waste storage practices occurred at SSA 1 (primarily in 1945). From 1960 to the present there has been no evidence of waste storage or release. However, a land survey conducted in the fall of 1993 indicated discrete piles of debris which appear to have been dumped on top of native soil and other areas of debris which appear to be partially buried. The debris was identified as concrete rubble, scrap metal, wooden pilings and railroad ties, empty fuel cans and

drums (four drums were found to contain unknown liquids), scrap metal, and asbestos pipe insulation and shingles.

Surface soil characterization sampling was completed in September 1993 before the proposed removal action. The samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, herbicides, and inorganics following the Toxicity Characteristic Leaching Procedure (TCLP). The samples also were analyzed for PCBs. The TCLP concentrations all were less than the RCRA regulatory levels governing the identification and listing of hazardous waste. Also, the PCBs detected were below the Toxic Substance Control Act (TSCA) "clean soil" level of 1 milligram per kilogram (mg/kg) (Baker, 1994b). Results of soil screening sampling are shown on Table 2-1.

An extensive removal action was conducted in 1994 by OHM Remediation Services Corporation (OHM), and entailed the removal of approximately 443 tons of wooden creosote timbers, 763 tons of ordinary non-hazardous debris, 1,119 tons of debris containing the non-friable asbestos, 1,680 pounds of pipe wrapped with friable asbestos, 31 tons of recyclable metals, two 55-gallon drums containing paint cans/spilled paint and two truck batteries from SSA 1.

After removal of debris, confirmatory surface soil samples were obtained, areas were regraded, seeded and received straw and temporary erosion control fabric.

2.1.2 SSA 6 - Aviation Field and Environs

SSA 6 is a large area approximately 64 acres in size located in the northern portion of the facility. It is bounded by Bellfield Road to the north, Diggs Road on the east, and Main Road on the south and west (Figure 2-4). The area consists of open grassy areas, storage sheds, a helicopter landing pad, and open storage areas with materials stacked on pallets. Historically, the area was used as an aviation field until 1927 and after which it was used for storage of munitions in underground caches. Batteries and cables coated with antifoulants containing polychlorinated biphenyl (PCB)-1254 and mercury compounds also may have been buried or stored on site. Aerial photography indicated that peak storage activity occurred in 1968. No storage of liquid or hazardous waste was reported or observed. However, sludges from the Sewage Treatment Plant (STP) #1 may have been disposed

in the eastern portion of SSA 6. In addition, the area in which the helicopter landing pad is currently located may have been used briefly as an explosives burning area.

To help identify sample locations, the site was divided into three investigative areas; the sludge disposal area, the helicopter landing pad area, and the current storage area.

Two surface soil samples were collected in August 1990 in the current storage area north of Buildings 407 and 408. The samples were collected where batteries and cables coated with antifoulants containing PCB-1254 and mercury compounds were reportedly stored. Figure 2-4 shows the approximate locations of these sampling points. The samples were analyzed for PCBs (USEPA Method 8080) and mercury by EP Toxicity (USEPA 1310). PCBs were detected in both of the soil samples at concentrations of 4.4 mg/kg and 2.1 mg/kg, respectively. Both of these concentrations exceeded the TSCA "clean soil" level of 1 mg/kg (Baker, 1994a). Refer to Table 2-2 for a summary of sample results.

A geophysical investigation was conducted in January of 1994 to identify areas of buried debris and fill material. The geophysical investigation utilized electromagnetic (EM) terrain conductivity, magnetometry, and ground penetrating radar (GPR) techniques to characterize the subsurface conditions. The surveys were completed within the central portion of the site as shown in Figure 2-3. The surveys did not encompass the current storage area because of interference caused by surface metal (debris piles and buildings). The sludge disposal area (Area A) at the southeast portion of the SSA was not characterized by geophysics because of inaccessibility due to heavy vegetative growth. Furthermore, building 500 was not included in the scope of work and the area was not investigated using geophysics.

Data from geophysical surveys showed similar anomalous subsurface conditions. GPR was utilized to further investigate these areas. GPR profiles revealed cross-sectional views of subsurface stratigraphy and buried debris in areas of geophysical anomalies identified using EM and magnetometry. Interpretation of the data suggests that four areas of widespread disposal are present. These four areas, shown in Figure 2-4, are located around the helicopter pad in the west central portion of the site. The disposed debris is both ferrous and non-ferrous and is generally buried just below the surface (i.e., 0- to 3-feet below ground surface [bgs]). Also, a small subsurface disposal area of ferrous metallic debris was identified southeast of Building 412 (Baker, 1994a).

An area of non-ferrous disposal was identified at the eastern portion of the site where sludge from Sewage Treatment Plant #1 (SSA 15) was reportedly discarded. The data collected suggests that the area is larger than originally described by WPNSTA Yorktown personnel.

Several underground utilities also were identified within the central portion of the site. Most of these were confirmed by Station utility maps and are still in use. Other utility lines were identified by geophysics not shown on these maps. These utilities could be old and abandoned.

A memorandum documenting two additional areas where rocket engines and unidentified materials were buried was found during a record search. These areas are also shown in Figure 2-4.

2.1.3 SSA 7 - Building 373 Rocket Plant/Group 18 Magazines/Main Road Disposal Area

SSA 7, the Rocket Plant, is approximately 13 acres in size and is located at the northern end of Main Road and borders the facility and the main branch of Felgates Creek. It is just north of Site 6 and west of SSA 6. Approximately 6 acres of the site is wooded. The open areas (located on Figure 2-5) include:

- Building 373, the Rocket Plant, which is located in the southwest portion of the site. Explosive loading operations take place in this building.

- Group 18 Magazine Area which is located in the clearing north of the Rocket Plant Area. Two bunkers, currently not in use, also are present in this clearing.

- Main Road Disposal Area, an area of inert mine casings, which is located south of Main Road on the eastern portion of the site. Many of these inert mine casings are partially buried.

Limited information is available about the Rocket Plant. 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 the suspended solids. The solids were incinerated at Site 4 (Burning Pad Residue Landfill). The wash/rinse water was then discharged into Felgates Creek. The discharge line to the creek was plugged in the early 1980s and a 220-gallon underground wastewater storage tank (UST)

constructed mostly of concrete, brick, and mortar was installed to contain the wash/rinse water. 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 the current aboveground storage tank (AST) was installed at the north end of the building.

A geophysical survey was conducted in January 1994 which utilized EM, magnetometry, and GPR techniques to characterize the subsurface conditions. Numerous above ground structures (buildings and overhead utilities) and underground utilities adversely affected the geophysical data and restricted the interpretation of subsurface conditions. Although restricted, interpretation of the data identified two areas of disposal. These areas, shown in Figure 2-5, are located south of the access road (Main Road) and along the dirt access road at the Group 18 Magazines. The disposed debris is ferrous and is generally buried just below the surface (i.e., 0- to 4-feet bgs). The survey data indicated the disposal area extends approximately 30 feet into the wooded area south of Main Road. Also, a possible subsurface disposal area of non-ferrous material was identified north of the main access road. This area is adjacent to where an underground utility was traced and may be a continuation of this utility (Baker, 1994a).

2.1.4 SSA 15- Sewage Treatment Plant #1/Sludge Drying Beds and Discharge Area

SSA 15 is the abandoned STP #1, located in the southeastern corner of the installation, east of Buildings 3 and 4 and south of Site 12 (Barracks Road Landfill). The area consists of an Imhoff tank, a trickling filter, a sludge drying bed, and a chlorination unit (Figure 2-6). Wastewater reportedly entered the Imhoff tank which operated as a primary settling basin for the waste. The water was then passed through the trickling filter for biological treatment and pumped back to the Imhoff tank for secondary settling. The water was chlorinated in the chlorination unit and discharged to a surface water feature which acts as an intermittent tributary of Ballard Creek. Sludge from the Imhoff tank was periodically removed and placed in the sludge drying beds. STP #1 reportedly managed only sanitary waste from physical plants and the Officer's Club, but may have treated nitramine-containing and other industrial wastewater. It has been reported by Station employees that during the operation of STP #1, a mercury-containing bearing on the trickling filter

cracked and mercury was released to the environment. Currently, rainwater fills the trickling filter and Imhoff tank, and substantial vegetation is present in the drying bed.

One surface water/sediment sample (12SW/SD08) was collected in the tributary of Ballard Creek southwest of the SSA (Figure 2-6). This sample was collected during the Round One RI of Site 12 (Barracks Road Landfill) in the summer of 1992 (Baker/Weston, 1993). The samples collected for the Round One RI were analyzed for VOCs, SVOCs, pesticides, PCBs, inorganics, nitramine compounds, hardness (surface water only), and total organic carbon (sediments only). Analytical results of surface water sample indicated very low concentrations of pesticides and low concentration of acetone. Total copper, mercury, and zinc exceeded the Virginia Water Quality Standard (VWQS) and the Clean Water Act (CWA) salt water chronic levels. Total lead was above the CWA salt water chronic level. Analytical results of sediment sample indicated high concentrations of SVOCs and pesticides. The pesticide concentrations exceeded the National Oceanic and Atmospheric Administration (NOAA) effects range - low (ER-L) screening criteria. Inorganics were not detected above the background criteria established during the Round One RI.

2.2 References

Baker Environmental, Inc. 1994a. Final Work Plan for Site Screening Areas 1, 6, 7, and 15, Naval Weapons Station Yorktown, Yorktown, Virginia. November 1994.

Baker Environmental, Inc. 1994b. Final Engineering Evaluation/Cost Analysis for Site Screening Areas 1, 2, and 5, Naval Weapons Station Yorktown, Yorktown, Virginia. June 1994.

Baker Environmental, Inc. and Roy F. Weston, Inc. 1993. Final Round One Remedial Investigation Report for Sites 1-9, 11, 12, 16-19, and 21, Naval Weapons Station, Yorktown, Virginia. July 1993.

United States Environmental Protection Agency. 1993. "Solid Waste Management Unit Investigation, Naval Weapons Station, Yorktown, Virginia." December 1993.

United States Environmental Protection Agency. 1992. "Study Area Analysis, Yorktown Naval Weapons Station, Yorktown, Virginia," Volume I. November 1992.

SECTION 2.0 TABLES

TABLE 2-1

SOIL TCLP ANALYTICAL RESULTS
SEPTEMBER 1993
SSA 1
NAVAL WEAPONS STATION
YORKTOWN, VIRGINIA

Analyte	Regulatory Level (ppm)	Sampling Results (ppm)												Sampling Results (ppm)								
		24-SS-05			24-SS-06			24-SS-07			24-SS-08			24-SS-09			24-SS-10			24-SS-11		
TCLP Constituents																						
Arsenic	5.0	0.0411	B		0.0362	B		0.0473	B		0.0584	B		0.0210	U		0.0590	B		0.0507	B	
Barium	100.0	0.649			0.473			0.773			0.419			0.263			0.508			0.261		
Benzene	0.5	0.010	U		0.010	U		0.010	U		0.010	U		0.010	U		0.010	U		0.010	U	
Cadmium	1.0	0.0060			0.0040	U		0.0040	U		0.0057			0.0040	U		0.0192			0.0040	U	
Carbon tetrachloride	0.5	0.010	U		0.010	U		0.010	U		0.010	U		0.010	U		0.010	U		0.010	U	
Chlordane	0.03	0.0017	U		0.017	U		0.0017	U		0.017	U		0.017	U		0.0017	U		0.0017	U	
Chlorobenzene	100.0	0.010	U		0.010	U		0.010	U		0.010	U		0.010	U		0.010	U		0.010	U	
Chloroform	6.0	0.010	U		0.010	U		0.010	U		0.010	U		0.010	U		0.010	U		0.010	U	
Chromium	5.0	0.0080	U		0.0096	B		0.0080	U		0.0080	U		0.0080	U		0.0080	U		0.0080	U	
o-Cresol [1]	200.0	---			---			---			---			---			---			---		
m-Cresol [1]	200.0	---			---			---			---			---			---			---		
p-Cresol [1]	200.0	---			---			---			---			---			---			---		
Cresol [1]	200.0	0.033	U		0.033	U		0.033	U		0.033	U		0.033	U		0.033	U		0.033	U	
2,4-D	10.0	0.0017	U		0.0017	U		0.0017	U		0.0017	U		0.0017	U		0.0017	U		0.0017	U	

TABLE 2-1 (Continued)

SOIL TCLP ANALYTICAL RESULTS
SEPTEMBER 1993
SSA 1
NAVAL WEAPONS STATION
YORKTOWN, VIRGINIA

Analyte	Regulatory Level (ppm)	Sampling Results (ppm)												Sampling Results (ppm)											
		24-SS-05				24-SS-06				24-SS-07				24-SS-08				24-SS-09				24-SS-10				24-SS-11			
1,4-Dichlorobenzene	7.5	0.033	U			0.033	U			0.033	U			0.033	U			0.033	U			0.033	U			0.033	U		
1,2-Dichloroethane	0.5	0.010	U			0.010	U			0.010	U			0.010	U			0.010	U			0.010	U			0.010	U		
1,1-Dichloroethylene	0.7	0.010	U			0.010	U			0.010	U			0.010	U			0.010	U			0.010	U			0.010	U		
2,4-Dinitrotoluene	0.13	0.033	U			0.033	U			0.033	U			0.033	U			0.033	U			0.033	U			0.033	U		
Endrin	0.02	0.0003	U			0.0003	U			0.0003	U			0.0003	U			0.0003	U			0.0003	U			0.0003	U		
Heptachlor (and its hydroxide)	0.008	0.0002	U			0.0002	U			0.0002	U			0.0002	U			0.0002	U			0.0002	U			0.0002	U		
Hexachlorobenzene	0.13	0.033	U			0.033	U			0.033	U			0.033	U			0.033	U			0.033	U			0.033	U		
Hexachloro-1,3-butadiene	0.5	0.033	U			0.033	U			0.033	U			0.033	U			0.033	U			0.033	U			0.033	U		
Hexachloroethane	3.0	0.033	U			0.033	U			0.033	U			0.033	U			0.033	U			0.033	U			0.033	U		
Lead	5.0	0.116	U			0.0578	U			0.0560	U			0.104	U			0.0560	U			0.0918	U			0.0560	U		
Lindane	0.4	0.0002	U			0.0002	U			0.0002	U			0.0002	U			0.0002	U			0.0002	U			0.0002	U		
Mercury	0.2	0.0001	U			0.0001	U			0.0001	U			0.0001	U			0.0001	B			0.0001	U			0.0001	U		
Methoxychlor	10.0	0.0017	U			0.0017	U			0.0017	U			0.0017	U			0.0017	U			0.0017	U			0.0017	U		
Methyl ethyl ketone	200.0	0.010	U			0.010	U			0.010	U			0.010	U			0.010	U			0.010	U			0.010	U		
Nitrobenzene	2.0	0.033	U			0.033	U			0.033	U			0.033	U			0.033	U			0.033	U			0.033	U		

TABLE 2-1 (Continued)

SOIL TCLP ANALYTICAL RESULTS
SEPTEMBER 1993
SSA 1
NAVAL WEAPONS STATION
YORKTOWN, VIRGINIA

Analyte	Regulatory Level (ppm)	Sampling Results (ppm)												Sampling Results (ppm)								
		24-SS-05			24-SS-06			24-SS-07			24-SS-08			24-SS-09			24-SS-10			24-SS-11		
Pentachlorophenol	100.0	0.083	U		0.083	U		0.083	U		0.083	U		0.083	U		0.083	U		0.083	U	
Pyridine	5.0	0.033	U		0.033	U		0.033	U		0.033	U		0.033	U		0.033	U		0.033	U	
Selenium	1.0	0.113			0.140	U		0.135			0.0595	B		0.113			0.112			0.121		
Silver	5.0	0.0010	U		0.0010	U		0.0010	U		0.0010	U		0.0010	U		0.0010	U		0.0010	U	
Tetrachloroethylene	0.7	0.010	U		0.010	U		0.010	U		0.010	U		0.010	U		0.010	U		0.010	U	
Toxaphene	0.5	0.0033	U		0.0033	U		0.0033	U		0.0033	U		0.0033	U		0.0033	U		0.0033	U	
Trichloroethylene	0.5	0.010	U		0.010	U		0.010	U		0.010	U		0.010	U		0.010	U		0.010	U	
2,4,5-Trichlorophenol	400.0	0.083	U		0.083	U		0.083	U		0.083	U		0.083	U		0.083	U		0.083	U	
2,4,6-Trichlorophenol	2.0	0.033	U		0.033	U		0.033	U		0.033	U		0.033	U		0.033	U		0.033	U	
2,4,5-TP (Silvex)	1.0	0.0017	U		0.0017	U		0.0017	U		0.0017	U		0.0017	U		0.0017	U		0.0017	U	
Vinyl chloride	0.2	0.010	U		0.010	U		0.010	U		0.010	U		0.010	U		0.010	U		0.010	U	
PCBs																						
Aroclor-1016	50	0.036	U		0.040	U		0.040	U		0.036	U		0.040	U		0.053	U		0.036	U	
Aroclor-1221	50	0.073	U		0.079	U		0.079	U		0.073	U		0.079	U		0.100	U		0.073	U	
Aroclor-1232	50	0.036	U		0.040	U		0.040	U		0.036	U		0.040	U		0.053	U		0.036	U	

TABLE 2-1 (Continued)

SOIL TCLP ANALYTICAL RESULTS
SEPTEMBER 1993
SSA 1
NAVAL WEAPONS STATION
YORKTOWN, VIRGINIA

Analyte	Regulatory Level (ppm)	Sampling Results (ppm)												Sampling Results (ppm)						
		24-SS-05		24-SS-06		24-SS-07		24-SS-08		24-SS-09		24-SS-10		24-SS-11	
Aroclor-1242	50	0.036	U	0.040	U	0.040	U	0.036	U	0.040	U	0.053	U	0.036	U
Aroclor-1248	50	0.036	U	0.040	U	0.040	U	0.036	U	0.040	U	0.053	U	0.036	U
Aroclor-1254	50	0.036	U	0.040	U	0.040	U	0.036	U	0.040	U	0.053	U	0.036	U
Aroclor-1260	50	0.036	U	0.040	U	0.019	*	0.036	U	0.040	U	0.053	U	0.036	U
Other Analytes															
Corrosivity	(2)	7.40		8.30		7.96		5.53		6.65		7.27		6.75	
Reactive Cyanide (ppm)		0.6	U	0.6	U	0.6	U	0.6	U	0.7	U	0.8	U	0.6	U
Reactive Sulfide (ppm)		1.5	U	1.5	U	2.1	+	1.4	U	1.5	U	2.4	+	1.4	U
Flashpoint		NC		NC		NC		NC		NC		NC		NC	

(1) If o-, m-, & p-cresol concentrations cannot be differentiated, the total cresol (D026) concentration is used. The regulatory level for total cresol is 200 mg/L.
(2) pH values less than or equal to 2 and greater than or equal to 12.5 are characteristically hazardous.
* Reported value is below detection limit.
\+ Reported value is less than 5 times the detection limit.
B - Constituent detected; reported value is estimated.
NC - No combustion up to 200°F.
U - Not detected; reported value is detection limit.
-- = Not assigned an EPA Hazardous Waste Number.

TABLE 2-2

SUMMARY OF SURFACE SOIL SAMPLING RESULTS
AUGUST 1990
SSA 6
NAVAL WEAPONS STATION
YORKTOWN, VIRGINIA

Sample ID	Location	Parameters	
		PCB USEPA Method 8080 (mg/kg)	EP Toxicity USEPA 1310 (mg/L)
900806P02	A	4.4 - PCB 1254	<0.0005
900806P03	B	2.1 - PCB 1254	0.0008

SECTION 2.0 FIGURES

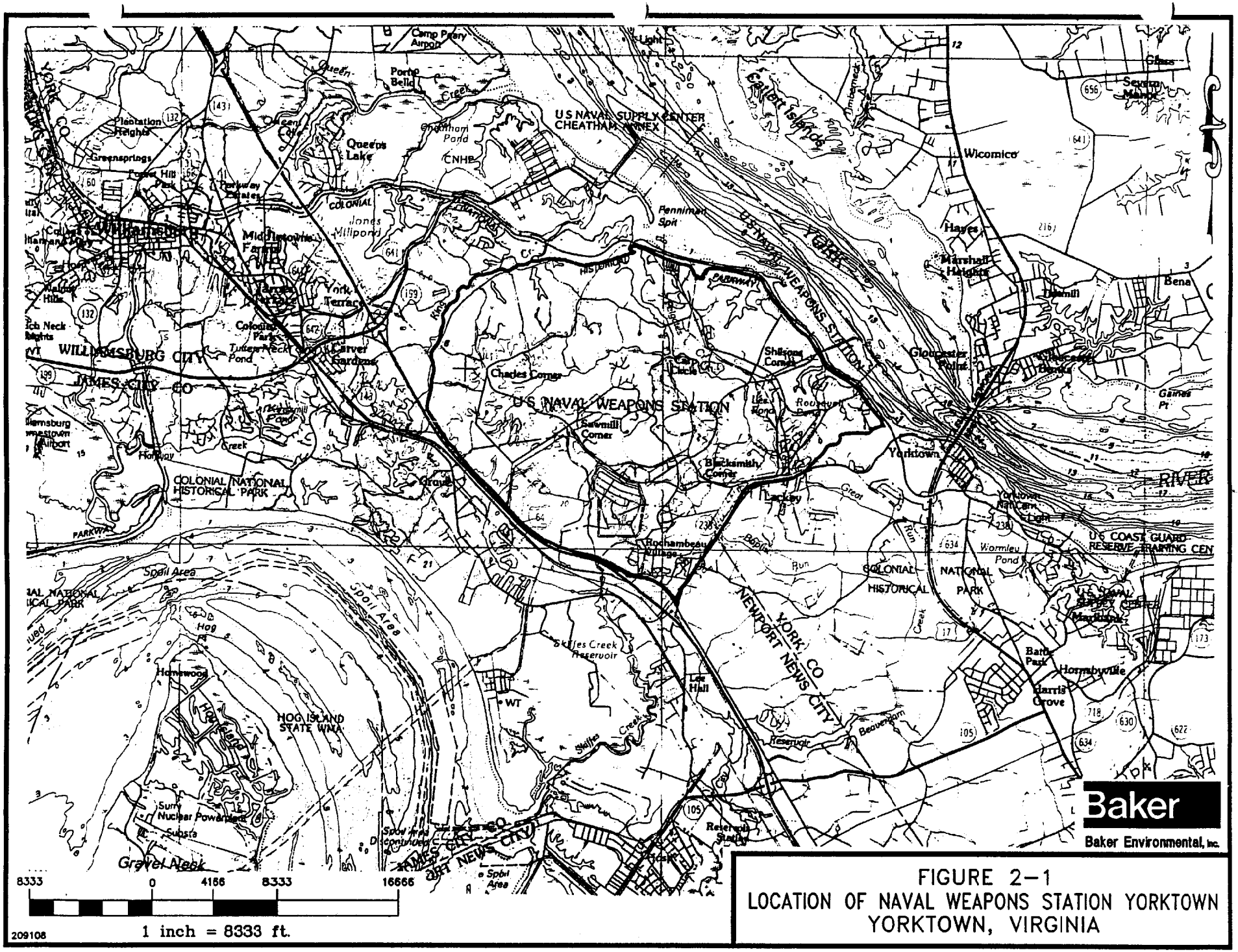
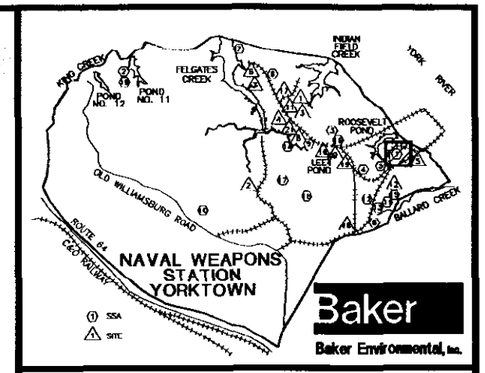


FIGURE 2-1
LOCATION OF NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

FIGURE 2-2
LOCATIONS OF
AREAS OF INVESTIGATION
(SITES AND SSAs)

NAVAL WEAPONS STATION YORKTOWN — YORKTOWN, VIRGINIA

SOURCE: NAVAL WEAPONS STATION, YORKTOWN, VIRGINIA.



100 0 50 100

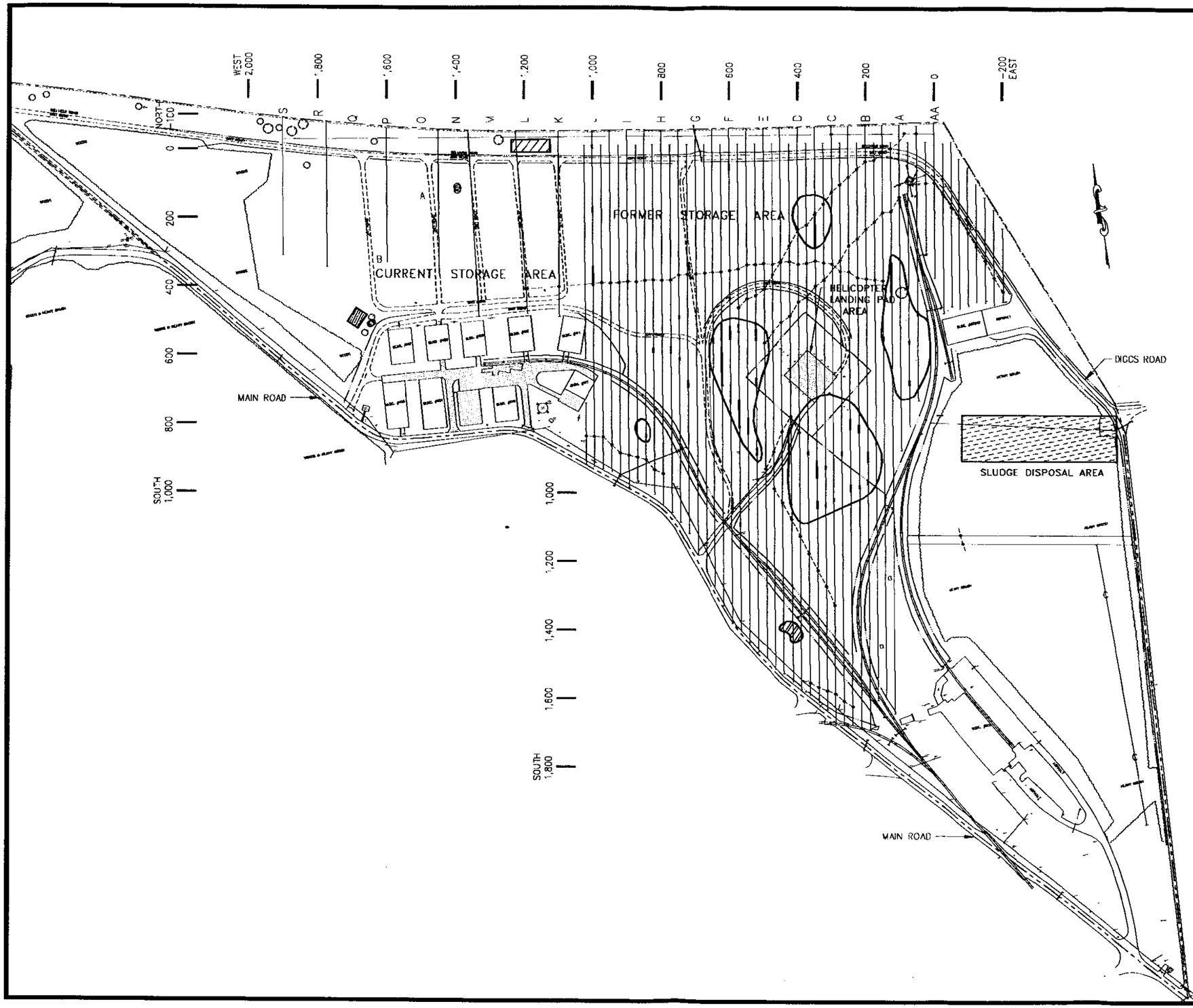
1 inch = 100 ft.

LEGEND

- CONCRETE
- WOODS
- CHAIN LINK FENCE
- TREE
- RAILROAD TRACKS
- DITCH OR SWALE
- EDGE OF PAVEMENT
- STRUCTURE
- LOCATION OF SURFICIAL DEBRIS PILES
- 24-SS-06 PREVIOUS SURFACE SOIL SAMPLE LOCATION
- SITE SCREENING AREA BOUNDRY
- CONTOUR INTERVAL = 10 FEET

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 278281SS

FIGURE 2-3
SITE PLAN AND PREVIOUS SAMPLING LOCATIONS
SSA 1 - BUILDING 428, TEAGUE ROAD DISPOSAL AREA
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



300 0 150 300
1 inch = 300 ft.

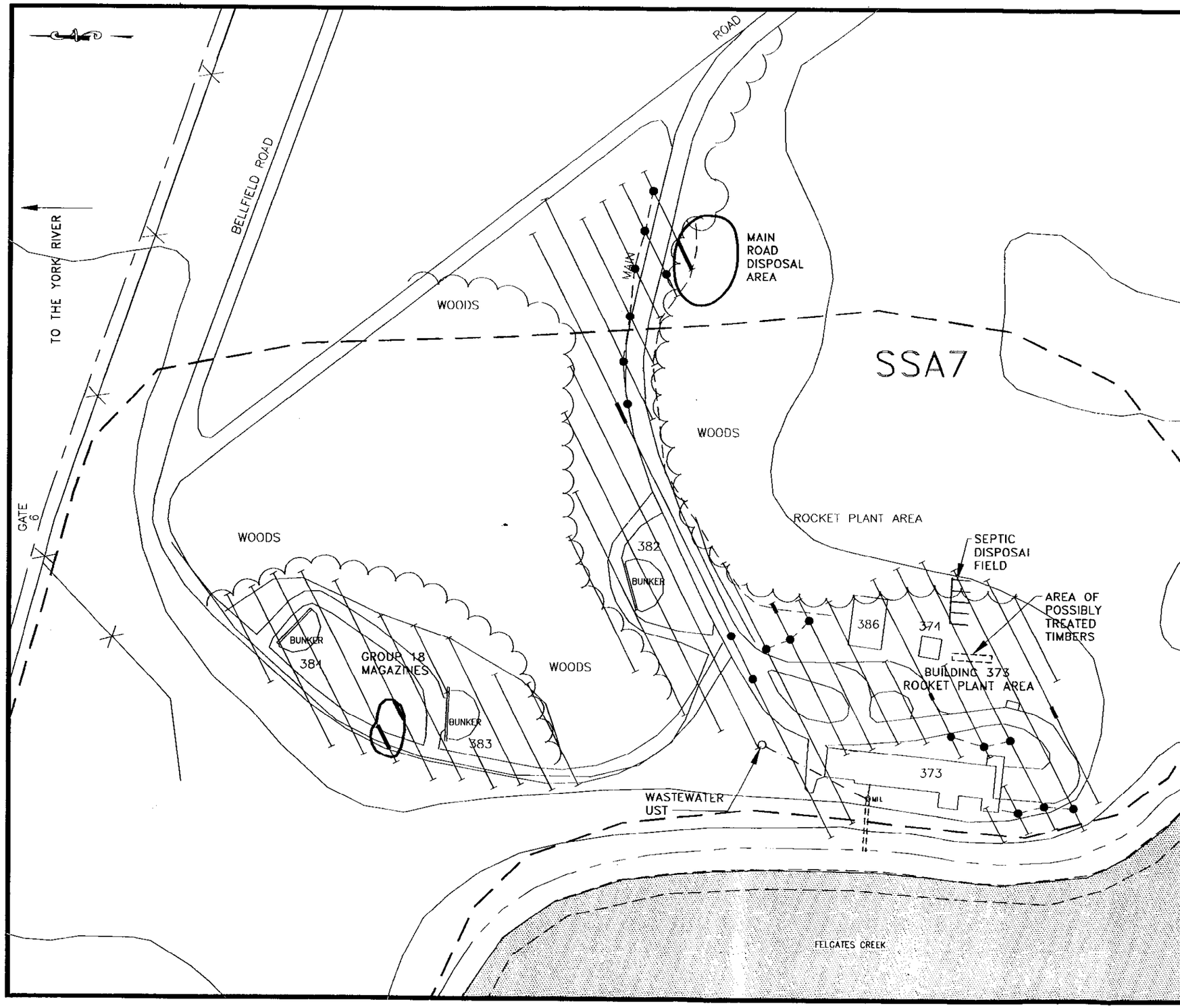
LEGEND

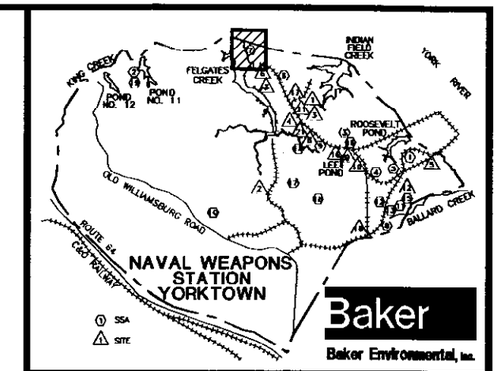
- CONCRETE
- WOODS
- CHAIN LINK FENCE
- TREE
- RAILROAD TRACKS
- DITCH OR SWALE
- EDGE OF PAVEMENT
- STRUCTURE
- GEOPHYSICAL SURVEY LINE
- BURIED METALLIC OBJECT/DEBRIS
- INFERRED UTILITY TREND
- APPROXIMATE LIMITS OF DISPOSAL AREAS EXHIBITING GREATER AMOUNTS OF DEBRIS. TYPICAL DEPTH RANGE OF 0-3' AS DETERMINED FROM RADAR DATA.
- APPROXIMATE AREA OF BLACK SLUDGE-LIKE MATERIAL
- APPROXIMATE AREA OF UNIDENTIFIED BURIED MATERIALS
- APPROXIMATE AREA OF BURIED ROCKET ENGINES
- APPROXIMATE EXTENT OF FORMER SLUDGE DISPOSAL AREA
- A B PREVIOUS SURFACE SOIL SAMPLE LOCATIONS
- GEOPHYSICAL TRAVERSE EXHIBITING HIGH CONDUCTIVITY
- SITE SCREENING AREA BOUNDARY

22828755

FIGURE 2-4
SITE PLAN, PREVIOUS SAMPLING LOCATIONS, AND GEOPHYSICAL SURVEY RESULTS
SSA 6-AVIATION FIELD AND ENVIRONS

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA





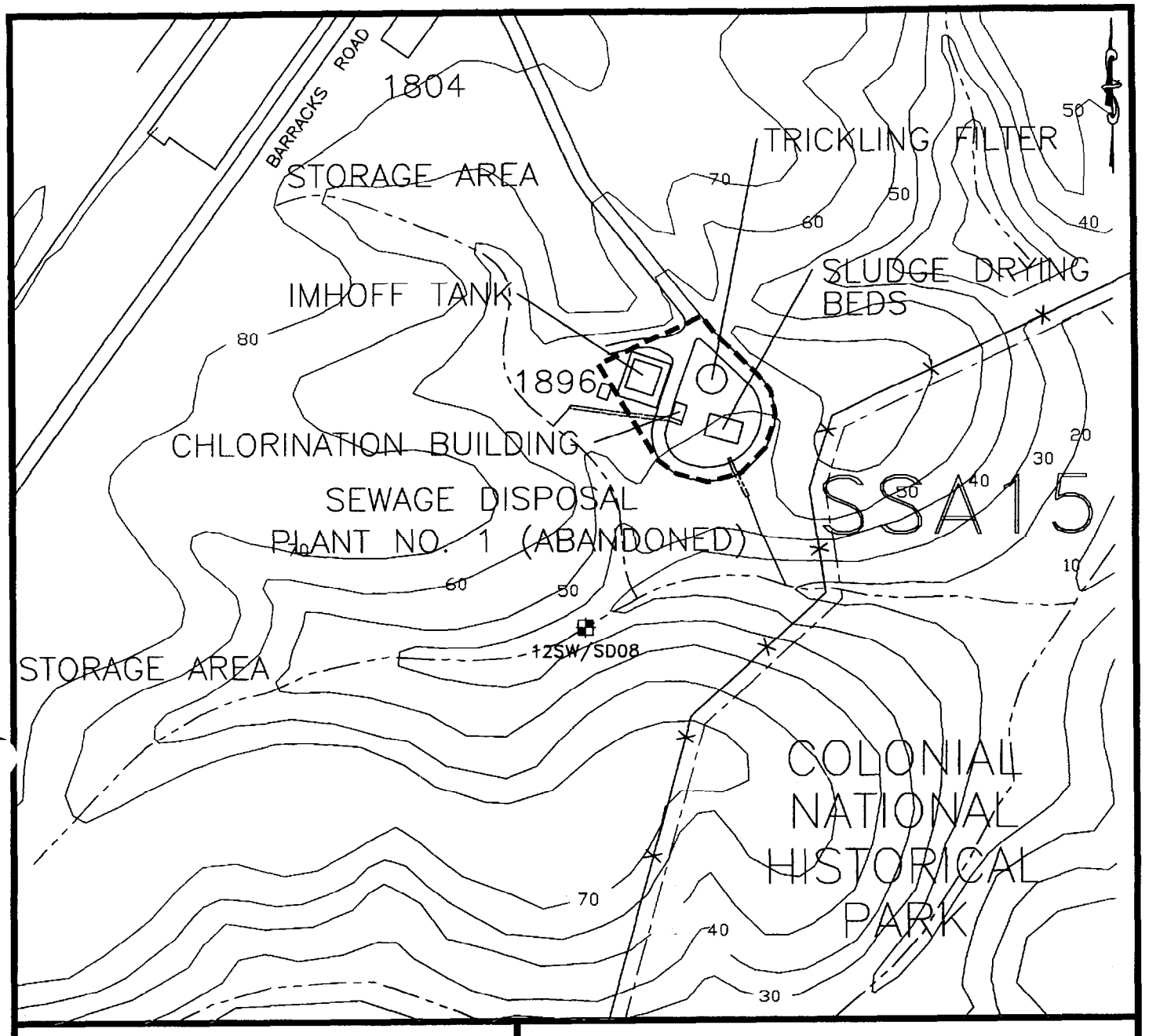
100 0 50 100
1 inch = 100 ft.

LEGEND

- FENCE
- EXISTING OVERHEAD ELECTRIC LINES
- EDGE OF PAVEMENT
- STRUCTURE
- GEOPHYSICAL SURVEY LINE
- BURIED METALLIC OBJECT/DEBRIS
- INFERRED UTILITY TREND
- APPROXIMATE LIMITS OF DISPOSAL AREAS EXHIBITING GREATER AMOUNTS OF DEBRIS. TYPICAL DEPTH RANGE OF 0-4' AS DETERMINED FROM RADAR DATA.
- SITE SCREENING AREA BOUNDARY
- BUILDING 373 FORMER DISCHARGE LINE
- BUILDING 373 FORMER UST PIPING

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 77871755

FIGURE 2-5
SITE PLAN AND
GEOPHYSICAL SURVEY RESULTS
SSA 7-BUILDING 373 ROCKET
PLANT AREA/GROUP 18 MAGAZINES/
MAIN ROAD DISPOSAL AREA
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



200 0 100 200

1 inch = 200 ft.

INSTALLATION BOUNDARY
DRAINAGE
EDGE OF PAVEMENT
MARSH
12SW/SD08 PREVIOUS SURFACE WATER/ SEDIMENT SAMPLE
SITE SCREENING AREA BOUNDARY
RAILROAD
FENCE
STRUCTURE
APPROXIMATE LOCATION OF SEWAGE TREATMENT PLANT DISCHARGE LINE
APPROXIMATE LOCATION OF STORM DRAINAGE LINE

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994.

22821355

Baker

Baker Environmental, Inc.

FIGURE 2-6
SITE PLAN AND PREVIOUS SAMPLING LOCATIONS
SSA 15-SEWAGE TREATMENT PLANT #1/ SLUDGE DRYING BEDS AND DISCHARGE AREA
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

3.0 PHYSICAL CHARACTERISTICS OF THE STUDY AREA

This section presents a summary of information regarding the environmental setting of the Station including geography, meteorology, surface water hydrology, soil, geology, hydrogeology, land use, and demography. Additional information on the environmental setting is found in the Summary of Background Constituent Concentrations and Characterization of the Biotic Community from the York River Drainage Basin (Baker, 1995).

3.1 General Physiography

WPNSTA Yorktown is located in the southeast portion of Virginia on the York-James Peninsula. The local terrain is gently rolling dissected by ravines and stream valleys.

The climate of WPNSTA is maritime that results in mild winters and long, warm, humid summers. Prevailing winds are usually from the south-southwest. The average precipitation during the SSA investigation (November to mid-December) was 12.9 inches.

WPNSTA is situated within two major drainage basins, the York River and the James River Basins. The SSA investigation was within the York River Basin. Within the York River Basin, four tributaries drain the northern and eastern portions of the Station.

The surface water drainage from SSA 1 is to the northeast to the York River and to the north to Roosevelt Pond. A small intermittent creek at the southeast portion of the SSA drains to the York River. Surface water also runs intermittently through ditches during precipitation events.

The majority of the surface water drainage from SSA 6 (Helo Pad Area) would be intercepted by the railroad drainage ditches and channeled to a creek that discharges into Indian Field Creek. Surface water from the sludge disposal area also would drain to the creek which discharges to Indian Field Creek. The remaining portion of the SSA (Storage Area) drains south and is discharged to the wastewater impoundment at Site 6 (Explosives - Contaminated Wastewater Impoundment).

The surface water drainage from SSA 7 is generally to the east and southeast to Felgates Creek.

Surface water from SSA 15 drains to the east to a small intermittent creek and to the south to another intermittent creek. These creeks act as tributaries to Ballard Creek.

3.2 Geology

The following sections contain a summary of the regional geology of WPNSTA Yorktown and the site-specific geology of SSAs 1, 6, 7, and 15. Additional details on the regional geology are found in the Background Report (Baker, 1995).

3.2.1 Regional Geology

The Atlantic Coastal Plain physiographic province is underlain by unconsolidated sediments of Quaternary, Tertiary, and Cretaceous ages (see Figures 3-1 and 3-2) that dip gently to the southeast and have a combined thickness of approximately 1,900 feet in the vicinity of WPNSTA Yorktown (Teifke, 1973).

Most of the surficial unconsolidated sediments at WPNSTA Yorktown have been mapped as the Windsor Formation of the Pleistocene series (Johnson, 1972; Mixon et al., 1989a). This formation is composed of a series of sand and silt deposited in marine and estuarine environments. Its thickness is estimated to vary from 0- to 40-feet at WPNSTA Yorktown. The Bacons Castle Formation of Pliocene age underlies the Windsor Formation and is described as a clayey silt and silty fine-grained sand. The unit rests unconformably on the weathered top of the Upper Yorktown Formation, also of Pliocene age. The presence of calcite-cemented shells and shell fragments is characteristic of the upper portion of the Yorktown Formation. This type of lithology was encountered during the Station Background Investigation (Baker, 1995) and during this investigation.

3.2.2 SSA Geology

The following subsections provide descriptions of the SSA-specific geology.

3.2.2.1 SSA 1- Building 428, Teague Road Disposal Area

Nine soil borings were advanced within the vicinity of SSA 1 (Figure 3-3) to characterize the subsurface soil conditions, to collect soil samples for laboratory analysis, and to collect groundwater samples via temporary piezometers. In general, the site is underlain by unconsolidated deposits varying in percentages of fine-grained sand, silt, clay, and marine shells.

Soil boring A01SB/HP04 was advanced to 29 feet bgs and achieved the greatest depth below ground surface at the site. The surficial strata is characterized by silty fine-grained sand. This is underlain by more cohesive deposits of silt with trace amounts of fine-grained sand and clay. This deposit grades downward into a silt with some marine shells and trace amounts of clay. Below these shelly deposits a greenish-gray silty clay was encountered. Underlying this interval deposits become slightly coarser-grained and were described on the boring logs as silty clay with little fine-grained sand and marine shell fragments. Although the remaining borings did not achieve the depth of A01SB/HP04 and did not encounter the second cohesive strata with marine shells, the depositional trend of the subsurface soil noted above was generally observed in the other soil borings throughout SSA 1. The Test Boring Records are provided in Appendix A.

Cross-sections depicting the subsurface geologic conditions underlying the site were developed based on information obtained during the drilling program. As shown in Figure 3-3, two cross-sections at SSA 1 were traversed. In general, cross-section A to A' (Figure 3-4) traverses northeast to southwest while cross-section B to B' (Figure 3-5) traverses northwest to southeast.

3.2.2.2 SSA 6- Aviation Field and Environs

Fourteen soil borings were advanced within the vicinity of SSA 6 (Figure 3-6) to characterize the subsurface soil conditions, to collect soil samples for laboratory analysis, and to collect groundwater samples via temporary piezometers. In general, the site is underlain by unconsolidated deposits of silt with varying percentages of fine-grained sand, clay, and marine shells.

The surficial strata at the SSA is described as sandy silt. The sand percentage within this unit decreases with depth and the clay content increases with depth. The unit then grades downward into silt with major amounts of marine shell fragments with trace amounts of sand and clay. This

depositional trend of the subsurface soil was generally observed throughout SSA 6. The Test Boring Records are provided in Appendix A.

Cross-sections depicting the subsurface geologic conditions underlying the site were developed based on information obtained during the drilling program. As shown in Figure 3-6, two cross-sections at SSA 6 were traversed. In general, cross-section A to A' (Figure 3-7) traverses west to east while cross-section B to B' (Figure 3-8) traverses north to south.

3.2.2.3 SSA 7- Building 373 Rocket Plant/Group 18 Magazines/Main Road Disposal Area

Twelve soil borings were advanced within the vicinity of SSA 7 (Figure 3-9) to characterize the subsurface soil conditions, to collect soil samples for laboratory analysis, and to collect groundwater samples via temporary piezometers. Nine of these soil borings are associated with the proposed UST removal action, and were located in the vicinity of the UST and piping. Six of the nine UST-related soil borings were advanced with hand augers. In general, the site is underlain by unconsolidated deposits of sandy silt, clay, and marine shells.

Soil boring A07SB/HP05 was advanced to 28 feet bgs and achieved the greatest depth below ground surface at the site. The geology of most of the soil borings (A07SB/HP01, A07SB/HP02, A07SB/HP03, and A07SB/HP04) is described as silt, with varying amounts fine-grained sand and clay. In general, shell fragments were described at the deeper intervals where groundwater was encountered. The depositional trend of remaining two soil borings (A07SB/HP05 and A07SB/HP06) exhibited characteristics of transgression/regression sequence (alternating beds of sand, silt, and clay). As noted above, strata containing marine shell fragments was described at the deeper intervals where groundwater was encountered. The depth to groundwater was 17 to 23 feet bgs. The Test Boring Records are provided in Appendix A.

Cross-sections depicting the subsurface geologic conditions underlying the site were developed based on information obtained during the drilling program. As shown in Figure 3-9, two cross-sections at SSA 7 were traversed. In general, cross-section A to A' (Figure 3-10) traverses north to south while cross-section B to B' (Figure 3-11) traverses east to west.

3.2.2.4 SSA 15- Sewage Treatment Plant #1/Sludge Drying Beds and Discharge Area

Four borings were advanced within the vicinity of SSA 15 (Figure 3-12) to characterize the subsurface soil conditions, to collect soil samples for laboratory analysis, and to collect groundwater samples. In general, the site is underlain by unconsolidated deposits of fine-grained sand, silt, clay, and marine shells.

Soil boring A15SB/HP01 was advanced to 27 feet bgs and achieved the greatest depth below ground surface at the site. The surficial strata is characterized by fine-grained sand with trace amounts of silt and clay. This is underlain by more cohesive deposits of clayey silt which becomes coarser-grained with depth with the addition of fine-grained sand and marine shells. This depositional trend of the subsurface soil was generally observed in the other soil borings throughout SSA 15. The Test Boring Records are provided in Appendix A.

Cross-sections depicting the subsurface geologic conditions underlying the site were developed based on information obtained during the drilling program. As shown in Figure 3-12, two cross-sections at SSA 15 were traversed. In general, cross-section A to A' (Figure 3-13) traverses northeast to southwest while cross-section B to B' (Figure 3-14) traverses northwest to southeast.

3.3 WPNSTA Yorktown Hydrogeology

The following section summarizes the hydrogeology of the Station. Additional hydrogeological details are found in the Background Report (Baker, 1995).

In the shallow aquifer system of York County, Brockman and Richardson (1992) differentiate between the Columbia aquifer and the Cornwallis Cave aquifer based on the presence or absence of artisan conditions. The shallow lithology at WPNSTA Yorktown consists of an upper sand, a clay-silt unit, basal gravel/shell, and sediment of the Pleistocene and Pliocene ages (see Figure 3-1 and Table 3-1). The sand and gravel/shell units are both water-bearing and are commonly separated by the clay-silt layer, which may function as a confining or semiconfining unit. Collectively, these units form the shallow aquifer system at WPNSTA Yorktown, and correspond to the Columbia aquifer, Cornwallis Cave aquifer, and the Cornwallis Cave confining unit, respectively.

3.4 Land Use and Demography

With respect to land use, no housing exists at SSA 1. The area is currently wooded and grass covered. The area may be used for hunting.

Currently, SSA 6 is used as warehouse storage and an open storage area. The helicopter landing pad is infrequently used. Station personnel at the SSA are involved with storage related tasks. Occupancy of Buildings 500 and 506 is on a limited basis. Building 500 is used for explosive manufacturing on a limited basis. The area is presently covered with grass except for the area south of Building 506 which is covered with low brush.

WPNSTA personnel employed at the Rocket Plant at SSA7 continue to load explosives on a limited basis. The buildings appear to be occupied on a daily basis. The Group 18 Magazines are abandoned. The area is partially wooded, with the remaining area being covered with grass and asphalt.

The former sewage treatment plant and sludge drying beds at SSA 15 were in operation until 1983, at which time they were abandoned. The area is currently grass covered and surrounded by woods.

3.5 References

Baker Environmental, Inc. 1995. Preliminary Draft Summary of Background Constituent Concentrations and Characterization of the Biotic Community from the York River Drainage Basin, Naval Weapons Station Yorktown, Yorktown, Virginia. March 1995.

Brockman, A. R. and D. L. Richardson. 1992. Hydrogeologic Framework of the Shallow Aquifer System of Yorktown, Virginia. Prepared in cooperation with York County Department of Environmental Services. USGS Water Resources Investigation Report 92-4111.

Johnson, G. H. 1972. Geology of the Yorktown Poquoson West and East Quadrangles, Virginia. Virginia Division of Mineral Resources, Report of Investigations 30.

Mixon, R. B., C. R. Berquist, Jr., W. L. Newell, and F. G. Johnson. 1989a. Geologic Map and Generalized Cross Sections of the Coastal Plain and Adjacent Parts of the Peidmont, Virginia. Virginia Division of Mineral Resources, Miscellaneous Investigations Series, Map I-2033.

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Teifke, R. H. 1973. Stratigraphic Units of the Lower Cretaceous Through Miocene Series, in Geologic Studies, Coastal Plain of Virginia. Virginia Division of Mineral Resources, Bulletin 83, Parts 1 and 2.

SECTION 3.0 TABLES

TABLE 3-1

GEOLOGIC FORMATIONS AND HYDROGEOLOGIC UNITS IN THE VICINITY OF WPNSTA YORKTOWN

System	Series	Formation	Hydrogeologic Unit
Quaternary	Pleistocene	Lower Shirley, Chuckatuck, Windsor	Columbia Aquifer (Where Unconfined)
Tertiary	Pliocene	Bacons Castle	Cornwallis Cave Confining Unit[1]
			Cornwallis Cave Aquifer (Where Confined)[2]
		Yorktown	Aquitard
		Eastover	Yorktown-Eastover Aquifer
	Miocene	St. Marys	Aquitard
		Calvert	Chickahominy and Piney Point-Nanjemoy Aquifers
	Eocene	Chickahominy	
		Piney Point	Aquitard
		Nanjemoy (Claiborne Age)	
	Paleocene	Nanjemoy (Wilcox Age)	Aquia Aquifer
		Aquia	Aquitard
		Brightseat	Brightseat Aquifer
Cretaceous	Upper Cretaceous	Undifferentiated Sediments	Potomac Aquifer
		Potomac Group	

Notes: (1) The Cornwallis Cave confining unit is approximately equivalent to the Yorktown confining unit of Meng and Harsh (1988, page CS1).

(2) The Cornwallis Cave aquifer is approximately equivalent to the Upper Yorktown-Eastover aquifer of Meng and Harsh (1988).

Sources: Brockman, A. R. and D. L. Richardson. 1992. Hydrogeologic Framework of the Shallow Aquifer System of Yorktown, Virginia. Prepared in Cooperation with York County Department of Environmental Services. USGS Water Resources Investigation Report 92-4111.

Meng, A.A., III and J.F. Harsh, 1988. "Hydrogeologic Framework of the Virginia Coastal Plain." U.S. Geological Survey Professional Paper 1401-C.

SECTION 3.0 FIGURES

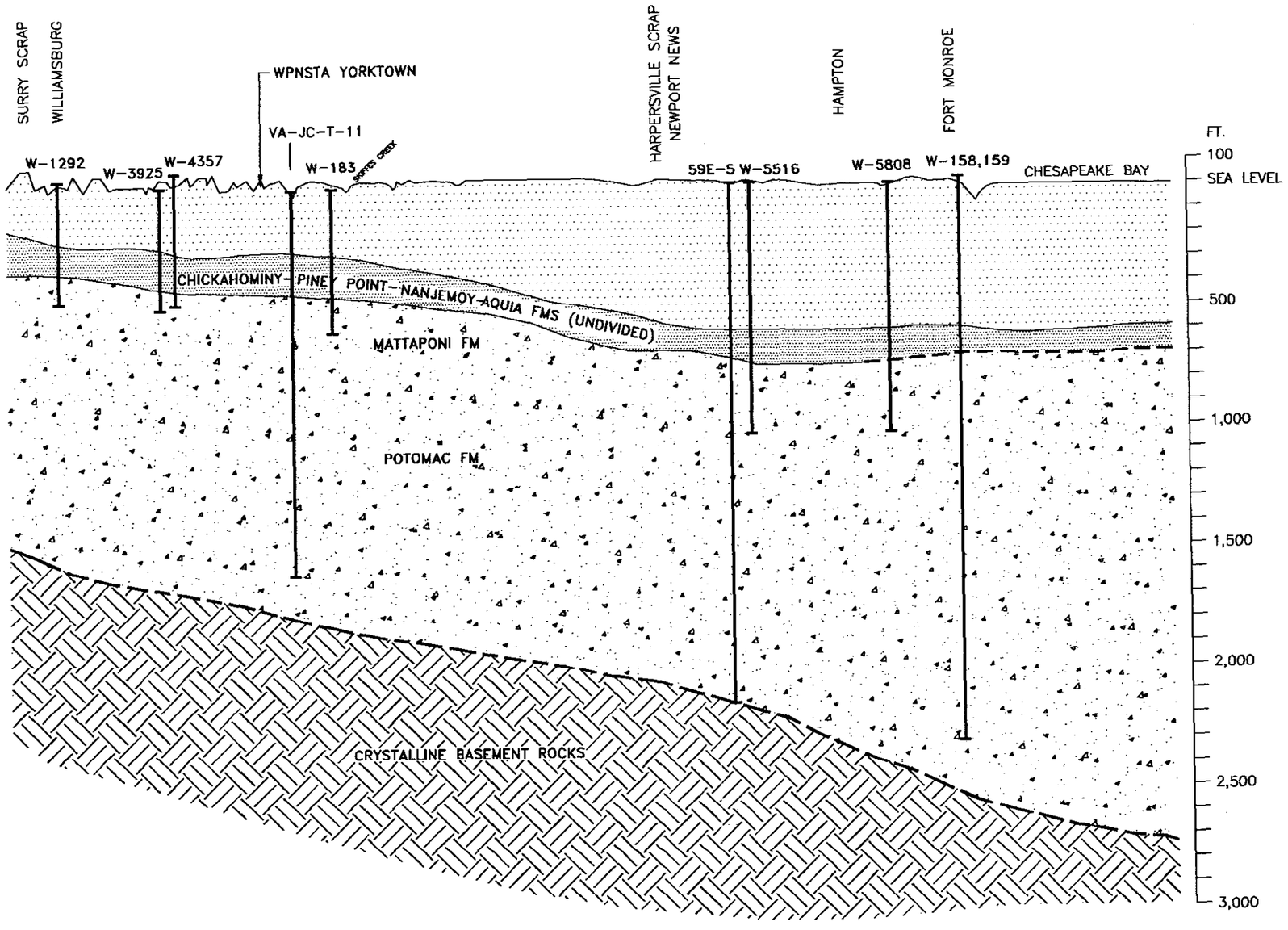
SYSTEM	SERIES	GEOLOGIC UNIT			HYDROGEOLOGIC UNIT IN THIS REPORT	HYDROGEOLOGIC UNITS OF MENG AND HARSH (1988)
QUATERNARY	HOLOCENE	ALLUVIAL AND MARSH DEPOSITS			YORK COUNTY SHALLOW AQUIFER SYSTEM: COLUMBIA AQUIFER (WHERE UNCONFINED) / CORNWALLIS CAVE CONFINING UNIT	COLUMBIA AQUIFER (CONFINED OR UNCONFINED)
	PLEISTOCENE	TABB FORMATION				
		SHIRLEY FORMATION				
		CHUCKATUCK FORMATION				
TERTIARY	PLIOCENE	WINDSOR FORMATION				
		BACONS CASTLE FORMATION				
		CHESAPEAKE GROUP	YORKTOWN FORMATION	MOORE HOUSE MEMBER	CORNWALLIS CAVE AQUIFER (WHERE CONFINED)	YORKTOWN CONFINING UNIT
				MORGARTS BEACH MEMBER	YORKTOWN CONFINING UNIT	
				RUSHMERE MEMBER	YORKTOWN–EASTOVER AQUIFER	YORKTOWN–EASTOVER UNIT
				SUNKEN MEADOW MEMBER		
	MIOCENE		EASTOVER FORMATION	COBHAM BAY MEMBER		
				CLAREMONT MANOR MEMBER	EASTOVER–CALVERT CONFINING UNIT	
			ST. MARYS FORMATION			ST. MARYS CONFINING UNIT
			CALVERT FORMATION			CALVERT CONFINING UNIT

SOURCE: BROCKMAN, A.R. AND RICHARDSON, D.L. 1992
HYDROGEOLOGIC FRAMEWORK OF THE SHALLOW AQUIFER SYSTEM OF YORK COUNTY, VIRGINIA:
U.S. GEOLOGIC SURVEY WATER-RESOURCES INVESTIGATIONS REPORT 92-4111.

228291SS

FIGURE 3-1
HYDROGEOLOGIC UNITS
IN YORK COUNTY

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



MODIFIED FROM MIXON AND OTHERS (1989)

W-5808 REFERENCE WELLS AS CITED BY MIXON, ET. AL.

LEGEND

DESCRIPTION OF CROSS SECTION UNITS

COASTAL PLAIN DEPOSITS

QUARTERNARY AND UPPER TERTIARY DEPOSITS, UNDIVIDED – UNIT INCLUDES FORMATIONS OF MIOCENE (CALVERT AND ST. MARY'S), PLIOCENE (YORKTOWN–EASTOVER AND BACONS CASTLE), AND PLEISTOCENE (WINDSOR, CHUCKATUCK, AND LOWER SHIRLEY) AGES AND UNNAMED HOLOCENE SEDIMENT. THICKNESS RANGES FROM A FEATHEREDGE ALONG THE WESTERN MARGIN OF THE COASTAL PLAIN TO AS MUCH AS 1,000 FT. OR MORE IN THE SUBSTANCE OF THE EASTERN SHORE.

LOWER TERTIARY DEPOSITS, UNDIVIDED – UNIT IS PREDOMINANTLY GLAUCONITIC SAND AND SILT OF OLIGOCENE, EOCENE (CHICKAHOMINY, PINEY POINT, AND NANJEMOY FORMATIONS), AND PALEOCENE (NANEMOY, AQUIA, AND MATTAPONI FORMATIONS) AGES. IN THE INNER COASTAL PLAIN, UNIT CONSISTS MAINLY OF THE PAMUNKEY GROUP, WHICH THINS SOUTHEASTWARD ACROSS THE OUTER MIDDLE COASTAL PLAIN AND IS TRUNCATED IN PART BY AN EASTWARD–THICKENING WEDGE OF YOUNGER STRATA, INCLUDING UPPER MIDDLE EOCENE, UPPER EOCENE (CHICKAHOMINY FORMATION), AND LOWER AND UPPER OLIGOCENE GLAUCONITIC SAND AND SILT. THICKNESS RANGES FROM A FEATHEREDGE NEAR THE FALL ZONE, WHERE THE UNIT IS OVERLAPPED BY UPPER TERTIARY FORMATIONS, TO APPROXIMATELY 400 FT. IN THE EASTERN SHORE AREA.

LOWER CRETACEOUS DEPOSITS – QUARTZO–FELDSPATHIC SAND, GRAVEL, SILT, AND ILLITE/SMECTITE CLAY. SEDIMENTS ARE LARGELY OF FLUVIAL–DELTAIC ORIGIN, AND FORM A CLASTIC WEDGE THICKENING NORTHEASTWARD AND EASTWARD INTO THE SALISBURY EMBAYMENT. UNIT COMPRISES MAINLY THE POTOMAC FORMATION AND, POSSIBLY BEDS EQUIVALENT TO THE WASTE GATE FORMATION OF HANSEN (1984) IN MARYLAND.

PALEOZOIC AND UPPER PROTEROZOIC CRYSTALLINE ROCKS

METASEDIMENTARY AND METAIGNEOUS ROCKS, UNDIFFERENTIATED.

CONTACT DASHED WHERE INFERRED

REFERENCES CITED:

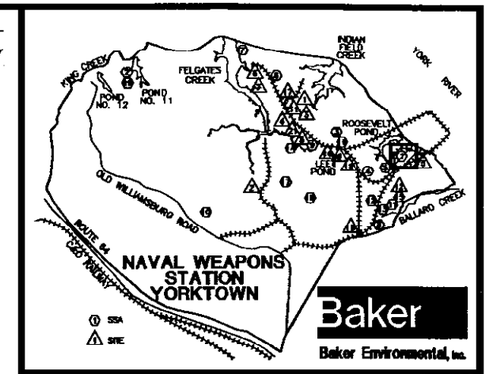
HANSEN, H.J. 1984. "HYDROGEOLOGIC CHARACTERISTICS OF THE WASTE GATE FORMATION, A NEW SUBSURFACE UNIT OF THE POTOMAC GROUP UNDERLYING THE EASTERN DELMARVA PENINSULA, MARYLAND." GEOLOGICAL SURVEY INFORMATION CIRCULAR 39, 22 PP.

MIXON R.B., D.S. POWARS, L.W. WARD, AND G.W. ANDREWS. 1989. "LITHOSTRATIGRAPHY AND MOLLUSCAN AND DIATOM BIOSTRATIGRAPHY OF THE HAYNESVILLE CORES, NORTHEASTERN VIRGINIA COASTAL PLAIN. CHAPTER A." MIXON R.B., ED. IN GEOLOGY AND PALEONTOLOGY OF THE HAYNESVILLE CORES, RICHMOND COUNTY, NORTHEASTERN VIRGINIA COASTAL PLAIN: U.S. GEOLOGICAL SURVEY PROFESSIONAL PAPER 1989.

32827855

FIGURE 3-2
GENERALIZED GEOLOGIC CROSS SECTION
WPNSTA YORKTOWN, VIRGINIA

NAVAL WEAPONS STATION YORKTOWN — YORKTOWN, VIRGINIA



100 0 50 100
1 inch = 100 ft.

LEGEND

- WOODS
- CHAIN LINK FENCE
- RAILROAD TRACKS
- DITCH OR SWALE
- STRUCTURE
- LOCATION OF SURFICIAL DEBRIS PILES
- A01SB/HP01 SOIL BORING/TEMPORARY PIEZOMETER LOCATION
- SITE SCREENING AREA BOUNDRY
- ASSUMED GROUNDWATER FLOW DIRECTION
- GROUNDSURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)

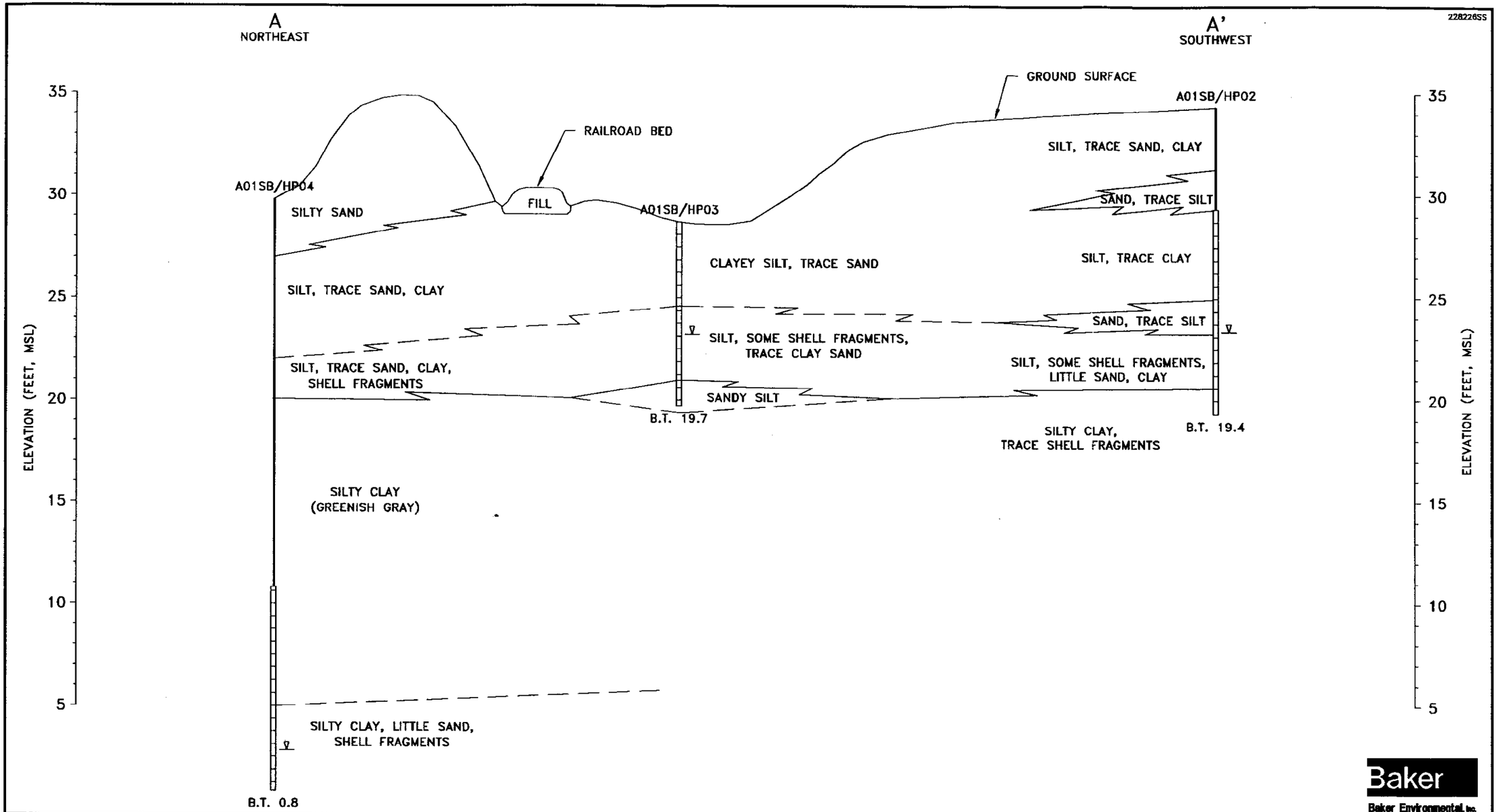
NOTE:
SURFACE SOIL SAMPLES WERE COLLECTED AS PART OF REMOVAL ACTION ACTIVITIES.

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 22822355

FIGURE 3-3

CROSS-SECTION LOCATION MAP
SSA1 - BUILDING 428 TEAGUE ROAD DISPOSAL AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



LEGEND

- GROUNDWATER ENCOUNTERED DURING DRILLING
- B.T. 19.7' BORING TERMINATED, ELEVATION MSL
- TEMPORARY PIEZOMETER SCREEN INTERVAL
- ESTIMATED — — — PROJECTED

40 0 20 40 80
Horizontal Scale: 1 inch = 40 ft.

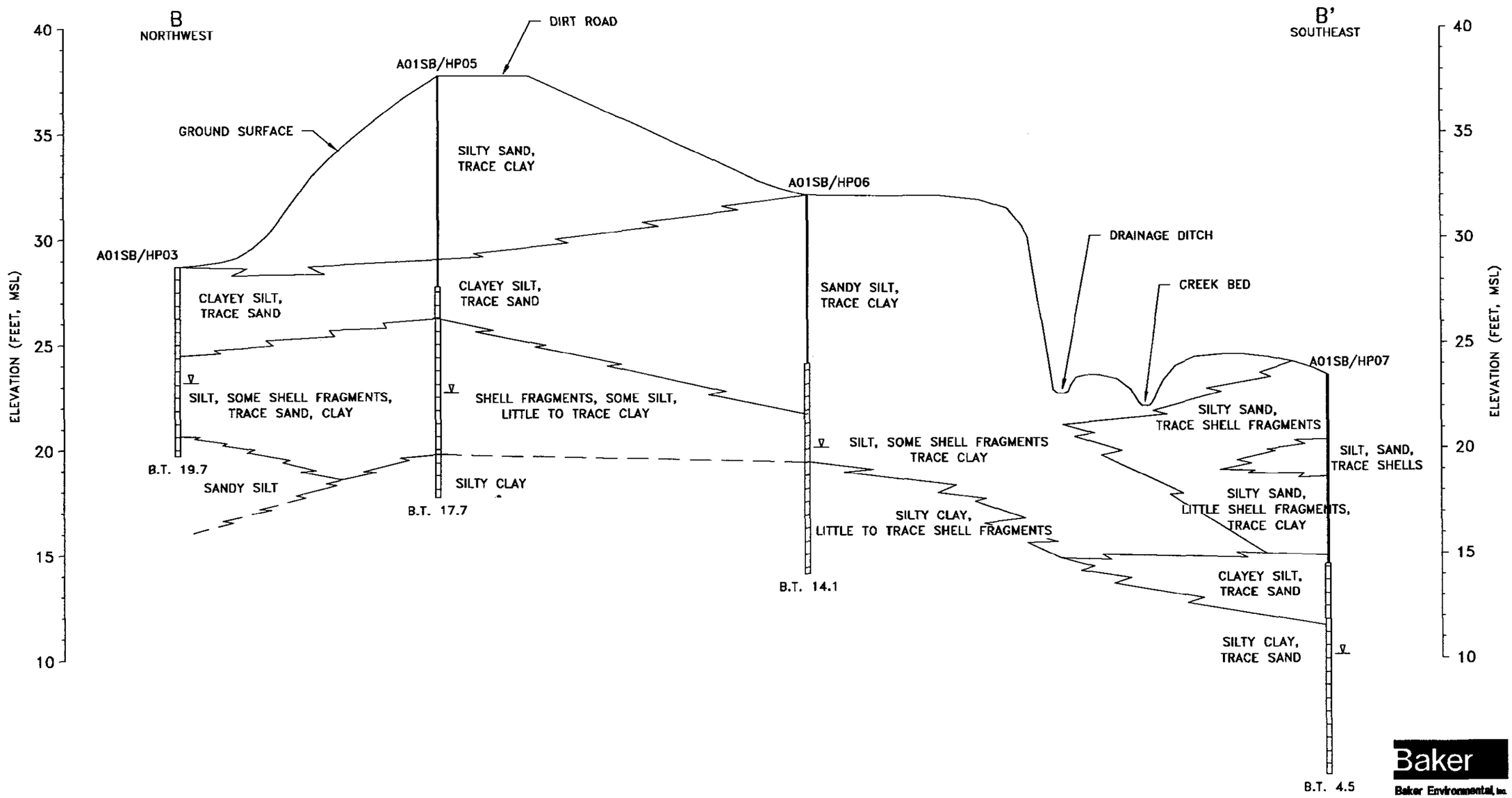
5 0 2.5 5 10
Vertical Scale: 1 inch = 5 ft.

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.

FIGURE 3-4
HYDROGEOLOGIC CROSS-SECTION A-A'
SSA-1 BUILDING 428 TEAGUE ROAD
DISPOSAL AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

228227SS



LEGEND

- ▽ GROUNDWATER ENCOUNTERED DURING DRILLING
- B.T. 19.7' BORING TERMINATED, ELEVATION MSL
- TEMPORARY PIEZOMETER SCREEN INTERVAL
- ——— ESTIMATED — — — PROJECTED

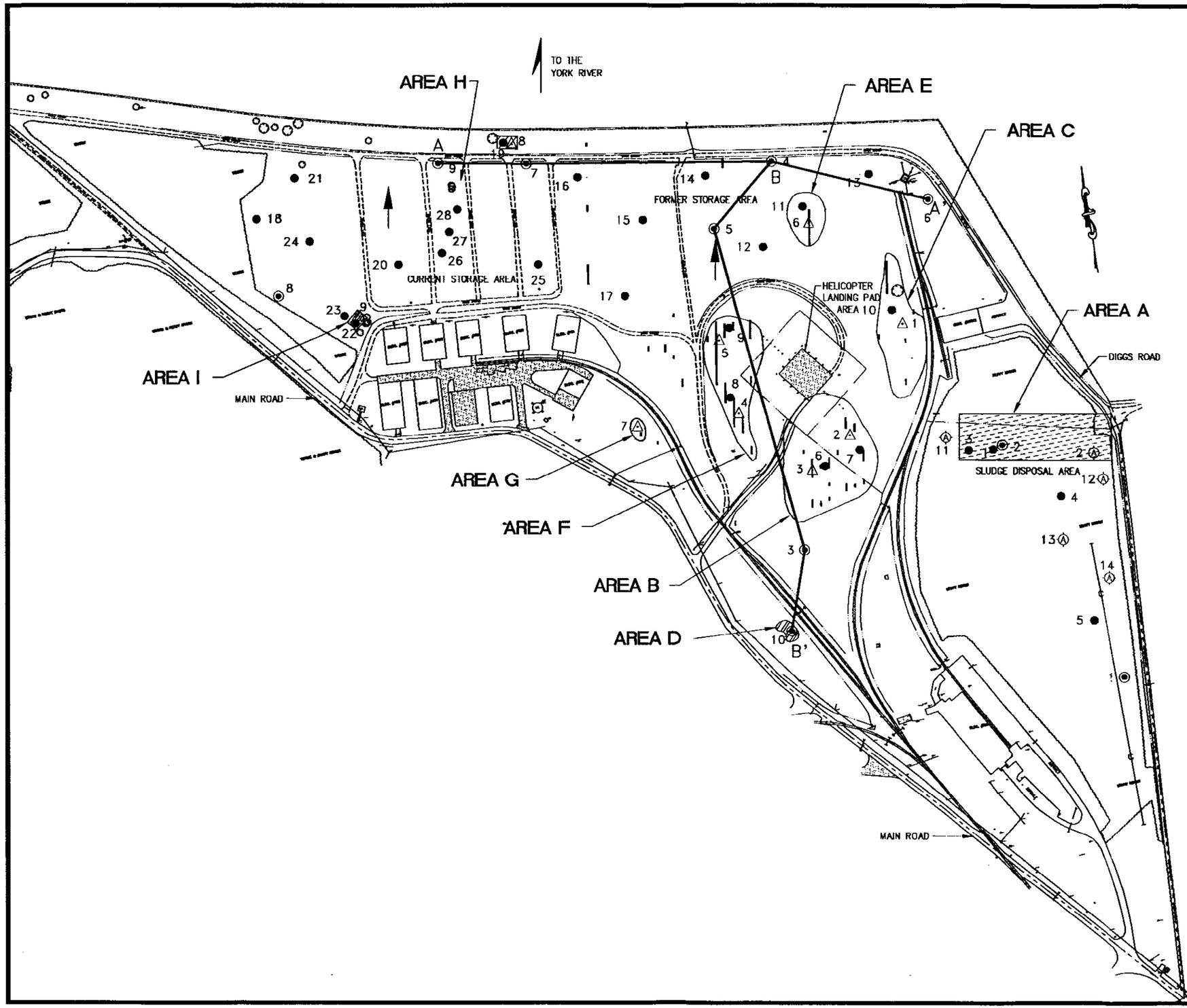
50 0 25 50 100
Horizontal Scale: 1 inch = 50 ft.

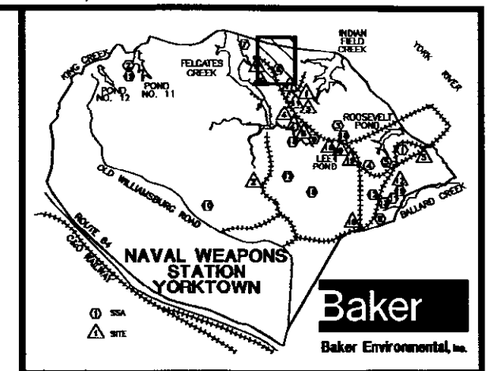
5 0 2.5 5 10
Vertical Scale: 1 inch = 5 ft.

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.

FIGURE 3-5
HYDROGEOLOGIC CROSS-SECTION B-B'
SSA-1 - BUILDING 428 TEAGUE ROAD DISPOSAL AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA





300 0 150 300
1 inch = 300 ft.

LEGEND

- CONCRETE
- WOODS
- DIRT ROAD
- TREE
- RAILROAD TRACKS
- DITCH OR SWALE
- EDGE OF PAVEMENT
- STRUCTURE
- BURIED METALLIC OBJECT/DEBRIS
- APPROXIMATE LIMITS OF DISPOSAL AREAS EXHIBITING GREATER AMOUNTS OF DEBRIS. TYPICAL DEPTH RANGE OF 0-3' AS DETERMINED FROM RADAR DATA.
- APPROXIMATE AREA OF BLACK SLUDGE-LIKE MATERIAL
- APPROXIMATE AREA OF UNIDENTIFIED BURIED MATERIALS
- APPROXIMATE AREA OF BURIED ROCKET ENGINES
- APPROXIMATE EXTENT OF FORMER SLUDGE DISPOSAL AREA
- -C——C- GEOPHYSICAL TRAVERSE EXHIBITING HIGH CONDUCTIVITY
- 1 SOIL BORING/TEMPORARY PIEZOMETER LOCATION
- 2 SOIL BORING LOCATION
- 3 TEST PIT LOCATION
- 4 SURFACE SOIL SAMPLE LOCATION
- SITE SCREENING AREA BOUNDRY
- ASSUMED GROUNDWATER FLOW DIRECTION

NOTE:

ALL SAMPLE NUMBERS ARE IDENTIFIED WITH THE FOLLOWING PREFIXES:

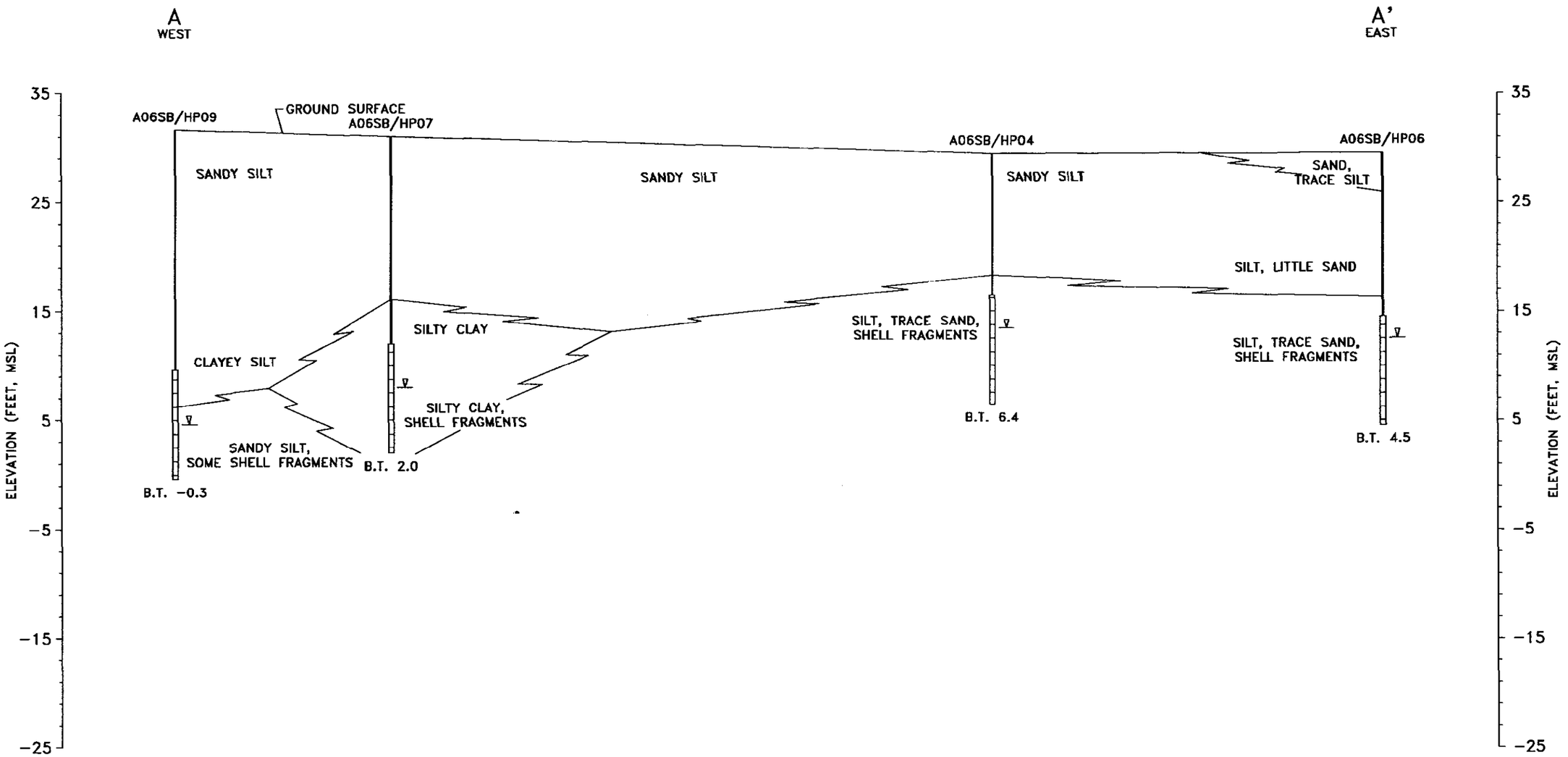
A06HP – HydroPunch® SAMPLES
A06SS – SURFICIAL SOIL SAMPLES
A06SB – SUBSURFACE SOIL SAMPLES

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 22822235

FIGURE 3-6
CROSS-SECTION LOCATION MAP
SSA 6
AVIATION FIELD AND ENVIRONS

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

228223SS



Baker
Baker Environmental, Inc.

LEGEND

- GROUNDWATER ENCOUNTERED DURING DRILLING
- B.T. 2.0' BORING TERMINATED, ELEVATION MSL
- TEMPORARY PIEZOMETER SCREEN INTERVAL
- ESTIMATED

130 0 65 130 260

Horizontal Scale: 1 inch = 130 ft.

10 0 5 10 20

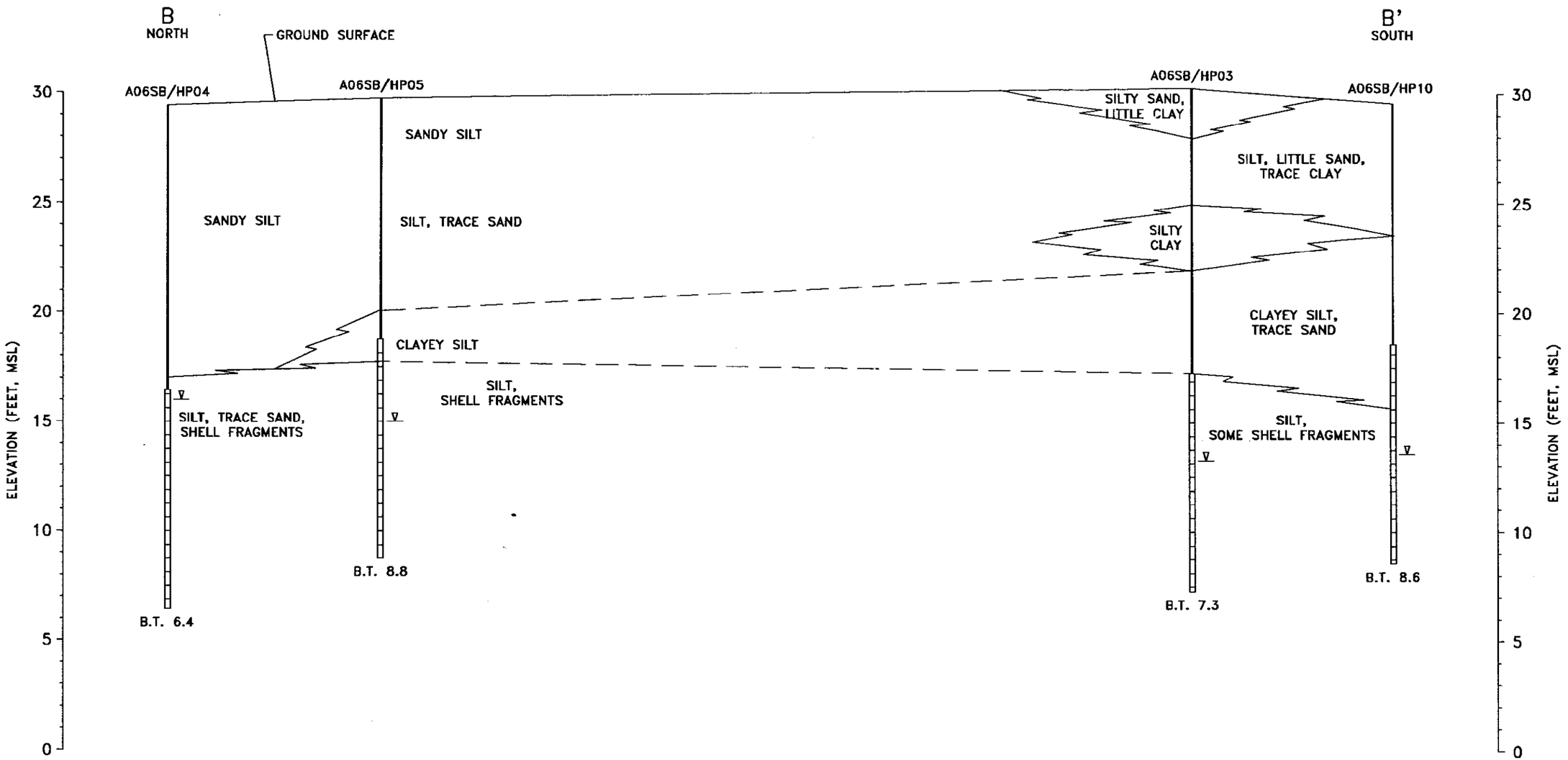
Vertical Scale: 1 inch = 10 ft.

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 3-7
HYDROGEOLOGIC CROSS-SECTION A-A'
SSA-6 AVIATION FIELD
AND ENVIRONS

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

228224SS



Baker
Baker Environmental, Inc.

LEGEND

- GROUNDWATER ENCOUNTERED DURING DRILLING
- B.T. 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.

FIGURE 3-8
HYDROGEOLOGIC CROSS-SECTION B-B'
SSA-6 AVIATION FIELD
AND ENVIRONS

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

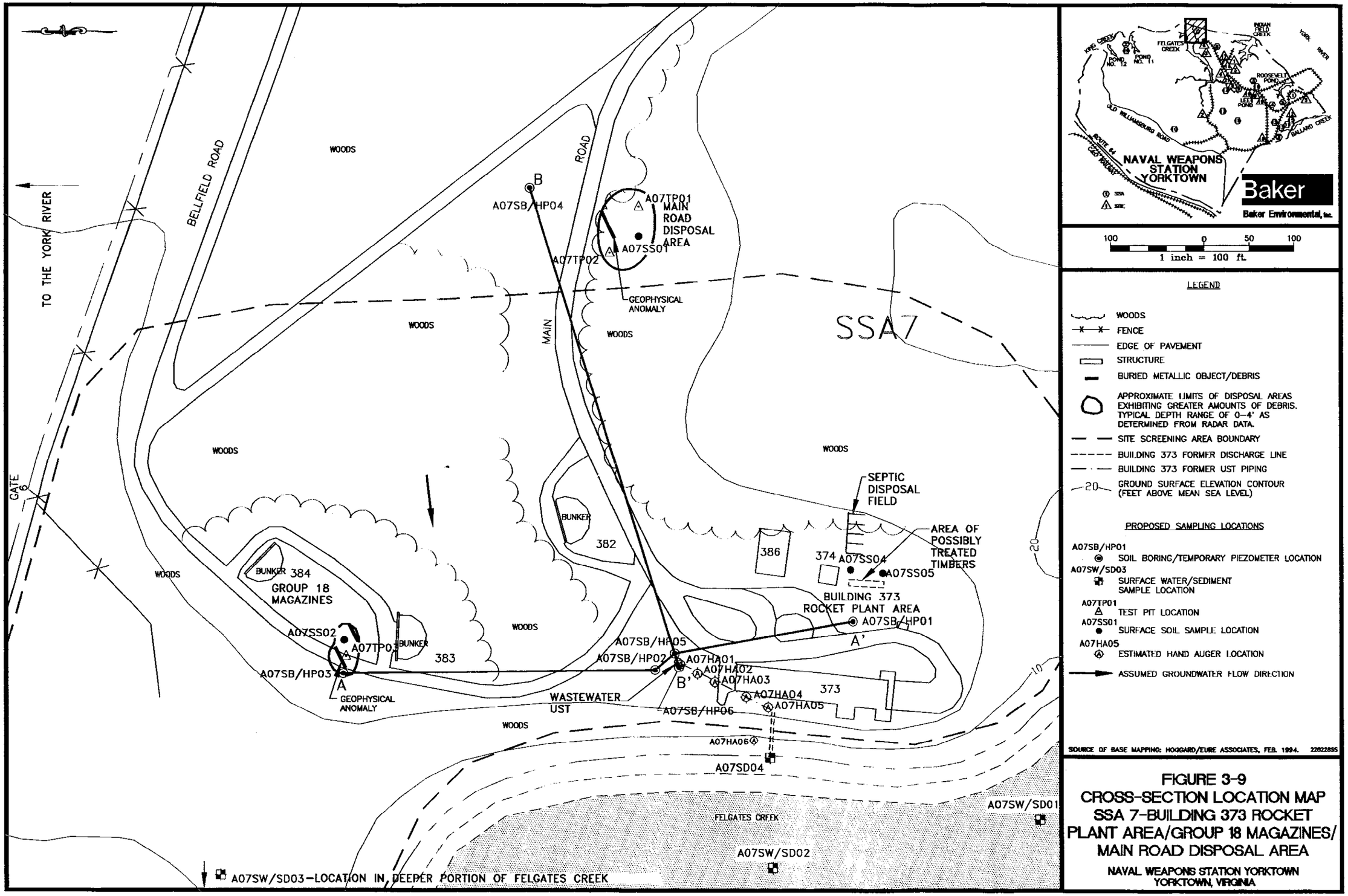
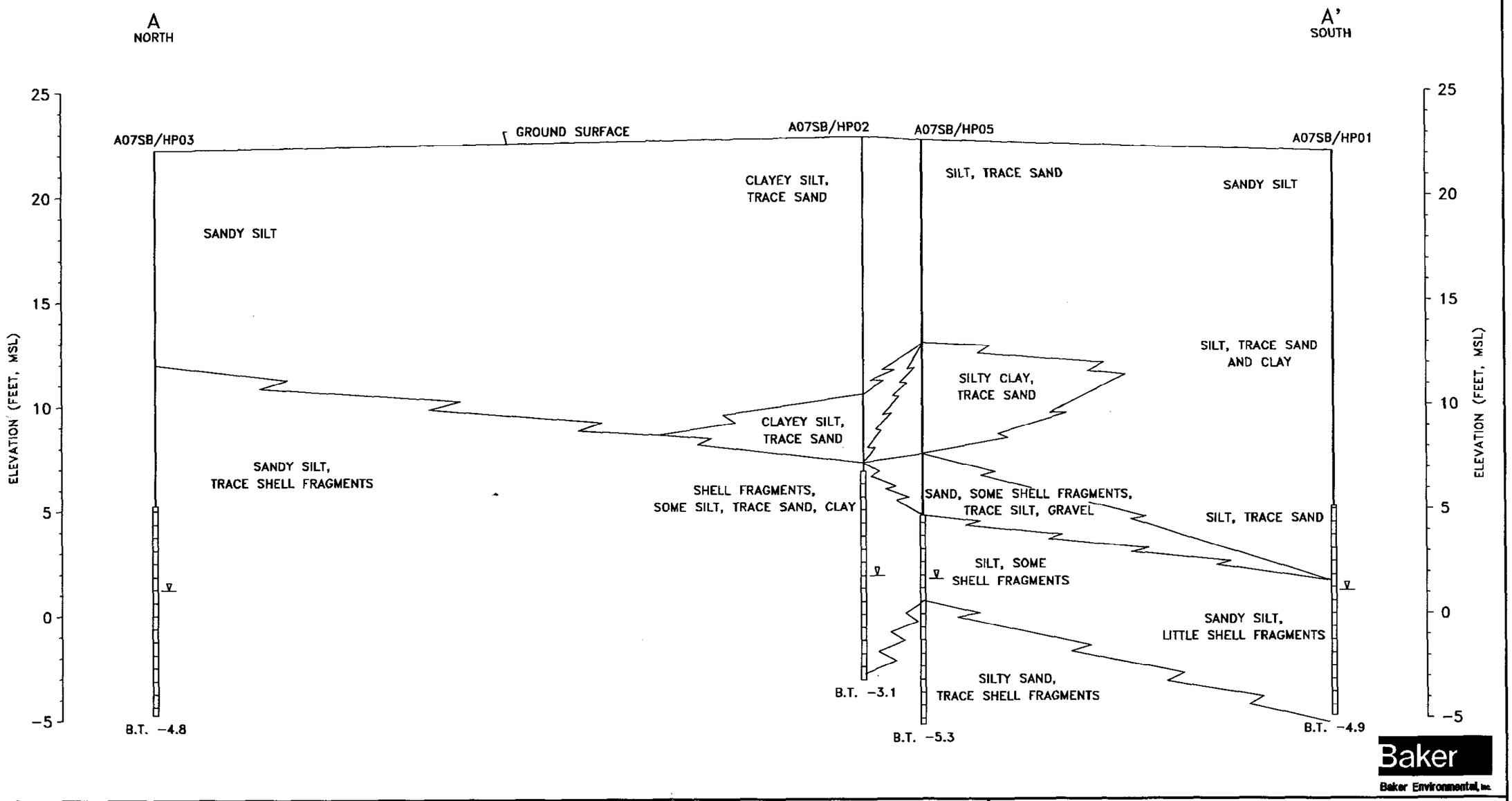


FIGURE 3-9
CROSS-SECTION LOCATION MAP
SSA 7-BUILDING 373 ROCKET PLANT AREA/GROUP 18 MAGAZINES/ MAIN ROAD DISPOSAL AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

228229SS



LEGEND

- ▽ GROUNDWATER ENCOUNTERED DURING DRILLING
- B.T. -4.8' BORING TERMINATED, ELEVATION MSL
- TEMPORARY PIEZOMETER SCREEN INTERVAL
- ESTIMATED

50 0 25 50 100
Horizontal Scale: 1 inch = 50 ft.

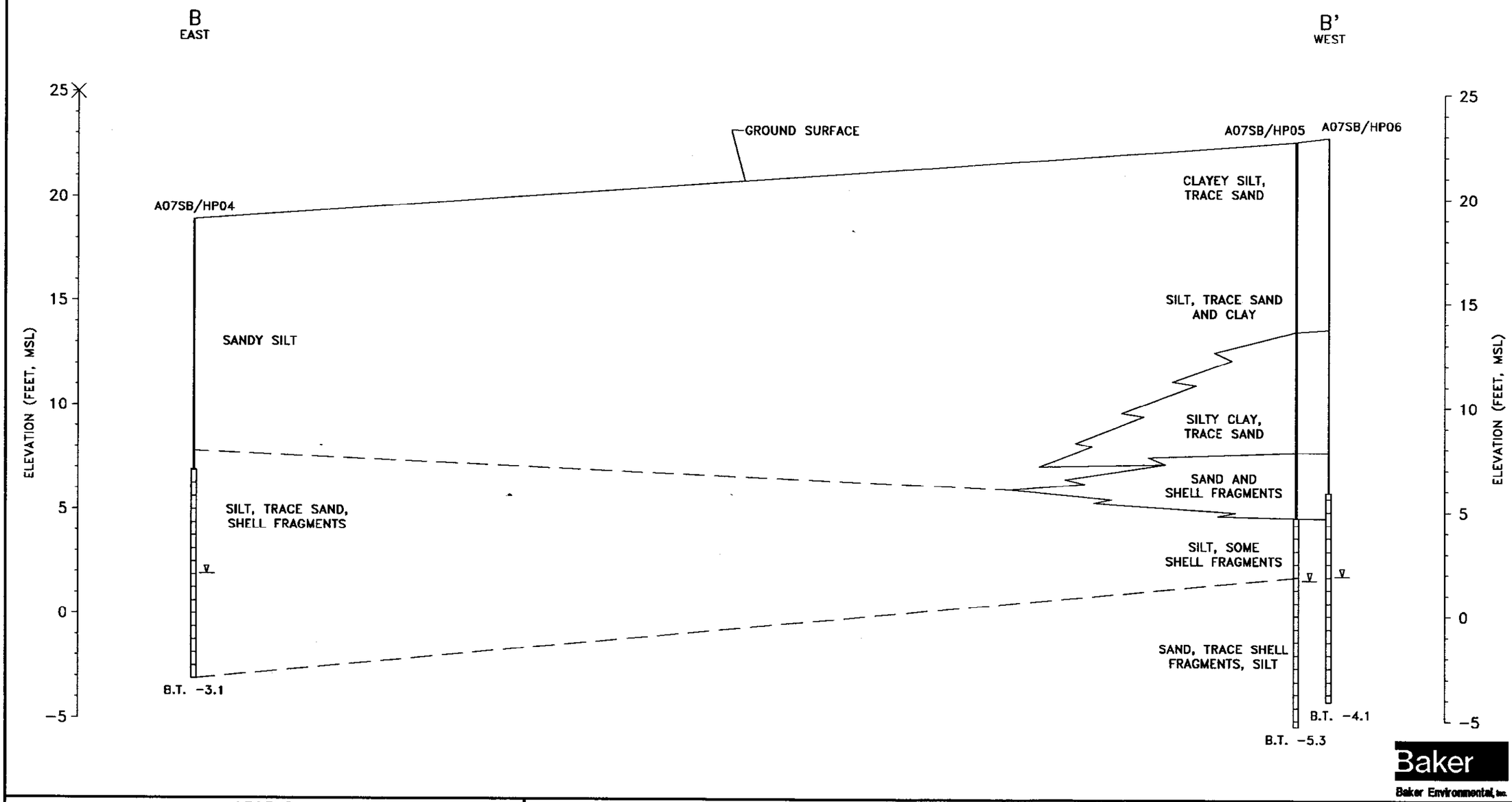
5 0 2.5 5 10
Vertical Scale: 1 inch = 5 ft.

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.

FIGURE 3-10
HYDROGEOLOGIC CROSS-SECTION A-A'
SSA-7 - BUILDING 373 ROCKET PLANT AREA/
GROUP 18 MAGAZINES/MAIN ROAD DISPOSAL AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

228230SS



LEGEND

- GROUNDWATER ENCOUNTERED DURING DRILLING
- B.T. -3.1' BORING TERMINATED, ELEVATION MSL
- TEMPORARY PIEZOMETER SCREEN INTERVAL
- ESTIMATED — — — PROJECTED

50 0 25 50 100

Horizontal Scale: 1 inch = 50 ft.

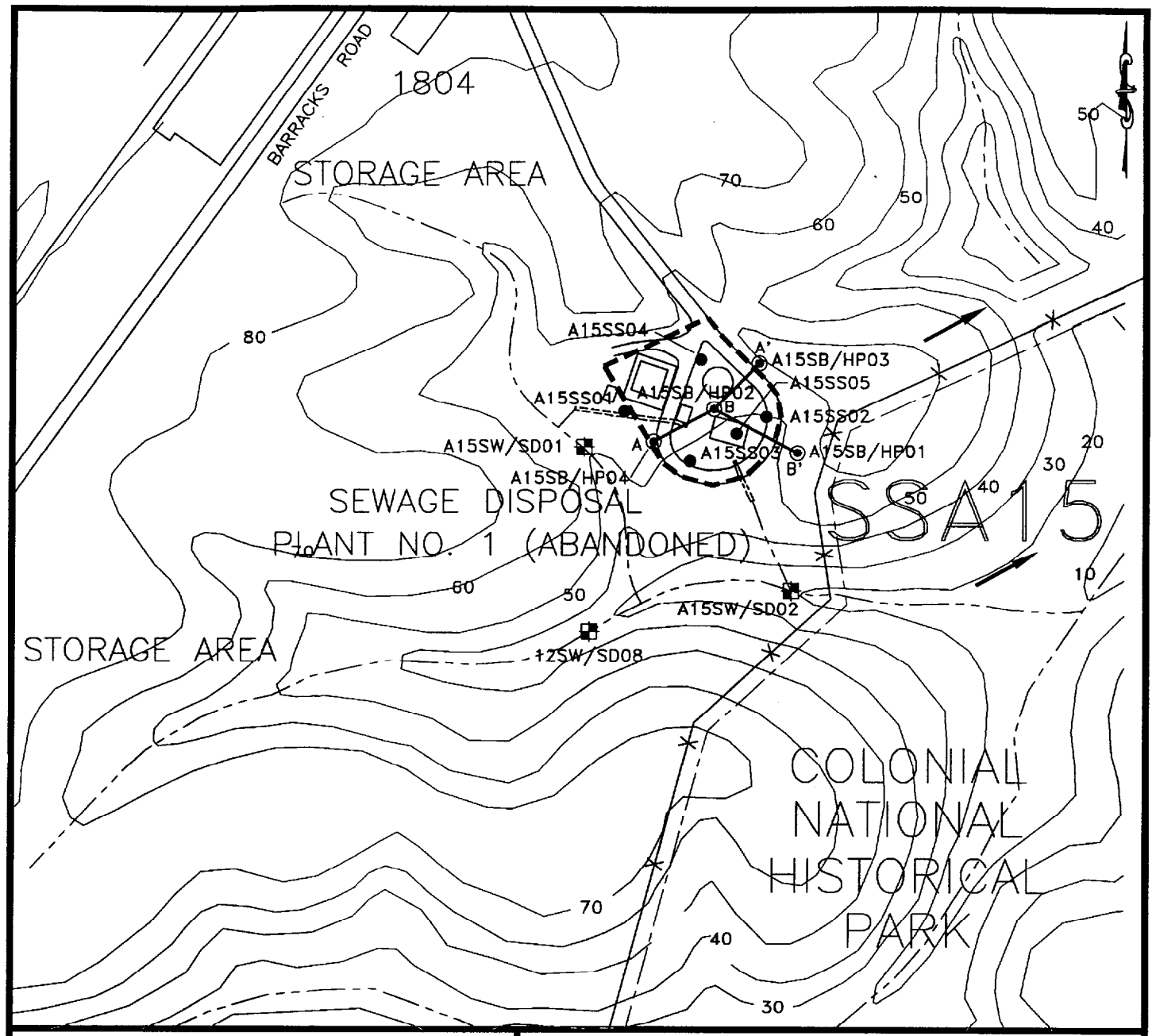
5 0 2.5 5 10

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.

FIGURE 3-11
HYDROGEOLOGIC CROSS-SECTION B-B'
SSA-7 - BUILDING 373 ROCKET PLANT AREA/
GROUP 18 MAGAZINES/MAIN ROAD DISPOSAL AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



200 0 100 200

1 inch = 200 ft.

INSTALLATION BOUNDARY
DRAINAGE
EDGE OF PAVEMENT
SITE SCREEENING AREA BOUNDRY
A15SW/SD01 SURFACE WATER/ SEDIMENT SAMPLE LOCATION
A15SS01 SURFACE SOIL SAMPLE LOCATION
A15SB/HP01 SOIL BORING/TEMPORARY PIEZOMETER LOCATION
FENCE
STRUCTURE
APPROXIMATE LOCATION OF SEWAGE TREATMENT PLANT DISCHARGE LINE
APPROXIMATE LOCATION OF STORM DRAINAGE LINE
ASSUMED GROUNDWATER FLOW DIRECTION

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994.

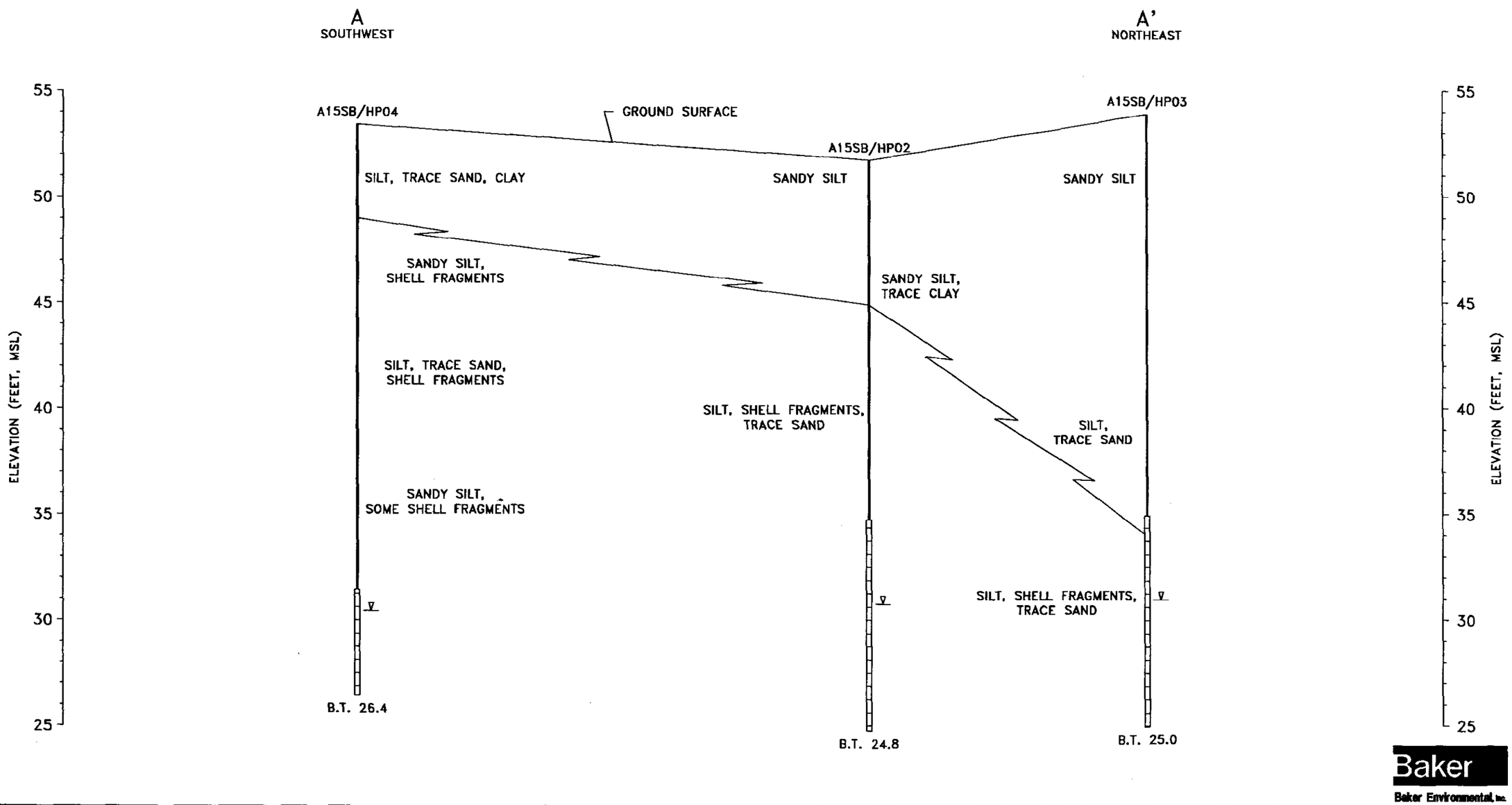
22821955

Baker

Baker Environmental, Inc.

FIGURE 3-12
CROSS SECTION LOCATION MAP
SSA 15-SEWAGE TREATMENT PLANT #1/
SLUDGE DRYING BEDS AND DISCHARGE AREA
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

228221SS



LEGEND

- ▽ GROUNDWATER ENCOUNTERED DURING DRILLING
- B.T. 26.4' BORING TERMINATED, ELEVATION MSL
- TEMPORARY PIEZOMETER SCREEN INTERVAL
- ESTIMATED

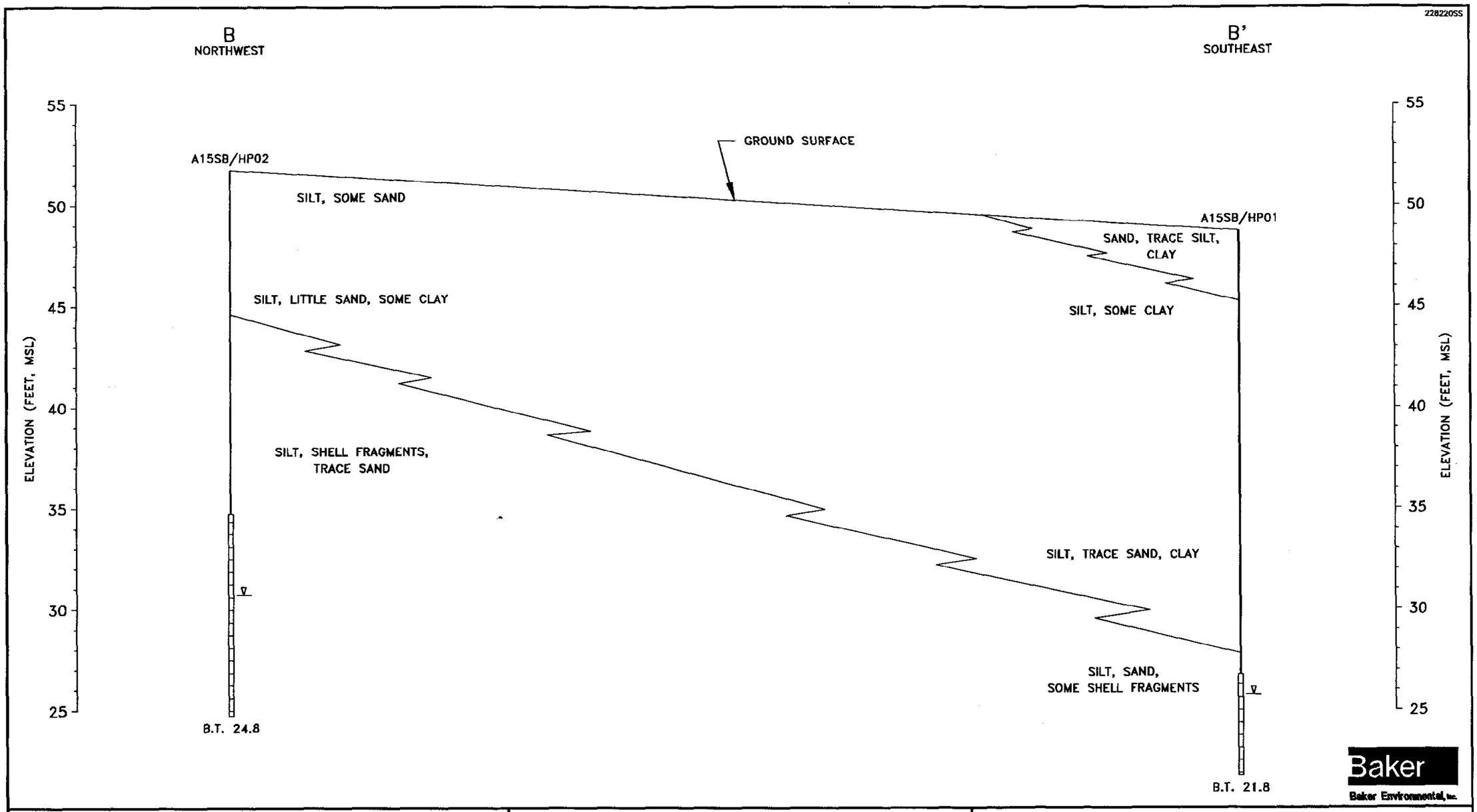
20 0 10 20 40
Horizontal Scale: 1 inch = 20 ft.

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.

FIGURE 3-13
HYDROGEOLOGIC CROSS-SECTION A-A'
SSA-15 SEWAGE TREATMENT PLANT #1/
SLUDGE DRYING BEDS AND
DISCHARGE AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



LEGEND

- GROUNDWATER ENCOUNTERED DURING DRILLING
- B.T. 24.8' BORING TERMINATED, ELEVATION MSL
- TEMPORARY PIEZOMETER SCREEN INTERVAL
- ESTIMATED

10 0 5 10 20

Horizontal Scale: 1 inch = 10 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.

FIGURE 3-14
HYDROGEOLOGIC CROSS-SECTION B-B'
SSA-15 SEWAGE TREATMENT PLANT #1/
SLUDGE DRYING BEDS AND
DISCHARGE AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

4.0 STUDY AREA INVESTIGATION

This section describes the field sampling activities conducted during the SSP at SSAs 1, 6, 7, and 15. This section describes the purpose of multi-media sampling, sampling procedures, and sampling locations for all media. This section also discusses Quality Assurance/Quality Control (QA/QC) conducted during the sampling, and IDW management.

4.1 Introduction

The field program at SSAs 1, 6, 7, and 15 was initiated to characterize potential environmental impacts and threats to human health and ecological impacts resulting from past disposal practices at each of the SSAs.

Only limited information is available regarding past activities conducted at the SSAs. This information was gathered from the USEPA Region III's RCRA "Solid Waste Management Unit Investigation" (USEPA, 1993), the "Study Area Analysis, Yorktown Naval Weapons Station, Yorktown, Virginia," Volume I (USEPA, 1992), and from SSA visits in September 1993 and January 1994. This information is presented in Section 2.0. With respect to the disposal practices, there is no information available to determine exactly what types of waste handling activities occurred. Therefore, samples were analyzed for Target Compound List (TCL) organics (i.e., VOCs, SVOCs, pesticides, and PCBs), nitramine compounds, and Target Analyte List (TAL) inorganics (including cyanide). Pesticides are a concern due to the reported Station-wide spraying of pesticides in the past.

The SSP activities at SSAs 1, 6, 7, and 15 were conducted from late October to early December 1994. Activities conducted during the field program consisted of a soil investigation including drilling, test pitting, and sampling; a groundwater investigation with temporary piezometers; a surface water investigation; and a sediment investigation. All field activities were conducted in Level D personal protection with the exception of test pitting which was conducted in Level B protection. The following sections discuss these investigative activities, in addition to the QA/QC samples collected, decontamination procedures employed, and the methods used to handle the IDW generated during the field program.

4.2 Soil Investigation

The soil sampling program developed for SSAs 1, 6, 7, and 15 was designed to identify contaminants of potential concern (COPCs), determine if former site activities adversely impacted the quality of the soil, and to evaluate potential human health and ecological risks associated with the COPCs. A summary of the soil sampling program at SSAs 1, 6, 7, and 15 describing the sample locations, the sample depth, and analytical methods is provided on Tables 4-1 through 4-10. Soil sampling locations are presented in Figures 4-1 through 4-4.

In general, the field procedures and sampling methods employed for the soil investigation were implemented in accordance with USEPA Region III standard operating procedures (SOPs), and the Final Work Plan for SSAs 1, 6, 7, and 15 (Baker, 1994b) and the Final Master Project Plans (Baker, 1994a) for WPNSTA Yorktown.

The soil investigation program for SSAs 1 and 15 included drilling, surface and subsurface soil sampling. The soil investigation program for SSAs 6 and 7 included these same activities and also test pitting. These activities are discussed in the following subsections.

4.2.1 Drilling Procedures

Drilling activities at SSAs 1, 6, 7, and 15 commenced in late October 1994 and continued to early December 1994. Soil borings were advanced at the SSAs to characterize the subsurface soil, collect soil samples, and facilitate the installation of temporary piezometers for groundwater sampling. Some of the soil borings were only advanced to collect subsurface soil samples (SSAs 6 and 7). A summary of the subsurface soil (soil boring) sampling program at SSAs 1, 6, 7, and 15 describing the sample locations, the sample depth, and analytical methods is provided on Tables 4-5 through 4-8. Figures 4-1 through 4-4 show the locations of the soil borings. Test Boring Records are provided in Appendix A.

Nineteen soil borings were advanced as SSA 1. Nine of the soil borings were advanced by Baker by means of a drill rig and converted into temporary piezometers for groundwater sampling. The remaining soil borings were advanced by OHM Remediation Corp. by hand augering (OHM, 1995).

These hand augured soil borings and confirmatory subsurface soil sampling were completed after the removal action at the SSA.

A total of fourteen soil borings were advanced at SSA 6. Thirteen of the soil borings were advanced using hollow stem auger and split-spoon sampling techniques. Ten of these soil borings were converted into temporary piezometer for groundwater sampling. The remaining soil boring (A06SB11) was advanced by hand augering due to the inaccessibility of the location for a drill rig. This soil boring along with A06SB12 through A06SB14 were advanced within the sludge disposal area.

Six of the twelve soil borings advanced at SSA 7 and were completed by using hollow stem auger and split-spoon sampling techniques. These soil borings were converted into temporary piezometers for groundwater sampling. The remaining six soil borings were advanced around the UST, associated piping, and the former discharge line by hand augering.

A total of four soil borings were advanced at SSA 15 using hollow stem auger and split spoon sampling techniques. The borings were converted into temporary piezometers for groundwater sampling.

4.2.2 Test Pitting Procedures

Test pits were completed at SSAs 6 and 7 in areas of possible buried materials identified by a geophysical survey completed in January 1994 (Figures 4-2 and 4-3). A summary of the subsurface soil sampling for the test pitting program at SSAs 6 and 7 describing the sample locations, the sample depth, and analytical methods is provided on Tables 4-9 and 4-10. In general, test pits were performed as an exploratory excavation to assess the contents of past burial/disposal practices. The depths of the test pits were dependent upon depth of the encountered material and/or depth of encountering natural soil. Test pitting activities were monitored before and during excavating the trench by an ordnance subcontractor with geophysical instruments to direct the backhoe operator in location and depth of each bucket. In general, the buried debris encountered was fill material, metal packing material, construction material, and military debris. Results of the test pitting activities are presented on Table 4-11. The test pits were backfilled with the stockpiled materials (soil and debris) encountered during the excavation.

4.2.3 Soil Sampling

Soil sampling activities at SSA 1, 6, 7, and 15 commenced in late October and continued through early December 1994. Surface (0- to 6-inches bgs) and subsurface (deeper than 6-inches bgs) soil samples were collected for chemical analysis. Surface soil samples were collected for the Risk Assessment (RA) evaluation while subsurface samples were collected to evaluate the horizontal and vertical extent of potentially impacted soil and for the RA evaluation purposes. In addition, confirmatory surface soil samples at SSA 1 were collected by OHM Corporation after the removal action was completed (OHM, 1995). Figures 4-1 through 4-4 depict the locations of the sampling points.

Soil samples were obtained by employing four methods. For the surface soil samples, stainless-steel spoons and aluminum pie pans were utilized to collect and composite the soil. Tables 4-1 through 4-4 summarize the surface soil sample depths, locations, and parameters analyzed. Deeper subsurface soil samples were collected with a split-spoon sampler or by hand augering. Confirmatory subsurface soil samples collected by OHM Corp. (after the removal action) for chemical analysis were obtained from depths of 1- to 2.5- ft bgs (OHM, 1995). The subsurface soil samples collected at the sludge disposal area at SSA 6 (soil borings A06SB11 through A06SB14) were obtained within the first foot bgs and between 2- to 4-feet bgs. The subsurface soil samples collected at SSA 7 around the UST and associated piping were obtained from depths ranging from 3- to 8-feet bgs and were composited from the approximate depth of the piping to 2 feet below the piping. Soil samples collected from test pits (SSAs 6 and 7) were composited from within the disposed material and from below the disposed material. All reusable sampling equipment was decontaminated according to the procedures outlined in Section 4.7.

Soil samples submitted for laboratory analysis were prepared according to USEPA Region III SOPs, the Final work Plan for SSA's 1, 6, 7, and 15 (Baker, 1994b) and the Final Master Project Plans (Baker, 1994a).

The analytical program for the soil investigation is summarized on Tables 4-1 through 4-10.

Specific screening and monitoring requirements are outlined in the Final Work Plan, Health and Safety Plan Addendum (Baker, 1994b).

4.3 Groundwater Investigation

The groundwater sampling program developed for SSAs 1, 6, 7, and 15 was designed to identify COPCs, to determine if former site activities adversely impacted the quality of groundwater, and to consider potential human health and ecological risks associated with the COPCs.

Several types of field QA/QC samples were collected and analyzed during the groundwater investigation including duplicate samples, equipment rinsate blanks, field blanks, and trip blanks. These sample types are defined in Section 4.6.

In general, the field procedures and sampling methods employed for the groundwater investigation were implemented in accordance with USEPA Region III SOPs (Baker, 1994b). These procedures also included sample handling and preservation, documentation, and COC procedures. Specific sampling procedures are outlined in Section 4.0 of the Final Work Plan for SSAs 1, 6, 7, and 15 (Baker, 1994b) and the Final Master Project Plans (Baker, 1994a) for WPNSTA Yorktown.

4.3.1 Temporary Piezometer Installation and Sampling Procedures

The following subsections pertain to the temporary piezometer installation, groundwater sampling procedures, and the analytical requirements for the water samples collected.

4.3.1.1 Temporary Piezometer Installation

Groundwater sampling activities occurred in late October through early December 1994 at SSAs 1, 6, 7, and 15. Temporary piezometers were installed to collect groundwater samples without the installation, development, and materials cost of a monitoring well. In addition, temporary piezometers were utilized to speed sample collection. Temporary piezometer locations are shown in Figures 4-1 through 4-4. Soil borings were advanced with hollow-stem augers (as described in Section 4.2.1) to 5- to 10- feet into the water table. A 2-inch outside diameter (OD) polyvinyl chloride (PVC) 5- or 10- foot screen and a riser was inserted inside the augers down the borehole. The augers were then withdrawn 5- to 10- feet to allow the groundwater to infiltrate the borehole.

4.3.1.2 Groundwater Sampling Procedures

Groundwater samples were collected using disposable polyethylene bailers dedicated to each temporary piezometer. Field measurements of temperature, pH, Eh, and specific conductivity were collected and are presented in Appendix B.

The analytical program for the groundwater investigation is summarized on Tables 4-12 through 4-15.

4.4 Surface Water and Sediment Investigation

Surface water and sediment samples were collected between mid-November to early December 1994 to characterize spatial trends in chemical concentrations and to assess impacts to the streams and the environment in the vicinity of SSAs 1, 7, and 15. The environmental sampling program developed for the SSAs was intended to identify COPCs and evaluate their distribution at the SSAs. A summary of the surface water and sediment sampling program at SSA 1, 7, and 15 describing the sample designations and analytical methods is provided on Tables 4-16 through 4-21. Surface water and sediment locations are presented in Figures 4-1 through 4-4.

Four surface water and sediment samples were collected within the small freshwater intermittent creek at the eastern portion of the SSA. These samples were collected during the removal action conducted by OHM.

Three surface water and four sediment samples were collected within Felgates Creek at SSA 7. Felgates Creek is classified as tidal freshwater.

Two surface water and sediment samples were collected at SSA 15. One sample was collected within the freshwater intermittent creek at the east portion of the SSA and the second sample was collected at the intersection of a storm culvert drainageway and a fresh water intermittent creek that drains to Ballard Creek.

Several types of field QA/QC samples were collected and analyzed during the surface water/sediment investigation including duplicate samples, equipment rinsate blanks, trip blanks, and field blanks. These sample types are defined in Section 4.6.

In general, the field procedures and sampling methods employed for the surface water/sediment investigation were implemented in accordance with USEPA Region III SOPs. Specific sampling procedures are outlined in Section 4.0 of the Final Work Plan for SSAs 1, 6, 7, and 15 (Baker, 1994b). Surface water and sediment sampling forms are provided in Appendix B.

4.4.1 Surface Water Sampling

Surface water sampling locations were identified to characterize upgradient and downgradient conditions within the waterbodies at the SSAs. These sampling locations are presented in Figures 4-1 through 4-4. At all three SSAs the water bodies were less than three feet deep (standing water), therefore, one surface water sample was collected from the upper one foot of water at each sampling station. The downstream water samples were collected first, with subsequent samples taken while moving upstream to reduce the amount of turbidity and cross-contamination in the surface water samples. Sediment samples were collected after the surface water samples to minimize sediment resuspension that might contaminate the water samples.

The analytical program for the surface water investigation is summarized on Tables 4-16 through 4-18.

4.4.2 Sediment Sampling

Sediment samples were collected to characterize upgradient and downgradient site conditions within the water bodies at SSAs 1, 7, and 15. At each surface water sampling location, a surface (0- to 4-inches) and a subsurface (4- to 8-inches) sediment sample was collected. The downstream sediment samples were collected first, with subsequent samples taken while moving upstream. Sediment samples were collected after the surface water samples to minimize sediment resuspension that might contaminate the surface water samples.

At each station, sediment samples were collected using a sediment sleeve. A disposable clear plastic liner tube, fitted with an eggshell catcher to prevent sample loss, was used at each station. The coring sleeve was pushed into the sediment to a depth of 12 inches, or until refusal. The sediment was extruded from the liner into the appropriate sample jars using a decontaminated extruder.

The analytical program for the sediment investigation is summarized on Tables 4-19 to 4-21.

4.6 Quality Assurance/Quality Control Sampling Procedures

Field QA/QC samples were collected during the sampling program. These samples were obtained to: (1) ensure that decontamination procedures were properly implemented (i.e., equipment rinsate blanks); (2) evaluate field methodology (i.e., duplicate samples); (3) establish field background conditions (i.e., field blanks); and, (4) evaluate whether cross-contamination occurred during sampling and/or shipping (i.e., trip blanks). A complete discussion of the QA/QC procedures can be found in the Master Project Plans (Baker, 1994a).

A summary of QA/QC samples collected during this investigation is provided in Tables 4-22 through 4-25.

4.7 Decontamination Procedures

The heavy equipment will be decontaminated by high pressure steam cleaning followed by air drying. The routine sample collection equipment will be decontaminated in accordance with USEPA, Region III guidelines. In general, sampling and drilling equipment were divided into two decontamination groups: heavy equipment and routine sample collection equipment. Heavy equipment included: drill rig, hollow-stem augers, and drill rods; routine sample collection equipment included: split-spoons, stainless-steel spoons, and sediment extruder and nose cone.

4.8 Investigation Derived Waste Management

Solids included soil cuttings and excess split-spoon samples; liquids included decontamination fluids (i.e., water, Liquinox soap solution, methanol, and 5 percent nitric acid).

Containerization and handling of solids were performed in two phases. At the completion of drilling activities, soil was temporarily placed into a backhoe bucket, then transported and emptied into a roll-off box for final containerization. The soil generated at SSAs 1 and 15 was placed into the roll-off box located at SSA 15 and the soil generated at SSAs 6 and 7 was placed into the roll-off box located at SSA 6. Composite samples were then collected from the roll-off box for disposal purposes. The analyses performed were full TCLP and RCRA hazardous waste characteristics.

Liquids generated during the field program also were containerized. Decontamination water generated from the steam cleaning of heavy equipment was containerized in 55-gallon drums. Decontamination water containing acids and solvents used for cleaning small sampling equipment was segregated from the other decontamination water and remained in a 55-gallon steel drum. This liquid included decontamination fluids (i.e., water, Liquinox soap solution, methanol, and 5 percent nitric acid). The drums were stored on wooden pallets until final disposition was decided. Samples of the generated fluids were collected and analyzed for disposal purposes. These analyses included Total Toxic Organics (TTO) which include volatiles, semivolatiles, pesticides, PCBs, and dioxins; TAL inorganics (total only); methane; and pH (measured in the field).

The IDW characterization results and recommended disposal options are provided in Appendix C. On March 8, 1995, the recommended IDW management options were executed. The two roll-off boxes that contained IDW solids (i.e., soil cuttings) generated during this investigation were emptied at SSAs 6 and 15. The IDW solids were subsequently spread over the ground surface and seeded. The empty roll-off boxes were transported from the Station. The 12 drums of IDW liquids were transported to Building 1894 at WPNSTA Yorktown and discharged to the nearby sewer.

Items of personal protective equipment (PPE), such as disposable gloves, Tyvek, and disposable bailers, were decontaminated, if appropriate, and double bagged in plastic bags and placed in the trash dumpster at Baker's Field Trailer.

4.9 References

American Society for Testing and Materials. 1984. Standard Method for Penetration Test and Split-Barrel Sampling of Soils. ASTM Method D1586-84, Annual Book of Standards, ASTM, Philadelphia, Pennsylvania.

Baker Environmental, Inc. 1994a. Final Master Project Plans, Naval Weapons Station Yorktown, Yorktown, Virginia. June 1994.

Baker Environmental, Inc. 1994b. Final Work Plan for Site Screening Areas 1, 6, 7, and 15, Naval Weapons Station Yorktown, Yorktown, Virginia. November 1994.

United States Environmental Protection Agency. 1993. "Solid Waste Management Unit Investigation, Naval Weapons Station, Yorktown, Virginia." December 1993.

United States Environmental Protection Agency. 1992. "Study Area Analysis, Yorktown Naval Weapons Station, Yorktown, Virginia," Volume I. November 1992.

SECTION 4.0 TABLES

TABLE 4-1

SUMMARY OF SURFACE SOIL SAMPLING PROGRAM
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample Location	Number of Samples	Sampling Interval (ft,bgs)	Analytical Parameters
A01SS06	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS07	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS08	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS09	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS10	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS11	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS12	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS13	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS14	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS15	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS16	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS17	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS18	1+Dup	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS19	1+Dup	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS20	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS21	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS22	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS23	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS24	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS25	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS26	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS27	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS28	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS29	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS30	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS31	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS32	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS33	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds

TABLE 4-1 (Continued)

SUMMARY OF SURFACE SOIL SAMPLING PROGRAM
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample Location	Number of Samples	Sampling Interval (ft,bgs)	Analytical Parameters
A01SS34	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS35	1+Dup	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS36	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS37	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS38	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS39	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS40	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS41	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS42	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS43	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS44	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS45	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS46	1+Dup	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS47	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS49	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS50	1+Dup	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS51	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS52	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS53	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS54	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS77	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS78	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS79	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS80	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS86	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS95	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS97	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS98	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds

TABLE 4-1 (Continued)

SUMMARY OF SURFACE SOIL SAMPLING PROGRAM
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample Location	Number of Samples	Sampling Interval (ft,bgs)	Analytical Parameters
A01SS99	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS100	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS103A	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS109	1+Dup	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS110	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS111	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS112	1	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SS113	1+Dup	0-0.5	TCL Organics, TAL Inorganics, & Nitramine Compounds

Notes: bgs = below ground surface
TCL = Target Compound List
TAL = Target Analyte List
Dup = Duplicate sample collected
Surface soil samples collected & analyzed by OHM Remediation Services Corp.

TABLE 4-2

SUMMARY OF SURFACE SOIL SAMPLING PROGRAM
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample Location	Number of Samples	Sampling Interval (ft,bgs)	Analytical Parameters
A06SS01	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS02	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS03	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS04	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS05	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS06	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS07	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS08	1+Dup	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS09	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS10	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS11	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS12	1+Dup	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS13	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS14	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS15	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS16	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS17	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS18	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS19	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS20	1+Dup	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS21	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS22	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS23	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS24	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS25	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS26	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS27	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SS28	1	0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds

Notes: bgs = below ground surface
TCL = Target Compound List
TAL = Target Analyte List
Dup = Duplicate sample collected

TABLE 4-3

SUMMARY OF SURFACE SOIL SAMPLING PROGRAM
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample Location	Number of Samples	Sampling Interval (ft,bgs)	Analytical Parameters
A07SS01	1	0.0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A07SS02	1	0.0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A07SS04	1+Dup	0.0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A07SS05	1	0.0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds

Notes: bgs = below ground surface
TCL = Target Compound List
TAL = Target Analyte List
Dup = Duplicate sample collected

TABLE 4-4

SUMMARY OF SURFACE SOIL SAMPLING PROGRAM
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample Location	Number of Samples	Sampling Intervals (ft,bgs)	Analytical Parameters
A15SS01	1	0.0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A15SS02	1	0.0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A15SS03	1+Dup	0.0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A15SS04	1	0.0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A15SS05	1	0.0-0.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds

Notes: bgs = below ground surface
TCL = Target Compound List
TAL = Target Analyte List
Dup = Duplicate sample collected

TABLE 4-5

SUMMARY OF SUBSURFACE SOIL SAMPLING PROGRAM
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample Location	Depth of Borehole (ft,bgs)	Number of Samples	Sampling Intervals (ft,bgs)	Analytical Parameters
A01SB01	31	1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	9-11	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	23-25	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A01SB02	15	1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	7-9	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	9-11	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A01SB03	9	1+Dup	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	3-5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A01SB04	29	1+Dup	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	5-7	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	11-13	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A01SB05	20	1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	7-9	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	13-15	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A01SB06	18	1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	5-7	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	9-11	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A01SB07	19	1+Dup	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	7-9	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	11-13	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A01SB08	15	1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	5-7	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	7-9	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A01SB09	19	1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	7-9	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	11-13	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds

TABLE 4-5 (Continued)

SUMMARY OF SUBSURFACE SOIL SAMPLING PROGRAM
SSA-1
NAVAL WEAPONS STATION YORKTOWN, VIRGINIA

Sample Location	Depth of Borehole (ft,bgs)	Number of Samples	Sampling Intervals (ft,bgs)	Analytical Parameters
A01SB06A[1]	1.5	1	1-3	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SB016[1]	2	1+Dup	1.5-2.0	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SB017[1]	1.5	1	1-1.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SB018[1]	1.5	1	1-1.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SB026[1]	1.5	1	1-1.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SB033[1]	2	1	1.5-2.0	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SB042[1]	2.5	1	2.0-2.5	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SB053[1]	2	1	1.5-2.0	TCL Organics, TAL Inorganics, & Nitramine Compounds
A01SB054[1]	2	1	1.5-2.0	TCL Organics, TAL Inorganics, & Nitramine Compounds

Notes: bgs = below ground surface
TCL = Target Compound List
TAL = Target Analyte List
Dup = Duplicate sample collected
[1] Subsurface samples collected and analyzed by OHM Remediation Services Corp.

TABLE 4-6

SUMMARY OF SUBSURFACE SOIL SAMPLING PROGRAM
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample Location	Depth of Borehole (ft, bgs)	Number of Samples	Sampling Intervals (ft, bgs)	Analytical Parameters
A06SB01	23	1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	7-9	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	15-17	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SB02	23	1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	7-9	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	11-13	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SB03	23	1+Dup	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	9-11	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	13-15	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SB04	23	1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	9-11	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	15-17	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SB05	23	1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1+Dup	9-11	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	11-13	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SB06	25	1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1+Dup	7-9	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	11-13	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SB07	29	1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	7-9	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	21-23	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SB08	25	1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	7-9	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	17-19	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SB09	32	1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	11-13	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	23-25	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SB10	21	1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	9-11	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	13-15	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds

TABLE 4-6 (Continued)

SUMMARY OF SUBSURFACE SOIL SAMPLING PROGRAM
SSA 6
NAVAL WEAPONS STATION YORKTOWN, VIRGINIA
YORKTOWN, VIRGINIA

Sample Location	Depth of Borehole (ft, bgs)	Number of Samples	Sampling Intervals (ft, bgs)	Analytical Parameters
A06SB11	3	1+Dup	0.5-1	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	2-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SB12	5	1	0.5-1	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SB13	5	1	0.5-1	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06SB14	4	1	0.5-2	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	2-4	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds

Notes: bgs = below ground surface
TCL = Target Compound List
TAL = Target Analyte List
Dup = Duplicate sample collected

TABLE 4-7

SUMMARY OF SUBSURFACE SOIL SAMPLING PROGRAM
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample Location	Depth of Borehole (ft,bgs)	Number of Samples	Sampling Intervals (ft,bgs)	Analytical Parameters
A07SB01	27	1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	9-11	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	19-21	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A07SB02	26	1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	11-13	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	17-19	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A07SB03	27	1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	9-11	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	19-21	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A07SB04	22	1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	11-13	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	15-17	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A07SB05	28	1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1+Dup	9-11	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	19-21	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A07SB06	27	1+Dup	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	9-11	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	15-17	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A07HA01 (1)		1	3-5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A07HA02 (1)		1	3-5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A07HA03 (1)		1	3-5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A07HA04 (1)		1	3-5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A07HA05 (1)		1	3-5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A07HA06 (1)		1+Dup	6-8	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds

Notes: bgs = below ground surface
TCL = Target Compound List
TAL = Target Analyte List
Dup = Duplicate sample collected
(1) Soil borings which were hand augered around UST piping and former discharge line to Felgates Creek.

TABLE 4-8

SUMMARY OF SUBSURFACE SOIL SAMPLING PROGRAM
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample Location	Depth of Borehole (ft,bgs)	Number of Samples	Sampling Intervals (ft,bgs)	Analytical Parameters
A15SB01	27	1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	5-7	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	21-23	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A15SB02	27	1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	11-12	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	19-21	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A15SB03	29	1+Dup	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	9-11	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	21-23	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A15SB04	27	1	1-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1+Dup	9-11	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
		1	21-23	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds

Notes: bgs = below ground surface
TCL = Target Compound List
TAL = Target Analyte List
Dup = Duplicate sample collected

TABLE 4-9

SUMMARY OF TEST PIT SOIL SAMPLING PROGRAM
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample Location	Number of Samples	Sampling Intervals (ft,bgs)	Analytical Parameters
A06TP01	1	0-2	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
	1	3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06TP02	1	1-9	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
	1	13	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06TP03	1	0-4	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
	1	4.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06TP04	1	0-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
	1	3-4	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06TP05	1	0-2	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
	1	2-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06TP06	1	2-3	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
	1	4-6	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06TP07	1	0-4	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
	1	4	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A06TP08[1]	0	--	--
	0	--	--
A06TP09	1	0-2.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
	1+Dup	2.5-4	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds

Notes: [1] Because no rocket motor was found, no samples were collected.
bgs = below ground surface
TCL = Target Compound List
TAL = Target Analyte List
Dup = Duplicate sample collected

TABLE 4-10

SUMMARY OF TEST PIT SOIL SAMPLING PROGRAM
SSA 7
NAVAL WEAPONS STATION YORKTOWN, VIRGINIA
YORKTOWN, VIRGINIA

Sample Location	Number of Samples	Sampling Interval (ft,bgs)	Analytical Parameters
A07TP01	1	0-2	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
	1	4	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A07TP02	1	0-8.5	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
	1	9	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A07TP03	1	0-4	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
	1+Dup	4	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds

Notes: bgs = below ground surface
TCL = Target Compound List
TAL = Target Analyte List
Dup = Duplicate sample collected

TABLE 4-11

SUMMARY OF TEST PIT FINDINGS
SSAs 6 AND 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	Test Pit Number	Depth (feet bgs)	Material Encountered
SSA 6	A06TP01	3	Metal banding
	A06TP02	13	Misc. metal debris
	A06TP03	4.5	Ordnance debris-inert deteriorating/activating devices & rocket motor casing. Misc. debris-brick, concrete, & parachute.
	A06TP04	4	Metal debris-banding & wire
	A06TP05	2	Metal pipe
	A06TP06	6	Metal debris-grating & wire
	A06TP07	4	Fill material, no debris
	A06TP08[1][2]	1.5	Metal banding & strapping
	A06TP09[2]	4	Fill material, no debris
SSA 7	A07TP01	4	Depth bomb casing
	A07TP02	9	Mine casings
	A07TP03	4	Cinder material

(1) No rocket engines were encountered; sample not collected.
(2) Test pit location identified by Station employee.

TABLE 4-12

SUMMARY OF GROUNDWATER SAMPLING PROGRAM
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample Location	Depth of Piezometer (ft, bgs)	Number of Samples	Analytical Parameters
A01HP01	31	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A01HP02	15	1+Dup	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A01HP03	9	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A01HP04	29	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A01HP05	20	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A01HP06	18	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A01HP07	19	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A01HP08	15	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A01HP09	19	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance

Notes: bgs = below ground surface
TCL = Target Compound List
TAL = Target Analyte List
Dup = Duplicate sample collected

TABLE 4-13

SUMMARY OF GROUNDWATER SAMPLING PROGRAM
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample Location	Depth of Piezometer (ft, bgs)	Number of Samples	Analytical Parameters
A06HP01	23	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A06HP02	23	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A06HP03	23	1+Dup	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A06HP04	23	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A06HP05	21	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A06HP06	25	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A06HP07	29	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A06HP08	25	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A06HP09	32	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A06HP10	21	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance

Notes: bgs = below ground surface
TCL = Target Compound List
TAL = Target Analyte List
Dup = Duplicate sample collected

TABLE 4-14

SUMMARY OF GROUNDWATER SAMPLING PROGRAM
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample Location	Depth of Piezometer (ft, bgs)	Number of Samples	Analytical Parameters
A07HP01	27	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A07HP02	26	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A07HP03	27	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A07HP04	22	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A07HP05	28	1+Dup	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A07HP06	27	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance

Notes: bgs = below ground surface
TCL = Target Compound List
TAL = Target Analyte List
Dup = Duplicate sample collected

TABLE 4-15

SUMMARY OF GROUNDWATER SAMPING PROGRAM
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample Location	Depth of Borehole (ft, bgs)	Number of Samples	Analytical Parameters
A15HP01	27	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A15HP02	27	1+Dup	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A15HP03	29	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance
A15HP04	27	1	TCL Organics, TAL Inorganics (total & dissolved), Nitramine Compounds, pH, Temperature, & Specific Conductance

Notes: bgs = below ground surface
TCL = Target Compound List
TAL = Target Analyte List
Dup = Duplicate sample collected

TABLE 4-16

SUMMARY OF SURFACE WATER SAMPLING PROGRAM
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample Location	Number of Samples	Analytical Parameters
A01SW01	1	TCL Organics, TAL Inorganics (total), Nitramine Compounds, Hardness, pH, Temperature, Specific Conductance & D.O.[1]
A01SW02	1+Dup	TCL Organics, TAL Inorganics (total), Nitramine Compounds, Hardness, pH, Temperature, Specific Conductance & D.O.[1]
A01SW03	1	TCL Organics, TAL Inorganics (total), Nitramine Compounds, Hardness, pH, Temperature, Specific Conductance& D.O.[1]
A01SW04	1	TCL Organics, TAL Inorganics (total), Nitramine Compounds, Hardness, pH, Temperature, Specific Conductance & D.O.[1]

Notes: bgs = below ground surface
TCL = Target Compound List
TAL = Target Analyte List
Dup = Duplicate sample collected
D.O. = Dissolved oxygen
[1] pH, temperature, specific conductance, and dissolved oxygen were measurements taken in the field.

TABLE 4-17

SUMMARY OF SURFACE WATER SAMPLING PROGRAM
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample Location	Number of Samples	Analytical Parameters
A07SW01	1+Dup	TCL Organics, TAL Inorganics (total), Nitramine Compounds, pH, Temperature, & Specific Conductance
A07SW02	1	TCL Organics, TAL Inorganics (total), Nitramine Compounds, pH, Temperature, Specific Conductance, Salinity & D.O.
A07SW03	1	TCL Organics, TAL Inorganics (total), Nitramine Compounds, pH, Temperature, Specific Conductance, Salinity & D.O.

Notes: TCL = Target Compound List
TAL = Target Analyte List
Dup = Duplicate sample collected
D.O. = Dissolved Oxygen

TABLE 4-18

SUMMARY OF SURFACE WATER SAMPLING PROGRAM
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample Location	Number of Samples	Analytical Parameters
A15SW01	1	TCL Organics, TAL Inorganics (total), Nitramine Compounds, Hardness, pH, Temperature, Specific Conductance & D.O.
A15SW02	1+Dup	TCL Organics, TAL Inorganics (total), Nitramine Compounds, Hardness, pH, Temperature, Specific Conductance & D.O.

Notes: bgs = below ground surface
TCL = Target Compound List
TAL = Target Analyte List
Dup = Duplicate sample collected
D.O. = Dissolved oxygen

TABLE 4-19

SUMMARY OF SEDIMENT SAMPLING PROGRAM
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample Location	Number of Samples	Sampling Intervals (ft,bgs)	Analytical Parameters
A01SD01	1	0.00-0.33	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
	1	0.33-0.67	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A01SD02	1	0.00-0.33	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
	1	0.33-0.67	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A01SD03	1+Dup	0.00-0.33	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
	1	0.33-0.67	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A01SD04	1	0.00-0.33	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
	1	0.33-0.67	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds

Notes: bgs = below ground surface
TCL = Target Compound List
TAL = Target Analyte List
Dup = Duplicate sample collected

TABLE 4-20

SUMMARY OF SEDIMENT SAMPLING PROGRAM
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample Location	Number of Samples	Sampling Interval (ft,bgs)	Analytical Parameters
A07SD01	1+Dup	0.00-0.33	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
	1	0.33-0.67	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A07SD02	1	0.00-0.33	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
	1	0.33-0.67	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A07SD03	1	0.00-0.33	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
	1	0.33-0.67	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A07SD04	1	0.00-0.33	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
	1	0.33-0.67	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds

Notes: bgs = below ground surface
TCL = Target Compound List
TAL = Target Analyte List
Dup = Duplicate sample collected

TABLE 4-21

SUMMARY OF SEDIMENT SAMPLING PROGRAM
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample Location	Number of Samples	Sampling Intervals (ft,bgs)	Analytical Parameters
A15SD01	1	0.00-0.33	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
	1	0.33-0.67	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
A15SD02	1+Dup	0.00-0.33	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds
	1	0.33-0.67	TCL Organics, TAL Inorganics, pH, & Nitramine Compounds

Notes: bgs = below ground surface
TCL = Target Compound List
TAL = Target Analyte List
Dup = Duplicate sample collected

TABLE 4-22

SUMMARY OF FIELD QA/QC SAMPLING PROGRAM
FOR ALL MEDIA
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

QA/QC Samples[1]	Frequency of Collection	Number of Samples	Analytical Parameters
Trip Blanks[2]	One per Cooler	7	TCL Volatiles
Field Blanks	One per Month[3][4]	3	TCL Organics/TAL Inorganics & Nitramine Compounds
Equipment Rinsates	One per Day	5	TCL Organics/TAL Inorganics & Nitramine Compounds
Field Duplicates	10% of Sample Frequency	6	TCL Organics/TAL Inorganics & Nitramine Compounds

Notes:
(1) QA/QC sample types defined in text.
(2) Trip blanks submitted with coolers which contained samples for volatile analysis. Samples analyzed for TCL Volatiles only.
(3) Field blank collected for laboratory supplied deionized water, store bought distilled water, and truck-mounted rig.
(4) Field program was slightly longer than one month therefore, only one field blank was collected.

TABLE 4-23

SUMMARY OF FIELD QA/QC SAMPLING PROGRAM
FOR ALL MEDIA
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

QA/QC Samples[1]	Frequency of Collection	Number of Samples	Analytical Parameters
Trip Blanks[2]	One per Cooler	12	TCL Volatiles
Field Blanks	One per Month[3][4]	3	TCL Organics/TAL Inorganics & Nitramine Compounds
Equipment Rinsates	One per Day	9	TCL Organics/TAL Inorganics & Nitramine Compounds
Field Duplicates	10% of Sample Frequency	9	TCL Organics/TAL Inorganics & Nitramine Compounds

Notes:
(1) QA/QC sample types defined in text.
(2) Trip blanks submitted with coolers which contained samples for volatile analysis. Samples analyzed for TCL Volatiles only.
(3) Field blank collected for laboratory supplied deionized water, store bought distilled water, and truck-mounted rig.
(4) Field program was slightly longer than one month therefore, only one field blank was collected.

TABLE 4-24

SUMMARY OF FIELD QA/QC SAMPLING PROGRAM
FOR ALL MEDIA
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

QA/QC Samples[1]	Frequency of Collection	Number of Samples	Analytical Parameters
Trip Blanks[2]	One per Cooler	15	TCL Volatiles
Field Blanks	One per Month[3][4]	3	TCL Organics/TAL Inorganics & Nitramine Compounds
Equipment Rinsates	One per Day	8	TCL Organics/TAL Inorganics & Nitramine Compounds
Field Duplicates	10% of Sample Frequency	8	TCL Organics/TAL Inorganics & Nitramine Compounds

Notes:
(1) QA/QC sample types defined in text.
(2) Trip blanks submitted with coolers which contained samples for volatile analysis. Samples analyzed for TCL Volatiles only.
(3) Field blank collected for laboratory supplied deionized water, store bought distilled water, and truck-mounted rig.
(4) Field program was slightly longer than one month therefore, only one field blank was collected.

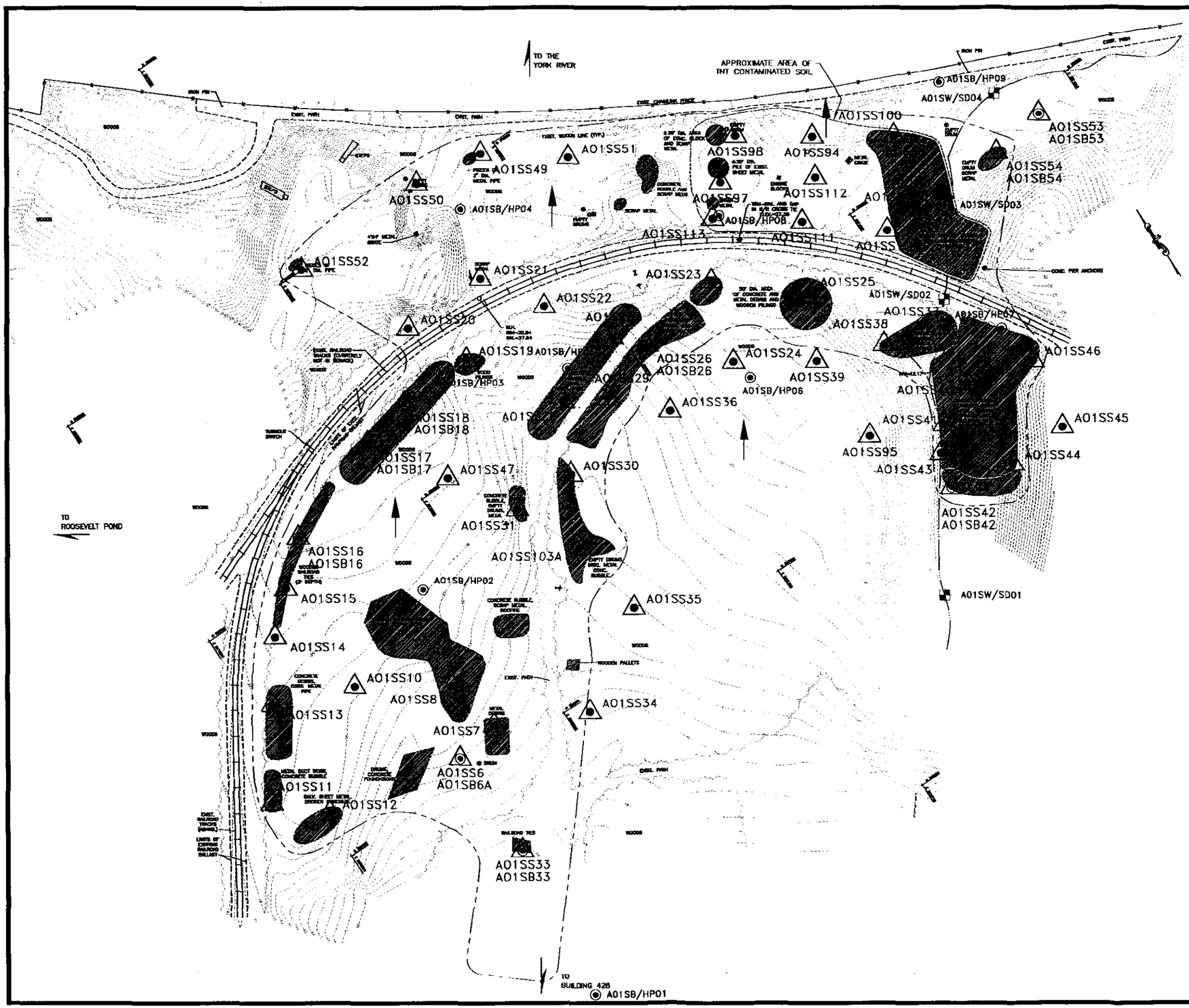
TABLE 4-25

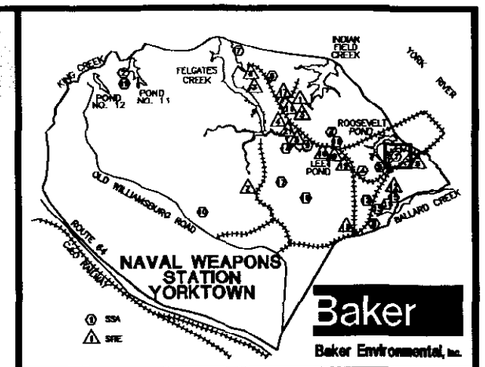
SUMMARY OF FIELD QA/QC SAMPLING PROGRAM
FOR ALL MEDIA
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

QA/QC Samples[1]	Frequency of Collection	Number of Samples	Analytical Parameters
Trip Blanks[2]	One per Cooler	5	TCL Volatiles
Field Blanks	One per Month[3][4]	3	TCL Organics/TAL Inorganics & Nitramine Compounds
Equipment Rinsates	One per Day	4	TCL Organics/TAL Inorganics & Nitramine Compounds
Field Duplicates	10% of Sample Frequency	6	TCL Organics/TAL Inorganics & Nitramine Compounds

Notes:
(1) QA/QC sample types defined in text.
(2) Trip blanks submitted with coolers which contained samples for volatile analysis. Samples analyzed for TCL Volatiles only.
(3) Field blank collected for laboratory supplied deionized water, store bought distilled water, and truck-mounted rig.
(4) Field program was slightly longer than one month therefore, only one field blank was collected.

SECTION 4.0 FIGURES





100 0 50 100

1 inch = 100 ft.

LEGEND

- WOODS
- CHAIN LINK FENCE
- RAILROAD TRACKS
- DITCH OR SWALE
- EDGE OF PAVEMENT
- STRUCTURE
- LOCATION OF SURFICIAL DEBRIS PILES
- A01SB/HP01 — SOIL BORING/TEMPORARY PIEZOMETER LOCATION
- A01SW/SD01 — SURFACE WATER/SEDIMENT SAMPLE
- SITE SCREENING AREA BOUNDRY
- ASSUMED GROUNDWATER FLOW DIRECTION
- GROUNDSURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)
- A01SS16 A01SB16 — SURFACE SOIL AND SUBSURFACE SOIL SAMPLES COLLECTED BY OHM CORPORATION
- A01SS7 — SURFACE SOIL SAMPLES COLLECTED BY OHM CORPORATION

NOTE:

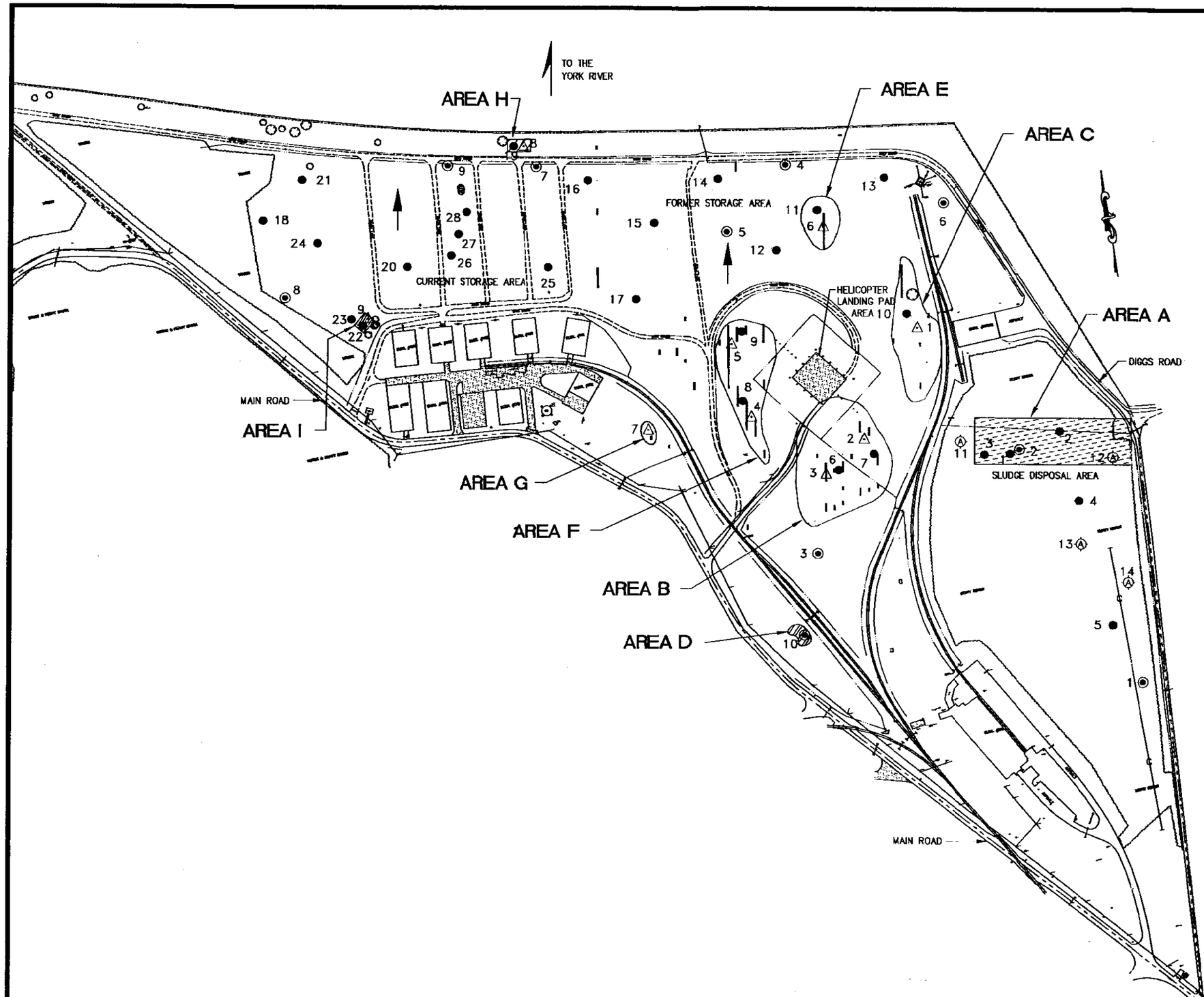
SURFACE SOIL SAMPLES AND SOME SUBSURFACE SOIL SAMPLES WERE COLLECTED AS PART OF REMOVAL ACTION ACTIVITIES.

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 228215SS

FIGURE 4-1

SAMPLE LOCATIONS
SSA1 - BUILDING 428 TEAGUE ROAD DISPOSAL AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



300 0 150 300
1 inch = 300 ft.

LEGEND

- CONCRETE
- WOODS
- DIRT ROAD
- TREE
- RAILROAD TRACKS
- DITCH OR SWALE
- EDGE OF PAVEMENT
- STRUCTURE
- BURIED METALLIC OBJECT/DEBRIS
- APPROXIMATE LIMITS OF DISPOSAL AREAS EXHIBITING GREATER AMOUNTS OF DEBRIS. TYPICAL DEPTH RANGE OF 0-3' AS DETERMINED FROM RADAR DATA.
- APPROXIMATE AREA OF BLACK SLUDGE-LIKE MATERIAL
- APPROXIMATE AREA OF UNIDENTIFIED BURIED MATERIALS
- APPROXIMATE AREA OF BURIED ROCKET ENGINES
- APPROXIMATE EXTENT OF FORMER SLUDGE DISPOSAL AREA
- -C——C- GEOPHYSICAL TRAVERSE EXHIBITING HIGH CONDUCTIVITY
- 1 SOIL BORING/HydroPunch™ LOCATION
- 2 SOIL BORING
- 3 TEST PIT LOCATION
- 4 SURFACE SOIL SAMPLE LOCATION
- SITE SCREENING AREA BOUNDRY
- ASSUMED GROUNDWATER FLOW DIRECTION

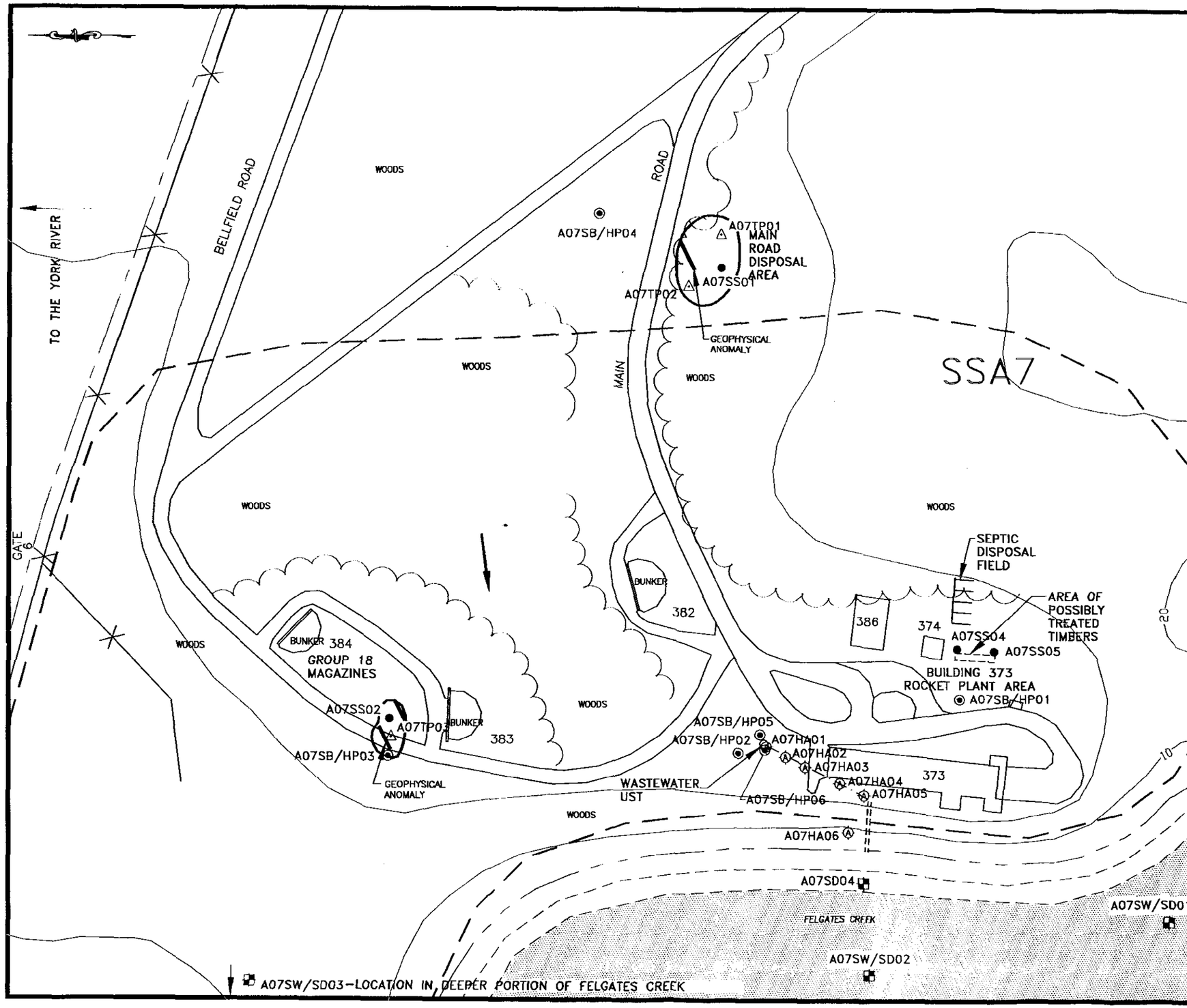
NOTE:
ALL SAMPLE NUMBERS WILL BE IDENTIFIED WITH THE FOLLOWING PREFIXES:

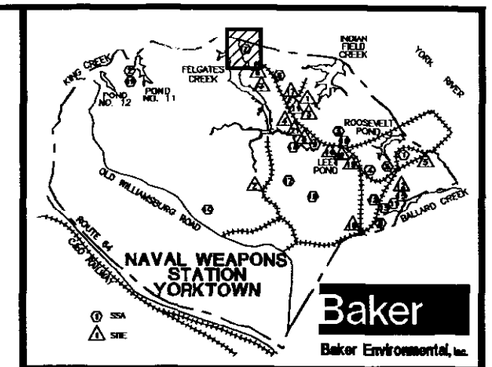
A06HP - HydroPunch™ SAMPLES
A06SS - SURFICIAL SOIL SAMPLES
A06SB - SUBSURFACE SOIL SAMPLES

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 22821855

FIGURE 4-2
SAMPLE LOCATIONS
SSA 6
AVIATION FIELD AND ENVIRONS

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA





100 0 50 100
1 inch = 100 ft.

LEGEND

- WOODS
- FENCE
- EDGE OF PAVEMENT
- STRUCTURE
- APPROXIMATE LIMITS OF DISPOSAL AREAS EXHIBITING GREATER AMOUNTS OF DEBRIS. TYPICAL DEPTH RANGE OF 0–4' AS DETERMINED FROM RADAR DATA.
- SITE SCREENING AREA BOUNDARY
- BUILDING 373 FORMER DISCHARGE LINE
- BUILDING 373 FORMER UST PIPING
- 20 GROUND SURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)

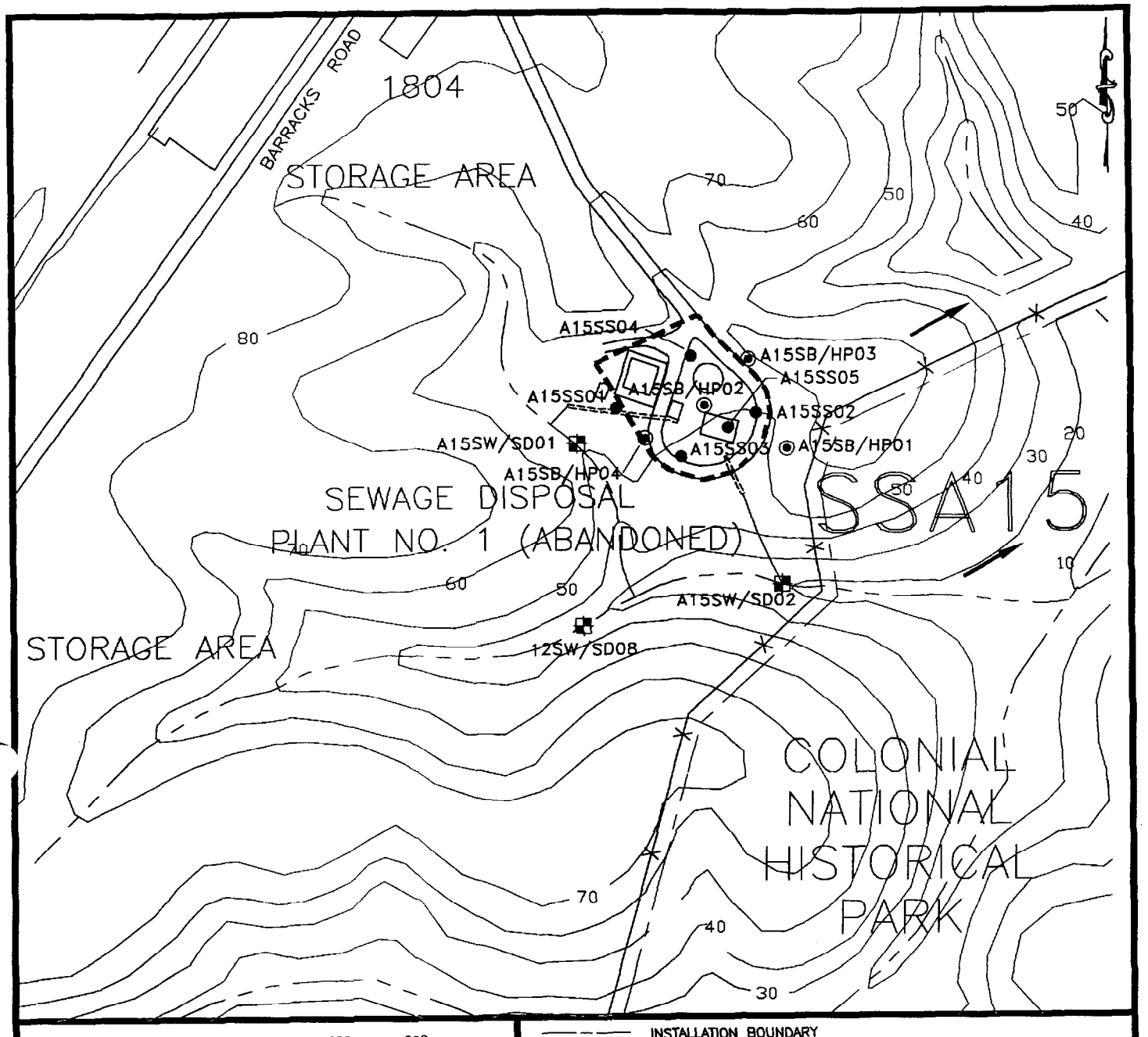
PROPOSED SAMPLING LOCATIONS

- A07SB/HP01 — SOIL BORING/HYDROPUNCH LOCATION
- A07SW/SD03 — SURFACE WATER/SEDIMENT SAMPLE LOCATION
- A07TP01 — TEST PIT LOCATION
- A07SS01 — SURFACE SOIL SAMPLE LOCATION
- A07HA05 — HAND AUGER LOCATION
- ASSUMED GROUNDWATER FLOW DIRECTION

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 22021SSS

FIGURE 4-3
SAMPLE LOCATIONS
SSA 7–BUILDING 373 ROCKET PLANT AREA/GROUP 18 MAGAZINES/ MAIN ROAD DISPOSAL AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



200 0 100 200

1 inch = 200 ft.

INSTALLATION BOUNDARY

DRAINAGE

EDGE OF PAVEMENT

SITE SCREEENING AREA BOUNDRY

FENCE

STRUCTURE

APPROXIMATE LOCATION OF SEWAGE TREATMENT PLANT DISCHARGE LINE

12SW/SD08

A15SW/SD01 SURFACE WATER/ SEDIMENT SAMPLE LOCATION

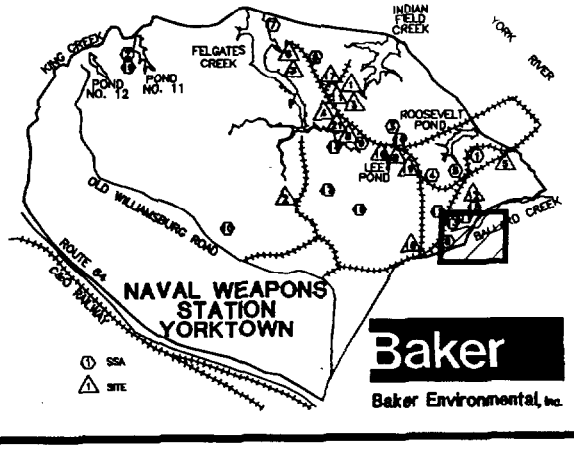
A15SB/HP01 SOIL BORING/ HYDROPUNCH LOCATION

A15SS01 SURFACE SOIL SAMPLE LOCATION

ASSUMED GROUNDWATER FLOW DIRECTION

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994.

228214SS



Baker

Baker Environmental, Inc.

FIGURE 4-4

SAMPLE LOCATIONS

SSA 15-SEWAGE TREATMENT PLANT #1/

SLUDGE DRYING BEDS AND DISCHARGE AREA

NAVAL WEAPONS STATION YORKTOWN

YORKTOWN, VIRGINIA

5.0 NATURE AND EXTENT OF CONTAMINATION

This section presents chemical analytical results obtained as part of the SSP performed at SSAs 1, 6, 7, and 15. The objectives of this section are to characterize the nature and delineate the extent of potential contamination in the investigated media at each SSA. The SSP was conducted through sample collection and analysis of the following environmental media: soil, groundwater, surface water, and sediment.

The analytical results are presented in two groups. Non-site related analytical results (laboratory blanks) are presented in Section 5.1. Environmental investigation analytical results, presented in Section 5.2, include results of the soil, groundwater, surface water, and sediment investigations. Section 5.3 describes the extent to which contaminants have migrated from possible source areas and the potential for future migration.

Appendices D through G present the COC forms, sampling summary, analytical laboratory results, and QA/QC results, respectively. Appendix M presents analytical and validation summaries for surface and subsurface samples collected by OHM Remedial Services Corporation. Figures 5-1 through 5-39 provide a graphical depiction of organic and inorganic contaminants as they occur in the various media throughout the SSAs. Positive detections of organic compounds and inorganic analytes according to media are presented in summary tables included at the end of this section (Tables 5-1 through 5-42).

This investigation has been conducted because previous site operations may have impacted environmental media at SSAs 1, 6, 7, and 15. This has been documented through site records, environmental sampling, and historical aerial photographs. The general areas of concern at SSAs 1, 6, 7, and 15 include:

- SSA 1 — Debris Disposal Areas
- SSA 6 — Current Storage Area, Sludge Disposal Area, Areas of Geophysical Anomalies

- SSA 7 Mine Casing Disposal Areas and the Wastewater UST
- SSA 15 Sludge Beds and Discharges from Sewage Treatment Plant

These are discussed in greater detail in Section 2.0.

This section presents the results of the laboratory analysis performed on samples collected as part of the Site Screening Process. Analytical parameters can be segregated into two broad categories: TCL organics (plus nitramine compounds) and TAL inorganics.

The organic parameters, for which samples were analyzed, are not expected to occur naturally at the SSAs. The organics detected in these samples can be attributed to either contamination from site operations or to sampling/laboratory contamination. Laboratory contaminants are discussed in Section 5.1.1. Common laboratory contaminants include acetone, 2-butanone, methylene chloride, and phthalate esters (USEPA, 1989).

Unlike organics, many of the inorganic parameters, for which environmental samples were analyzed, do occur naturally. For example, lead is an element that occurs naturally in most soil (in low concentrations) but also is considered a contaminant if its concentration is well above background levels and its presence can be attributable to site operations (e.g., lead from lead based paints or batteries). In addition, some inorganic constituents are considered to be essential human nutrients and will not be addressed in this section. These nutrients typically include calcium, iron, magnesium, potassium and sodium (USEPA, 1989). In order to accurately present the nature and extent of inorganic contamination at the SSAs, those detected inorganic parameters that are naturally occurring were segregated from those that could be attributed to site operations. Naturally occurring inorganic elements in soil, groundwater, surface water, and sediment are discussed in the following subsections.

5.1 Non-Site-Related Analytical Results

Many of the organic compounds and inorganic constituents detected in the various environmental media investigations are attributable to non-site related conditions. Two general sources of this

include sampling/laboratory (blank) contaminants and the presence of naturally occurring constituents.

5.1.1 Laboratory Contaminants

Blank samples provide a measure of contamination that has been introduced into a sample set during the collection, transportation, preparation, and/or analysis of environmental samples. The concentrations of chemicals detected in blanks were compared with concentrations of the same chemicals detected in environmental samples.

Common laboratory contaminants (i.e., acetone, 2-butanone, methylene chloride, and phthalate esters) are considered by USEPA as positive results only when concentrations in the environmental sample exceeded ten times the concentration detected in any blank. If the concentration of a common laboratory contaminant in an environmental sample was less than ten times the associated blank concentration, then it was concluded that the chemical was not detected in that particular sample (USEPA, 1989). Because of the complexity of associating the presence of laboratory or sampling induced contamination with concentrations detected in environmental samples, maximum detected concentrations of laboratory or sampling induced contaminants detected in blanks were used in the evaluation. The maximum concentrations (in µg/L) of common laboratory contaminants detected in blanks during this investigation are as follows:

- Acetone 27,000
- Methylene Chloride 38
- 2-Butanone 10 J
- bis-(2-Ethylhexyl)phthalate 9 J
- Di-n-butylphthalate 11
- Diethylphthalate 9 J

The "J" qualifier indicates that the reported sample concentration value has been estimated. Organic contaminants detected in laboratory blanks but not considered to be common laboratory contaminants also were evaluated. In general, all organic compounds at less than five times the maximum level of contamination noted in any blank cannot be attributed specifically to the site. The maximum concentration (in µg/L) of all other detected blank contaminants are as follows:

- Chloroform 7
- 1, 2-Dichloroethane 0.6 J
- 1, 1, 1-Trichloroethane 18
- 1, 1, 2, 2-Tetrachloroethane 1 J
- Chlorobenzene 1 J
- Ethylbenzene 1 J
- Toluene 1 J
- Styrene 1 J
- Aldrin 0.022 J
- 2, 4, 6-TNT 0.84

All possible laboratory contaminants are listed in Table 5-1. These compounds are presented in the positive detection summary tables in this section, however, they are not included in the figures (Figures 5-1 through 5-39).

5.2 Environmental Investigation Analytical Results

The following subsections present analytical results for samples collected during the Site Screening Process at SSAs 1, 6, 7, and 15. Analytical results are presented for the:

- Soil investigation
- Groundwater investigation
- Surface water investigation
- Sediment investigation

Blank contaminants and essential nutrients detected in the various samples are not discussed in this section. As discussed earlier, essential nutrients (calcium, iron, magnesium, potassium, and sodium) are included on the positive detection tables, but are not presented on the positive detection figures. Compounds detected at concentrations less than the concentration of comparison for the blank samples are considered to be non-detections. In order to minimize the number of contaminants, only the most significant chemicals (i.e., toxic or most prevalent) will be presented on figures. Furthermore, polycyclic aromatic hydrocarbons (PAHs) will be expressed as potentially

carcinogenic PAHs (cPAHs) which include benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, indeno(1,2,3-c,d)pyrene and dibenz(a,h)anthracene, and noncarcinogenic PAHs (nPAHs), which include naphthalene pyrene, fluoranthene, etc. Table 5-1A presents a complete list of the carcinogenic and noncarcinogenic PAHs. Figures 5-1 through 5-39 present the PAHs as carcinogens (cPAH) and noncarcinogens (nPAH). Phthalates that were detected in environmental samples but were not detected in blank samples (i.e., butylbenzyl phthalate) are included in the positive detection tables and figures. However, because phthalates are typically associated with laboratory or sampling activities, they are not discussed in the text.

5.2.1 SSA 1- Investigative Results

The following subsections present analytical results for samples collected during the Site Screening Process at SSA 1. Results are presented for soil, groundwater, surface water, and sediment investigations.

5.2.1.1 Surface Soil Results

Sixty-four surface soil samples were collected at SSA 1 by OHM Remediation Services Corporation, after the removal action. Positive detection summaries for both organic compounds and inorganic elements in surface soil are presented in Tables 5-2 and 5-3, provided at the end of this section. The complete surface soil analytical results are presented in Appendix F.

Figure 5-1 presents the organic compounds which were detected. Ten VOCs were detected at relatively low concentrations. Excluding laboratory contaminants carbon disulfide, trichloroethylene, benzene, and methyl-iso-butyl ketone, VOCs were detected at relatively low concentrations. Twenty-six SVOCs were detected within the sample set. Both cPAHs and nPAHs were detected throughout the SSA in areas where concrete rubble, wood piling, and other debris were removed comprised the majority of the SVOCs detected. Relatively low levels of pesticides and nitramine compounds were also detected.

Figure 5-2 presents the inorganic elements which were detected. All nineteen inorganics analyzed were detected in surface soil samples. These inorganic elements include: aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, vanadium, zinc, and cyanide.

5.2.1.2 Subsurface Soil Results

Thirty-nine subsurface soil samples (including duplicates) were collected at the eighteen soil boring locations throughout the SSA. Complete analytical results are presented in Appendix F.

Table 5-4 presents the organic analytical results for these samples. These results are graphically presented on Figure 5-3. Excluding laboratory contaminants, the samples had detectable concentration of two VOCs (trichloroethene and tetrachloroethene). Twenty-one SVOCs were detected within the sample set which included three phthalate laboratory contaminants. The majority of the SVOCs detected were PAHs. Relatively low concentrations of six pesticide, one PCB and two nitramine compounds were also detected within the sample set.

Table 5-5 and Figure 5-4 present the inorganic elements which were detected. Sixteen of 19 inorganics analyzed were detected in subsurface soil samples. Antimony, selenium, and silver were not detected within the sample set.

5.2.1.3 Groundwater Results

Groundwater samples were collected from nine temporary piezometers installed at the SSA during this investigation. The detected concentrations for total inorganic elements may be biased (high) as these groundwater samples have very high sediment content (i.e., turbid).

The organic analytical results are presented on Table 5-6. Figure 5-5 graphically presents the organic compounds which were detected at SSA 1. There were no VOCs, SVOCs, pesticides, or PCB compounds detected in the groundwater samples. Three nitramine compounds (RDX, 2,4,6-Trinitrotoluene, and 4-Amino-2,6-Dinitrotoluene) were detected in one sample.

Sixteen of 19 total inorganics analyzed were detected in the groundwater samples. Silver, thallium, and cyanide were not detected within the total inorganics sample set. Seven of 18 dissolved inorganics analyzed for were detected in the groundwater samples. Aluminum, barium, copper, manganese, thallium, vanadium, and zinc were detected in the dissolved inorganics sample set. Table 5-7 presents the total and dissolved inorganic analytical results. Figure 5-6 presents the

inorganic elements which were detected. The complete groundwater analytical results are presented in Appendix F.

5.2.1.4 Surface Water Results

Positive detection summaries for both organic compounds and inorganic elements in surface water are presented in Tables 5-8 and 5-7, provided at the end of this section. Five surface water samples were collected from an unnamed freshwater stream at SSA 1 during this investigation. Analytical results from surface water samples collected do not indicate the presence of VOC, SVOC, pesticide, or PCB contamination. Relatively low concentrations of two nitramine compounds were detected in the samples collected (see Figure 5-7). Hardness results for surface water samples are presented in Table 5-10. The complete surface water analytical results are presented in Appendix F.

Table 5-9 and Figure 5-8 present the inorganic elements which were detected in surface water at SSA 1. Fifteen of 19 total inorganics analyzed were detected in the surface water samples. Antimony, selenium, silver, and cyanide were not detected within the total inorganics sample set.

5.2.1.5 Sediment Results

Table 5-11 and Figure 5-9 present the organic compounds which were detected. Nine sediment samples were collected from four locations , one at 0- to 4-inches bgs and one at 4- to 8-inches bgs, during this investigation. Eleven SVOCs, which included three phthalate laboratory contaminants and eight PAHs, and five pesticide compounds were detected for these samples. There were no VOCs, PCBs, or nitramine compounds detected in any of the sediment samples. The complete sediment analytical results are presented in Appendix F.

Table 5-12 and Figure 5-10 present the inorganic elements which were detected. Fifteen of 19 inorganics analyzed were detected in sediment samples. Aluminum, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, thallium, vanadium and zinc were the elements detected within the sample set.

5.2.2 SSA 6- Investigative Results

The following subsections present analytical results for samples collected during the Site Screening Process at SSA 6. Results are presented for soil and groundwater investigations.

5.2.2.1 Surface Soil Results

Thirty-one surface soil samples were collected at SSA 6 during this investigation. Positive detection summaries for both organic compounds and inorganic elements in surface soil are presented in Tables 5-13 and 5-14, provided at the end of this section. The pH for these soil samples also is presented on these tables. The complete surface soil analytical results are presented in Appendix F.

Figure 5-11 presents the organic compounds which were detected. Excluding the laboratory contaminants, three VOCs (tetrachloroethene, toluene and chlorobenzene) were detected at relatively low levels. Sixteen SVOCs, mostly comprised of PAHs, were detected within the sample set. Finally, thirteen pesticide and two PCB compounds were detected throughout the SSA.

Figure 5-12 presents the inorganic elements which were detected. Eighteen of 19 inorganics analyzed were detected in surface soil samples. Thallium was the only element not detected within the sample set.

5.2.2.2 Subsurface Soil Results

The subsurface soil investigation included environmental samples collected from soil borings and test pits for SSA 6.

Soil Borings

Fourteen soil borings were advanced at SSA 6. Three subsurface soil samples were collected from each soil boring for a total of forty-two samples during this investigation (1-3 bgs, just above the water table, and a midpoint sample). Table 5-15 presents the organic compounds which were detected. These results are presented graphically on Figure 5-13. Excluding laboratory contaminants relatively low concentrations of two VOCs (1,1,2,2-tetrachloroethane and total

xylenes), one SVOC (excluding three laboratory contaminants) and thirteen pesticide compounds were detected within the sample set. In addition, five nitramine compounds were detected. There were no PCBs detected in any of these subsurface soil samples. The complete subsurface soil analytical results are presented in Appendix F.

Table 5-16 and Figure 5-14 present the inorganic elements which were detected. Aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, vanadium, zinc, and cyanide were detected within the sample set.

Test Pits

Two samples were collected from each test pit (except at A06TP08 where no buried materials were found therefore, no samples were collected) for a total of 16 samples during this investigation.

Table 5-17 presents the organic compounds which were detected. These results are presented graphically on Figure 5-15. Relatively low concentrations of three VOCs (carbon tetrachloride, tetrachloroethene, and total xylenes) and ten SVOCs (mostly PAHs) were detected within the sample set. In addition elevated concentrations of some pesticide, PCB, and nitramine compounds were detected. The complete subsurface soil analytical results are presented in Appendix F.

Table 5-18 and Figure 5-16 present the inorganic elements which were detected. Sixteen of the 19 inorganics analyzed were detected in the subsurface soil samples. Antimony, thallium, selenium, and cyanide were not detected in the sample set.

5.2.2.3 Groundwater Results

Groundwater samples were collected from ten temporary piezometers installed at SSA 6 during this investigation. The detected concentrations for total inorganic elements may be biased (high) as these groundwater samples have very high sediment content (i.e., turbid).

Table 5-19 and Figure 5-17 present the organic compounds which were detected. Three VOCs, two pesticides, and three nitramine compounds were detected in the sample set. There were no SVOCs

or PCBs detected in the groundwater samples. The complete groundwater analytical results are presented in Appendix F.

Table 5-20 and Figure 5-18 present the inorganic elements which were detected. Seventeen of 19 total inorganics analyzed for were detected in the groundwater samples. Mercury and silver were not detected within the total inorganics sample set. Ten of 18 dissolved inorganics analyzed were detected in the groundwater samples. Antimony, arsenic, cadmium, chromium, lead, mercury, selenium, and silver were not detected in the sample set of dissolved inorganics.

5.2.3 SSA 7- Investigative Results

The following subsections present analytical results for samples collected during the Site Screening Process at SSA 7. Results are presented for soil, groundwater, surface water, and sediment investigations.

5.2.3.1 Surface Soil Results

Five surface soil samples were collected during this investigation. Positive detection summaries for both organic compounds and inorganic elements in surface soil are presented in Tables 5-21 and 5-22, provided at the end of this section. The complete surface soil analytical results are presented in Appendix F.

Figure 5-20 graphically presents the organic compounds which were detected. One VOC laboratory contaminant (methylene chloride) and twelve SVOCs (comprised of phthalate laboratory contaminants and PAHs) and four pesticide compounds were detected in the samples. There were no PCB, or nitramine compounds detected in any of the surface soil samples.

Figure 5-20 graphically presents the inorganic elements which were detected. Thirteen of 19 inorganics analyzed were detected in surface soil samples. Antimony, cadmium, mercury, silver, thallium, and cyanide were the only inorganics not detected within the sample set.

5.2.3.2 Subsurface Soil Results

The subsurface soil investigation included environmental samples collected from soil borings and test pits at SSA 7.

Soil Borings

Six soil borings and six hand-augered borings were advanced at SSA 7. Three subsurface soil samples (1-3 feet bgs., just above the water table, and a midpoint sample) were collected from each soil boring. One subsurface soil sample was collected from each hand augered boring, at the depth interval of the pipe running from the UST to Building 373 (the depth of these samples varied from 3 feet to 8 feet bgs). Three duplicate subsurface soil samples also were collected. A total of 27 subsurface soil samples were collected in association with these borings. Table 5-23 presents the organic compounds which were detected. These results are presented graphically on Figure 5-21. Relatively low concentrations of one VOC laboratory contaminant (methylene chloride) and eight SVOCs (comprised of phthalates and PAHs) were detected in the sample set. In addition, concentrations of five pesticide, one PCB, and two nitramine compounds were detected. The complete subsurface soil analytical results are presented in Appendix F.

Sixteen of the 19 inorganics compounds analyzed were detected in the subsurface soil samples. Table 5-24 and Figure 5-22 present the inorganic elements which were detected.

Test Pits

Three test pits were excavated at SSA 7. Table 5-25 presents the organic compounds which were detected. These results are presented graphically on Figure 5-23. Two samples were collected from each test pit for a total of 7 samples (including one duplicate sample) during this investigation. Relatively low concentrations of two VOCs (including laboratory contaminant methylene chloride), seven SVOCs (phthalate laboratory contaminants and PAHs) and three pesticide compounds were detected within the sample set. In addition, concentrations of one PCB and nitramine compound were detected.

Table 5-26 and Figure 5-24 present the inorganic elements which were detected. Twelve of the 19 inorganics analyzed were detected in the subsurface soil samples. Antimony, cadmium mercury, selenium, silver, thallium, and cyanide were not detected in the sample set.

5.2.3.3 Groundwater Results

Groundwater samples were collected from the six temporary piezometers installed at SSA 7 during this investigation. The detected concentrations for total inorganic elements may be biased (high) as these groundwater samples have very high sediment content (i.e., turbid). Complete analytical results are presented in Appendix F.

The organic analytical results are presented on Table 5-27. Figure 5-25 presents the organic compounds which were detected. Excluding laboratory contaminants, concentrations of six VOCs (1,1-dichloroethene, 1,1-dichloroethane, 1,1,1-trichloroethane, trichloroethane, and ethylbenzene), nine SVOCs (mostly PAHs), four pesticides (alpha-BHC, delta-BHC, aldrin and dieldrin) and two nitramine compounds (HMX and RDX) were detected at the SSA. No PCB compounds were detected in groundwater at the SSA.

Table 5-28 presents the total and dissolved inorganic analytical results. Figure 5-26 presents the inorganic elements which were detected. Sixteen of 19 total inorganics analyzed were detected in the groundwater samples. Mercury, silver, and cyanide were not detected within the total inorganics sample set. Eleven of 18 dissolved inorganics were detected in the groundwater samples. Aluminum, antimony, arsenic, barium, cobalt, copper, manganese, nickel, thallium, vanadium, and zinc were detected in the dissolved inorganics sample set.

5.2.3.4 Surface Water Results

Three surface water samples were collected from Felgates Creek at SSA 7 during this investigation. Felgates Creek is a tidal freshwater stream.

Analytical results from surface water samples collected do not indicate the presence of VOC, SVOC, or pesticide, PCB, nitramine, contamination. The complete surface water analytical results are presented in Appendix F.

Table 5-29 and Figure 5-27 present the inorganic elements which were detected. Eight of 19 total inorganics analyzed were detected in the surface water samples. Aluminum, barium, beryllium, copper, manganese, thallium, vanadium, and zinc were detected within the total inorganics sample set.

5.2.3.5 Sediment Results

Nine sediment samples were collected from four locations in Felgates Creek, one at 0- to 4-inches bgs and one at 4- to 8-inches bgs, during this investigation. Felgates Creek is a tidal freshwater stream.

Table 5-30 and Figure 5-28 present the organic compounds which were detected. Eleven SVOCs (PAHs and phthalates) were detected for these samples. There were no VOCs, pesticides, PCBs, or nitramine compounds detected in any of the sediment samples.

Table 5-31 and Figure 5-29 present the inorganic elements which were detected. Fifteen of 19 inorganics analyzed for were detected in sediment samples. Antimony, cadmium, mercury, and cyanide were not detected within the sample set.

5.2.4 SSA 15 Investigative Results

The following subsections present analytical results for samples collected during the Site Screening Process at SSA 15. Results are presented for soil, groundwater, surface water, and sediment investigations.

5.2.4.1 Surface Soil Results

Six surface soil samples (including one duplicate) were collected during this investigation. Positive detection summaries for both organic compounds and inorganic elements in surface soil are presented in Tables 5-32 and 5-33, provided at the end of this section. The complete surface soil analytical results are presented in Appendix F.

Figure 5-30 graphically presents the organic compounds detected in surface soil at SSA 15. Five SVOCs and seven pesticides were detected in the samples. There were no VOCs, PCBs, or nitramine compounds in the sample set.

Figure 5-31 graphically presents the inorganic elements detected in surface soil. Eighteen of the 19 inorganic elements analyzed were detected in the surface soil. Thallium was the only compound not detected in the sample set.

5.2.4.2 Subsurface Soil Results

Four soil borings were advanced at SSA 15. Three subsurface soil samples (1-3 feet bgs., just above the water table, and a midpoint sample) were collected from each soil boring. Two duplicate subsurface samples also were collected. A total of 14 subsurface soil samples were collected in association with these borings. Both organic and inorganic concentrations reported for these samples are presented on Tables 5-34 and 5-35, respectively. The complete surface soil analytical results are presented in Appendix F.

Two VOC laboratory contaminants (acetone, methylene chloride), seven SVOCs (mostly PAHs), and three pesticides (4,4'-DDE, 4,4'-DDD, and 4,4'-DDT) were detected in the samples. There were no PCB or nitramine compounds in the sample set. Positive detection summaries for organic compounds in subsurface soil are presented on Figure 5-32.

A total of 17 inorganic compounds were detected in the subsurface soil samples. Only mercury and silver were not detected in the sample set. Positive detection summaries for inorganic elements in subsurface soil are presented on Figure 5-33.

5.2.4.3 Groundwater Results

Groundwater samples were collected from four temporary piezometers installed at SSA 15. A duplicate groundwater sample also was collected. Organic and inorganic concentrations reported for these samples are presented on Tables 5-36 and 5-37, respectively. Positive detection summaries for both organic and inorganic compounds in groundwater are presented on Figures 5-34 and 5-35, respectively. The complete groundwater analytical results are presented in Appendix F.

Excluding laboratory contaminants, six VOCs (mostly chlorinated compounds) and four pesticides (beta-BHC, 4,4'-DDE, 4,4'-DDE, and 4,4'-DDT) were detected in the samples. No SVOCs, PCB, or nitramine compounds were detected in the sample set.

A total of 17 inorganic elements (total fraction) were detected in samples analyzed during this investigation. Only mercury and silver were not detected in the sample set. A total of six inorganic compounds were detected in the dissolved fraction of the groundwater samples. The inorganic elements include barium, cobalt, copper, manganese, nickel, and vanadium.

5.2.4.4 Surface Water Results

A total of three surface water samples (including one duplicate) were collected from adjacent surface water features (which are tributaries to Ballard Creek) during this investigation. Analytical results for surface water samples collected at SSA 15 are presented on Tables 5-38 and 5-39, respectively. Total hardness results are presented on Table 5-40.

Five VOCs (vinyl chloride, 1,1-dichloroethene, 1,1-dichloroethane, trichloroethene and cis-1,2-dichloroethene) were detected in the surface water samples collected. There were no SVOCs, pesticides, PCBs, or nitramine compounds detected in the samples analyzed. Figure 5-36 presents the positive detections graphically.

A total of nine inorganic elements were detected in the surface water samples. The inorganic positive detections are presented on Figure 5-37. Aluminum, barium, cadmium, copper, lead, manganese, thallium, vanadium, and zinc were the inorganic elements detected.

5.2.4.5 Sediment Results

A total of five sediment samples (including one duplicate) were collected from adjacent surface water features during this investigation. These surface water features are tributaries of Ballard Creek. Organic compounds detected in the samples are presented on Table 5-41 while detected inorganics are presented on Table 5-42.

Relatively low concentration of five VOCs and three SVOCs, were detected in the surface water samples collected. In addition, six pesticide compounds (delta-BHC, 4,4'-DDE, 4,4'-DDD, 4,4'-DDT, alpha-Chlordane, and gamma-Chlordane). There were no PCB or nitramine compounds detected in the samples analyzed. Figure 5-38 presents the organic positive detections graphically.

Fourteen of 19 inorganic compounds analyzed were detected in the sediment samples. Figure 5-39 presents the inorganic positive detections graphically.

5.3 Extent of Contamination

This section discusses the extent to which contamination has migrated at SSAs 1, 6, 7, and 15 and the potential for future migration of contaminants.

5.3.1 SSA 1 - Building 428 Teague Road Disposal Site

Figures 5-1 and 5-2 present organic and inorganic constituents detected in the surface soil samples, respectively. Figures 5-3 and 5-4 illustrate those organic and inorganic constituents detected in the subsurface soil samples. Figures 5-5 and 5-6 illustrate those organic and inorganic compounds detected in the groundwater samples. Figures 5-7 and 5-8 illustrate those organic and inorganic compounds detected in the surface water samples. Figures 5-9 and 5-10 illustrate the detected organic and inorganic compounds detected in the sediment samples.

5.3.1.1 Surface Soil

Trace concentrations of VOCs were detected in the surface soil of SSA 1. These compounds were mostly detected at the eastern portion of the SSA. Most of these were detected in an area where empty drums and fuel cans were disposed and may be related to past disposal/storage activity.

Several SVOCs also were detected across the SSA. The highest number of detections and concentrations were observed within the eastern portion of the SSA at sample location A01SS25 (Figure 5-1). The majority of these SVOCs are PAHs. The detection of cPAHs may be related to treated wooden pilings that were disposed of in the area and have subsequently been removed as part of the removal action.

Relatively low concentrations of pesticides were detected within the south western portion of the SSA. These concentrations are consistent with historical use of Station-wide pesticide spraying. PCBs were not detected in the samples. Four nitramine compounds were detected in one sample (A01SS38) at the SSA. The location of the detection is at the western portion of the SSA.

The inorganic constituents were randomly distributed throughout the SSA, exhibiting no pattern that would be indicative of a contaminant source.

5.3.1.2 Subsurface Soil

Based on analytical results, organic contaminants identified at SSA 1 appears to be limited to SVOCs, pesticides, and trace amounts of nitramine compounds. Minor amounts of VOCs and PCBs were detected in some of the subsurface samples. Low levels of the VOCs, toluene, ethylbenzene, and total xylenes were detected in the uppermost sample collected from A01SB08. These detections may be related to railroad activity since the boring was in close proximity to the railroad tracks. Relatively low levels of tetrachloroethane was detected in the upper most sample collected from A015B53. These concentrations may be related to former contents of empty drums found upgradient of the soil boring.

The detection of SVOCs is most prominent within the western portion of the SSA at the locations of boring A01SB17 and A01SB03 (Figure 5-3). The majority of these SVOCs are polycyclic aromatic hydrocarbons (PAHs) and phthalates. PAHs are commonly found in the environment. They are provided during the combustion of hydrocarbon fuels. Their presence at SSA 1 may be attributable to automobile exhaust, railroad operations, or some other anthropogenic activity. These compounds were detected in the railroad track samples collected during the Background Investigation (Baker, 1995). The presence of phthalates may be attributable to sampling/laboratory contamination.

Pesticides also were detected at low levels in subsurface soil collected from A01SB02 and A01SB03. The levels of observed pesticide contamination is consistent with the historical use of Station-wide pesticide spraying. Pesticides, in general, are persistent and immobile in environmental media. The pesticides tend to adhere to soil particles. The compounds are not subject to aqueous transport, unlike those compounds with higher water solubilities. The rate at which pesticides are

leached from soil by infiltrating precipitation is low. They are classified as immobile by Roy and Griffin (1985). The future potential for pesticide contamination to migrate from the site is limited to soil erosion and runoff.

PCB contamination (Aroclor-1260) was detected in only one subsurface sample (A01SB04-01D) at a concentration of 12J microgram per kilogram (μg/kg). PCBs are strongly adsorbed to soil and are very persistent (immobile). The future potential for PCB contamination to migrate from the site is limited to soil erosion and runoff. Additionally, low concentrations of nitramine compounds were detected in the subsurface sample A01SB09-06. A01SB09 is located north-northeast and down slope of the TNT contaminated soil area. This TNT contaminated soil has been removed as part of the SSA 1 removal action.

Concentrations of cadmium, lead, mercury, and thallium were detected in subsurface samples (Figure 5-4).

5.3.1.3 Groundwater

There were no reported concentrations of VOCs, SVOCs, pesticides, or PCB compounds in the groundwater samples above the method detection limits (Figure 5-5). Nitramine compounds were detected at low concentrations from two of the temporary piezometers; A01HP02 and A01HP09. RDX was detected in samples A01HP02-01, its duplicate (A01HP02-01D) and A01HP09-01. 2,4,6-Trinitrotoluene and 4-amino-2,6-dinitrotoluene also were detected in sample A01HP09-01.

The nitramine compound detected in the groundwater sample from A01HP02 may be related to the storage of debris located immediately to the west of the piezometer. Nitramine compounds detected at A01HP09 are most likely related to the TNT contaminated soil area. The debris and contaminated soil have been removed as part of the removal action.

All of the total inorganic compounds detected in the groundwater samples were reported at concentrations in excess of the background concentrations (Figure 5-6). Those dissolved inorganic compounds which exceeded the maximum background concentrations included barium, copper, manganese, and thallium. The highest concentrations of total inorganic compounds were observed in the sample collected from A01HP06 located approximately in the middle of the SSA. Dissolved

inorganic concentrations were evenly distributed across the SSA with no apparent pattern. Elevated total inorganic concentrations may be due to sediment in the piezometer at the time of sampling.

Groundwater samples at SSA 1 were collected from temporary piezometers. Background groundwater samples were collected from permanent monitoring wells. Greater amounts of suspended solids in groundwater samples are expected from temporary piezometers. In contrast to permanent monitoring wells, temporary piezometers do not have a sand filter-pack installed around the screen and they do not undergo development. The filter pack and well development in the background monitoring wells reduce the amount of suspended solids, which could skew total inorganic results. It is thus expected that the total inorganic concentrations of groundwater samples collected form temporary piezometers at SSA 1 would exceed background groundwater concentrations.

Additionally, detected inorganics do not exhibit a pattern of occurrence that would be indicative of a contaminant source area. It thus appears that inorganics detected in groundwater are not attributable to any contamination due to site operations at SSA 1.

5.3.1.4 Surface Water

VOCs, SVOCs, pesticides, or PCBs were not detected in the surface water samples. Low concentrations of nitramine compounds were detected in sample A01SW03 and are most likely related to the TNT contaminated soil area (Figure 5-7). The contaminated soil has been removed as part of the removal action.

Inorganic compounds were detected in each of the surface water samples from SSA 1. Figure 5-8 indicates that the highest detected concentrations of inorganics were observed in sample A01SW04. Surface water samples obtained throughout the unnamed stream were observed to be cloudy, therefore, the presence of inorganics is not unexpected. The reason for the elevated concentrations of inorganics in the downstream sample may be related to the shallow nature of the stream and the collection of some sediments with the water sample.

5.3.1.5 Sediment

There were no reported concentrations of VOCs or nitramine compounds detected in the sediment samples collected from SSA 1 (Figure 5-9). Several SVOCs were detected in the samples with the highest concentrations detected in sample A01SD03-01. The majority of these SVOCs are PAHs and phthalates. PAHs are commonly found in the environment. They are produced during the combustion of hydrocarbon fuels. Their presence at SSA 1 may be attributable to automobile exhaust, railroad operations, or some other anthropogenic activity. These compounds were detected in the railroad track samples collected during the Background Investigation (Baker, 1995). The presence of phthalates may be attributable to sampling/laboratory contamination.

Low concentrations of pesticides also were detected in the sediment samples. The highest concentrations were reported in sample A01SD02-01. There were no detections reported in samples A01SD01-02 or A01SD04-02. As previously stated, the levels of observed pesticide contamination is consistent with the historical use of Station-wide pesticide spraying.

The highest concentrations of inorganics were reported in the furthest downstream sample, A01SD04-02 (Figure 5-10). Concentrations generally decrease in upstream direction toward station A01SD01. The inorganic concentrations detected in the sediment may represent conditions that exist Station-wide.

5.3.2 SSA 6 - Aviation Field and Environs

Figures 5-11 and 5-12 illustrate those organic and inorganic compounds detected in the surface soil samples, respectively. Figures 5-13 and 5-14 illustrate those organic and inorganic compounds detected in the subsurface soil samples. Figures 5-15 and 5-16 illustrate those organic and inorganic compounds detected in the test pit samples. Figures 5-17 and 5-18 illustrate the detected organic and inorganic compounds detected in the groundwater samples.

5.3.2.1 Surface Soil

Low concentrations of VOCs were detected in the surface soil of SSA 6. These compounds were mostly detected at the northern portion of the SSA within Area H and Area E. These compounds

included tetrachloroethane, chlorobenzene, and 2-butanone and may be related to past disposal/storage activity.

Several SVOCs also were detected across the SSA. The highest number of detections and concentrations were observed within Area A, Area E, Area I, and Area F (Figure 5-11). The majority of these SVOCs are PAHs and phthalates. PAHs are commonly found in the environment. They are produced during the combustion of hydrocarbon fuels. Their presence at SSA 6 may be attributable to automobile exhaust, railroad operations, or some other anthropogenic activity. These compounds were detected in the railroad track samples collected during the Background Investigation (Baker, 1995). The presence of phthalates may be attributable to sampling/laboratory contamination.

Pesticides were most commonly detected within Areas A and E at concentrations consistent with historical use of Station-wide pesticide spraying. PCBs were detected in only two samples, A06SS23-00 (Area I) and A06SS02-00 (Area A).

Inorganic constituents were randomly distributed throughout the SSA and results are not indicative of a contaminant source. It thus appears that the presence of inorganics in surface soil samples is not attributable to operations at SSA 6.

5.3.2.2 Subsurface Soil

Trace levels of the VOCs, 2-butanone carbon disulfide, 1,1,2,2-tetrachloroethane, and total xylenes were detected in subsurface soil samples collected from the SSA. Detections were observed at locations along the northern, western, and southeastern perimeters of the SSA with no readily discernable pattern (Figure 5-13).

Several SVOCs were detected in the subsurface soil as presented on Figure 5-13. Compounds were most frequently detected at boring locations adjacent to Area H (A6SB07), Area E (A6SB05), Area A (A6SB11), and at the northeast and southeast corners of the SSA (A6SB06 and A6SB01, respectively). These SVOCs are phthalates, which are most likely the result of sampling/laboratory contamination.

Pesticides were detected at low levels in subsurface soil throughout SSA 6. Observed pesticide concentrations are probably due to historical application for insect control. Additionally, low levels of nitramine compounds were detected at two locations (Figure 5-11). These included A06SB09 (adjacent to Area H) and A06SB05 (adjacent to Area E).

Figure 5-14 indicates that the distribution and concentration of inorganic elements in subsurface soils is random across the SSA with no discernable pattern that would be indicative of a contaminant source.

5.3.2.3 Test Pits

Low levels of VOCs were detected in the test pit samples collected from SSA 6 (Figure 5-15). These compounds included carbon tetrachloride, tetrachloroethane, and total xylenes. VOCs were detected at test pits A06TP01 (Area C) and A06TP04 (Area F).

The highest number of detections of SVOCs occurred at test pit A06TP06 located within Area E. SVOCs also were detected at A06TP02, A06TP03, and A06TP07 but to a much lower degree. The remaining test pit samples did not report any SVOCs above the method detection limits. Pesticides and PCBs were most commonly detected in the samples collected from test pit A06TP03 and A06TP02 both located within Area B.

As expected, inorganic compounds were detected in each of the test pit samples submitted for analysis. Generally, the highest number of detections and concentrations were observed in the samples collected from test pits A06TP03 and A06TP02 located in Area B and A06TP06 located in Area E (Figure 5-16). These same three test pits also reported the highest number of detections of SVOCs. With the exception of antimony, thallium and cyanide, inorganics were detected throughout subsurface soils obtained during test pit operations.

5.3.2.4 Groundwater

Trace levels of VOCs were detected at three temporary piezometers at the SSA (Figure 5-17). These piezometers included A06HP09 (adjacent to Area H), A06HP03 (south of Area B), and A06HP10 (Area D). These compounds included ethylbenzene, cis 1,2-dichloroethene, and trichloroethene.

There were no SVOCs reported in the samples above the method detection limits.

Trace levels of pesticides were detected at stations A06HP05 (adjacent to Area E), A06HP02 (Area A), and A06HP10 (Area D). Additionally, minor amounts of the nitramine compounds, nitrobenzene, 2,4,6-trinitrotoluene, and 4-amino-2, 6-dinitrotoluene were detected in the samples collected from A06HP04 (north of Area E), and A06HP10 (Area D).

As expected, inorganic compounds were detected in the groundwater samples collected from SSA 6 (Figure 5-18). The highest number of detections and, generally higher concentrations, were observed at stations A06HP09, A06HP05, and A06HP01.

Groundwater samples at SSA 6 were collected from temporary piezometers. Background groundwater samples were collected from permanent monitoring wells. Greater amounts of suspended solids in groundwater samples are expected from temporary piezometers. In contrast to permanent monitoring wells, temporary piezometers do not have a sand filter-pack installed around the screen and they do not undergo development. The filter pack and well development in the background monitoring wells reduce the amount of suspended solids, which could skew total inorganic results. It is thus expected that the total inorganic concentrations of groundwater samples collected from temporary piezometers at SSA 6 would exceed background groundwater concentrations.

Additionally, detected inorganics do not exceed a pattern of occurrence that would be indicative of a contaminant source area. It thus appears that inorganics detected in groundwater are not attributable to any contamination due to site operations at SSA 6.

5.3.3 SSA 7 - Building 373 Rocket Plant/Group 18 Magazine/Main Road Disposal Area

Figures 5-19 and 5-20 illustrate those organic and inorganic constituents detected in the surface soil samples, respectively. Figures 5-21 and 5-22 illustrate those organic and inorganic compounds detected in subsurface soil samples. Figures 5-23 and 5-24 illustrate those organic and inorganic compounds detected in the test pit samples. Figures 5-25 and 5-26 illustrate those organic and inorganic compounds detected in the groundwater samples. Figures 5-27 and 5-28 illustrate the detected organic and inorganic compounds detected in the surface water samples.

5.3.3.1 Surface Soil

Based on analytical results, organic contaminants identified at SSA 7 appear to be limited to minor concentrations of SVOCs and pesticides (Figure 5-19). No concentrations of VOCs, PCB, or nitramine compounds were detected in the surface soil samples.

Low levels of SVOCs were detected in both the disposal area and adjacent to possibly creosote treated timbers (Figure 5-19). The majority of detected SVOCs are PAHs. PAHs are commonly found in the environment. They are produced during combustion of hydrocarbon fuels. Their presence at SSA 7 may be attributable to automobile exhaust or some other anthropogenic activity.

Pesticides also were detected at low levels in surface soil adjacent to the creosote-treated timbers. The levels of observed pesticide contamination is consistent with the historical use of Station-wide pesticide spraying of pesticides. Pesticides, in general, are persistent and immobile in environmental media. The pesticides tend to adhere to soil particles. The compounds are not subject to aqueous transport, unlike those compounds with higher water solubilities. The rate at which pesticides are leached from soil by infiltrating precipitation is low. They are classified as immobile by Roy and Griffin (1985). The future potential for pesticide contamination to migrate from the site is limited to soil erosion.

Inorganic elements including aluminum, chromium, copper, lead, manganese, selenium, vanadium and zinc were detected throughout SSA 7 surface soils (Figure 5-20). Detected inorganics did not exhibit a pattern of occurrence that would be indicative of a contaminant source area. It appears that inorganics detected in surface soil are likely not attributable to site operations at SSA 7.

5.3.3.2 Subsurface Soil

The following paragraphs present the nature and extent of contaminants in subsurface soil. Subsurface soil samples were collected from soil borings and test pits at SSA 7.

Soil Borings

Based on analytical results, organic contaminants identified at SSA 7 appear to be limited to pesticides, PCBs and trace amounts of SVOCs and nitramine compounds. These detections may be related to the wastewater UST and Building 374 (boiler house). Figure 5-21 presents the organic compounds detected at the SSA.

The greatest concentrations of SVOCs were detected at A07SB01 just above the water table. The soil sample exhibited an HNu reading of 6.6 ppm and a petroleum odor. The soil boring is located down gradient from Building 374 which houses a boiler/furnace. These detections may be related to activities involving the boiler/furnace (i.e. fuel spills). Trace amounts of SVOCs were detected in the subsurface samples from a soil boring adjacent to the wastewater UST. These concentrations may be attributable to the wastewater UST.

Pesticides were detected in subsurface soil collected from A07SB02. The levels of observed pesticide contamination is consistent with the historical use of Station-wide pesticide spraying. Pesticides, in general, are persistent and immobile in environmental media. The pesticides tend to adhere to soil particles. The compounds are not subject to aqueous transport, unlike those compounds with higher water solubilities. The rate at which pesticides are leached from soil by infiltrating precipitation is low. They are classified as immobile by Roy and Griffin (1985). The concentrations detected in the subsurface may be related to pesticide-contaminated surface soil that fell into the borehole while drilling and were detected within the analytical sample. The future potential for pesticide contamination to migrate from the site is limited to soil erosion.

PCB contamination (Aroclor-1260) was detected in only one subsurface sample also at A07SB02 which is located approximately 25 feet southwest of the wastewater UST. PCBs are strongly adsorbed to soil and are very persistent (immobile). The concentrations detected in the subsurface may be related to the presence of the UST; however, historical information concerning the UST does not corroborate this hypotheses. The future potential for PCB contamination to migrate from the site is limited to soil erosion.

Nitramine compounds were detected in three subsurface soil samples. The soil borings where these concentrations were detected are located around the wastewater UST and associated piping. The UST accepted nitramine contaminated wastewaters from the Rocket Plant for later disposal.

Inorganics inlcuding cadmium, selenium, and thallium were detected in SSA 7 the subsurface samples. The concentrations of inorganics are presented on Figure 5-22. The occurrence of inorganics does not exhibit a pattern indicative of a contaminant source area. It appears that inorganics detected in subsurface soil are not related to operations at SSA 7.

Test Pits

Based on analytical results, organic contaminants identified at SSA 7 appear to be limited to concentrations of VOCs, SVOCs, pesticide, PCB and nitramine compounds. The concentrations are presented on Figure 5-23. Figure 5-24 presents the inorganic concentrations of the SSA.

All VOC and SVOCs were detected at A07TP03 which is located on the dirt road in the Group 18 magazine. These concentrations may be related to vehicle travel on the road.

Nitramine compounds were detected at one test pit location (A07TP02). These concentrations are likely related to the disposal of mine casing in this area.

Concentrations of pesticides were detected at main road disposal area (A07TP02). These concentrations are consistent with the historical use of Station-wide pesticide spraying of pesticides.

5.3.3.3 Groundwater

Based on analytical results, organic contaminants identified at SSA 7 appear to be limited to VOCs, nitramine compounds, and trace amounts of SVOCs and pesticides. These detections may be related to the wastewater UST and Building 374 (boiler/furnace house). Figure 5-25 presents the organic compound detected at the SSA.

The VOCs detected above trace concentrations were detected at A07HP02, A07HP05, and A07HP06. These concentrations were located near the wastewater UST and Building 374 (boiler/furnace house) where organic compounds were detected in the soil.

SVOCs detected in the groundwater sample A07HP01 are consistent with the concentrations detected in the soil. The majority of the detected SVOCs are PAHs. PAHs are commonly found in the environment. They are produced during the combustion of hydrocarbon fuels. Although the SVOCs may be attributable to site operations (wastewater UST, boiler/furnace, creosote-treated timbers), they may also be the result of automobile exhaust or some other anthropogenic activity.

The nitramine compounds detected (HMX and RDX) in the groundwater from A07HP05 and A07HP06 are located around the wastewater UST which accepted nitramine contaminated wastewater from the Rocket Plant for later disposal. These concentrations are most likely attributable to the UST.

Trace concentrations of pesticides (alpha-BHC, beta-BHC, aldrin, and dieldrin) were detected in one temporary piezometer (A07HP01). It is unlikely that pesticide contaminants have leached from the soil into the groundwater. Pesticides do not readily leach from soil (Roy and Griffin, 1985). It is more likely that the pesticides were attached to soil particles, which entered the temporary piezometer through the screen from the formation, suspended in the groundwater sample.

All of the total inorganic compounds detected in the groundwater samples were reported at concentrations in excess twice the Station-wide background concentrations (Figure 5-26). SSA 7 history does not show any evidence which would identify either an activity or source of the inorganic concentrations found at the SSA.

Groundwater samples at SSA 7 were collected from temporary piezometers. Background groundwater samples were collected from permanent monitoring wells. Greater amounts of suspended solids in groundwater samples are expected from temporary piezometers. In contrast to permanent monitoring wells, temporary piezometers do not have a sand filter-pack installed around the screen and they do not undergo development. The filter pack and well development in the background monitoring wells reduce the amount of suspended solids, which could skew total inorganic results. It is thus expected that the total inorganic concentrations of groundwater samples

collected from temporary piezometers at SSA 7 would exceed background groundwater concentrations.

Additionally, detected inorganics do not exhibit a pattern of occurrence that would be indicative of a contaminant source area. It thus appears that inorganics detected in groundwater are not attributable to any contamination due to site operations at SSA 7.

5.3.3.4 Surface Water

There were no organic compounds detected in surface water at SSA 7. Beryllium and thallium concentrations detected in surface water exceeded the maximum detected concentrations of the off-Station background samples collected form tidal freshwater streams. The concentrations of these compounds were similar in all of the samples. The inorganic concentrations found within the surface water may represent conditions that exist Station-wide. Figure 5-27 presents the inorganic elements detected at the SSA.

5.3.3.5 Sediment

There were no reported concentrations of VOCs, pesticides, PCBs or nitramine compounds detected in the sediment samples collected from SSA 7. Positive detections of organic compounds are presented on Figure 5-28. Several SVOCs (PAHs) were detected A07SD01-01D. This sample is located upstream from the Rocket Plant and may not be related to past operations at the SSA. SVOCs detected at the other sampling locations include phthalates, which are common blank contaminants. These phthalates, however, were detected at concentrations greater than detected in the different types of blanks collected for this investigation. The presence of phthalates in sediment samples is not expected to be due to site operations at SSA 7. They are more likely the result of sampling equipment (sediment samples, gloves, etc.).

The highest concentrations of inorganics were reported in the furthest downstream sample, A07SD01. All of the concentrations except selenium and thallium were below the maximum detected off-Station sediment samples collected in tidal freshwater streams. Selenium was detected slightly above the off-Station sediment sample concentrations. Thallium was not detected in the off-Station background samples but was detected just above detection limits at SSA 7. The

inorganic concentrations found within the sediment may represent conditions that exist Station-wide. Figure 5-29 presents the inorganic elements detected at the SSA.

5.3.4 SSA 15 - Sewage Treatment Plant #1/Sludge Drying Beds and Discharge Area

Detected organic and inorganic elements reported for the surface soil collected from SSA 15 are graphically presented on Figures 5-30 and 5-31, respectively. Subsurface soil results are presented on Figures 5-32 and 5-33. Groundwater analytical results are presented on Figures 5-34 and 5-35. Detected organic and inorganic elements reported in the surface water samples are presented on Figures 5-36 and 5-37. Sediment results are presented on Figures 5-38 and 5-39.

5.3.4.1 Surface Soil

There were no VOCs reported above the method detection limits in any of the surface soil samples collected from the SSA. Of the five surface soil samples collected at SSA 15, two samples, (A15SS02-00 and A155505-00), reported any detectable concentrations of SVOCs (Figure 5-30). These sample stations are located at the southern portion of the SSA. The majority of these SVOCs are phthalates. The phthalates are most likely due to laboratory or sampling procedure contamination. The remaining stations did not report any SVOCs above the laboratory detection limits.

Trace amounts of pesticides were detected at each sampling station. The sample collected at A15SS02-00 reported the highest number of detections as well as the highest concentrations. Sample A15SS03-00 reported the second highest number of detections. A15SS03 is situated along the southern perimeter of the SSA. The detection of pesticides at A15SS02 is most likely related to the Station-wide use of pesticides. There were no PCBs or nitramine compounds reported above the laboratory detection limits in any of the samples.

Inorganics were detected at each of the surface soil sampling locations (Figure 5-31). In general, the detected inorganics are not present in a discernable pattern that would indicate that their presence is attributable to a contaminant source.

5.3.4.2 Subsurface Soil

Of the subsurface soil analyzed for VOCs, only one sample, A15SB01-03, reported a detectable concentration of acetone. This sample was collected from a boring located southeast of the SSA at a depth of 5- to 7-feet bgs (Figure 5-32). Although not found in any of the blanks collected in association with SSA 15, it was detected in a SSA 6 rinsate blank. It is thus likely that this compound is a laboratory artifact.

Several SVOCs were detected in the subsurface samples collected during this investigation. The highest number of detections were observed at soil boring A15SB04 at a depth of 1- to 3-feet bgs (Figure 5-32). Minor concentrations of SVOCs also were detected in samples collected from borings A15SB03 and A15SB02. The majority of these SVOCs are PAHs. PAHs are common in the environment. These compounds are produced from the combustion of hydrocarbon fuels. The presence of these compounds may be attributable to automobile exhaust or some other anthropogenic activity.

The uppermost sample from A15SB02 (depth of 1- to 3-feet bgs) exhibited the greatest number of pesticide detections of the subsurface samples. Sample A15SB03-01 (from a depth of 1- to 3-feet bgs) also exhibited detectable concentrations of pesticides (Figure 5-32). As with the surface soil samples, these detections are likely attributable to the historical Station-wide use of pesticides.

Inorganics were detected in each subsurface soil sample (Figure 5-33). In general, the detected inorganics are not present in a discernable pattern that would indicate that their presence is attributable to a contaminant source.

5.3.4.3 Groundwater

VOCs were detected in shallow groundwater at SSA 15 (Figure 5-34). Detected VOCs include: 1,1-dichloroethane, 1,1-dichloroethene, 1,1,1-trichloroethane, trichloroethene and cis 1,2-dichloroethene and ethylbenzene.

Total VOC concentrations are highest in samples collected at the western boundary and in the center of the SSA. Total VOC concentrations decrease in the direction of groundwater flow (east). It thus

appears that shallow groundwater has been impacted by site operations at SSA 15. There were no SVOCs reported in the groundwater samples above the method detection limits.

Relatively low concentrations of pesticides were detected in two of the groundwater samples; A15HP02 and A15HP04 (Figure 5-34). Pesticides were not detected in the remaining two samples. This is likely the result of pesticide-contaminated surface soil particles falling into the borehole and being entrained in the groundwater sample. There were no reported concentrations of PCBs above the method detection limits in any of the groundwater samples.

Total inorganic concentrations were highest in the groundwater sample collected from A15HP03 followed by A15HP01 and A15HP02 (Figure 5-35). Although some compounds reported higher concentrations when compared to background conditions, their difference was within an order of magnitude. Dissolved inorganic concentrations were generally within the limits of background conditions. These observations suggest that groundwater at the SSA has not been impacted by inorganic contamination.

5.3.4.4 Surface Water

The downstream surface water sample (A15SW02-01) was the only sample to exhibit detectable concentrations of VOCs (Figure 5-36). The compounds detected in the surface water sample also were detected in two of the groundwater samples. Vinyl chloride is a degradation product of the compounds detected in shallow groundwater. It thus appears that VOC contaminants in shallow groundwater are discharging to surface water in this area. There were no SVOCs, pesticides, PCBs or nitramine compounds reported above the method detection limits for either surface water sample.

The downstream sample, A15SW02-01, exhibited generally higher total inorganic concentrations than the upstream sample (Figure 5-37). This occurrence is most likely due to the transport of sediments in the downstream direction. In general, total inorganic concentrations were at or below the background fresh water stream concentrations.

5.3.4.5 Sediment

Trace amounts of VOCs were detected in sediment samples collected from SSA 15 (Figure 5-38). The higher concentrations of VOCs were detected in the deeper sediment samples (depth of 4- to 8-inches). Similar contaminants were detected in groundwater and surface water samples. VOC contaminants in the sediment are likely the result of VOC contaminated groundwater discharge. PAHs are present in the downstream samples. These may be the result of automobile exhaust, site runoff, or some other anthropogenic activity.

Low levels of pesticides were detected in each of the sediment samples collected. The highest concentrations were reported in sample A15SD02-01 which is the uppermost sample in the downstream position (Figure 5-38). These detections are believed to be a result of surface runoff from the SSA. However, their low concentrations do not suggest that the sediment has been significantly impacted by pesticide contamination. There were no PCB or nitramine compounds reported above the laboratory detections limits for any of the sediment samples.

Inorganic concentrations were observed to be highest in the two surface sediment samples (depth of 0- to 4-inches) and decrease with depth. The concentrations of the on-site samples were generally within the limits of the concentrations of the background samples (Figure 5-39).

5.4 References

Baker Environmental, Inc. 1995. Preliminary Draft Summary of Background Constituent Concentrations and Characterization of the Biotic Community from the York River Drainage Basin, Naval Weapons Station Yorktown, Yorktown, Virginia. March 1995.

Hodges, R.L., P.B. Sabo, M.E. Newhouse, and L.F. Baldwin. 1982. Soil Survey Report, Naval Weapons Station, Yorktown, Virginia. Virginia Polytechnic Institute and State University in cooperation with Atlantic Division, Naval Facilities Engineering Command, Soil Conservation Service, U.S. Department of Agriculture and Colonial Soil and Water Conservation District.

IT Corporation. 1995 (to be published). Removal Action Report, Naval Weapons Station Yorktown, Yorktown, Virginia.

SECTION 5.0 TABLES

TABLE 5-1

SUMMARY OF ORGANIC BLANK CONTAMINANT RESULTS
SSAs 1, 6, 7 AND 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

SSA 1 Constituents	Maximum Concentration Detected in Blank (µg/L)	Type of Blank with Maximum Detected Value	Concentration for Comparison[1] (Aqueous-µg/L)	Concentration for Comparison[2] (Solid-µg/kg)
VOCs: Acetone	27,000		270,000	891,000
Chloroform	4	Rinsate Blank	20	660
Methylene Chloride	23	Rinsate Blank	230	7,590
1,2-Dichloroethane	1J	Trip Blank	5	165
2-Butanone	10J	OHMRIN-04	100	3,300
Xylenes (Total)	6J	OHMRIN-03	30	990
Ethylbenzene	1J	OHMTB-03A	5	165
Styrene	1J	OHMTB-03A	5	165
1,1,2,2-Tetrachloroethane	1J	OHMFB-01	5	165
Chlorobenzene	1J	OHMFB-01	5	165
Toluene	0.9J	FBDI	9	297
SVOCs: Di-n-butylphthalate	9J	Rinsate Blank	90	2970
Bis (2 ethylhexyl)-phthalate	9J	Rinsate Blank	90	2970

SSA 6 Constituents	Maximum Concentration Detected in Blank (µg/L)	Type of Blank with Maximum Detected Value	Concentration for Comparison[1] (Aqueous-µg/L)	Concentration for Comparison[2] (Solid-µg/kg)
VOCs: Acetone	9J	Rinsate Blank	90	2,970
Chloroform	7	Rinsate Blank	35	1,155
1,2-Dichloroethane	0.6J	Trip Blank	3	99
Methylene Chloride	38D	Rinsate Blank	380	12,540
1,1,1-Trichloroethane	18	Rinsate Blank	90	2,970
SVOCs: Diethylphthalate	9J	Rinsate Blank	90	2,970
bis(2-ethylhexyl)phthalate	1J	Rinsate Blank	10	330
Di-n-butylphthalate	7J	Rinsate Blank	70	2,310
Pesticides: Aldrin	0.022J	Rinsate Blank	0.11	3.63

[1] Concentration is five or ten times (for common laboratory blank contaminants) the maximum detected concentration in a blank.
[2] Concentration is five or ten times the maximum detected concentration in a blank; converted to µg/kg.

TABLE 5-1 (Continued)

SUMMARY OF ORGANIC BLANK CONTAMINANT RESULTS
SSAs 1, 6, 7 AND 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

SSA7 Constituents	Maximum Concentration Detected in Blank (µg/L)	Type of Blank with Maximum Detected Value	Concentration for Comparison[1] (Aqueous-µg/L)	Concentration for Comparison[2] (Solid-µg/kg)
VOCs:				
Chloroform	6	Rinsate Blank	30	990
Methylene Chloride	30	Rinsate Blank	300	9,900
Toluene	1	Rinsate Blank	10	330
SVOCs:				
Di-n-butylphthalate	9J	Rinsate Blank	90	2,970

SSA15 Constituents	Maximum Concentration Detected in Blank (µg/L)	Type of Blank with Maximum Detected Value	Concentration for Comparison[1] (Aqueous-µg/L)	Concentration for Comparison[2] (Solid-µg/kg)
VOCs:				
Chloroform	6	Rinsate Blank	30	990
Methylene Chloride	3	Rinsate Blank	30	990
SVOCs:				
Di-n-butylphthalate	11	Rinsate Blank	110	3,630
Bis(2-ethylhexyl)phthalate	2J	Rinsate Blank	20	660
Nitramines:				
2,4,6-TNT	0.84	Rinsate Blank	4.2	138.6

(1) Concentration is five or ten times (for common laboratory blank contaminants) the maximum detected concentration in a blank.
(2) Concentration is five or ten times the maximum detected concentration in a blank; converted to µg/kg.

TABLE 5-1 (Continued)

SUMMARY OF ORGANIC BLANK CONTAMINANT RESULTS
SSAs 1, 6, 7 AND 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Field Blank Constituents	Maximum Concentration Detected in Blank (µg/L)	Field Blank with Maximum Detected Value	Concentration for Comparison[1] (Aqueous-µg/L)	Concentration for Comparison[2] (Solid-µg/kg)
VOCs: Acetone	97	OHMFB-01	970	32,010
Chloroform	37D	FBRIG	185	6,105
Bromodichloromethane	10	FBRIG	50	1,650
Dibromochloromethane	1	FBRIG	5	165
Methylene Chloride	33	FBDI	330	10,890
1,2-Dichlorocthane	1J	OHMFB-01	5	165
1,1,2,2-Tetrachloroethane	1J	OHMFB-01	5	165
Chlorobenzene	1J	OHMFB-01	5	165
Ethylbenzene	1J	OHMFB-01	5	165
Toluene	0.9J	FBDI	9	297
SVOCs: Di-n-butylphthalate		FBDI	10	330

(1) Concentration is five or ten times (for common laboratory blank contaminants) the maximum detected concentration in a blank.
(2) Concentration is five or ten times the maximum detected concentration in a blank; converted to µg/kg.

TABLE 5-1A

LIST OF CARCINOGENIC AND NON CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS

Carcinogens [1]	Non-carcinogens [1]
Benzo (a) anthracene	Acenaphthene
Benzo (b) flouranthene	Acenaphthylene
Benzo (k) flouranthene	Anthracene
Benzo (a) pyrene	Benzo(g,h,i) perylene
Carbazole	Flouranthene
Chrysene	Flourene
Diebenzo (a,h) anthracene	Naphthalene
Indeno (1,2,3-cd) pyrene	Phenanthrene
	Pyrene

Notes:

[1] Polycyclic aromatic hydrocarbon classification from USEPA Region III Risk-Based Concentration Summary Table, October ,1995

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS06-00	A01SS07-00	A01SS08-00	A01SS09-00	A01SS10-00	A01SS11-00
Sample Date	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	8 B	18 B	8 B	26 B	20 B	6 B
Carbon Disulfide	6 U	25 U	6 U	22 U	22 U	5 U
Chloroform	6 U	25 U	6 U	22 U	22 U	5 U
Trichlroethylene	6 U	25 U	6 U	22 U	22 U	5 U
Benzene	6 U	25 U	6 U	22 U	22 U	5 U
Methyl-iso-butyl ketone	12 U	50 U	12 UJ	43 U	45 U	11 U
Tetrachloroethene	6 U	25 U	6 UJ	22 U	22 U	5 U
1,1,2,2-Tetrachloroethane	6 U	7	6 UJ	22 U	22 U	5 U
Toluene	47 J	12 J	6 UJ	22 UJ	12 J	5 UJ
Styrene	6 U	7 B	6 UJ	22 U	22 U	5 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
L - biased low
U - not detected
UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS12-00	A01SS13-00	A01SS14-00	A01SS15-00	A001SS16-00	A01SS17-00
Sample Date	11/02/94	11/02/94	11/02/94	34641	34641	34641
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	36 B	27 B	6 B	20 B	7 B	25 B
Carbon Disulfide	30 U	28 U	5 U	6 U	5 U	6 U
Chloroform	30 U	28 U	5 U	6 U	5 U	6 U
Trichlroethylene	30 U	28 U	5 U	3 J	5 U	3 J
Benzene	30 U	28 U	5 U	6 U	5 U	6 U
Methyl-iso-butyl ketone	61 U	56 U	10 U	11 U	11 U	12 U
Tetrachloroethene	30 U	28 U	5 U	6 U	5 U	6 U
1,1,2,2-Tetrachloroethane	30 U	28 U	5 U	6 U	5 U	6 U
Toluene	220 J	16 J	3 B	6 UJ	5 UJ	6 UJ
Styrene	30 U	28 U	5 U	6 U	5 U	6 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
L - biased low
U - not detected
UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS18-00	A01SS19-00	A01SS20-00	A01SS21-00	A01SS22-00	A01SS23-00
Sample Date	34641	11/04/93	11/02/94	11/02/94	11/02/94	11/02/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	14 B	8 B	6 B	5 B	3 B	6 B
Carbon Disulfide	7 U	5 U	26 U	24 U	6 U	26 U
Chloroform	7 U	5 U	26 U	24 U	6 U	26 U
Trichloroethylene	3 J	2 J	26 U	24 U	6 U	26 U
Benzene	7 U	5 U	26 U	24 U	6 U	26 U
Methyl-iso-butyl ketone	14 U	11 U	51 U	49 U	12 U	52 U
Tetrachloroethene	7 U	5 U	26 U	24 U	6 U	26 U
1,1,2,2-Tetrachloroethane	7 U	5 U	5 B	24 U	6 U	26 U
Toluene	7 UJ	5 U	26 UJ	24 UJ	2 B	26 UJ
Styrene	7 U	5 U	26 U	24 U	6 U	26 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
L - biased low
U - not detected
UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS24-00	A01SS25-00	A01SS26-00	A01SS27-00	A01SS28-00	A01SS29-00
Sample Date	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	4 B	15 B	2 B	3 B	5 B	17 B
Carbon Disulfide	5 U	34 U	5 U	5 U	5 U	29 U
Chloroform	5 U	34 U	5 U	5 U	5 U	29 U
Trichloroethylene	5 U	34 U	5 U	5 U	5 U	29 U
Benzene	5 U	34 U	5 U	5 U	5 U	29 U
Methyl-iso-butyl ketone	10 U	67 U	11 U	11 U	10 U	58 U
Tetrachloroethene	5 U	34 U	5 U	5 U	5 U	29 U
1,1,2,2-Tetrachloroethane	5 U	34 U	5 U	5 U	5 U	29 U
Toluene	5 UJ	81 J	5 UJ	5 UJ	5 UJ	21 J
Styrene	5 U	34 U	5 U	5 U	5 U	29 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
L - biased low
U - not detected
UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS30 -00	A01SS31-00	A01SS32-00	A01SS33-00	A01SS34-00	A01SS35-00
Sample Date	11/02/94	11/02/94	11/02/94	11/03/94	34641	11/03/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	28 U	12 B	5 B	6 B	5 U	4 B
Carbon Disulfide	28 U	6 U	23 U	5 U	5 U	5 U
Chloroform	28 U	6 U	23 U	5 U	5 U	5 U
Trichlroethylene	28 U	2 J	23 U	2 J	5 U	2 J
Benzene	28 U	6 U	23 U	5 U	5 U	5 U
Methyl-iso-butyl ketone	56 U	11 U	45 U	10 U	11 U	11 U
Tetrachloroethene	28 U	6 U	23 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	28 U	6 U	23 U	5 U	5 U	5 U
Toluene	9 B	3 B	23 UJ	4 B	5 UJ	20 J
Styrene	28 U	6 U	23 U	5 U	5 U	5 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
L - biased low
U - not detected
UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS36-00	A01SS37-00	A01SS38-00	A01SS39-00	A01SS40-00	A01SS41-00
Sample Date	11/03/94	11/03/94	11/03/94	11/03/94	11/03/94	11/04/93
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	7 B	150 L	150 L	87 B	5 B	8 B
Carbon Disulfide	6 U	5 UL	6 UL	6 UL	5 U	6 U
Chloroform	6 U	5 UL	6 UL	6 UL	5 U	6 U
Trichlroethylene	3 J	1 L	3 L	2 L	5 U	2 J
Benzene	6 U	5 UL	6 UL	6 UL	5 U	6 U
Methyl-iso-butyl ketone	11 UJ	10 UL	12 UL	11 UL	11 U	13 U
Tetrachloroethene	6 UJ	5 UL	6 UL	6 UL	5 U	6 U
1,1,2,2-Tetrachloroethane	6 UJ	5 UL	6 UL	6 UL	5 U	6 U
Toluene	6 UJ	5 UL	6 UL	6 UL	5 U	6 U
Styrene	6 UJ	5 UL	6 UL	6 UL	5 U	6 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
L - biased low
U - not detected
UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS42-00	A01SS43-00	A01SS44-00	A01SS45-00	A01SS46-00	A01SS47-00
Sample Date	11/04/93	11/04/93	11/04/93	11/04/93	11/04/93	11/04/93
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	9 B	8 B	10 B	8 B	12 B	11 B
Carbon Disulfide	8 U	7 U	6 U	7 U	6 U	6 U
Chloroform	8 U	1 J	6 U	7 U	6 U	6 U
Trichlroethylene	4 J	2 J	6 U	3 J	6 U	6 U
Benzene	8 U	1 J	6 U	7 U	6 U	6 U
Methyl-iso-butyl ketone	4 J	13 U	11 U	14 U	12 U	12 U
Tetrachloroethene	8 UJ	2 B	6 U	7 U	6 U	6 U
1,1,2,2-Tetrachloroethane	8 UJ	7 U	6 U	7 U	6 U	6 U
Toluene	8 UJ	2 B	6 U	2 B	1 B	1 B
Styrene	8 UJ	7 U	6 U	7 U	6 U	6 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
L - biased low
U - not detected
UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS49-00	A01SS50-00	A01SS51-00	A01SS52-00	A01SS53-00	A01SS54-00
Sample Date	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	2 B	2 B	4 B	4 B	4 B	3 B
Carbon Disulfide	5 U	5 U	5 U	6 U	6 U	6 U
Chloroform	5 U	5 U	5 U	6 U	6 U	6 U
Trichlroethylene	1 J	5 U	5 U	6 U	6 UJ	1 J
Benzene	5 U	5 U	5 U	6 U	6 UJ	6 U
Methyl-iso-butyl ketone	10 U	11 U	11 U	12 U	11 UJ	12 UJ
Tetrachloroethene	12	5 B	1 B	5 B	3 B	11 J
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U	6 U	6 UJ	6 UJ
Toluene	2 B	5 UJ	5 UJ	6 UJ	5 B	2 B
Styrene	5 U	5 U	5 U	6 U	6 UJ	6 UJ

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
L - biased low
U - not detected
UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS77-00	A01SS78-00	A01SS79-00	A01SS80-00	A01SS86-00	A01SS95-00
Sample Date	11/04/93	11/04/93	34641	11/04/93	11/07/94	11/10/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	16 B	7 U	5 U	5 B	5 U	2 B
Carbon Disulfide	6 U	7 U	5 U	6 U	5 U	6 U
Chloroform	6 U	7 U	5 U	6 U	5 U	6 U
Trichlroethylene	2 J	3 J	1 J	6 U	5 U	6 U
Benzene	6 U	7 U	5 U	6 U	5 U	6 U
Methyl-iso-butyl ketone	12 U	15 UJ	11 U	13 U	11 U	12 U
Tetrachloroethene	6 U	7 UJ	5 U	6 U	2 B	4 B
1,1,2,2-Tetrachloroethane	6 U	7 UJ	5 U	6 U	5 U	6 U
Toluene	1 B	7 UJ	5 U	6 U	5 UJ	6 U
Styrene	6 U	7 UJ	5 U	6 U	5 U	6 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
L - biased low
U - not detected
UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS97-00	A01SS98-00	A01SS99-00	A01SS100-00	A01SS103A-00	A01SS109-00
Sample Date	12/02/94	12/02/94	12/02/94	12/02/94	12/06/94	12/12/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	5 U	4 B	5 B	3 B	7 B	3 B
Carbon Disulfide	5 U	5 U	9	5 U	5 U	1 J
Chloroform	5 U	5 U	5 U	5 U	5 U	5 U
Trichlroethylene	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	5 U	5 U	5 U	5 U	5 U	5 U
Methyl-iso-butyl ketone	10 U	10 U	10 U	10 U	11 U	10 U
Tetrachloroethene	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	5 U	4 B	2 B	5 U	5 U	1 B
Styrene	3 B	5 U	5 U	5 U	5 U	11

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
L - biased low
U - not detected
UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS110-00	A01SS111-00	A01SS112-00	A01SS113-00
Sample Date	12/12/94	12/13/94	12/13/94	12/14/94
Units	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	8 B	7 B	6 B	8 B
Carbon Disulfide	6 U	3 J	5 UL	6 U
Chloroform	6 U	5 U	5 UL	6 U
Trichlroethylene	6 U	5 U	5 UL	6 U
Benzene	6 U	5 U	5 UL	6 U
Methyl-iso-butyl ketone	12 U	11 U	11 UL	12 U
Tetrachloroethene	6 U	5 U	5 UL	6 U
1,1,2,2-Tetrachloroethane	6 U	5 U	5 UL	6 U
Toluene	6 U	1 B	5 UL	6 U
Styrene	7	5 B	1 B	6 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
L - biased low
U - not detected
UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS06-00	A01SS07-00	A01SS08-00	A01SS09-00	A01SS10-00	A01SS11-00
Sample Date	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Phenol	390 U	360 U	8100 U	4300 U	390 U	390 U
1,4-Dichlorobenzene	390 U	360 U	8100 U	4300 U	390 U	390 U
2-Methylphenol	390 U	360 U	8100 U	4300 U	47 J	390 U
2,2'-oxybis(1-chloropropene)	390 U	360 U	8100 U	4300 U	390 U	390 U
4-Methylphenol	390 U	360 U	8100 U	4300 U	390 U	390 U
Naphthalene	390 U	360 U	8100 U	4300 U	42 J	390 U
2-Methylnaphthalene	390 U	360 U	8100 U	4300 U	390 U	390 U
Acenaphthylene	390 U	360 U	1900 J	1500 J	390 U	390 U
Acenapthene	390 U	360 U	860 J	4300 U	170 J	390 U
Dibenzofuran	390 U	360 U	8100 U	4300 U	73 J	390 U
2,4-Dinitrotoluene	390 U	360 U	8100 U	4300 U	390 U	390 U
Fluorene	390 U	360 U	8100 U	550 J	120 J	390 U
Phenanthrene	45 J	360 U	15000	4700	1200	67 J
Anthracene	17 J	360 U	3400 J	2400 J	330 J	20 J
Carbazole	390 U	360 U	2900 J	590 J	180 J	390 U
Fluoranthene	390 U	50 J	88000	13000	1900	93 J
Pyrene	120 J	51 J	72000	16000	3100	130 J
3,3-Dichlorobenzidine	390 U	360 U	8100 U	4300 U	390 U	390 U
Benzo(a)anthracene	390 U	360 U	7400 J	7000	890	57 J
Chrysene	390 U	360 U	22000	16000	1100	69 J
Bis(2-ethylhexyl)-phthalate	390 U	100 B	8100 U	4300 U	290 B	180 B
Benzo(b)fluoranthene	130 J	46 J	14000	23000	1600 J	160 J
Benzo(k)fluoranthene	120 J	24 J	11000	16000	1400 J	390 UJ
Benzo(a)pyrene	87 J	360 U	5100 J	12000	1000 J	57 J
Indeno(1,2,3-cd)pyrene	390 U	360 U	1300 J	3000 J	280 J	390 UJ
Dibenzo(a,h)anthracene	390 U	360 U	8100 U	1300 J	120 J	390 UJ
Benzo(g,h,i)perylene	390 U	360 U	8100 U	3100 J	330 J	390 UJ

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
K - biased high
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS12-00	A01SS13-00	A01SS14-00	A01SS15-00	A001SS16-00	A01SS17-00
Sample Date	11/02/94	11/02/94	11/02/94	34641	34641	34641
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Phenol	4100 U	4100 U	1700 UJ	7500 U	360 U	4000 U
1,4-Dichlorobenzene	670 J	4100 U	1700 U	7500 U	360 U	4000 U
2-Methylphenol	4100 U	4100 U	1700 UJ	7500 U	360 U	4000 U
2,2'-oxybis(1-chloropropene)	4100 U	4100 U	1700 U	7500 U	360 U	4000 U
4-Methylphenol	4100 U	4100 U	1700 UJ	7500 U	360 U	4000 U
Naphthalene	4100 U	4100 U	1700 U	7500 U	360 U	4000 U
2-Methylnaphthalene	4100 U	4100 U	1700 U	7500 U	360 U	4000 U
Acenaphthylene	4100 U	1500 J	840 J	4600 J	340 J	1300 J
Acenapthene	4100 U	610 J	1700 U	7500 U	360 U	4000 U
Dibenzofuran	4100 U	4100 U	1700 U	7500 U	360 U	4000 U
2,4-Dinitrotoluene	4100 U	4100 U	1700 U	7500 U	360 U	4000 U
Fluorene	4100 U	720 J	1700 U	7500 U	360 U	4000 U
Phenanthrene	1500 J	4200	300 J	7500 U	230 J	2000 J
Anthracene	440 J	2000 J	870 J	4800 J	260 J	1300 J
Carbazole	4100 U	610 J	180 J	1100 J	48 J	4000 U
Fluoranthene	2000 J	12000	2400	14000	1700	8300
Pyrene	4200	18000	6300 J	30000	2500 K	12000
3,3-Dichlorobenzidine	4100 U	4100 U	1700 U	7500 U	360 U	4000 U
Benzo(a)anthracene	1200 J	6100	2000	17000	1200	6200
Chrysene	1600 J	12000	3500	25000	1600	12000
Bis(2-ethylhexyl)-phthalate	4100 U	3800 B	1700 U	7500 U	240 B	4000 U
Benzo(b)fluoranthene	4100 UJ	16000 J	8000 J	35000	1600	14000
Benzo(k)fluoranthene	4100 UJ	14000 J	6000 J	3200	1900 J	7600 J
Benzo(a)pyrene	4100 UJ	8700 J	3000 J	20000	1100	7500
Indeno(1,2,3-cd)pyrene	4100 UJ	3200 J	1700 UJ	5300 J	390	2400 J
Dibenzo(a,h)anthracene	4100 UJ	670 J	1700 UJ	2600 J	190 J	920 J
Benzo(g,h,i)perylene	4100 UJ	3300 J	1700 UJ	4300 J	320 J	1400 J

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
K - biased high
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS18-00	A01SS19-00	A01SS20-00	A01SS21-00	A01SS22-00	A01SS23-00
Sample Date	34641	11/04/93	11/02/94	11/02/94	11/02/94	11/02/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Phenol	79 J	360 U	360 U	370 U	410 U	79 J
1,4-Dichlorobenzene	480 U	360 U	360 U	370 U	410 U	380 U
2-Methylphenol	480 U	360 U	360 U	370 U	410 U	380 U
2,2'-oxybis(1-chloropropene)	480 U	360 U	360 U	370 U	410 U	380 U
4-Methylphenol	700	360 U	360 U	370 U	410 U	1300
Naphthalene	480 U	360 U	360 U	370 U	410 U	380 U
2-Methylnaphthalene	480 U	360 U	360 U	370 U	410 U	380 U
Acenaphthylene	92 J	100 J	360 U	72 J	410 U	130 J
Acenapthene	480 U	80 J	360 U	370 U	410 U	380 U
Dibenzofuran	480 U	360 U	360 U	370 U	410 U	380 U
2,4-Dinitrotoluene	480 U	360 U	360 U	370 U	410 U	380 U
Fluorene	480 U	61 J	360 U	370 U	410 U	380 U
Phenanthrene	380 J	680	360 U	200 J	410 U	350 J
Anthracene	110 J	150 J	360 U	38 J	410 U	280 J
Carbazole	480 U	100 J	360 U	45 J	410 U	71 J
Fluoranthene	960	2800	360 U	450	410 U	1300
Pyrene	1200	2700	360 U	820	410 U	3400
3,3-Dichlorobenzidine	480 U	360 U	360 U	370 U	410 U	44 J
Benzo(a)anthracene	450 J	620	360 U	180 J	410 U	860
Chrysene	1000	1700	360 U	360 J	410 U	1500
Bis(2-ethylhexyl)-phthalate	330 B	360 B	360 U	55 B	240 J	250 B
Benzo(b)fluoranthene	1400 J	360 U	360 UJ	490 J	410 UJ	3000 J
Benzo(k)fluoranthene	820 J	1400	360 UJ	500 J	410 UJ	2500 J
Benzo(a)pyrene	550 J	1000	360 UJ	240 J	410 UJ	1200 J
Indeno(1,2,3-cd)pyrene	170 J	330 J	360 UJ	370 UJ	410 UJ	320 J
Dibenzo(a,h)anthracene	480 UJ	140 J	360 UJ	370 UJ	410 UJ	140 J
Benzo(g,h,i)perylene	170 J	360	360 UJ	370 UJ	410 UJ	340 J

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
K - biased high
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS24-00	A01SS25-00	A01SS26-00	A01SS27-00	A01SS28-00	A01SS29-00
Sample Date	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Phenol	350 U	9300 U	350 U	360 U	350 U	400 U
1,4-Dichlorobenzene	350 U	9300 U	350 U	360 U	350 U	400 U
2-Methylphenol	350 U	9300 U	350 U	360 U	350 U	400 U
2,2'-oxybis(1-chloropropene)	350 U	2000 J	350 U	360 U	350 U	400 U
4-Methylphenol	350 U	9300 U	350 U	360 U	350 U	400 U
Naphthalene	350 U	1800 J	350 U	360 U	350 U	400 U
2-Methylnaphthalene	350 U	1600 J	350 U	360 U	350 U	400 U
Acenaphthylene	97 J	4700 J	350 U	360 U	350 U	400 U
Acenapthene	350 U	9300 U	350 U	360 U	350 U	400 U
Dibenzofuran	350 U	2300 J	350 U	360 U	350 U	400 U
2,4-Dinitrotoluene	350 U	9300 U	350 U	360 U	350 U	400 U
Fluorene	350 U	9300 U	350 U	360 U	350 U	400 U
Phenanthrene	83 J	43000	350 U	360 U	350 U	400 U
Anthracene	100 J	130000	350 U	360 U	350 U	400 U
Carbazole	350 U	10000	350 U	360 U	350 U	400 U
Fluoranthene	420	26000	46 J	360 U	350 U	400 U
Pyrene	1500	63000	58 J	360 U	350 U	400 U
3,3-Dichlorobenzidine	350 U	9300	350 U	360 U	350 U	400 U
Benzo(a)anthracene	370	27000	350 U	360 U	350 U	400 U
Chrysene	780	63000	350 U	360 U	350 U	400 U
Bis(2-ethylhexyl)-phthalate	370 B	24000 B	350 U	2600 B	110 B	1100 B
Benzo(b)fluoranthene	1100 J	49000 J	51 J	360 U	350 U	400 U
Benzo(k)fluoranthene	880 J	39000 J	51 J	360 U	350 U	400 U
Benzo(a)pyrene	550 J	26000 J	36 J	360 U	350 U	400 U
Indeno(1,2,3-cd)pyrene	150 J	110000 J	350 U	360 U	350 U	400 U
Dibenzo(a,h)anthracene	350 UJ	53000 J	350 U	360 U	350 U	400 U
Benzo(g,h,i)perylene	160 J	100000 J	350 U	360 U	350 U	400 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
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TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS30 -00	A01SS31-00	A01SS32-00	A01SS33-00	A01SS34-00	A01SS35-00
Sample Date	11/02/94	11/02/94	11/02/94	11/03/94	34641	11/03/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Phenol	380 U	330 U	2700 U	340 U	370 U	360 U
1,4-Dichlorobenzene	380 U	330 U	2700 U	340 U	370 U	360 U
2-Methylphenol	380 U	330 U	2700 U	340 U	370 U	360 U
2,2'-oxybis(1-chloropropene)	380 U	330 U	2700 U	340 U	370 U	360 U
4-Methylphenol	380 U	40 J	2700 U	340 U	370 U	360 U
Naphthalene	380 U	330 U	360 J	340 U	370 U	360 U
2-Methylnaphthalene	110 J	330 U	2700 U	340 U	370 U	360 U
Acenaphthylene	380 U	330 U	3000	72 J	370 U	360 U
Acenapthene	380 U	330 U	2700 U	340 U	370 U	360 U
Dibenzofuran	50 J	330 U	280 J	340 U	370 U	360 U
2,4-Dinitrotoluene	380 U	330 U	2700 U	340 U	370 U	360 U
Fluorene	380 U	330 U	380 J	340 U	370 U	360 U
Phenanthrene	380 J	330 U	4700	43 J	370 U	360 U
Anthracene	71 J	330 U	3100	71 J	370 U	360 U
Carbazole	380 U	330 U	660 J	340 U	370 U	360 U
Fluoranthene	450	43 J	14000	440	370 U	360 U
Pyrene	1000	50 J	26000	650	370 U	360 U
3,3-Dichlorobenzidine	380 U	330 U	2700 U	340 U	370 U	360 U
Benzo(a)anthracene	270 J	28 J	16000	310 J	370 U	360 U
Chrysene	340 J	37 J	23000	450	370 U	360 U
Bis(2-ethylhexyl)-phthalate	270 B	45 B	650 B	340 U	46 B	400 B
Benzo(b)fluoranthene	600 J	62 J	31000 J	760	370 U	360 U
Benzo(k)fluoranthene	380 UJ	330 U	31000 J	440 J	370 U	360 U
Benzo(a)pyrene	320 J	330 U	20000 J	270 J	370 U	360 U
Indeno(1,2,3-cd)pyrene	380 UJ	330 U	6000 J	91 J	370 U	360 U
Dibenzo(a,h)anthracene	380 UJ	330 U	3000 J	340 U	370 U	360 U
Benzo(g,h,i)perylene	380 UJ	330 U	53000 J	80 J	370 U	360 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
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UJ - reported quantitation limit is qualified as estimated

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS36-00	A01SS37-00	A01SS38-00	A01SS39-00	A01SS40-00	A01SS41-00
Sample Date	11/03/94	11/03/94	11/03/94	11/03/94	11/03/94	11/04/93
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Phenol	390 U	370 U	410 U	390 U	380 U	430 U
1,4-Dichlorobenzene	390 U	370 U	410 U	390 U	380 U	430 U
2-Methylphenol	390 U	370 U	410 U	390 U	380 U	430 U
2,2'-oxybis(1-chloropropene)	390 U	370 U	410 U	390 U	380 U	430 U
4-Methylphenol	390 U	370 U	410 U	390 U	380 U	430 U
Naphthalene	390 U	370 U	410 U	390 U	380 U	430 U
2-Methylnaphthalene	390 U	370 U	410 U	390 U	380 U	430 U
Acenaphthylene	390 U	66 J	250 J	390 U	380 U	430 U
Acenapthene	390 U	370 U	410 U	390 U	380 U	430 U
Dibenzofuran	390 U	370 U	410 U	390 U	380 U	430 U
2,4-Dinitrotoluene	390 U	69 J	430	390 U	380 U	430 U
Fluorene	390 U	370 U	410 U	390 U	380 U	430 U
Phenanthrene	39 J	140 J	140 J	390 U	380 U	430 U
Anthracene	7 J	64 J	180 J	390 U	380 U	430 U
Carbazole	390 U	370 U	410 U	390 U	380 U	430 U
Fluoranthene	40 J	500	1900	390 U	380 U	430 U
Pyrene	390 U	800	4400	390 U	380 U	430 U
3,3-Dichlorobenzidine	390 U	370 U	410 U	390 U	380 U	430 U
Benzo(a)anthracene	390 U	410	1400	390 U	380 U	430 U
Chrysene	64 J	560	1800	390 U	380 U	430 U
Bis(2-ethylhexyl)-phthalate	630 B	730 B	270 B	420 B	720 B	430 U
Benzo(b)fluoranthene	390 UJ	910 J	4700 J	390 UJ	380 UJ	430 U
Benzo(k)fluoranthene	390 UJ	370 UJ	2200 J	390 UJ	380 UJ	430 U
Benzo(a)pyrene	390 UJ	380 J	1900 J	390 UJ	380 UJ	430 U
Indeno(1,2,3-cd)pyrene	390 UJ	110 J	380 J	390 UJ	380 UJ	430 U
Dibenzo(a,h)anthracene	390 UJ	370 UJ	180 J	390 UJ	380 UJ	430 U
Benzo(g,h,i)perylene	390 UJ	100 J	390 J	390 UJ	380 UJ	430 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
K - biased high
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UJ - reported quantitation limit is qualified as estimated

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS42-00	A01SS43-00	A01SS44-00	A01SS45-00	A01SS46-00	A01SS47-00
Sample Date	11/04/93	11/04/93	11/04/93	11/04/93	11/04/93	11/04/93
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Phenol	550 U	460 U	380 U	460 U	390 U	2000 U
1,4-Dichlorobenzene	550 U	460 U	380 U	460 U	390 U	2000 U
2-Methylphenol	550 U	460 U	380 U	460 U	390 U	2000 U
2,2'-oxybis(1-chloropropene)	550 U	460 U	380 U	460 U	390 U	2000 U
4-Methylphenol	550 U	460 U	380 U	460 U	390 U	2000 U
Naphthalene	550 U	460 U	380 U	460 U	390 U	2000 U
2-Methylnaphthalene	550 U	460 U	380 U	460 U	390 U	2000 U
Acenaphthylene	100 J	460 U	380 U	460 U	390 U	1100 J
Acenapthene	550 U	460 U	380 U	460 U	390 U	2000 U
Dibenzofuran	550 U	460 U	380 U	460 U	390 U	2000 U
2,4-Dinitrotoluene	550 U	460 U	380 U	460 U	390 U	2000 U
Fluorene	550 U	460 U	380 U	460 U	390 U	2000 U
Phenanthrene	77 J	460 U	380 U	460 U	390 U	1200 J
Anthracene	550 U	460 U	380 U	460 U	390 U	1100 J
Carbazole	550 U	460 U	380 U	460 U	390 U	310 J
Fluoranthene	490 J	460 U	380 U	460 U	390 U	6000
Pyrene	1600 J	460 U	380 U	460 U	390 U	13000
3,3-Dichlorobenzidine	550 UJ	460 U	380 U	460 U	390 U	2000 U
Benzo(a)anthracene	400 J	460 U	380 U	460 U	390 U	3900
Chrysene	460 J	460 U	380 U	460 U	390 U	9300
Bis(2-ethylhexyl)-phthalate	620 B	460 U	140 B	180 B	470 B	470 B
Benzo(b)fluoranthene	1100 J	460 U	380 U	460 U	390 U	19000 J
Benzo(k)fluoranthene	550 UJ	460 U	380 U	460 U	390 U	11000 J
Benzo(a)pyrene	390 J	460 U	380 U	460 U	390 U	8100 J
Indeno(1,2,3-cd)pyrene	550 UJ	460 U	380 U	460 U	390 U	1800 J
Dibenzo(a,h)anthracene	550 UJ	460 U	380 U	460 U	390 U	830 J
Benzo(g,h,i)perylene	550 UJ	460 U	380 U	460 U	390 U	2200 J

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
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TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS49-00	A01SS50-00	A01SS51-00	A01SS52-00	A01SS53-00	A01SS54-00
Sample Date	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Phenol	330 U	330 U	330 U	330 U	330 U	330 U
1,4-Dichlorobenzene	330 U	330 U	330 U	330 U	330 U	330 U
2-Methylphenol	330 U	330 U	330 U	330 U	330 U	330 U
2,2'-oxybis(1-chloropropene)	330 U	330 U	330 U	330 U	330 U	330 U
4-Methylphenol	330 U	330 U	330 U	330 U	330 U	330 U
Naphthalene	330 U	330 U	330 U	330 U	330 U	330 U
2-Methylnaphthalene	330 U	330 U	330 U	330 U	330 U	330 U
Acenaphthylene	330 U	330 U	330 U	330 U	330 U	330 U
Acenapthene	330 U	330 U	330 U	330 U	330 U	330 U
Dibenzofuran	330 U	330 U	330 U	330 U	330 U	330 U
2,4-Dinitrotoluene	330 U	330 U	330 U	330 U	330 U	330 U
Fluorene	330 U	330 U	330 U	330 U	330 U	330 U
Phenanthrene	330 U	330 U	330 U	330 U	45 J	330 U
Anthracene	330 U	330 U	330 U	330 U	330 U	330 U
Carbazole	330 U	330 U	330 U	330 U	330 U	330 U
Fluoranthene	330 U	330 U	330 U	330 U	78 J	330 U
Pyrene	330 U	330 U	330 U	330 U	68 J	330 U
3,3-Dichlorobenzidine	330 U	330 U	330 U	330 U	330 U	330 U
Benzo(a)anthracene	330 U	330 U	330 U	330 U	44 J	330 U
Chrysene	330 U	330 U	330 U	330 U	56 J	330 U
Bis(2-ethylhexyl)-phthalate	330 U	78 B	130 B	330 U	330 U	330 U
Benzo(b)fluoranthene	330 U	330 U	330 U	330 U	39 J	330 U
Benzo(k)fluoranthene	330 U	330 U	330 U	330 U	56 J	330 U
Benzo(a)pyrene	330 U	330 U	330 U	330 U	43 J	330 U
Indeno(1,2,3-cd)pyrene	330 U	330 U	330 U	330 U	330 U	330 U
Dibenzo(a,h)anthracene	330 U	330 U	330 U	330 U	330 U	330 U
Benzo(g,h,i)perylene	330 U	330 U	330 U	330 U	330 U	330 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
K - biased high
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS77-00	A01SS78-00	A01SS79-00	A01SS80-00	A01SS86-00	A01SS95-00
Sample Date	11/04/93	11/04/93	34641	11/04/93	11/07/94	11/10/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Phenol	380 U	500 U	370 U	430 U	360 U	2300
1,4-Dichlorobenzene	380 U	500 U	370 U	430 U	360 U	2000 U
2-Methylphenol	380 U	500 U	370 U	430 U	360 U	2000 U
2,2'-oxybis(1-chloropropene)	380 U	500 U	370 U	430 U	360 U	2000 U
4-Methylphenol	380 U	180 J	370 U	430 U	360 U	2000 U
Naphthalene	380 U	500 U	370 U	430 U	360 U	2000 U
2-Methylnaphthalene	380 U	500 U	370 U	430 U	360 U	2000 U
Acenaphthylene	98 J	240 J	370 U	430 U	360 U	2000 U
Acenapthene	380 U	500 U	370 U	430 U	360 U	2000 U
Dibenzofuran	380 U	500 U	370 U	430 U	360 U	2000 U
2,4-Dinitrotoluene	380 U	500 U	370 U	430 U	360 U	2000 U
Fluorene	380 U	500 U	370 U	430 U	360 U	2000 U
Phenanthrene	260 J	370 J	370 U	430 U	360 U	2000 U
Anthracene	100 J	220 J	370 U	430 U	360 U	2000 U
Carbazole	50 J	78 J	370 U	430 U	360 U	2000 U
Fluoranthene	970	2000	370 U	430 U	360 U	2000 U
Pyrene	1200	3700	370 U	430 U	360 U	2000 U
3,3-Dichlorobenzidine	380 U	500 U	370 U	430 U	360 U	2000 U
Benzo(a)anthracene	460	1100	370 U	430 U	360 U	2000 U
Chrysene	1300	2600	370 U	430 U	360 U	2000 U
Bis(2-ethylhexyl)-phthalate	480 B	370 B	110 B	210 B	360 U	2000 U
Benzo(b)fluoranthene	2300	4900	370 U	430 U	360 UJ	2000 U
Benzo(k)fluoranthene	1400	2800	370 U	430 U	360 UJ	2000 U
Benzo(a)pyrene	900	1900	370 U	430 U	360 UJ	2000 U
Indeno(1,2,3-cd)pyrene	270 J	410 J	370 U	430 U	360 UJ	2000 U
Dibenzo(a,h)anthracene	110 J	180 J	370 U	430 U	360 UJ	2000 U
Benzo(g,h,i)perylene	300 J	460 J	370 U	430 U	360 UJ	2000 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
K - biased high
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS97-00	A01SS98-00	A01SS99-00	A01SS100-00	A01SS103A-00	A01SS109-00
Sample Date	12/02/94	12/02/94	12/02/94	12/02/94	12/06/94	12/12/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Phenol	350 U	350 U	380 U	370 U	370 U	350 U
1,4-Dichlorobenzene	350 U	350 U	380 U	370 U	370 U	350 U
2-Methylphenol	350 U	350 U	380 U	370 U	370 U	350 U
2,2'-oxybis(1-chloropropene)	350 U	350 U	380 U	370 U	370 U	350 U
4-Methylphenol	64 J	350 U	380 U	370 U	370 U	350 U
Naphthalene	350 U	350 U	380 U	370 U	370 U	350 U
2-Methylnaphthalene	350 U	350 U	380 U	370 U	370 U	350 U
Acenaphthylene	350 U	350 U	380 U	370 U	370 U	350 U
Acenapthene	350 U	350 U	380 U	370 U	370 U	350 U
Dibenzofuran	350 U	350 U	380 U	370 U	370 U	350 U
2,4-Dinitrotoluene	350 U	350 U	380 U	370 U	370 U	350 U
Fluorene	350 U	350 U	380 U	370 U	370 U	350 U
Phenanthrene	350 U	350 U	380 U	370 U	370 U	350 U
Anthracene	350 U	350 U	380 U	370 U	370 U	350 U
Carbazole	350 U	350 U	380 U	370 U	370 U	350 U
Fluoranthene	350 U	29 J	380 U	370 U	370 U	350 U
Pyrene	350 U	39 J	380 U	370 U	370 U	350 U
3,3-Dichlorobenzidine	350 U	350 U	380 U	370 U	370 U	350 U
Benzo(a)anthracene	350 U	350 U	380 U	370 U	370 U	350 U
Chrysene	350 U	350 U	380 U	370 U	370 U	350 U
Bis(2-ethylhexyl)-phthalate	350 U	350 U	380 U	370 U	37 B	350 U
Benzo(b)fluoranthene	350 U	69 J	38 J	370 U	370 U	350 U
Benzo(k)fluoranthene	350 U	350 U	380 U	370 U	370 U	350 U
Benzo(a)pyrene	350 U	350 U	380 U	370 U	370 U	350 U
Indeno(1,2,3-cd)pyrene	350 U	350 U	380 U	370 U	370 U	350 U
Dibenzo(a,h)anthracene	350 U	350 U	380 U	370 U	370 U	350 U
Benzo(g,h,i)perylene	350 U	350 U	380 U	370 U	370 U	350 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
K - biased high
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS110-00	A01SS111-00	A01SS112-00	A01SS113-00
Sample Date	12/12/94	12/13/94	12/13/94	12/14/94
Units	UG/KG	UG/KG	UG/KG	UG/KG
Phenol	420 U	360 U	360 U	380 U
1,4-Dichlorobenzene	420 U	360 U	360 U	380 U
2-Methylphenol	420 U	360 U	360 U	380 U
2,2'-oxybis(1-chloropropene)	420 U	360 U	360 U	380 U
4-Methylphenol	420 U	360 U	360 U	380 U
Naphthalene	420 U	360 U	360 U	380 U
2-Methylnaphthalene	420 U	360 U	360 U	380 U
Acenaphthylene	420 U	360 U	360 U	380 U
Acenapthene	420 U	360 U	360 U	380 U
Dibenzofuran	420 U	360 U	360 U	380 U
2,4-Dinitrotoluene	420 U	360 U	360 U	380 U
Fluorene	420 U	360 U	360 U	380 U
Phenanthrene	420 U	360 U	360 U	380 U
Anthracene	420 U	360 U	360 U	380 U
Carbazole	420 U	360 U	360 U	380 U
Fluoranthene	420 U	360 U	360 U	380 U
Pyrene	420 U	360 U	360 U	380 U
3,3-Dichlorobenzidine	420 U	360 U	360 U	380 U
Benzo(a)anthracene	420 U	360 U	360 U	380 U
Chrysene	420 U	360 U	360 U	380 U
Bis(2-ethylhexyl)-phthalate	93 B	360 U	360 U	380 U
Benzo(b)fluoranthene	420 U	360 U	360 U	380 U
Benzo(k)fluoranthene	420 U	360 U	360 U	380 U
Benzo(a)pyrene	420 U	360 U	360 U	380 U
Indeno(1,2,3-cd)pyrene	420 U	360 U	360 U	380 U
Dibenzo(a,h)anthracene	420 U	360 U	360 U	380 U
Benzo(g,h,i)perylene	420 U	360 U	360 U	380 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
K - biased high
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
PESTICIDE/PCB COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS06-00	A01SS07-00	A01SS08-00	A01SS09-00	A01SS10-00	A01SS11-00
Sample Date	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Dieldrin	20 U	18 U	20 U	86	87	20 U
4,4-DDE	20 U	18 U	20 U	22 U	20 U	20 U
4,4-DDT	20 U	18 U	20 U	35	20 U	20 U

UG/KG - milligram per kilogram
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
PESTICIDE/PCB COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS12-00	A01SS13-00	A01SS14-00	A01SS15-00	A001SS16-00	A01SS17-00
Sample Date	11/02/94	11/02/94	11/02/94	34641	34641	34641
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Dieldrin	20 U	21 U	18 U	19 U	18 U	21 U
4,4-DDE	11 J	21 U	18 U	19 U	18 U	21 U
4,4-DDT	56	21 U	18 U	19 U	18 U	21 U

UG/KG - milligram per kilogram
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
PESTICIDE/PCB COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS18-00	A01SS19-00	A01SS20-00	A01SS21-00	A01SS22-00	A01SS23-00
Sample Date	34641	11/04/93	11/02/94	11/02/94	11/02/94	11/02/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Dieldrin	24 U	18 U	18 U	19 U	20 U	19 U
4,4-DDE	24 U	18 U	18 U	19 U	20 U	19 U
4,4-DDT	24 U	18 U	18 U	19 U	20 U	19 U

UG/KG - milligram per kilogram
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
PESTICIDE/PCB COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS24-00	A01SS25-00	A01SS26-00	A01SS27-00	A01SS28-00	A01SS29-00
Sample Date	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Dieldrin	17 U	23 U	18 U	18 U	18 U	20 U
4,4-DDE	17 U	23 U	18 U	18 U	18 U	20 U
4,4-DDT	17 U	31	18 U	18 U	18 U	20 U

UG/KG - milligram per kilogram
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
PESTICIDE/PCB COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS30 -00	A01SS31-00	A01SS32-00	A01SS33-00	A01SS34-00	A01SS35-00
Sample Date	11/02/94	11/02/94	11/02/94	11/03/94	34641	11/03/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Dieldrin	19 U	19 UJ	190 UJ	17 U	19 U	18 U
4,4-DDE	19 U	19 UJ	190 UJ	17 U	19 U	18 U
4,4-DDT	19 U	19 UJ	190 UJ	17 U	19 U	18 U

UG/KG - milligram per kilogram
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
PESTICIDE/PCB COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS36-00	A01SS37-00	A01SS38-00	A01SS39-00	A01SS40-00	A01SS41-00
Sample Date	11/03/94	11/03/94	11/03/94	11/03/94	11/03/94	11/04/93
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Dieldrin	20 U	19 U	20 U	20 U	19 U	22 U
4,4-DDE	20 U	19 U	20 U	20 U	19 U	22 U
4,4-DDT	20 U	19 U	20 U	20 U	19 U	22 U

UG/KG - milligram per kilogram
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
PESTICIDE/PCB COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS42-00	A01SS43-00	A01SS44-00	A01SS45-00	A01SS46-00	A01SS47-00
Sample Date	11/04/93	11/04/93	11/04/93	11/04/93	11/04/93	11/04/93
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Dieldrin	27 U	23 U	19 U	23 U	19 U	20 U
4,4-DDE	27 U	23 U	19 U	23 U	19 U	20 U
4,4-DDT	27 U	23 U	19 U	23 U	19 U	20 U

UG/KG - milligram per kilogram
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
PESTICIDE/PCB COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS49-00	A01SS50-00	A01SS51-00	A01SS52-00	A01SS53-00	A01SS54-00
Sample Date	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Dieldrin	17 U	18 U	18 U	22 U	19 U	20 U
4,4-DDE	17 U	18 U	18 U	22 U	19 U	20 U
4,4-DDT	17 U	18 U	18 U	22 U	19 U	20 U

UG/KG - milligram per kilogram
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
PESTICIDE/PCB COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS77-00	A01SS78-00	A01SS79-00	A01SS80-00	A01SS86-00	A01SS95-00
Sample Date	11/04/93	11/04/93	34641	11/04/93	11/07/94	11/10/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Dieldrin	19 U	24 U	18 U	21 U	18 U	20 U
4,4-DDE	19 U	24 U	18 U	21 U	18 U	20 U
4,4-DDT	19 U	24 U	18 U	21 U	18 U	20 U

UG/KG - milligram per kilogram
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
PESTICIDE/PCB COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS97-00	A01SS98-00	A01SS99-00	A01SS100-00	A01SS103A-00	A01SS109-00
Sample Date	12/02/94	12/02/94	12/02/94	12/02/94	12/06/94	12/12/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Dieldrin	17 U	18 U	18 U	19 U	19 U	18 U
4,4-DDE	17 U	18 U	18 U	19 U	19 U	18 U
4,4-DDT	17 U	18 U	18 U	19 U	19 U	18 U

UG/KG - milligram per kilogram
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
PESTICIDE/PCB COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS110-00	A01SS111-00	A01SS112-00	A01SS113-00
Sample Date	12/12/94	12/13/94	12/13/94	12/14/94
Units	UG/KG	UG/KG	UG/KG	UG/KG
Dieldrin	21 U	18 U	18 U	19 U
4,4-DDE	21 U	18 U	18 U	19 U
4,4-DDT	21 U	18 U	18 U	19 U

UG/KG - milligram per kilogram
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS06-00	A01SS07-00	A01SS08-00	A01SS09-00	A01SS10-00	A01SS11-00
Sample Date	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
1,3,5-Trinitrobenzene	220 U	250 U	280 U	280 U	210 U	230 U
1,3-Dinitrobenzene	270 U	300 U	330 U	330 U	250 U	280 U
2,4,6-Trinitrotoluene	310 U	360 U	390 U	390 U	290 U	330 U
2,4-Dinitrotoluene	220 U	250 U	280 U	280 U	210 U	230 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS12-00	A01SS13-00	A01SS14-00	A01SS15-00	A001SS16-00	A01SS17-00
Sample Date	11/02/94	11/02/94	11/02/94	34641	34641	34641
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
1,3,5-Trinitrobenzene	270 U	280 U	260 U	230 U	220 U	240 U
1,3-Dinitrobenzene	330 U	330 U	310 U	280 U	270 U	290 U
2,4,6-Trinitrotoluene	380 U	390 U	360 U	320 U	310 U	340 U
2,4-Dinitrotoluene	270 U	280 U	260 U	230 U	220 U	240 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS18-00	A01SS19-00	A01SS20-00	A01SS21-00	A01SS22-00	A01SS23-00
Sample Date	34641	11/04/93	11/02/94	11/02/94	11/02/94	11/02/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
1,3,5-Trinitrobenzene	280 J	230 U	230 U	250 U	270 U	220 U
1,3-Dinitrobenzene	430 U	280 U	270 U	300 U	320 U	260 U
2,4,6-Trinitrotoluene	500 U	330 U	320 U	340 U	370 U	310 U
2,4-Dinitrotoluene	350 U	230 U	230 U	250 U	270 U	220 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS24-00	A01SS25-00	A01SS26-00	A01SS27-00	A01SS28-00	A01SS29-00
Sample Date	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
1,3,5-Trinitrobenzene	250 U	330 U	260 U	220 U	180 U	310 U
1,3-Dinitrobenzene	300 U	400 U	310 U	270 U	220 U	370 U
2,4,6-Trinitrotoluene	350 U	470 U	360 U	310 U	260 U	430 U
2,4-Dinitrotoluene	250 U	330 U	260 U	220 U	180 U	310 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS30 -00	A01SS31-00	A01SS32-00	A01SS33-00	A01SS34-00	A01SS35-00
Sample Date	11/02/94	11/02/94	11/02/94	11/03/94	34641	11/03/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
1,3,5-Trinitrobenzene	230 U	250 U	260 U	240 U	260 U	230 U
1,3-Dinitrobenzene	280 U	300 U	310 U	290 U	310 U	280 U
2,4,6-Trinitrotoluene	320 U	360 U	360 U	340 U	360 U	320 U
2,4-Dinitrotoluene	230 U	250 U	260 U	240 U	260 U	230 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS36-00	A01SS37-00	A01SS38-00	A01SS39-00	A01SS40-00	A01SS41-00
Sample Date	11/03/94	11/03/94	11/03/94	11/03/94	11/03/94	11/04/93
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
1,3,5-Trinitrobenzene	270 U	250 U	1100	220 U	250 U	230 U
1,3-Dinitrobenzene	320 U	300 U	170 J	270 U	300 U	270 U
2,4,6-Trinitrotoluene	370 U	350 U	5900	310 U	350 U	320 U
2,4-Dinitrotoluene	270 U	250 U	850	220 U	250 U	230 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS42-00	A01SS43-00	A01SS44-00	A01SS45-00	A01SS46-00	A01SS47-00
Sample Date	11/04/93	11/04/93	11/04/93	11/04/93	11/04/93	11/04/93
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
1,3,5-Trinitrobenzene	380 U	310 U	260 U	290 U	250 U	220 U
1,3-Dinitrobenzene	460 U	370 U	320 U	350 U	300 U	270 U
2,4,6-Trinitrotoluene	540 U	430 U	370 U	400 U	350 U	310 U
2,4-Dinitrotoluene	380 U	310 U	260 U	290 U	250 U	220 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS49-00	A01SS50-00	A01SS51-00	A01SS52-00	A01SS53-00	A01SS54-00
Sample Date	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
1,3,5-Trinitrobenzene	230 U	250 U	260 U	310 U	260 U	280 U
1,3-Dinitrobenzene	270 U	300 U	310 U	370 U	310 U	360 U
2,4,6-Trinitrotoluene	320 U	340 U	360 U	430 U	360 U	420 U
2,4-Dinitrotoluene	230 U	250 U	260 U	310 U	260 U	300 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS77-00	A01SS78-00	A01SS79-00	A01SS80-00	A01SS86-00	A01SS95-00
Sample Date	11/04/93	11/04/93	34641	11/04/93	11/07/94	11/10/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
1,3,5-Trinitrobenzene	290 U	100 J	260 U	270 U	230 U	300 U
1,3-Dinitrobenzene	350 U	340 U	320 U	320 U	270 U	370 U
2,4,6-Trinitrotoluene	400 U	390 U	370 U	380 U	320 U	430 U
2,4-Dinitrotoluene	290 U	280 U	260 U	270 U	230 U	300 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS97-00	A01SS98-00	A01SS99-00	A01SS100-00	A01SS103A-00	A01SS109-00
Sample Date	12/02/94	12/02/94	12/02/94	12/02/94	12/06/94	12/12/94
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
1,3,5-Trinitrobenzene	200 U	230 U	260 U	240 U	250 U	240 U
1,3-Dinitrobenzene	240 U	280 U	310 U	290 U	300 U	290 U
2,4,6-Trinitrotoluene	1500	330 U	1100	330 U	350 U	340 U
2,4-Dinitrotoluene	200 U	230 U	260 U	240 U	250 U	240 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-2
SURFACE SOILS - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS110-00	A01SS111-00	A01SS112-00	A01SS113-00
Sample Date	12/12/94	12/13/94	12/13/94	12/14/94
Units	UG/KG	UG/KG	UG/KG	UG/KG
1,3,5-Trinitrobenzene	240 U	270 U	170 J	280 U
1,3-Dinitrobenzene	290 U	320 U	260 U	340 U
2,4,6-Trinitrotoluene	340 U	2500	740	390 U
2,4-Dinitrotoluene	240 U	270 U	220 U	280 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-3
SURFACE SOILS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS06-00	A01SS07-00	A01SS08-00	A01SS09-00	A01SS10-00	A01SS11-00
Sample Date	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	937	1060	1450	2170	2130	1700
Antimony	1.14 B	0.814 UL	0.876 UL	1.02 UL	0.866 UL	0.768 UL
Arsenic	52.7 L	10.9	12.3 B	28 B	2.82 B	1 U
Barium	8.31	8.47	11.8	15.4	23	14
Beryllium	0.087 B	0.245 B	0.164 B	0.288 B	0.317 B	0.173 B
Cadmium	0.34 B	0.505 B	0.512 B	0.425 B	0.154 B	0.224 B
Calcium	988	366 B	6090	4140	1130	199 B
Chromium	3.13 B	4.34 B	3.91 B	5.89 B	2.35 B	2.41 B
Cobalt	0.536 B	3.52 B	1.54 B	1.62 B	2.16 B	1.36 B
Copper	5.21 B	1.78 B	10.6 B	8.8 B	1.84 B	1.23 B
Iron	2550	11800	5500	5410	2280	2760
Lead	10.2 J	2.71 J	15 J	11.5 J	10.5 J	54.4 J
Magnesium	119 B	110 B	362	404	174	121 B
Manganese	31.9	47.5	73.8	61.6	127	67.5
Mercury	0.051 U	0.05 U	0.05 U	0.079	0.043 U	0.045 U
Nickel	1.59 L	1.4 L	2.44 L	2.28 L	1.74 L	1.15 L
Potassium	185 L	143 L	297 L	473 L	196 L	115 L
Selenium	0.5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 UL
Silver	0.175 UL	0.158 UL	0.171 UL	0.199 UL	0.169 UL	0.149 UL
Sodium	11.2 B	6.01 B	55.3 B	23.5 B	22.6 B	8.38 B
Thallium	1 U	1 U	1 U	1 U	1 U	1 U
Vanadium	12.3 B	5.93 B	6.71 B	11.3 B	5.03 B	6.49 B
Zinc	18.6 B	10.8 B	97.9 J	38 J	11.4 B	16.1 B
TAL Cyanide	0.589	0.524	0.596	0.635 U	0.569	0.557 U

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-3
SURFACE SOILS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS12-00	A01SS13-00	A01SS14-00	A01SS15-00	A001SS16-00	A01SS17-00
Sample Date	11/02/94	11/02/94	11/02/94	34641	34641	34641
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	2150	1800	3070	925	1250	1340
Antimony	0.931 UL	0.871 UL	0.727 UL	0.831 U	0.745 U	0.9 U
Arsenic	1 U	1 U	4.59 B	32.7	10.3	11.6
Barium	32.2	21.8	23.6	6.03 B	10.2	11.1
Beryllium	0.334 B	0.135 B	0.3 B	0.293	0.289	0.146
Cadmium	0.172 B	0.261 B	0.432 B	0.031 U	0.505 B	0.358 B
Calcium	1060	2590	96300 J	609	440	4210
Chromium	2.34 B	2.69 B	7.29 B	4.11	5.55	3.85
Cobalt	1.66 B	1.28 B	2.12 B	2.05 B	4.09 B	1.62 B
Copper	2.52 B	2.66 B	5.49 B	3.49 B	1.38 B	8.64 B
Iron	2700	2800	8950	2470	12700	4390
Lead	33.8 J	11.9 J	7.12 J	10.5	5.8	13.6
Magnesium	176	229	890	113 B	137 B	303
Manganese	199	95.9	65.1	28.2	56.3	82.1
Mercury	0.055	0.05	0.046 U	0.044 U	0.047 U	0.116
Nickel	1.82 L	1.6 L	4.07 L	1.58	1.84	1.61
Potassium	135 L	191 L	666 L	321	312	273
Selenium	0.5 UL	0.5 UL	0.5 UL	0.138 UL	0.135 UL	0.167 UL
Silver	0.181 UL	0.17 UL	0.141 UL	0.162 UL	0.146 UL	0.176 UL
Sodium	7.5 B	16.4 B	224 B	19.9 B	7 B	39.4 B
Thallium	1 U	1 U	1 U	0.223 U	0.219 UJ	0.269 UJ
Vanadium	6.63 B	9.88 B	6.83 B	9.75	6.98	6.55
Zinc	11.3 B	15.2 B	32.2 J	15	9.5	92.4
TAL Cyanide	0.625	0.592	0.504 U	0.56	0.52 U	0.586

MG/KG - milligram per kilogram
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J - estimated
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U - not detected
UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-3
SURFACE SOILS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS18-00	A01SS19-00	A01SS20-00	A01SS21-00	A01SS22-00	A01SS23-00
Sample Date	34641	11/04/93	11/02/94	11/02/94	11/02/94	11/02/94
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	2970	855 J	1980	1320	4300	1520
Antimony	5.86 B	0.801 U	0.723 UL	0.819 R	0.909 R	0.801 R
Arsenic	38.6	12.6 L	1.89 B	1.7 B	4.24 B	1.17 B
Barium	20.2	7.37	166	13.9	16.5	26.5
Beryllium	0.355	0.122	0.193 B	0.124 B	0.393 B	0.265 B
Cadmium	0.383 B	0.26 B	6.38 B	0.215 B	0.543 B	0.138 B
Calcium	6970 J	505	14700	1580	121000 J	992
Chromium	7.59	1.76 L	6.48 B	2.37 B	9.76 L	1.62 B
Cobalt	2.34 B	1.1 B	1.34 B	0.783 B	2.34 B	1.37 B
Copper	10 B	5.35 B	166	3.63 B	2.2 B	2.09 B
Iron	7450	2420 J	6820	2970	13000	1740
Lead	14.3	8.09	364 J	9.78	2.88	28.8
Magnesium	507	84.4 B	1650	171	601	131 B
Manganese	74.5	80.1	191	58.5	78.7	169
Mercury	0.065	0.193	0.039 U	0.182 L	0.05 UL	0.061 L
Nickel	3.37	0.704	3.96 L	1.28	3.48	1.27
Potassium	576	86 L	294 L	235 L	494 L	125 L
Selenium	0.203 UL	0.131 UL	0.5 UL	0.5 U	0.5 U	0.5 U
Silver	0.2 UL	0.156 UL	0.141 UL	0.159 UL	0.177 UL	0.156 UL
Sodium	54.8 B	13.6 B	31.8 B	5.3 B	122 B	9.33 B
Thallium	0.328 UJ	0.211 UJ	1 U	1 U	1 U	1 U
Vanadium	14.3	2.85	5.61 B	6.13 B	11.2 B	5.13 B
Zinc	46.6	31.2	733 J	11.6 B	14.9 B	8.63 B
TAL Cyanide	0.729 U	0.542 U	0.519	0.539	0.568	0.556

MG/KG - milligram per kilogram
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UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-3
SURFACE SOILS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS24-00	A01SS25-00	A01SS26-00	A01SS27-00	A01SS28-00	A01SS29-00
Sample Date	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	949	3240	2030	299	4230	1450
Antimony	0.72 R	1.07 R	0.727 R	0.819 R	0.696 R	0.832 R
Arsenic	11.8 B	2.97 B	1.82 B	1 UL	5.75 B	1.3 B
Barium	7	34.2	20.1	2.91 B	24.5	14.5
Beryllium	0.119 B	0.287 B	0.22 B	0.052 B	0.35 B	0.218 B
Cadmium	0.278 B	0.468 B	0.324 B	0.053 B	0.563 B	0.158 B
Calcium	483 B	11400	6410	514 B	17000	1730
Chromium	1.81 B	7.16 B	3.85 B	0.964 B	8.36 B	2.04 B
Cobalt	0.954 B	2.37 B	1.92 B	0.226 B	2.43 B	1.01 B
Copper	5.14 B	5.43 B	6.59 B	0.514 B	4.49 B	1.47 B
Iron	2750	9820	5170	992	9180	2220
Lead	6.52	27.6	10.4	2.97	4.72	8.13
Magnesium	98.3 B	561	341	27 B	484	169
Manganese	69.1	67.6	41.2	4.4	73.1	59.2
Mercury	0.05 UL	0.094 L	0.067 L	0.063 L	0.05 UL	0.112 L
Nickel	1.02	3.19	2.16	0.308	3.81	1.34
Potassium	107 L	334 L	385 L	40.9 UL	367 UL	134 L
Selenium	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Silver	0.14 UL	0.209 UL	0.141 UL	0.159 UL	0.136 UL	0.162 UL
Sodium	9.69 B	34.4 B	42 B	4.81 B	119 B	5.89 B
Thallium	1 U	1 U	1 U	1 U	1 U	1 U
Vanadium	2.92 B	7.66 B	6.51 B	1.06 B	9.37 B	5.14 B
Zinc	27.8	33.8	26.3	19.1 B	86.7	6.45 B
TAL Cyanide	0.524	0.673	0.527	0.526	0.531	0.579

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
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UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-3
SURFACE SOILS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS30 -00	A01SS31-00	A01SS32-00	A01SS33-00	A01SS34-00	A01SS35-00
Sample Date	11/02/94	11/02/94	11/02/94	11/03/94	34641	11/03/94
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	4670	5310	1350	1880	930	1270
Antimony	0.892 R	0.847 U	1.51 B	0.73 B	0.805	4.08 B
Arsenic	5.84 B	3.61 B	14.1 B	3.7	2.28	1.25
Barium	14.6	48.3	8.53	20.2	11.6	25.9
Beryllium	0.766 B	0.986 B	0.126 B	0.257	0.125	0.25
Cadmium	1.01 B	0.168 B	0.261 B	0.027 U	0.141 B	0.086 B
Calcium	2750	4120	461 B	863	196	870
Chromium	13 L	5.28 B	2.49 B	2	1.14	1.13
Cobalt	4.79 B	0.591 B	1.12 B	1.8 B	1.28 B	1.52 B
Copper	3.92 B	3.13 B	5.56 B	1.46 B	0.824 B	2.96 B
Iron	23800	5140	3530	2060 B	943	1270
Lead	4.49	37.2	6.67	9.07	97.3	29.9
Magnesium	808	1100	138 B	160	54.6 B	103 B
Manganese	85.3	347	68.3	105	51.1	161
Mercury	0.191 L	0.773	0.127	0.186	0.04	0.13
Nickel	4.43	1.43	1.39	1.44	0.459	1.32
Potassium	838 L	648	125	153	85.9	76.9
Selenium	0.5 U	0.5 UL	0.5 UL	30.6 L	0.148 UL	0.144 UL
Silver	0.174 UL	0.165 UL	0.161 UL	0.142 UL	1.56 L	0.158 UL
Sodium	14 B	51.7 B	8 B	17.5 B	8.7 B	16.2 B
Thallium	1 U	1 U	1 U	0.194 UJ	0.239 UJ	0.202 U
Vanadium	10.9 B	9.97 B	4.33 B	4.53	4.54	4.4
Zinc	26.5	34.9	33.3	8.9	10.8	7.69
TAL Cyanide	0.558	0.551	0.657	0.485 U	0.515	0.518

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
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UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-3
SURFACE SOILS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS36-00	A01SS37-00	A01SS38-00	A01SS39-00	A01SS40-00	A01SS41-00
Sample Date	11/03/94	11/03/94	11/03/94	11/03/94	11/03/94	11/04/93
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	1880	2420	2210	1140	3340	903
Antimony	0.825 U	0.819 U	0.861 U	0.847 U	0.882 U	0.937 U
Arsenic	1.49	4.64 L	2.96 L	4.18 L	5.15 L	16.9 L
Barium	21.2	28.3	162	15.1	15.6	7.23
Beryllium	0.128	0.263	0.193	0.126	0.373	0.108
Cadmium	0.191 B	0.316 B	6.65	0.149	0.322 B	0.215 B
Calcium	1920	36000	19200	1800	17000	742
Chromium	2.85	5.58 L	7.43 L	2.38 L	7.51 L	1.98 L
Cobalt	1.27 B	2.07 B	1.81 B	0.838 B	2.71 B	1.02 B
Copper	2.46 B	9.09 B	158	4.6 B	2.15 B	5.06 B
Iron	3040	6900 J	12600 J	2700 J	9290 J	3360 J
Lead	11.9	14.4	457	11.8	3.52	7.52
Magnesium	224	602	1620	176	462	118 B
Manganese	91.2	78.6	238	65.9	83.7	77.7
Mercury	0.107	0.05	0.246	0.05	0.036 U	0.197
Nickel	1.7	2.91	7.57	1.18	2.72	1.08
Potassium	153	418 L	332 L	252 L	302 L	100 L
Selenium	0.144 UL	0.129 UL	0.153 UL	0.135 UL	0.14 UL	0.165 UL
Silver	0.262 L	0.159 UL	0.168 UL	0.165 UL	0.172 UL	0.182 UL
Sodium	9.08 B	257 B	43.9 B	11.2 B	119 B	28.8 B
Thallium	0.233 U	0.209 UJ	0.168 UJ	0.217 UJ	0.226 UJ	0.266 UJ
Vanadium	9.89	6.15	6.27	6.31	9.05	3.4
Zinc	13.7	35.7	642	14.6	13.5	23.2
TAL Cyanide	0.559	0.552 U	0.59	0.556 U	0.582 U	0.659

MG/KG - milligram per kilogram
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UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-3
SURFACE SOILS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS42-00	A01SS43-00	A01SS44-00	A01SS45-00	A01SS46-00	A01SS47-00
Sample Date	11/04/93	11/04/93	11/04/93	11/04/93	11/04/93	11/04/93
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	2110	553	2790	1540	4890	3880
Antimony	1.6 U	1.16 B	0.814 U	1.08 B	0.822 B	1.08 B
Arsenic	3.49 L	1.01 L	4.36 L	1.2 L	2.67	2.81
Barium	30.4	5.92 B	20.4	14.4	12.1	20.9
Beryllium	0.302	0.162	0.264	0.227	0.755	0.162
Cadmium	0.372 B	0.068 B	0.317 B	0.136 B	0.785 B	0.287 B
Calcium	12400	862	21400	1430	3400 J	1840
Chromium	4.26 L	1.91 L	4.95 L	2.39	16.3	5.98
Cobalt	2.45 B	0.486 B	2.05 B	1.06 B	5.8 B	0.799 B
Copper	20.2 B	1.3 B	2.55 B	2.15 B	4.76 B	3.99 B
Iron	6200 J	1300 J	4180 J	2580	24200	5620
Lead	18.9	4.36	3.47	9.16	4.55	23.6
Magnesium	446	38.3 B	331	169	957	283
Manganese	63.2	8.69	68	60.1	85.6	59.5
Mercury	0.123	0.05 U	0.05	0.044 U	0.051 U	0.051 U
Nickel	2.82	0.539	2.4	1.48	5.37	1.48
Potassium	457 L	52.8 UL	189 L	130	1040	299
Selenium	0.226 UL	0.179 UL	0.128 UL	0.16 UL	0.155 UL	0.155 UL
Silver	0.225 UL	0.206 UL	0.158 UL	0.203 UL	0.154 UL	0.172 UL
Sodium	143 B	19.4 B	162 B	55.9 B	27.1 B	38.5 B
Thallium	0.365 UJ	0.288 U	0.208 U	0.259 U	0.25 U	0.25 U
Vanadium	9.34	1.73	5.63	5.59	12.7	10.9
Zinc	45.3	42.6	53.6	6.96	31.1	38.8
TAL Cyanide	0.833	0.675 U	0.573	0.681	0.585 U	0.596 U

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
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TABLE 5-3
SURFACE SOILS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS49-00	A01SS50-00	A01SS51-00	A01SS52-00	A01SS53-00	A01SS54-00
Sample Date	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	1610	945	1860	4280	1030	1480
Antimony	0.738 R	0.819 R	0.814 R	0.856 R	0.784 R	0.819 R
Arsenic	0.2 UL	0.22 UL	0.17 UL	2.86 L	5.49 L	2.3 L
Barium	29.7	14.4 B	36.9	20.6	32.4	18.5
Beryllium	0.312	0.111	0.352	0.408	0.109	0.16
Cadmium	0.088 B	0.087 B	0.877 B	0.583 B	0.732 B	0.239 B
Calcium	720	1700	579	13400	15800	2120
Chromium	1.82	1.53	2.71	10.8	2.44	3.19
Cobalt	1.38 B	0.791 B	0.874 B	3.33 B	1.31 B	0.838 B
Copper	1.73	2	5.08	3.65	211	5.25
Iron	1700	1430	1420	12100	5030	3300
Lead	8.99 J	7.5 J	17.3 J	8.36 J	147 J	14.4 J
Magnesium	135	124	80.1	787	214	198
Manganese	222 J	107 J	281 J	107 J	289 J	40.9 J
Mercury	0.031	0.046	0.044	0.049	0.051	0.119
Nickel	1.87 B	1.08 B	1.23 B	4.91 B	2.14 B	1.41 B
Potassium	101	121	82.2	830	96.3	143
Selenium	0.13 R	0.2 R	0.11 R	0.14 R	0.13 R	0.12 R
Silver	0.144 UL	0.159 UL	0.158 UL	0.167 UL	0.153 UL	0.159 UL
Sodium	6.56 B	4.18 B	4.86 B	85.3 B	37.1 B	11.8 B
Thallium	0.2 U	0.22	0.17 U	0.22	0.2 U	0.19 U
Vanadium	4.63 B	3.93 B	1.82 B	13.2	4.66 B	5.49 B
Zinc	7.45 K	8.1 K	139 K	21.7 K	140 K	17.7 K
TAL Cyanide	0.501 U	0.538 U	0.534 U	0.635 U	0.572 U	0.579 U

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-3
SURFACE SOILS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS77-00	A01SS78-00	A01SS79-00	A01SS80-00	A01SS86-00	A01SS95-00
Sample Date	11/04/93	11/04/93	34641	11/04/93	11/07/94	11/10/94
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	1350 J	2740	1200	4830	934	2910
Antimony	0.898 U	1.04 U	0.832 U	1.17 U	1.02 B	0.81 R
Arsenic	15.5	44.1	1.1 L	6.69	0.24 UL	1.17
Barium	8.77	19.3	27	15.4	13.5 B	20.9 L
Beryllium	0.143	0.287	0.254	0.726	0.104	0.315
Cadmium	0.271 B	0.42 B	0.081 B	0.767 B	0.089 B	0.342 B
Calcium	690	2990 J	1280	12100 J	1470 K	2210
Chromium	2.94	7.13	1.21 L	15.4	1.58	6.6 B
Cobalt	1.14 B	1.73 B	1.38 B	4.26 B	0.749 B	2.26
Copper	5.45 B	5.28 B	2.36 B	5.03 B	1.8	2.96 B
Iron	4220 J	7410	1160 J	23200	1400	6280
Lead	8.13	14	36.6	6.79	7.2	10.2
Magnesium	193	448	130 B	976	130	459
Manganese	84	83.9	179	86.1	99.4	102
Mercury	0.047 U	0.063	0.142	0.049 U	0.054	0.047
Nickel	1.47	2.56	1.18	5.47	0.96 B	3.51
Potassium	152	524	107 L	983	260	438
Selenium	0.142 UL	0.159 UL	0.132 UL	0.158 UL	0.13 R	0.677 UL
Silver	0.175 UL	0.203 UL	0.162 UL	0.196 UL	0.166 UL	0.158 UL
Sodium	17.3 B	21.8 B	12.7 B	110 B	11.8 B	8.72 B
Thallium	0.23 U	0.257 U	0.214 UJ	0.255 U	0.24 UL	0.208 U
Vanadium	4.67	14	4.97	12.8	3.6 B	8.34
Zinc	32.5	45.1	8.69	31.2	7.11	19.6
TAL Cyanide	0.579 U	0.751	0.554 U	0.656	0.525 U	0.615 U

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
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TABLE 5-3
SURFACE SOILS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS97-00	A01SS98-00	A01SS99-00	A01SS100-00	A01SS103A-00	A01SS109-00
Sample Date	12/02/94	12/02/94	12/02/94	12/02/94	12/06/94	12/12/94
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	2020	1760	2250	9350	3360	4550 J
Antimony	0.72 UL	0.74 UL	0.768 UL	0.801 UL	0.706 R	0.797 R
Arsenic	1.02 U	1.06 U	1.16 U	6.96 B	2.32 J	4.582
Barium	30.2	19.5	27.6	30.1	40.3	158
Beryllium	0.314	0.27	0.289	0.688	0.443 L	0.345
Cadmium	0.096	0.105	0.177	0.876	0.171 B	0.663 B
Calcium	292	513	691	1400	623	1400
Chromium	2.68	2.39	4.05	21.8	3.63 B	13.5 L
Cobalt	1.5	1.38	2.96	5.35	2.16 B	1.9 B
Copper	1.8 B	1.55 B	3.89 B	3.76 B	4.05 B	10.3 J
Iron	1860	2330	3250	23100	3410	12500
Lead	3.07 B	2.9 B	7.76 B	7.39 B	13.3	27.3 K
Magnesium	175	185	296	1470	234 B	984 L
Manganese	177	128	88.4	161	236	98.4
Mercury	0.051 U	0.045 U	0.036 U	0.05 U	0.038 L	0.02
Nickel	1.7 L	1.74 L	2.57 L	6.56 L	2.7 B	3.37
Potassium	153	155	257	1550	207	995
Selenium	0.51 U	0.532 U	0.581 U	0.51 U	0.125 U	0.118 UL
Silver	0.14 U	0.145 U	0.149 U	0.156 U	0.137 U	0.155 U
Sodium	9.28 B	9.5 B	14 B	18.8 B	9.34 B	23.9 B
Thallium	1.02 U	1.06 U	1.16 U	1.02 U	0.192 UJ	0.182 U
Vanadium	2.16 B	2.73 B	3.53 B	21.5	5.55 L	12.2
Zinc	6.33	7	15.5	24	105	86.9 J
TAL Cyanide	0.294	0.269	0.254	1.79	1.07	0.495 U

MG/KG - milligram per kilogram
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UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-3
SURFACE SOILS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS110-00	A01SS111-00	A01SS112-00	A01SS113-00
Sample Date	12/12/94	12/13/94	12/13/94	12/14/94
Units	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	12300 J	4100	1880	4150
Antimony	0.943 R	0.764 UL	0.772 UL	0.876 R
Arsenic	10.5	13.1 K	0.185 K	9.71 L
Barium	37.3	34.6	15.3	18.5
Beryllium	0.835	0.372	0.158	0.359
Cadmium	1.39 B	0.279 B	0.087 B	0.621 B
Calcium	1550	1080	347	5740
Chromium	32 L	6.41	3.21	16.1 L
Cobalt	3.39 B	2.08	2.43	2.5
Copper	4.65 B	4.79 B	1.19 B	3.38 B
Iron	33200	7510	2580	14300
Lead	7.82 K	14 K	2.2 K	6.26
Magnesium	2370 L	433	290	1450
Manganese	77.8	185	37	129
Mercury	0.039	0.04 L	0.012 UL	0.012 U
Nickel	8.29	2.69	1.67	5.56
Potassium	1960	428	285	1590
Selenium	0.171 UL	0.099 UJ	0.12 UJ	0.128 UL
Silver	0.184 U	0.149 U	0.184 B	0.171 UL
Sodium	29.4 B	14.7	6.97	57.6
Thallium	0.264 U	0.152 U	0.185 U	0.232 UJ
Vanadium	29.5	8.74	3.13	11.1 L
Zinc	30.6 J	30.3	18.5	32.9
TAL Cyanide	0.602 U	0.159	0.131	0.388

MG/KG - milligram per kilogram
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L - biased low
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U - not detected
UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB01-01	A01SB01-05	A01SB01-12	A01SB02-01	A01SB02-04	A01SB02-05
Sampling Date	11/20/94	11/20/94	11/20/94	11/29/94	11/29/94	11/29/94
Depth	1-3'	9-11'	23-25'	1-3'	7-9'	9-11'
pH	5.66	7.11	6.88	7.79	7.46	7.41
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	12 U	11 U	12 U	4 J	7 J	5 J
2-Butanone	12 U	11 U	12 U	12 UJ	11 UJ	12 UJ
Trichloroethene	12 U	11 U	12 U	12 U	11 U	12 U
Tetrachloroethene	12 U	11 U	12 U	12 U	11 U	12 U
Toluene	12 U	11 U	12 U	12 U	11 U	12 U
Ethylbenzene	12 U	11 U	12 U	12 U	11 U	12 U
Total Xylenes	12 U	11 U	12 U	12 U	11 U	12 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
R - rejected
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB03-01	A01SB03-01D	A01SB03-02	A01SB04-01	A01SB04-01D	A01SB04-03
Sampling Date	11/19/94	11/19/94	11/19/94	11/29/94	11/29/94	11/29/94
Depth	1-3'	1-3'	3-5'	1-3'	1-3'	5-7'
pH	7.18	7.06	8.20	6.16	6.08	6.03
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	17	3 J	14 U	11 U	1 J	12 U
2-Butanone	13 U	11 U	14 U	11 UJ	11 UJ	12 UJ
Trichloroethene	13 U	11 U	14 U	11 U	11 U	12 U
Tetrachloroethene	13 U	11 U	14 U	11 U	11 U	12 U
Toluene	13 U	11 U	14 U	11 U	11 U	12 U
Ethylbenzene	13 U	11 U	14 U	11 U	11 U	12 U
Total Xylenes	13 U	11 U	14 U	11 U	11 U	12 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
R - rejected
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB04-06	A01SB05-01	A01SB05-04	A01SB05-07	A01SB06-01	A01SB06-03
Sampling Date	11/29/94	11/18/94	11/18/94	11/18/94	11/19/94	11/19/94
Depth	11-13'	1-3'	7-9'	13-15'	1-3'	5-7'
pH	7.85	7.61	7.44	8.52	7.52	5.78
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	16 U	10 U	12	2 J	12 U	12 U
2-Butanone	16 UJ	11 J	11 U	12 U	12 U	12 U
Trichloroethene	16 U	10 U	11 U	12 U	12 U	12 U
Tetrachloroethene	16 U	10 U	11 U	12 U	12 U	12 U
Toluene	16 U	10 U	11 U	12 U	12 U	12 U
Ethylbenzene	16 U	10 U	11 U	12 U	12 U	12 U
Total Xylenes	16 U	10 U	11 U	12 U	12 U	12 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
R - rejected
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB06-05	A01SB07-01	A01SB07-01D	A01SB07-04	A01SB07-06	A01SB08-01
Sampling Date	11/19/94	12/03/94	12/03/94	12/03/94	12/03/94	12/03/94
Depth	9-11'	1-3'	1-3'	7-9'	11-13'	1-3'
pH	8.07	7.83	7.85	8.11	7.87	5.41
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	11 U	14 U	12 U	12 U	13 U	12 U
2-Butanone	11 U	14 U	12 U	12 U	13 U	12 U
Trichloroethene	11 U	14 U	12 U	12 U	13 U	12 U
Tetrachloroethene	11 U	14 U	12 U	12 U	13 U	12 U
Toluene	11 U	14 U	12 U	12 U	13 U	33
Ethylbenzene	11 U	14 U	12 U	12 U	13 U	4 J
Total Xylenes	11 U	14 U	12 U	12 U	13 U	19

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
R - rejected
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB08-03	A01SB08-04	A01SB09-01	A01SB09-04	A01SB09-06	A01SB06A-01
Sampling Date	12/03/94	12/03/94	11/29/94	11/29/94	11/29/94	11/10/94
Depth	5-7'	7-9'	1-3'	7-9'	11-13'	1-1.5
pH	8.16	8.01	8.25	7.91	7.79	NA
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	12 U	14 U	6 J	7 J	15 U	11 B
2-Butanone	12 U	14 U	12 UJ	12 UJ	15 U	7 U
Trichloroethene	12 U	14 U	12 U	12 U	15 U	7 U
Tetrachloroethene	12 U	14 U	12 U	12 U	15 U	7 U
Toluene	12 U	14 U	12 U	12 U	15 U	7 U
Ethylbenzene	12 U	14 U	12 U	12 U	15 U	7 U
Total Xylenes	12 U	14 U	12 U	12 U	15 U	7 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
R - rejected
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB16-01	A01SB17-01	A01SB18-01	A01SB26-01	A01SB33-01	A01SB42-01
Sampling Date	11/10/94	11/10/94	12/06/94	12/06/94	11/10/94	11/11/94
Depth	1-1.5	1-1.5	1-1.5	1-1.5	1.5-2	2-2.5
pH	NA	NA	NA	NA	NA	NA
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	6 R	5 B	8 B	8 B	6 B	10 B
2-Butanone	6 R	13 U	6 U	5 U	5 U	14 U
Trichloroethene	6 R	6 U	6 U	5 U	5 U	7 U
Tetrachloroethene	6 R	4 B	6 U	5 U	5 J	5 B
Toluene	6 R	6 U	6 U	5 U	3 B	7 U
Ethylbenzene	6 R	6 U	6 U	5 U	5 U	7 U
Total Xylenes	6 R	6 U	6 U	5 U	3 B	7 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
R - rejected
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB53-01	A01SB54-01	A01SB96-01
Sampling Date	11/11/94	11/11/94	11/11/94
Depth	1.5-2	1.5-2	1.5-2
pH	NA	NA	NA
Units	UG/KG	UG/KG	UG/KG
Methylene chloride	28 B	11 B	8 B
2-Butanone	6 U	6 U	6 U
Trichloroethene	1 J	6 U	6 U
Tetrachloroethene	19	8	6 U
Toluene	9	2 B	6 U
Ethylbenzene	2 B	6 U	6 U
Total Xylenes	5 B	1 B	6 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
R - rejected
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB01-01	A01SB01-05	A01SB01-12	A01SB02-01	A01SB02-04	A01SB02-05
Sampling Date	11/20/94	11/20/94	11/20/94	11/29/94	11/29/94	11/29/94
Depth	1-3'	9-11'	23-25'	1-3'	7-9'	9-11'
pH	5.66	7.11	6.88	7.79	7.46	7.41
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
4-Methylphenol	380 U	340 U	400 U	390 U	380 U	410 U
Dimethylphthalate	380 U	340 U	400 U	390 U	380 U	410 U
Acenaphthylene	380 U	340 U	400 U	390 U	380 U	410 U
Acenaphthene	380 U	340 U	400 U	110 J	380 U	410 U
Dibenzofuran	380 U	340 U	400 U	390 U	380 U	410 U
Fluorene	380 U	340 U	400 U	80 J	380 U	410 U
Phenanthrene	380 U	340 U	400 U	880	380 U	74 J
Anthracene	380 U	340 U	400 U	230 J	380 U	410 U
Carbazole	380 U	340 U	400 U	84 J	380 U	410 U
Di-n-Butyl Phthalate	39 J	340 U	400 U	390 U	380 U	410 U
Fluoranthene	380 U	340 U	400 U	1300	380 U	160 J
Pyrene	380 U	340 U	400 U	800	380 U	130 J
Benzo(a)anthracene	380 U	340 U	400 U	610	380 U	59 J
Chrysene	380 U	340 U	400 U	650	380 U	84 J
bis(2-Ethylhexyl)Phthalat	65 J	55 J	270 J	67 J	58 J	410 U
Benzo(b)fluoranthene	380 U	340 U	400 U	640	380 U	54 J
Benzo(k)fluoranthene	380 U	340 U	400 U	440	380 U	60 J
Benzo(a)Pyrene	380 U	340 U	400 U	600	380 U	78 J
Indeno(1,2,3-cd)pyrene	380 U	340 U	400 U	180 J	380 U	410 U
Dibenzo(a,h)anthracene	380 U	340 U	400 U	62 J	380 U	410 U
Benzo(g,h,i)Perylene	380 U	340 U	400 U	160 J	380 U	410 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
U - not detected

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB03-01	A01SB03-01D	A01SB03-02	A01SB04-01	A01SB04-01D	A01SB04-03
Sampling Date	11/19/94	11/19/94	11/19/94	11/29/94	11/29/94	11/29/94
Depth	1-3'	1-3'	3-5'	1-3'	1-3'	5-7'
pH	7.18	7.06	8.2	6.16	6.08	6.03
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
4-Methylphenol	430 U	390 U	430 U	360 U	370 U	370 U
Dimethylphthalate	430 U	390 U	430 U	360 U	370 U	370 U
Acenaphthylene	80 J	82 J	430 U	360 U	370 U	370 U
Acenaphthene	160 J	500	430 U	360 U	370 U	370 U
Dibenzofuran	68 J	230 J	430 U	360 U	370 U	370 U
Fluorene	110 J	340 J	430 U	360 U	370 U	370 U
Phenanthrene	640	1100	220 J	360 U	370 U	370 U
Anthracene	460	570	64 J	360 U	370 U	370 U
Carbazole	140 J	150 J	430 U	360 U	370 U	370 U
Di-n-Butyl Phthalate	430 U	390 U	430 U	360 U	370 U	370 U
Fluoranthene	2200	3300	510	360 U	370 U	370 U
Pyrene	2100	3300	630	360 U	370 U	370 U
Benzo(a)anthracene	1300	2000	240 J	360 U	370 U	370 U
Chrysene	2600	3300	520	360 U	370 U	370 U
bis(2-Ethylhexyl)Phthalat	100 J	74 J	200 J	360 U	370 U	370 U
Benzo(b)fluoranthene	3800	5100	620	360 U	370 U	370 U
Benzo(k)fluoranthene	1700	1200	440	360 U	370 U	370 U
Benzo(a)Pyrene	2200	2500	300 J	360 U	370 U	370 U
Indeno(1,2,3-cd)pyrene	610	600	270 J	360 U	370 U	370 U
Dibenzo(a,h)anthracene	270 J	280 J	91 J	360 U	370 U	370 U
Benzo(g,h,i)Perylene	560	530	230 J	360 U	370 U	75 J

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
U - not detected

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB04-06	A01SB05-01	A01SB05-04	A01SB05-07	A01SB06-01	A01SB06-03
Sampling Date	11/29/94	11/18/94	11/18/94	11/18/94	11/19/94	11/19/94
Depth	11-13'	1-3'	7-9'	13-15'	1-3'	5-7'
pH	7.85	7.61	7.44	8.52	7.52	5.78
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
4-Methylphenol	490 U	370 U	350 U	410 U	370 U	370 U
Dimethylphthalate	490 U	370 U	350 U	410 U	370 U	370 U
Acenaphthylene	490 U	370 U	350 U	410 U	370 U	370 U
Acenaphthene	490 U	370 U	350 U	410 U	370 U	370 U
Dibenzofuran	490 U	370 U	350 U	410 U	370 U	370 U
Fluorene	490 U	370 U	350 U	410 U	370 U	370 U
Phenanthrene	490 U	370 U	350 U	410 U	370 U	370 U
Anthracene	490 U	370 U	350 U	410 U	370 U	370 U
Carbazole	490 U	370 U	350 U	410 U	370 U	370 U
Di-n-Butyl Phthalate	490 U	370 U	350 U	51 J	37 J	370 U
Fluoranthene	490 U	370 U	350 U	410 U	370 U	370 U
Pyrene	490 U	370 U	350 U	410 U	370 U	370 U
Benzo(a)anthracene	490 U	370 U	350 U	410 U	370 U	370 U
Chrysene	490 U	370 U	350 U	410 U	370 U	370 U
bis(2-Ethylhexyl)Phthalat	490 U	370 U	56 J	83 J	160 J	180 J
Benzo(b)fluoranthene	490 U	370 U	350 U	410 U	370 U	370 U
Benzo(k)fluoranthene	490 U	370 U	350 U	410 U	370 U	370 U
Benzo(a)Pyrene	490 U	370 U	350 U	410 U	370 U	370 U
Indeno(1,2,3-cd)pyrene	490 U	370 U	350 U	410 U	370 U	370 U
Dibenzo(a,h)anthracene	490 U	370 U	350 U	410 U	370 U	370 U
Benzo(g,h,i)Perylene	490 U	370 U	350 U	410 U	370 U	370 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
U - not detected

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB06-05	A01SB07-01	A01SB07-01D	A01SB07-04	A01SB07-06	A01SB08-01
Sampling Date	11/19/94	12/03/94	12/03/94	12/03/94	12/03/94	12/03/94
Depth	9-11'	1-3'	1-3'	7-9'	11-13'	1-3'
pH	8.07	7.83	7.85	8.11	7.87	5.41
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
4-Methylphenol	370 U	460 U	390 U	410 U	420 U	400 U
Dimethylphthalate	370 U	460 U	390 U	410 U	420 U	400 U
Acenaphthylene	370 U	460 U	390 U	410 U	420 U	400 U
Acenaphthene	370 U	460 U	390 U	410 U	420 U	400 U
Dibenzofuran	370 U	460 U	390 U	410 U	420 U	400 U
Fluorene	370 U	460 U	390 U	410 U	420 U	400 U
Phenanthrene	370 U	460 U	390 U	410 U	420 U	400 U
Anthracene	370 U	460 U	390 U	410 U	420 U	400 U
Carbazole	370 U	460 U	390 U	410 U	420 U	400 U
Di-n-Butyl Phthalate	370 U	310 B	180 B	210 B	270 B	180 B
Fluoranthene	370 U	460 U	390 U	410 U	420 U	400 U
Pyrene	370 U	460 U	390 U	410 U	420 U	400 U
Benzo(a)anthracene	370 U	460 U	390 U	410 U	420 U	400 U
Chrysene	370 U	460 U	390 U	410 U	420 U	400 U
bis(2-Ethylhexyl)Phthalat	160 J	92 J	390 U	70 J	420 U	400 U
Benzo(b)fluoranthene	370 U	460 U	390 U	410 U	420 U	400 U
Benzo(k)fluoranthene	370 U	460 U	390 U	410 U	420 U	400 U
Benzo(a)Pyrene	370 U	460 U	390 U	410 U	420 U	400 U
Indeno(1,2,3-cd)pyrene	370 U	460 U	390 U	410 U	420 U	400 U
Dibenzo(a,h)anthracene	370 U	460 U	390 U	410 U	420 U	400 U
Benzo(g,h,i)Perylene	370 U	460 U	390 U	410 U	420 U	400 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
U - not detected

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB08-03	A01SB08-04	A01SB09-01	A01SB09-04	A01SB09-06	A01SB06A-01
Sampling Date	12/03/94	12/03/94	11/29/94	11/29/94	11/29/94	11/10/94
Depth	5-7'	7-9'	1-3'	7-9'	11-13'	1-1.5
pH	8.16	8.01	8.25	7.91	7.79	NA
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
4-Methylphenol	420 U	460 U	420 U	370 U	480 U	150 J
Dimethylphthalate	420 U	460 U	420 U	370 U	480 U	460 U
Acenaphthylene	420 U	460 U	420 U	370 U	480 U	460 U
Acenaphthene	420 U	460 U	420 U	370 U	480 U	460 U
Dibenzofuran	420 U	460 U	420 U	370 U	480 U	460 U
Fluorene	420 U	460 U	420 U	370 U	480 U	460 U
Phenanthrene	420 U	460 U	420 U	370 U	480 U	460 U
Anthracene	420 U	460 U	420 U	370 U	480 U	460 U
Carbazole	420 U	460 U	420 U	370 U	480 U	460 U
Di-n-Butyl Phthalate	240 B	220 B	420 U	370 U	480 U	460 U
Fluoranthene	420 U	460 U	420 U	370 U	480 U	460 U
Pyrene	420 U	460 U	420 U	370 U	480 U	460 U
Benzo(a)anthracene	420 U	460 U	420 U	370 U	480 U	460 U
Chrysene	420 U	460 U	420 U	370 U	480 U	460 U
bis(2-Ethylhexyl)Phthalat	76 J	460 U	420 U	370 U	480 U	83 B
Benzo(b)fluoranthene	420 U	460 U	420 U	370 U	480 U	460 U
Benzo(k)fluoranthene	420 U	460 U	420 U	370 U	480 U	460 U
Benzo(a)Pyrene	420 U	460 U	420 U	370 U	480 U	460 U
Indeno(1,2,3-cd)pyrene	420 U	460 U	420 U	370 U	480 U	460 U
Dibenzo(a,h)anthracene	420 U	460 U	420 U	370 U	480 U	460 U
Benzo(g,h,i)Perylene	420 U	460 U	420 U	370 U	480 U	460 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
U - not detected

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB16-01	A01SB17-01	A01SB18-01	A01SB26-01	A01SB33-01	A01SB42-01
Sampling Date	11/10/94	11/10/94	12/06/94	12/06/94	11/10/94	11/11/94
Depth	1-1.5	1-1.5	1-1.5	1-1.5	1.5-2	2-2.5
pH	NA	NA	NA	NA	NA	NA
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
4-Methylphenol	410 U	430 U	400 U	400 U	360 U	470 U
Dimethylphthalate	410 U	430 U	400 U	140 J	360 U	470 U
Acenaphthylene	110 J	380 J	140 J	400 U	86 J	470 U
Acenaphthene	410 U	66 J	400 U	400 U	360 U	470 U
Dibenzofuran	410 U	430 U	400 U	400 U	360 U	470 U
Fluorene	410 U	58 J	400 U	400 U	360 U	470 U
Phenanthrene	62 J	780	110 J	400 U	55 J	470 U
Anthracene	95 J	450	110 J	400 U	140 J	470 U
Carbazole	410 U	120 J	400 U	400 U	360 U	470 U
Di-n-Butyl Phthalate	410 U	430 U	400 U	400 U	360 U	470 U
Fluoranthene	700	5000	590	400 U	550	470 U
Pyrene	960	6200	860	400 U	890	470 U
Benzo(a)anthracene	480	2700	730	400 U	540	470 U
Chrysene	830	4900	930	400 U	970	470 U
bis(2-Ethylhexyl)Phthalat	550 B	130 B	220 B	400 U	270 B	140 B
Benzo(b)fluoranthene	1400	430 U	1500	400 U	1500	470 U
Benzo(k)fluoranthene	1100	12000	1100	400 U	1100	470 U
Benzo(a)Pyrene	520	3700	1100	400 U	590	470 U
Indeno(1,2,3-cd)pyrene	190 J	890	350 J	400 U	180 J	470 U
Dibenzo(a,h)anthracene	410 U	430 U	400 U	400 U	360 U	470 U
Benzo(g,h,i)Perylene	220 J	990 J	330 J	400 U	210 J	470 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
U - not detected

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB53-01	A01SB54-01	A01SB96-01
Sampling Date	11/11/94	11/11/94	11/11/94
Depth	1.5-2	1.5-2	1.5-2
pH	NA	NA	NA
Units	UG/KG	UG/KG	UG/KG
4-Methylphenol	390 U	410 U	430 U
Dimethylphthalate	390 U	410 U	430 U
Acenaphthylene	390 U	410 U	73 J
Acenaphthene	390 U	410 U	430 U
Dibenzofuran	390 U	410 U	430 U
Fluorene	390 U	410 U	430 U
Phenanthrene	390 U	410 U	49 J
Anthracene	390 U	410 U	55 J
Carbazole	390 U	410 U	430 U
Di-n-Butyl Phthalate	390 U	410 U	430 U
Fluoranthene	390 U	410 U	440
Pyrene	390 U	410 U	480
Benzo(a)anthracene	390 U	410 U	230 J
Chrysene	390 U	410 U	380 J
bis(2-Ethylhexyl)Phthalat	240 B	2700 B	440 B
Benzo(b)fluoranthene	390 U	410 U	450
Benzo(k)fluoranthene	390 U	410 U	300 J
Benzo(a)Pyrene	390 U	410 U	200 J
Indeno(1,2,3-cd)pyrene	390 U	410 U	110 J
Dibenzo(a,h)anthracene	390 U	410 U	430 U
Benzo(g,h,i)Perylene	390 U	410 U	110 J

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
U - not detected

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
PESTICIDE/PCB COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB01-01	A01SB01-05	A01SB01-12	A01SB02-01	A01SB02-04	A01SB02-05
Sampling Date	11/20/94	11/20/94	11/20/94	11/29/94	11/29/94	11/29/94
Depth	1-3'	9-11'	23-25'	1-3'	7-9"	9-11'
pH	5.66	7.11	6.88	7.79	7.46	7.41
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Heptachlor Epoxide	2 U	1.8 U	2.1 U	2 U	1.9 U	2.1 U
4,4'-DDE	3.8 U	3.4 U	4 U	3.9 U	3.8 U	4.1 U
Endosulfan Sulfate	3.8 U	3.4 U	4 U	1.5 J	3.8 U	4.1 U
4,4'-DDT	3.8 U	3.4 U	4 U	3.8 J	3.8 U	4.1 U
Methoxychlor	20 U	18 U	21 U	5.8 J	19 U	21 U
Endrin Ketone	3.8 U	3.4 U	4 U	3.9 U	3.8 U	4.1 U
Aroclor-1260	38 U	34 U	40 U	39 U	38 U	41 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
PESTICIDE/PCB COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB03-01	A01SB03-01D	A01SB03-02	A01SB04-01	A01SB04-01D	A01SB04-03
Sampling Date	11/19/94	11/19/94	11/19/94	11/29/94	11/29/94	11/29/94
Depth	1-3'	1-3'	3-5'	1-3'	1-3'	5-7'
pH	7.18	7.06	8.20	6.16	6.08	6.03
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Heptachlor Epoxide	2.2 U	0.76 J	2.2 U	1.9 U	1.9 U	1.9 U
4,4'-DDE	1.4 J	1.6 J	4.3 U	3.6 U	3.7 U	3.7 U
Endosulfan Sulfate	4.3 U	3.9 U	4.3 U	3.6 U	3.7 U	3.7 U
4,4'-DDT	2.4 J	3.3 J	4.3 U	3.6 U	3.7 U	3.7 U
Methoxychlor	21 J	27 J	22 U	19 U	19 U	19 U
Endrin Ketone	6.7	8.4 J	4.3 U	3.6 U	3.7 U	3.7 U
Aroclor-1260	43 U	39 U	43 U	36 U	12 J	37 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
PESTICIDE/PCB COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB04-06	A01SB05-01	A01SB05-04	A01SB05-07	A01SB06-01	A01SB06-03
Sampling Date	11/29/94	11/18/94	11/18/94	11/18/94	11/19/94	11/19/94
Depth	11-13'	1-3'	7-9'	13-15'	1-3'	5-7'
pH	7.85	7.61	7.44	8.52	7.52	5.78
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Heptachlor Epoxide	2.5 U	1.9 U	1.8 U	2.1 U	1.9 U	1.9 U
4,4'-DDE	4.8 U	3.7 U	3.5 U	4.1 U	3.7 U	3.7 U
Endosulfan Sulfate	4.8 U	3.7 U	3.5 U	4.1 U	3.7 U	3.7 U
4,4'-DDT	4.8 U	3.7 U	3.5 U	4.1 U	3.7 U	3.7 U
Methoxychlor	25 U	19 U	18 U	21 U	19 U	19 U
Endrin Ketone	4.8 U	3.7 U	3.5 U	4.1 U	3.7 U	3.7 U
Aroclor-1260	48 U	37 U	35 U	41 U	37 U	37 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
PESTICIDE/PCB COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB06-05	A01SB07-01	A01SB07-01D	A01SB07-04	A01SB07-06	A01SB08-01
Sampling Date	11/19/94	12/03/94	12/03/94	12/03/94	12/03/94	12/03/94
Depth	9-11'	1-3'	1-3'	7-9'	11-13'	1-3'
pH	8.07	7.83	7.85	8.11	7.87	5.41
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Heptachlor Epoxide	1.9 U	2.4 U	2 UJ	2.1 U	2.2 U	2 U
4,4'-DDE	3.7 U	4.6 U	3.9 UJ	4.1 U	4.2 U	4 U
Endosulfan Sulfate	3.7 U	4.6 U	3.9 UJ	4.1 U	4.2 U	4 U
4,4'-DDT	3.7 U	4.6 U	3.9 UJ	4.1 U	4.2 U	4 U
Methoxychlor	19 U	24 U	20 UJ	21 U	22 U	20 U
Endrin Ketone	3.7 U	4.6 U	3.9 UJ	4.1 U	4.2 U	4 U
Aroclor-1260	37 U	46 U	39 UJ	41 U	42 U	40 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
PESTICIDE/PCB COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB08-03	A01SB08-04	A01SB09-01	A01SB09-04	A01SB09-06	A01SB06A-01
Sampling Date	12/03/94	12/03/94	11/29/94	11/29/94	11/29/94	11/10/94
Depth	5-7'	7-9'	1-3'	7-9'	11-13'	1-1.5
pH	8.16	8.01	8.25	7.91	7.79	NA
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Heptachlor Epoxide	2.2 U	2.4 U	2.1 U	1.9 U	2.5 U	23 U
4,4'-DDE	4.2 U	4.6 U	4.2 U	3.7 U	4.8 U	23 U
Endosulfan Sulfate	4.2 U	4.6 U	4.2 U	3.7 U	4.8 U	23 U
4,4'-DDT	4.2 U	4.6 U	4.2 U	3.7 U	4.8 U	23 U
Methoxychlor	22 U	24 U	21 U	19 U	25 U	23 U
Endrin Ketone	4.2 U	4.6 U	4.2 U	3.7 U	4.8 U	23 U
Aroclor-1260	42 U	46 U	42 U	37 U	48 U	230 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
PESTICIDE/PCB COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB16-01	A01SB17-01	A01SB18-01	A01SB26-01	A01SB33-01	A01SB42-01
Sampling Date	11/10/94	11/10/94	12/06/94	12/06/94	11/10/94	11/11/94
Depth	1-1.5	1-1.5	1-1.5	1-1.5	1.5-2	2-2.5
pH	NA	NA	NA	NA	NA	NA
Units	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Heptachlor Epoxide	20 U	22 U	20 U	18 U	19 U	24 U
4,4'-DDE	20 U	22 U	20 U	18 U	19 U	24 U
Endosulfan Sulfate	20 U	22 U	20 U	18 U	19 U	24 U
4,4'-DDT	20 U	22 U	20 U	18 U	19 U	24 U
Methoxychlor	20 U	22 U	20 U	18 U	19 U	24 U
Endrin Ketone	20 U	22 U	20 U	18 U	19 U	24 U
Aroclor-1260	200 U	220 U	200 U	180 U	190 U	240 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
PESTICIDE/PCB COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB53-01	A01SB54-01	A01SB96-01
Sampling Date	11/11/94	11/11/94	11/11/94
Depth	1.5-2	1.5-2	1.5-2
pH	NA	NA	NA
Units	UG/KG	UG/KG	UG/KG
Heptachlor Epoxide	20 U	20 U	22 U
4,4'-DDE	20 U	20 U	22 U
Endosulfan Sulfate	20 U	20 U	22 U
4,4'-DDT	20 U	20 U	22 U
Methoxychlor	20 U	20 U	22 U
Endrin Ketone	20 U	20 U	22 U
Aroclor-1260	200 U	200 U	220 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB01-01	A01SB01-05	A01SB01-12	A01SB02-01	A01SB02-04	A01SB02-05
Sampling Date	11/20/94	11/20/94	11/20/94	11/29/94	11/29/94	11/29/94
Depth	1-3'	9-11'	23-25'	1-3'	7-9'	9-11'
pH	5.66	7.11	6.88	7.79	7.46	7.41
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
1,3,5-Trinitrobenzene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4,6-Trinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U

MG/KG - milligram per kilogram
U - not detected

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB03-01	A01SB03-01D	A01SB03-02	A01SB04-01	A01SB04-01D	A01SB04-03
Sampling Date	11/19/94	11/19/94	11/19/94	11/29/94	11/29/94	11/29/94
Depth	1-3'	1-3'	3-5'	1-3'	1-3'	5-7'
pH	7.18	7.06	8.20	6.16	6.08	6.03
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
1,3,5-Trinitrobenzene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4,6-Trinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U

MG/KG - milligram per kilogram
U - not detected

TABLE 6-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB04-06	A01SB05-01	A01SB05-04	A01SB05-07	A01SB06-01	A01SB06-03
Sampling Date	11/29/94	11/18/94	11/18/94	11/18/94	11/19/94	11/19/94
Depth	11-13'	1-3'	7-9'	13-15'	1-3'	5-7'
pH	7.85	7.61	7.44	8.52	7.52	5.78
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
1,3,5-Trinitrobenzene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4,6-Trinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U

MG/KG - milligram per kilogram
U - not detected

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB06-05	A01SB07-01	A01SB07-01D	A01SB07-04	A01SB07-06	A01SB08-01
Sampling Date	11/19/94	12/03/94	12/03/94	12/03/94	12/03/94	12/03/94
Depth	9-11'	1-3'	1-3'	7-9'	11-13'	1-3'
pH	8.07	7.83	7.85	8.11	7.87	5.41
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
1,3,5-Trinitrobenzene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4,6-Trinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U

MG/KG - milligram per kilogram
U - not detected

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB08-03	A01SB08-04	A01SB09-01	A01SB09-04	A01SB09-06	A01SB06A-01
Sampling Date	12/03/94	12/03/94	11/29/94	11/29/94	11/29/94	11/10/94
Depth	5-7'	7-9'	1-3'	7-9'	11-13'	1-1.5
pH	8.16	8.01	8.25	7.91	7.79	NA
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
1,3,5-Trinitrobenzene	0.25 U	0.25 U	0.25 U	0.25 U	0.25	0.24 U
2,4,6-Trinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.91	0.34 U

MG/KG - milligram per kilogram
U - not detected

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB16-01	A01SB17-01	A01SB18-01	A01SB26-01	A01SB33-01	A01SB42-01
Sampling Date	11/10/94	11/10/94	12/06/94	12/06/94	11/10/94	11/11/94
Depth	1-1.5	1-1.5	1-1.5	1-1.5	1.5-2	2-2.5
pH	NA	NA	NA	NA	NA	NA
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
1,3,5-Trinitrobenzene	0.26 U	0.3 U	0.3 U	0.25 U	0.26 U	0.34 U
2,4,6-Trinitrotoluene	0.37 U	0.42 U	0.42 U	0.34 U	0.36 U	0.48 U

MG/KG - milligram per kilogram
U - not detected

TABLE 5-4
SUBSURFACE SOIL - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB53-01	A01SB54-01	A01SB96-01
Sampling Date	11/11/94	11/11/94	11/11/94
Depth	1.5-2	1.5-2	1.5-2
pH	NA	NA	NA
Units	MG/KG	MG/KG	MG/KG
1,3,5-Trinitrobenzene	0.3 U	0.29 U	0.27 U
2,4,6-Trinitrotoluene	0.42 U	0.41 U	0.37 U

MG/KG - milligram per kilogram
U - not detected

TABLE 5-5
SUBSURFACE SOIL -POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB01-01	A01SB01-05	A01SB01-12	A01SB02-01	A01SB02-04	A01SB02-05
Sampling Date	11/20/94	11/20/94	11/20/94	11/29/94	11/29/94	11/29/94
Depth	1-3'	9-11'	23-25'	1-3'	7-9'	9-11'
pH	5.66	7.11	6.88	7.79	7.46	7.41
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	5450	242	4690	4130	5660	3020
Arsenic	1.9	0.48 U	6.3	2.5 J	5.8 J	10.4 J
Barium	42.3	0.78	14.1	22.4	17.9	17.4
Beryllium	0.39 B	0.02 U	0.6	0.16 L	1.3 L	0.56 L
Cadmium	0.34 U	0.31 U	0.37 U	0.52	0.35	0.58
Calcium	524	46.2	1020	3100	1900	1250
Chromium	5.8	0.67 B	17.8	9.6 L	20.2 L	15.4 L
Cobalt	3.1	0.4 U	4	1.4 L	12.3 L	4.4 L
Copper	3.3	0.29 U	2.7	4.1	5.3	3
Iron	4940	303	15000	7150	21500	14800
Lead	11	0.65	4.9	43.7	7	4.9
Magnesium	407	15.3	902	235	1320	1120
Manganese	233	2.4	52.9	69.4 L	91.7 L	206 L
Mercury	0.11 UL	0.1 UL	0.12 UL	0.12 U	0.12 U	0.13 U
Nickel	3.9	0.89 U	4.4	1.9 J	9.5 J	8.2 J
Potassium	233	79.3 U	1070	128	1590	1300
Sodium	28.9	54.9	74.8	31.9	37.6	76
Thallium	0.92 UL	0.83 UL	0.98 UL	0.93 U	0.9 U	0.96 U
Vanadium	9.3	0.38	16.1	11	16	10.1
Zinc	38.6	1.9 K	19.2	315 L	53.4 L	26.9 L
Cyanide	2.9 U	2.6 U	3 U	3 R	2.9 R	3.1 R

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UL - not detected, biased low

TABLE 5-5
SUBSURFACE SOIL -POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB03-01	A01SB03-01D	A01SB03-02	A01SB04-01	A01SB04-01D	A01SB04-03
Sampling Date	11/19/94	11/19/94	11/19/94	11/29/94	11/29/94	11/29/94
Depth	1-3'	1-3'	3-5'	1-3'	1-3'	5-7'
pH	7.18	7.06	8.20	6.16	6.08	6.03
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	7140	5510	4550	2900	3170	4350
Arsenic	14.5 J	4.9 J	5.1	0.51 UL	0.49 UL	4
Barium	14.6	11.4	13.1	18.6	17.3	11.7
Beryllium	1.1 L	0.56 L	0.53	0.07 L	0.07 L	0.63 L
Cadmium	0.39 U	0.36 U	0.39 U	0.33 U	0.32 U	0.33 U
Calcium	2340	1680	30000	329	313	987
Chromium	30.3 L	22.8 L	19.3	3.9 L	4.5 L	13.4
Cobalt	7.6 L	4.5 L	5.7	0.62 L	0.41 L	3
Copper	7.7	5.4	3.7	2	2.5	2.2
Iron	34600	16400	14300	2930	2600	7510
Lead	10.8	7.2	4.8	3.4	3.5	5.4
Magnesium	1550	1190	1450	189	204	555
Manganese	39.5 L	25.7 L	85.7	22.6 L	15.5 L	35.6
Mercury	0.13 U	0.21 K	0.13 UL	0.11 U	0.11 U	0.11 UL
Nickel	13 J	7.5 J	6.5	0.95 UL	1.8 J	3.1
Potassium	1890	1630	1720	84.2 U	101	662
Sodium	54.4	39.8	262	40.8	27.3	73.3
Thallium	1.1 K	1.6 K	1 UL	0.88 U	1 K	0.87 U
Vanadium	21.4	17.1	13.6	4.8	5	9.9
Zinc	45 L	33.3 L	27.3	4.5 L	4.6 L	16.9 J
Cyanide	3.3 R	3 R	3.3 U	2.8 R	2.8 R	2.8 U

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UL - not detected, biased low

TABLE 5-5
SUBSURFACE SOIL -POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB04-06	A01SB05-01	A01SB05-04	A01SB05-07	A01SB06-01	A01SB06-03
Sampling Date	11/29/94	11/18/94	11/18/94	11/18/94	11/19/94	11/19/94
Depth	11-13'	1-3'	7-9'	13-15'	1-3'	5-7'
pH	7.85	7.61	7.44	8.52	7.52	5.78
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	6640	4550	2150	4070	3010	4460
Arsenic	8.6	1.9	0.94	3.6	1.2	1.3
Barium	22.6	38.4	7.3	19.1	61	30.6
Beryllium	0.51 L	0.22 B	0.05 B	0.36 B	0.42 B	0.34 B
Cadmium	0.42 U	0.33	0.32 U	0.38 U	0.34 U	0.34 U
Calcium	15400	926	194	109000	1380	870
Chromium	20.7	5.4	3	17.4	3.6	14
Cobalt	5.1	2.6	1.6	3	3	2.9
Copper	5.1	3.4	1.4 B	2.9	3.7	2.8
Iron	19300	6150	1900	11400	3360	7020
Lead	9.4	9.2	1.7	3.7	12.7	3.6
Magnesium	2560	385	95.6	1640	268	589
Manganese	63	105	73.9	108	351	105
Mercury	0.16 K	0.11 UL	0.11 UL	0.13 UL	0.11 UL	0.11 UL
Nickel	9	3.3	2.5	3.6	3.2	3
Potassium	2710	252	80.6 U	1650	223	681
Sodium	168	79.7	17.5 B	1030	25.9	72.9
Thallium	1.1 U	0.89 UL	0.85 UL	1 UL	0.9 UL	0.89 UL
Vanadium	14.7	9.8	3.6	12	5	12.3
Zinc	37.5 J	12.7	4.2 K	20.5	14.5	14
Cyanide	3.7 U	2.8 U	2.6 U	3.1 U	2.8 U	2.8 U

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UL - not detected, biased low

TABLE 5-5
SUBSURFACE SOIL -POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB06-05	A01SB07-01	A01SB07-01D	A01SB07-04	A01SB07-06	A01SB08-01
Sampling Date	11/19/94	12/03/94	12/03/94	12/03/94	12/03/94	12/03/94
Depth	9-11'	1-3'	1-3'	7-9'	11-13'	1-3'
pH	8.07	7.83	7.85	8.11	7.87	5.41
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	2570	5000	3320	4190	6030	8190
Arsenic	4.9	24.8	14.4	4.8	6	2.6
Barium	15.1	17.1	12.3	19	26	32.1
Beryllium	0.29 B	0.54	0.28	0.39	0.48	0.56
Cadmium	0.34 U	0.4 U	0.34 U	0.36 UL	0.37 UL	0.36 UL
Calcium	70400	8530 J	6830 J	124000	50100	1100
Chromium	11.7	15.5	9.2	14.9	16.3	18.9
Cobalt	2.5	4.7	2.7	3.1	5.2	4
Copper	2	3.9	2.8	2.6	4.4	2.9
Iron	9000	16900	9840	12200 J	15800 J	17500 J
Lead	3.1	6.8 J	5.4 J	4.1	8.6	6.2
Magnesium	1190	803	457	1920	2230	1060
Manganese	86	69.9	51.9	108 J	55.9 J	78.8 J
Mercury	0.11 UL	0.14 U	0.12 U	0.12 U	0.13 U	0.12 U
Nickel	3.3	4.6	3.4	5.1	8.5	5.2
Potassium	1090	777	487	1630	1600	1270
Sodium	695	76.3	57.6	656	56.7	37.3
Thallium	0.91 UL	1.1 U	0.9 U	0.97 U	0.98 U	1.5 K
Vanadium	8.6	14.6	9.5	11.9	11.9	17.5
Zinc	17	19.3 J	12 J	20.4 J	34.7 J	24.1 J
Cyanide	2.8 U	3.5 U	2.9 U	3.1 U	3.2 U	3 U

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UL - not detected, biased low

TABLE 5-5
SUBSURFACE SOIL -POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB08-03	A01SB08-04	A01SB09-01	A01SB09-04	A01SB09-06	A01SB06A-01
Sampling Date	12/03/94	12/03/94	11/29/94	11/29/94	11/29/94	11/10/94
Depth	5-7'	7-9'	1-3'	7-9'	11-13'	1-1.5
pH	8.16	8.01	8.01	8.25	7.79	NA
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	5020	5440	1760	4360	7170	4680
Arsenic	4	5.9	2.7 J	5.1 J	7.1	2.22
Barium	19.9	18	10.2	19.5	23.2	24.2 L
Beryllium	0.43	0.48	0.14 L	0.37 L	0.55 L	0.221
Cadmium	0.39 UL	0.41 UL	0.37 U	0.32 U	0.41 U	0.369 B
Calcium	120000	10200	141000	31200	6100	2430
Chromium	16.2	17.6	7.1 L	13 L	23.1	6.92 B
Cobalt	3.3	5.8	1.2 L	4.7 L	5.4	1.12
Copper	2.6	4.7	1.3	5.9	5.1	2.38 B
Iron	12800 J	15200 J	5830	12300	18700	6920
Lead	4.8	7	2.5	7.4	9	9.33
Magnesium	2190	2340	1360	1640	2620	240
Manganese	121 J	60.6 J	88.9 L	46.4 L	46.9	71.8
Mercury	0.13 U	0.14 U	0.13 U	0.11 U	0.14 UL	0.031
Nickel	5.5	9.4	1.8 J	7.3 J	10	7.34
Potassium	1790	2230	947	1260	2450	252
Sodium	547	127	901	67.9	60.9	19.1 B
Thallium	1 U	1.1 U	1.3 K	0.86 U	1.1 U	0.269 U
Vanadium	13	13.6	6.2	7.1	17.2	13.3
Zinc	23.8 J	35.3 J	10 L	31.4 L	49.4 J	20.2
Cyanide	3.2 U	3.5 U	3.2 R	2.8 R	3.6 U	0.667 U

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UL - not detected, biased low

TABLE 5-5
SUBSURFACE SOIL -POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB16-01	A01SB17-01	A01SB18-01	A01SB26-01	A01SB33-01	A01SB42-01
Sampling Date	11/10/94	11/10/94	12/06/94	12/06/94	11/10/94	11/11/94
Depth	1-1.5	1-1.5	1-1.5	1-1.5	1.5-2	2-2.5
pH	NA	NA	NA	NA	NA	NA
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	8140	3430	7340	3700	4480	4900
Arsenic	2.89	4.65	13.5 J	0.752	3.47	1.41
Barium	25.3 L	25.2 L	17.7	36.7	31.1 L	30.7 L
Beryllium	1.23 J	0.346	0.417 L	0.375 L	0.281	0.596
Cadmium	0.62 B	0.539 B	0.601 B	0.191 B	0.29 B	0.282 B
Calcium	1280	181000	1160	435 B	842	1690
Chromium	19.9 J	10.6 B	21.5	3.88 B	5.63 B	6.51 B
Cobalt	3.01	1.86	1.77 B	1.89 B	1.97	3.15
Copper	2.88 B	3.53 B	8.46 B	5.08 B	2.2 B	2.5 B
Iron	13000 J	12200	16200	3910	5930	5550
Lead	6.61	5	6.89	7.19	7.1	6.37
Magnesium	814	1720	1230	352	328	300
Manganese	21.9 J	63.7	13.2 B	155	92.3	18.1
Mercury	0.016	0.034	0.034 L	0.023 L	0.044	0.127
Nickel	11.1	3.89	3.99 B	1.14 B	3.14	3.6
Potassium	890	1460	1690	236	232	258
Sodium	18 B	853	24.4 B	13.9 B	37.4 B	19.7 B
Thallium	0.225 U	0.211 U	0.27 U	0.208 UJ	0.213 U	0.236 U
Vanadium	13.3	9.25	21.7 L	4.97 L	10.7	9.86
Zinc	42.6 J	36.9	28.6 B	20.2 B	11.5	12.9
Cyanide	0.611 U	0.613 U	0.226	0.226	0.537 U	0.686 U

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UL - not detected, biased low

TABLE 5-5
SUBSURFACE SOIL -POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB53-01	A01SB54-01	A01SB96-01
Sampling Date	11/11/94	11/11/94	11/11/94
Depth	1.5-2	1.5-2	1.5-2
pH	NA	NA	NA
Units	MG/KG	MG/KG	MG/KG
Aluminum	3130	8300	7630
Arsenic	13.2	16	1.63
Barium	30.4 L	48.9 L	26.2 L
Beryllium	0.27	0.609	3.8 J
Cadmium	0.412 B	1.1 B	1.43 B
Calcium	1590	2910	2430
Chromium	5.54 B	26	29.7 J
Cobalt	1.59	2.74	10.7
Copper	16.2	4.41 B	3.74 B
Iron	5630	25400	25700 J
Lead	16.3	8.91	7.86
Magnesium	238	1310	1550
Manganese	49.4	86.9	161 J
Mercury	0.069	0.029	0.014
Nickel	2.48	6.42	13.5
Potassium	227	1350	1810
Sodium	22.4 B	27.2 B	24.2 B
Thallium	0.229 U	0.236 U	0.251 U
Vanadium	7.5	21.3	17.1
Zinc	54.8	30.7	71.1 J
Cyanide	0.596 U	0.619 U	0.634 U

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UL - not detected, biased low

TABLE 5-6
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A01HP01-01	A01HP02-01	A01HP02-01D	A01HP03-01	A01HP04-01	A01HP05-01	A01HP06-01	A01HP07-01	A01HP08-01	A01HP09-01
Date Sampled:	11/20/94	11/30/94	11/30/94	11/20/94	12/03/94	11/19/94	11/20/94	12/03/94	12/03/94	11/30/94
pH:	7.43	6.79	6.79	7.42	7.92	7.53	NA	7.31	7.31	7.27
Units:	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
Chloroform	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.6 J

UG/L - microgram per liter
J - estimated
NA - not analyzed
U - not detected

TABLE 5-6
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A01HP01-01	A01HP02-01	A01HP02-01D	A01HP03-01	A01HP04-01	A01HP05-01	A01HP06-01	A01HP07-01	A01HP08-01	A01HP09-01
Date Sampled:	11/20/94	11/30/94	11/30/94	11/20/94	12/03/94	11/19/94	11/20/94	12/03/94	12/03/94	11/30/94
pH:	7.43	6.79	6.79	7.42	7.92	7.53	NA	7.31	7.31	7.27
Units:	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
RDX	0.59 U	13	15	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	1.3
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	4.6
4-Amino-2,6-Dinitrotoluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	9.4

UG/L - microgram per liter
NA - not analyzed
U - not detected

TABLE 5-7
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01HP01-01	A01HP02-01	A01HP02-01D	A01HP03-01	A01HP04-01	A01HP05-01
Sampling Date	11/20/94	11/30/94	11/30/94	11/20/94	12/03/94	11/19/94
pH	7.43	6.79	6.79	7.42	7.92	7.53
Units	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
Aluminum	19900	29500	25600	28500	28200	771
Antimony	12.2 R	14.1 L	12.2 UL	12.2 R	12.2 U	12.2 R
Arsenic	52.6	36.6	37.2	29	26.1	2.3 U
Barium	78.9	181	159	116	149	65.3
Beryllium	1.6	7.3	5.7	2	1.8	0.33 B
Cadmium	1.5 U	2.7	1.5 U	1.5 U	1.5 U	1.5 U
Calcium	185000	249000	248000	203000	140000	137000
Chromium	78.4	104	94.8	85	85.7	1.8 U
Cobalt	15.5	54	41.1	18.2	20.5	1.9 U
Copper	12.6	22	22	17.1	19.6	3.9
Iron	49200	80000	76100	59400	64000	1730
Lead	13.9	24.2	22.8	21.8	24.8	1.4 U
Magnesium	8090	29800	29100	13300	11200	3560
Manganese	241	1020	852	261	268	14.6
Mercury	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	25.2	48.1	44.2	25.1	32.4	4.3 U
Potassium	7450	11900	11600	10400	10200	4260
Selenium	2.6 UL	2.6 U	2.6 U	2.6 UL	2.6 U	2.6 UL
Sodium	5530	8310	8210	26900	6000	6930
Vanadium	67.1 L	82.5	75.3	74.6 UL	75.8	3.7 L
Zinc	94.5	173 J	164 J	118	129 J	9.1 B

UG/L - microgram per liter
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UL - not detected, biased low

TABLE 5-7
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01HP06-01	A01HP07-01	A01HP08-01	A01HP09-01
Sampling Date	11/20/94	12/03/94	12/03/94	11/30/94
pH	N/A	7.31	7.31	7.27
Units	UG/L	UG/L	UG/L	UG/L
Aluminum	76300	70100	46300	14700
Antimony	12.2 R	12.2 U	18.8	12.2 UL
Arsenic	45.8	64.4	36.7	12.3
Barium	820	248	199	85.2
Beryllium	9.2	4.9	3	0.89
Cadmium	1.5 U	1.5 U	1.5 U	1.5 U
Calcium	230000	265000	223000	149000
Chromium	168	197	135	40.7
Cobalt	79.9	53.2	34.2	9.9
Copper	70.3	36.3	25.8	11.9
Iron	136000	159000	103000	31500
Lead	236	63.2	40.1	12
Magnesium	22100	24700	19300	12000
Manganese	4350	632	391	87
Mercury	0.21 K	0.2 U	0.2 U	0.2 U
Nickel	91.3	86	48.7	18
Potassium	21400	17600	18200	8610
Selenium	3.8 L	4 K	2.6 U	2.6 U
Sodium	9390	10000	6480	6980
Vanadium	182 L	168	114	39.8
Zinc	413	333 J	210 J	77 J

UG/L - microgram per liter
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UL - not detected, biased low

TABLE 5-7
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
DISSOLVED INORGANICS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01HP01F-01	A01HP02F-01	A01HP02F-01D	A01HP03F-01	A01HP04F-01	A01HP05F-01
Sampling Date	11/20/94	11/30/94	11/30/94	11/20/94	12/03/94	11/19/94
pH	7.43	6.79	6.79	7.42	7.92	7.53
Units	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
Aluminum	11 U	11 U	11 U	11 U	11 U	11 U
Barium	13.3	63.3	62.5	30.6	56.1	62.7
Calcium	67800	229000	228000	149000	86300	134000
Copper	8.4	2.1	10.4	12.6	1.4 U	14.6
Iron	7.8 B	18.7 B	16.5 B	17 B	3.6	33 B
Magnesium	2110	22300	22200	4200	1310	3330
Manganese	2.5 B	3.4	3.7	2.8 B	25.4	5.3
Potassium	1900	5200	4860	2590	1870	3770
Sodium	4000	7490	7420	26300	5470	6310
Thallium	4.8 B	4 U	5.2 K	4 U	5.4 K	4 U
Vanadium	1.4 U	1.7	1.4 U	2.3	1.4 U	1.4 U

UG/L - microgram per liter
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
K - biased high
U - not detected

TABLE 7
FREQUENCY OF DETECTION SUMMARY
DISSOLVED INORGANICS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01HP06F-01	A01HP07F-01	A01HP08F-01	A01HP09F-01
Sampling Date	11/20/94	12/03/94	12/03/94	11/30/94
pH	N/A	7.31	7.31	7.27
Units	UG/L	UG/L	UG/L	UG/L
Aluminum	11 U	20.2	11 U	11 U
Barium	92.2	29.5	70.2	43.9
Calcium	128000	149000	143000	140000
Copper	13.1	1.4 U	1.4 U	3.1
Iron	30.6 B	46.7	19.2	22.3 B
Magnesium	4170	2210	2860	7630
Manganese	173	5.1	10.9	0.76
Potassium	5120	920	3660	4760
Sodium	8530	9350	5740	6810
Thallium	4 U	4 U	4.7 K	4 U
Vanadium	1.4	1.4 U	1.4 U	1.7

UG/L - microgram per liter
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
K - biased high
U - not detected

TABLE 5-8
SURFACE WATER - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A01SW01-01	A01SW02-01	A01SW02-01D	A01SW03-01	A01SW04-01
Date Sampled:	12/03/94	12/03/94	12/03/94	12/03/94	12/03/94
pH:	4.39	4.28	4.28	7.20	6.57
Units:	UG/L	UG/L	UG/L	UG/L	UG/L
2,4,6-Trinitroluene	0.62 U	0.62 U	0.62 U	2.9	0.62 U
4-Amino-2,6-Dinitrotoluene	1 U	1 U	1 U	3.6	1 U

UG/L microgram per liter
U - not detected

TABLE 5-9
SURFACE WATER - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SW01-01	A01SW02-01	A01SW02-01D	A01SW03-01	A01SW04-01
Sampling Date	12/03/94	12/03/94	12/03/94	12/03/94	12/03/94
pH	4.39	4.28	4.28	7.20	6.57
Units	UG/L	UG/L	UG/L	UG/L	UG/L
Aluminum	1840	13600	11400	1970	11100
Arsenic	2.8	16.6	13.6	2.3 U	23.8
Barium	53.7	133	118	78.1	240
Beryllium	0.1	0.86	0.7	0.14	1.1
Cadmium	1.5 U	1.5 U	1.5 U	1.5 U	2.4
Calcium	120000	126000	126000	129000	138000
Chromium	2.5 L	25.6 L	19.4 L	3.1 L	19 L
Cobalt	2.4	8.7	7.3	2.4	16.8
Copper	2.2	14.7	12.3	15.8	57.5
Iron	5360	39500	32900	4610	39000
Lead	4.5 K	34.9	25.9	26.9	112
Magnesium	2550	4250	4110	3320	4820
Manganese	142	272	263	171	584
Mercury	0.2 U	0.3	0.21	0.2 U	0.31
Nickel	4.3 U	9.8	4.3 U	4.3 U	11.7
Potassium	2310	3690	3450	2260	4430
Sodium	6430	6290	6250	6950	6640
Thallium	4 U	4 U	5.2 K	5.6 K	4 U
Vanadium	5.2	35.4	28.4	6.9	33.8
Zinc	10.3 J	103 J	83.8 J	70.6 J	551 J

UG/L - microgram per liter
J - estimated
K - biased high
L - biased low
U - not detected

TABLE 5-10
SURFACE WATER - POSITIVE DETECTION SUMMARY
ENGINEERING PARAMETERS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A01SW01-01	A01SW02-01	A01SW02-01D	A01SW03-01	A01SW04-01
Date Sampled:	12/03/94	12/03/94	12/03/94	12/03/94	12/03/94
pH:	4.39	4.28	4.28	7.20	6.57
Units:	MG/L	MG/L	MG/L	MG/L	MG/L
Hardness	320	310	320	350	370

MG/L - milligram per liter

TABLE 5-11
SEDIMENT - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A01SD01-01	A01SD01-02	A01SD02-01	A01SD02-02	A01SD03-01	A01SD03-01D	A01SD03-02	A01SD04-01	A01SD04-02
Date Sampled:	12/04/94	12/04/94	12/04/94	12/04/94	12/03/94	12/03/94	12/03/94	12/03/94	12/03/94
Depth:	0-4"	4-8"	0-4"	4-8"	0-4"	0-4"	4-8"	0-4"	4-8"
pH:	7.96	7.72	7.44	7.51	7.70	7.60	7.61	7.51	7.24
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Di-n-Butyl Phthalate	2000 B	140 B	4400 B	4000	240 B	180 B	2300 B	290 B	1100 B
Fluoranthene	430 U	490 U	170 J	460 U	140 J	160 J	440 U	54 J	500 U
Pyrene	430 U	490 U	220 J	460 U	140 J	140 J	440 U	53 J	500 U
Butyl Benzyl Phthalate	430 U	490 U	840 U	460 U	480 U	460 U	1200	460 U	500 U
Benzo(a)anthracene	430 U	490 U	840 U	460 U	86 J	100 J	440 U	460 U	500 U
Chrysene	430 U	490 U	840 U	460 U	120 J	170 J	440 U	460 U	500 U
bis(2-Ethylhexyl)Phthalate	430 U	490 U	840 U	460 U	480 U	460 U	120 J	460 U	210 J
Benzo(b)fluoranthene	430 U	490 U	840 U	460 U	140 J	270 J	440 U	460 U	500 U
Benzo(k)fluoranthene	430 U	490 U	840 U	460 U	110 J	160 J	440 U	460 U	500 U
Benzo(a)Pyrene	430 U	490 U	840 U	460 U	110 J	170 J	440 U	460 U	500 U
Indeno(1,2,3-cd)pyrene	430 U	490 U	840 U	460 U	480 U	120 J	440 U	460 U	500 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
U - not detected

TABLE 5-11
SEDIMENT - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A01SD01-01	A01SD01-02	A01SD02-01	A01SD02-02	A01SD03-01	A01SD03-01D	A01SD03-02	A01SD04-01	A01SD04-02
Date Sampled:	12/04/94	12/04/94	12/04/94	12/04/94	12/03/94	12/03/94	12/03/94	12/03/94	12/03/94
Depth:	0-4"	4-8"	0-4"	4-8"	0-4"	0-4"	4-8"	0-4"	4-8"
pH:	7.96	7.72	7.44	7.51	7.70	7.60	7.61	7.51	7.24
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
delta-BHC	2.2 U	2.5 U	1 J	2.1 J	2.5 U	2.4 U	2.3 U	2.4 U	2.6 U
gamma-BHC (Lindane)	2.2 U	2.5 U	0.61 J	2.4 U	2.5 U	2.4 U	2.3 U	2.4 U	2.6 U
Endosulfan Sulfate	4.3 U	4.8 U	1.6 J	4.6 U	4.8 U	1.3 J	4.5 U	4.6 U	5 U
4,4'-DDT	1.6 J	4.8 U	5.6 U	4.6 U	4.8 U	1.7 J	4.5 U	4.6 U	5 U
Methoxychlor	22 U	25 U	6 J	24 U	5.3 J	3.1 J	1.5 J	2.7 J	26 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-12
SEDIMENT - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SD01-01	A01SD01-02	A01SD02-01	A01SD02-02	A01SD03-01	A01SD03-01D
Sampling Date	12/04/94	12/04/94	12/04/94	12/04/94	12/03/94	12/03/94
Depth	0-4"	4-8"	0-4"	4-8"	0-4"	0-4"
pH	7.96	7.72	7.44	7.51	7.70	7.60
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	595	519	3420	1120	1200	554
Arsenic	0.59 U	0.65 U	3.8	0.75	2.3	1.5
Barium	4.5	3.8	22.4	6	23.3	90.9
Beryllium	0.05	0.03	0.28	0.05	0.08	0.04
Cadmium	0.39 U	0.42 U	0.51 U	0.41 U	0.43 U	0.54
Calcium	750 J	583 J	5080 J	2570 J	4760 J	1440 J
Chromium	1.4 L	1.2 L	8.4 L	2.5 L	3.5 L	5.4 L
Cobalt	0.49 U	0.54 U	2.6	0.52 U	0.77	1
Copper	0.5	0.57	4.9	1.1	9	6.9
Iron	1250	854	9440	2300	4500	6320
Lead	2.2 J	2 J	11.5 J	3.9 J	24.1 J	14.6 J
Magnesium	46.1	43.8	411	123	150	73.1
Manganese	7.2	5.8	70.7	11.5	54.1	38.2
Mercury	0.13 U	0.15 U	0.17 U	0.14 U	0.14 U	0.14 U
Nickel	1.1 U	1.2 U	3.3	1.2 U	1.2 U	1.7
Potassium	98.6 U	107 U	399	103 U	110 U	103 U
Sodium	29.3	41.7	101	46.2	56.1	80.1
Thallium	1 U	1.1 U	1.3 U	1.1 U	1.2 U	1.1 U
Vanadium	1.6	1.1	10.3	2.9	3.6	1.8
Zinc	3.2 J	2.6 J	29.6 J	11.3 J	43.3 J	79.9 J

MG/KG - milligram per kilogram
J - estimated
K - biased high
L - biased low
U - not detected

TABLE 5-12
SEDIMENT - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SD03-02	A01SD04-01	A01SD04-02
Sampling Date	12/03/94	12/03/94	12/03/94
Depth	4-8"	0-4"	4-8"
pH	7.61	7.51	7.24
Units	MG/KG	MG/KG	MG/KG
Aluminum	1060	507	4570
Arsenic	1.2	0.98	3.1
Barium	10	6.1	32
Beryllium	0.04	0.03 U	0.3
Cadmium	0.41 U	0.41 U	0.44 U
Calcium	1250 J	707 J	1940 J
Chromium	2.3 L	1.5 L	6.9 L
Cobalt	0.51 U	0.51 U	1.9
Copper	9.4	2.3	5.9
Iron	3300	1620	8470
Lead	18.2 J	5.4 J	16.1 J
Magnesium	117	61	409
Manganese	13.2	6.3	29
Mercury	0.14 U	0.14 U	0.3
Nickel	1.2 U	1.2 U	2.9
Potassium	103 U	103 U	340
Sodium	75.3	46	96.2
Thallium	1.1 U	1.1 U	1.3 K
Vanadium	2.7	1.6	9.5
Zinc	36.3 J	19.7 J	54.2 J

MG/KG - milligram per kilogram
J - estimated
K - biased high
L - biased low
U - not detected

TABLE 5-13
SURFACE SOIL - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SS01-00	A06SS02-00	A06SS03-00	A06SS04-00	A06SS05-00	A06SS06-00	A06SS07-00	A06SS08-00	A06SS08-00D
Date Sampled:	11/06/94	11/06/94	11/06/94	11/06/94	11/06/94	11/06/94	11/06/94	11/06/94	11/06/94
Depth:	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"
pH:	4.95	3.95	5.73	6.29	5.54	5.79	5.96	5.95	5.87
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	12 U	3 J	12 U	12 U	11 U	11 U	12 U	11 U	12 U
Acetone	3 J	13 U	12 U	12 U	11 U	11 U	12 U	11 U	12 U
2-Butanone	12 R	13 U	12 U	12 U	11 R	6 J	12 U	11 R	4 J
Tetrachloroethene	12 U	13 U	12 U	12 U	11 U	11 U	12 U	11 U	12 U
Toluene	12 U	13 U	12 U	12 U	11 U	11 U	12 U	11 U	12 U
Chlorobenzene	12 U	13 U	12 U	12 U	11 U	11 U	12 U	11 U	12 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
R - rejected
U - not detected

TABLE 5-13
SURFACE SOIL - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SS09-00	A06SS10-00	A06SS11-00	A06SS12-00	A06SS12-00D	A06SS13-00	A06SS14-00	A06SS15-00	A06SS16-00
Date Sampled:	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94
Depth:	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"
pH:	5.84	5.97	3.58	5.25	5.24	5.67	5.34	5.67	4.93
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	11 U	11 U	12 U	11 U	12 U	11 U	11 U	11 U	11 U
Acetone	11 U	11 U	12 U	3 J	12 U	11 U	11 U	11 U	11 U
2-Butanone	11 U	11 R	12 U	11 R	4 J	11 R	11 R	11 R	11 R
Tetrachloroethene	11 U	11 U	12 U	11 U	12 U	11 U	11 U	11 U	11 U
Toluene	11 U	11 U	1 J	11 U	12 U	11 U	11 U	11 U	1 J
Chlorobenzene	11 U	11 U	12 U	11 U	12 U	11 U	11 U	11 U	1 J

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
R - rejected
U - not detected

TABLE 5-13
SURFACE SOIL - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SS17-00	A06SS18-00	A06SS19-00	A06SS20-00	A06SS20-00D	A06SS21-00	A06SS22-00	A06SS23-00	A06SS24-00
Date Sampled:	11/07/94	11/08/94	12/04/94	11/08/94	11/08/94	12/04/94	11/08/94	11/08/94	11/08/94
Depth:	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"
pH:	5.53	5.49	5.76	5.03	4.89	5.22	5.12	5.76	4.93
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	11 U	11 U	12 U	6 J	11 U	2 J	11 U	11 U	10 U
Acetone	11 U	4 B	12 U	11 U	1 B	5 B	11 U	11 U	10 U
2-Butanone	11 U	11 U	12 U	11 U	11 U	12 U	11 U	11 U	10 U
Tetrachloroethene	11 U	11 U	2 J	11 U	11 U	12 U	11 U	11 U	10 U
Toluene	11 U	11 U	12 U	11 U	11 U	12 U	11 U	11 U	10 U
Chlorobenzene	11 U	11 U	12 U	11 U	11 U	12 U	11 U	11 U	10 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
R - rejected
U - not detected

TABLE 5-13
SURFACE SOIL - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SS25-00	A06SS26-00	A06SS27-00	A06SS28-00
Date Sampled:	11/08/94	11/08/94	11/08/94	11/08/94
Depth:	0-6"	0-6"	0-6"	0-6"
pH:	5.81	6.04	5.80	6.08
Units:	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	3 J	11 U	3 J	3 J
Acetone	10 U	11 U	3 B	10 U
2-Butanone	10 U	11 U	11 U	10 U
Tetrachloroethene	10 U	11 U	11 U	10 U
Toluene	10 U	11 U	11 U	10 U
Chlorobenzene	10 U	11 U	11 U	10 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
R - rejected
U - not detected

TABLE 5-13
SURFACE SOIL - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SS01-00	A06SS02-00	A06SS03-00	A06SS04-00	A06SS05-00	A06SS06-00	A06SS07-00	A06SS08-00	A06SS08-00D
Date Sampled:	11/06/94	11/06/94	11/06/94	11/06/94	11/06/94	11/06/94	11/06/94	11/06/94	11/06/94
Depth:	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"
pH:	4.95	3.95	5.73	6.29	5.54	5.79	5.96	5.95	5.87
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
1,4-Dichlorobenzene	370 U	400 U	390 U	370 U	360 U	370 U	390 U	380 U	380 U
4-Chloroaniline	370 U	950	390 U	370 U	360 U	370 U	390 U	380 U	380 U
Phenanthrene	370 U	83 J	390 U	370 U	360 U	370 U	390 U	380 U	380 U
Di-n-Butyl Phthalate	510	540	600	700	73 J	680	1100	290 J	520
Fluoranthene	370 U	210 J	390 U	370 U	360 U	370 U	390 U	380 U	380 U
Pyrene	370 U	130 J	390 U	370 U	360 U	57 J	390 U	380 U	380 U
Butyl Benzyl Phthalate	370 U	130 J	390 U	370 U	360 U	370 U	390 U	380 U	380 U
Benzo(a)anthracene	370 U	100 J	390 U	370 U	360 U	370 U	390 U	380 U	380 U
Chrysene	370 U	170 J	390 U	370 U	360 U	370 U	390 U	380 U	380 U
bis(2-Ethylhexyl)Phthalate	370 U	790	390 U	370 U	360 U	370 U	390 U	380 U	380 U
Di-n-Octylphthalate	370 U	400 U	390 U	370 U	360 U	370 U	390 U	380 U	380 U
Benzo(b)fluoranthene	370 U	250 J	390 U	370 U	360 U	370 U	390 U	380 U	380 U
Benzo(k)fluoranthene	370 U	160 J	390 U	370 U	360 U	370 U	390 U	380 U	380 U
Benzo(a)Pyrene	370 U	150 J	390 U	370 U	360 U	40 J	390 U	380 U	380 U
Indeno(1,2,3-cd)pyrene	370 U	81 J	390 U	370 U	360 U	370 U	390 U	380 U	380 U
Benzo(g,h,i)Perylene	76 J	48 J	390 U	370 U	360 U	170 J	390 U	100 J	72 J

UG/KG - microgram per kilogram
B - analyte detected in associated blanks(s)
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 6-13
SURFACE SOIL - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SS09-00	A06SS10-00	A06SS11-00	A06SS12-00	A06SS12-00D	A06SS13-00	A06SS14-00	A06SS15-00
Date Sampled:	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94
Depth:	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"
pH:	5.84	5.97	3.58	5.25	5.24	5.67	5.34	5.67
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
1,4-Dichlorobenzene	370 U	360 U	380 U	370 U	370 U	52 J	350 U	360 U
4-Chloroaniline	370 UJ	360 UJ	180 J	370 U	370 U	360 U	350 U	360 UJ
Phenanthrene	80 J	360 U	64 J	370 U	370 U	360 U	350 U	360 U
Di-n-Butyl Phthalate	440	2300	2500	1000	4600	2600	760	200 J
Fluoranthene	100 J	360 U	88 J	370 U	370 U	360 U	350 U	360 U
Pyrene	240 J	360 U	100 J	370 U	370 U	360 U	350 U	360 U
Butyl Benzyl Phthalate	370 U	360 U	270 J	370 U	780	360 U	350 U	360 U
Benzo(a)anthracene	40 J	360 U	59 J	370 U	370 U	360 U	350 U	360 U
Chrysene	58 J	360 U	94 J	370 U	370 U	360 U	350 U	360 U
bis(2-Ethylhexyl)Phthalate	50 J	360 U	3600	370 U	540	360 U	350 U	360 U
Di-n-Octylphthalate	370 U	360 U	98 J	370 U	370 U	360 U	350 U	360 U
Benzo(b)fluoranthene	46 J	360 U	150 J	370 U	370 U	360 U	350 U	360 U
Benzo(k)fluoranthene	50 J	360 U	100 J	370 U	370 U	360 U	350 U	360 U
Benzo(a)Pyrene	140 J	360 U	90 J	370 U	370 U	360 U	350 U	360 U
Indeno(1,2,3-cd)pyrene	63 J	360 U	380 U	370 U	370 U	360 U	350 U	360 U
Benzo(g,h,i)Perylene	870 J	360 U	380 U	370 U	370 U	360 U	350 U	360 U

UG/KG - microgram per kilogram
B - analyte detected in associated blanks(s)
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-13
SURFACE SOIL - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SS16-00	A06SS17-00	A06SS18-00	A06SS19-00	A06SS20-00	A06SS20-00D	A06SS21-00	A06SS22-00
Date Sampled:	11/07/94	11/07/94	11/08/94	12/04/94	11/08/94	11/08/94	12/04/94	11/08/94
Depth:	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"
pH:	4.93	5.53	5.49	5.76	5.03	4.89	5.22	5.12
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
1,4-Dichlorobenzene	370 U	370 U	360 U	380 U	360 U	360 U	370 U	360 U
4-Chloroaniline	370 UJ	370 U	360 UJ	380 U	360 U	360 U	370 UJ	360 U
Phenanthrene	370 U	370 U	360 U	380 U	360 U	360 U	370 U	360 U
Di-n-Butyl Phthalate	68 J	2500	180 J	2100 B	160 J	82 J	310 J	2900 B
Fluoranthene	370 U	370 U	360 U	380 U	360 U	360 U	370 U	230 J
Pyrene	370 U	370 U	360 U	380 U	360 U	360 U	370 U	95 J
Butyl Benzyl Phthalate	370 U	370 U	360 U	380 U	360 U	360 U	370 U	360 U
Benzo(a)anthracene	370 U	370 U	360 U	380 U	360 U	360 U	370 U	40 J
Chrysene	370 U	370 U	360 U	380 U	360 U	360 U	370 U	81 J
bis(2-Ethylhexyl)Phthalate	370 U	370 U	360 U	380 U	72 J	46 J	38 J	360 U
Di-n-Octylphthalate	370 U	370 U	360 U	380 U	360 U	360 U	370 U	360 U
Benzo(b)fluoranthene	370 U	370 U	360 U	380 U	360 U	360 U	370 U	250 J
Benzo(k)fluoranthene	370 U	370 U	360 U	380 U	360 U	360 U	370 U	140 J
Benzo(a)Pyrene	370 U	370 U	360 U	380 U	360 U	360 U	370 U	120 J
Indeno(1,2,3-cd)pyrene	370 U	370 U	360 U	380 U	360 U	360 U	370 U	110 J
Benzo(g,h,i)Perylene	370 U	370 U	360 U	380 U	360 U	360 U	370 U	67 J

UG/KG - microgram per kilogram
B - analyte detected in associated blanks(s)
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-13
SURFACE SOIL - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SS23-00	A06SS24-00	A06SS25-00	A06SS26-00	A06SS27-00	A06SS28-00
Date Sampled:	11/08/94	11/08/94	11/08/94	11/08/94	11/08/94	11/08/94
Depth:	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"
pH:	5.76	4.93	5.81	6.04	5.80	6.08
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
1,4-Dichlorobenzene	360 U	350 U	360 U	360 U	370 U	360 U
4-Chloroaniline	360 UJ	350 UJ	360 UJ	360 UJ	370 UJ	360 U
Phenanthrene	360 U	350 U	360 U	360 U	370 U	360 U
Di-n-Butyl Phthalate	160 J	120 J	110 J	220 J	83 J	36 J
Fluoranthene	360 U	350 U	360 U	360 U	370 U	360 U
Pyrene	360 U	350 U	360 U	360 U	370 U	360 U
Butyl Benzyl Phthalate	360 U	350 U	360 U	360 U	370 U	360 U
Benzo(a)anthracene	360 U	350 U	360 U	360 U	370 U	360 U
Chrysene	360 U	350 U	360 U	360 U	370 U	360 U
bis(2-Ethylhexyl)Phthalate	360 U	350 U	360 U	68 J	370 U	360 U
Di-n-Octylphthalate	360 U	350 U	360 U	360 U	370 U	360 U
Benzo(b)fluoranthene	360 U	350 U	360 U	360 U	370 U	360 U
Benzo(k)fluoranthene	360 U	350 U	360 U	360 U	370 U	360 U
Benzo(a)Pyrene	360 U	350 U	360 U	360 U	370 U	360 U
Indeno(1,2,3-cd)pyrene	360 U	350 U	360 U	360 U	370 U	360 U
Benzo(g,h,i)Perylene	360 U	350 U	360 U	360 U	370 U	360 U

UG/KG - microgram per kilogram
B - analyte detected in associated blanks(s)
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-13
SURFACE SOIL - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SS01-00	A06SS02-00	A06SS03-00	A06SS04-00	A06SS05-00	A06SS06-00	A06SS07-00	A06SS08-00
Date Sampled:	11/06/94	11/06/94	11/06/94	11/06/94	11/06/94	11/06/94	11/06/94	11/06/94
Depth:	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"
pH:	4.95	3.95	5.73	6.29	5.54	5.79	5.96	5.87
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
beta-BHC	1.9 UJ	4.8 J	2 UJ	1.9 UJ	1.8 UJ	1.9 UJ	2 UJ	2 UJ
delta-BHC	1.9 UJ	29 J	2 UJ	1.9 UJ	1.8 UJ	1.9 UJ	2 UJ	2 UJ
gamma-BHC (Lindane)	1.9 UJ	3.9 J	2 UJ	1.9 UJ	1.8 UJ	1.9 UJ	2 UJ	2 UJ
Heptachlor Epoxide	1.9 UJ	37 J	2 UJ	1.9 UJ	1.8 UJ	1.9 UJ	2 UJ	2 UJ
Dieldrin	5.7 J	79 J	3.9 UJ	3.7 UJ	3.6 UJ	3.7 UJ	3.9 UJ	3.8 UJ
4,4'-DDE	4 J	110 J	3.9 UJ	3.7 UJ	3.6 UJ	3.7 UJ	3.9 UJ	3.8 UJ
4,4'-DDD	5.2 J	350 J	3.9 UJ	3.7 UJ	3.6 UJ	3.7 UJ	3.9 UJ	3.8 UJ
Endosulfan Sulfate	3.7 UJ	7.2 J	3.9 UJ	3.7 UJ	3.6 UJ	3.7 UJ	3.9 UJ	3.8 UJ
4,4'-DDT	4.6 J	200 J	3.9 UJ	3.7 UJ	3.6 UJ	3.7 UJ	3.9 UJ	3.8 UJ
Methoxychlor	19 UJ	410 UJ	20 UJ	19 UJ	18 UJ	19 UJ	20 UJ	20 UJ
Endrin Aldehyde	3.7 UJ	9.5 J	3.9 UJ	3.7 UJ	3.6 UJ	3.7 UJ	3.9 UJ	3.8 UJ
alpha-Chlordane	26 J	1700 J	2 UJ	1.9 UJ	1.8 UJ	1.9 UJ	2 UJ	2 UJ
gamma-Chlordane	19 J	1700	2 UJ	1.9 UJ	1.8 UJ	1.9 UJ	2 UJ	2 UJ
Aroclor-1254	37 UJ	4200 J	39 UJ	37 UJ	36 UJ	37 UJ	39 UJ	38 UJ
Aroclor-1260	37 UJ	800 UJ	39 UJ	37 UJ	36 UJ	37 UJ	39 UJ	38 UJ

UG/KG - microgram per kilogram
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-13
SURFACE SOIL - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SS8-D00	A06SS09-00	A06SS10-00	A06SS11-00	A06SS12-00	A06SS12-00D	A06SS13-00	A06SS14-00	A06SS15-00
Date Sampled:	11/06/94	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94
Depth:	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"
pH:	5.87	5.84	5.97	3.58	5.25	5.24	5.67	5.34	5.67
Units:	UG\KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
beta-BHC	2 UJ	1.9 U	1.9 U	9.9 U	1.9 U	1.9 U	1.8 U	1.8 U	1.9 U
delta-BHC	2 UJ	1.9 U	1.9 U	9.9 U	1.9 U	1.9 U	1.8 U	1.8 U	1.9 U
gamma-BHC (Lindane)	2 UJ	1.9 U	1.9 U	9.9 U	1.9 U	1.9 U	1.8 U	1.8 U	1.9 U
Heptachlor Epoxide	2 UJ	1.9 U	1.9 U	9.9 U	1.9 U	1.9 U	1.8 U	1.8 U	1.9 U
Dieldrin	3.8 UJ	3.7 U	3.6 U	6.6 J	3.7 U	3.7 U	3.6 U	3.5 U	3.6 U
4,4'-DDE	3.8 UJ	3.7 U	3.6 U	11 J	3.7 U	3.7 U	3.6 U	3.5 U	3.6 U
4,4'-DDD	3.8 UJ	3.7 U	3.6 U	35	3.7 U	3.7 U	3.6 U	3.5 U	3.6 U
Endosulfan Sulfate	3.8 UJ	3.7 U	3.6 U	19 U	3.7 U	3.7 U	3.6 U	3.5 U	3.6 U
4,4'-DDT	3.8 UJ	3.7 U	3.6 U	29	3.7 U	3.7 U	3.6 U	3.5 U	3.6 U
Methoxychlor	20 UJ	19 U	19 U	99 U	19 U	19 U	18 U	18 U	19 U
Endrin Aldehyde	3.8 UJ	3.7 U	3.6 U	19 U	3.7 U	3.7 U	3.6 U	3.5 U	3.6 U
alpha-Chlordane	2 UJ	1.9 U	1.9 U	74 J	1.9 U	1.9 U	1.8 U	1.8 U	1.9 U
gamma-Chlordane	2 UJ	1.9 U	1.9 U	76	1.9 U	1.9 U	1.8 U	1.8 U	1.9 U
Aroclor-1254	38 UJ	37 U	36 U	190 U	37 U	37 U	36 U	35 U	36 U
Aroclor-1260	38 UJ	37 U	36 U	190 U	37 U	37 U	36 U	35 U	36 U

UG/KG - microgram per kilogram
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-13
SURFACE SOIL - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SS16-00	A06SS17-00	A06SS18-00	A06SS19-00	A06SS20-00	A06SS20-00D	A06SS21-00	A06SS22-00	A06SS23-00
Date Sampled:	11/07/94	11/07/94	11/08/94	12/04/94	11/08/94	11/08/94	12/04/94	11/08/94	11/08/94
Depth:	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"
pH:	4.93	5.53	5.49	5.76	5.03	4.89	5.22	5.12	5.76
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
beta-BHC	1.9 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.8 U
delta-BHC	1.9 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U	1.9 U	1.4 J	1.8 U
gamma-BHC (Lindane)	1.9 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.8 U
Heptachlor Epoxide	1.9 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.8 U
Dieldrin	3.7 U	3.7 U	3.6 U	3.8 U	3.6 U	3.6 U	3.7 U	3.6 U	3.6 U
4,4'-DDE	3.7 U	3.7 U	1.1 J	3.8 U	3.6 U	3.6 U	3.7 U	0.89 J	0.6 J
4,4'-DDD	3.7 U	3.7 U	3.6 U	3.8 U	3.6 U	3.6 U	3.7 U	1.1 J	3.6 U
Endosulfan Sulfate	3.7 U	3.7 U	3.6 U	3.8 U	3.6 U	3.6 U	3.7 U	3.6 U	3.6 U
4,4'-DDT	3.7 U	3.7 U	3.6 U	3.8 U	3.6 U	3.6 U	3.7 U	0.93 J	3.6 U
Methoxychlor	19 U	19 U	19 U	20 U	19 U	19 U	19 U	3.1 J	2.5 J
Endrin Aldehyde	3.7 U	3.7 U	3.6 U	3.8 U	3.6 U	3.6 U	3.7 U	3.6 U	3.6 U
alpha-Chlordane	1.9 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.8 U
gamma-Chlordane	1.9 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.8 U
Aroclor-1254	37 U	37 U	36 U	38 U	36 U	36 U	37 U	36 U	36 U
Aroclor-1260	37 U	37 U	36 U	38 U	36 U	36 U	37 U	36 U	24 J

UG/KG - microgram per kilogram
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-13
SURFACE SOIL - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SS24-00	A06SS25-00	A06SS26-00	A06SS27-00	A06SS28-00
Date Sampled:	11/08/94	11/08/94	11/08/94	11/08/94	11/08/94
Depth:	0-6"	0-6"	0-6"	0-6"	0-6"
pH:	4.93	5.81	6.04	5.80	6.08
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
beta-BHC	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U
delta-BHC	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U
gamma-BHC (Lindane)	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U
Heptachlor Epoxide	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U
Dieldrin	3.5 U	3.6 U	3.6 U	3.7 U	3.6 U
4,4'-DDE	1.6 J	8.6	3.6 U	3.7 U	3.6 U
4,4'-DDD	3.5 U	0.78 J	3.6 U	3.7 U	3.6 U
Endosulfan Sulfate	3.5 U	3.6 U	3.6 U	3.7 U	3.6 U
4,4'-DDT	1.6 J	4.7	3.6 U	3.7 U	3.6 U
Methoxychlor	18 U	19 U	19 U	19 U	18 U
Endrin Aldehyde	3.5 U	3.6 U	3.6 U	3.7 U	3.6 U
alpha-Chlordane	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U
gamma-Chlordane	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U
Aroclor-1254	35 U	36 U	36 U	37 U	36 U
Aroclor-1260	35 U	36 U	36 U	37 U	36 U

UG/KG - microgram per kilogram
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-14
SURFACE SOIL - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A06SS01-00	A06SS02-00	A06SS03-00	A06SS04-00	A06SS05-00	A06SS06-00
Sampling Date	11/06/94	11/06/94	11/06/94	11/06/94	11/06/94	11/06/94
Depth	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"
pH	4.95	3.95	5.73	6.29	5.54	5.79
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	4070	3310	12600	3550	3680	8030
Antimony	2.7 UL	11.9 L	2.8 UL	2.6 UL	2.7 UL	2.6 UL
Arsenic	1.5	2.8	2.4	1.6	1.6	2.1
Barium	43.1	63.1	48.8	37	27.4	45.5
Beryllium	0.17	0.09	0.22	0.23	0.22	0.24
Cadmium	0.51 K	1.7 B	0.34 U	0.32 U	0.33 U	0.32 U
Calcium	369	551	1280	303	275	828
Chromium	5	15.3	14.6	3.6	4.1	10.2
Cobalt	1.6	1	2.1	2.1	3.5	2.2
Copper	10	79.4	3.2 B	1.6 B	1.2 B	3.4
Iron	3160	4280	8180	2370	3310	5590
Lead	11.2	73.7	10	4.6	4.9	8.4
Magnesium	224	212	591	273	283	486
Manganese	75.7	8.1	15.3	40.3	46.8	61.9
Mercury	0.31 L	2.1	0.1 UL	0.1 UL	0.09 UL	0.1 UL
Nickel	2.6	3.6	3.8	3	3.6	3.7
Potassium	253 B	177 B	534	200 B	285 B	383
Selenium	0.58 U	0.97 K	0.6 U	0.55 U	0.57 U	0.56 U
Silver	2	37.6	0.46 U	0.42 U	0.43 U	0.43 U
Sodium	21.1	24.1	39.3	68.3	66	31.6
Vanadium	8.2	22.1	21.4	6.3	7.3	12.9
Zinc	28.3 J	26.8 J	9.5 J	6.6 J	6.8 J	11.1 J
Cyanide	2.8 UL	15.5 L	2.9 UL	2.8 UL	2.7 UL	2.8 UL

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
U - not detected
UL - not detected, biased low

TABLE 5-14
SURFACE SOIL - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A06SS07-00	A06SS08-00	A06SS08D-00	A06SS09-00	A06SS10-00	A06SS11-00
Sampling Date	11/06/94	11/06/94	11/06/94	11/07/94	11/07/94	11/07/94
Depth	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"
pH	5.96	5.95	5.87	5.84	5.97	3.58
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	6040	4310	4060	6330	6890	4180
Antimony	2.8 UL	2.8 UL	2.8 UL	2.7 UL	2.7 UL	2.8 UL
Arsenic	2.8	2.6	2	2.1	1.4	2
Barium	32	39	38.9	51.3	34.4	46.8
Beryllium	0.19	0.36	0.23	0.32	0.17 K	0.09 K
Cadmium	0.34 U	0.41 K	0.55 K	0.9 K	0.33 U	0.61
Calcium	824	915	509	398	419	210
Chromium	9.5	5.6	4.5	5.8	6.2	7.7
Cobalt	1.4	4.2	1.9	2	1.8	0.86
Copper	3.3 B	4.3	3.2 B	4.3	1.9	139
Iron	5640	4170	2860	3970	3650	3180
Lead	7	10.4	5.2	22.8	6.1	34.6
Magnesium	400	277	220	276	435	342
Manganese	39	171	82.1	77.9	42.9	19.3
Mercury	0.1 UL	0.12 UL	0.12 UL	0.09 UL	0.09 UL	4.7
Nickel	2	4.4	2.3	4.3	2.3	1.2
Potassium	538	265 B	271 B	280 B	305	181
Selenium	0.59 U	0.59 U	0.62 K	0.58 U	0.57 U	0.66 K
Silver	0.45 U	0.46 U	0.46 U	0.45 U	0.44 U	8.1
Sodium	71.2	74.6	68.5	23.8	32.9	77.3
Vanadium	13.2	9.7	6.4	9	10.3	13.1
Zinc	11.3 J	17.6 J	8.2 J	28.1 J	22.9 J	13.1 J
Cyanide	2.9 UL	2.9 UL	2.9 UL	2.8 UL	2.8 U	2.9 U

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
U - not detected
UL - not detected, biased low

TABLE 5-14
SURFACE SOIL - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A06SS12-00	A06SS12-00D	A06SS13-00	A06SS14-00	A06SS15-00	A06SS16-00
Sampling Date	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94
Depth	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"
pH	5.25	5.24	5.67	5.34	5.67	4.93
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	4870	4670	2290	1760	5390	5650
Antimony	2.7 UL	2.7 UL	2.6 UL	2.6 UL	2.7 UL	2.6 UL
Arsenic	1.2	1.2	0.64	0.88	1.2	1.7
Barium	42.6	39.1	22.9	16.3	33.8	37.2
Beryllium	0.32	0.3	0.07	0.08	0.26 K	0.31 K
Cadmium	0.34 U	0.41 K	0.31 U	0.37 K	0.33 U	0.32 U
Calcium	274	269	226	135	221	117
Chromium	4	5.2	2.9	2.5	4.7	4.5
Cobalt	1.3	1.6	0.79	0.85	2.8	2.6
Copper	2.9 B	3.8	1.5 B	1.3 B	9.8	3.5
Iron	2300	2510	1510	1580	2980	2930
Lead	6.2	7.1	4.4	3.3	11.1	7.6
Magnesium	254	259	176	133	303	311
Manganese	145	139	27.6	22.3	80.4	143
Mercury	0.1 UL	0.1 UL	0.09 UL	0.1 UL	0.11 UL	0.1 UL
Nickel	2.8	3.4	1.4	1.3	3.2	3.4
Potassium	294 B	293 B	240 B	189 B	247	241
Selenium	0.78 K	0.59 U	0.54 U	0.58 K	0.57 U	0.56 U
Silver	0.45 U	0.45 U	0.42 U	0.42 U	0.44 U	0.43 U
Sodium	78.4	68.2	73.7	25.8	23.9	22.9
Vanadium	5	5.5	4.1	3.7	6.7	6
Zinc	13.2 J	15.1 J	4.9 J	9.7 J	68.3 J	24.7 J
Cyanide	2.8 UL	2.8 UL	2.7 L	2.7 UL	2.7 U	2.8 U

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
U - not detected
UL - not detected, biased low

TABLE 5-14
SURFACE SOIL - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A06SS17-00	A06SS18-00	A06SS19-00	A06SS20-00	A06SS20-00D	A06SS21-00
Sampling Date	11/07/94	11/08/94	12/04/94	11/08/94	11/08/94	12/04/94
Depth	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"
pH	5.53	5.49	5.76	5.03	4.89	5.22
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	4210	4760	5680	4580	4610	4950
Antimony	2.7 UL	2.9 L	2.8 UL	2.6 UL	2.6 UL	2.6 UL
Arsenic	1.2	1.3	3	1.4	1.3	1.1
Barium	44	43.7	42.1	29.7	28	28.5
Beryllium	0.26	0.27 B	0.36	0.26 B	0.26 B	0.21 B
Cadmium	4.3	0.32 U	0.39	2.4	2.4	0.32 U
Calcium	175	277	433 J	146	137	264
Chromium	3.4	4.4	9.3	3.7	3.5	4.7
Cobalt	3.8	3.1	5.1	1.6	1.8	1.5
Copper	1.4 B	1.2	6.1	2.3	2.5	1.1
Iron	2520	3290	15300	2550	2580	3720
Lead	4.1	4.1	10 J	7.7	8.8	4.5
Magnesium	204	326	329	224	215	346
Manganese	73.6	106	221	109	124	46.8
Mercury	0.11 UL	0.11 UL	0.12 U	0.1 UL	0.1 UL	0.1 UL
Nickel	4.9	4.1 B	7.2	2.9 B	2.4 B	3.1 B
Potassium	198 B	270	233	167	149	264
Selenium	0.58 U	0.55 U	0.6 U	0.56 U	0.55 U	0.56 U
Silver	0.45 U	0.42 U	0.46 UL	0.43 U	0.42 U	0.43 U
Sodium	27.9	63.9	41.5	20.5	60.3	25.2
Vanadium	4.9	6.6	6.2	4.7	4.5	7.6
Zinc	27.4 J	14.3 J	36.7 J	32.1 J	34 J	12.2 J
Cyanide	2.8 UL	2.7 UL	2.9 U	2.7 UL	2.7 UL	2.8 UL

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
U - not detected
UL - not detected, biased low

TABLE 5-14
SURFACE SOIL - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A06SS22-00	A06SS23-00	A06SS24-00	A06SS25-00	A06SS26-00	A06SS27-00
Sampling Date	11/08/94	11/08/94	11/08/94	11/08/94	11/08/94	11/08/94
Depth	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"
pH	5.12	5.76	4.93	5.81	6.04	5.80
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	3580	4420	3230	5520	6430	7270
Antimony	2.6 UL	2.6 UL	2.5 UL	2.6 UL	2.5 UL	2.9 L
Arsenic	1.9	1.4	0.93	2	1.3	1.7
Barium	24.1	35.5	17.1	29.1	35.2	39.1
Beryllium	0.24	0.25 B	0.16 B	0.28 B	0.27 B	0.32 B
Cadmium	0.32	1.2	0.31 U	0.32 U	0.5	1.7
Calcium	122 J	251	71.2	394	375	308
Chromium	4.5 L	5	3.6	5.5	5.3	6.1
Cobalt	2.2	2.1	1.8	2	2.4	2.3
Copper	3.2	6.8	6.9	5	2.5	3
Iron	3640	3820	2530	3100	3430	3430
Lead	21.8 J	27	4.3	9.2	7.2	12.8
Magnesium	156	305	197	352	377	434
Manganese	177	77.3	124	96.5	107	150
Mercury	0.11 U	0.11 UL	0.11 UL	0.1 UL	0.1 UL	0.11 L
Nickel	2.6	3.5 B	2.8 B	4.4 B	3.8 B	4.1 B
Potassium	80.3 U	184	123	274	271	355
Selenium	0.55 U	0.56 U	0.54 U	0.56 U	0.54 U	0.58 U
Silver	0.42 UL	0.43 U	0.41 U	0.43 U	0.42 U	0.44 U
Sodium	28.1	20.6	15.5	65.4	65.4	29.3
Vanadium	5.1	6.9	4.8	6.9	7.3	8.1
Zinc	66.6 J	62.6 J	19.1 J	72.7 J	31.5 J	108 J
Cyanide	2.7 U	2.7 UL	2.7 UL	2.8 UL	2.7 UL	2.8 UL

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
U - not detected
UL - not detected, biased low

TABLE 5-14
SURFACE SOIL - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A06SS28-00	
Sampling Date	11/08/94	
Depth	0-6"	
pH	6.08	
Units	MG/KG	
Aluminum	4880	
Antimony	2.6	UL
Arsenic	1.3	
Barium	29.3	
Beryllium	0.21	B
Cadmium	0.31	U
Calcium	321	
Chromium	4	
Cobalt	2.1	
Copper	1.3	
Iron	2240	
Lead	5.1	
Magnesium	289	
Manganese	52.7	
Mercury	0.11	UL
Nickel	2.7	B
Potassium	183	
Selenium	0.55	U
Silver	0.42	U
Sodium	21.2	
Vanadium	5.8	
Zinc	32.9	J
Cyanide	2.7	UL

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
U - not detected
UL - not detected, biased low

TABLE 5-15
SOIL BORINGS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SB01-01	A06SB01-04	A06SB01-08	A06SB02-01	A06SB02-04	A06SB02-06	A06SB03-01	A06SB03-01D
Date Sampled:	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/15/94	11/15/94
Depth:	1-3'	7-9'	15-17'	1-3'	7-9'	11-13'	1-3'	1-3'
pH:	5.39	5.69	8.52	4.82	6.02	6.27	5.54	5.52
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	11 U	11 U	11 U	12 U	140	78	4 BJ	3 BJ
Acetone	11 U	11 U	11 U	12 U	13 U	12 U	15 B	8 B
Carbon disulfide	11 U	11 U	11 U	12 U	13 U	12 U	11 U	11 U
2-Butanone	11 R	11 U	6 J	12 U	13 U	12 U	11 B	8 B
1,1,2,2-Tetrachloroethane	11 U	11 U	11 U	12 U	13 U	12 U	11 U	11 U
Total Xylenes	11 U	11 U	11 U	12 U	13 U	12 U	11 U	11 U

UG/KG - microgram per kilogram
B -analyte detected in associated blank(s)
BJ - estimated, analyte detected in associated blank(s)
J - estimated
R - rejected
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-15
SOIL BORINGS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SB03-05	A06SB03-07	A06SB04-01	A06SB04-05	A06SB04-08	A06SB05-01	A06SB05-05	A06SB05-05D	A06SB05-06
Date Sampled:	11/15/94	11/15/94	11/04/94	11/04/94	11/04/94	11/08/94	11/08/94	11/08/94	11/08/94
Depth:	9-11'	13-15'	1-3'	9-11'	15-17'	1-3'	9-11'	9-11'	11-13'
pH:	5.39	8.11	5.80	6.40	8.75	5.48	6.29	6.36	7.26
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	8 B	6 B	12 U	13 U	13 U	13 U	24	40	4 J
Acetone	11 B	23 B	12 U	13 U	13 U	13 U	13 U	15 U	5 B
Carbon disulfide	14 U	2 J	12 U	13 U	13 U	13 U	13 U	15 U	11 U
2-Butanone	14 B	12 B	12 U	13 U	13 U	13 U	13 U	15 U	9 J
1,1,2,2-Tetrachloroethane	14 U	13 U	12 U	13 U	13 U	13 U	13 U	15 U	11 U
Total Xylenes	14 U	13 U	12 U	13 U	13 U	13 U	13 U	15 U	11 U

UG/KG - microgram per kilogram
B -analyte detected in associated blank(s)
BJ - estimated, analyte detected in associated blank(s)
J - estimated
R - rejected
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-15
SOIL BORINGS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SB06-01	A06SB06-04	A06SB06-04D	A06SB06-06	A06SB07-01	A06SB07-04	A06SB07-11	A06SB08-01	A06SB08-04
Date Sampled:	11/06/94	11/06/94	11/06/94	11/06/94	11/05/94	11/05/94	11/05/94	11/15/94	11/15/94
Depth:	1-3'	7-9'	7-9'	11-13'	1-3'	7-9'	21-23'	1-3'	7-9'
pH:	5.57	6.47	5.71	7.42	5.69	5.59	8.04	6.89	6.00
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	3 J	12 U	11 U	11 U	11 U	8 J	12 U	5 B	3 B
Acetone	12 U	2 J	3 J	11 U	11 U	12 U	12 U	3 B	18 B
Carbon disulfide	12 U	12 U	11 U	11 U	11 U	12 U	12 U	12 U	14 U
2-Butanone	12 U	12 R	11 R	11 U	11 U	12 U	12 U	7 B	12 B
1,1,2,2-Tetrachloroethane	12 U	12 U	11 U	11 U	11 U	12 U	12 U	12 U	14 U
Total Xylenes	12 U	12 U	11 U	11 U	11 U	12 U	12 U	12 U	14 U

UG/KG - microgram per kilogram
B -analyte detected in associated blank(s)
BJ - estimated, analyte detected in associated blank(s)
J - estimated
R - rejected
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-15
SOIL BORINGS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SB08-09	A06SB09-01	A06SB09-06	A06SB09-12	A06SB10-01	A06SB10-05	A06SB10-07	A06SB11-00	A06SB11-00D
Date Sampled:	11/15/94	11/05/94	11/05/94	11/05/94	11/08/94	11/08/94	11/08/94	12/04/94	12/04/94
Depth:	17-19'	1-3'	11-13'	23-25'	1-3'	9-11'	13-15'	0-1'	0-1'
pH:	4.50	5.75	4.61	7.68	5.45	5.63	7.65	5.10	4.99
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	9 B	10 U	15 U	16 U	8 J	18	25	12 U	12 U
Acetone	56 B	10 U	15 U	16 U	12 U	14 U	9 J	12 U	12 U
Carbon disulfide	2 J	10 U	15 U	16 U	12 U	14 U	12 U	12 U	12 U
2-Butanone	24 B	10 U	15 U	16 U	12 U	14 U	12 U	12 U	12 U
1,1,2,2-Tetrachloroethane	2 J	10 U	15 U	16 U	12 U	14 U	12 U	12 U	12 U
Total Xylenes	2 J	10 U	15 U	16 U	12 U	14 U	12 U	12 U	12 U

UG/KG - microgram per kilogram
B -analyte detected in associated blank(s)
BJ - estimated, analyte detected in associated blank(s)
J - estimated
R - rejected
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-15
SOIL BORINGS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SB11-01	A06SB12-00	A06SB12-01	A06SB13-00	A06SB13-01	A06SB14-00	A06SB14-01
Date Sampled:	12/04/94	11/17/94	11/17/94	11/17/94	11/17/94	11/17/94	11/17/94
Depth:	2-3'	0-1'	1-3'	0-1'	1-3'	0-1'	2-4'
pH:	5.03	5.25	5.57	5.59	5.62	5.41	5.84
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	11 U	6 J	10 J	20	12	11 U	12
Acetone	11 U	12 UJ	11 UJ	11 UJ	11 UJ	11 UJ	11 UJ
Carbon disulfide	11 U	12 U	11 U	11 U	11 U	11 U	11 U
2-Butanone	11 U	12 R	11 R	11 R	11 R	11 R	11 R
1,1,2,2-Tetrachloroethane	11 U	12 U	11 U	11 U	11 U	11 U	11 U
Total Xylenes	11 U	12 U	11 U	11 U	11 U	11 U	11 U

UG/KG - microgram per kilogram
B -analyte detected in associated blank(s)
BJ - estimated, analyte detected in associated blank(s)
J - estimated
R - rejected
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-15
SOIL BORINGS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SB01-01	A06SB01-04	A06SB01-08	A06SB02-01	A06SB02-04	A06SB02-06	A06SB03-01	A06SB03-01D	A06SB03-05
Date Sampled:	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/15/94	11/15/94	11/15/94
Depth:	1-3'	7-9'	15-17'	1-3'	7-9'	11-13'	1-3'	1-3'	9-11'
pH:	5.39	5.69	8.52	4.82	6.02	6.27	5.54	5.52	5.39
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
2,4-Dinitrotoluene	370 U	390 U	380 U	380 U	430 U	430 U	380 U	380 U	420 U
Di-n-Butyl Phthalate	150 J	2700	2500	70 J	250 J	160 J	49 J	380 U	63 J
Butyl Benzyl Phthalate	370 U	390 U	380 U	380 U	430 U	430 U	380 U	380 U	420 U
bis(2-Ethylhexyl)Phthalate	54 J	45 J	380 U	380 U	430 U	51 J	380 U	380 U	45 J

UG/KG - microgram per kilogram
B - analyte detected is associated blanks(s)
J - estimated
U - not detected

TABLE 5-15
SOIL BORINGS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SB03-07	A06SB04-01	A06SB04-05	A06SB04-08	A06SB05-01	A06SB05-05	A06SB05-05D	A06SB05-06	A06SB06-01
Date Sampled:	11/15/94	11/04/94	11/04/94	11/04/94	11/08/94	11/08/94	11/08/94	11/08/94	11/06/94
Depth:	13-15'	1-3'	9-11'	15-17'	1-3'	9-11'	9-11'	11-13'	1-3'
pH:	8.11	5.80	6.40	8.75	5.48	6.29	6.36	7.26	5.57
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
2,4-Dinitrotoluene	440 U	380 U	430 U	410 U	110 J	440 U	480 U	360 U	370 U
Di-n-Butyl Phthalate	59 J	340 J	330 J	230 J	64 J	55 J	150 J	210 J	400
Butyl Benzyl Phthalate	440 U	380 U	430 U	410 U	450 U	440 U	480 U	360 U	370 U
bis(2-Ethylhexyl)Phthalate	380 J	55 J	430 U	50 J	470	440 U	480 U	91 J	58 J

UG/KG - microgram per kilogram
B - analyte detected is associated blanks(s)
J - estimated
U - not detected

TABLE 5-15
SOIL BORINGS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SB06-04	A06SB06-04D	A06SB06-06	A06SB07-01	A06SB07-04	A06SB07-11	A06SB08-01	A06SB08-04	A06SB08-09
Date Sampled:	11/06/94	11/06/94	11/06/94	11/05/94	11/05/94	11/05/94	11/15/94	11/15/94	11/15/94
Depth:	7-9'	7-9'	11-13'	1-3'	7-9'	21-23'	1-3'	7-9'	17-19'
pH:	6.47	5.71	7.42	5.69	5.59	8.04	6.89	6.00	4.50
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
2,4-Dinitrotoluene	390 U	360 U	370 U	380 U	110 J	420 U	380 U	490 U	540 U
Di-n-Butyl Phthalate	2100	330 J	240 J	1900	6000	6200	74 J	63 J	56 J
Butyl Benzyl Phthalate	1200	360 U	370 U	380 U	620	320 J	380 U	490 U	540 U
bis(2-Ethylhexyl)Phthalate	140 J	68 J	62 J	380 U	58 J	95 J	160 J	490 U	540 U

UG/KG - microgram per kilogram
B - analyte detected is associated blanks(s)
J - estimated
U - not detected

TABLE 5-15
SOIL BORINGS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SB09-01	A06SB09-06	A06SB09-12	A06SB10-01	A06SB10-05	A06SB10-07	A06SB11-00	A06SB11-00D	A06SB11-01
Date Sampled:	11/05/94	11/05/94	11/05/94	11/08/94	11/08/94	11/08/94	12/04/94	12/04/94	12/04/94
Depth:	1-3'	11-13'	23-25'	1-3'	9-11'	13-15'	0-1'	0-1'	2-3'
pH:	5.75	4.61	7.68	5.45	5.63	7.65	5.10	4.99	5.03
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
2,4-Dinitrotoluene	360 U	470 U	500 U	370 U	450 U	400 U	380 U	380 U	380 U
Di-n-Butyl Phthalate	89 J	1900	300 J	45 J	130 J	80 J	3500	2600 B	6000
Butyl Benzyl Phthalate	360 U	470 U	500 U	370 U	450 U	400 U	150 J	380 U	380 U
bis(2-Ethylhexyl)Phthalate	85 J	470 U	66 J	370 U	65 J	61 J	65 J	380 U	380 U

UG/KG - microgram per kilogram
B - analyte detected is associated blanks(s)
J - estimated
U - not detected

TABLE 5-15
SOIL BORINGS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SB12-00	A06SB12-01	A06SB13-00	A06SB13-01	A06SB14-00	A06SB14-01
Date Sampled:	11/17/94	11/17/94	11/17/94	11/17/94	11/17/94	11/17/94
Depth:	0-1'	1-3'	0-1'	1-3'	0-1'	2-4'
pH:	5.25	5.57	5.59	5.62	5.41	5.84
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
2,4-Dinitrotoluene	380 U	370 U	390 U	380 U	380 U	380 U
Di-n-Butyl Phthalate	68 J	330 J	50 J	380 U	51 J	43 J
Butyl Benzyl Phthalate	380 U	370 U	390 U	380 U	380 U	380 U
bis(2-Ethylhexyl)Phthalate	90 J	370 U	390 U	380 U	380 U	380 U

UG/KG - microgram per kilogram
B - analyte detected is associated blanks(s)
J - estimated
U - not detected

TABLE 5-15
SOIL BORINGS - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SB01-01	A06SB01-04	A06SB01-08	A06SB02-01	A06SB02-04	A06SB02-06	A06SB03-01	A06SB03-01D	A06SB03-05
Date Sampled:	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/15/94	11/15/94	11/15/94
Depth:	1-3'	7-9'	15-17'	1-3'	7-9'	11-13'	1-3'	1-3'	9-11'
pH:	5.39	5.69	8.52	4.82	6.02	6.27	5.54	5.52	5.39
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
alpha-BHC	1.9 U	2 U	2 U	4 U	2.2 UJ	2.2 U	1.9 UJ	2 U	2.2 U
beta-BHC	1.9 U	2 U	2 U	4 U	2.2 UJ	2.2 U	1.9 UJ	2 U	2.2 U
delta-BHC	1.9 U	2 U	2 U	4 J	2.2 UJ	2.2 U	1.9 UJ	2 U	2.2 U
gamma-BHC (Lindane)	1.9 U	2 U	2 U	4 U	2.2 UJ	2.2 U	1.9 UJ	2 U	2.2 U
Heptachlor Epoxide	1.9 U	2 U	2 U	5.1 J	2.2 UJ	2.2 U	1.9 UJ	2 U	2.2 U
Endosulfan I	1.9 U	2 U	2 U	4 U	2.2 UJ	2.2 U	1.9 UJ	2 U	2.2 U
Dieldrin	3.7 U	3.9 U	3.8 U	32	4.3 UJ	4.3 U	3.8 UJ	3.8 U	4.2 U
4,4'-DDE	3.7 U	3.9 U	3.8 U	38	4.3 UJ	4.3 U	3.8 UJ	3.8 U	4.2 U
4,4'-DDD	3.7 U	3.9 U	3.8 U	62 J	4.3 UJ	4.3 U	3.8 UJ	3.8 U	4.2 U
4,4'-DDT	3.7 U	3.9 U	3.8 U	42	4.3 UJ	4.3 U	3.8 UJ	3.8 U	4.2 U
Methoxychlor	19 U	20 U	11 J	40 U	22 UJ	22 U	19 UJ	20 U	22 U
alpha-Chlordane	1.9 U	2 U	2 U	250	2.2 UJ	2.2 U	1.9 UJ	2 U	2.2 U
gamma-Chlordane	1.9 U	2 U	2 U	230	2.2 UJ	2.2 U	1.9 UJ	2 U	2.2 U

UG/KG - microgram per kilogram
J - estimated
L - biased low
R - rejected
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-15
SOIL BORINGS - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SB03-07	A06SB04-01	A06SB04-05	A06SB04-08	A06SB05-01	A06SB05-05	A06SB05-05D	A06SB05-06	A06SB06-01
Date Sampled:	11/15/94	11/04/94	11/04/94	11/04/94	11/08/94	11/08/94	11/08/94	11/08/94	11/06/94
Depth:	13-15'	1-3'	9-11'	15-17'	1-3'	9-11'	9-11'	11-13'	1-3'
pH:	8.11	5.80	6.40	8.75	5.48	6.29	6.36	7.26	5.57
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
alpha-BHC	2.3 U	1.9 U	2.2 U	2.1 U	1.9 L	2.3 U	2.5 U	1.9 U	1.9 UJ
beta-BHC	2.3 U	1.9 U	2.2 U	2.1 U	1.1 L	5.4	3.2 J	1.9 U	1.9 UJ
delta-BHC	2.3 U	1.9 U	2.2 U	2.1 U	2.3 R	2.3 U	2.5 U	1.9 U	1.9 UJ
gamma-BHC (Lindane)	2.3 U	1.9 U	2.2 U	2.1 U	2.3 R	2.3 U	2.5 U	1.9 U	1.9 UJ
Heptachlor Epoxide	2.3 U	1.9 U	2.2 U	2.1 U	2.3 R	2.3 U	2.5 U	1.9 U	1.9 UJ
Endosulfan I	2.3 U	1.9 U	2.2 U	2.1 U	2.3 R	1.3 J	1.5 J	1.9 U	1.9 UJ
Dieldrin	4.4 U	3.8 U	4.3 U	4.1 U	1.7 L	4.4 U	4.8 U	3.6 U	3.7 UJ
4,4'-DDE	4.4 U	3.8 U	4.3 U	4.1 U	2.2 L	4.4 U	4.8 U	3.6 U	3.7 UJ
4,4'-DDD	4.4 U	3.8 U	4.3 U	4.1 U	1.3 L	4.4 U	4.8 U	3.6 U	3.7 UJ
4,4'-DDT	4.4 U	3.8 U	4.3 U	4.1 U	1.4 L	4.4 U	4.8 U	3.6 U	3.7 UJ
Methoxychlor	23 U	19 U	22 U	21 U	23 R	23 U	25 U	19 U	19 UJ
alpha-Chlordane	2.3 U	1.9 U	2.2 U	2.1 U	2.3 R	2.3 U	2.5 U	1.9 U	1.9 UJ
gamma-Chlordane	2.3 U	1.9 U	2.2 U	2.1 U	2.3 R	2.3 U	2.5 U	1.9 U	1.9 UJ

UG/KG - microgram per kilogram
J - estimated
L - biased low
R - rejected
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-15
SOIL BORINGS - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SB06-04	A06SB06-04D	A06SB06-06	A06SB07-01	A06SB07-04	A06SB07-11	A06SB08-01	A06SB08-04	A06SB08-09
Date Sampled:	11/06/94	11/06/94	11/06/94	11/05/94	11/05/94	11/05/94	11/15/94	11/15/94	11/15/94
Depth:	7-9'	7-9'	11-13'	1-3'	7-9'	21-23'	1-3'	7-9'	17-19'
pH:	6.47	5.71	7.42	5.69	5.59	8.04	6.89	6.00	4.50
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
alpha-BHC	2 U	1.8 UJ	1.9 U	2 U	2.1 U	2.2 U	2 U	2.5 U	2.8 UJ
beta-BHC	2 U	1.8 UJ	1.9 U	2 U	2.1 U	2.2 U	2 U	2.5 U	2.8 UJ
delta-BHC	2 U	1.8 UJ	1.9 U	2 U	2.1 U	2.2 U	2 U	2.5 U	2.8 UJ
gamma-BHC (Lindane)	2 U	1.8 UJ	1.9 U	2 U	2.1 U	2.2 U	2 U	2.5 U	2.8 UJ
Heptachlor Epoxide	2 U	1.8 UJ	1.9 U	2 U	2.1 U	2.2 U	2 U	2.5 U	2.8 UJ
Endosulfan I	2 U	1.8 UJ	1.9 U	2 U	2.1 U	2.2 U	2 U	2.5 U	2.8 UJ
Dieldrin	3.9 U	3.6 UJ	3.7 U	3.8 U	4.1 U	4.2 U	3.8 U	4.9 U	5.4 UJ
4,4'-DDE	3.9 U	3.6 UJ	3.7 U	3.8 U	4.1 U	4.2 U	14	4.9 U	5.4 UJ
4,4'-DDD	3.9 U	3.6 UJ	3.7 U	3.8 U	4.1 U	4.2 U	6.5	4.9 U	5.4 UJ
4,4'-DDT	3.9 U	3.6 UJ	3.7 U	3.8 U	4.1 U	4.2 U	11	4.9 U	5.4 UJ
Methoxychlor	20 U	18 UJ	19 U	20 U	21 U	22 U	20 U	25 U	28 UJ
alpha-Chlordane	2 U	1.8 UJ	1.9 U	2 U	2.1 U	2.2 U	2 U	2.5 U	2.8 UJ
gamma-Chlordane	2 U	1.8 UJ	1.9 U	2 U	2.1 U	2.2 U	2 U	2.5 U	2.8 UJ

UG/KG - microgram per kilogram
J - estimated
L - biased low
R - rejected
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-15
SOIL BORINGS - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SB09-01	A06SB09-06	A06SB09-12	A06SB10-01	A06SB10-05	A06SB10-07	A06SB11-00	A06SB11-00D	A06SB11-01
Date Sampled:	11/05/94	11/05/94	11/05/94	11/08/94	11/08/94	11/08/94	12/04/94	12/04/94	12/04/94
Depth:	1-3'	11-13'	23-25'	1-3'	9-11'	13-15'	0-1'	0-1'	2-3'
pH:	5.75	4.61	7.68	5.45	5.63	7.65	5.10	4.99	5.03
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
alpha-BHC	1.9 U	2.4 U	2.6 UJ	1.9 U	2.3 U	2.1 U	1.9 U	2 U	1.9 U
beta-BHC	1.9 U	2.4 U	2.6 UJ	1.9 U	2.3 U	2.1 U	1.9 U	2 U	1.9 U
delta-BHC	1.9 U	2.4 U	2.6 UJ	1.9 U	2.3 U	2.1 U	1.9 U	2 U	1.9 U
gamma-BHC (Lindane)	1.9 U	2.4 U	2.6 UJ	1.9 U	2.3 U	2.1 U	1.9 U	0.48 J	1.9 U
Heptachlor Epoxide	1.9 U	2.4 U	2.6 UJ	1.9 U	2.3 U	2.1 U	1.9 U	2 U	1.9 U
Endosulfan I	1.9 U	2.4 U	2.6 UJ	1.9 U	2.3 U	2.1 U	1.9 U	2 U	1.9 U
Dieldrin	3.6 U	4.7 U	5 UJ	3.7 U	4.5 U	4 U	4.2	4.9	3.8 U
4,4'-DDE	0.67 J	4.7 U	5 UJ	3.7 U	4.5 U	4 U	4.1 J	5.2	3.8 U
4,4'-DDD	3.6 U	4.7 U	5 UJ	3.7 U	4.5 U	4 U	6.5 J	7.8 J	3.8 U
4,4'-DDT	3.6 U	4.7 U	5 UJ	3.7 U	4.5 U	4 U	6.5	8	3.8 U
Methoxychlor	19 U	24 U	26 UJ	19 U	23 U	21 U	19 U	20 U	19 U
alpha-Chlordane	1.9 U	2.4 U	2.6 UJ	1.9 U	2.3 U	2.1 U	9.9 J	14 J	1.9 U
gamma-Chlordane	1.9 U	2.4 U	2.6 UJ	1.9 U	2.3 U	2.1 U	8.3	12	1.9 U

UG/KG - microgram per kilogram
J - estimated
L - biased low
R - rejected
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-15
SOIL BORINGS - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SB12-00	A06SB12-01	A06SB13-00	A06SB13-01	A06SB14-00	A06SB14-01
Date Sampled:	11/17/94	11/17/94	11/17/94	11/17/94	11/17/94	11/17/94
Depth:	0-1'	1-3'	0-1'	1-3'	0-1'	2-4'
pH:	5.25	5.57	5.59	5.62	5.41	5.84
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
alpha-BHC	2 U	1.9 U	2 U	2 U	2 U	2 U
beta-BHC	2 U	1.9 U	2 U	2 U	2 U	2 U
delta-BHC	2 U	1.9 U	2 U	2 U	2 U	2 U
gamma-BHC (Lindane)	2 U	1.9 U	2 U	2 U	2 U	2 U
Heptachlor Epoxide	2 U	1.9 U	2 U	2 U	2 U	2 U
Endosulfan I	2 U	1.9 U	2 U	2 U	2 U	2 U
Dieldrin	2.9 J	3.7 U	3.9 U	3.8 U	3.8 U	3.8 U
4,4'-DDE	3.6 J	3.7 U	3.9 U	3.8 U	3.8 U	3.8 U
4,4'-DDD	5.8	3.7 U	3.9 U	3.8 U	3.8 U	3.8 U
4,4'-DDT	3.8 U	3.7 U	3.9 U	3.8 U	3.8 U	3.8 U
Methoxychlor	20 U	19 U	20 U	20 U	20 U	20 U
alpha-Chlordane	5	1.9 U	2 U	2 U	2 U	2 U
gamma-Chlordane	2 U	1.9 U	2 U	2 U	2 U	2 U

UG/KG - microgram per kilogram
J - estimated
L - biased low
R - rejected
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-15
SOIL BORINGS - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SB01-01	A06SB01-04	A06SB01-08	A06SB02-01	A06SB02-04	A06SB02-06	A06SB03-01	A06SB03-01D	A06SB03-05
Date Sampled:	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/15/94	11/15/94	11/15/94
Depth:	1-3'	7-9'	15-17'	1-3'	7-9'	11-13'	1-3'	1-3'	9-11'
pH:	5.39	5.69	8.52	4.82	6.02	6.27	5.54	5.52	5.39
Units:	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
1,3,5-Trinitrobenzene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4,6-Trinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-Amino-2,6-Dinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,6-Dinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4-Dinitrotoluene	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U

UG/KG - microgram per kilogram
U - not detected

TABLE 5-15
SOIL BORINGS - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SB03-07	A06SB04-01	A06SB04-05	A06SB04-08	A06SB05-01	A06SB05-05	A06SB05-05D	A06SB05-06	A06SB06-01
Date Sampled:	11/15/94	11/04/94	11/04/94	11/04/94	11/08/94	11/08/94	11/08/94	11/08/94	11/06/94
Depth:	13-15'	1-3'	9-11'	15-17'	1-3'	9-11'	9-11'	11-13'	1-3'
pH:	8.11	5.80	6.40	8.75	5.48	6.29	6.36	7.26	5.57
Units:	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
1,3,5-Trinitrobenzene	0.25 U	0.25 U	0.25 U	0.25 U	0.66	1.2	0.25 U	0.25 U	0.25 U
2,4,6-Trinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	1.2	3.4	1.5	0.25 U	0.25 U
4-Amino-2,6-Dinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.37	0.28	0.25 U	0.25 U
2,6-Dinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.5	0.73	0.25 U	0.25 U	0.25 U
2,4-Dinitrotoluene	0.26 U	0.26 U	0.26 U	0.26 U	0.43	0.68	0.45	0.26 U	0.26 U

UG/KG - microgram per kilogram
U - not detected

TABLE 5-15
SOIL BORINGS - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SB06-04	A06SB06-04D	A06SB06-06	A06SB07-01	A06SB07-04	A06SB07-11	A06SB08-01	A06SB08-04	A06SB08-09
Date Sampled:	11/06/94	11/06/94	11/06/94	11/05/94	11/05/94	11/05/94	11/15/94	11/15/94	11/15/94
Depth:	7-9'	7-9'	11-13'	1-3'	7-9'	21-23'	1-3'	7-9'	17-19'
pH:	6.47	5.71	7.42	5.69	5.59	8.04	6.89	6.00	4.50
Units:	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
1,3,5-Trinitrobenzene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4,6-Trinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-Amino-2,6-Dinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,6-Dinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4-Dinitrotoluene	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U

UG/KG - microgram per kilogram
U - not detected

TABLE 5-15
SOIL BORINGS - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SB09-01	A06SB09-06	A06SB09-12	A06SB10-01	A06SB10-05	A06SB10-07	A06SB11-00	A06SB11-00D	A06SB11-01
Date Sampled:	11/05/94	11/05/94	11/05/94	11/08/94	11/08/94	11/08/94	12/04/94	12/04/94	12/04/94
Depth:	1-3'	11-13'	23-25'	1-3'	9-11'	13-15'	0-1'	0-1'	2-3'
pH:	5.75	4.61	7.68	5.45	5.63	7.65	5.10	4.99	5.03
Units:	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
1,3,5-Trinitrobenzene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4,6-Trinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-Amino-2,6-Dinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,6-Dinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4-Dinitrotoluene	0.26 U	0.3	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U

UG/KG - microgram per kilogram
U - not detected

TABLE 5-15
SOIL BORINGS - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06SB12-00	A06SB12-01	A06SB13-00	A06SB13-01	A06SB14-00	A06SB14-01
Date Sampled:	11/17/94	11/17/94	11/17/94	11/17/94	11/17/94	11/17/94
Depth:	0-1'	1-3'	0-1'	1-3'	0-1'	2-4'
pH:	5.25	5.57	5.59	5.62	5.41	5.84
Units:	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
1,3,5-Trinitrobenzene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4,6-Trinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-Amino-2,6-Dinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,6-Dinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4-Dinitrotoluene	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U

UG/KG - microgram per kilogram
U - not detected

TABLE 5-16
SOIL BORINGS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A06SB01-01	A06SB01-04	A06SB01-08	A06SB02-01	A06SB02-04	A06SB02-06
Sampling Date	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94	11/07/94
Depth	1-3'	7-9'	15-17'	1-3	7-9'	11-13'
pH	5.39	5.69	8.52	4.82	6.02	6.27
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	4030	6570	4810	5650	5720	5330
Antimony	2.7 UL	2.9 UL	2.8 UL	2.7 UL	3 R	3.1 R
Arsenic	1	4.4	3.7	2.7	6.7	5.1
Barium	20.6	15.2	17.6	56.8	16.9	20.6
Beryllium	0.13 K	0.22 K	0.25 K	0.25 B	0.25 U	0.5
Cadmium	0.33 U	0.35 U	0.35 U	0.8	0.42 B	0.38 U
Calcium	186	702	188000	428	2020	221000
Chromium	4.7	20.7	11.8	8.9	20.5 L	13.2 L
Cobalt	1.2	1.6	2.3	1.5	1.4	4.5
Copper	9.4	16.4	3	37.5	5.6	4.6
Iron	2870	6700	9020	4210	12400 J	15400 J
Lead	8.9	6.3	4.6	47	6.8	5
Magnesium	282	571	2120	341	899	2940
Manganese	55	8	47.7	38.7	6.2 J	152 J
Mercury	0.1 UL	0.11 UL	0.1 UL	2.9 K	0.13 UL	0.13 UL
Nickel	1.7	1.8	4.4	4.5 B	1.2	8.2
Potassium	219	627	1470	284	901	1080
Selenium	0.57 U	0.61 U	0.6 U	0.58 U	0.65 U	0.66 U
Silver	0.44 U	0.47 U	0.46 U	13.5	0.5 U	0.51 U
Sodium	68.8	88.2	1580	23.9	79.8	939
Thallium	0.88 UL	0.94 UL	0.92 UL	0.89 U	1	1 U
Vanadium	8.2	19.6	12.8	13.2	16.7	12.8
Zinc	7.5 J	11.1 J	10.4 J	41 J	9.7 J	41.4 J
Cyanide	2.8 U	2.9 U	2.9 U	3.1 L	3.2 U	3.3 U

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UL - not detected, biased low

TABLE 5-16
SOIL BORINGS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A06SB03-01	A06SB03-01D	A06SB03-05	A06SB03-07	A06SB04-01	A06SB04-05
Sampling Date	11/15/94	11/15/94	11/15/94	11/15/94	11/04/94	11/04/94
Depth	1-3	1-3'	9-11'	13-15'	1-3'	9-11'
pH	5.54	5.52	5.39	5.39	8.11	6.4
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	4090	4880	6760	3310	5710	4490
Antimony	2.8 UL	2.8 UL	3 R	3.2 R	2.7 UL	3.1 UL
Arsenic	1.9	1.4	9.2	5.8	1.4	13.6
Barium	28	29.2	25.9	19.7	20.2	14.3
Beryllium	0.21	0.24	0.57	0.27	0.07 K	0.15 K
Cadmium	0.34 U	0.35 U	0.37 U	0.4 U	0.34 U	0.38 U
Calcium	386	326	1770	202000	445	2440
Chromium	6	6.1	20.5 L	11.3 L	6.1	22.1
Cobalt	4.4	4.7	6.5	2.7	0.9	2.2
Copper	1.9	1.8	8	3.9	2.1	7.7
Iron	5920	4830	21700 J	11300 J	4150	22300
Lead	4.8	5.3	9.4	4.5	6.3	9.1
Magnesium	320	407	2110	2150	318	719
Manganese	61.6	68.3	51.8 J	96.5 J	14.4	8.2
Mercury	0.11 U	0.11 U	0.12 UL	0.12 UL	0.11 UL	0.13 UL
Nickel	3	3.8	10.7	3.9	1.2	1.1 U
Potassium	283	274	1250	934	236	759
Selenium	0.6 U	0.6 U	0.63 U	0.69 U	0.59 U	0.66 U
Silver	0.46 U	1.2	0.49 U	0.53 U	0.45 U	0.51 U
Sodium	73.9	79.4	42.4	1440	25.9	43.4
Thallium	0.92 UL	0.92 UL	0.97 U	1.1 U	0.9 UL	1 UL
Vanadium	10.4	9.5	17.8	10.9	9.7	27.6
Zinc	10.6	13.5	39.6 J	23.1 J	10.1 J	9.5 J
Cyanide	2.9 U	2.9 U	3.2 U	3.3 U	2.9 U	3.2 U

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UL - not detected, biased low

TABLE 5-16
SOIL BORINGS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A06SB04-08	A06SB05-01	A06SB05-05	A06SB05-05D	A06SB05-06	A06SB06-01
Sampling Date	11/04/94	11/08/94	11/08/94	11/08/94	11/08/94	11/06/94
Depth	15-17'	1-3'	9-11'	9-11'	11-13	1-3
pH	8.75	5.48	6.29	6.36	7.26	5.57
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	2350	5140	4090	8180	6810	2670
Antimony	3 UL	3.3 UL	3.2 R	3.4 R	4.6 L	2.7 UL
Arsenic	5.7	1.6	12.2	9.7	9.4	1
Barium	13.5	40	9.4	16.7	14.1	23.6
Beryllium	0.18 K	0.23 B	0.26 U	0.28 U	0.89 B	0.09
Cadmium	0.37 U	0.85	0.42 B	0.42 U	0.32 U	0.51 K
Calcium	230000	413	1160	1550	5020	224
Chromium	7	6.4	21.3 L	30.9 L	25.3	3
Cobalt	3	1.4	1.5	2	12.3	0.81
Copper	3.7	23.3	7.2	6.9	7.3	2.8 B
Iron	10700	3340	17200 J	16700 J	35800	1720
Lead	3.9	11.8	9.4	8.9	7.7	4.7
Magnesium	1860	286	710	1410	1160	185
Manganese	102	42.2	5 J	9.5 J	50.3	32.5
Mercury	0.11 UL	0.56 K	0.13 UL	0.13 UL	0.1 UL	0.11 UL
Nickel	5.8	3.6 B	1.1 U	1.6	26.7	1.2
Potassium	760	251	854	1580	1010	210 B
Selenium	0.64 U	0.7 U	0.67 U	0.73 U	0.55 U	0.59 U
Silver	0.49 U	0.54 U	0.52 U	0.57 U	0.42 U	0.45 U
Sodium	1310	77.7	91.2	102	77.1	19.8
Thallium	0.99 UL	1.1 U	1 U	1.1 U	0.85 U	0.9 UL
Vanadium	5.1	8.1	26	28.9	23.4	4.5
Zinc	14.6 J	61.1 J	10.1 J	17.4 J	76 J	6.4 J
Cyanide	3.1 U	3.4 UL	3.3 U	3.6 U	2.8 UL	2.8 UL

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UL - not detected, biased low

TABLE 5-16
SOIL BORINGS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A06SB06-04	A06SB06-04D	A06SB06-06	A06SB07-01	A06SB07-04	A06SB07-11
Sampling Date	11/06/94	11/06/94	11/06/94	11/05/94	11/05/94	11/05/94
Depth	7-9'	7-9'	11-13'	1-3'	7-9'	21-23'
pH	6.47	5.71	7.42	5.69	5.59	8.04
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	5340	4140	9170	10300	8040	2900
Antimony	2.9 UL	2.6 UL	2.7 UL	3.7 L	3 UL	3.1 UL
Arsenic	49.5	5.1	16.5	3.1	4	4.1
Barium	10.3	8.9	22.5	14.5	13	16.6
Beryllium	0.15	0.12	0.56	0.18 B	0.26 B	0.38 B
Cadmium	0.35 U	0.32 U	0.33 U	0.33 U	0.37 U	0.38 U
Calcium	793	642	62400	619	800	111000
Chromium	28.6	11.1	21.9	11	18.1	9.7
Cobalt	1.2	0.8	4	2.1	1	3.2
Copper	3.9	3.3 B	6.8	1.8	3	3.2
Iron	11500	4900	19800	13500	8630	14000
Lead	9	4.7	6.9	6.8	6.7	4.1
Magnesium	491	426	1390	440	1020	2890
Manganese	4.8	4.7	79.4	9.6	8.1	237
Mercury	0.11 UL	0.1 UL	0.11 UL	0.1 UL	0.12 UL	0.11 UL
Nickel	1.6	2.7	7.5	3.1 B	2.3 B	5.9 B
Potassium	873	789	1140	340	1240	1760
Selenium	0.61 U	0.56 U	0.57 U	0.58 U	0.65 U	0.66 U
Silver	0.47 U	0.43 U	0.44 U	0.44 U	0.5 U	0.5 U
Sodium	72.6	23	246	76	86.1	1000
Thallium	0.94 UL	0.86 UL	0.88 UL	0.89 U	0.99 U	1 U
Vanadium	99.3	17.9	25.7	24.4	19.8	7.3
Zinc	6.1 J	5 J	23.9 J	12.8 J	10.7 J	23 J
Cyanide	3 UL	3.5 L	2.8 UL	2.9 UL	3.1 UL	3.2 UL

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UL - not detected, biased low

TABLE 5-16
SOIL BORINGS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A06SB08-01	A06SB08-04	A06SB08-09	A06SB09-01	A06SB09-06	A06SB09-12
Sampling Date	11/15/94	11/15/94	11/15/94	11/05/94	11/05/94	11/05/94
Depth	1-3'	7-9'	17-19'	1-3	11-13'	23-25'
pH	6.89	6	4.5	5.75	4.61	7.68
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	8990	7290	6250	6730	5410	6800
Antimony	2.8 R	3.5 R	3.8 R	2.5 UL	3.5 UL	3.5 UL
Arsenic	3 K	15	8.3	1.5	14	6.8
Barium	51.3	86.9	28	29.4	17	37.9
Beryllium	0.36	0.35	2.1	0.21 B	0.33 B	0.59
Cadmium	0.52 B	0.43 U	0.47 U	0.53	0.43 U	0.43 U
Calcium	714	1990	1550	383	238	11800
Chromium	12.2 L	25.2 L	21 L	6.6	15.1	18.4
Cobalt	4.4	3.5	10.5	2.2	2.2	7.3
Copper	10.1	5.6	6.6	1.8	4.7	8.8
Iron	7780 J	33900 J	17500 J	4480	11500	23900
Lead	18.8	14.3	9.8	6.2	8.7	11
Magnesium	647	2150	2890	359	890	3510
Manganese	147 J	24.1 J	65.2 J	37.6	11.5	269
Mercury	0.56	0.15 UL	0.16 UL	0.09 UL	0.14 UL	0.15 UL
Nickel	5.4	3.6	24.5	2.9 B	2.5 B	13.1
Potassium	442	2190	2740	269	1460	2700
Selenium	0.59 U	0.95 K	0.82 U	0.54 U	0.74 U	1.1 K
Silver	2.4	0.58 U	0.63 U	0.42 U	0.57 U	0.58 U
Sodium	78.7	69.8	82.2	64.9	47.8	244
Thallium	0.9 U	1.2	1.3 U	0.84 U	1.1 U	1.2 UL
Vanadium	16.2	20.5	14.2	10.1	13.8	12.7
Zinc	73.8 J	22.6 J	59.4 J	43.4 J	27.1 J	50.4 J
Cyanide	2.9 U	3.7 U	4.1 U	2.7 UL	3.6 UL	3.8 UL

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UL - not detected, biased low

TABLE 5-16
SOIL BORINGS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A06SB10-01	A06SB10-05	A06SB10-07	A06SB11-00	A06SB11-00D	A06SB11-01
Sampling Date	11/08/94	11/08/94	11/08/94	12/04/94	12/04/94	12/04/94
Depth	1-3'	9-11'	13-15'	0-1'	0-1'	2-3'
pH	5.45	5.63	7.65	5.1	4.99	5.03
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	3960	6120	4820	4800	4020	5810
Antimony	2.7 R	3.2 R	2.9 R	2.7 UL	2.7 UL	2.7 UL
Arsenic	2.4 K	8.9	8	1.8	1.6	2
Barium	35.6	27	19.9	53.1	51.3	33.3
Beryllium	0.35	0.63	0.39	0.19 L	0.18 L	0.14 L
Cadmium	0.33 U	0.39 U	0.36 U	0.54	0.33 U	0.36
Calcium	374	2170	58900	360	356	381
Chromium	5.6 L	18 L	17.1 L	5.3	5.1	6.9
Cobalt	6.8	7.3	4.6	1.2	1.4	0.89
Copper	10.6	8.9	6	12.6	13.3	3.3
Iron	6380 J	21200 J	15300 J	2990	2900	4690
Lead	15.3	9.4	6.8	15.1	15.3	6.9
Magnesium	281	1890	1900	265	209	253
Manganese	151 J	54.5 J	113 J	68.8	73.6	32.6
Mercury	0.11 UL	0.12 UL	0.12 UL	0.56 K	0.75 K	0.12 UL
Nickel	4.9	13.4	7	2.4	2.1	2.2
Potassium	162	1010	1120	102	122	211
Selenium	0.57 U	0.68 U	0.63 U	0.58 U	0.58 U	0.57 U
Silver	0.44 U	0.52 U	0.48 U	2.4 L	2.5 L	0.44 UL
Sodium	70.5	37	425	36.4	82.7	77.3
Thallium	0.88 U	1 U	0.96 U	0.89 U	0.89 U	0.88 U
Vanadium	9.6	16.8	15.5	7.8	7.4	10.7
Zinc	26.4 J	45.7 J	31.9 J	38.1 J	37.6 J	36.7 J
Cyanide	2.8 U	3.4 U	3 U	2.9 U	2.9 U	2.9 U

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UL - not detected, biased low

TABLE 5-16
SOIL BORINGS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A06SB12-00	A06SB12-01	A06SB13-00	A06SB13-01	A06SB14-00	A06SB14-01
Sampling Date	11/17/94	11/17/94	11/17/94	11/17/94	11/17/94	11/17/94
Depth	0-1'	1-3'	0-1'	1-3'	0-1'	2-4'
pH	5.25	5.57	5.59	5.62	5.41	5.84
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	6630	3420	3880	8280	4530	4600
Antimony	2.8 UL	2.7 UL	2.8 UL	2.8 UL	2.8 UL	2.8 UL
Arsenic	1.9	1.1	1.3	1.7	1.4	1
Barium	32.4	30.7	29.6	36.6	44.4	19.9
Beryllium	0.19	0.28	0.27	0.22	0.3	0.06
Cadmium	0.34 U	0.34 U	0.35 U	0.34 U	0.34 U	0.34 U
Calcium	546	395	240	870	389	796
Chromium	8.4	3.3	3.3	9.7	4.3	7.1
Cobalt	2.1	2	2.5	1.9	5.2	0.83
Copper	11.2	2.5	1.6	1.4	1.3	0.86
Iron	4550	2270	2110	4710	4310	5380
Lead	13.4	4.4	6.8	5.8	4.7	4.8
Magnesium	475	183	263	471	235	292
Manganese	58.2	132	81.1	17	134	5.5
Mercury	0.98	0.11 U	0.12 U	0.11 U	0.11 U	0.12 U
Nickel	2.7	1.7	2.7	2.7	4	0.97 U
Potassium	444	158	203	326	150	264
Selenium	0.59 U	0.58 U	0.61 U	0.59 U	0.59 U	0.59 U
Silver	3.6	0.45 U	0.47 U	0.45 U	0.45 U	0.45 U
Sodium	33.5	30.5	76.3	27.3	23.2	72.1
Thallium	0.9 UL	0.9 UL	0.93 UL	0.9 UL	0.9 UL	0.9 UL
Vanadium	13	4.3	6.1	14.4	8.1	12.3
Zinc	23.4	10.3	10.8	7.5 K	8.4 K	5.4 K
Cyanide	2.9 U	2.8 U	3 U	2.9 U	2.9 U	2.9 U

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UL - not detected, biased low

TABLE 5-17
TEST PITS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06TP01-01	06TP01-02	06TP02-01	A06TP02-02	A06TP03-01	A06TP03-02	A06TP04-01	A06TP04-02	06TP05-01
Date Sampled:	11/16/94	11/16/94	11/16/94	11/16/94	11/17/94	11/17/94	11/15/94	11/15/94	11/15/94
Depth	0-2'	2-3'	1-9'	9-10'	0-4'	4-4.5'	0-3'	3-4'	0-2'
pH:	6.02	5.86	6.65	7.89	6.61	6.70	5.90	5.76	5.63
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	8 B	5 B	8 B	6 B	13	9 J	5 B	3 B	3 B
Acetone	11 U	11 B	90	46	12 UJ	13 UJ	8 B	12 U	19 B
Carbon Tetrachloride	2 J	12 U	14 U	13 U	12 U	13 U	11 U	12 U	11 U
Tetrachloroethene	11 U	12 U	14 U	13 U	12 U	13 U	11 U	2 J	11 U
Total Xylenes	1 J	12 U	14 U	13 U	12 U	13 U	11 U	12 U	11 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
BJ - estimated, analyte detected in associated blank(s)
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-17
TEST PITS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06TP05-02	A06TP06-01	A06TP06-02	A06TP07-01	A06TP07-02	A06TP09-01	A06TP09-02	A06TP09-02D
Date Sampled:	11/15/94	11/15/94	11/15/94	11/17/94	11/17/94	11/18/94	11/18/94	11/18/94
Depth	2-3'	2-3'	4-6'	0-4'	4-5'	0-2.5'	2.5-3'	2.5-3'
pH:	5.52	4.80	5.27	5.92	6.13	5.78	6.07	5.97
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	2 BJ	7 B	3 BJ	13	28	3 J	3 J	3 J
Acetone	8 B	15 B	11 U	12 UJ	12 UJ	12 U	11 U	12 U
Carbon Tetrachloride	11 U	12 U	11 U	12 U	12 U	12 U	11 U	12 U
Tetrachloroethene	11 U	12 U	11 U	12 U	12 U	12 U	11 U	12 U
Total Xylenes	11 U	12 U	11 U	12 U	12 U	12 U	11 U	12 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
BJ - estimated, analyte detected in associated blank(s)
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-17
TEST PITS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06TP01-01	A06TP01-02	A06TP02-01	A06TP02-02	A06TP03-01	A06TP03-02	A06TP04-01	A06TP04-02	06TP05-01
Date Sampled:	11/16/94	11/16/94	11/16/94	11/16/94	11/17/94	11/17/94	11/15/94	11/15/94	11/15/94
Depth	0-2'	2-3'	1-9'	9-10'	0-4'	4-4.5'	0-3'	3-4'	0-2'
pH:	6.02	5.86	6.65	7.89	6.61	6.70	5.90	5.76	5.63
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
1,4-Dichlorobenzene	380 U	380 U	440 U	440 U	390 U	57 J	540 U	380 U	380 U
2-Chloronaphthalene	380 U	380 U	440 U	71 J	390 U	420 U	540 U	380 U	380 U
N-nitrosodiphenylamine	380 U	380 U	440 U	440 U	390 U	93 J	540 U	380 U	380 U
Phenanthrene	380 U	380 U	440 U	440 U	390 U	420 U	540 U	380 U	380 U
Di-n-Butyl Phthalate	47 J	46 J	51 J	440 U	390 U	82 J	61 J	58 J	42 J
Fluoranthene	380 U	380 U	440 U	440 U	390 U	420 U	540 U	380 U	380 U
Pyrene	380 U	380 U	440 U	440 U	390 U	420 U	540 U	380 U	380 U
Butyl Benzyl Phthalate	380 U	380 U	440 U	440 U	390 U	420 U	540 U	380 U	380 U
Benzo(a)anthracene	380 U	380 U	440 U	440 U	390 U	420 U	540 U	380 U	380 U
Chrysene	380 U	380 U	440 U	440 U	390 U	420 U	540 U	380 U	380 U
bis(2-Ethylhexyl)Phthalate	380 U	380 U	48 J	650	220 J	2000	540 U	380 U	380 U
Benzo(b)fluoranthene	380 U	380 U	440 U	440 U	390 U	420 U	540 U	380 U	380 U
Benzo(k)fluoranthene	380 U	380 U	440 U	440 U	390 U	420 U	540 U	380 U	380 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-17
TEST PITS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06TP05-02	A06TP06-01	A06TP06-02	A06TP07-01	A06TP07-02	A06TP09-01	A06TP09-02	A06TP09-02D
Date Sampled:	11/15/94	11/15/94	11/15/94	11/17/94	11/17/94	11/18/94	11/18/94	11/18/94
Depth	2-3'	2-3'	4-6'	0-4'	4-5'	0-2.5'	2.5-3'	2.5-3'
pH:	5.52	4.80	5.27	5.92	6.13	5.78	6.07	5.97
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
1,4-Dichlorobenzene	370 U	380 U	380 U	390 U	420 U	380 U	380 U	390 U
2-Chloronaphthalene	370 U	380 U	380 U	390 U	420 U	380 U	380 U	390 U
N-nitrosodiphenylamine	370 U	380 U	380 U	390 U	420 U	380 U	380 U	390 U
Phenanthrene	370 U	380 U	380 U	390 U	420 U	380 U	49 J	390 U
Di-n-Butyl Phthalate	48 J	380 U	54 J	160 J	3200	380 U	57 J	390 U
Fluoranthene	370 U	88 J	380 U	390 U	420 U	380 U	380 U	390 U
Pyrene	370 U	68 J	380 U	390 U	420 U	380 U	380 U	390 U
Butyl Benzyl Phthalate	370 U	380 U	380 U	390 U	62 J	380 U	380 U	390 U
Benzo(a)anthracene	370 U	42 J	380 U	390 U	420 U	380 U	380 U	390 U
Chrysene	370 U	50 J	380 U	390 U	420 U	380 U	380 U	390 U
bis(2-Ethylhexyl)Phthalate	370 U	76 J	83 J	390 U	420 U	380 U	380 U	390 U
Benzo(b)fluoranthene	370 U	56 J	380 U	390 U	420 U	380 U	380 U	390 U
Benzo(k)fluoranthene	370 U	46 J	380 U	390 U	420 U	380 U	380 U	390 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-17
TEST PITS - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06TP01-01	A06TP01-02	A06TP02-01	A06TP02-02	A06TP03-01	A06TP03-02	A06TP04-01	A06TP04-02	06TP05-01
Date Sampled:	11/16/94	11/16/94	11/16/94	11/16/94	11/17/94	11/17/94	11/15/94	11/15/94	11/15/94
Depth	0-2'	2-3'	1-9'	9-10'	0-4'	4-4.5'	0-3'	3-4'	0-2'
pH:	6.02	5.86	6.65	7.89	6.61	6.70	5.90	5.76	5.63
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
beta-BHC	2 UJ	2 U	4.5 U	4.5 U	2 U	87 U	2.8 UJ	2 U	2 U
delta-BHC	2 UJ	2 U	4.5 U	4.5 U	0.84 J	87 U	2.8 UJ	2 U	2 U
Dieldrin	3.8 UJ	3.8 U	7.3 J	90 J	3.9 U	170 U	5.4 UJ	3.8 U	3.8 U
Endrin	3.8 UJ	3.8 U	8.8 U	8.8 U	29	170 U	5.4 UJ	3.8 U	3.8 U
Endosulfan Sulfate	3.8 UJ	3.8 U	8.8 U	8.8 U	3.9 U	170 U	5.4 UJ	3.8 U	3.8 U
alpha-Chlordane	2 UJ	2 U	4.5 U	4.5 U	9.8 J	1200 J	2.8 UJ	2 U	2 U
gamma-Chlordane	2 UJ	2 U	4.5 U	37 J	2 U	87 U	2.8 UJ	2 U	2 U
Aroclor-1254	38 UJ	38 U	770 J	12000 J	590	79000	54 UJ	38 U	38 U
Aroclor-1260	38 UJ	38 U	340	4900	190 J	1700 U	54 UJ	38 U	38 U

UG/KG - microgram per kilogram
J - estimated
L - biased low
U - not detected
UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-17
TEST PITS - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06TP05-02	A06TP06-01	A06TP06-02	A06TP07-01	A06TP07-02	A06TP09-01	A06TP09-02	A06TP09-02D
Date Sampled:	11/15/94	11/15/94	11/15/94	11/17/94	11/17/94	11/18/94	11/18/94	11/18/94
Depth	2-3'	2-3'	4-6'	0-4'	4-5'	0-2.5'	2.5-3'	2.5-3'
pH:	5.52	4.80	5.27	5.92	6.13	5.78	6.07	5.97
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
beta-BHC	1.9 U	1.6 L	2 U	2 U	2.2 U	2 U	2 U	2 U
delta-BHC	1.9 U	2 UL	2 U	2 U	2.2 U	2 U	2 U	2 U
Dieldrin	3.7 U	3.8 UL	3.8 U	3.9 U	4.2 U	3.8 U	3.8 U	3.9 U
Endrin	3.7 U	3.8 UL	3.8 U	3.9 U	4.2 U	3.8 U	3.8 U	3.9 U
Endosulfan Sulfate	3.7 U	3.6 L	3.8 U	3.9 U	4.2 U	3.8 U	3.8 U	3.9 U
alpha-Chlordane	1.9 U	2 UL	2 U	2 U	2.2 U	2 U	2 U	2 U
gamma-Chlordane	1.9 U	2 UL	2 U	2 U	2.2 U	2 U	2 U	2 U
Aroclor-1254	37 U	38 UL	38 U	33 J	42 U	38 U	38 U	39 U
Aroclor-1260	37 U	38 UL	38 U	39 U	42 U	38 U	38 U	39 U

UG/KG - microgram per kilogram
J - estimated
L - biased low
U - not detected
UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-17
TEST PITS - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06TP01-01	A06TP01-02	A06TP02-01	A06TP02-02	A06TP03-01	A06TP03-02	A06TP04-01	A06TP04-02	A06TP05-01	A06TP05-02
Date Sampled:	11/16/94	11/16/94	11/16/94	11/16/94	11/17/94	11/17/94	11/15/94	11/15/94	11/15/94	11/15/94
Depth	0-2'	2-3'	1-9'	9-10'	0-4'	4-4.5'	0-3'	3-4'	0-2'	2-3'
pH:	6.02	5.86	6.65	7.89	6.61	6.70	5.90	5.76	5.63	5.52
Units:	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
1,3,5-Trinitrobenzene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.45 U	0.25 U	0.25 U	0.25 U	0.45 J
2,4,6-Trinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	4.1 J
2,6-Dinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.28 J
2,4-Dinitrotoluene	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	2.1 J

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-17
TEST PITS - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06TP06-01	A06TP06-02	A06TP07-01	A06TP07-02	A06TP09-01	A06TP09-02	A06TP09-02D
Date Sampled:	11/15/94	11/15/94	11/17/94	11/17/94	11/18/94	11/18/94	11/18/94
Depth	2-3'	4-6'	0-4'	4-5'	0-2.5'	2.5-3'	2.5-3'
pH:	4.80	5.27	5.92	6.13	5.78	6.07	5.97
Units:	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
1,3,5-Trinitrobenzene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4,6-Trinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,6-Dinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4-Dinitrotoluene	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-18
TEST PITS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A06TP01-01	A06TP01-02	A06TP02-01	A06TP02-02	A06TP0301	A06TP03-02
Sampling Date	11/16/94	11/16/94	11/16/94	11/16/94	11/19/94	11/19/94
Depth	0-2'	2-3'	1-9'	9-10'	0-4'	4-4.5'
pH	6.02	5.86	6.65	7.89	6.61	6.7
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	4740	3570	7360	3340	11600	9270
Arsenic	1.3 K	0.79 K	4.5	5.6	5.6	3.4
Barium	19.3	15.7	32.2	31.3	73.8	327
Beryllium	0.22 U	0.22 U	0.31	0.36	0.22	0.2
Cadmium	0.33 U	0.33 U	101	7.3	786	51.9
Calcium	512	539	3610	196000	1300	953
Chromium	5.8 L	5.6 L	22.8 L	8.1 L	20.6	28.3
Cobalt	0.9	0.64	3.8	3.4	6	7.9
Copper	2.1	1.9	14.8	44.5	74.4	181
Iron	3120 J	2920 J	16500 J	14800 J	11000	12400
Lead	29.2	3.6	26.8	33.9	344	182
Magnesium	288	250	1050	2020	617	538
Manganese	20.2 J	8.8 J	45.6 J	144 J	38.5	41.7
Mercury	0.1 UL	0.12 UL	0.13 UL	0.12 UL	1.3	0.12 U
Nickel	1.5	1.4	13.7	12.9	17.8	62
Potassium	235	313	1170	772	559	540
Silver	0.44 U	0.44 U	0.52 U	0.53 U	8.8	1.9
Sodium	23.9	19.6	48.1	1170	85.4	51.4
Vanadium	8.5	8.4	18.2	7.6	18.9	16.2
Zinc	12.2 J	6 J	618 J	100 J	1190	1580

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
U - not detected
UL - not detected, biased low

TABLE 5-18
TEST PITS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A06TP04-01	A06TP04-02	A06TP05-01	A06TP05-02	A06TP06-01	A06TP06-02
Sampling Date	11/15/94	11/15/94	11/15/94	11/15/94	11/15/94	11/15/94
Depth	0-3'	3-4'	0-2'	2-3'	2-3'	4-6'
pH	5.9	5.76	5.63	5.52	4.8	5.27
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	11200	3390	5570	7320	4640	4130
Arsenic	2.5 K	1.1 K	1 K	1.7	1.2 K	1.4
Barium	50.8	24.2	36.3	31.3	31.1	30.4
Beryllium	0.34	0.22 U	0.24	0.19	0.22 U	0.16
Cadmium	0.49 U	0.33 U	0.34 U	0.32 U	3.8	2.1
Calcium	1090	509	466	797	494	432
Chromium	11.4 L	4.3 L	4.5 L	7.7	6.1 L	5.8
Cobalt	2.5	0.65	1	1.1	1.1	1.3
Copper	2.9	0.72	1.3	1.6	16.8	23
Iron	7110 J	2480 J	3010 J	4750	3590 J	3510
Lead	11.2	3.1	5	7.6	10.2	16
Magnesium	639	128	232	348	272	270
Manganese	73.3 J	10.1 J	39.3 J	21.8	52 J	76.8
Mercury	0.16 UL	0.1 UL	0.1 UL	0.11 U	0.3 L	0.15
Nickel	3.6	1.4	2	2.7	1.2	1.5
Potassium	493	159	248	221	351	325
Silver	0.65 U	0.44 U	0.45 U	0.43 U	0.45 U	0.46 U
Sodium	110	64.4	23.7	72.8	20.4	73.5
Vanadium	17.1	6.5	6.5	12.3	8.4	7.3
Zinc	35 J	7.9 J	7.9 J	18.1	40.3 J	44

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
U - not detected
UL - not detected, biased low

TABLE 5-18
TEST PITS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A06TP07-01	A06TP07-02	A06TP09-01	A06TP09-02	A06TP09-02D
Sampling Date	11/17/94	11/17/94	11/18/94	11/18/94	11/18/94
Depth	0-4'	4-5'	0-2.5'	2.5-3'	2.5-3'
pH	5.92	6.13	5.78	6.07	5.97
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	7210	9990	6420	5470	4700
Arsenic	10.8	20.1	3	1.9	2.2
Barium	33.1	36.5	43.7	19.4	17
Beryllium	0.53	0.84	0.23 B	0.16 B	0.15 B
Cadmium	0.66	0.38 U	0.35 U	0.35 U	0.35 U
Calcium	1550	2340	603	760	687
Chromium	17.8	26.3	7.7	8	7.2
Cobalt	5.7	6.6	2.6	0.99	1.2
Copper	4.2	4	1.3 B	1.2	1.4 B
Iron	15900	26900	10100	7450	6880
Lead	12.3	9.2	5.6	4.5	3.9
Magnesium	1090	1620	385	370	326
Manganese	81.2	49.2	50.9	9.1	9.6
Mercury	0.1 U	0.12 U	0.12 UL	0.12 UL	0.12 UL
Nickel	7.4	10.6	2.3	1.5	1.2
Potassium	919	1240	269	402	362
Silver	0.46 U	0.51 U	0.46 U	0.46 U	0.47 U
Sodium	34.9	104	59.8	22.9	26.4
Vanadium	19.3	25.3	15	14.6	14.6
Zinc	26.6	41.5	21.7	7.4 K	6.1 K

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
U - not detected
UL - not detected, biased low

TABLE 5-19
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06HP01-01	A06HP02-01	A06HP03-01	A06HP03-01D	A06HP04-01	A06HP05-01	A06HP06-01	A06HP07-01	A06HP08-01
Date Sampled:	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
pH:	7.75	7.16	7.80	7.80	7.77	7.56	7.66	7.79	6.34
Units:	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
Trichloroethene	1 U	1 U	1 U	1	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	1 U	1 U	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

UG/L - microgram per liter
J - estimated
U - not detected

TABLE 5-19
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06HP09-01	A06HP10-01
Date Sampled:	11/05/94	11/08/94
pH:	8.19	7.36
Units:	UG/L	UG/L
Trichloroethene	1 U	1 U
Ethylbenzene	0.8 J	1 U
Cis 1,2-Dichloroethene	1 U	4

UG/L - microgram per liter
J - estimated
U - not detected

TABLE 5-19
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06HP01-01	A06HP02-01	A06HP03-01	A06HP03-01D	A06HP04-01	A06HP05-01	A06HP06-01	A06HP07-01	A06HP08-01
Date Sampled:	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
pH:	7.75	7.16	7.80	7.80	7.77	7.56	7.66	7.79	6.34
Units:	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	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
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

UG/L - microgram per liter
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-19
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06HP09-01	A06HP10-01
Date Sampled:	11/05/94	11/08/94
pH:	8.19	7.36
Units:	UG/L	UG/L
beta-BHC	0.05 UL	0.05 UJ
delta-BHC	0.05 UL	0.029 J

UG/L - microgram per liter
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-19
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06HP01-01	A06HP02-01	A06HP03-01	A06HP03-01D	A06HP04-01	A06HP05-01	A06HP06-01	A06HP07-01
Date Sampled:	11/07/94	11/08/94	11/15/94	11/15/94	11/05/94	11/08/94	11/07/94	11/05/94
pH:	7.75	7.16	7.80	7.80	7.77	7.56	7.66	7.79
Units:	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
Nitrobenzene	0.73 U	0.73 U	0.73 U	0.73 U	3.2	0.73 U	2.6 U	0.73 U
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
4-Amino-2,6-Dinitrotoluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

UG/L - microgram per liter
U - not detected

TABLE 5-19
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A06HP08-01	A06HP09-01	A06HP10-01
Date Sampled:	11/16/94	11/05/94	11/08/94
pH:	6.34	8.19	7.36
Units:	UG/L	UG/L	UG/L
Nitrobenzene	4.1 U	0.73 U	0.73 U
2,4,6-Trinitrotoluene	0.62 U	0.62 U	0.73
4-Amino-2,6-Dinitrotoluene	1 U	1 U	1.7

UG/L - microgram per liter
U - not detected

TABLE 5-20
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A06HP01-01	A06HP02-01	A06HP03-01	A06HP03-01D	A06HP04-01	A06HP05-01
Sampling Date	11/07/94	11/08/94	11/15/94	11/15/94	11/05/94	11/08/94
pH	7.75	7.16	7.80	7.80	7.77	7.56
Units	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
Aluminum	77200 J	29000 J	14800 J	18300 J	9040	52700 J
Antimony	19.8 L	12.7 L	12.2 UL	15.7 L	12.2 UL	23 L
Arsenic	65.7	26.3	15.5	22.2	8.9	67.3
Barium	255	146	74.4	94	56.6	187
Beryllium	4.4	1.8	1.1	1.6	1 U	3.8
Cadmium	1.9	1.5 U	1.5 U	1.5 U	1.5 U	2.8
Calcium	2350000	880000	656000	836000	350000	2170000
Chromium	232	86.1	41.5	64.7	27.2	159
Cobalt	42.9	19.6	12	19.6	9.7	42.6
Copper	66	28	16.9	23.1	9	52.5
Iron	155000	70400	33000	52500	26900	153000
Lead	61.2	27.2	13.6	21.7	7.5 J	51.3
Magnesium	76000	20200	10300	14600	13800	29100
Manganese	1010	452	205	286	193	920
Nickel	93.9	35.2	16.6	32.2	8.9	89.4
Potassium	19900	8760	5580	7170	3990	14100
Selenium	6.2	2.6 U	2.6 U	3.7	2.6 U	4.3
Sodium	14400	7880	7710	8420	6510	9790
Vanadium	210	80.6	44.1	61.3	24	144
Zinc	322 J	134 J	68.4 J	112 J	41 J	294 J
Cyanide	20 U	5.4	5 U	5 U	5 U	20 U

UG/L - microgram per liter
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
L - biased low
R - rejected
U - not detected
UL - not detected, biased low

TABLE 5-20
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A06HP06-01	A06HP07-01	A06HP08-01	A06HP09-01	A06HP10-01
Sampling Date	11/07/94	11/05/94	11/16/94	11/05/94	11/08/94
pH	7.66	7.79	6.34	8.19	7.37
Units	UG/L	UG/L	UG/L	UG/L	UG/L
Aluminum	44000 J	15500 J	4580	98800 J	19100 J
Antimony	13.3 L	12.2 UL	12.2 R	28.3 L	12.2 UL
Arsenic	59.9	19.6	5.8	436	16.5
Barium	190	92.3	37.7	474	95.4
Beryllium	3.2	1.1	1.4	7.8	1.2
Cadmium	1.7	1.8	1.5 U	27.1	1.5 U
Calcium	1140000	168000	8640	1230000	594000
Chromium	160	62.4	15.8	500	49.6
Cobalt	30.9	9.7	9.4	87.2	16.3
Copper	45.3	18.6	7.4	107	19.4
Iron	131000	38900	13900	279000	39500
Lead	43.8	16.2	4.2	113	17.8
Magnesium	24000	12100	4250	56800	10800
Manganese	631	247	116	1690	321
Nickel	63.8	17.8	23.1	237	20.9
Potassium	18200	12900	4870	42900	5430
Selenium	2.8	2.6 U	2.6 UL	28.4	2.6 U
Sodium	11700	7410	4710	17400	6340
Vanadium	140	50.8	13.2 L	603	55.5
Zinc	242 J	91.6 J	39 B	618 J	96.3 J
Cyanide	5 U	5 U	5 U	6.8	5.2

UG/L - microgram per liter
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
L - biased low
R - rejected
U - not detected
UL - not detected, biased low

TABLE 5-20
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
DISSOLVED INORGANICS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A06HP01F-01	A06HP02F-01	A06HP03F-01	A06HP03F-01D	A06HP04F-01	A06HP05F-01
Sampling Date	11/07/94	11/08/94	11/15/94	11/15/94	11/05/94	11/08/94
pH	7.75	7.16	7.80	7.80	7.77	7.56
Units	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
Aluminum	11 U	11 U	11 U	11 U	11 U	20.3
Barium	21.1	34.3	23	23.2	21	9.9
Beryllium	0.1 U	0.11	0.18	0.13	1 U	0.16
Calcium	79200	141000	112000	116000	89000	85300
Cobalt	1.9 U	1.9 U	1.9 U	1.9 U	2.2	1.9 U
Copper	14.1	11.3	15.6	8.8	9.6	15.4
Iron	1.5 U	66.1	40.8 B	1.5 U	1.5 U	35.6 B
Magnesium	2310	4260	2600	2630	3950	2180
Manganese	3.7	59.6	13	14.5	27.6	6
Nickel	4.3 U	4.8	4.5	4.3 U	4.3 U	4.4
Potassium	1540	1870	1750	1430	1700	1950
Sodium	6700	5090	6100	6250	5250	4090
Thallium	4 U	5.3	4 U	4.4	4 U	4 U
Vanadium	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U

UG/L - microgram per liter
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
U - not detected

TABLE 5-20
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
DISSOLVED INORGANICS
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A06HP06F-01	A06HP07F-01	A06HP08F-01	A06HP09F-01	A06HP10F-01
Sampling Date	11/07/94	11/05/94	11/16/94	11/05/94	11/08/94
pH	7.66	7.79	6.34	8.19	7.37
Units	UG/L	UG/L	UG/L	UG/L	UG/L
Aluminum	11 U	11 U	11 U	11 U	11 U
Barium	25.5	38.8	21.5	63.4	23
Beryllium	0.1 U	0.13	0.23 B	0.1 U	0.22
Calcium	87500	77900	7920	72500	99400
Cobalt	1.9 U	1.9 U	2.1	1.9 U	1.9 U
Copper	1.5	8.8	7.3	7.3	13.4
Iron	12.5 B	8.3 B	3080	12.1 B	2.4 B
Magnesium	2370	4700	2600	5720	2170
Manganese	33.9	55.1	76.7	25.6	12.2
Nickel	4.3 U	6.1	9.3	4.3 U	6.2
Potassium	4230	6640	3050	3720	1730
Sodium	6720	6570	4620	8110	4320
Thallium	4 U	4 U	4 U	4 U	4 U
Vanadium	1.4 U	1.4 U	1.4 U	1.4 U	1.9

UG/L - microgram per liter
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
U - not detected

TABLE 5-21
SURFACE SOIL - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07SS01-00	A07SS02-00	A07SS04-01	A07SS04-01D	A07SS05-00
Date Sampled:	11/04/94	11/30/94	11/29/94	11/29/94	11/29/94
Depth:	0-6"	0-6"	0-6"	0-6"	0-6"
pH:	5.06	6.09	6.25	6.19	6.31
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	12 U	11 U	4 J	7 J	9 J

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-21
SURFACE SOIL - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07SS01-00	A07SS02-00	A07SS04-01	A07SS04-01D	A07SS05-00
Date Sampled:	11/04/94	11/30/94	11/29/94	11/29/94	11/29/94
Depth:	0-6"	0-6"	0-6"	0-6"	0-6"
pH:	5.06	6.09	6.25	6.19	6.31
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Acenaphthylene	380 U	360 U	360 U	360 U	50 J
Phenanthrene	90 J	51 J	360 U	360 U	370 U
Di-n-Butyl Phthalate	450	360 U	360 U	320 B	370 U
Fluoranthene	120 J	64 J	360 U	360 U	300 J
Pyrene	110 J	47 J	360 U	360 U	170 J
Benzo(a)anthracene	49 J	360 U	360 U	360 U	150 J
Chrysene	58 J	360 U	360 U	360 U	240 J
bis(2-Ethylhexyl)Phthalate	62 J	360 U	360 U	360 U	370 U
Benzo(b)fluoranthene	46 J	360 U	360 U	360 U	340 J
Benzo(k)fluoranthene	41 J	360 U	360 U	360 U	260 J
Benzo(a)Pyrene	43 J	360 U	360 U	360 U	170 J
Indeno(1,2,3-cd)pyrene	380 U	360 U	360 U	360 U	55 J

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
U - not detected

TABLE 5-21
SURFACE SOIL - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07SS01-00	A07SS02-00	A07SS04-01	A07SS04-01D	A07SS05-00
Date Sampled:	11/04/94	11/30/94	11/29/94	11/29/94	11/29/94
Depth:	0-6"	0-6"	0-6"	0-6"	0-6"
pH:	5.06	6.09	6.25	6.19	6.31
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Endosulfan Sulfate	3.8 U	3.6 U	3.6 U	3.6 U	1.1 J
4,4'-DDT	3.8 U	3.6 U	3.6 U	3.6 U	7.1
Methoxychlor	20 U	19 U	19 U	19 U	10 J
Endrin Ketone	3.8 U	3.6 U	3.6 U	3.6 U	2.3 J

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-22
SURFACE SOIL - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A07SS01-00	A07SS02-00	A07SS04-00	A07SS04-00D	A07SS05-00
Sampling date	11/04/94	11/30/94	11/29/94	11/29/94	11/29/94
Depth	0-6"	0-6"	0-6"	0-6"	0-6"
pH	5.06	6.09	6.25	6.19	6.31
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	8270	3560	2440	2230	3170
Arsenic	2	1.1 J	2.3	2.7	2.7 J
Barium	13.4	16.9	31.6	30.5	36.5
Beryllium	0.07 K	0.2 L	0.22 L	0.18 L	0.33 L
Calcium	221	209	337	318	578
Chromium	11	4.1 L	3.6	3.2	4.4 L
Cobalt	1.3	1.7 L	1.9	1.8	2.7 L
Copper	2.4	1.7	4.9	3.9	3.7
Iron	13800	4120	4490	4250	5050
Lead	6.7	6	4.2	4.4	16.2
Magnesium	176	295	268	254	533
Manganese	9.1	105 L	100	92.5	328 L
Nickel	0.97 U	1.4 J	2.2	1.7	2.6 J
Potassium	220	179	134	115	174
Selenium	0.81 K	0.57 U	0.56 U	0.55 U	0.56 U
Sodium	65.3	29.1	73	22.6	37
Vanadium	25.8	6.7	4.6	4.2	9
Zinc	6.8 J	7.6 L	16 J	10.9 J	21.9 L

MG/KG - milligram per kilogram
J - estimated
K - biased high
L - biased low
U - not detected

TABLE 5-23
SOIL BORINGS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07SB01-01	A07SB01-05	A07SB01-10	A07SB02-01	A07SB02-06	A07SB02-09	A07SB03-01	A07SB03-05	A07SB03-10
Date Sampled:	11/04/94	11/04/94	11/04/94	11/17/94	11/17/94	11/17/94	11/03/94	11/03/94	11/03/94
Depth:	1-3'	9-11'	19-21'	1-3'	11-13'	17-19'	1-3'	9-11'	19-21'
pH:	6.79	6.32	7.89	7.04	7.33	8.05	7.19	8.47	8.67
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	10 U	13 U	13 U	9 J	24	12 U	11 U	12 U	14 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-23
SOIL BORINGS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07SB04-01	A07SB04-06	A07SB04-08	A07SB05-01	A07SB05-05	A07SB05-05D	A07SB05-11	A07SB06-01	A07SB06-01D
Date Sampled:	11/03/94	11/03/94	11/03/94	11/30/94	11/30/94	11/30/94	12/01/94	11/30/94	11/30/94
Depth:	1-3'	11-13'	15-17'	1-3'	9-11'	9-11'	21-23'	1-3'	1-3'
pH:	5.32	8.71	8.66	6.21	5.51	5.61	8.16	6.70	6.58
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	11 U	12 U	11 U	11 U	13 U	13 U	12 U	11 J	11 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-23
SOIL BORINGS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07SB06-05	A07SB06-08	A07HA01-03	A07HA02-03	A07HA03-03	A07HA04-03	A07HA05-03	A07HA06-06	A07HA06-06D
Date Sampled:	11/30/94	11/30/94	11/21/94	11/21/94	11/21/94	11/28/94	11/28/94	11/22/94	11/22/94
Depth:	9-11'	15-17'	5-7'	5-7'	5-7'	5-7'	5-7'	11-13'	11-13'
pH:	6.58	8.31	5.63	5.98	5.96	5.94	5.87	4.96	4.97
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	6 J	12 U	2 J	2 J	2 J	18	7 J	12 U	12 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-23
SOIL BORINGS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07SB01-01	A07SB01-05	A07SB01-10	A07SB02-01	A07SB02-06	A07SB02-09	A07SB03-01	A07SB03-05	A07SB03-10
Date Sampled:	11/04/94	11/04/94	11/04/94	11/17/94	11/17/94	11/17/94	11/03/94	11/03/94	11/03/94
Depth:	1-3'	9-11'	19-21'	1-3'	11-13'	17-19'	1-3'	9-11'	19-21'
pH:	6.79	6.32	7.89	7.04	7.33	8.05	7.19	8.47	8.67
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
1,4-Dichlorobenzene	49 J	410 U	400 U	380 U	410 U	410 U	360 U	390 U	430 U
Naphthalene	360 U	410 U	810	380 U	410 U	410 U	360 U	390 U	430 U
2-Methylnaphthalene	360 U	410 U	4000	380 U	410 U	410 U	360 U	390 U	430 U
Phenanthrene	360 U	410 U	2600	380 U	410 U	410 U	360 U	390 U	430 U
Di-n-Butyl Phthalate	170 J	290 J	200 J	380 U	74 J	410 U	260 B	290 B	490
Pyrene	360 U	410 U	170 J	380 U	410 U	410 U	360 U	390 U	430 U
Butyl Benzyl Phthalate	360 U	410 U	400 U	380 U	410 U	410 U	360 U	390 U	430 U
bis(2-Ethylhexyl)Phthalate	59 J	66 J	95 J	380 U	100 J	230 J	360 U	390 U	92 J
Di-n-Octylphthalate	360 U	410 U	400 U	380 U	410 U	410 U	360 U	390 U	430 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
BJ - estimated, analyte detected in associated blank(s)
J - estimated
U - not detected

TABLE 5-23
SOIL BORINGS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07SB04-01	A07SB04-06	A07SB04-08	A07SB05-01	A07SB05-05	A07SB05-05D	A07SB05-11	A07SB06-01	A07SB06-01D
Date Sampled:	11/03/94	11/03/94	11/03/94	11/30/94	11/30/94	11/30/94	12/01/94	11/30/94	11/30/94
Depth:	1-3'	11-13'	15-17'	1-3'	9-11'	9-11'	21-23'	1-3'	1-3'
pH:	5.32	8.71	8.66	6.21	5.51	5.61	8.16	6.70	6.58
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
1,4-Dichlorobenzene	370 U	400 U	380 U	380 U	410 U	410 U	380 U	370 U	380 U
Naphthalene	370 U	400 U	380 U	380 U	410 U	410 U	380 U	370 U	380 U
2-Methylnaphthalene	370 U	400 U	380 U	380 U	410 U	410 U	380 U	370 U	380 U
Phenanthrene	370 U	400 U	380 U	380 U	410 U	410 U	380 U	370 U	380 U
Di-n-Butyl Phthalate	340 J	170 J	260 J	1100 B	650 B	2300 B	160 BJ	370 U	380 U
Pyrene	370 U	400 U	380 U	380 U	410 U	410 U	380 U	370 U	380 U
Butyl Benzyl Phthalate	370 U	400 U	380 U	380 U	410 U	410 U	380 J	370 U	380 U
bis(2-Ethylhexyl)Phthalate	450	400 U	110 J	380 U	410 U	410 U	380 U	370 U	380 U
Di-n-Octylphthalate	370 U	400 U	380 U	380 U	410 U	410 U	140 J	370 U	380 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
BJ - estimated, analyte detected in associated blank(s)
J - estimated
U - not detected

TABLE 5-23
SOIL BORINGS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07SB06-05	A07SB06-08	A07HA01-03	A07HA02-03	A07HA03-03	A07HA04-03	A07HA05-03	A07HA06-06	A07HA06-06D
Date Sampled:	11/30/94	11/30/94	11/21/94	11/21/94	11/21/94	11/28/94	11/28/94	11/22/94	11/22/94
Depth:	9-11'	15-17'	5-7'	5-7'	5-7'	5-7'	5-7'	11-13'	11-13'
pH:	6.58	8.31	5.63	5.98	5.96	5.94	5.87	4.96	4.97
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
1,4-Dichlorobenzene	410 U	370 U	400 U	380 U	380 U	410 U	410 U	370 U	370 U
Naphthalene	410 U	370 U	400 U	380 U	380 U	410 U	410 U	370 U	370 U
2-Methylnaphthalene	410 U	370 U	400 U	380 U	380 U	410 U	410 U	370 U	370 U
Phenanthrene	410 U	370 U	400 U	380 U	380 U	410 U	410 U	370 U	370 U
Di-n-Butyl Phthalate	410 U	370 U	59 J	380 U	380 U	57 J	410 U	370 U	370 U
Pyrene	410 U	370 U	400 U	380 U	380 U	410 U	410 U	370 U	370 U
Butyl Benzyl Phthalate	410 U	370 U	400 U	380 U	380 U	410 U	410 U	370 U	370 U
bis(2-Ethylhexyl)Phthalate	410 U	370 U	400 U	380 U	380 U	410 U	410 U	370 U	370 U
Di-n-Octylphthalate	410 U	370 U	400 U	380 U	380 U	410 U	410 U	370 U	370 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
BJ - estimated, analyte detected in associated blank(s)
J - estimated
U - not detected

TABLE 5-23
SOIL BORINGS - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07SB01-01	A07SB01-05	A07SB01-10	A07SB02-01	A07SB02-06	A07SB02-09	A07SB03-01	A07SB03-05	A07SB03-10
Date Sampled:	11/04/94	11/04/94	11/04/94	11/17/94	11/17/94	11/17/94	11/03/94	11/03/94	11/03/94
Depth:	1-3'	9-11'	19-21'	1-3'	11-13'	17-19'	1-3'	9-11'	19-21'
pH:	6.79	6.32	7.89	7.04	7.33	8.05	7.19	8.47	8.67
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
beta-BHC	1.8 U	2.1 U	2.1 U	1.9 U	4.2 U	2.1 U	1.8 U	2 U	2.2 U
Endrin	3.6 U	4.1 U	4 U	0.51 J	8.2 U	4.1 U	3.6 U	3.9 U	4.3 U
Methoxychlor	18 U	21 U	21 U	19 U	42 U	21 U	18 U	20.0 U	22 U
Endrin Aldehyde	3.6 U	4.1 U	4 U	6.8 J	250	4.1 U	3.6 U	3.9 U	4.3 U
gamma-Chlordane	1.8 U	2.1 U	2.1 U	1.9 U	4.8 J	2.1 U	1.8 U	2 U	2.2 U
Aroclor-1260	36 U	41 U	40 U	210	5700 K	41 U	36 U	39 U	43 U

UG/KG - microgram per kilogram
J - estimated
K - biased high
U - not detected
UJ - not detected, biased low

TABLE 5-23
SOIL BORINGS - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07SB04-01	A07SB04-06	A07SB04-08	A07SB05-01	A07SB05-05	A07SB05-05D	A07SB05-11	A07SB06-01	A07SB06-01D
Date Sampled:	11/03/94	11/03/94	11/03/94	11/30/94	11/30/94	11/30/94	12/01/94	11/30/94	11/30/94
Depth:	1-3'	11-13'	15-17'	1-3'	9-11'	9-11'	21-23'	1-3'	1-3'
pH:	5.32	8.71	8.66	6.21	5.51	5.61	8.16	6.70	6.58
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
beta-BHC	1.9 U	2.1 U	1.9 U	1.9 U	2.1 U	2.1 U	2 U	1.9 U	1.9 U
Endrin	3.7 U	4 U	3.8 U	3.8 U	4.1 U	4.1 U	3.8 U	3.7 U	3.8 U
Methoxychlor	19 U	21 U	19 U	19 U	21 U	21.0 U	20 U	19 U	19 U
Endrin Aldehyde	3.7 U	4 U	3.8 U	3.8 U	4.1 U	4.1 U	3.8 U	3.7 U	3.8 U
gamma-Chlordane	1.9 U	2.1 U	1.9 U	1.9 U	2.1 U	2.1 U	2 U	1.9 U	1.9 U
Aroclor-1260	37 U	40 U	38 U	38 U	41 U	41 U	38 U	37 U	38 U

UG/KG - microgram per kilogram
J - estimated
K - biased high
U - not detected
UJ - not detected, biased low

TABLE 5-23
SOIL BORINGS - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07SB06-05	A07SB06-08	A07HA01-03	A07HA02-03	A07HA03-03	A07HA04-03	A07HA05-03	A07HA06-06	A07HA06-06D
Date Sampled:	11/30/94	11/30/94	11/21/94	11/21/94	11/21/94	11/28/94	11/28/94	11/22/94	11/22/94
Depth:	9-11'	15-17'	5-7'	5-7'	5-7'	5-7'	5-7'	11-13'	11-13'
pH:	6.58	8.31	5.63	5.98	5.96	5.94	5.87	4.96	4.97
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
beta-BHC	2.1 U	1.9 U	2.1 U	2 U	2 U	2.1 U	2.1 U	0.57 J	1.9 UJ
Endrin	4.1 U	3.7 U	4 U	3.8 U	3.8 U	4.1 U	4.1 U	3.7 UJ	3.7 UJ
Methoxychlor	21 U	19 U	21 U	20 U	20 U	21 U	21 U	19 UJ	3.6 J
Endrin Aldehyde	4.1 U	3.7 U	4 U	3.8 U	3.8 U	4.1 U	4.1 U	3.7 UJ	3.7 UJ
gamma-Chlordane	2.1 U	1.9 U	2.1 U	2 U	2 U	2.1 U	2.1 U	1.9 UJ	1.9 UJ
Aroclor-1260	41 U	37 U	40 U	38 U	38 U	41 U	41 U	37 UJ	37 UJ

UG/KG - microgram per kilogram
J - estimated
K - biased high
U - not detected
UJ - not detected, biased low

TABLE 5-23
SOIL BORINGS - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07SB01-01	A07SB01-05	A07SB01-10	A07SB02-01	A07SB02-06	A07SB02-09	A07SB03-01	A07SB03-05	A07SB03-10
Date Sampled:	11/04/94	11/04/94	11/04/94	11/17/94	11/17/94	11/17/94	11/03/94	11/03/94	11/03/94
Depth:	1-3'	9-11'	19-21'	1-3'	11-13'	17-19'	1-3'	9-11'	19-21'
pH:	6.79	6.32	7.89	7.04	7.33	8.05	7.19	8.47	8.67
Units:	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
HMX	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RDX	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

MG/KG - milligram per kilogram
U - not detected

TABLE 5-23
SOIL BORINGS - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07SB04-01	A07SB04-06	A07SB04-08	A07SB05-01	A07SB05-05	A07SB05-05D	A07SB05-11	A07SB06-01	A07SB06-01D
Date Sampled:	11/03/94	11/03/94	11/03/94	11/30/94	11/30/94	11/30/94	12/01/94	11/30/94	11/30/94
Depth:	1-3'	11-13'	15-17'	1-3'	9-11'	9-11'	21-23'	1-3'	1-3'
pH:	5.32	8.71	8.66	6.21	5.51	5.61	8.16	6.70	6.58
Units:	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
HMX	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RDX	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

MG/KG - milligram per kilogram
U - not detected

TABLE 5-23
SOIL BORINGS - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07SB06-05	A07SB06-08	A07HA01-03	A07HA02-03	A07HA03-03	A07HA04-03	A07HA05-03	A07HA06-06	A07HA06-06D
Date Sampled:	11/30/94	11/30/94	11/21/94	11/21/94	11/21/94	11/28/94	11/28/94	11/22/94	11/22/94
Depth:	9-11'	15-17'	5-7'	5-7'	5-7'	5-7'	5-7'	11-13'	11-13'
pH:	6.58	8.31	5.63	5.98	5.96	5.94	5.87	4.96	4.97
Units:	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
HMX	0.52	0.5 U	0.5 U	0.5 U	0.5 U	0.65	30	0.5 U	0.5 U
RDX	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.58	0.5 U	0.5 U

MG/KG - milligram per kilogram
U - not detected

TABLE 5-24
SOIL BORINGS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A07SB01-01	A07SB01-05	A07SB01-10	A07SB02-01	A07SB02-06	A07SB02-09
Sampling date	11/04/94	11/04/94	11/04/94	11/17/94	11/17/94	11/17/94
Depth	1-3'	9-11'	19-21'	1-3'	11-13'	17-19'
pH	6.79	6.32	7.89	7.04	7.33	8.05
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	3720	11400	5780	6010	5280	3290
Antimony	2.6 UL	3 UL	2.8 UL	2.7 UL	3 UL	3 UL
Arsenic	1.6	12.9	8.1	2.7	9.7	8
Barium	43.3	28.8	15.4	45.9	14.1	22.8
Beryllium	0.32 K	0.85 K	0.77 K	0.4	0.58	0.5 B
Cadmium	0.32 U	0.37 U	0.35 U	0.33 U	0.37 U	0.37 U
Calcium	589	2220	4690	1100	2130	186000
Chromium	5	27.1	26.5	7.3	19.7	14.6
Cobalt	2.8	11.2	5.3	4.8	5.2	3.2
Copper	3	6.2	4.6	2.8	4.6	2.9
Iron	5560	46100	30000	8380	28100	16300
Lead	5.3	9.9	7.7	6.8	7.9	4.2
Magnesium	502	2590	2800	612	2420	2980
Manganese	225	403	130	201	32.7	148
Nickel	2.6	7.2	6.2	4.2	5.2	6.1
Potassium	284	3700	4430	321	3600	3550
Selenium	0.56 U	0.89 K	0.61 U	0.58 U	0.64 U	0.64 UL
Sodium	27.6	89.9	90.8	77.1	35.1	1710
Thallium	0.86 UL	0.98 UL	0.93 UL	0.89 UL	0.99 UL	0.99 UL
Vanadium	7.9	38.4	21	12	18.2	13.7
Zinc	15.6 J	36.1 J	28.5 J	21.1	33.9	17.3

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UL - not detected, biased low

TABLE 5-24
SOIL BORINGS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A07SB03-01	A07SB03-05	A07SB03-10	A07SB04-01	A07SB04-06	A07SB04-08
Sampling date	11/03/94	11/03/94	11/03/94	11/03/94	11/03/94	11/03/94
Depth	1-3'	9-11'	19-21'	1-3'	11-13'	15-17'
pH	7.19	8.47	8.67	5.32	8.71	8.66
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	3120	2870	4530	7770	1510	1750
Antimony	2.6 UL	2.9 UL	3 UL	2.7 UL	2.9 UL	2.7 UL
Arsenic	2.6	6.6	12.7	3.1	3.8	2
Barium	29.1	18.6	16.6	59	17	12.4
Beryllium	0.31	0.38	0.73 K	0.52 K	0.14 K	0.16 K
Cadmium	0.33 U	0.35 U	0.58	0.33 U	0.38	0.33 U
Calcium	1160	188000	71500	510	280000	232000
Chromium	4.4	12	21.3	9.1	4.8	5.4
Cobalt	2.3	3.1	2.7	3.9	1.3	1.3
Copper	4.1	3.4	2.5	3.9	2.5	2.2
Iron	5290	15800	25100	10500	5820	4890
Lead	9.6	5.1	3.4	7.6	2.7	2.9
Magnesium	334	2350	4050	788	929	1380
Manganese	174 J	80.8 J	36.8	752	33.3	38.5
Nickel	2.2	3.2	3.4	5	1.3	2
Potassium	134	2170	6470	469	738	761
Selenium	0.56 U	0.61 U	0.69 K	0.58 U	0.61 U	0.58 U
Sodium	24.9	1470	679	27.7	1430	1920
Thallium	0.87 UL	0.94 UL	1 UL	0.89 UL	0.93 UL	0.89 UL
Vanadium	8.2	10.9	19	12.5	5.2	5.3
Zinc	15.2 J	20.8 J	21 J	27.5 J	10.8 J	10.3 J

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UL - not detected, biased low

TABLE 5-24
SOIL BORINGS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A07SB05-01	A07SB05-05	A07SB05-05D	A07SB05-11	A07SB06-01	A07SB06-01D
Sampling date	11/30/94	11/30/94	11/30/94	12/01/94	11/30/94	11/30/94
Depth	1-3'	9-11'	9-11'	21-23'	1-3'	1-3'
pH	6.21	5.51	5.61	8.16	6.7	6.58
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	8080	6200	11900	3850	5540	9320
Antimony	2.8 UL	3 UL	3 UL	2.8 UL	2.8 R	2.8 R
Arsenic	4.3	23.2	14.2	11.1	3 J	4.1 J
Barium	50.3	16	25.7	12.9	37.3	58.1
Beryllium	0.51 L	0.53 L	0.64 L	0.65 L	0.36 L	0.52 L
Cadmium	0.34 U	0.37 U	0.36 U	0.35 U	0.34 U	0.34 U
Calcium	899	1930	3400	107000	698	1240
Chromium	9.9	18.4	30.8	17.8	6.8 L	11.1 L
Cobalt	5.4	4.4	7.8	2.1	4.1 L	3.9 L
Copper	3	4.7	6	1.8	2.6	3.6
Iron	12600	23500	27200	22000	8320	14900
Lead	6.5	10.9	10.3	2.5	5.6	6.8
Magnesium	738	2070	3160	3870	477	783
Manganese	207	30.5	59.7	57.7	160 L	151 L
Nickel	5.9	5.9	9.1	2.2	4 J	5.6 J
Potassium	445	2920	2770	6040	407	455
Selenium	0.59 U	0.64 U	0.63 U	0.6 U	0.59 U	0.59 U
Sodium	74.9	45.5	114	953	32.6	43.5
Thallium	0.91 U	0.99 U	0.97 U	0.92 U	0.9 U	0.9 U
Vanadium	16.6	18.6	23.4	16.2	10.8	20.2
Zinc	20.6 J	33.4 J	49 J	16.8 J	13 L	20.3 L

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UL - not detected, biased low

TABLE 5-24
SOIL BORINGS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A07SB06-05	A07SB06-08	A07HA01-03	A07HA02-03	A07HA03-03	A07HA04-03
Sampling date	11/30/94	11/30/94	11/21/94	11/21/94	11/21/94	11/28/94
Depth	9-11'	15-17'	5-7'	5-7'	5-7'	5-7'
pH	6.58	8.31	5.63	5.98	5.96	5.94
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	6480	1590	11200	12400	7120	10900
Antimony	3 R	2.6 R	3 UL	2.8 UL	2.8 UL	3 R
Arsenic	11.1 J	3.5 J	7.5	7.4	4.2	11.8 J
Barium	15.6	13.1	29.4	48.6	32.4	24
Beryllium	0.48 L	0.22 L	0.68	1.2	0.54	0.71 L
Cadmium	0.37 U	0.32 U	0.36 U	0.35 U	0.35 U	0.36 U
Calcium	2410	203000	1380	1210	771	1780
Chromium	17.6 L	6.7 L	20	16.8	10.6	24.9 L
Cobalt	4.4 L	1.4 L	9.8	32	9.6	7.6 L
Copper	5.4	1.3	5.8	4.7	3.8	7.1
Iron	25400	8960	25100	21600	16000	39400
Lead	8.4	2.6	8.4	7	4.5	10.4
Magnesium	1980	1940	1640	1360	680	1740
Manganese	58.9 L	89.9 L	271	177	54.7	78 L
Nickel	5.7 J	1.6 J	6	25.8	13.3	9.6 J
Potassium	2480	2050	2100	1540	658	2010
Selenium	0.64 U	0.55 U	0.63 UL	0.6 UL	0.6 UL	0.87
Sodium	58.1	1890	79.9	85.8	26.2	41.4
Thallium	1 K	0.85 U	0.97 UL	0.93 UL	0.93 UL	1.4 K
Vanadium	16.4	7.4	26	23.2	14.3	30.2
Zinc	35.8 L	9.2 L	39.1	54.8	31	30 L

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UL - not detected, biased low

TABLE 5-24
SOIL BORINGS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A07HA05-03	A07HA06-06	A07HA06-06D
Sampling date	11/28/94	11/22/94	11/22/94
Depth	5-7'	11-13'	11-13'
pH	5.87	4.96	4.97
Units	MG/KG	MG/KG	MG/KG
Aluminum	10100	13300	9900
Antimony	3 R	2.9 L	2.7 R
Arsenic	6.7 J	8.5 J	7.6 J
Barium	19.6	30.2	24.1
Beryllium	0.53 L	1.9 L	1.2 L
Cadmium	0.37 U	0.34	0.33 U
Calcium	1770	1070	1000
Chromium	24.9 L	23.8 L	19.3 L
Cobalt	5.9 L	35.7 L	23 L
Copper	6.3	8.6	5.1
Iron	30900	53700	31700
Lead	10.2	9.1	8.7
Magnesium	2210	2080	2170
Manganese	41.6 L	132 L	106
Nickel	8.3 J	61.9 J	29.2 J
Potassium	2530	2550	2790
Selenium	0.64 U	0.58 U	0.58 U
Sodium	101	49.2	44.5
Thallium	1.4 K	2 K	1.9 K
Vanadium	29.3	23.1	20.8
Zinc	34.2 L	137 L	83.8 L

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UL - not detected, biased low

TABLE 5-25
TEST PITS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07TP01-01	A07TP01-02	A07TP02-01	A07TP02-02	A07TP03-01	A07TP03-02	A07TP03-02D
Date Sampled:	11/17/94	11/17/94	11/17/94	11/17/94	11/18/94	11/18/94	11/18/94
Depth:	1-3'	3-5'	1-3'	3-5'	1-3'	3-5'	3-5'
pH:	5.19	6.15	5.90	6.59	6.00	6.72	6.73
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	3 J	12 J	12 U	3 J	12 U	7 J	4 J
Styrene	11 U	11 U	12 U	13 U	12 U	4 J	12 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-25
TEST PITS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07TP01-01	A07TP01-02	A07TP02-01	A07TP02-02	A07TP03-01	A07TP03-02	A07TP03-02D
Date Sampled:	11/17/94	11/17/94	11/17/94	11/17/94	11/18/94	11/18/94	11/18/94
Depth:	1-3'	3-5'	1-3'	3-5'	1-3'	3-5'	3-5'
pH:	5.19	6.15	5.90	6.59	6.00	6.72	6.73
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Phenanthrene	370 U	350 U	390 U	420 U	380 U	380 U	130 J
Di-n-Butyl Phthalate	2900	37 J	390 U	51 J	380 U	39 J	380 U
Fluoranthene	370 U	350 U	390 U	420 U	380 U	380 U	80 J
Pyrene	370 U	350 U	390 U	420 U	380 U	380 U	59 J
Butyl Benzyl Phthalate	170 J	350 U	390 U	420 U	380 U	380 U	380 U
bis(2-Ethylhexyl)Phthalate	97 J	350 U	390 U	420 U	380 U	380 U	380 U
Benzo(k)fluoranthene	370 U	350 U	390 U	420 U	380 U	380 U	58 J

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-25
TEST PITS - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07TP01-01	A07TP01-02	A07TP02-01	A07TP02-02	A07TP03-01	A07TP03-02	A07TP03-02D
Date Sampled:	11/17/94	11/17/94	11/17/94	11/17/94	11/18/94	11/18/94	11/18/94
Depth:	1-3'	3-5'	1-3'	3-5'	1-3'	3-5'	3-5'
pH:	5.19	6.15	5.90	6.59	6.00	6.72	6.73
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Heptachlor	1.9 U	1.8 U	8.1 U	0.61 J	2 U	2 U	2 U
Endrin	3.7 U	3.5 U	12 J	4.2 U	3.8 U	3.8 U	3.8 U
Endrin Aldehyde	3.7 U	3.5 U	34 J	4.2 U	3.8 U	3.8 U	3.8 U
Aroclor-1260	37 U	35 U	980 J	42 U	38 U	38 U	38 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-25
TEST PITS - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07TP01-01	A07TP01-02	A07TP02-01	A07TP02-02	A07TP03-01	A07TP03-02	A07TP03-02D
Date Sampled:	11/17/94	11/17/94	11/17/94	11/17/94	11/18/94	11/18/94	11/18/94
Depth:	1-3'	3-5'	1-3'	3-5'	1-3'	3-5'	3-5'
pH:	5.19	6.15	5.90	6.59	6.00	6.72	6.73
Units:	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
2,4,6-Trinitrotoluene	0.25 U	0.25 U	0.39	0.25 U	0.25 U	0.25 U	0.25 U

MG/KG - milligram per kilogram
U - not detected

TABLE 5-26
TEST PITS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A07TP01-01	A07TP01-02	A07TP02-01	A07TP02-02	A07TP03-01	A07TP03-02
Sampling date	11/17/94	11/17/94	11/17/94	11/17/94	11/18/94	11/18/94
Depth	1-3'	3-5'	1-3'	3-5'	1-3'	3-5'
pH	5.19	6.15	5.90	6.59	6.00	6.72
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	6780	4980	8590	13600	7650	11200
Arsenic	1.9	3.9	3.3	5.6	3.1	4.7
Barium	21.7	14.9	39.9	83.9	44.1	42.6
Beryllium	0.15	0.16	0.27	0.78	0.21 B	0.48 B
Calcium	759	427	678	1470	576	1070
Chromium	8.1	8.4	10.9	16.7	9	12.4
Cobalt	1.4	1.3	2.9	6.6	2.4	4.1
Copper	2.7	2.2	5	6.8	1.7	3.5
Iron	9100	7400	13100	18100	11300	14000
Lead	5.9	3.6	25.3	18.4	5.7	7.5
Magnesium	350	446	610	1420	467	905
Manganese	109	26.3	296	443	38.5	84.2
Nickel	1.6	2.9	4.2	8.5	3.4	6.5
Potassium	350	558	496	1230	282	665
Sodium	77.7	23.5	27.2	103	25.4	81.2
Vanadium	14.6	10.1	19.4	23.9	16.2	24.1
Zinc	10.5	8.7	25.1	64.5	18.2	21

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).

TABLE 5-26
TEST PITS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A07TP03-02D
Sampling date	11/18/94
Depth	3-5'
pH	6.73
Units	MG/KG
Aluminum	8360
Arsenic	4.2
Barium	37.3
Beryllium	0.4 B
Calcium	947
Chromium	10.1
Cobalt	3.9
Copper	3
Iron	12400
Lead	6.2
Magnesium	731
Manganese	90.4
Nickel	4.9
Potassium	555
Sodium	26.9
Vanadium	20.2
Zinc	15.7

MG/KG - milligram per kilogram
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).

TABLE 5-27
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07HP01-01	A07HP02-01	A07HP03-01	A07HP04-01	A07HP05-01	A07HP05-01D	A07HP06-01
Date Sampled:	11/04/94	11/18/94	11/04/94	11/03/94	12/01/94	12/01/94	11/30/94
pH:	7.13	7.27	7.65	7.58	6.68	6.68	NA
Units:	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
Acetone	12 J	5 R	5 J	5 R	5 R	250 R	5 R
1,1-Dichloroethene	1 U	110	1 U	1 U	82	100	32 J
1,1-Dichloroethane	1 U	4	1 U	1 U	15	50 U	7
1,1,1-Trichloroethane	1 U	450	1 U	1 U	630	700	520
Trichloroethene	1 U	0.8 J	1 U	1 U	1	50 U	0.7 J
Toluene	1 U	1 U	0.6 J	1 U	1 U	50 U	1 U
Ethylbenzene	2	1 U	1	0.7 J	0.6 J	50 U	1 U

UG/L - microgram per liter
J - estimated
NA - not analyzed
R - rejected
U - not detected

TABLE 5-27
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07HP01-01	A07HP02-01	A07HP03-01	A07HP04-01	A07HP05-01	A07HP05-01D	A07HP06-01
Date Sampled:	11/04/94	11/18/94	11/04/94	11/03/94	12/01/94	12/01/94	11/30/94
pH:	7.13	7.27	7.65	7.58	6.68	6.68	NA
Units:	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
Naphthalene	29	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	68	10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthene	5 J	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzofuran	8 J	10 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	5 J	10 U	10 U	10 U	10 U	10 U	10 U
Fluorene	8 J	10 U	10 U	10 U	10 U	10 U	10 U
Phenanthrene	11	10 U	10 U	10 U	10 U	10 U	10 U
Carbazole	4 J	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)Phthalate	1 J	10 U	10 U	10 U	41 B	7 B	10 U

UG/L - microgram per liter
B - analyte detected in associated blank(s)
J - estimated
NA - not analyzed
U - not detected

TABLE 5-27
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07HP01-01	A07HP02-01	A07HP03-01	A07HP04-01	A07HP05-01	A07HP05-01D	A07HP06-01
Date Sampled:	11/04/94	11/18/94	11/04/94	11/03/94	12/01/94	12/01/94	11/30/94
pH:	7.13	7.27	7.65	7.58	6.68	6.68	NA
Units:	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
alpha-BHC	0.042 L	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 R
delta-BHC	0.029 L	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 R
Aldrin	0.026 L	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 R
Dieldrin	0.033 L	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 R

UG/L - microgram per liter
L - biased low
NA - not analyzed
R - rejected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-27
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
NITRAMINE COMPOUNDS
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07HP01-01	A07HP02-01	A07HP03-01	A07HP04-01	A07HP05-01	A07HP05-01D	A07HP06-01
Date Sampled:	11/04/94	11/18/94	11/04/94	11/03/94	12/01/94	12/01/94	11/30/94
pH:	7.13	7.27	7.65	7.58	6.68	6.68	NA
Units:	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
HMX	0.63 U	0.61 U	0.61 U	0.61 U	39	37	22
RDX	1.7 U	0.59 U	0.59 U	0.59 U	48	46	25

UG/L - microgram per liter
NA - not analyzed
U - not detected

TABLE 5-28
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A07HP01-01	A07HP02-01	A07HP03-01	A07HP04-01	A07HP05-01	A07HP05-01D
Sampling date	11/04/94	11/18/94	11/04/94	11/03/94	12/01/94	12/01/94
pH	7.13	7.27	7.65	7.58	6.68	6.68
Units	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
Aluminum	170000	206000	43200	121000	89800	101000
Antimony	38.9 L	53.4 L	20.6 L	29.6 L	32.2 L	29.1 L
Arsenic	615	825	248	172	405	440
Barium	972	734	293	448	326 L	360 L
Beryllium	13.8	17.4	3.4	8.1	7.4 L	8.2 L
Cadmium	19.8	24.8	10	1.5 U	15.8	16.5
Calcium	1120000	822000	1150000	1430000	428000	461000
Chromium	878	1020	209	391	472	522
Cobalt	156	174	55.1	79.4	85.6	94.2
Copper	167	182	44.6	79.2	88.4	93.8
Iron	535000	620000	114000	301000	293000 L	319000 L
Lead	185 J	236	48 J	112 J	102	111
Magnesium	61700	77400	18300	377000	35900	39400
Manganese	3950	2490	748	909	1390	1520
Nickel	332	391	104	132	191 L	196 L
Potassium	46900	59600	16300	32300	30900	34200
Selenium	13.8	3.4 L	12.7	3.4 K	7.5	8.6
Sodium	21100	10000	15000	30100	6050	6480
Thallium	20 UL	15.5	9 L	13.5 L	12.1 K	10.2 K
Vanadium	1010	1100 L	342	382	537 L	612 L
Zinc	895 J	1130	219 J	502 J	519 J	567 J

UG/L - microgram per liter
J - estimated
K - biased high
L - biased low
NA - not analyzed
U - not detected
UL - not detected, biased low

TABLE 5-28
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A07HP06-01	
Sampling date	11/30/94	
pH	N/A	
Units	UG/L	
Aluminum	17000	
Antimony	21.8	L
Arsenic	106	
Barium	87.5	L
Beryllium	2.6	L
Cadmium	5.4	K
Calcium	106000	
Chromium	96.9	
Cobalt	38.4	
Copper	26.8	
Iron	49900	L
Lead	19.1	
Magnesium	8240	
Manganese	240	
Nickel	53.8	L
Potassium	6350	
Selenium	2.6	U
Sodium	3830	
Thallium	6.3	K
Vanadium	141	L
Zinc	129	J

UG/L - microgram per liter
J - estimated
K - biased high
L - biased low
NA - not analyzed
U - not detected
UL - not detected, biased low

TABLE 5-28
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
DISSOLVED INORGANICS
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A07HP01F-01	A07HP02F-01	A07HP03F-01	A07HP04F-01	A07HP05F-01	A07HP05F-01D
Sampling date	11/04/94	11/18/94	11/04/94	11/03/94	12/01/94	12/01/94
pH	7.13	7.27	7.65	7.58	6.68	6.68
Units	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
Aluminum	11 U	57.4 B	11 U	11 U	11 U	52.6
Antimony	12.2 U	12.2 U	12.2 U	12.2 U	12.2 U	13.7
Arsenic	14.6	2.3 U	2.3 U	2.3 U	2.3 UL	2.3 UL
Barium	53.7	17	18.3	15	13.4	13.5
Calcium	167000	118000	126000	105000	114000	114000
Cobalt	3.6	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Copper	21.8	11.6	14.6	10.6	1.9	2.7
Iron	1370	173	2.8	17.6	73.1 B	153
Magnesium	5410	2520	2030	1370	2060	2270
Manganese	1020	4 B	39.2	4.3	17.8	20.1
Nickel	6.1	4.3 U	4.6	4.6	4.3 U	4.3 U
Potassium	803	744	1690	852	411 B	625 B
Sodium	13300	3610	4400	18700	3540	3600
Thallium	4 U	4 U	5.6	4.4	7.3 K	6.4 K
Vanadium	1.7	1.4 U	1.6	1.4 U	1.4 U	2.2 B
Zinc	13.4 B	8.2 B	10.3 B	9.7 B	3.2 J	4.9 B

UG/L - microgram per liter
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
NA - not analyzed
U - not detected
UL - not detected, biased low

TABLE 5-28
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
DISSOLVED INORGANICS
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A07HP06F-01	
Sampling date	11/30/94	
pH	N/A	
Units	UG/L	
Aluminum	11	U
Antimony	12.2	U
Arsenic	2.3	UL
Barium	11.8	
Calcium	99200	
Cobalt	1.9	U
Copper	5.6	
Iron	6	B
Magnesium	2900	
Manganese	4.3	
Nickel	4.3	U
Potassium	903	B
Sodium	3730	
Thallium	4.8	K
Vanadium	2.2	B
Zinc	4	B

UG/L - microgram per liter
B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL).
J - estimated
K - biased high
NA - not analyzed
U - not detected
UL - not detected, biased low

TABLE 5-29
SURFACE WATER - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A07SW01-01	A07SW01-01D	A07SW02-01	A07SW03-01
Sampling date	12/01/94	12/01/94	12/01/94	12/01/94
pH	8.13	8.13	8.11	8.2
Units	UG/L	UG/L	UG/L	UG/L
Aluminum	116	81.6	114	75.1
Barium	23.4 L	23.4 L	22.9 L	22.9 L
Beryllium	0.1 L	0.1 UL	0.1 UL	0.1 UL
Calcium	175000	182000	179000	180000
Copper	2.4	1.4 U	1.4 U	1.4 U
Iron	167 L	133 L	161 L	130 L
Magnesium	544000	562000	553000	553000
Manganese	9.1	8.7	8.7	8.1
Potassium	196000	202000	198000	199000
Sodium	4990000	5180000	5140000	5140000
Thallium	4.6 K	6.9 K	10 K	5.7 K
Vanadium	6.8 L	5.1 L	4.1 L	5.9 L
Zinc	6.1 J	3 J	2.3 J	2.2 J

UG/L - microgram per liter
J - estimated
K - biased high
L - biased low
U - not detected
UL - not detected, biased low

TABLE 5-30
SEDIMENT - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A07SD01-01	A07SD01-01D	A07SD01-02	A07SD02-01	A07SD02-02	A07SD03-01	A07SD03-02	A07SD04-01	A07SD04-02
Date Sampled:	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
pH:	7.60	8.20	8.40	8.23	8.46	8.67	8.69	8.31	8.07
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Di-n-Butyl Phthalate	14000	550 B	12000	13000	7800	7700	5100	3000 B	3100 B
Fluoranthene	1100 U	360 J	870 U	1000 U	690 U	530 U	460 U	400 U	410 U
Pyrene	1100 U	470 J	870 U	1000 U	690 U	530 U	460 U	400 U	410 U
Butyl Benzyl Phthalate	1100 U	1100 U	870 U	600 J	2300	690	810	400 U	410 U
Benzo(a)anthracene	1100 U	260 J	870 U	1000 U	690 U	530 U	460 U	400 U	410 U
Chrysene	1100 U	360 J	870 U	1000 U	690 U	530 U	460 U	400 U	410 U
bis(2-Ethylhexyl)Phthalate	1100 U	220 J	870 U	1000 U	2300	310 J	550	400 U	410 U
Benzo(b)fluoranthene	1100 U	440 J	870 U	1000 U	690 U	530 U	460 U	400 U	410 U
Benzo(k)fluoranthene	1100 U	340 J	870 U	1000 U	690 U	530 U	460 U	400 U	410 U
Benzo(a)Pyrene	1100 U	300 J	870 U	1000 U	690 U	530 U	460 U	400 U	410 U
Indeno(1,2,3-cd)pyrene	1100 U	190 J	870 U	1000 U	690 U	530 U	460 U	400 U	410 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
U - not detected

TABLE 5-31
SEDIMENT - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A07SD01-01	A07SD01-01D	A07SD01-02	A07SD02-01	A07SD02-02	A07SD03-01
Sampling date	12/01/94	12/01/94	12/01/94	12/01/94	12/01/94	12/01/94
Depth	0-4"	0-4"	4-8"	0-4"	4-8"	0-4"
pH	7.6	8.2	8.4	8.23	8.46	8.67
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	20800	15400	17600	14200	12100	4380
Arsenic	9.6	8.8	17.1	10.3	10.5	6.8
Barium	42.1	32.1	36.2	31.7	25.9	9.7
Beryllium	1 L	0.87 L	1.1 L	0.9 L	0.77 L	0.33 L
Calcium	2390	2170	2270	2450	1640	1690
Chromium	40.5	34.8	40	33.5	27.7	11.6
Cobalt	9.5	8.8	10.7	8.7	7.3	3.4
Copper	21.8	21.2	23	19.8	15.7	6
Iron	31400	30200	35800	29400	24500	10800
Lead	26.8	27.4	36	28.5	26.6	9.3
Magnesium	7240	6640	7100	6300	5060	2190
Manganese	223	223	252	200	178	58.3
Nickel	17.6	17.9	21.9	14.1	13.4	4.4
Potassium	4320	3850	4310	3720	3240	1930
Selenium	2.2 K	1.7 U	1.3 U	1.6 U	1 U	0.8 U
Silver	1.3 UL	1.3 UL	1 UL	1.2 UL	0.82	0.61 UL
Sodium	12900	11400	8590	8000	6190	3460
Thallium	2.5 U	2.6 U	2 U	2.4 U	1.6 UL	1.2 U
Vanadium	48.9	42.3	55.8	45.4	39.2	13.8
Zinc	124 J	123 J	137 J	119 J	96.6 J	42.2 J

MG/KG - milligram per kilogram
J - estimated
K - biased high
L - biased low
U - not detected
UL - not detected, biased low

TABLE 5-31
SEDIMENT - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A07SD03-02	A07SD04-01	A07SD04-02
Sampling date	12/01/94	12/04/94	12/04/94
Depth	4-8"	0-4"	4-8"
pH	8.69	8.31	8.07
Units	MG/KG	MG/KG	MG/KG
Aluminum	5890	3460	2550
Arsenic	6.3	7.7	5.4
Barium	12.4	5.8	4.8
Beryllium	0.37 L	0.51	0.39
Calcium	4560	20600 J	22500 J
Chromium	13.2	12.1	7.9 L
Cobalt	3	5.9	4.7
Copper	6.2	2.4	2.1
Iron	12600	14200	11100
Lead	13.3	5.4 J	3.3 J
Magnesium	2290	1950	1470
Manganese	87.5	46.9	30.1
Nickel	5.8	5.2	4.5
Potassium	2210	2740	1830
Selenium	0.7 U	0.64 U	0.64 U
Silver	0.54 UL	0.49 UL	0.49 UL
Sodium	2430	1600	1710
Thallium	1.1 U	0.98 U	0.98 K
Vanadium	16.6	8.7	7.9
Zinc	44.3 J	20 J	16.6 J

MG/KG - milligram per kilogram
J - estimated
K - biased high
L - biased low
U - not detected
UL - not detected, biased low

TABLE 5-32
SURFACE SOIL - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A15SS01-00	A15SS02-00	A15SS03-00	A15SS03-00D	A15SS04-00	A15SS05-00
Date Sampled:	11/04/94	11/04/94	11/04/94	11/04/94	11/04/94	11/04/94
Depth:	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"
pH:	7.45	8.17	5.74	4.97	8.25	6.73
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
4-Chloroaniline	380 U	110 J	370 U	370 U	370 U	370 U
4-Chloro-3-methylphenol	380 U	350 J	370 U	370 U	370 U	370 U
Di-n-Butyl Phthalate	490 B	2600 BJ	470	130 J	460 B	400 B
Butyl Benzyl Phthalate	380 U	120 J	370 U	370 U	370 U	370 U
bis(2-Ethylhexyl)phthalate	380 U	1500 J	210 J	370 U	370 U	67 J
Benzo(g,h,i)perylene	380 U	350 U	370 U	370 U	370 U	100 J

UG/KG - microgram per kilogram
B -analyte detected in associated blank(s)
BJ - estimated, analyte detected in associated blank(s)
J - estimated
U - not detected

TABLE 5-32
SURFACE SOIL - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A15SS01-00	A15SS02-00	A15SS03-00	A15SS03-00D	A15SS04-00	A15SS05-00
Date Sampled:	11/04/94	11/04/94	11/04/94	11/04/94	11/04/94	11/04/94
Depth:	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"
pH:	7.45	8.17	5.74	4.97	8.25	6.73
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Dieldrin	3.8 U	9.2	3.7 U	3.7 U	3.7 U	3.7 U
4,4'-DDE	8.2 J	18	17	20	9.6 J	20 J
4,4'-DDD	3.8 U	110	1.9 J	2.2 J	3.7 U	3.7 U
Endosulfan Sulfate	3.8 U	8.5 J	3.7 U	3.7 U	3.7 U	3.7 U
4,4'-DDT	2.6 J	82	6.1	6.8	2.4 J	12 J
alpha-Chlordane	2 U	280	2.1 J	2.8 J	1.9 U	1.9 U
gamma-Chlordane	2 U	260	1.9 U	1.9 U	1.9 U	1.9 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-33
SURFACE SOIL - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A15SS01-00	A15SS02-00	A15SS03-00	A15SS03-00D	A15SS04-00	A15SS05-00
Sampling Date	11/04/94	11/04/94	11/04/94	11/04/94	11/04/94	11/04/94
Depths	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"
pH	7.45	8.17	5.74	4.97	8.25	6.73
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	5190	1290	2570	3080	6330	3840
Antimony	2.8 UJ	4 L	2.7 UL	2.7 UL	2.8 UL	2.7 UL
Arsenic	19.2	2.4	2.6	2.5	14.7	3.5
Barium	10.8	27.8	16.8	16.7	21.1	12.9
Beryllium	0.32	0.06	0.16 K	0.17 K	0.61	0.14
Cadmium	0.34 U	0.51	0.33 U	0.33 U	0.34 U	0.38
Calcium	946	154	268	256	6490	537
Chromium	20.4	7.6	3.3	4	16.9	5.4
Cobalt	2.3	0.86	0.53	0.82	6	0.95
Copper	5.2	14.3	3.2	3.4	6	4.4
Iron	22400	3970	3770	3900	23900	7000
Lead	17.1	227	10.2	9.1	11.2	11.3
Magnesium	261	83.3	128	148	446	197
Manganese	53.1 J	8.4 J	36.6	33.7	175 J	40.2 J
Mercury	0.11 U	0.59 K	0.11 UL	0.09 UL	0.11 U	0.11 U
Nickel	1.1	0.91 U	1.2	1.6	5	1
Potassium	530	101	94.1 J	233	692	261
Selenium	0.91 K	0.55 U	0.57 U	0.67 K	1.1 K	0.58 U
Silver	0.46 U	5.3	0.44 U	0.44 U	0.45 U	0.44 U
Sodium	25.9	15.8	61.8	68.4	121	71
Vanadium	39.2	9.9	7.4	8.3	28.2	14.6
Zinc	18.9 J	21.7 J	43.6 J	43.5 J	31.6 J	13.1 J
Cyanide	2.9 K	4.6 L	2.8 U	2.8 U	2.8 R	2.8 R

MG/KG - milligram per kilogram
J - estimated
K - biased high
L - biased low
R - rejected
U - not detected
UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low

TABLE 5-34
SOIL BORINGS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A15SB01-01	A15SB01-03	A15SB01-11	A15SB02-01	A15SB02-06	A15SB02-10	A15SB03-01	A15SB03-01D	A15SB03-05
Date Sampled:	11/01/94	11/01/94	11/01/94	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94
Depth:	1-3'	5-7'	21-23'	1-3'	11-13'	19-21'	1-3'	1-3'	9-11'
pH:	4.99	missing from Lab	7.99	8.09	8.06	8.13	6.91	7.64	5.25
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	11 U	15 U	14 U	11 U	1 J	13 U	11 U	10 U	12 U
Acetone	11 U	22	14 U	11 U	12 U	13 U	11 UJ	10 U	12 U

UG/KG - microgram per kilogram
B -analyte detected in associated blank(s)
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-34
SOIL BORINGS - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A15SB03-11	A15SB04-01	A15SB04-05	A15SB04-05D	A15SB04-11
Date Sampled:	11/02/94	11/01/94	11/01/94	11/01/94	11/01/94
Depth:	21-23'	1-3'	9-11'	9-11'	21-23'
pH:	8.02	8.01	7.77	7.74	8.04
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Methylene chloride	11 U	10 B	9 B	9 B	11 B
Acetone	11 U	11 U	13 U	12 U	13 U

UG/KG - microgram per kilogram
B -analyte detected in associated blank(s)
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated

TABLE 5-34
SOIL BORINGS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A15SB01-01	A15SB01-03	A15SB01-11	A15SB02-01	A15SB02-06	A15SB02-10	A15SB03-01	A15SB03-01D
Date Sampled:	11/01/94	11/01/94	11/01/94	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94
Depth:	1-3'	5-7'	21-23'	1-3'	11-13'	19-21'	1-3'	1-3'
pH:	4.99	NA	7.99	8.09	8.06	8.13	6.91	7.64
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
1,4-Dichlorobenzene	370 U	NA	440 U	380 U	370 U	73 J	350 U	350 U
Phenanthrene	370 U	NA	440 U	380 U	370 U	420 U	350 U	350 U
Di-n-Butyl Phthalate	470 B	NA	610 B	3700	2800	5500	490 B	1500 B
Fluoranthene	370 U	NA	440 U	380 U	370 U	420 U	350 U	350 U
Pyrene	370 U	NA	440 U	380 U	370 U	420 U	350 U	350 U
Benzo(a)anthracene	370 U	NA	440 U	380 U	370 U	420 U	350 U	350 U
Chrysene	370 U	NA	440 U	380 U	370 U	420 U	350 U	350 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
NA - not analyzed

TABLE 5-34
SOIL BORINGS - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A15SB03-05	A15SB03-11	A15SB04-01	A15SB04-05	A15SB04-05D	A15SB04-11
Date Sampled:	11/02/94	11/02/94	11/01/94	11/01/94	11/01/94	11/01/94
Depth:	9-11'	21-23'	1-3'	9-11'	9-11'	21-23'
pH:	5.25	8.02	8.01	7.77	7.74	8.04
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
1,4-Dichlorobenzene	400 U	89 J	380 U	410 U	390 U	410 U
Phenanthrene	400 U	390 U	87 J	410 U	390 U	410 U
Di-n-Butyl Phthalate	5700	3800	240 B	370 B	310 B	54 B
Fluoranthene	400 U	390 U	95 J	410 U	390 U	410 U
Pyrene	400 U	390 U	110 J	410 U	390 U	410 U
Benzo(a)anthracene	400 U	390 U	43 J	410 U	390 U	410 U
Chrysene	400 U	390 U	41 J	410 U	390 U	410 U

UG/KG - microgram per kilogram
B - analyte detected in associated blank(s)
J - estimated
NA - not analyzed

TABLE 5-34
SOIL BORINGS - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A15SB01-01	A15SB01-03	A15SB01-11	A15SB02-01	A15SB02-06	A15SB02-10	A15SB03-01	A15SB03-01D
Date Sampled:	11/01/94	11/01/94	11/01/94	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94
Depth:	1-3'	5-7'	21-23'	1-3'	11-13'	19-21'	1-3'	1-3'
pH:	4.99	NA	7.99	8.09	8.06	8.13	6.91	7.64
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
4,4'-DDE	1.1 J	NA	4.4 U	26 J	3.7 U	4.2 U	300 J	3.5 UJ
4,4'-DDD	3.7 U	NA	4.4 U	46 J	3.7 U	4.2 U	32 U	3.5 U
4,4'-DDT	3.7 U	NA	4.4 U	51 J	3.7 U	4.2 U	190 L	3.5 R

UG/KG - microgram per kilogram
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low
R - rejected

TABLE 5-34
SOIL BORINGS - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A15SB03-05	A15SB03-11	A15SB04-01	A15SB04-05	A15SB04-05D	A15SB04-11
Date Sampled:	11/02/94	11/02/94	11/01/94	11/01/94	11/01/94	11/01/94
Depth:	9-11'	21-23'	1-3'	9-11'	9-11'	21-23'
pH:	5.25	8.02	8.01	7.77	7.74	8.04
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
4,4'-DDE	4 U	3.9 U	3.8 U	4.1 UL	3.9 U	4.1 U
4,4'-DDD	4 U	3.9 U	3.8 U	4.1 UL	3.9 U	4.1 U
4,4'-DDT	4 U	3.9 U	3.8 U	4.1 UL	3.9 U	4.1 U

UG/KG - microgram per kilogram
J - estimated
U - not detected
UJ - reported quantitation limit is qualified as estimated
UL - not detected, biased low
R - rejected

TABLE 5-35
SOIL BORINGS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A15SB01-01	A15SB01-03	A15SB01-11	A15SB02-01	A15SB02-06	A15SB02-10
Sampling Date	11/01/94	11/01/94	11/01/94	11/02/94	11/02/94	11/02/94
Depth	1-3'	5-7'	21-23'	1-3'	11-13'	19-21'
pH	4.99	NA	7.99	8.09	8.06	8.13
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	5330	NA	4060	5280	1750	1700
Antimony	2.7 U	NA	3.2 L	2.7 UL	3.4 L	3.1 UL
Arsenic	5.6	NA	2	18.8	5.2	1.5
Barium	14.6	NA	22.6	14.3	17.9	16.1
Beryllium	0.23	NA	0.34	0.49	0.24	0.18
Cadmium	0.33 U	NA	0.39 U	0.33 U	0.32 U	0.38 U
Calcium	346	NA	187000	18500	239000	265000
Chromium	10.2	NA	15.1	18.7	9.8	7
Cobalt	2.6	NA	2.4	4.2	2.5	1.8
Copper	14	NA	2.7	5	19.7	1.7
Iron	15000	NA	11100	23400	16800	8930
Lead	8.7	NA	3.7	229	3.8	3
Magnesium	235	NA	2260	504	1850	2160
Manganese	44.3 J	NA	75.5 J	134 J	138 J	73.5 J
Nickel	2.5	NA	3.8	3.9	2.5	3
Potassium	471	NA	1780	755	663	793
Selenium	0.57 U	NA	0.67 U	1.4 K	0.56 U	0.66 U
Sodium	71.3	NA	1720	223	1560	1490
Thallium	0.87 UL	NA	1 UL	0.88 UL	0.86 UL	1 UL
Vanadium	20.8	NA	11.5	33.7	13	3.5
Zinc	32.6 J	NA	20.8 J	18.9 J	22.2 J	16.9 J
Cyanide	2.9 R	NA	3.3 R	2.9 R	31	3.2 R

MG/KG - milligram per kilogram
K - biased high
L - biased low
U - not detected
UL - not detected, biased low
R - rejected

TABLE 5-35
SOIL BORINGS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A15SB03-01	A15SB03-01D	A15SB03-05	A15SB03-11	A15SB04-01	A15SB04-05
Sampling Date	11/02/94	11/02/94	11/02/94	11/02/94	11/01/94	11/01/94
Depth	1-3'	1-3'	9-11'	21-23'	1-3'	9-11'
pH	6.91	7.64	5.25	8.02	8.01	7.77
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	3900	2760	5280	2110	7470	9280
Antimony	2.5 UL	2.6 UL	2.9 UL	2.7 UL	2.7 UL	4.7 L
Arsenic	2.5	2	23.2	1.6	15.6	29.2
Barium	19.9	16.8	12.3	33.8	15.6	26.8
Beryllium	0.23	0.2	0.17	0.2	0.74	2.1
Cadmium	0.31 U	0.32 U	0.36 U	0.34 U	0.33 U	0.38 U
Calcium	587	568	32.3	200000	3910	114000
Chromium	5.7	4.8	24.5	9.1	17.5	33.5
Cobalt	2.2	2	2	1.9	6	58
Copper	10	2.6	8.2	2.4	5.1	8.2
Iron	7550	6180	14700	7830	35700	73500
Lead	8.6	10.1	9.8	2.6	10	7.1
Magnesium	341	253	272	2270	415	1290
Manganese	131 J	137 J	5.3 J	109 J	129 J	1300 J
Nickel	2.4	2.1	1.3	1.5	3.7	21.6
Potassium	254	183	770	952	715	920
Selenium	0.54 U	0.57 K	1 K	0.66 K	1.2	1.2 K
Sodium	66	22.4	87.4	1880	102	836
Thallium	0.83 UL	0.85 UL	0.95 UL	0.89 UL	0.88 U	1.3 L
Vanadium	11.9	9.2	36.5	7	34	29.8
Zinc	14.2 J	11.8 J	9.8 J	15.5 J	29.5 J	80.3 J
Cyanide	2.7 R	2.6 R	3 R	2.9 R	2.9 R	3.1 R

MG/KG - milligram per kilogram
K - biased high
L - biased low
U - not detected
UL - not detected, biased low
R - rejected

TABLE 5-35
SOIL BORINGS - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A15SB04-05D	A15SB04-11
Sampling Date	11/01/94	11/01/94
Depth	9-11'	21-23'
pH	7.74	8.04
Units	MG/KG	MG/KG
Aluminum	9090	2670
Antimony	4.2 L	2.9 UL
Arsenic	21.2	1.1
Barium	32	21
Beryllium	1.4	0.26
Cadmium	0.34	0.35 U
Calcium	153000	216000
Chromium	27.7	11.2
Cobalt	37.3	1.9
Copper	5.4	1.8
Iron	45900	10100
Lead	6.6	2.8
Magnesium	1620	2760
Manganese	888 J	69 J
Nickel	19.4	1.1
Potassium	1100	1240
Selenium	1.3 K	0.61 U
Sodium	1160	1830
Thallium	0.91 UL	0.95 UL
Vanadium	36.8	8
Zinc	65.1 J	14.6 J
Cyanide	2.9 R	3.1 R

MG/KG - milligram per kilogram
K - biased high
L - biased low
U - not detected
UL - not detected, biased low
R - rejected

TABLE 5-36
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A15HP01-01	A15HP02-01	A15HP02-01D	A15HP03-01	A15HP04-01
Date Sampled:	11/02/94	11/02/94	11/02/94	11/03/94	11/02/94
pH:	7.19	7.05	7.05	7.34	7.30
Units:	UG/L	UG/L	UG/L	UG/L	UG/L
Acetone	6 J	5 R	5 R	5 R	5 R
1,1-Dichloroethene	1 U	0.6 J	1 U	1 U	1 U
1,1-Dichloroethane	1 U	1	1	1 U	2
Chloroform	1 U	0.6 J	0.7 J	0.8 J	4
1,1,1-Trichloroethane	2	12	11	2	16
Bromodichloromethane	1 U	1 U	1 U	1 U	0.5 J
Trichloroethene	1 U	1 U	1 U	7	1 U
Ethylbenzene	1 U	1 U	0.7 J	1 U	1 U
CIS 1,2-Dichloroethene	1 U	1 U	1 U	0.9 J	1 U

UG/L - microgram per liter
J - estimated
R - Rejected
U - not detected

TABLE 5-36
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A15HP01-01	A15HP02-01	A15HP02-01D	A15HP03-01	A15HP04-01
Date Sampled:	11/02/94	11/02/94	11/02/94	11/03/94	11/02/94
pH:	7.19	7.05	7.05	7.34	7.30
Units:	UG/L	UG/L	UG/L	UG/L	UG/L
beta-BHC	0.05 UJ	0.05 UJ	0.05 U	0.05 UJ	0.05 J
4,4'-DDE	0.1 UJ	0.059 J	0.06 J	0.1 UJ	0.1 UJ
4,4'-DDD	0.1 UJ	0.067 J	0.06 J	0.1 UJ	0.1 UJ
4,4'-DDT	0.1 UJ	0.16 J	0.12 J	0.1 UJ	0.1 UJ

UG/L - microgram per liter
J - estimated
U - not detected
UL - not detected, biased low

TABLE 5-37
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A15HP01-01	A15HP02-01	A15HP02-01D	A15HP03-01	A15HP04-01
Sampling Date	34640	11/02/94	11/02/94	11/03/94	11/02/94
pH	7.19	7.05	7.05	7.34	7.30
Units	UG/L	UG/L	UG/L	UG/L	UG/L
Aluminum	54800	35900	32800	135000	10800
Antimony	14.5 L	15.3 L	12.2 UL	26.9 L	12.2 UL
Arsenic	112	30.9	28.5	61.2	5
Barium	272	290	273	849	91.6
Beryllium	4.4	2.7	3	12.3	1 U
Cadmium	1.5 U	1.5 U	1.5 U	2	1.5 U
Calcium	897000	1160000	910000	1590000	313000
Chromium	237	156	140	448	33.1
Cobalt	53.1	31.5	35.6	95.3	8.3
Copper	37.7	27.9	29.3	86.2	9.8
Iron	158000	94200	83700	355000	20200
Lead	47.1 J	36.8 J	37.8 J	115 J	8 J
Magnesium	24600	20200	18300	44700	6800
Manganese	1300	665	703	3620	128
Nickel	84.3	42.7	42.3	263	10.4
Potassium	19100	17300	16200	34200	5340
Selenium	5.9 K	2.6 K	4.1 K	5.2 U	2.6 U
Sodium	20700	20800	19000	21500	17100
Thallium	8.1 L	4 UL	6.2 L	16.4 L	5.1 L
Vanadium	170	115	97.1	329	27.1
Zinc	314 J	195 J	196 J	803 J	57.8 J
Cyanide	5 U	5 U	5 U	5.4 J	5 U

UG/L - microgram per liter
K - biased high
L - biased low
U - not detected
UL - not detected, biased low

TABLE 5-37
TEMPORARY PIEZOMETER - POSITIVE DETECTION SUMMARY
DISSOLVED INORGANICS
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A15HP01F-01	A15HP02F-01	A15HP02F-01D	A15HP03F-01	A15HP04F-01
Sampling Date	11/02/94	11/02/94	11/02/94	11/03/94	11/02/94
pH	7.19	7.05	7.05	7.34	7.30
Units	UG/L	UG/L	UG/L	UG/L	UG/L
Barium	41.4	54	53.9	43.3	28.7
Calcium	155000	165000	165000	125000	102000
Cobalt	2.6	1.9 U	1.9 U	1.9 U	1.9 U
Copper	9.4	12	12.2	13.8	10.4
Iron	119	1.5 U	1.5 U	4.1	19.5
Magnesium	3090	3730	3760	2080	2850
Manganese	155	20.2	19.9	1.8	1.9
Nickel	10.6	4.3 U	7.2	4.4	4.3 U
Potassium	4350	6630	6950	2180	2410
Sodium	15300	12900	12900	11100	15500
Vanadium	1.4 U	1.4 U	2.6	1.4 U	1.6

UG/L - microgram per liter
J - estimated
U - not detected

TABLE 5-38
SURFACE WATER - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A15SW01-01	A15SW02-01	A15SW02-01D
Date Sampled:	12/02/94	12/02/94	12/02/94
pH:	7.50	7.40	7.40
Units:	UG/L	UG/L	UG/L
Vinyl chloride	1 U	2	25 U
1,1-Dichloroethene	1 U	1	25 U
1,1-Dichloroethane	1 U	0.5 J	25 U
Trichloroethene	1 U	500	420
Cis 1,2-Dichloroethene	1 U	77 J	49

UG/L - microgram per liter
J - estimated
U - not detected

TABLE 5-38
SURFACE WATER - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A15SW01-01	A15SW02-01	A15SW02-01D
Date Sampled:	12/02/94	12/02/94	12/02/94
pH:	7.50	7.40	7.40
Units:	UG/L	UG/L	UG/L
Vinyl chloride	1 U	2	25 U
1,1-Dichloroethene	1 U	1	25 U
1,1-Dichloroethane	1 U	0.5 J	25 U
Trichloroethene	1 U	500	420
Cis 1,2-Dichloroethene	1 U	77 J	49

UG/L - microgram per liter
J - estimated
U - not detected

TABLE 5-39
SURFACE WATER - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A15SW01-01	A15SW02-01	A15SW02-01D
Sampling Date	12/02/94	12/02/94	12/02/94
pH	7.50	7.40	7.40
Units	UG/L	UG/L	UG/L
Aluminum	75.6	80.4	50.5
Barium	35.2 L	42.5 L	43.2 L
Cadmium	1.5 U	1.5 U	2.1 K
Calcium	114000	102000	108000
Copper	1.4 U	4.1	1.4 U
Iron	889 L	442 L	331 L
Lead	1.4 U	1.4	1.6
Magnesium	2620	3100	3220
Manganese	70.1	26.2	24
Potassium	1030	1560	1390
Sodium	7020	9010	9290
Thallium	4 U	7 K	7.6 K
Vanadium	1.4 UL	1.8 L	1.4 UL
Zinc	2.5 J	7.6 J	5.5 J

UG/L - microgram per liter
J - estimated
K - biased low
L - biased high
U - not detected
UL - not detected, biased low

TABLE 5-40
SURFACE WATER - POSITIVE DETECTION SUMMARY
ENGINEERING PARAMETERS
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

	Sample ID:	A15SW01-01	A15SW02-01	A15SW02-01D
	Date Sampled:	12/02/94	12/02/94	12/02/94
	pH:	7.50	7.40	7.40
	Units:	MG/L	MG/L	MG/L
Hardness		300	280	280

MG/L - milligram per liter

TABLE 5-41
SEDIMENT - POSITIVE DETECTION SUMMARY
VOLATILE ORGANIC COMPOUNDS
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A15SD01-01	A15SD01-02	A15SD02-01	A15SD02-01D	A15SD02-02
Date Sampled:	12/03/94	12/03/94	12/03/94	12/03/94	12/03/94
Depth:	0-4"	4-8"	0-4"	0-4"	4-8"
pH:	7.60	7.87	7.62	7.62	7.60
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
1,2-Dichloroethene (total)	15 U	13 U	13 U	11 U	2 J
Trichloroethene	15 U	13 U	2 J	7 J	12 U
Benzene	15 U	2 J	13 U	11 U	12 U
Toluene	15 U	5 J	13 U	11 U	12 U
Total Xylenes	15 U	2 J	13 U	11 U	12 U

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-41
SEDIMENT - POSITIVE DETECTION SUMMARY
SEMIVOLATILE ORGANIC COMPOUNDS
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A15SD01-01	A15SD01-02	A15SD02-01	A15SD02-01D	A15SD02-02
Date Sampled:	12/03/94	12/03/94	12/03/94	12/03/94	12/03/94
Depth:	0-4"	4-8"	0-4"	0-4"	4-8"
pH:	7.60	7.87	7.62	7.62	7.60
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Phenanthrene	460 U	47 J	420 U	400 U	62 J
Fluoranthene	460 U	430 U	420 U	400 U	99 J
Pyrene	460 U	430 U	420 U	400 U	70 J
bis(2-Ethylhexyl)Phthalate	360 J	430 U	170 J	570	110 J

UG/KG - microgram per kilogram
J - estimated
U - not detected

TABLE 5-41
SEDIMENT - POSITIVE DETECTION SUMMARY
PESTICIDES/PCBs
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A15SD01-01	A15SD01-02	A15SD02-01	A15SD02-01D	A15SD02-02
Date Sampled:	12/03/94	12/03/94	12/03/94	12/03/94	12/03/94
Depth:	0-4"	4-8"	0-4"	0-4"	4-8"
pH:	7.60	7.87	7.62	7.62	7.60
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
delta-BHC	1.1 J	1.5 J	0.68 J	0.62 J	2 U
4,4'-DDE	13	4.1 J	31	19	17
4,4'-DDD	49 J	40	15 J	8.2	10
4,4'-DDT	86	22	35	20	25
alpha-Chlordane	4.8 U	4.5	3.9 J	2.2 J	2.4 J
gamma-Chlordane	4.8 U	2.9	5.4	2.2	2.9

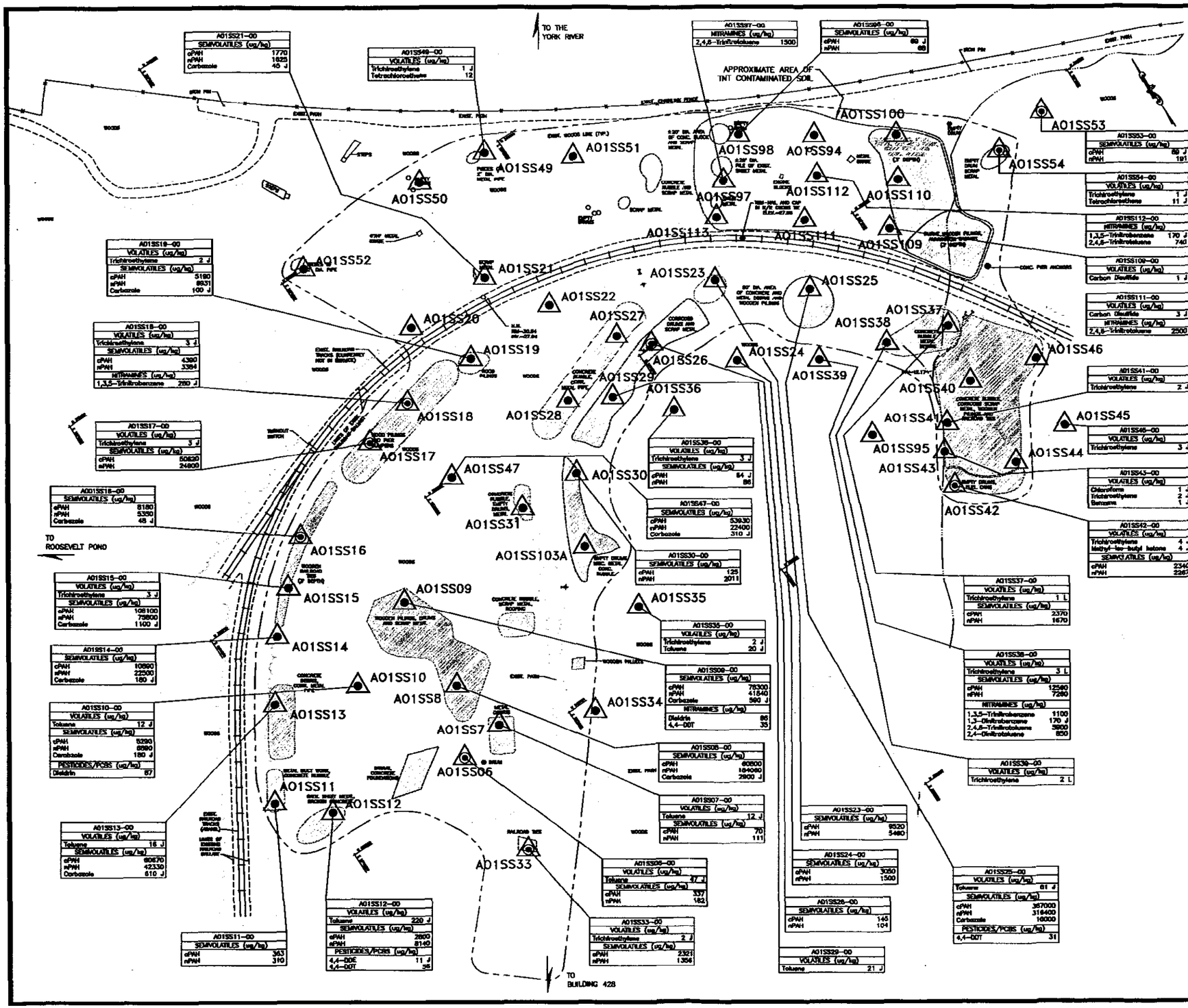
UG/KG - microgram per kilogram
J - estimated
U - not detected

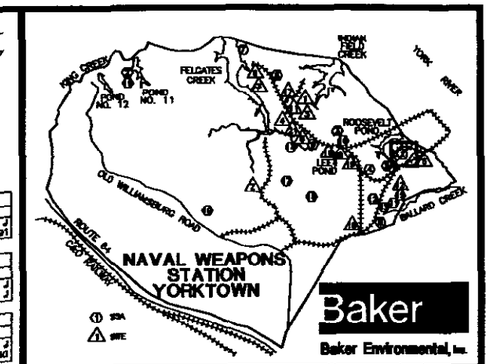
TABLE 5-42
SEDIMENT - POSITIVE DETECTION SUMMARY
TOTAL INORGANICS AND CYANIDE
SSA 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A15SD01-01	A15SD01-02	A15SD02-01	A15SD02-01D	A15SD02-02
Sampling Date	12/03/94	12/03/94	12/03/94	12/03/94	12/03/94
Depth	0-4"	4-8"	0-4"	0-4"	4-8"
pH	7.60	7.87	7.62	7.62	7.60
Units	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	683	497	959	669	562
Arsenic	0.65 U	0.72	1.3	0.56 U	0.74
Barium	5.9	4.7	10.4	3	4.2
Beryllium	0.04	0.03	0.05	0.03	0.02
Cadmium	0.43	0.41	0.38	0.36 U	0.36 U
Calcium	1050 J	2770 J	1480 J	4350 J	682 J
Chromium	2.6 L	2.4 L	3.1 L	1.6 L	2.3 L
Cobalt	0.53 U	0.5 U	0.82	0.46 U	0.46 U
Copper	2.3	2.7	3.5	1.4	1.3
Iron	1650	1050	2390	2060	1810
Lead	6.6 J	5.3 J	11.5 J	4.5 J	5.3 J
Magnesium	44.7	49.4	199	343	221
Manganese	6.7	5.2	25.4	37.4	18.2
Mercury	0.23	0.33	0.13 U	0.12 U	0.44
Silver	0.56 UL	0.53 UL	0.87 L	0.48 UL	0.48 UL
Sodium	33.5	46.6	37.9	49	30
Vanadium	4.3	3.3	4.2	2.3	3.2
Zinc	17.1 J	16.5 J	19.1 J	10.1 J	9.5 J

MG/KG - milligram per kilogram
J - estimated
L - biased low
U - not detected
UL - not detected, biased low

SECTION 5.0 FIGURES





100 0 50 100

1 inch = 100 ft.

LEGEND

- WOODS
- CHAIN LINK FENCE
- RAILROAD TRACKS
- DITCH OR SWALE
- EDGE OF PAVEMENT
- STRUCTURE
- LOCATION OF SURFICIAL DEBRIS PILES
- SITE SCREENING AREA BOUNDRY
- GROUNDSURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)
- A01SS16 — SURFACE SOIL AND SUBSURFACE SOIL SAMPLES COLLECTED BY OHM CORPORATION
- A01SS7 — SURFACE SOIL SAMPLES COLLECTED BY OHM CORPORATION
- cPAH — POLYCYCLIC AROMATIC HYDROCARBONS (CARCINOGENS)
- nPAH — POLYCYCLIC AROMATIC HYDROCARBONS (NON-CARCINOGENS)

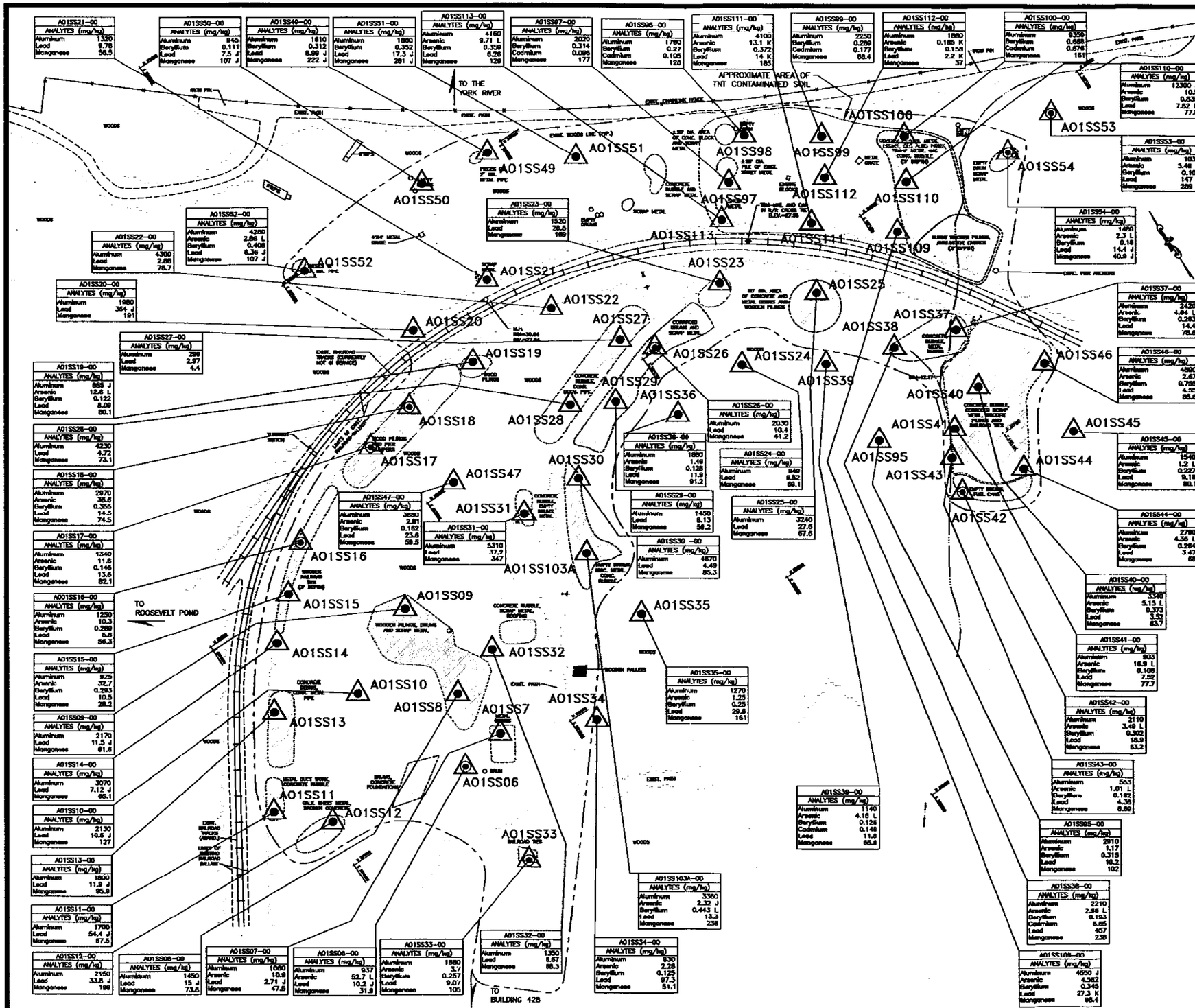
NOTE:

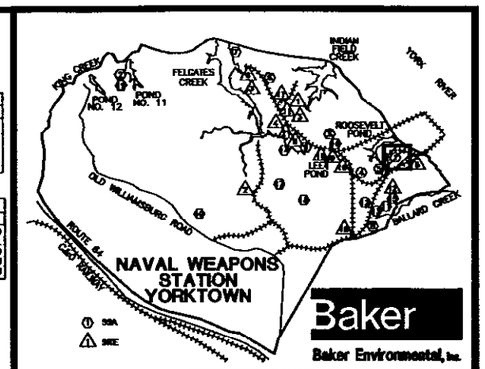
SURFACE SOIL SAMPLES AND SOME SUBSURFACE SOIL SAMPLES WERE COLLECTED AS PART OF REMOVAL ACTION ACTIVITIES.

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 22828355

FIGURE 5-1
POSITIVE DETECTIONS OF SELECT ORGANIC COMPOUNDS IN SURFACE SOILS
SSA1 - BUILDING 428 TEAGUE ROAD DISPOSAL AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA





100 0 50 100

1 inch = 100 ft.

LEGEND

- WOODS
- CHAIN LINK FENCE
- RAILROAD TRACKS
- DITCH OR SWALE
- EDGE OF PAVEMENT
- STRUCTURE
- LOCATION OF SURFICIAL DEBRIS PILES
- SITE SCREENING AREA BOUNDRY
- GROUNDSURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)
- A01SS16 — SURFACE SOIL AND SUBSURFACE SOIL SAMPLES COLLECTED BY OHM CORPORATION
- A01SS7 — SURFACE SOIL SAMPLES COLLECTED BY OHM CORPORATION

DATA QUALIFIERS

- B — CONTAMINANT DETECTED IN BLANK
- J — ESTIMATED CONCENTRATION
- K — BIASED HIGH
- L — BIASED LOW

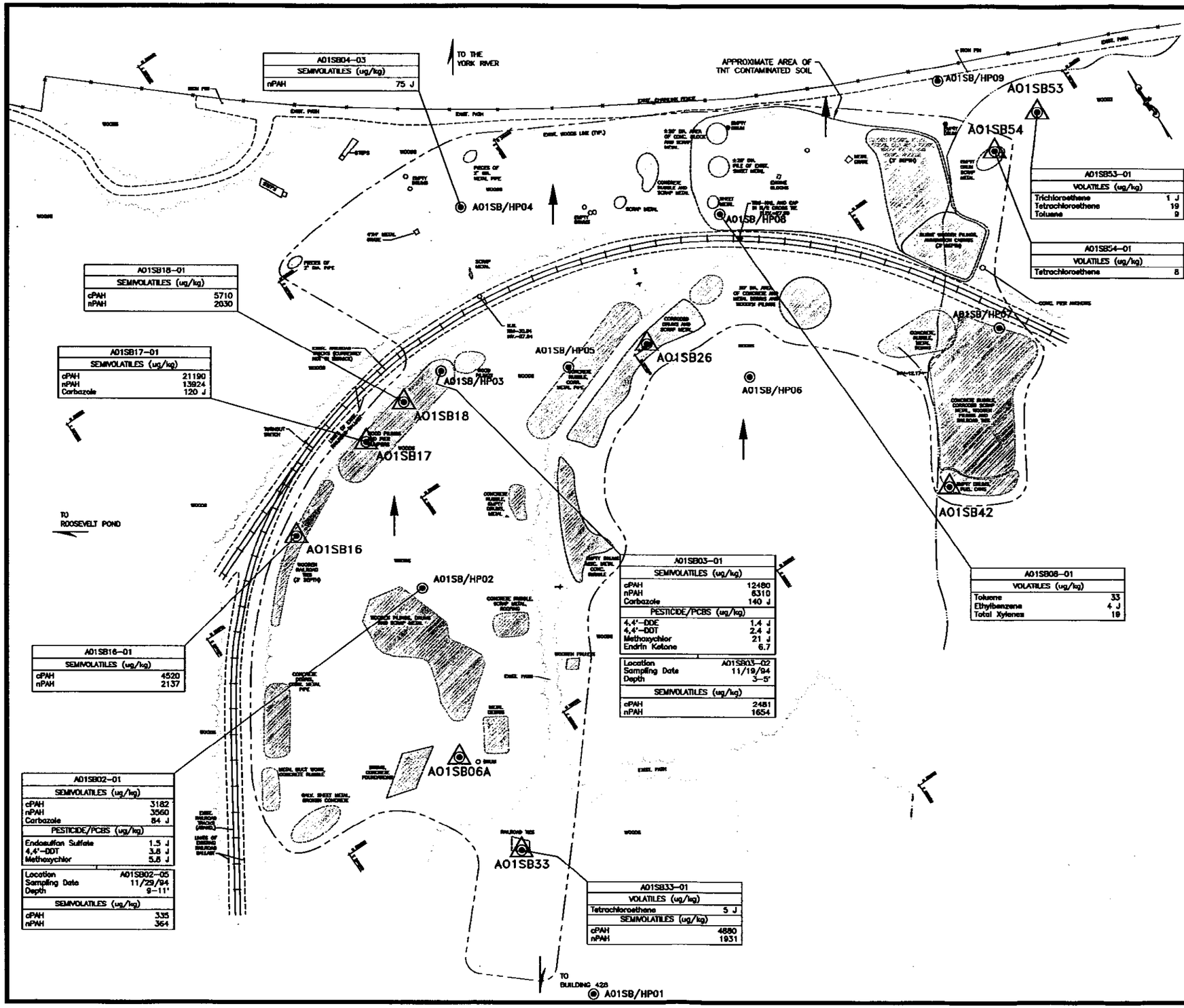
ANALYTE CONCENTRATIONS EXPRESSED IN Mg/Kg.

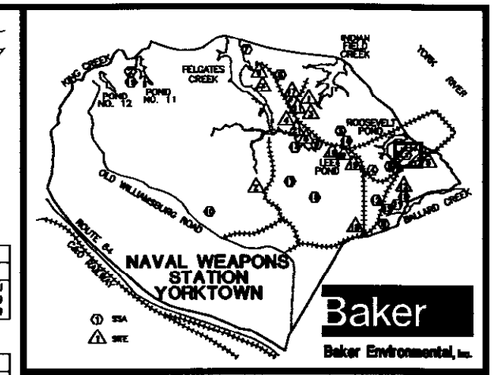
NOTE:

SURFACE SOIL SAMPLES AND SOME SUBSURFACE SOIL SAMPLES WERE COLLECTED AS PART OF REMOVAL ACTION ACTIVITIES.

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 22828055

FIGURE 5-2
POSITIVE DETECTIONS OF SELECT INORGANIC ANALYTES IN SURFACE SOILS
SSA1 - BUILDING 428 TEAGUE ROAD DISPOSAL AREA
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA





100 0 50 100
1 inch = 100 ft.

LEGEND

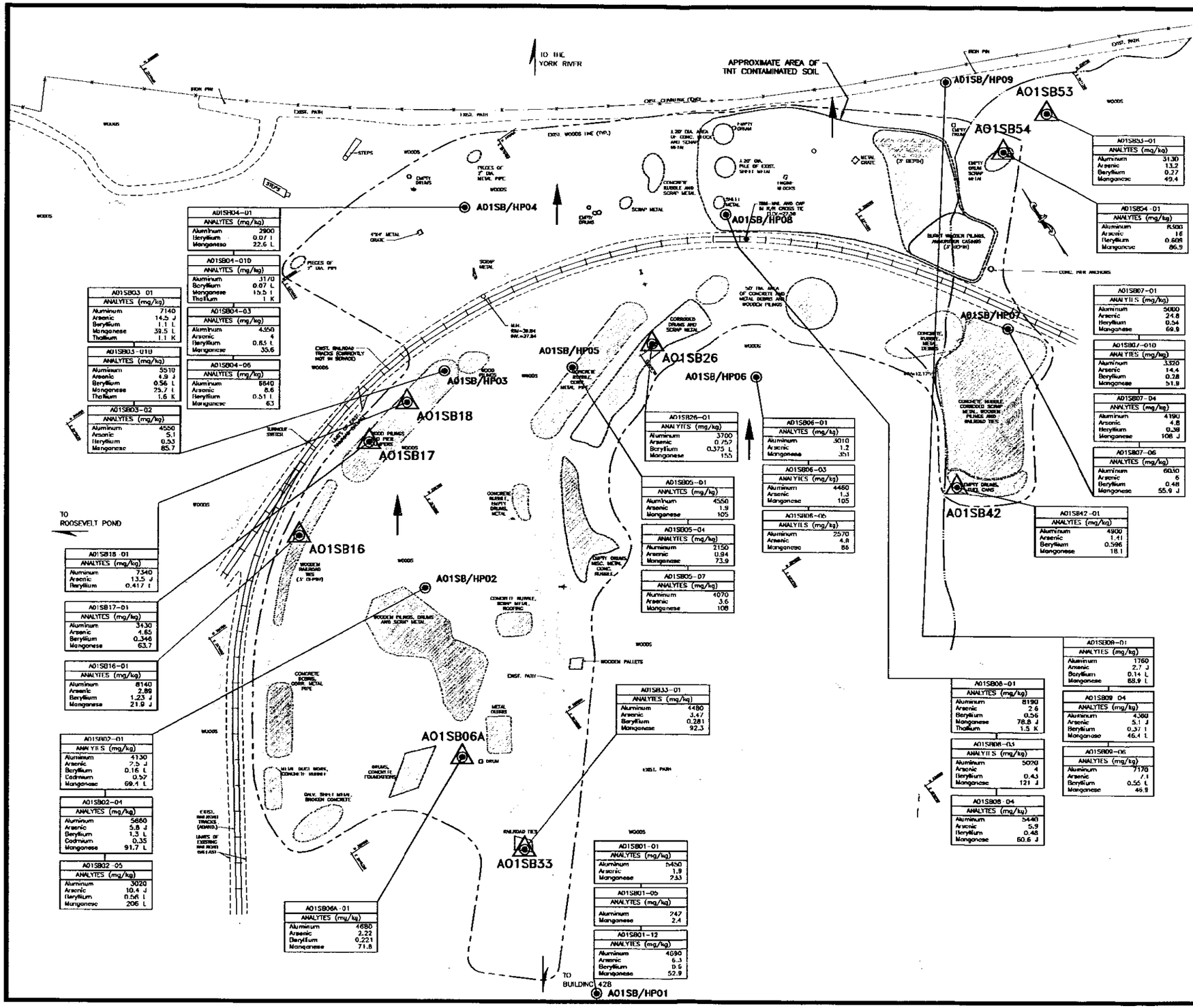
- WOODS
- CHAIN LINK FENCE
- RAILROAD TRACKS
- DITCH OR SWALE
- EDGE OF PAVEMENT
- STRUCTURE
- LOCATION OF SURFICIAL DEBRIS PILES
- SITE SCREENING AREA BOUNDRY
- GROUNDSURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)
- A01SB16 — SURFACE SOIL AND SUBSURFACE SOIL SAMPLES COLLECTED BY OHM CORPORATION
- A01SB/HP01 — SOIL BORING/TEMPORARY PIEZOMETER LOCATION
- ASSUMED GROUNDWATER FLOW DIRECTION
- cPAH — POLYCYCLIC AROMATIC HYDROCARBONS (CARCINOGENS)
- nPAH — POLYCYCLIC AROMATIC HYDROCARBONS (NON-CARCINOGENS)

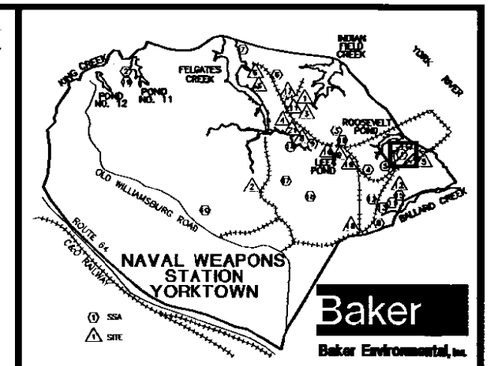
NOTE:
SURFACE SOIL SAMPLES AND SOME SUBSURFACE SOIL SAMPLES WERE COLLECTED AS PART OF REMOVAL ACTION ACTIVITIES.

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 22826755

FIGURE 5-3
POSITIVE DETECTIONS OF SELECT ORGANIC COMPOUNDS IN SUBSURFACE SOILS SSA1 - BUILDING 428 TEAGUE ROAD DISPOSAL AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA





100 0 50 100

1 inch = 100 ft.

LEGEND

- WOODS
- CHAIN LINK FENCE
- RAILROAD TRACKS
- DITCH OR SWALE
- EDGE OF PAVEMENT
- STRUCTURE
- LOCATION OF SURFICIAL DEBRIS PILES
- SITE SCREENING AREA BOUNDRY
- GROUNDSURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)
- A01SB16 — SURFACE SOIL AND SUBSURFACE SOIL SAMPLES COLLECTED BY OHM CORPORATION
- A01SB/HP01 — SOIL BORING/TEMPORARY PIEZOMETER LOCATION
- ASSUMED GROUNDWATER FLOW DIRECTION

DATA QUALIFIERS

B	CONTAMINANT DETECTED IN BLANK
J	ESTIMATED CONCENTRATION
K	BIASED HIGH
L	BIASED LOW

ANALYTE CONCENTRATIONS EXPRESSED IN Mg/Kg.

NOTE:

SURFACE SOIL SAMPLES AND SOME SUBSURFACE SOIL SAMPLES WERE COLLECTED AS PART OF REMOVAL ACTION ACTIVITIES.

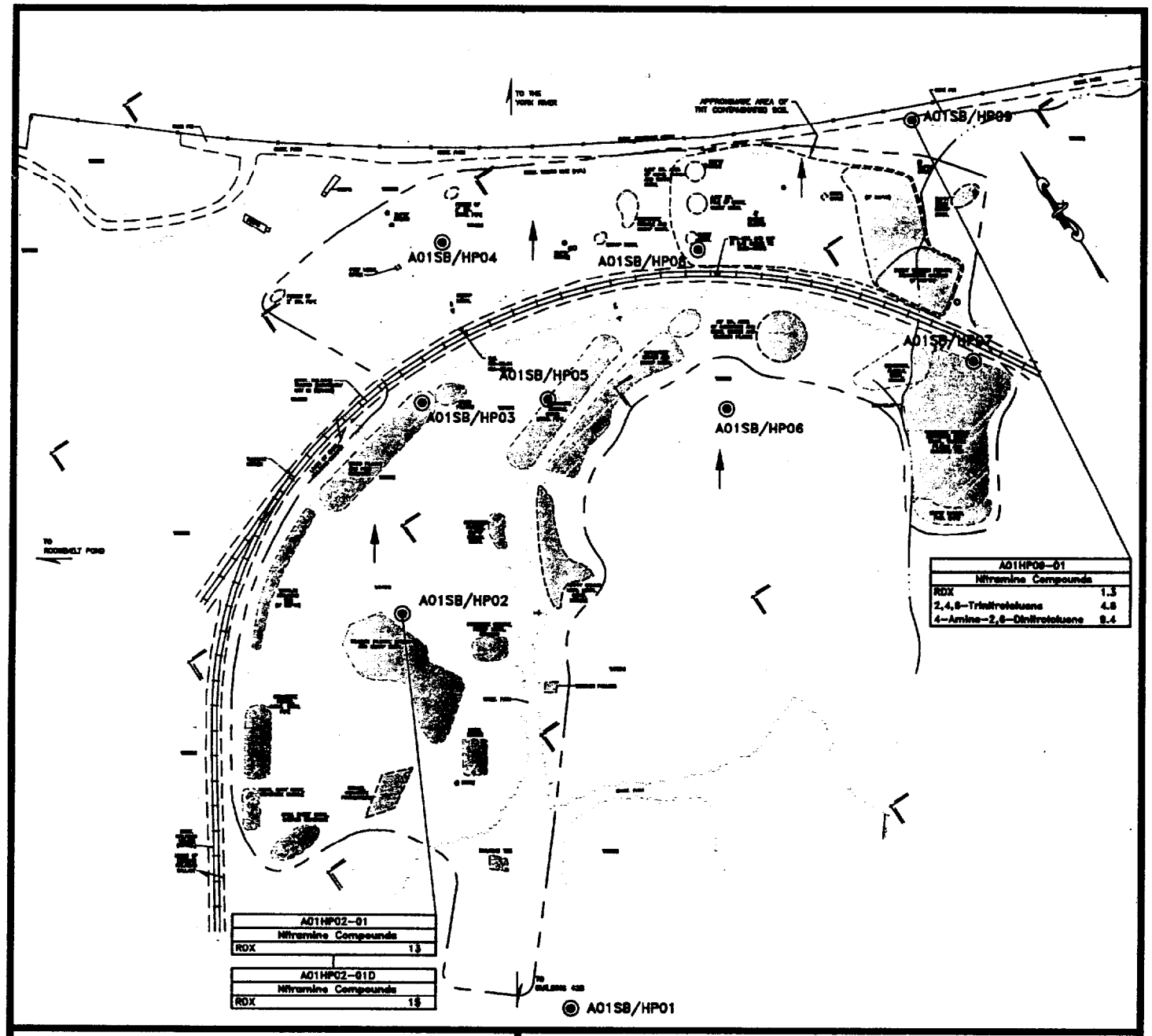
SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 278289SS

FIGURE 5-4

POSITVE DETECTIONS OF SELECT INORGANIC ANALYTES IN SUBSURFACE SOIL

SSA1 - BUILDING 428 TEAGUE ROAD DISPOSAL AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



150 0 75 150

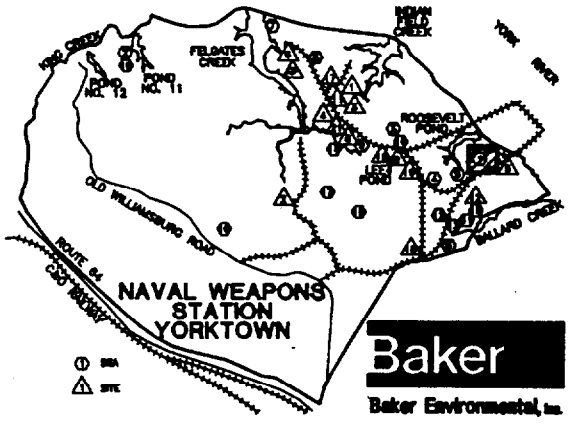
1 inch = 150 ft.

WOODS
CHAIN LINK FENCE
RAILROAD TRACKS
DITCH OR SWALE
EDGE OF PAVEMENT
STRUCTURE
LOCATION OF SURFICIAL DEBRIS PILES
A01SB/HP01 SOIL BORING/TEMPORARY PIEZOMETER LOCATION
SITE SCREENING AREA BOUNDRY
ASSUMED GROUNDWATER FLOW DIRECTION
COMPOUND CONCENTRATIONS EXPRESSED IN ug/L

NOTE:
GROUNDWATER SAMPLING LOCATIONS SHOWN WITHOUT CONCENTRATIONS INDICATES NON-DETECTABLE LEVELS. SEE TABLES IN TEXT.

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994.

22824233

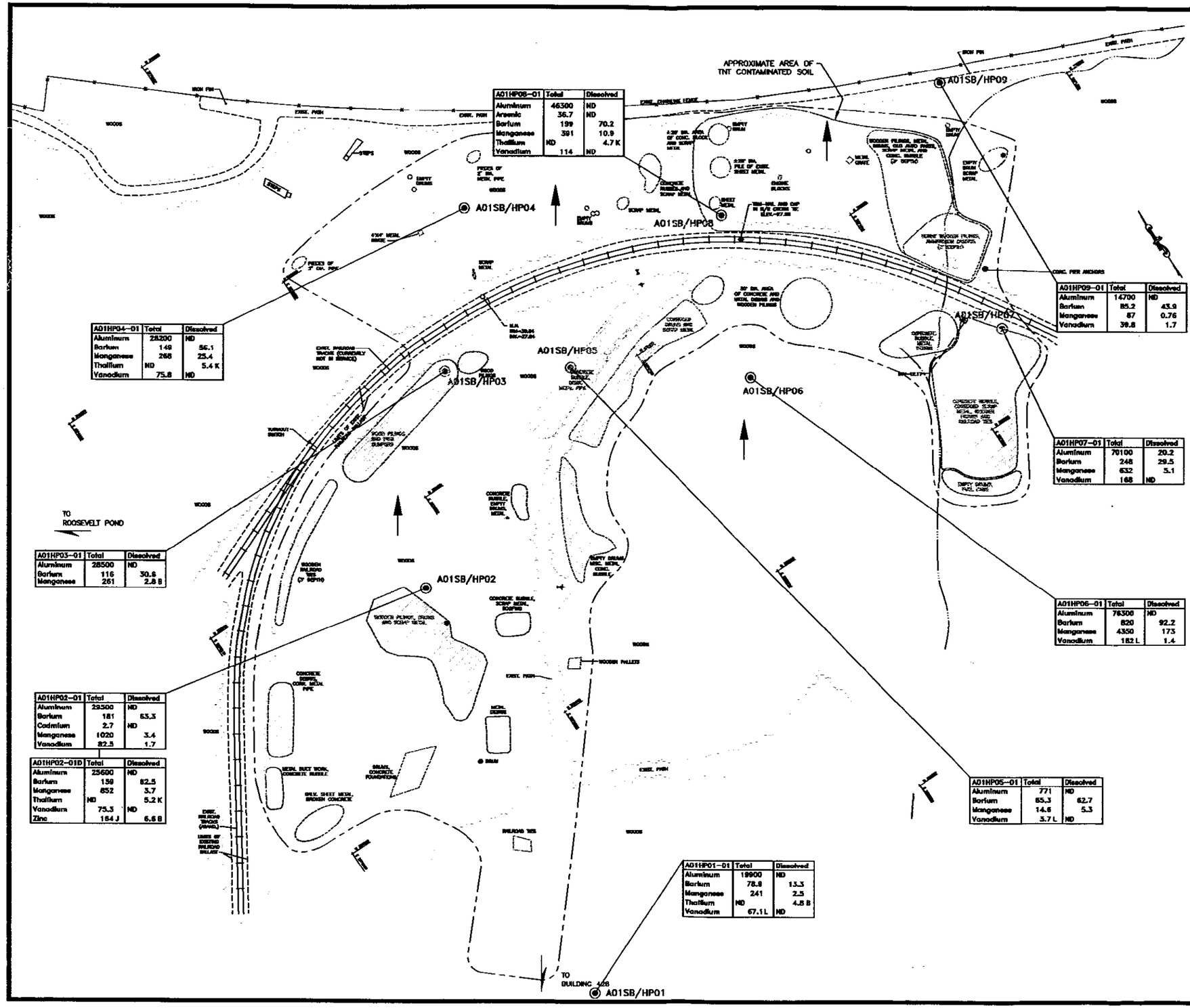


Baker

Baker Environmental, Inc.

FIGURE 5-5
POSITIVE DETECTIONS OF ORGANIC COMPOUNDS IN GROUNDWATER
SSA1 – BUILDING 428 TEAGUE ROAD DISPOSAL AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



A01HP08-01	Total	Dissolved
Aluminum	46300	ND
Arsenic	36.7	ND
Barium	199	70.2
Manganese	391	10.9
Thallium	ND	4.7 K
Vanadium	114	ND

A01HP09-01	Total	Dissolved
Aluminum	14700	ND
Barium	85.2	43.9
Manganese	87	0.76
Vanadium	39.8	1.7

A01HP04-01	Total	Dissolved
Aluminum	28200	ND
Barium	149	56.1
Manganese	268	25.4
Thallium	ND	5.4 K
Vanadium	75.8	ND

A01HP07-01	Total	Dissolved
Aluminum	70100	20.2
Barium	248	29.5
Manganese	632	5.1
Vanadium	168	ND

A01HP03-01	Total	Dissolved
Aluminum	28500	ND
Barium	116	30.6
Manganese	261	2.8 B

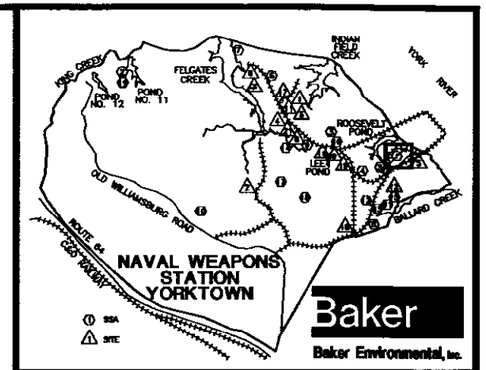
A01HP06-01	Total	Dissolved
Aluminum	76300	ND
Barium	820	92.2
Manganese	4350	173
Vanadium	182 L	1.4

A01HP02-01	Total	Dissolved
Aluminum	29500	ND
Barium	181	63.3
Cadmium	2.7	ND
Manganese	1020	3.4
Vanadium	82.5	1.7

A01HP02-01D	Total	Dissolved
Aluminum	25600	ND
Barium	159	82.5
Manganese	852	3.7
Thallium	ND	5.2 K
Vanadium	75.3	ND
Zinc	154 J	6.6 B

A01HP05-01	Total	Dissolved
Aluminum	771	ND
Barium	65.3	62.7
Manganese	14.6	5.3
Vanadium	3.7 L	ND

A01HP01-01	Total	Dissolved
Aluminum	19900	ND
Barium	78.8	13.3
Manganese	241	2.5
Thallium	ND	4.8 B
Vanadium	67.1 L	ND



100 0 50 100

1 inch = 100 ft.

LEGEND

- WOODS
- CHAIN LINK FENCE
- RAILROAD TRACKS
- DITCH OR SWALE
- EDGE OF PAVEMENT
- STRUCTURE
- LOCATION OF SURFICIAL DEBRIS PILES
- A01SB/HP01 — SOIL BORING/TEMPORARY PIEZOMETER LOCATION
- SITE SCREENING AREA BOUNDRY
- ASSUMED GROUNDWATER FLOW DIRECTION
- GROUND SURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)

DATA QUALIFIERS

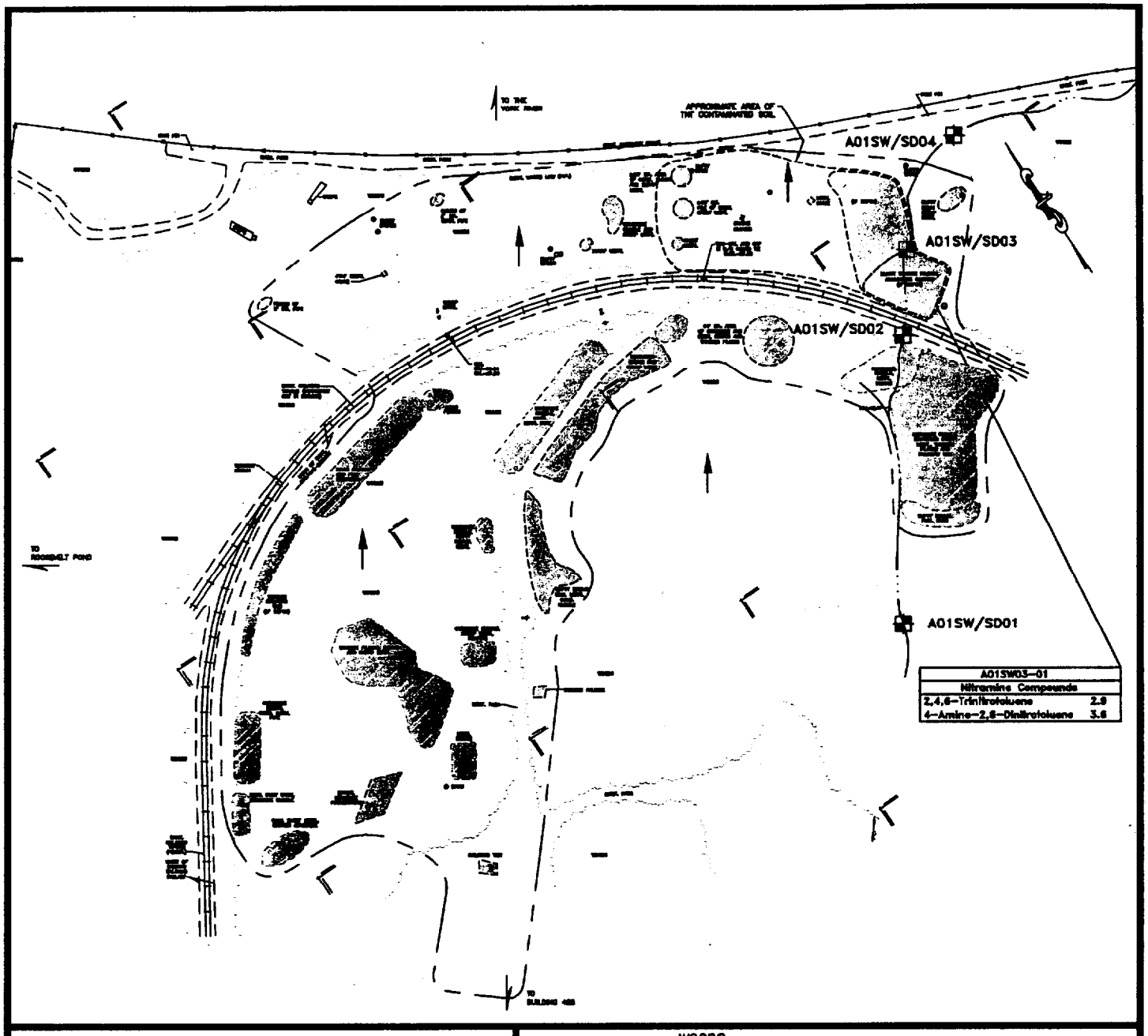
B	CONTAMINANT DETECTED IN BLANK
J	ESTIMATED CONCENTRATION
K	BIASED HIGH
L	BIASED LOW
ND	NOT DETECTED

ANALYTE CONCENTRATIONS EXPRESSED IN ug/L

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1984. 22824355

FIGURE 5-6
POSITIVE DETECTIONS OF SELECT INORGANIC ANALYTES IN GROUNDWATER
SSA1 - BUILDING 428 TEAGUE ROAD DISPOSAL AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



150 0 75 150

1 inch = 150 ft.

WOODS
CHAIN LINK FENCE
RAILROAD TRACKS
DITCH OR SWALE
EDGE OF PAVEMENT
STRUCTURE
LOCATION OF SURFICIAL DEBRIS PILES
A01SW/SD01 SURFACE WATER/SEDIMENT SAMPLE
SITE SCREENING AREA BOUNDRY
ASSUMED GROUNDWATER FLOW DIRECTION
COMPOUND CONCENTRATIONS EXPRESSED IN ug/L

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994.

22824455

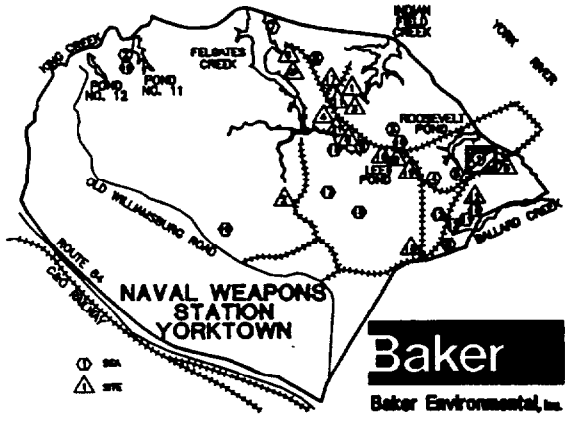
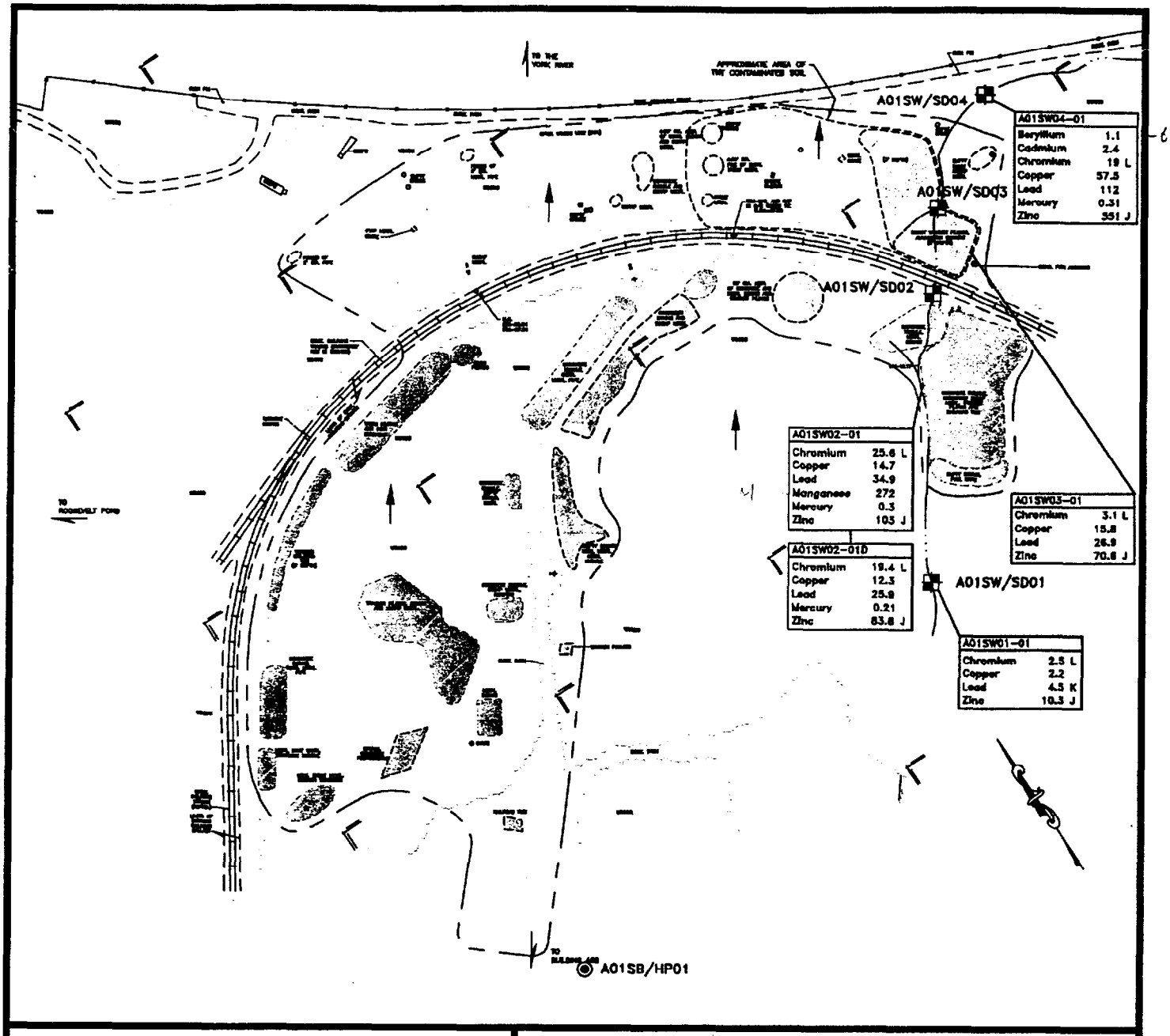


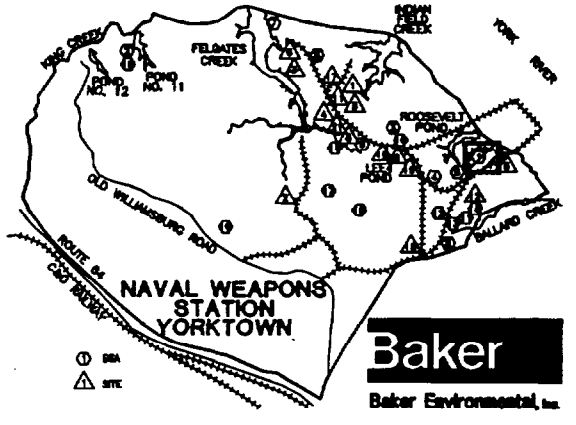
FIGURE 5-7
POSITIVE DETECTIONS OF ORGANIC COMPOUNDS IN SURFACE WATER
SSA1 – BUILDING 428 TEAGUE ROAD DISPOSAL AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



150 0 75 150

1 inch = 159 ft.



Baker

Baker Environmental, Inc.

WOODS
CHAIN LINK FENCE
RAILROAD TRACKS
DITCH OR SWALE
EDGE OF PAVEMENT
STRUCTURE
LOCATION OF SURFICIAL DEBRIS PILES
A01SW/SD01 SURFACE WATER/SEDIMENT SAMPLE LOCATION
SITE SCREENING AREA BOUNDRY
ASSUMED GROUNDWATER FLOW DIRECTION

DATA QUALIFIERS

J ESTIMATED CONCENTRATION
K· BIASED HIGH
L BIASED LOW

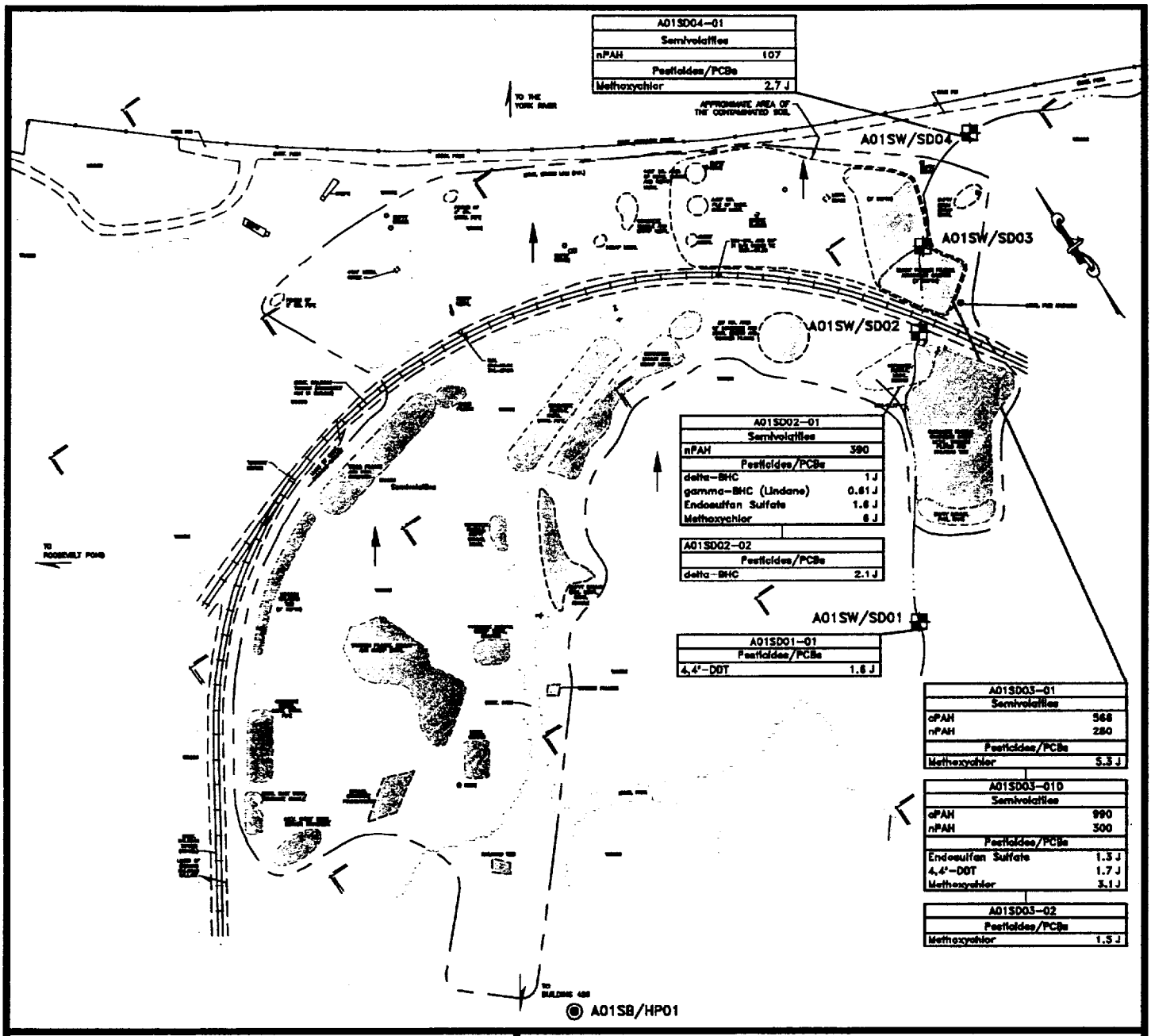
ANALYTE CONCENTRATIONS EXPRESSED IN ug/L

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994.

22824555

FIGURE 5-8
POSITIVE DETECTIONS OF SELECT INORGANIC ANALYTES IN SURFACE WATER
SSA1 - BUILDING 428 TEAGUE ROAD DISPOSAL AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



200 0 100 200

1 inch = 200 ft.

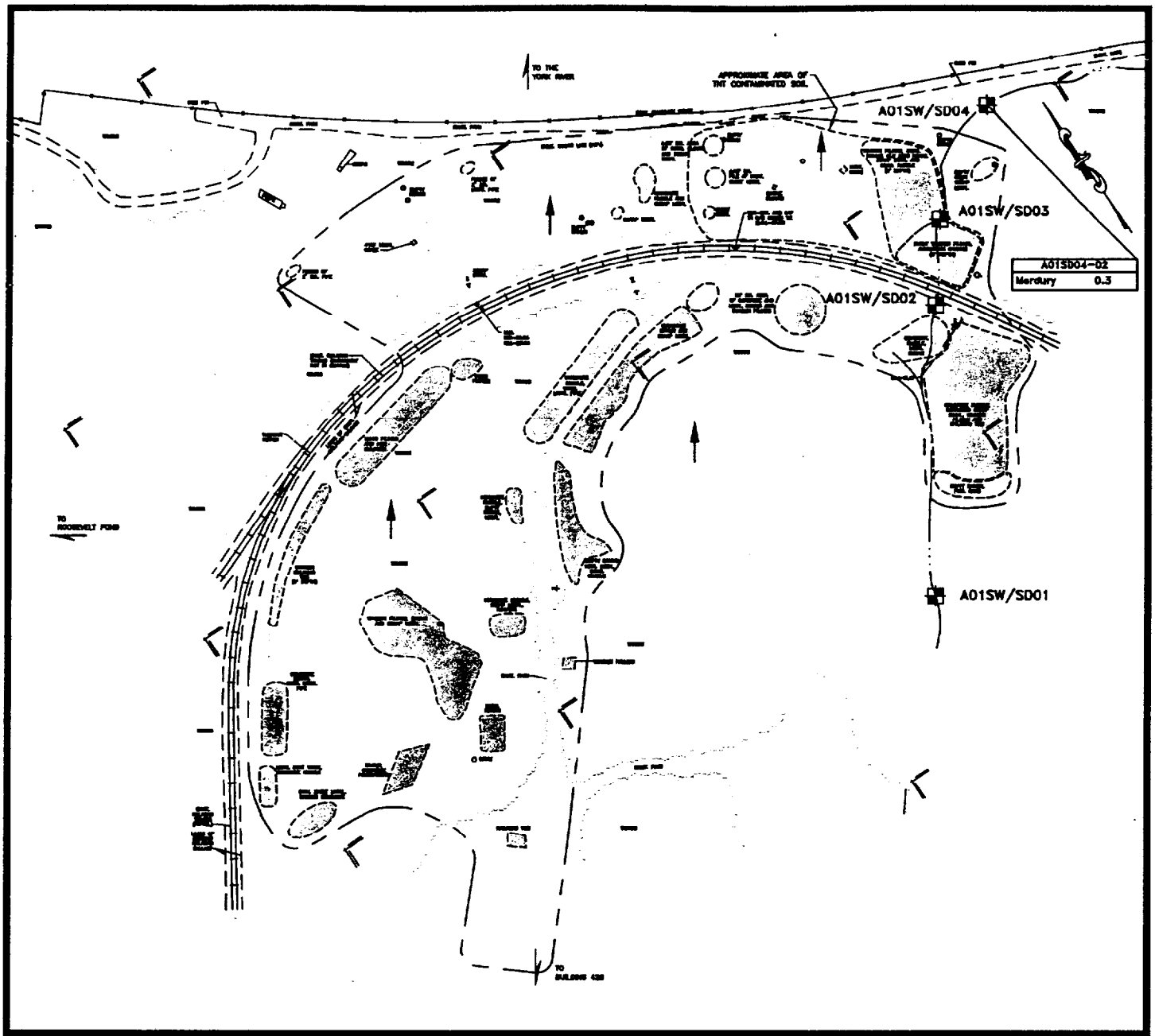
WOODS
CHAIN LINK FENCE
RAILROAD TRACKS
DITCH OR SWALE
EDGE OF PAVEMENT
STRUCTURE
LOCATION OF SURFICIAL DEBRIS PILES
A01SW/SD01 SURFACE WATER/SEDIMENT SAMPLE
SITE SCREENING AREA BOUNDRY
ASSUMED GROUNDWATER FLOW DIRECTION
J ESTIMATED CONCENTRATION
COMPOUND CONCENTRATION EXPRESSED IN ug/Kg.
cPAH POLYCYCLIC AROMATIC HYDROCARBONS (CARCINOGENS)
nPAH POLYCYCLIC AROMATIC HYDROCARBONS (NON-CARCINOGENS)

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994.

22824655

Baker
Baker Environmental, Inc.

FIGURE 5-9
POSITIVE DETECTIONS OF ORGANIC COMPOUNDS IN SEDIMENT
SSA1 - BUILDING 428 TEAGUE ROAD DISPOSAL AREA
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



150 0 75 150

1 inch = 150 ft.

WOODS
CHAIN LINK FENCE
RAILROAD TRACKS
DITCH OR SWALE
EDGE OF PAVEMENT
STRUCTURE
LOCATION OF SURFICIAL DEBRIS PILES
A01SW/SD01 SURFACE WATER/SEDIMENT SAMPLE LOCATION
SITE SCREENING AREA BOUNDRY
ASSUMED GROUNDWATER FLOW DIRECTION

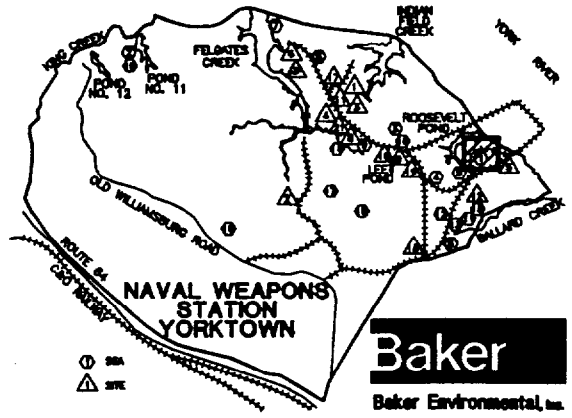
DATA QUALIFIERS

J ESTIMATED CONCENTRATION
K BIASED HIGH
L BIASED LOW

ANALYTE CONCENTRATIONS EXPRESSED IN Mg/Kg.

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994.

22824753

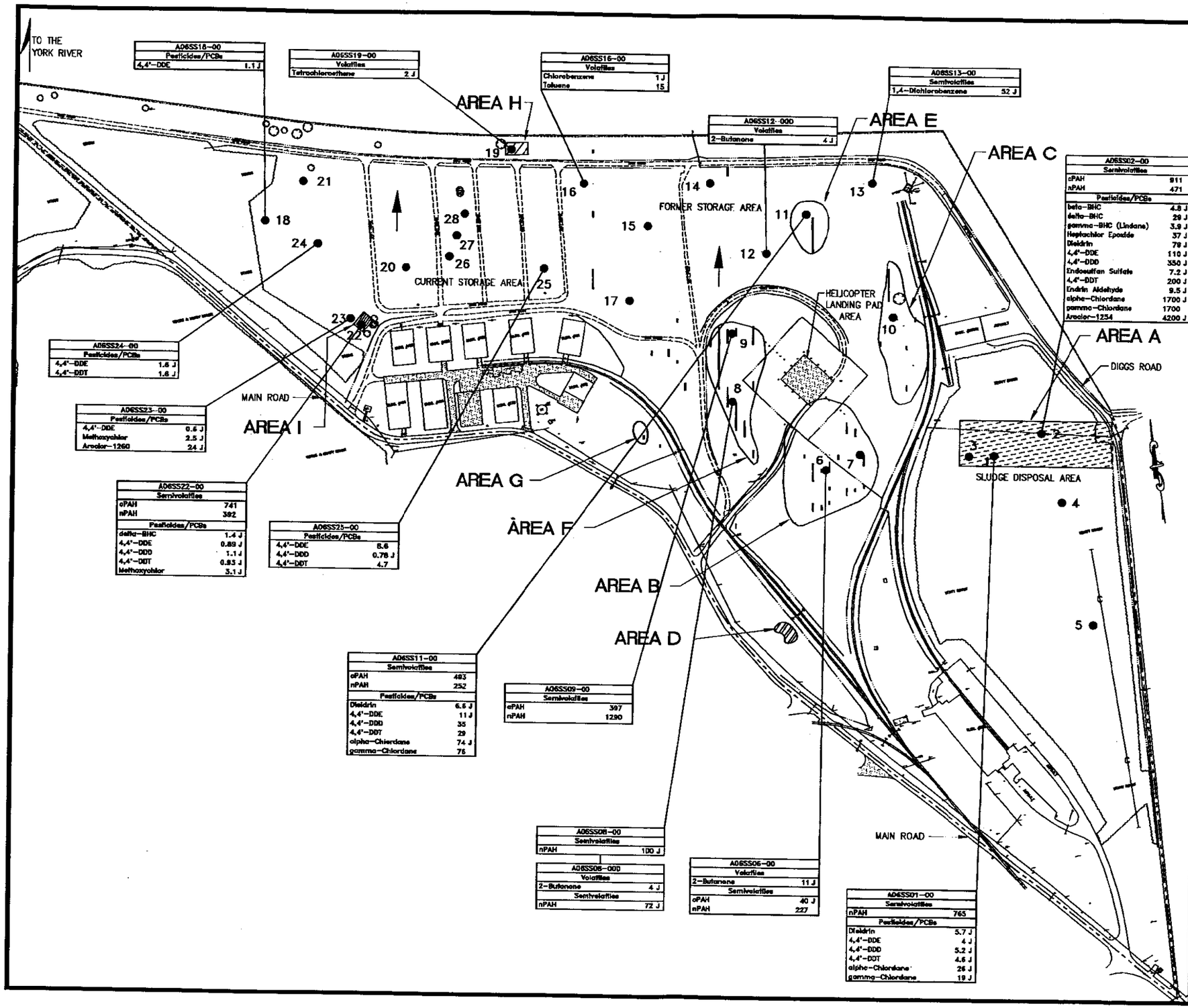


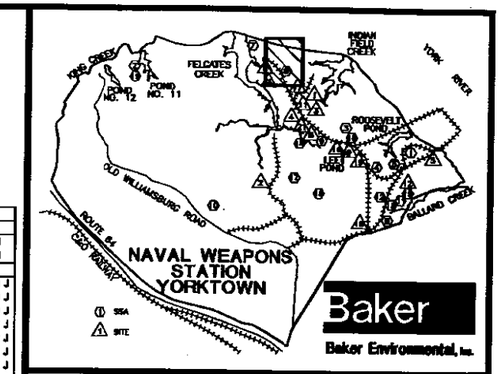
Baker

Baker Environmental, Inc.

FIGURE 5-10
POSITIVE DETECTIONS OF SELECT INORGANIC ANALYTES IN SEDIMENT
SSA1 - BUILDING 428 TEAGUE ROAD DISPOSAL AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA





300 0 150 300
1 inch = 300 ft.

LEGEND

- CONCRETE
- TREE
- RAILROAD TRACKS
- DITCH OR SWALE
- EDGE OF PAVEMENT
- STRUCTURE
- BURIED METALLIC OBJECT/DEBRIS
- APPROXIMATE LIMITS OF DISPOSAL AREAS EXHIBITING GREATER AMOUNTS OF DEBRIS. TYPICAL DEPTH RANGE OF 0-3' AS DETERMINED FROM RADAR DATA.
- APPROXIMATE AREA OF BLACK SLUDGE-LIKE MATERIAL
- APPROXIMATE AREA OF UNIDENTIFIED BURIED MATERIALS
- APPROXIMATE AREA OF BURIED ROCKET ENGINES
- APPROXIMATE EXTENT OF FORMER SLUDGE DISPOSAL AREA
- GEOPHYSICAL TRAVERSE EXHIBITING HIGH CONDUCTIVITY
- 4 ● SURFACE SOIL SAMPLE LOCATION
- SITE SCREENING AREA BOUNDRY
- ASSUMED GROUNDWATER FLOW DIRECTION
- J ESTIMATED CONCENTRATION
- COMPOUND CONCENTRATIONS EXPRESSED IN ug/Kg.
- cPAH POLYCYCLIC AROMATIC HYDROCARBONS (CARCINOGENS)
- nPAH POLYCYCLIC AROMATIC HYDROCARBONS (NON-CARCINOGENS)

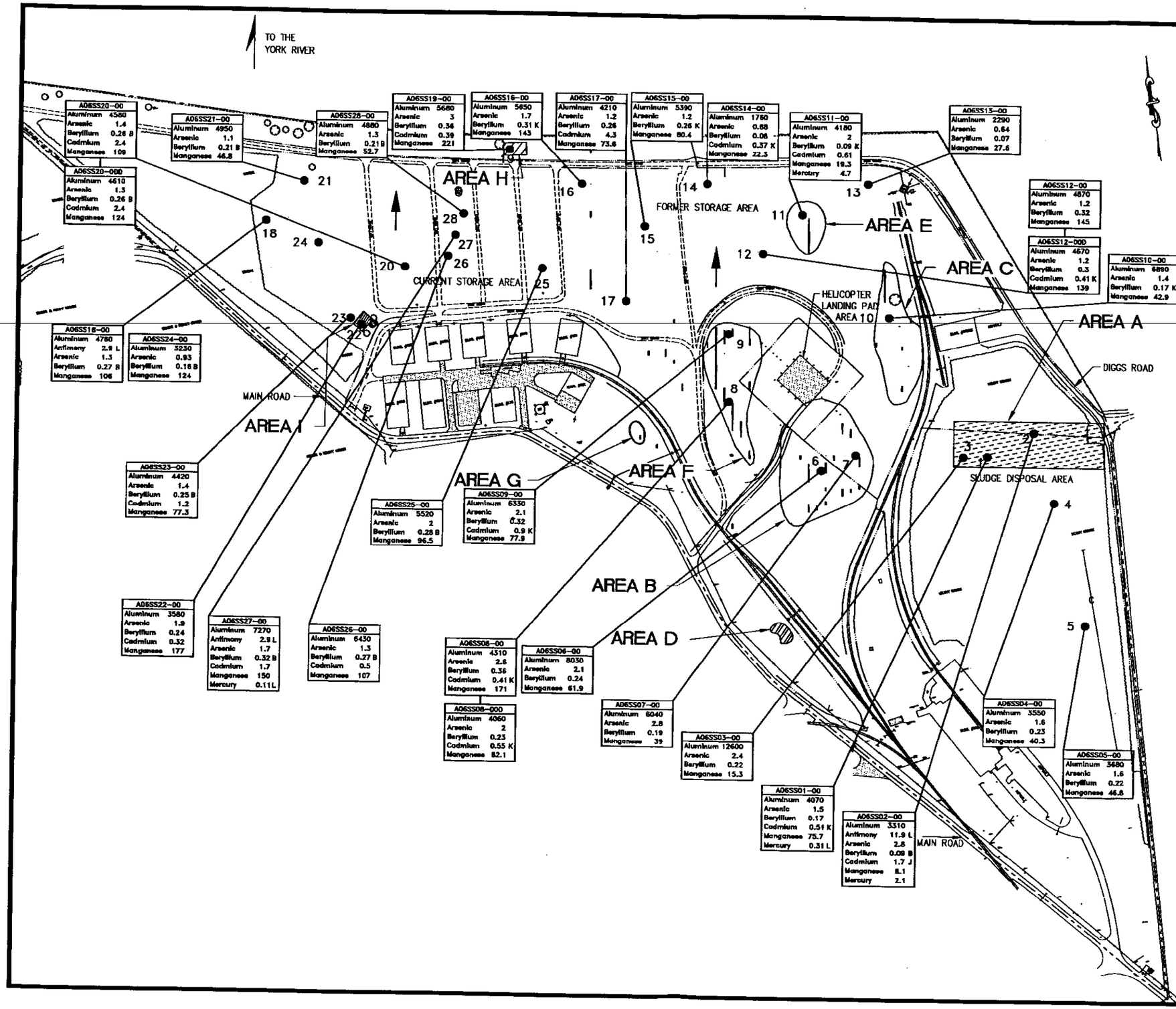
NOTE:
SURFACE SOIL SAMPLING LOCATIONS SHOWN WITHOUT CONCENTRATIONS INDICATES NON-DETECTABLE LEVELS. SEE TABLES IN TEXT.

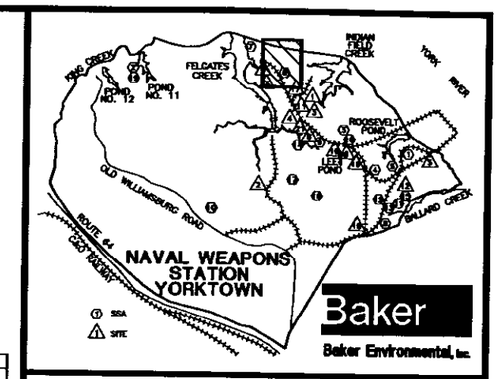
NOTE:
ALL SAMPLE NUMBERS ARE IDENTIFIED WITH THE FOLLOWING PREFIXES:
A06SS - SURFICIAL SOIL SAMPLES

SOURCE OF BASE MAPPING: HOOGARD/EURE ASSOCIATES, FEB. 1994. 22624855

FIGURE 5-11
POSITIVE DETECTIONS OF ORGANIC COMPOUNDS IN SURFACE SOIL
SSA 6
AVIATION FIELD AND ENVIRONS

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA





300 0 150 300

1 inch = 300 ft.

LEGEND

- CONCRETE
- TREE
- RAILROAD TRACKS
- DITCH OR SWALE
- EDGE OF PAVEMENT
- STRUCTURE
- BURIED METALLIC OBJECT/DEBRIS
- APPROXIMATE LIMITS OF DISPOSAL AREAS EXHIBITING GREATER AMOUNTS OF DEBRIS. TYPICAL DEPTH RANGE OF 0-3' AS DETERMINED FROM RADAR DATA.
- APPROXIMATE AREA OF BLACK SLUDGE-LIKE MATERIAL
- APPROXIMATE AREA OF UNIDENTIFIED BURIED MATERIALS
- APPROXIMATE AREA OF BURIED ROCKET ENGINES
- APPROXIMATE EXTENT OF FORMER SLUDGE DISPOSAL AREA
- GEOPHYSICAL TRAVERSE EXHIBITING HIGH CONDUCTIVITY
- 4 SURFACE SOIL SAMPLE LOCATION
- SITE SCREENING AREA BOUNDRY
- ASSUMED GROUNDWATER FLOW DIRECTION

DATA QUALIFIERS

- B CONTAMINANT DETECTED IN BLANK
- J ESTIMATED CONCENTRATION
- K BIASED HIGH
- L BIASED LOW

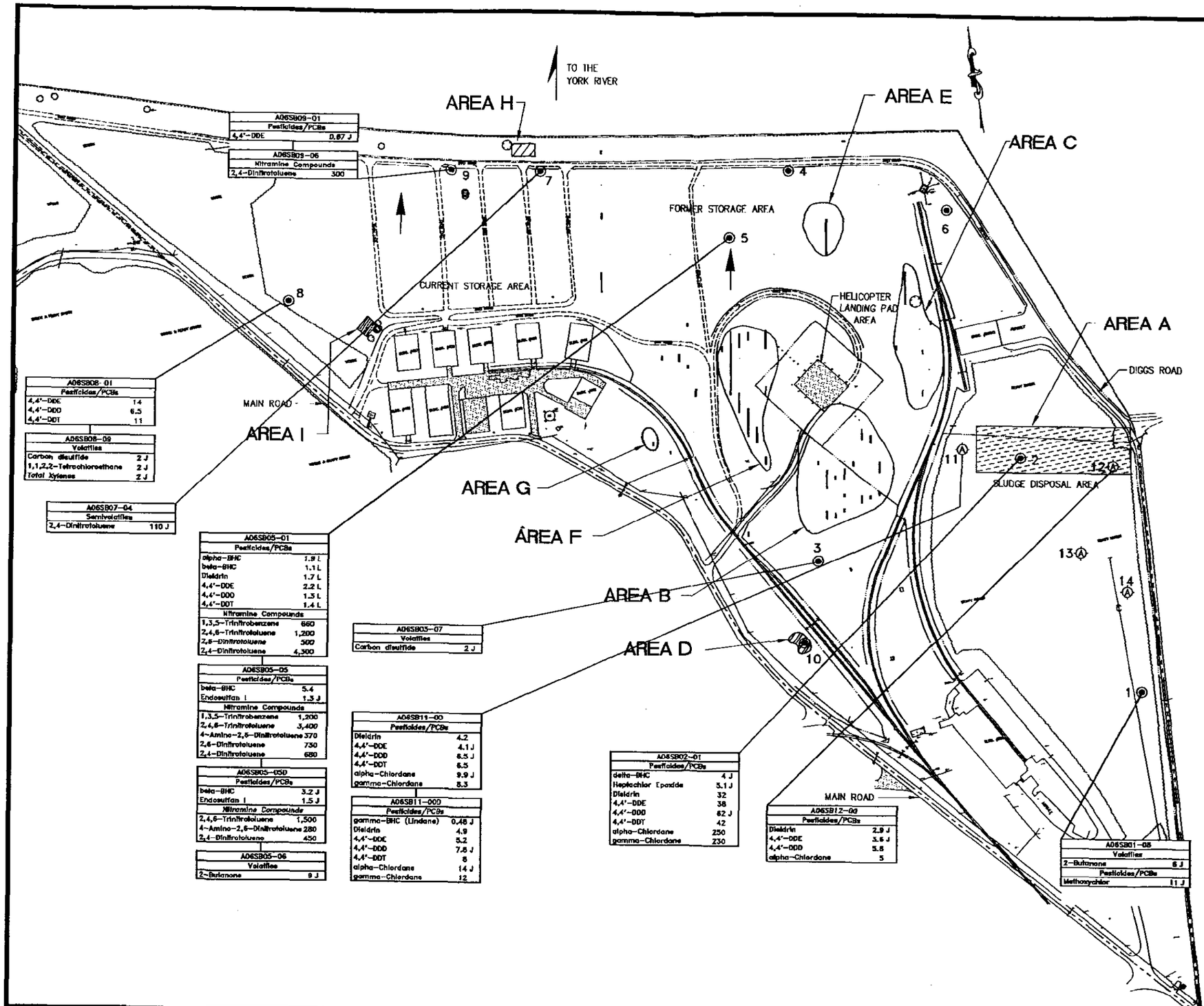
ANALYTE CONCENTRATIONS EXPRESSED IN Mg/Kg.

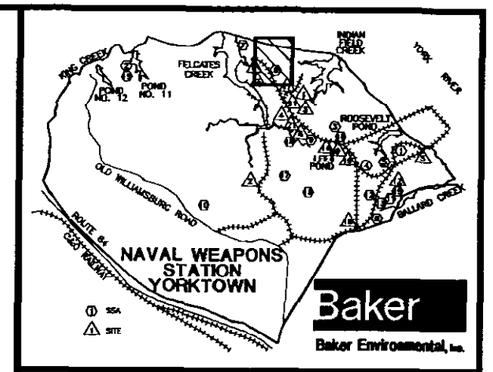
NOTE:
ALL SAMPLE NUMBERS ARE IDENTIFIED WITH THE FOLLOWING PREFIX:
A06SS - SURFICIAL SOIL SAMPLES

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 228249SS

FIGURE 5-12
POSITIVE DETECTIONS OF SELECT INORGANIC ANALYTES IN SURFACE SOIL
SSA 6
AVIATION FIELD AND ENVIRONS

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA





300 0 150 300

1 inch = 300 ft.

LEGEND

- CONCRETE
- TREE
- RAILROAD TRACKS
- DITCH OR SWALE
- EDGE OF PAVEMENT
- STRUCTURE
- BURIED METALLIC OBJECT/DEBRIS
- APPROXIMATE LIMITS OF DISPOSAL AREAS EXHIBITING GREATER AMOUNTS OF DEBRIS. TYPICAL DEPTH RANGE OF 0-3' AS DETERMINED FROM RADAR DATA.
- APPROXIMATE AREA OF BLACK SLUDGE-LIKE MATERIAL
- APPROXIMATE AREA OF UNIDENTIFIED BURIED MATERIALS
- APPROXIMATE AREA OF BURIED ROCKET ENGINES
- APPROXIMATE EXTENT OF FORMER SLUDGE DISPOSAL AREA
- GEOPHYSICAL TRAVERSE EXHIBITING HIGH CONDUCTIVITY
- 1 SOIL BORING/HydroPunch® LOCATION
- 2 SOIL BORING
- SITE SCREENING AREA BOUNDRY
- ASSUMED GROUNDWATER FLOW DIRECTION
- J ESTIMATED CONCENTRATION
- L BIASED LOW

COMPOUND CONCENTRATIONS EXPRESSED IN ug/Kg.

- cPAH POLYCYCLIC AROMATIC HYDROCARBONS (CARCINOGENS)
- nPAH POLYCYCLIC AROMATIC HYDROCARBONS (NON-CARCINOGENS)

NOTE:
SUBSURFACE SOIL SAMPLING LOCATIONS SHOWN WITHOUT CONCENTRATIONS INDICATES NON-DETECTABLE LEVELS. SEE TABLES IN TEXT.

NOTE:
ALL SAMPLE NUMBERS ARE IDENTIFIED WITH THE FOLLOWING PREFIX:
A06SB - SUBSURFACE SOIL SAMPLES

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 22825055

FIGURE 5-13
POSITIVE DETECTIONS OF SELECT ORGANIC COMPOUNDS IN SUBSURFACE SOIL
SSA 6
AVIATION FIELD AND ENVIRONS

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

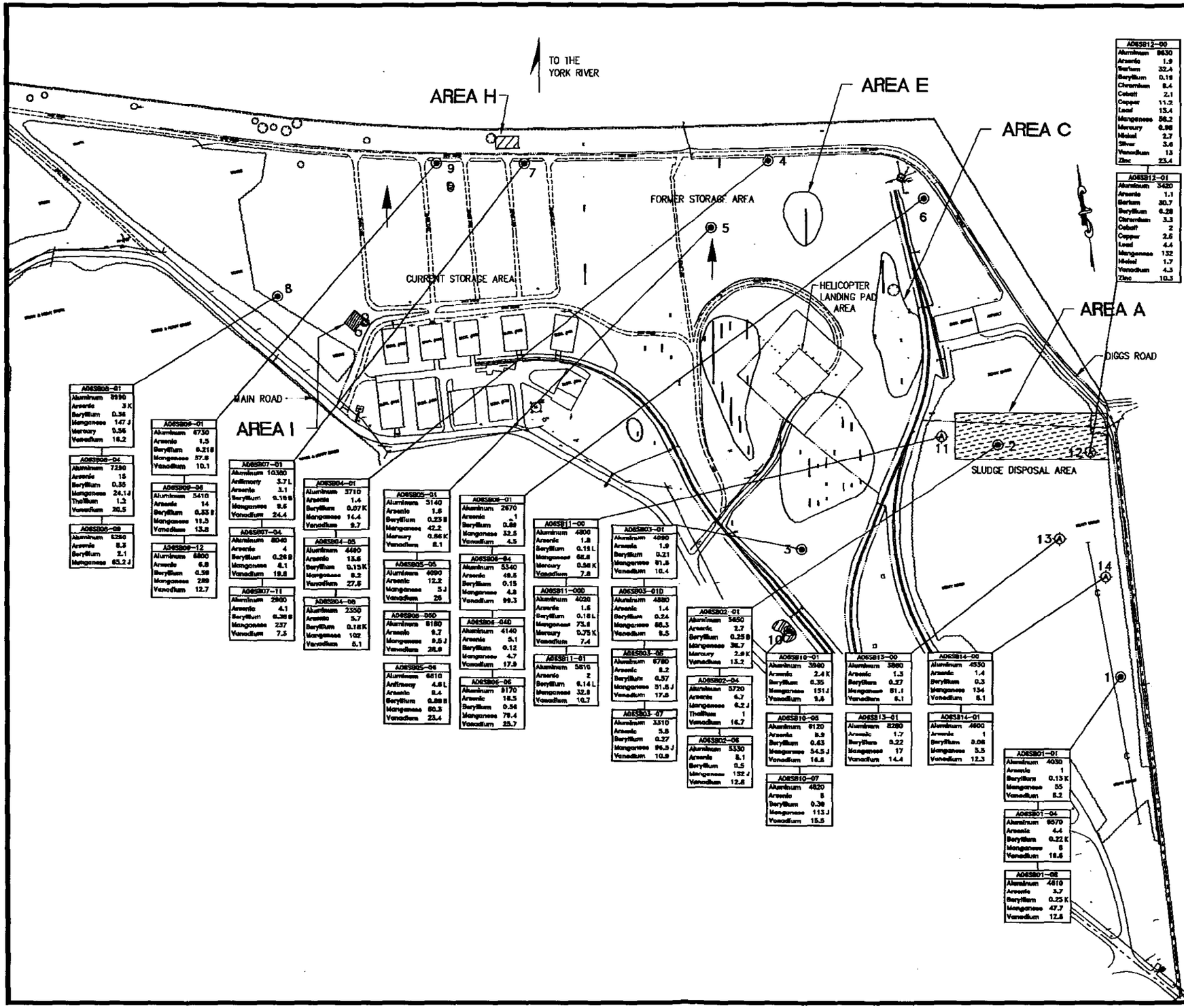
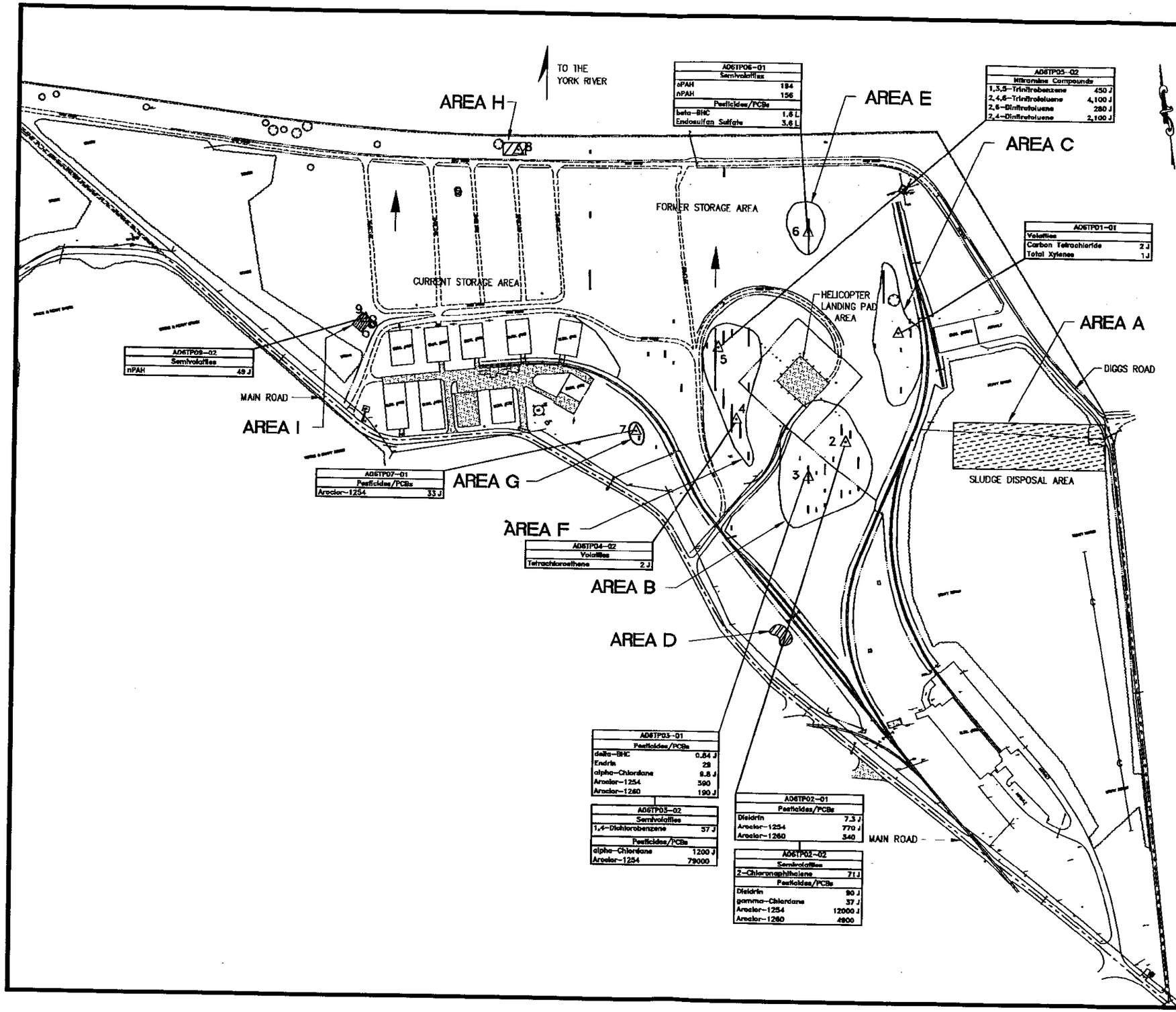
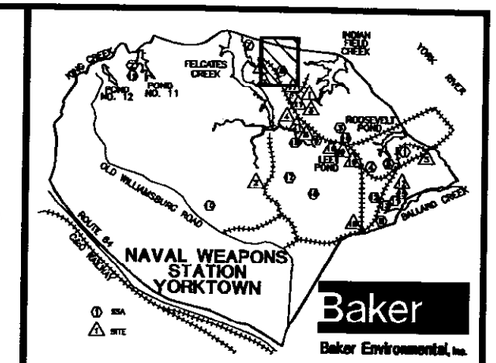


FIGURE 5-14
POSITIVE DETECTIONS OF INORGANIC ANALYTES IN SUBSURFACE SOIL
SSA 6
AVIATION FIELD AND ENVIRONS

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA





300 0 150 300
1 inch = 300 ft.

LEGEND

- CONCRETE
- TREE
- RAILROAD TRACKS
- DITCH OR SWALE
- EDGE OF PAVEMENT
- STRUCTURE
- BURIED METALLIC OBJECT/DEBRIS
- APPROXIMATE LIMITS OF DISPOSAL AREAS EXHIBITING GREATER AMOUNTS OF DEBRIS. TYPICAL DEPTH RANGE OF 0-3' AS DETERMINED FROM RADAR DATA.
- APPROXIMATE AREA OF BLACK SLUDGE-LIKE MATERIAL
- APPROXIMATE AREA OF UNIDENTIFIED BURIED MATERIALS
- APPROXIMATE AREA OF BURIED ROCKET ENGINES
- APPROXIMATE EXTENT OF FORMER SLUDGE DISPOSAL AREA
- GEOPHYSICAL TRAVERSE EXHIBITING HIGH CONDUCTIVITY
- 3 △ TEST PIT LOCATION
- SITE SCREENING AREA BOUNDRY
- ASSUMED GROUNDWATER FLOW DIRECTION
- J ESTIMATED CONCENTRATION
- L BIASED LOW
- COMPOUND CONCENTRATIONS EXPRESSED IN ug/Kg.
- cPAH POLYCYCLIC AROMATIC HYDROCARBONS (CARCINOGENS)
- nPAH POLYCYCLIC AROMATIC HYDROCARBONS (NON-CARCINOGENS)

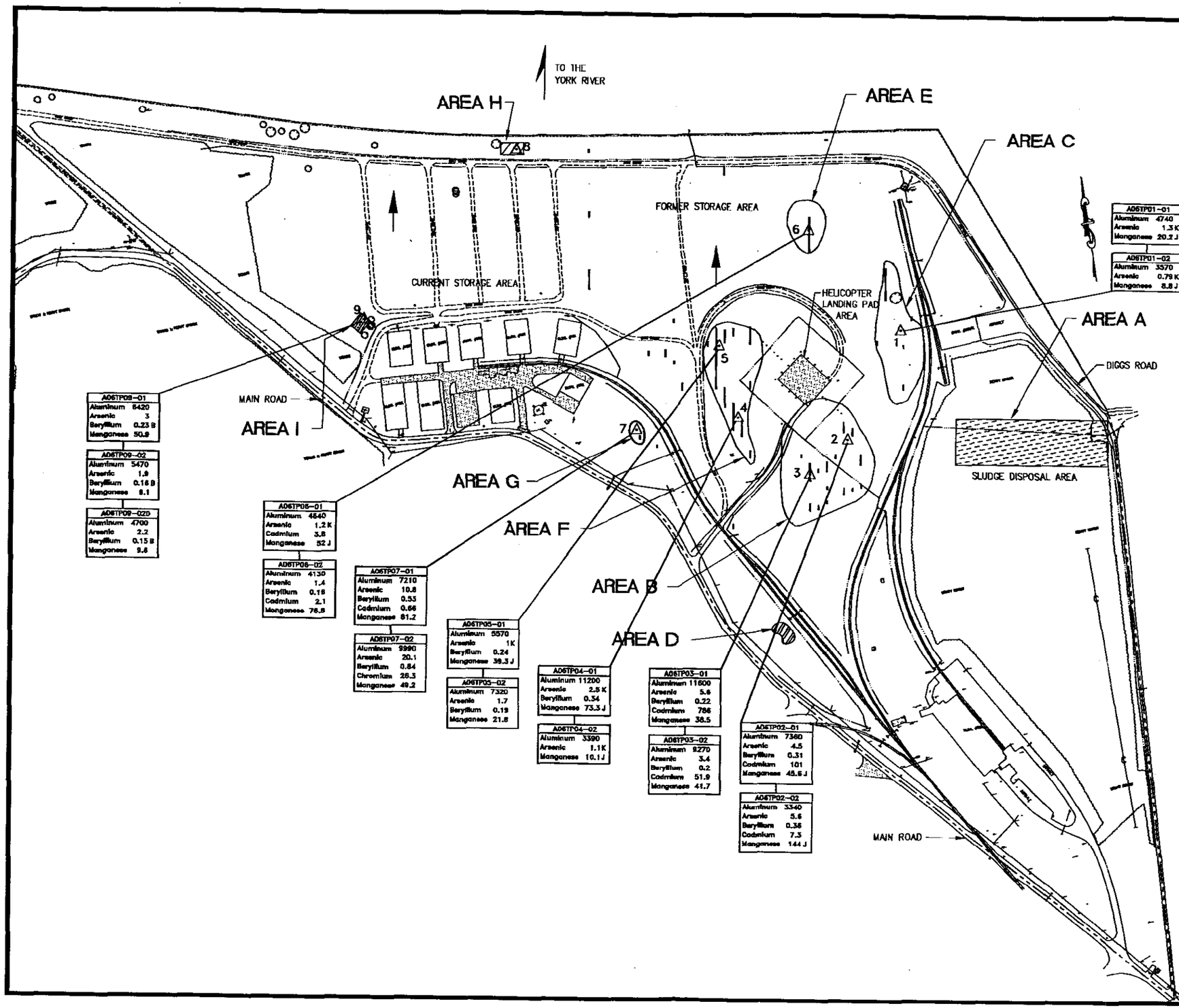
NOTE:
SOIL SAMPLING LOCATIONS SHOWN WITHOUT CONCENTRATIONS INDICATES NON-DETECTABLE LEVELS. SEE TABLES IN TEXT.

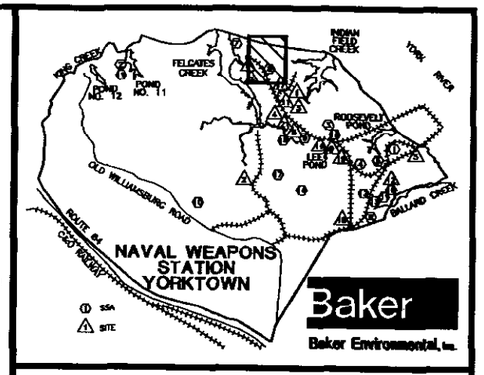
NOTE:
ALL SAMPLE NUMBERS ARE IDENTIFIED WITH THE FOLLOWING PREFIXE:
A06TP - SUBSURFACE SOIL SAMPLES

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 22026235

FIGURE 5-15
POSITIVE DETECTIONS OF SELECT ORGANIC COMPOUNDS IN SOIL-TEST PITS
SSA 6
AVIATION FIELD AND ENVIRONS

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA





300 0 150 300
1 inch = 300 ft.

LEGEND

- CONCRETE
- TREE
- RAILROAD TRACKS
- DITCH OR SWALE
- EDGE OF PAVEMENT
- STRUCTURE
- BURIED METALLIC OBJECT/DEBRIS
- APPROXIMATE LIMITS OF DISPOSAL AREAS EXHIBITING GREATER AMOUNTS OF DEBRIS. TYPICAL DEPTH RANGE OF 0–3' AS DETERMINED FROM RADAR DATA.
- APPROXIMATE AREA OF BLACK SLUDGE-LIKE MATERIAL
- APPROXIMATE AREA OF UNIDENTIFIED BURIED MATERIALS
- APPROXIMATE AREA OF BURIED ROCKET ENGINES
- APPROXIMATE EXTENT OF FORMER SLUDGE DISPOSAL AREA
- GEOPHYSICAL TRAVERSE EXHIBITING HIGH CONDUCTIVITY
- 3 TEST PIT LOCATION
- SITE SCREENING AREA BOUNDRY
- ASSUMED GROUNDWATER FLOW DIRECTION

DATA QUALIFIERS

- B CONTAMINANT DETECTED IN BLANK
- J ESTIMATED CONCENTRATION
- K BIASED HIGH
- L BIASED LOW

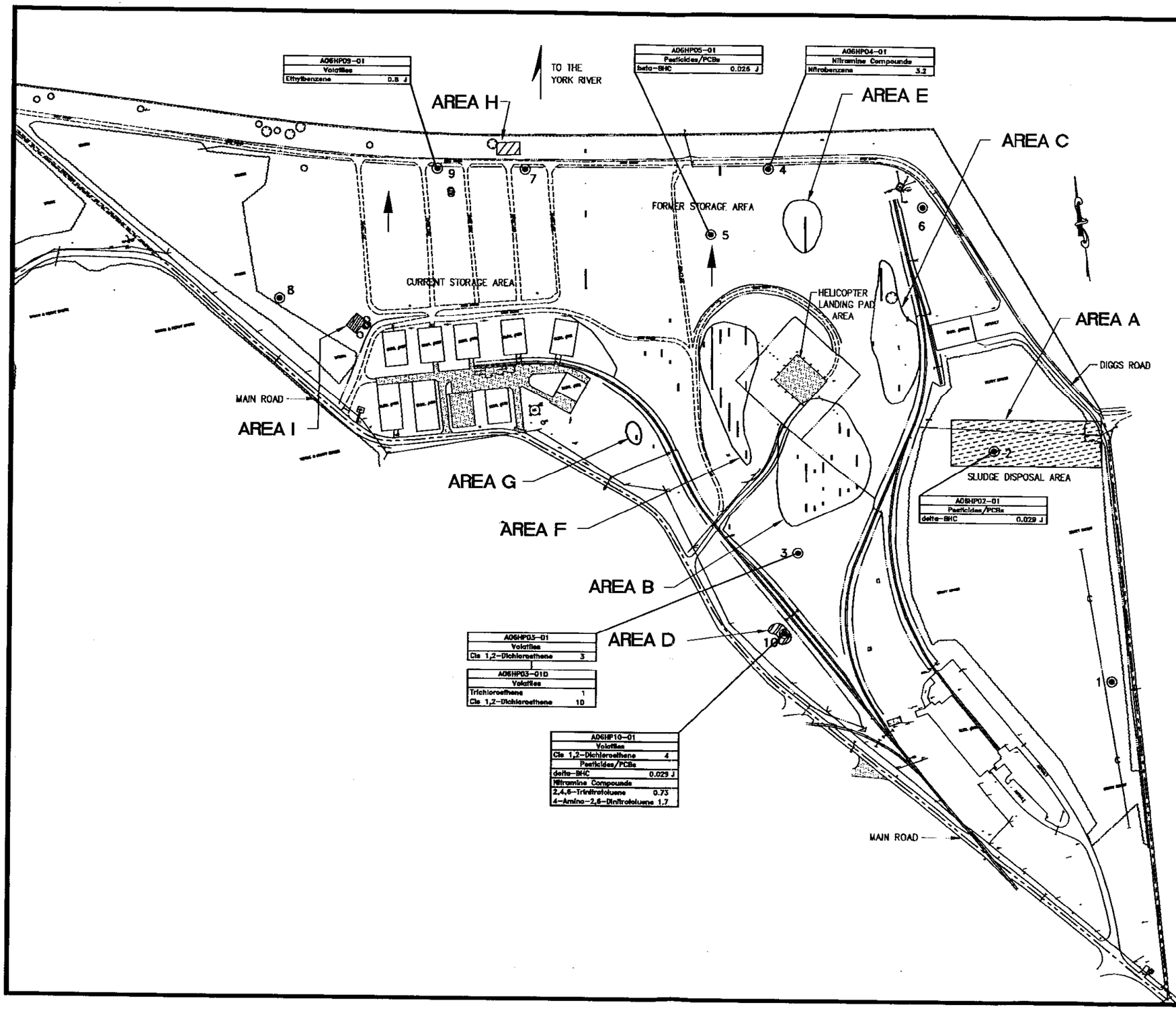
ANALYTE CONCENTRATIONS EXPRESSED IN Mg/Kg.

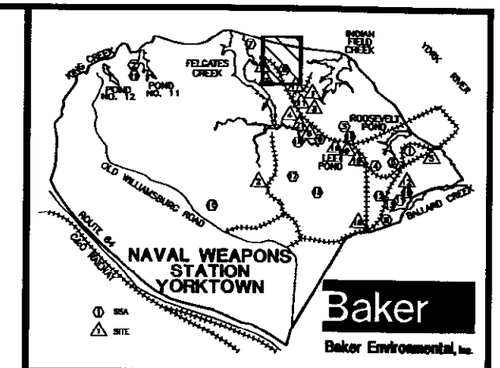
NOTE:
ALL SAMPLE NUMBERS ARE IDENTIFIED WITH THE FOLLOWING PREFIXE:
A06TP – TEST PIT SOIL SAMPLES

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 22825355

FIGURE 5-16
POSITIVE DETECTIONS OF SELECT INORGANIC ANALYTES IN SOIL-TEST PITS
SSA 6
AVIATION FIELD AND ENVIRONS

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA





300 0 150 300
1 inch = 300 ft.

LEGEND

- CONCRETE
- TREE
- RAILROAD TRACKS
- DITCH OR SWALE
- EDGE OF PAVEMENT
- STRUCTURE
- BURIED METALLIC OBJECT/DEBRIS
- APPROXIMATE LIMITS OF DISPOSAL AREAS EXHIBITING GREATER AMOUNTS OF DEBRIS. TYPICAL DEPTH RANGE OF 0-3' AS DETERMINED FROM RADAR DATA.
- APPROXIMATE AREA OF BLACK SLUDGE-LIKE MATERIAL
- APPROXIMATE AREA OF UNIDENTIFIED BURIED MATERIALS
- APPROXIMATE AREA OF BURIED ROCKET ENGINES
- APPROXIMATE EXTENT OF FORMER SLUDGE DISPOSAL AREA
- GEOPHYSICAL TRAVERSE EXHIBITING HIGH CONDUCTIVITY
- 1 SOIL BORING/TEMPORARY PIEZOMETER LOCATION
- SITE SCREENING AREA BOUNDRY
- ASSUMED GROUNDWATER FLOW DIRECTION
- J ESTIMATED CONCENTRATION
- COMPOUND CONCENTRATIONS EXPRESSED IN ug/L

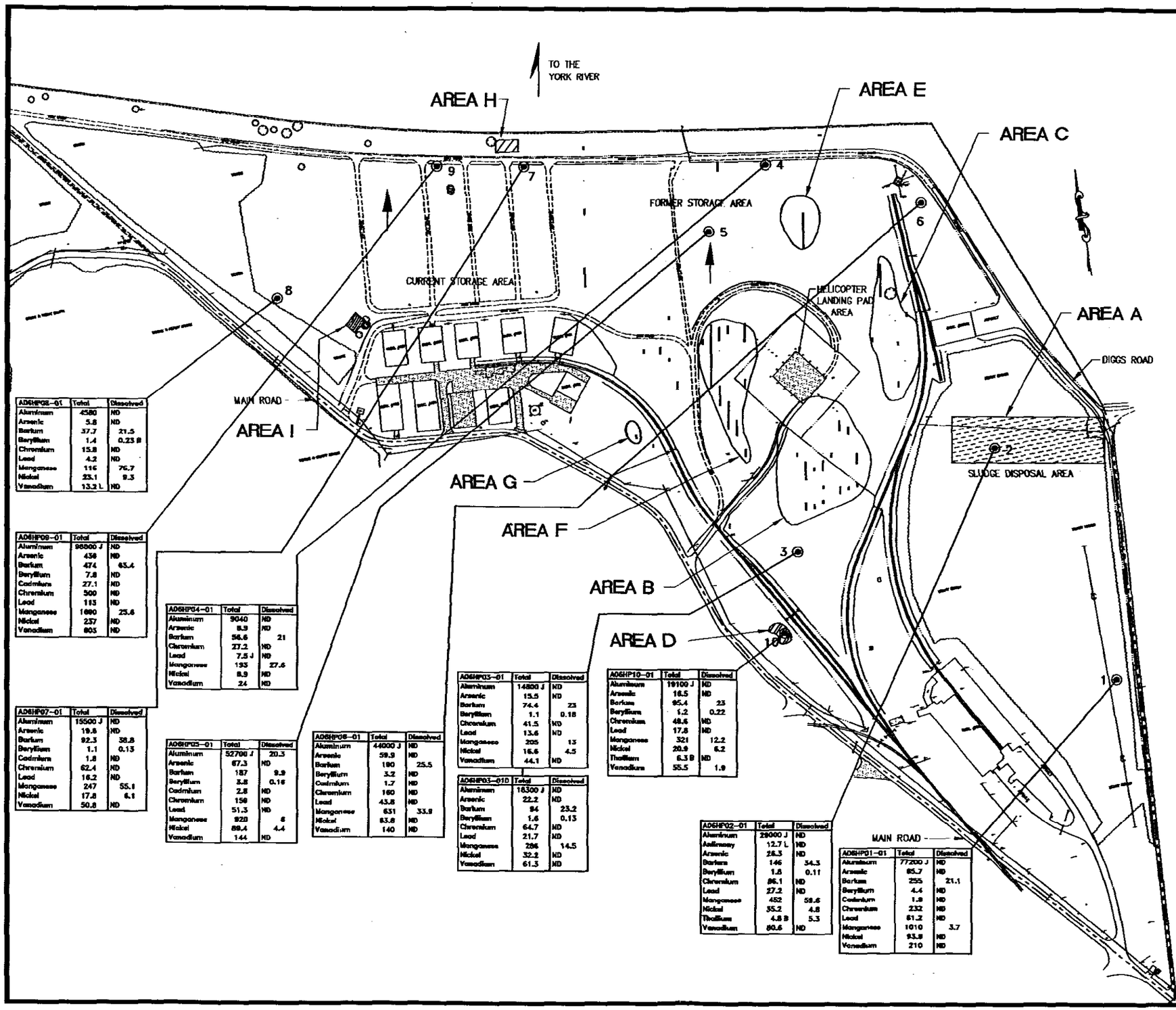
NOTE:
GROUNDWATER SAMPLING LOCATIONS SHOWN WITHOUT CONCENTRATIONS INDICATES NON-DETECTABLE LEVELS. SEE TABLES IN TEXT.

ALL SAMPLE NUMBERS ARE IDENTIFIED WITH THE FOLLOWING PREFIX:
AO6HP - TEMPORARY PIEZOMETER SAMPLES

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 22820455

FIGURE 5-17
POSITIVE DETECTIONS OF ORGANIC COMPOUNDS IN GROUNDWATER
SSA 6
AVIATION FIELD AND ENVIRONS

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



A06HP08-01	Total	Dissolved
Aluminum	4580	ND
Arsenic	5.8	ND
Barium	37.7	21.5
Beryllium	1.4	0.23 B
Chromium	15.8	ND
Lead	4.2	ND
Manganese	116	76.7
Nickel	23.1	9.3
Vanadium	13.2 L	ND

A06HP09-01	Total	Dissolved
Aluminum	98500 J	ND
Arsenic	436	ND
Barium	474	65.4
Beryllium	7.8	ND
Cadmium	27.1	ND
Chromium	500	ND
Lead	113	ND
Manganese	1690	25.6
Nickel	237	ND
Vanadium	803	ND

A06HP04-01	Total	Dissolved
Aluminum	9040	ND
Arsenic	8.9	ND
Barium	56.6	21
Chromium	27.2	ND
Lead	7.5 J	ND
Manganese	193	27.6
Nickel	8.9	ND
Vanadium	24	ND

A06HP07-01	Total	Dissolved
Aluminum	15500 J	ND
Arsenic	19.8	ND
Barium	92.3	38.8
Beryllium	1.1	0.13
Cadmium	1.8	ND
Chromium	62.4	ND
Lead	16.2	ND
Manganese	247	55.1
Nickel	17.8	6.1
Vanadium	50.8	ND

A06HP05-01	Total	Dissolved
Aluminum	52700 J	20.3
Arsenic	67.3	ND
Barium	187	9.9
Beryllium	3.8	0.16
Cadmium	2.8	ND
Chromium	158	ND
Lead	51.3	ND
Manganese	920	8
Nickel	89.4	4.4
Vanadium	144	ND

A06HP06-01	Total	Dissolved
Aluminum	44000 J	ND
Arsenic	59.9	ND
Barium	190	25.5
Beryllium	3.2	ND
Cadmium	1.7	ND
Chromium	160	ND
Lead	43.8	ND
Manganese	631	33.8
Nickel	83.8	ND
Vanadium	140	ND

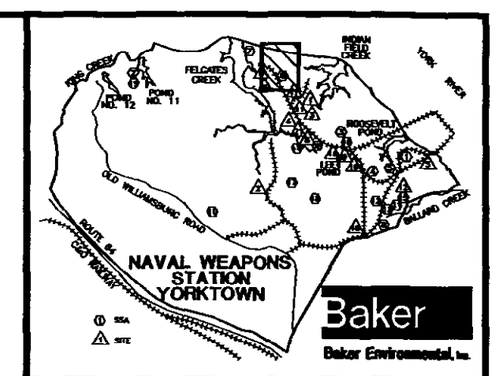
A06HP03-01	Total	Dissolved
Aluminum	14800 J	ND
Arsenic	15.5	ND
Barium	74.4	23
Beryllium	1.1	0.18
Chromium	41.5	ND
Lead	13.6	ND
Manganese	205	13
Nickel	16.6	4.5
Vanadium	44.1	ND

A06HP03-01D	Total	Dissolved
Aluminum	18300 J	ND
Arsenic	22.2	ND
Barium	94	23.2
Beryllium	1.6	0.13
Chromium	64.7	ND
Lead	21.7	ND
Manganese	286	14.5
Nickel	32.2	ND
Vanadium	61.3	ND

A06HP10-01	Total	Dissolved
Aluminum	19100 J	ND
Arsenic	16.5	ND
Barium	95.4	23
Beryllium	1.2	0.22
Chromium	48.6	ND
Lead	17.8	ND
Manganese	321	12.2
Nickel	20.9	6.2
Thallium	6.3 B	ND
Vanadium	55.5	1.9

A06HP02-01	Total	Dissolved
Aluminum	29000 J	ND
Antimony	12.7 L	ND
Arsenic	26.3	ND
Barium	146	34.3
Beryllium	1.8	0.11
Chromium	86.1	ND
Lead	27.2	ND
Manganese	452	58.6
Nickel	35.2	4.8
Thallium	4.8 B	5.3
Vanadium	80.6	ND

A06HP01-01	Total	Dissolved
Aluminum	77200 J	ND
Arsenic	85.7	ND
Barium	255	21.1
Beryllium	4.4	ND
Cadmium	1.8	ND
Chromium	232	ND
Lead	61.2	ND
Manganese	1010	3.7
Nickel	93.8	ND
Vanadium	210	ND



300 0 150 300
1 inch = 300 ft.

LEGEND

- CONCRETE
- TREE
- RAILROAD TRACKS
- DITCH OR SWALE
- EDGE OF PAVEMENT
- STRUCTURE
- BURIED METALLIC OBJECT/DEBRIS
- APPROXIMATE LIMITS OF DISPOSAL AREAS EXHIBITING GREATER AMOUNTS OF DEBRIS. TYPICAL DEPTH RANGE OF 0-3' AS DETERMINED FROM RADAR DATA.
- APPROXIMATE AREA OF BLACK SLUDGE-LIKE MATERIAL
- APPROXIMATE AREA OF UNIDENTIFIED BURIED MATERIALS
- APPROXIMATE AREA OF BURIED ROCKET ENGINES
- APPROXIMATE EXTENT OF FORMER SLUDGE DISPOSAL AREA
- GEOPHYSICAL TRAVERSE EXHIBITING HIGH CONDUCTIVITY
- 1 SOIL BORING/HydraPunch® LOCATION
- SITE SCREENING AREA BOUNDRY
- ASSUMED GROUNDWATER FLOW DIRECTION

DATA QUALIFIERS

- B — CONTAMINANT DETECTED IN BLANK
- J — ESTIMATED CONCENTRATION
- L — BIASED LOW
- ND — NOT DETECTED

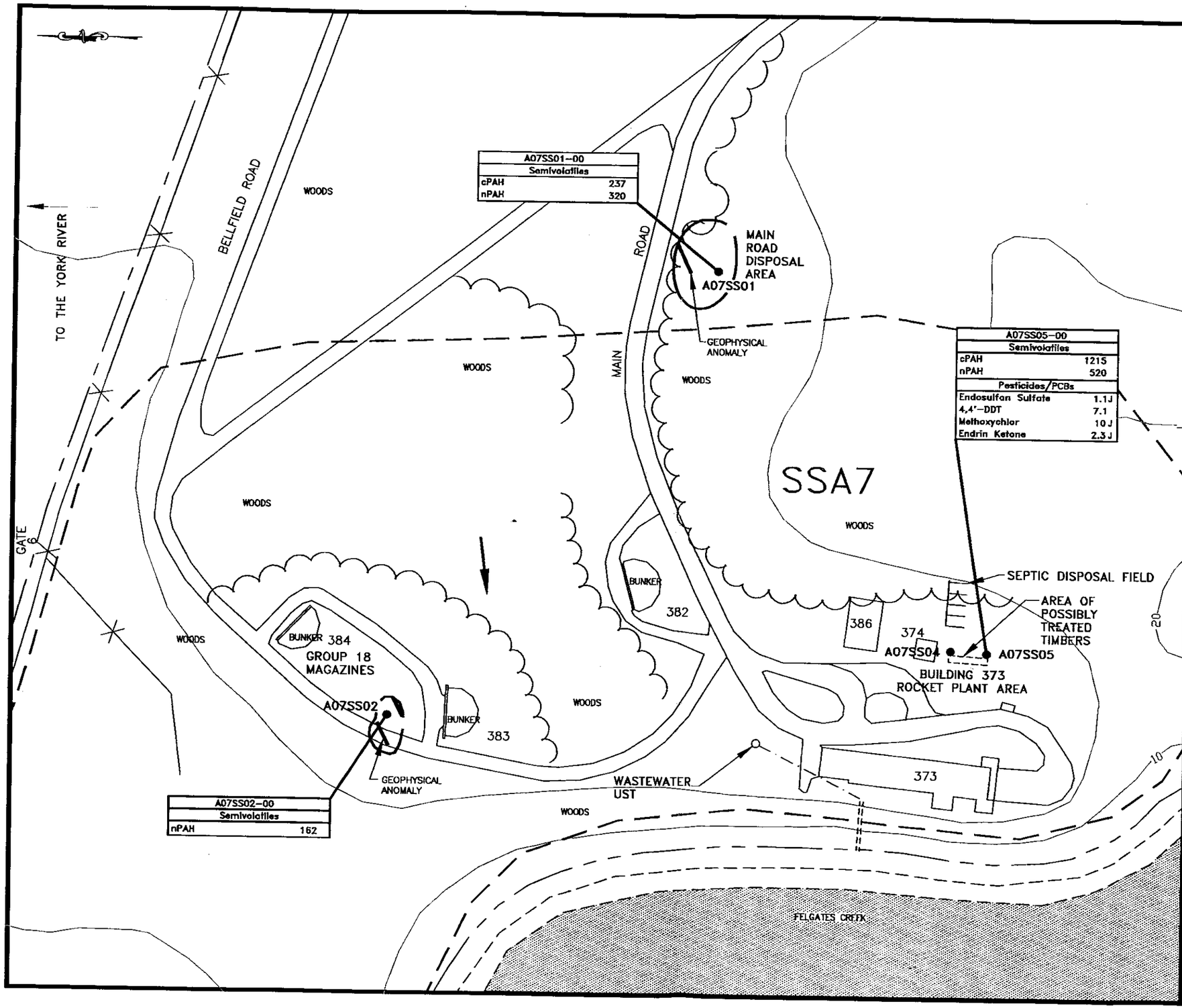
ANALYTE CONCENTRATIONS EXPRESSED IN ug/L

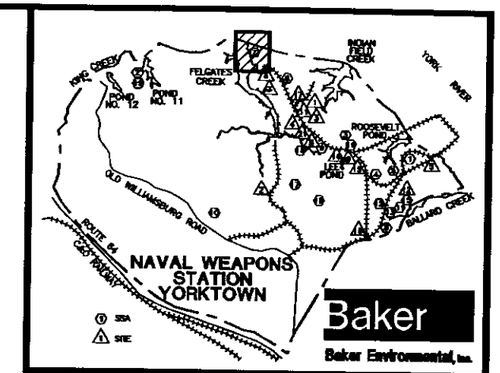
NOTE:
ALL SAMPLE NUMBERS ARE IDENTIFIED WITH THE FOLLOWING PREFIXES:
A06HP – HydraPunch® SAMPLES

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 2282505S

FIGURE 5-18
POSITIVE DETECTIONS OF SELECT INORGANIC ANALYTES IN GROUNDWATER SSA 6 AVIATION FIELD AND ENVIRONS

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA





100 0 50 100
1 inch = 100 ft.

LEGEND

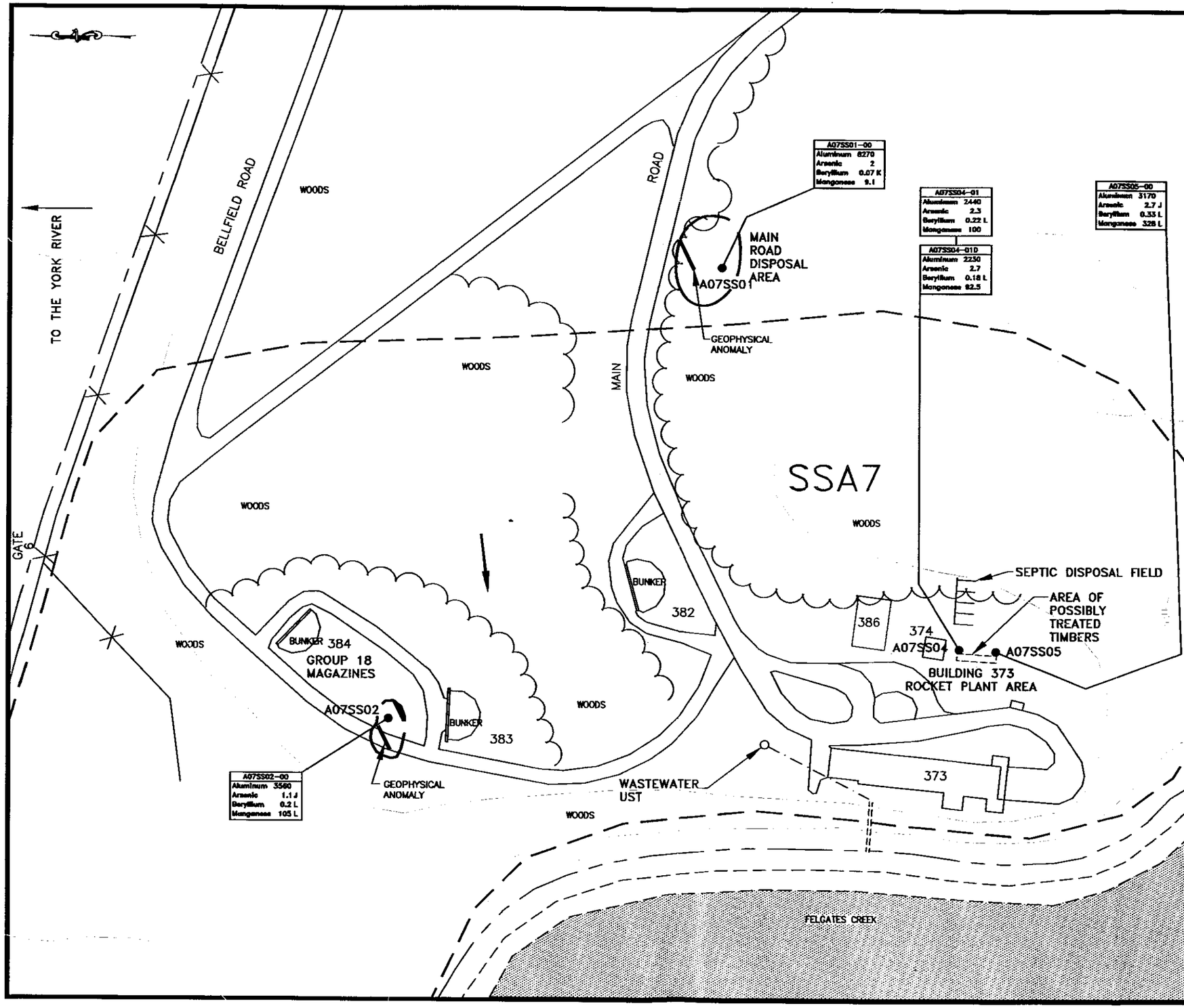
- WOODS
- FENCE
- EDGE OF PAVEMENT
- STRUCTURE
- APPROXIMATE LIMITS OF DISPOSAL AREAS EXHIBITING GREATER AMOUNTS OF DEBRIS. TYPICAL DEPTH RANGE OF 0–4' AS DETERMINED FROM RADAR DATA.
- SITE SCREENING AREA BOUNDARY
- BUILDING 373 FORMER DISCHARGE LINE
- BUILDING 373 FORMER UST PIPING
- 20 GROUND SURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)
- A07S01 SURFACE SOIL SAMPLE LOCATION
- ASSUMED GROUNDWATER FLOW DIRECTION
- J ESTIMATED CONCENTRATION
- COMPOUND CONCENTRATIONS EXPRESSED IN ug/Kg.
- cPAH POLYCYCLIC AROMATIC HYDROCARBONS (CARCINOGENS)
- nPAH POLYCYCLIC AROMATIC HYDROCARBONS (NON–CARCINOGENS)

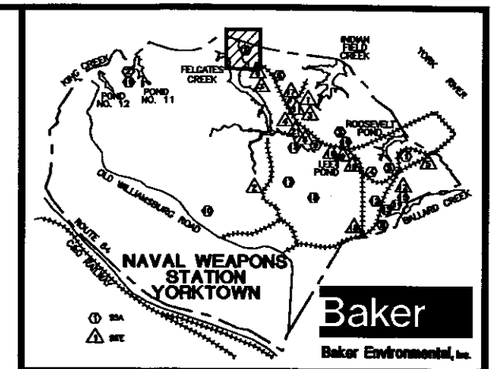
NOTE:
SURFACE SOIL SAMPLING LOCATIONS SHOWN WITHOUT CONCENTRATIONS INDICATES NON–DETECTABLE LEVELS. SEE TABLES IN TEXT.

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 22825855

FIGURE 5–19
POSITIVE DETECTIONS OF SELECT ORGANIC COMPOUNDS IN SURFACE SOIL
SSA 7–BUILDING 373 ROCKET PLANT AREA/GROUP 18 MAGAZINES/ MAIN ROAD DISPOSAL AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA





100 0 50 100
1 inch = 100 ft.

LEGEND

- WOODS
- FENCE
- EDGE OF PAVEMENT
- STRUCTURE
- APPROXIMATE LIMITS OF DISPOSAL AREAS EXHIBITING GREATER AMOUNTS OF DEBRIS. TYPICAL DEPTH RANGE OF 0–4' AS DETERMINED FROM RADAR DATA.
- SITE SCREENING AREA BOUNDARY
- BUILDING 373 FORMER DISCHARGE LINE
- BUILDING 373 FORMER UST PIPING
- A07SS01 SURFACE SOIL SAMPLE LOCATION
- ASSUMED GROUNDWATER FLOW DIRECTION
- GROUND SURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)

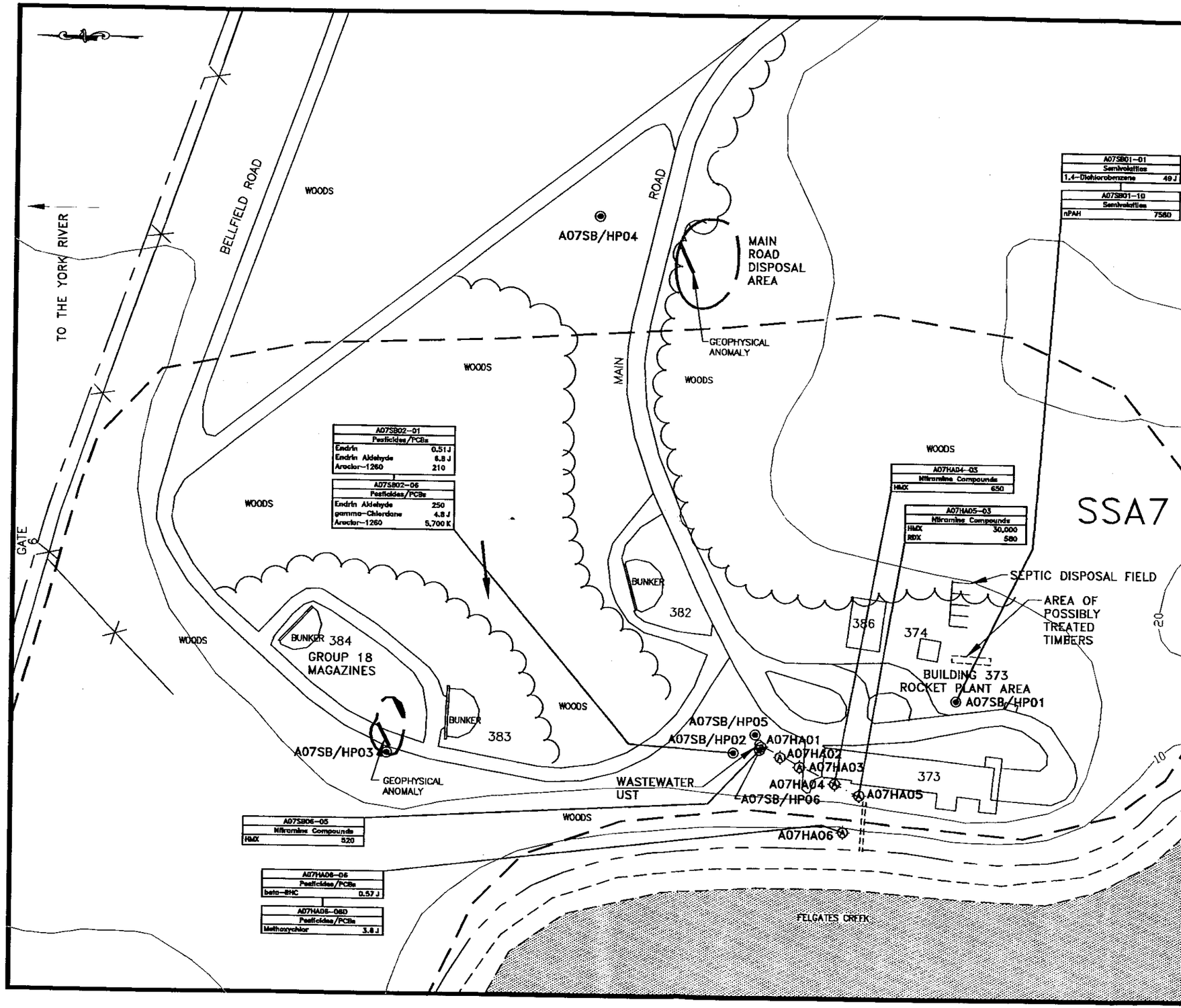
DATA QUALIFIERS

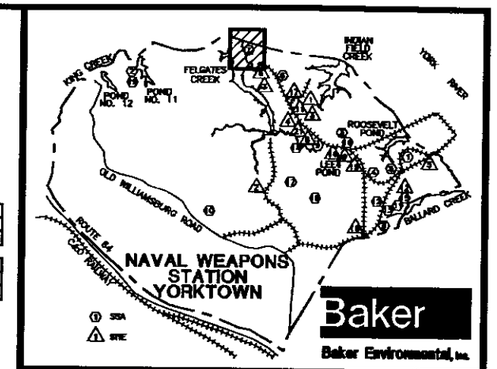
- J ESTIMATED CONCENTRATION
- K BIASED HIGH
- L BIASED LOW

ANALYTE CONCENTRATIONS EXPRESSED IN Mg/Kg.

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 22825755

FIGURE 5-20
POSITIVE DETECTIONS OF SELECT INORGANIC ANALYTES IN SURFACE SOIL SSA 7-BUILDING 373 ROCKET PLANT AREA/GROUP 18 MAGAZINES/ MAIN ROAD DISPOSAL AREA
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA





100 0 50 100
1 inch = 100 ft.

LEGEND

- WOODS
- FENCE
- EDGE OF PAVEMENT
- STRUCTURE
- APPROXIMATE LIMITS OF DISPOSAL AREAS EXHIBITING GREATER AMOUNTS OF DEBRIS. TYPICAL DEPTH RANGE OF 0–4' AS DETERMINED FROM RADAR DATA.
- SITE SCREENING AREA BOUNDARY
- BUILDING 373 FORMER DISCHARGE LINE
- BUILDING 373 FORMER UST PIPING
- 20 GROUND SURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)

A07SB/HP01 SOIL BORING/TEMPORARY PIEZOMETER LOCATION

A07SB05 HAND AUGER LOCATION

ASSUMED GROUNDWATER FLOW DIRECTION

J ESTIMATED CONCENTRATION

K BIASED HIGH

COMPOUND CONCENTRATIONS EXPRESSED IN ug/Kg.

cPAH POLYCYCLIC AROMATIC HYDROCARBONS (CARCINOGENS)

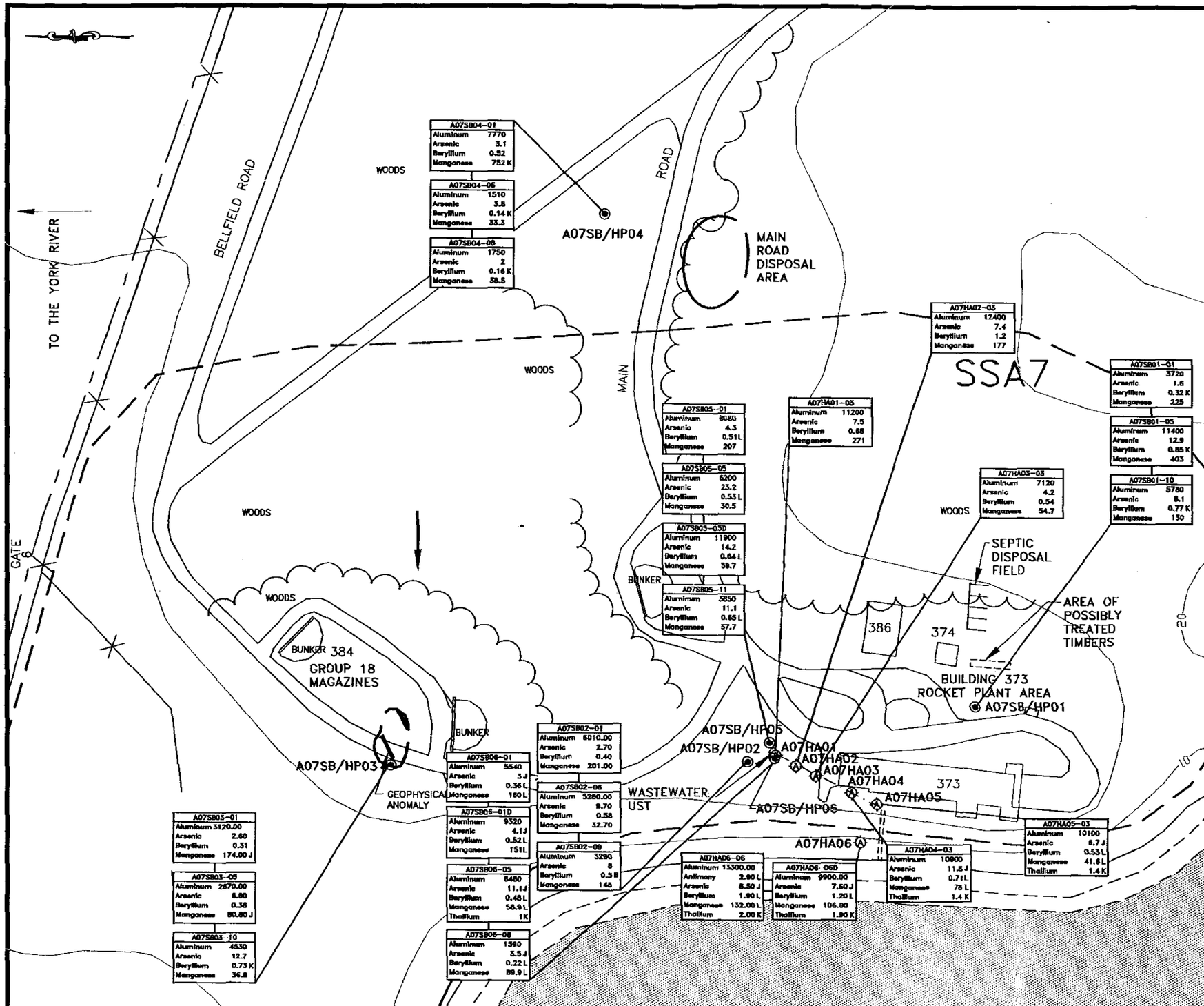
nPAH POLYCYCLIC AROMATIC HYDROCARBONS (NON-CARCINOGENS)

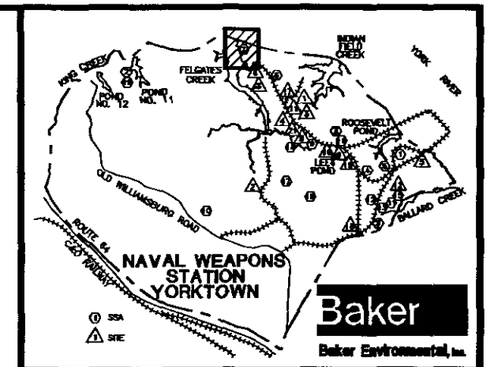
NOTE:
SUBSURFACE SOIL SAMPLING LOCATIONS SHOWN WITHOUT CONCENTRATIONS INDICATES NON-DETECTABLE LEVELS. SEE TABLES IN TEXT.

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 22625655

FIGURE 5-21
POSITIVE DETECTIONS OF SELECT ORGANIC COMPOUNDS IN SUBSURFACE SOIL SSA 7-BUILDING 373 ROCKET PLANT AREA/GROUP 18 MAGAZINES/ MAIN ROAD DISPOSAL AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA





100 0 50 100
1 inch = 100 ft.

LEGEND

- WOODS
- FENCE
- EDGE OF PAVEMENT
- STRUCTURE
- BURIED METALLIC OBJECT/DEBRIS
- APPROXIMATE LIMITS OF DISPOSAL AREAS EXHIBITING GREATER AMOUNTS OF DEBRIS. TYPICAL DEPTH RANGE OF 0–4' AS DETERMINED FROM RADAR DATA.
- SITE SCREENING AREA BOUNDARY
- BUILDING 373 FORMER DISCHARGE LINE
- BUILDING 373 FORMER UST PIPING
- A07SB/HP01 SOIL BORING/HYDROPUNCH LOCATION
- A07HA01 HAND AUGER LOCATION
- ASSUMED GROUNDWATER FLOW DIRECTION
- 20 GROUND SURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)

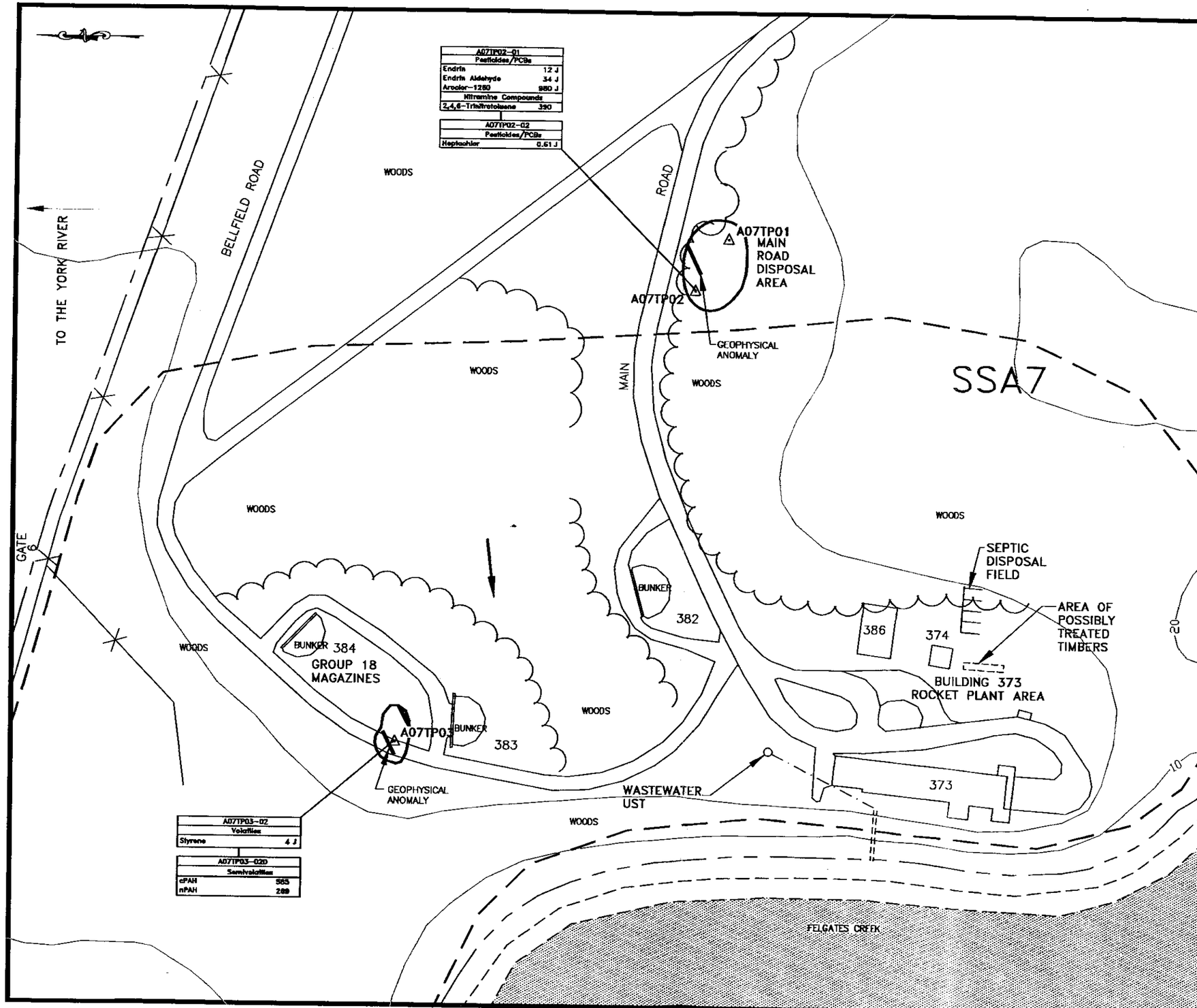
DATA QUALIFIERS

- B CONTAMINANT DETECTED IN BLANK
- J ESTIMATED CONCENTRATION
- K BIASED HIGH
- L BIASED LOW

ANALYTE CONCENTRATIONS EXPRESSED IN Mg/Kg.

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 22025455

FIGURE 5-22
POSITIVE DETECTIONS OF SELECT INORGANIC ANALYTES IN SUBSURFACE SOILS
SSA 7-BUILDING 373 ROCKET PLANT AREA/GROUP 18 MAGAZINES/ MAIN ROAD DISPOSAL AREA
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

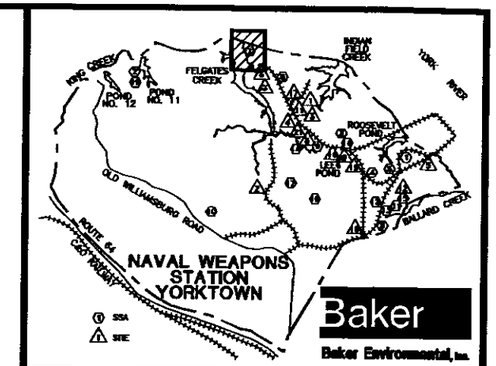


A07TP02-01	
Pesticides/PCBs	
Endrin	12 J
Endrin Aldehyde	34 J
Aroclor-1260	980 J
Nitramine Compounds	
2,4,6-Trinitrotoluene	390

A07TP02-02	
Pesticides/PCBs	
Heptachlor	0.61 J

A07TP03-02	
Volatiles	
Styrene	4 J

A07TP03-02D	
Semivolatiles	
cPAH	585
nPAH	289



100 0 50 100
1 inch = 100 ft.

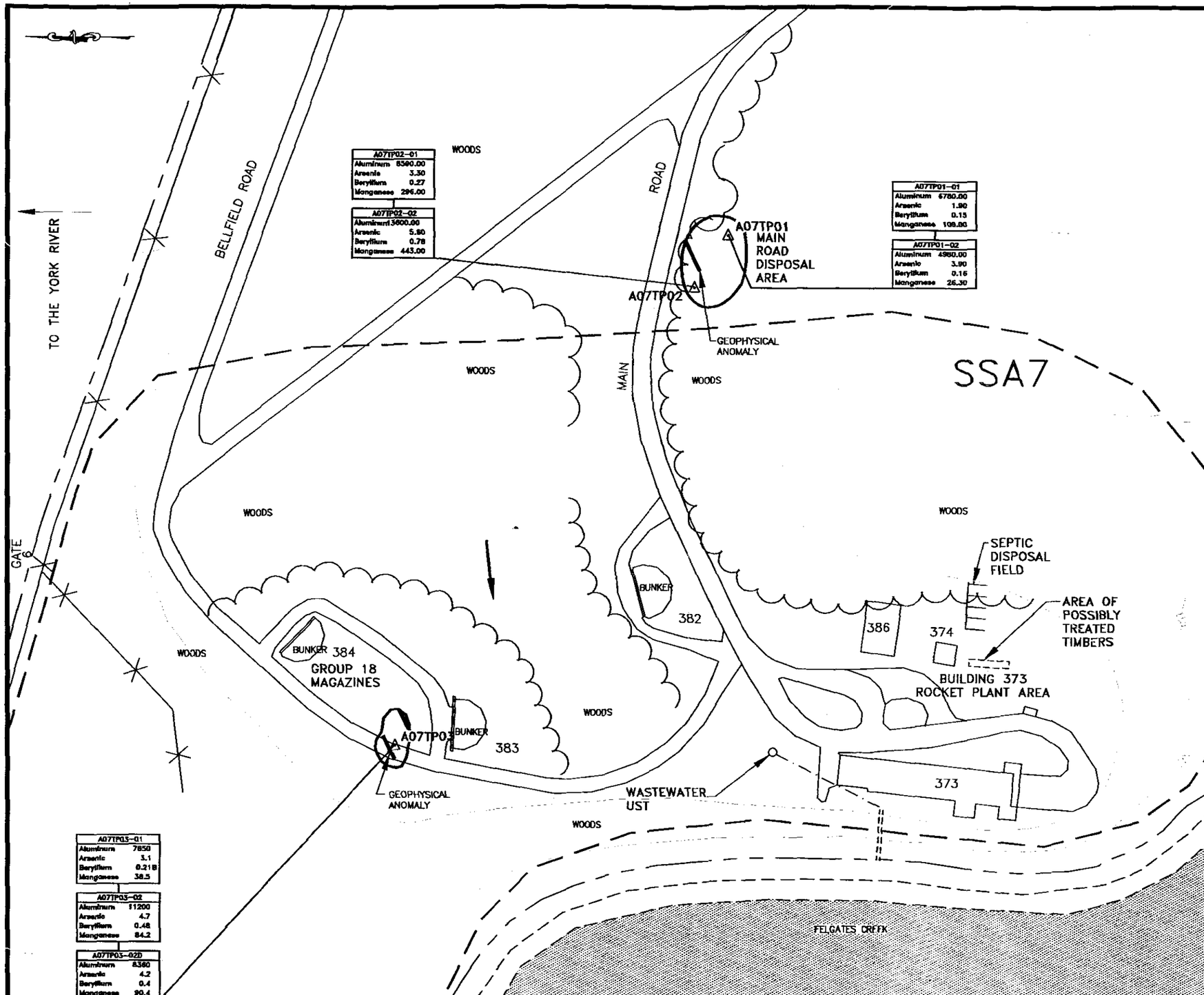
LEGEND

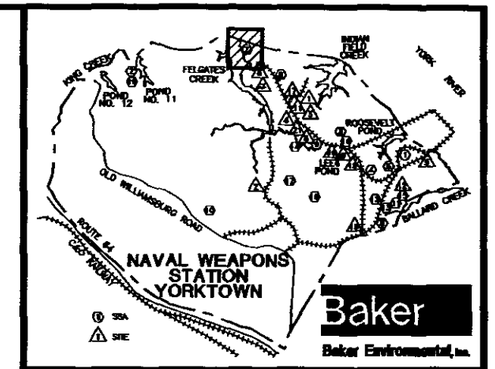
- WOODS
- FENCE
- EDGE OF PAVEMENT
- STRUCTURE
- APPROXIMATE LIMITS OF DISPOSAL AREAS EXHIBITING GREATER AMOUNTS OF DEBRIS. TYPICAL DEPTH RANGE OF 0-4' AS DETERMINED FROM RADAR DATA.
- SITE SCREENING AREA BOUNDARY
- BUILDING 373 FORMER DISCHARGE LINE
- BUILDING 373 FORMER UST PIPING
- 20 GROUND SURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)
- A07TP01 TEST PIT LOCATION
- ASSUMED GROUNDWATER FLOW DIRECTION
- J ESTIMATED CONCENTRATION
- COMPOUND CONCENTRATIONS EXPRESSED IN ug/Kg.
- cPAH POLYCYCLIC AROMATIC HYDROCARBONS (CARCINOGENS)
- nPAH POLYCYCLIC AROMATIC HYDROCARBONS (NON-CARCINOGENS)

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 22826055

FIGURE 5-23
POSITIVE DETECTIONS OF SELECT ORGANIC COMPOUNDS IN SUBSURFACE SOIL - TEST PITS SSA 7-BUILDING 373 ROCKET PLANT AREA/GROUP 18 MAGAZINES/ MAIN ROAD DISPOSAL AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA





100 0 50 100
1 inch = 100 ft.

LEGEND

- WOODS
- FENCE
- EDGE OF PAVEMENT
- STRUCTURE
- APPROXIMATE LIMITS OF DISPOSAL AREAS EXHIBITING GREATER AMOUNTS OF DEBRIS. TYPICAL DEPTH RANGE OF 0–4' AS DETERMINED FROM RADAR DATA.
- SITE SCREENING AREA BOUNDARY
- BUILDING 373 FORMER DISCHARGE LINE
- BUILDING 373 FORMER UST PIPING
- A07TP01 TEST PIT LOCATION
- ASSUMED GROUNDWATER FLOW DIRECTION
- GROUND SURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)

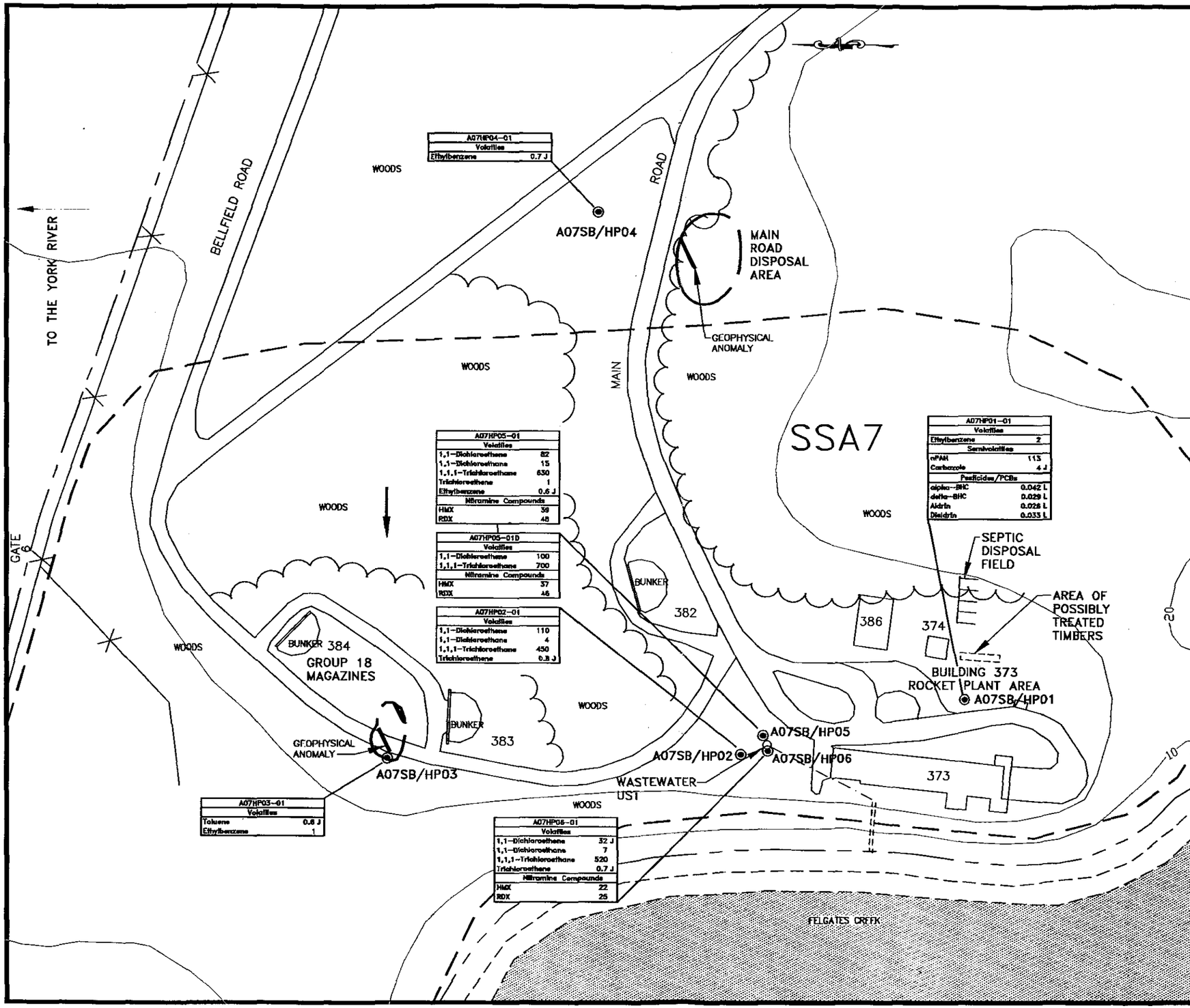
DATA QUALIFIERS

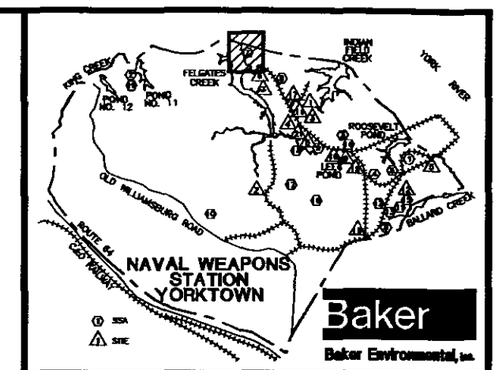
B CONTAMINANT DETECTED IN BLANK

ANALYTE CONCENTRATIONS EXPRESSED IN Mg/Kg.

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 22826135

FIGURE 5-24
POSITIVE DETECTIONS OF SELECT INORGANIC ANALYTES IN SUBSURFACE SOIL - TEST PITS SSA 7-BUILDING 373 ROCKET PLANT AREA/GROUP 18 MAGAZINES/ MAIN ROAD DISPOSAL AREA
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA





100 0 50 100
1 inch = 100 ft.

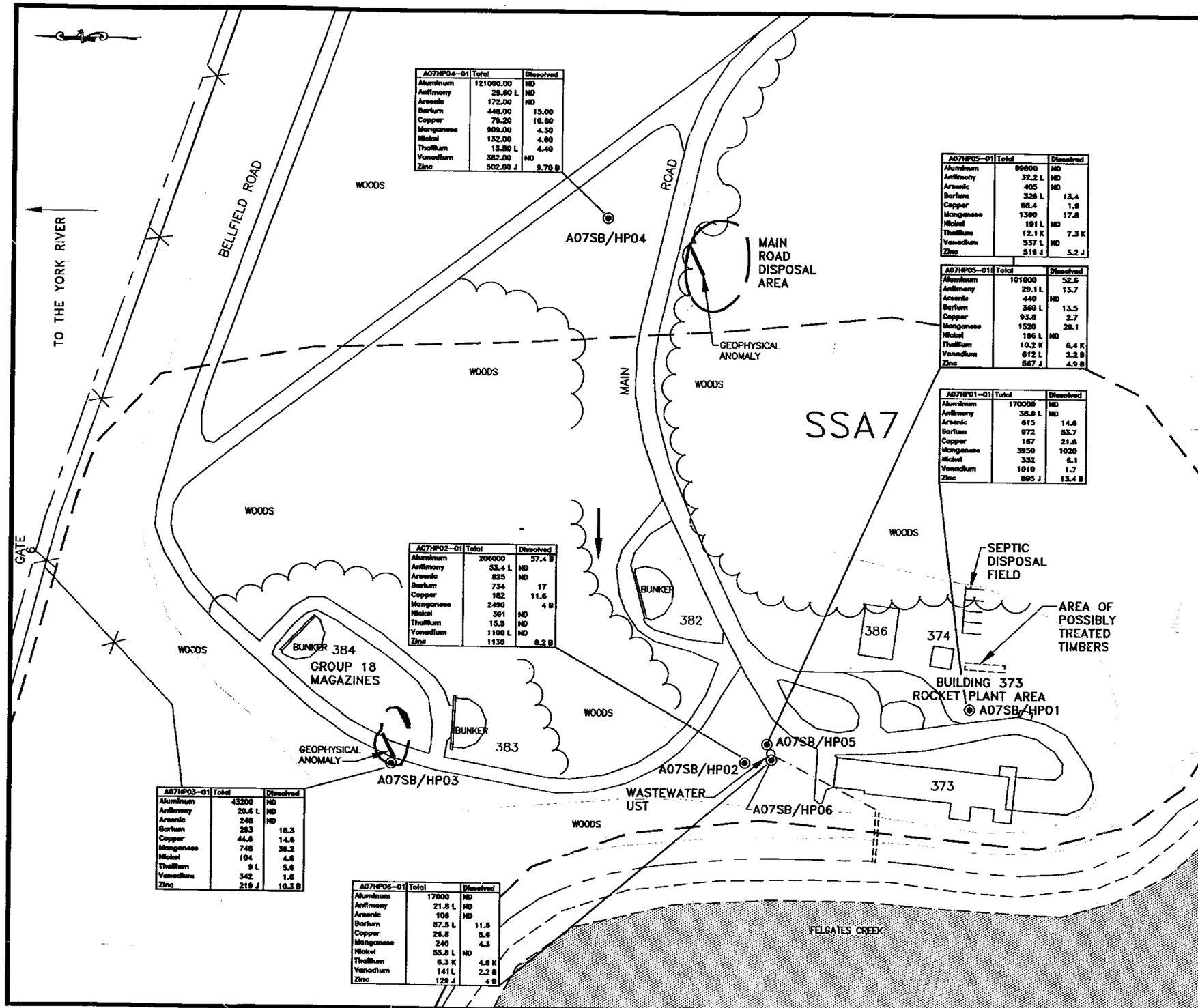
LEGEND

- WOODS
- FENCE
- EDGE OF PAVEMENT
- STRUCTURE
- APPROXIMATE LIMITS OF DISPOSAL AREAS EXHIBITING GREATER AMOUNTS OF DEBRIS. TYPICAL DEPTH RANGE OF 0-4' AS DETERMINED FROM RADAR DATA.
- SITE SCREENING AREA BOUNDARY
- BUILDING 373 FORMER DISCHARGE LINE
- BUILDING 373 FORMER UST PIPING
- 20 GROUND SURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)
- A07SB/HP01 SOIL BORING/HYDROPUNCH LOCATION
- ASSUMED GROUNDWATER FLOW DIRECTION
- J ESTIMATED CONCENTRATION
- L BIASED LOW
- COMPOUND CONCENTRATIONS EXPRESSED IN ug/L
- cPAH POLYCYCLIC AROMATIC HYDROCARBONS (CARCINOGENS)
- nPAH POLYCYCLIC AROMATIC HYDROCARBONS (NON-CARCINOGENS)

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 22826255

FIGURE 5-25
POSITIVE DETECTIONS OF SELECT ORGANIC COMPOUNDS IN GROUNDWATER
SSA 7-BUILDING 373 ROCKET PLANT AREA/GROUP 18 MAGAZINES/ MAIN ROAD DISPOSAL AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



A07HP04-01	Total	Dissolved
Aluminum	121000.00	ND
Antimony	29.60 L	ND
Arsenic	172.00	ND
Barium	448.00	15.00
Copper	79.20	10.80
Manganese	909.00	4.30
Nickel	152.00	4.60
Thallium	13.50 L	4.40
Vanadium	382.00	ND
Zinc	502.00 J	9.70 B

A07HP05-01	Total	Dissolved
Aluminum	89600	ND
Antimony	32.2 L	ND
Arsenic	405	ND
Barium	326 L	13.4
Copper	88.4	1.9
Manganese	1390	17.8
Nickel	191 L	ND
Thallium	12.1 K	7.3 K
Vanadium	537 L	ND
Zinc	519 J	3.2 J

A07HP05-01D	Total	Dissolved
Aluminum	101000	52.6
Antimony	28.1 L	13.7
Arsenic	440	ND
Barium	360 L	13.5
Copper	93.8	2.7
Manganese	1520	20.1
Nickel	196 L	ND
Thallium	10.2 K	6.4 K
Vanadium	612 L	2.2 B
Zinc	567 J	4.9 B

A07HP01-01	Total	Dissolved
Aluminum	170000	ND
Antimony	38.9 L	ND
Arsenic	615	14.6
Barium	972	53.7
Copper	187	21.8
Manganese	3850	1020
Nickel	332	6.1
Vanadium	1010	1.7
Zinc	885 J	13.4 B

A07HP02-01	Total	Dissolved
Aluminum	206000	57.4 B
Antimony	53.4 L	ND
Arsenic	825	ND
Barium	734	17
Copper	182	11.6
Manganese	2490	4 B
Nickel	391	ND
Thallium	15.5	ND
Vanadium	1100 L	ND
Zinc	1130	8.2 B

A07HP03-01	Total	Dissolved
Aluminum	43200	ND
Antimony	20.6 L	ND
Arsenic	248	ND
Barium	293	18.3
Copper	44.6	14.6
Manganese	748	39.2
Nickel	104	4.6
Thallium	9 L	5.6
Vanadium	342	1.5
Zinc	219 J	10.3 B

A07HP06-01	Total	Dissolved
Aluminum	17000	ND
Antimony	21.8 L	ND
Arsenic	106	ND
Barium	87.5 L	11.8
Copper	26.8	5.6
Manganese	240	4.3
Nickel	53.8 L	ND
Thallium	6.3 K	4.8 K
Vanadium	141 L	2.2 B
Zinc	129 J	4 B

100 0 50 100
1 inch = 100 ft.

LEGEND

- WOODS
- FENCE
- EDGE OF PAVEMENT
- STRUCTURE
- APPROXIMATE LIMITS OF DISPOSAL AREAS EXHIBITING GREATER AMOUNTS OF DEBRIS. TYPICAL DEPTH RANGE OF 0–4' AS DETERMINED FROM RADAR DATA.
- SITE SCREENING AREA BOUNDARY
- BUILDING 373 FORMER DISCHARGE LINE
- BUILDING 373 FORMER UST PIPING
- A07SB/HP01 SOIL BORING/HYDROPUNCH LOCATION
- ASSUMED GROUNDWATER FLOW DIRECTION
- GROUND SURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)

DATA QUALIFIERS

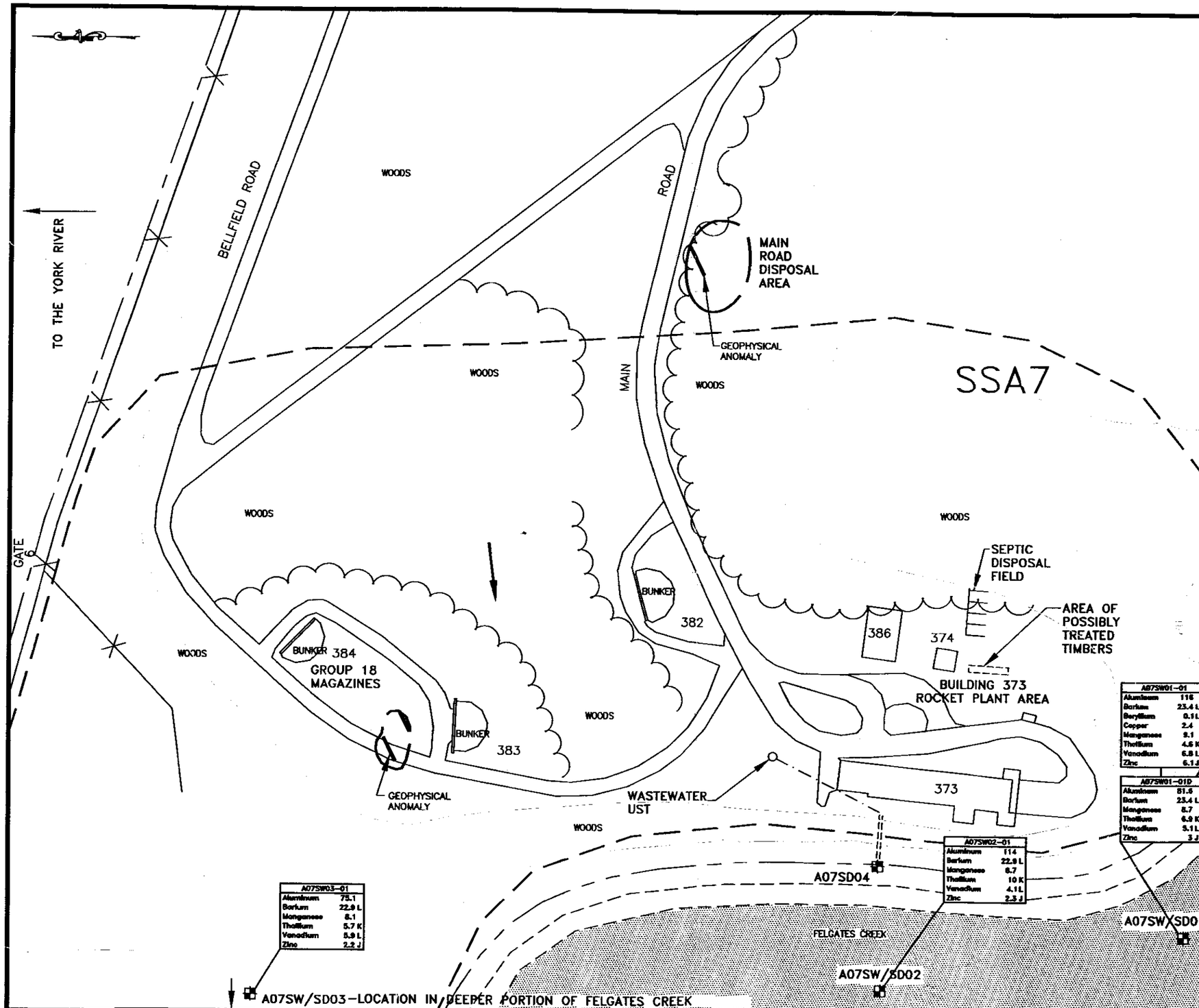
- B CONTAMINANT DETECTED IN BLANK
- J ESTIMATED CONCENTRATION
- K BIASED HIGH
- L BIASED LOW
- ND NOT DETECTED

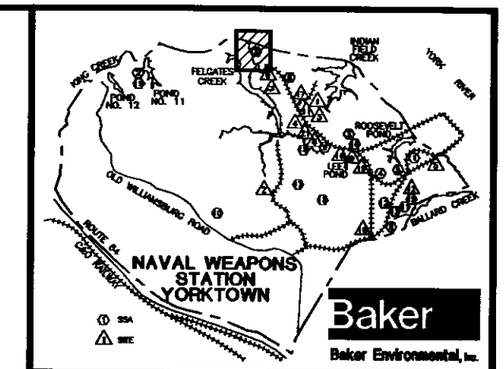
ANALYTE CONCENTRATIONS EXPRESSED IN ug/L

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 22826355

FIGURE 5-26
POSITIVE DETECTIONS OF SELECT INORGANIC ANALYTES IN GROUNDWATER SSA 7-BUILDING 373 ROCKET PLANT AREA/GROUP 18 MAGAZINES/ MAIN ROAD DISPOSAL AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA





100 0 50 100
1 inch = 100 ft.

LEGEND

- WOODS
- FENCE
- EDGE OF PAVEMENT
- STRUCTURE
- APPROXIMATE LIMITS OF DISPOSAL AREAS EXHIBITING GREATER AMOUNTS OF DEBRIS. TYPICAL DEPTH RANGE OF 0–4' AS DETERMINED FROM RADAR DATA.
- SITE SCREENING AREA BOUNDARY
- BUILDING 373 FORMER DISCHARGE LINE
- BUILDING 373 FORMER UST PIPING
- A07SW/SD03 SURFACE WATER/SEDIMENT SAMPLE LOCATION
- ASSUMED GROUNDWATER FLOW DIRECTION
- GROUND SURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)

DATA QUALIFIERS

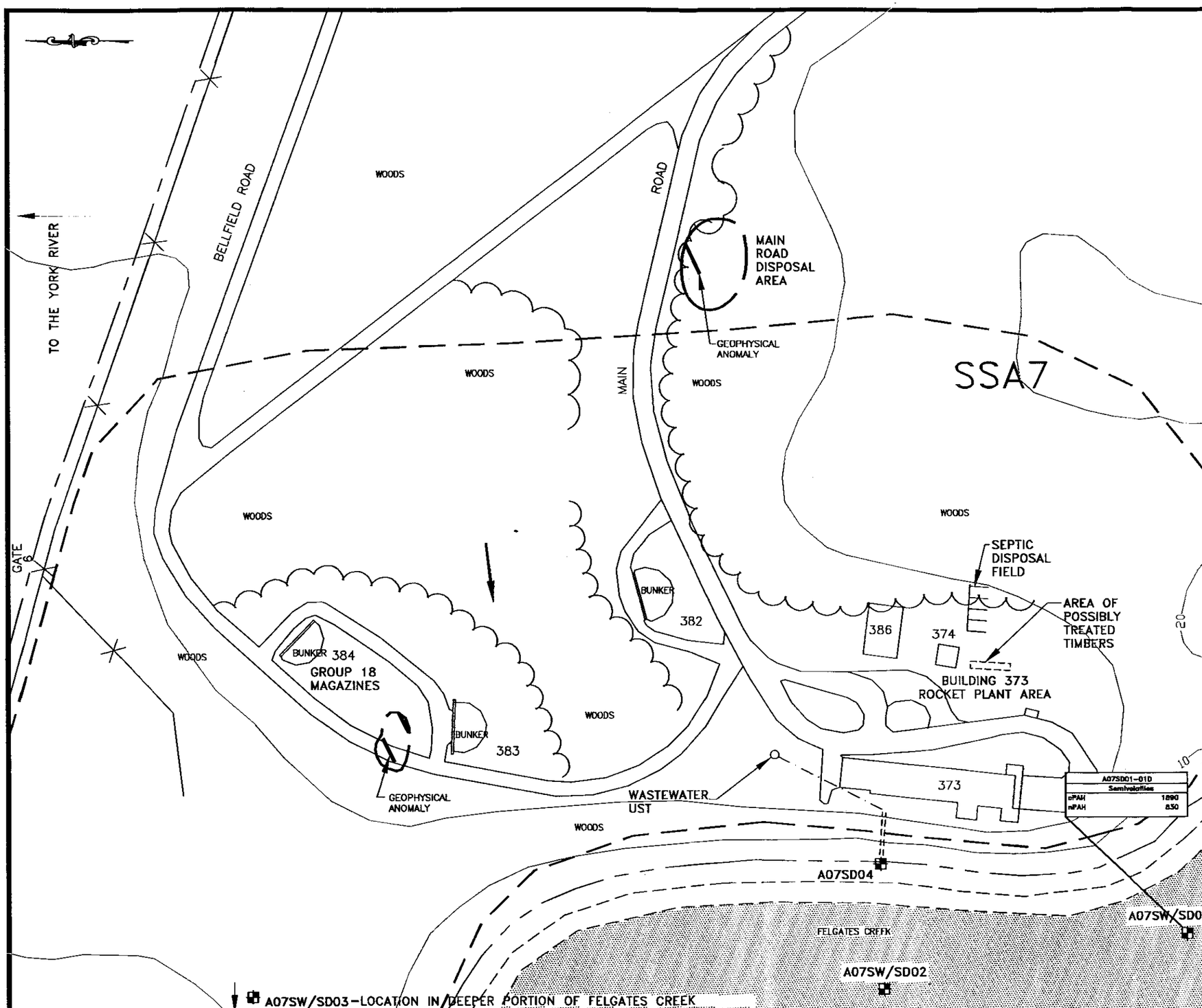
- J ESTIMATED CONCENTRATION
- K BIASED HIGH
- L BIASED LOW

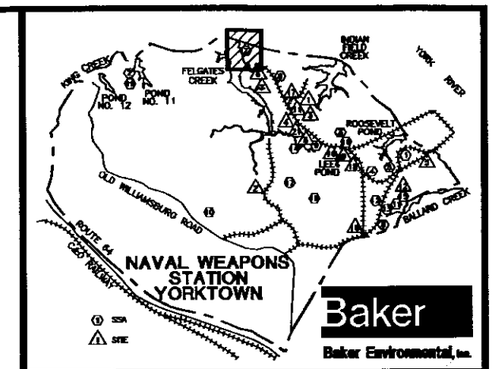
ANALYTE CONCENTRATIONS EXPRESSED IN ug/L.

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 2282648S

FIGURE 5-27
POSITIVE DETECTIONS OF SELECT INORGANIC ANALYTES IN SURFACE WATER SSA 7-BUILDING 373 ROCKET PLANT AREA/GROUP 18 MAGAZINES/ MAIN ROAD DISPOSAL AREA

NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA





100 0 50 100
1 inch = 100 ft.

LEGEND

- WOODS
- FENCE
- EDGE OF PAVEMENT
- STRUCTURE
- APPROXIMATE LIMITS OF DISPOSAL AREAS EXHIBITING GREATER AMOUNTS OF DEBRIS. TYPICAL DEPTH RANGE OF 0–4' AS DETERMINED FROM RADAR DATA.
- SITE SCREENING AREA BOUNDARY
- BUILDING 373 FORMER DISCHARGE LINE
- BUILDING 373 FORMER UST PIPING
- 20 GROUND SURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)
- A07SW/SD03 SURFACE WATER/SEDIMENT SAMPLE LOCATION
- ASSUMED GROUNDWATER FLOW DIRECTION
- J ESTIMATED CONCENTRATION

COMPOUND CONCENTRATIONS EXPRESSED IN ug/Kg.

cPAH POLYCYCLIC AROMATIC HYDROCARBONS (CARCINOGENS)

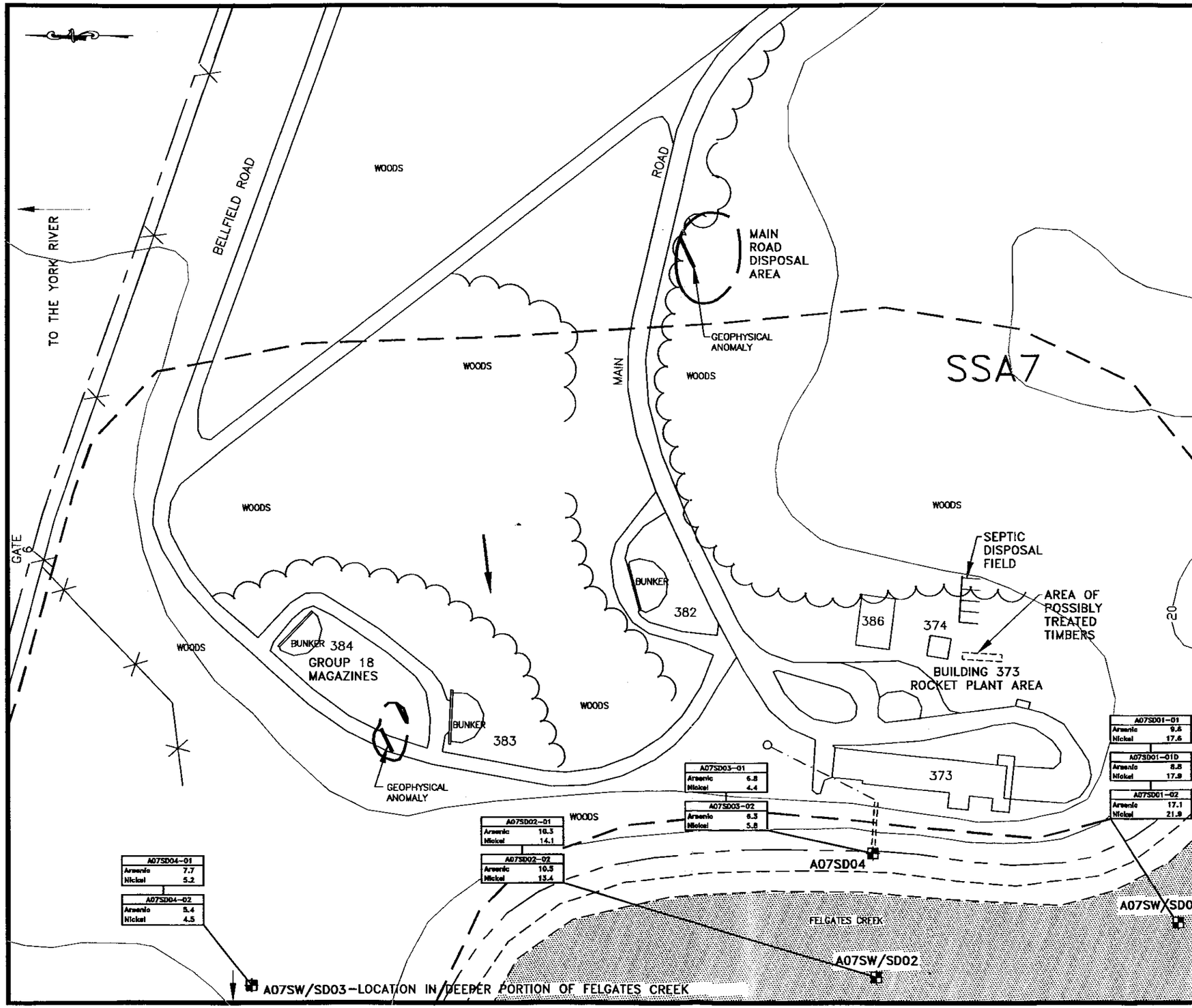
nPAH POLYCYCLIC AROMATIC HYDROCARBONS (NON–CARCINOGENS)

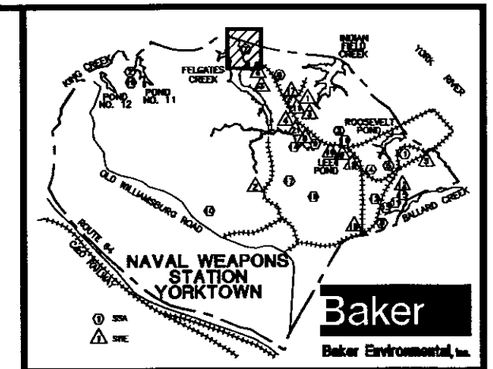
NOTE

SEDIMENT SAMPLING LOCATIONS SHOWN WITHOUT CONCENTRATIONS INDICATES NON–DETECTABLE LEVELS. SEE TABLES IN TEXT.

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 22826555

FIGURE 5-28
POSITIVE DETECTIONS OF SELECT ORGANIC COMPOUNDS IN SEDIMENT SSA 7–BUILDING 373 ROCKET PLANT AREA/GROUP 18 MAGAZINES/ MAIN ROAD DISPOSAL AREA
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA





100 0 50 100
1 inch = 100 ft.

LEGEND

- WOODS
- FENCE
- EDGE OF PAVEMENT
- STRUCTURE
- APPROXIMATE LIMITS OF DISPOSAL AREAS EXHIBITING GREATER AMOUNTS OF DEBRIS. TYPICAL DEPTH RANGE OF 0–4' AS DETERMINED FROM RADAR DATA.
- SITE SCREENING AREA BOUNDARY
- BUILDING 373 FORMER DISCHARGE LINE
- BUILDING 373 FORMER UST PIPING
- A07SW/SD03 SURFACE WATER/SEDIMENT SAMPLE LOCATION
- ASSUMED GROUNDWATER FLOW DIRECTION
- 20 GROUND SURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)

DATA QUALIFIERS

- J ESTIMATED CONCENTRATION
- K BIASED HIGH
- L BIASED LOW

ANALYTE CONCENTRATIONS EXPRESSED IN Mg/Kg.

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 22826655

FIGURE 5-29
POSITIVE DETECTIONS OF SELECT INORGANIC ANALYTES IN SEDIMENT SSA 7-BUILDING 373 ROCKET PLANT AREA/GROUP 18 MAGAZINES/ MAIN ROAD DISPOSAL AREA
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

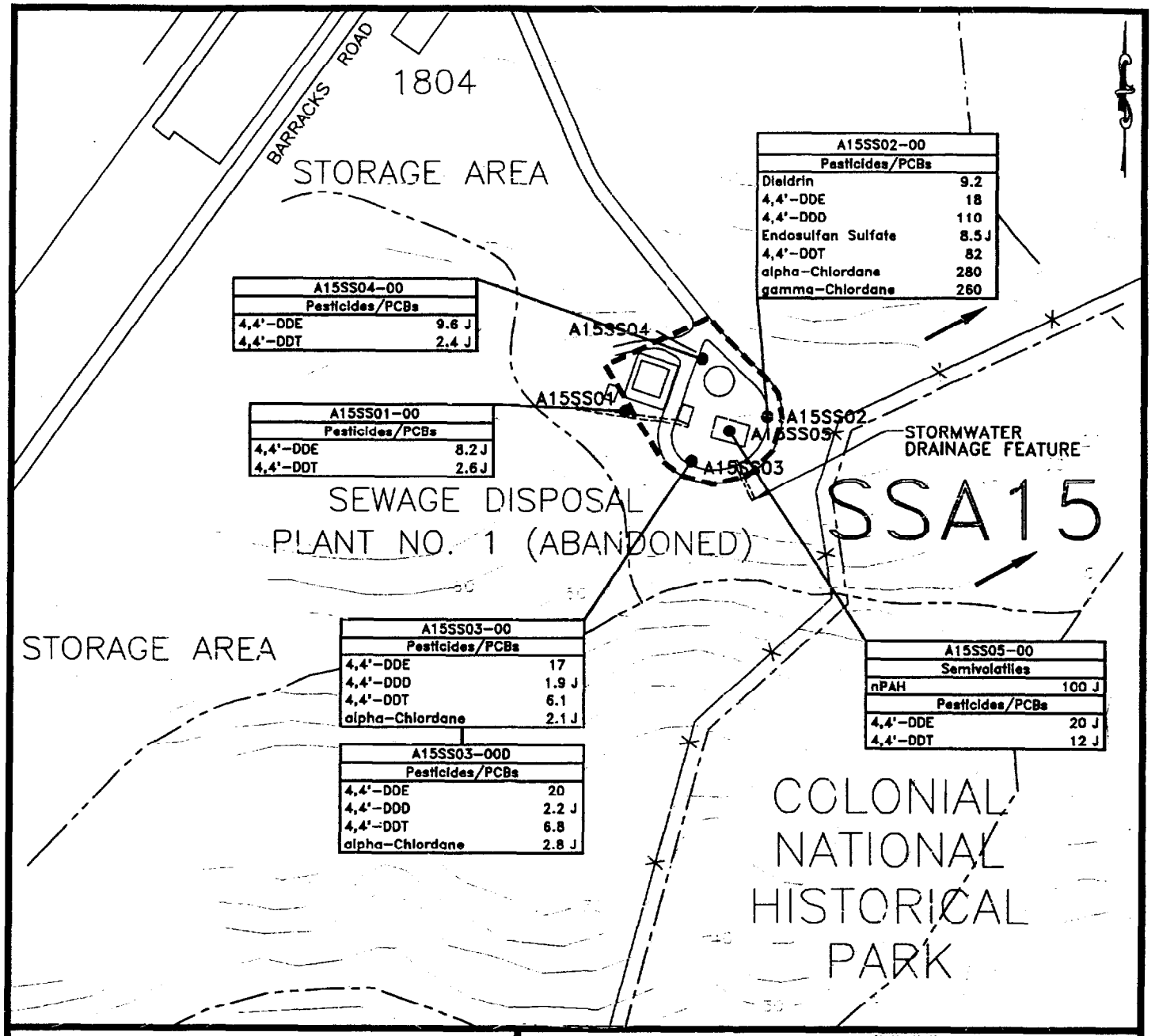
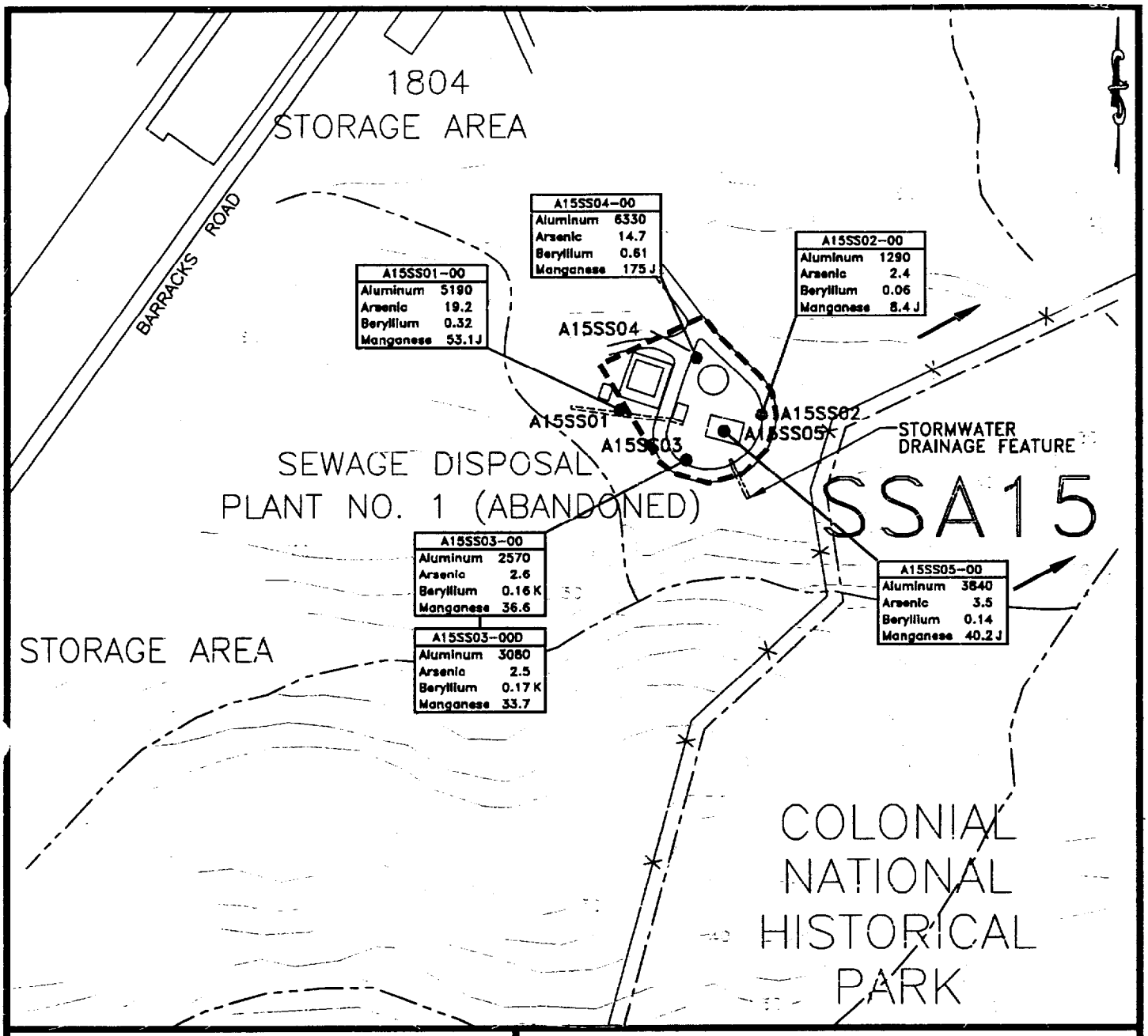
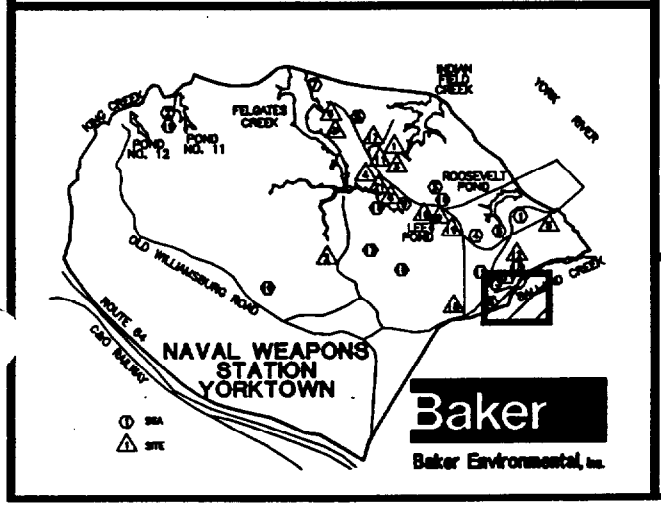


FIGURE 5-30
POSITIVE DETECTIONS OF SELECT ORGANIC COMPOUNDS IN SURFACE SOIL
SSA 15-SEWAGE TREATMENT PLANT #1/ SLUDGE DRYING BEDS AND DISCHARGE AREA
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



200 0 100 200

1 inch = 200 ft.



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INSTALLATION BOUNDARY
DRAINAGE
EDGE OF PAVEMENT
SITE SCREEENING AREA BOUNDRY
A15SS01 SURFACE SOIL SAMPLE LOCATION
GROUND SURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)

DATA QUALIFIERS

J ESTIMATED CONCENTRATION
K BASED HIGH
L BASED LOW

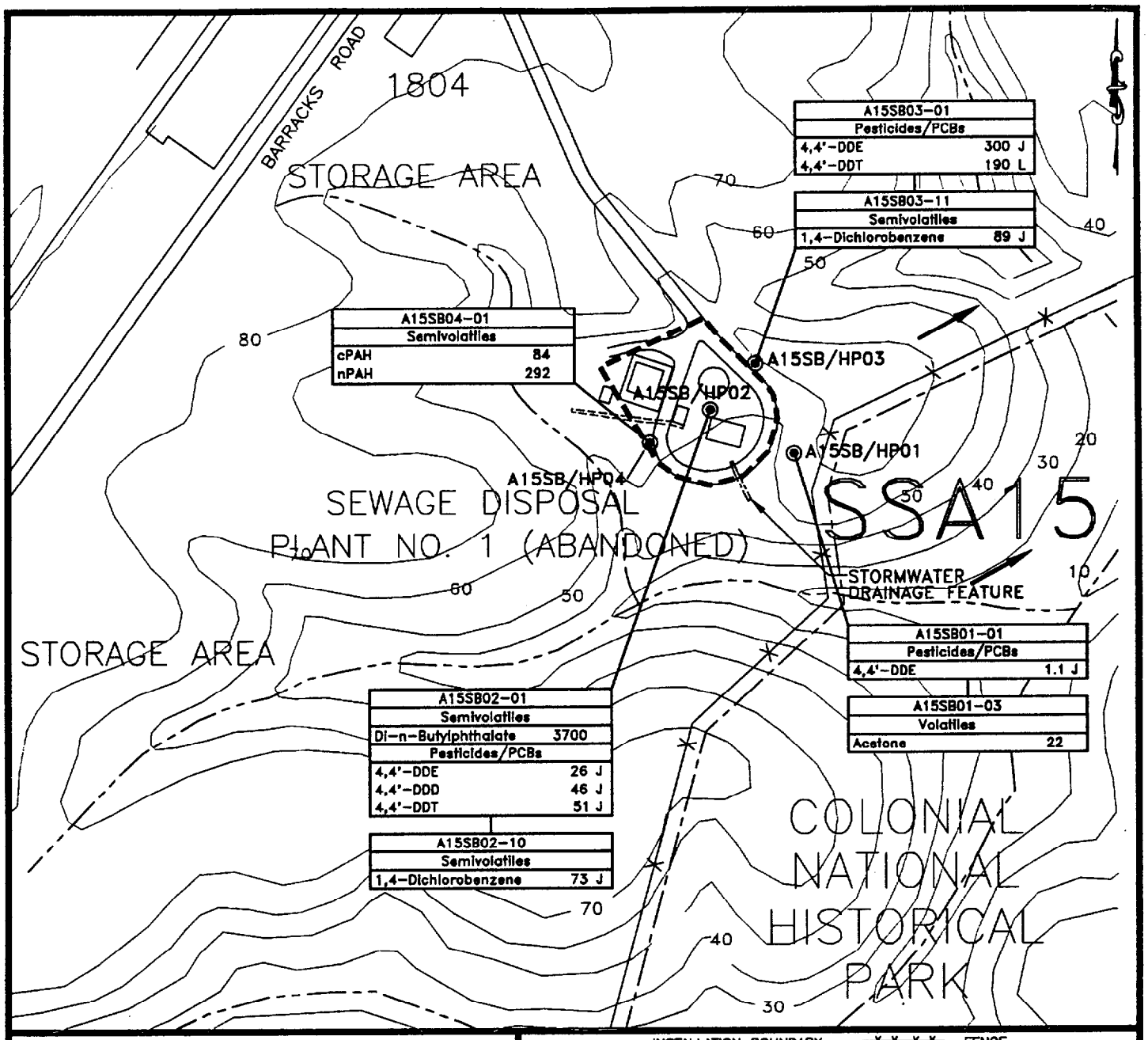
FENCE
STRUCTURE
APPROXIMATE LOCATION OF SEWAGE TREATMENT PLANT DISCHARGE LINE
APPROXIMATE LOCATION OF STORM DRAINAGE LINE
ASSUMED GROUNDWATER FLOW DIRECTION

COMPOUND CONCENTRATIONS EXPRESSED IN Mg/Kg.

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994.

22826033

FIGURE 5-31
POSITIVE DETECTIONS OF SELECT INORGANIC ANALYTES IN SURFACE SOIL
SSA 15-SEWAGE TREATMENT PLANT #1/ SLUDGE DRYING BEDS AND DISCHARGE AREA
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



200 0 100 200

1 inch = 200 ft.

INSTALLATION BOUNDARY
DRAINAGE
EDGE OF PAVEMENT
SITE SCREEENING AREA BOUNDRY
A15SB/HP01 SOIL BORING/TEMPORARY PIEZOMETER LOCATION
30 GROUND SURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)
J ESTIMATED CONCENTRATION
cPAH POLYCYCLIC AROMATIC HYDROCARBONS (CARCINOGENS)
nPAH POLYCYCLIC AROMATIC HYDROCARBONS (NON-CARCINOGENS)
FENCE
STRUCTURE
APPROXIMATE LOCATION OF SEWAGE TREATMENT PLANT DISCHARGE LINE
APPROXIMATE LOCATION OF STORM DRAINAGE LINE
ASSUMED GROUNDWATER FLOW DIRECTION

COMPOUND CONCENTRATIONS EXPRESSED IN ug/Kg.

NOTE: SUBSURFACE SOIL SAMPLING LOCATIONS SHOWN WITHOUT CONCENTRATIONS INDICATES NON-DETECTABLE LEVELS. SEE TABLES IN TEXT.

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994.

22826035

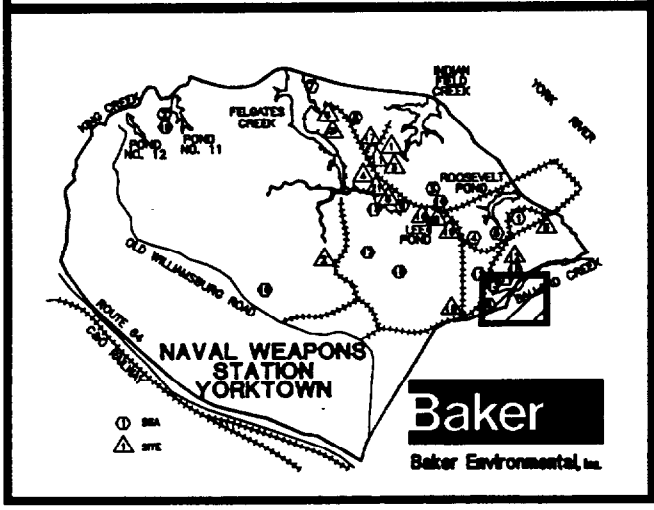
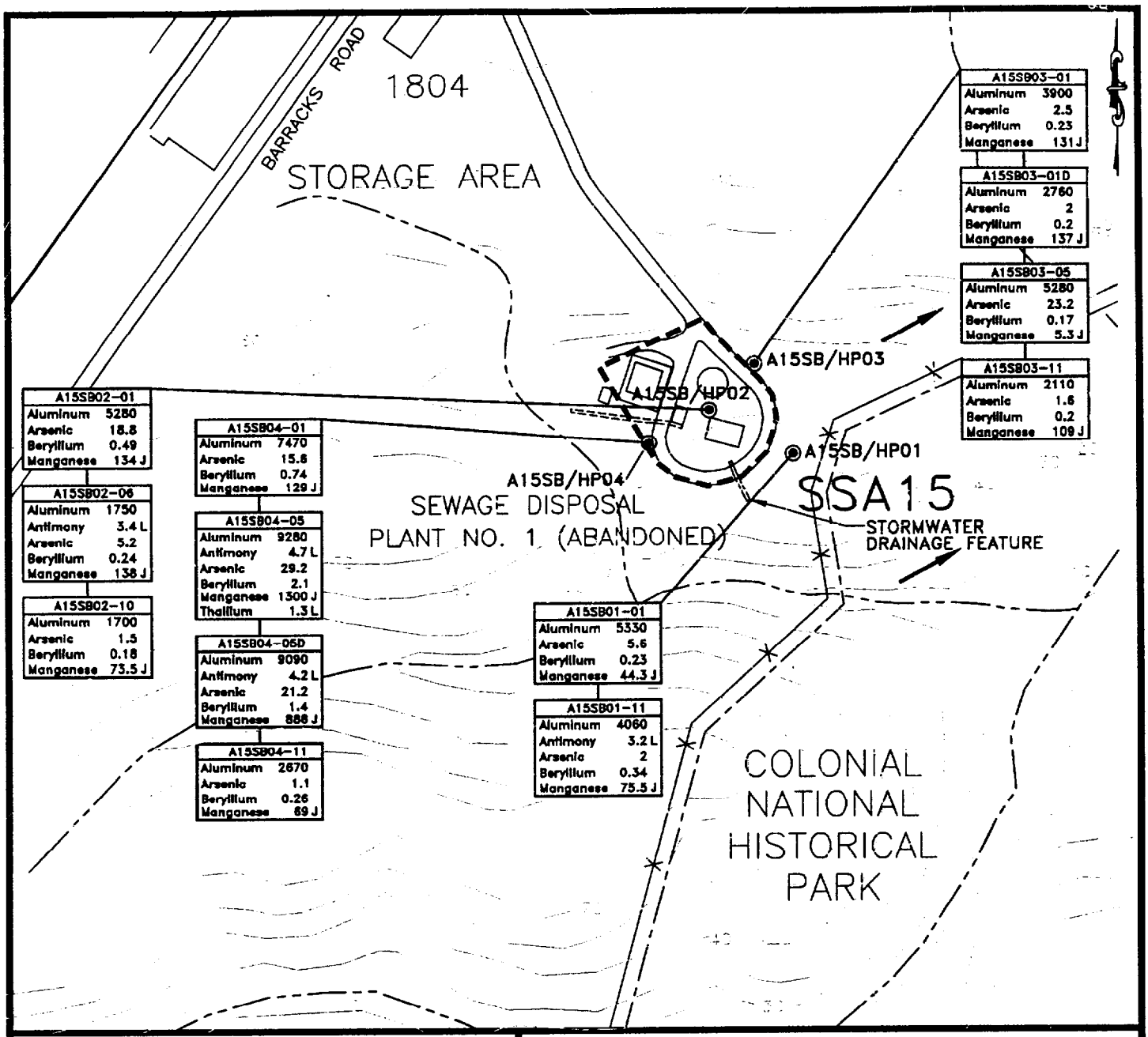


FIGURE 5-32
POSITIVE DETECTIONS OF SELECT ORGANIC COMPOUNDS IN SUBSURFACE SOIL
SSA 15-SEWAGE TREATMENT PLANT #1/ SLUDGE DRYING BEDS AND DISCHARGE AREA
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



200 0 100 200

1 inch = 200 ft.

INSTALLATION BOUNDARY
DRAINAGE
EDGE OF PAVEMENT
SITE SCREEENING AREA BOUNDRY
A15SB/HP01 SOIL BORING/TEMPORARY PIEZOMETER LOCATION
GROUND SURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)

DATA QUALIFIERS

J ESTIMATED CONCENTRATION
K BIASED HIGH
L BIASED LOW

FENCE
STRUCTURE
APPROXIMATE LOCATION OF SEWAGE TREATMENT PLANT DISCHARGE LINE
APPROXIMATE LOCATION OF STORM DRAINAGE LINE
ASSUMED GROUNDWATER FLOW DIRECTION

COMPOUND CONCENTRATIONS EXPRESSED IN Mg/Kg.

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994.

22827055

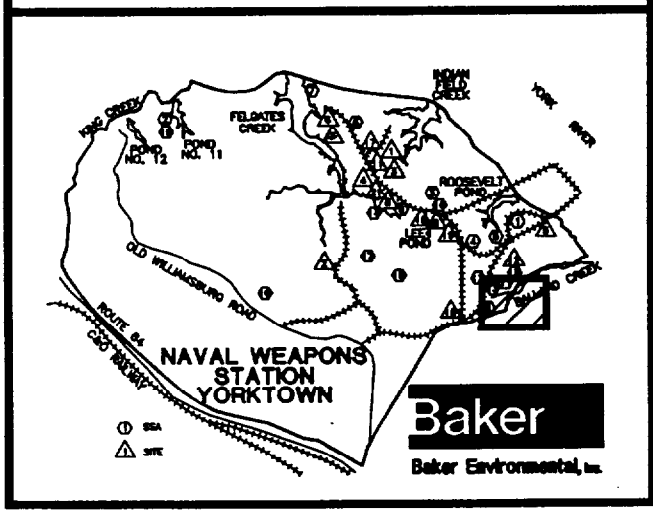


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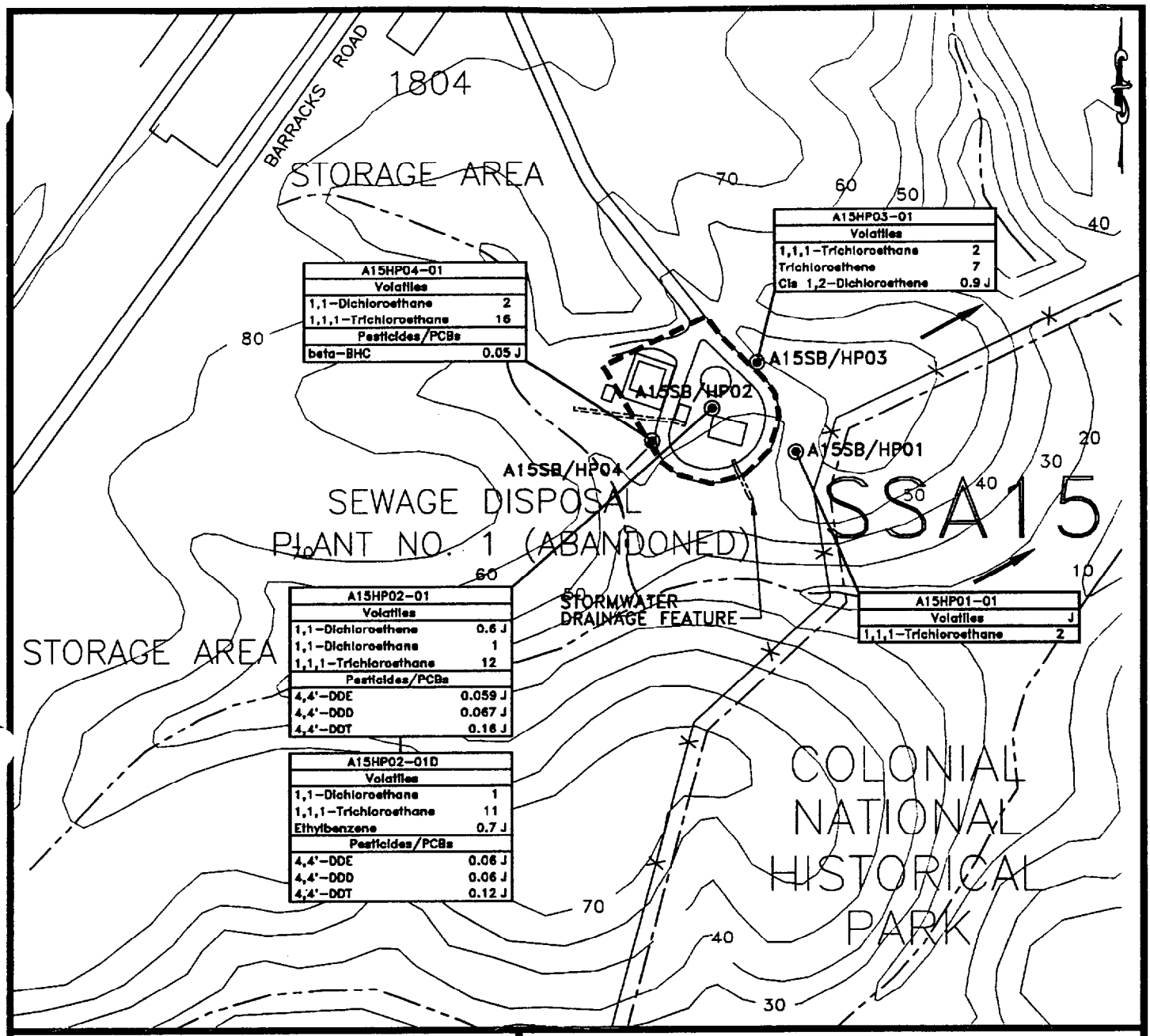
FIGURE 5-33
POSITIVE DETECTIONS OF SELECT INORGANIC ANALYTES IN SUBSURFACE SOIL
SSA 15-SEWAGE TREATMENT PLANT #1/ SLUDGE DRYING BEDS AND DISCHARGE AREA
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



200 0 100 200

1 inch = 200 ft.

Baker

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INSTALLATION BOUNDARY

DRAINAGE

EDGE OF PAVEMENT

SITE SCREEENING AREA BOUNDRY

A15SB/HP01 SOIL BORING/TEMPORARY PIEZOMETER LOCATION

30 GROUND SURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)

J ESTIMATED CONCENTRATION

COMPOUND CONCENTRATIONS EXPRESSED IN ug/L

FENCE

STRUCTURE

APPROXIMATE LOCATION OF SEWAGE TREATMENT PLANT DISCHARGE LINE

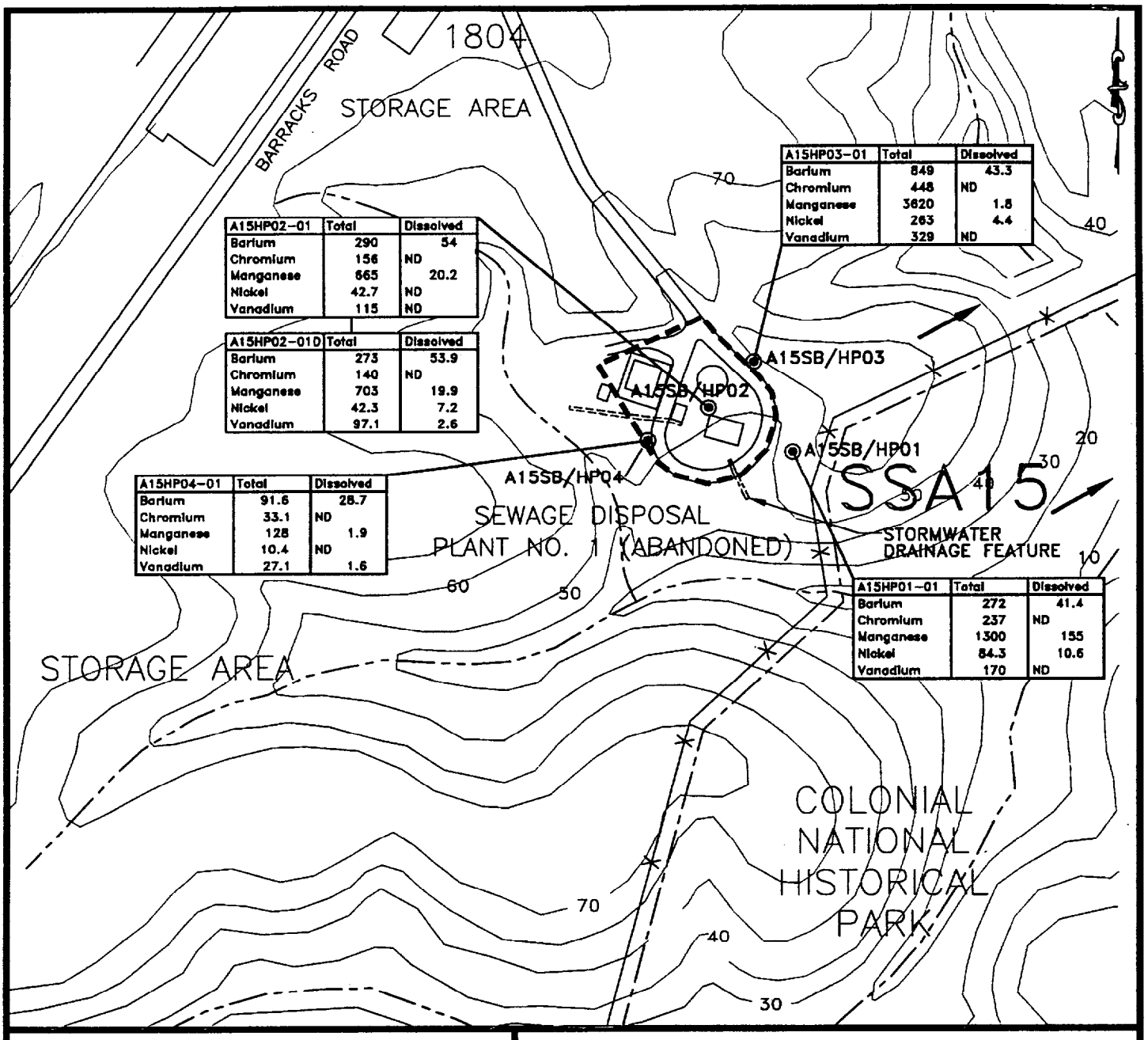
APPROXIMATE LOCATION OF STORM DRAINAGE LINE

ASSUMED GROUNDWATER FLOW DIRECTION

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994.

Z2827135

FIGURE 5-34
POSITIVE DETECTIONS OF ORGANIC COMPOUNDS IN GROUNDWATER
SSA 15-SEWAGE TREATMENT PLANT #1/ SLUDGE DRYING BEDS AND DISCHARGE AREA
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



A15HP03-01	Total	Dissolved
Barium	849	43.3
Chromium	448	ND
Manganese	3620	1.8
Nickel	263	4.4
Vanadium	329	ND

A15HP02-01	Total	Dissolved
Barium	290	54
Chromium	156	ND
Manganese	665	20.2
Nickel	42.7	ND
Vanadium	115	ND

A15HP02-01D	Total	Dissolved
Barium	273	53.9
Chromium	140	ND
Manganese	703	19.9
Nickel	42.3	7.2
Vanadium	97.1	2.6

A15HP04-01	Total	Dissolved
Barium	91.6	28.7
Chromium	33.1	ND
Manganese	128	1.9
Nickel	10.4	ND
Vanadium	27.1	1.6

A15HP01-01	Total	Dissolved
Barium	272	41.4
Chromium	237	ND
Manganese	1300	155
Nickel	84.3	10.6
Vanadium	170	ND

200 0 100 200

1 inch = 200 ft.

INSTALLATION BOUNDARY
DRAINAGE
EDGE OF PAVEMENT
SITE SCREEENING AREA BOUNDRY
SOIL BORING/TEMPORARY PIEZOMETER LOCATION
A15SB/HP01
FENCE
STRUCTURE
APPROXIMATE LOCATION OF SEWAGE TREATMENT PLANT DISCHARGE LINE
APPROXIMATE LOCATION OF STORM DRAINAGE LINE
ASSUMED GROUNDWATER FLOW DIRECTION
30 GROUND SURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)

DATA QUALIFIERS

B	CONTAMINATION DETECTED IN BLANK
J	ESTIMATED CONCENTRATION
K	BIASED HIGH
L	BIASED LOW
ND	NOT DETECTED
NA	NOT ANALYZED

ANALYTE CONCENTRATIONS EXPRESSED IN ug/L.

SOURCE OF BASE MAPPING: HOGGARD/CURE ASSOCIATES, FEB. 1994.

22827238

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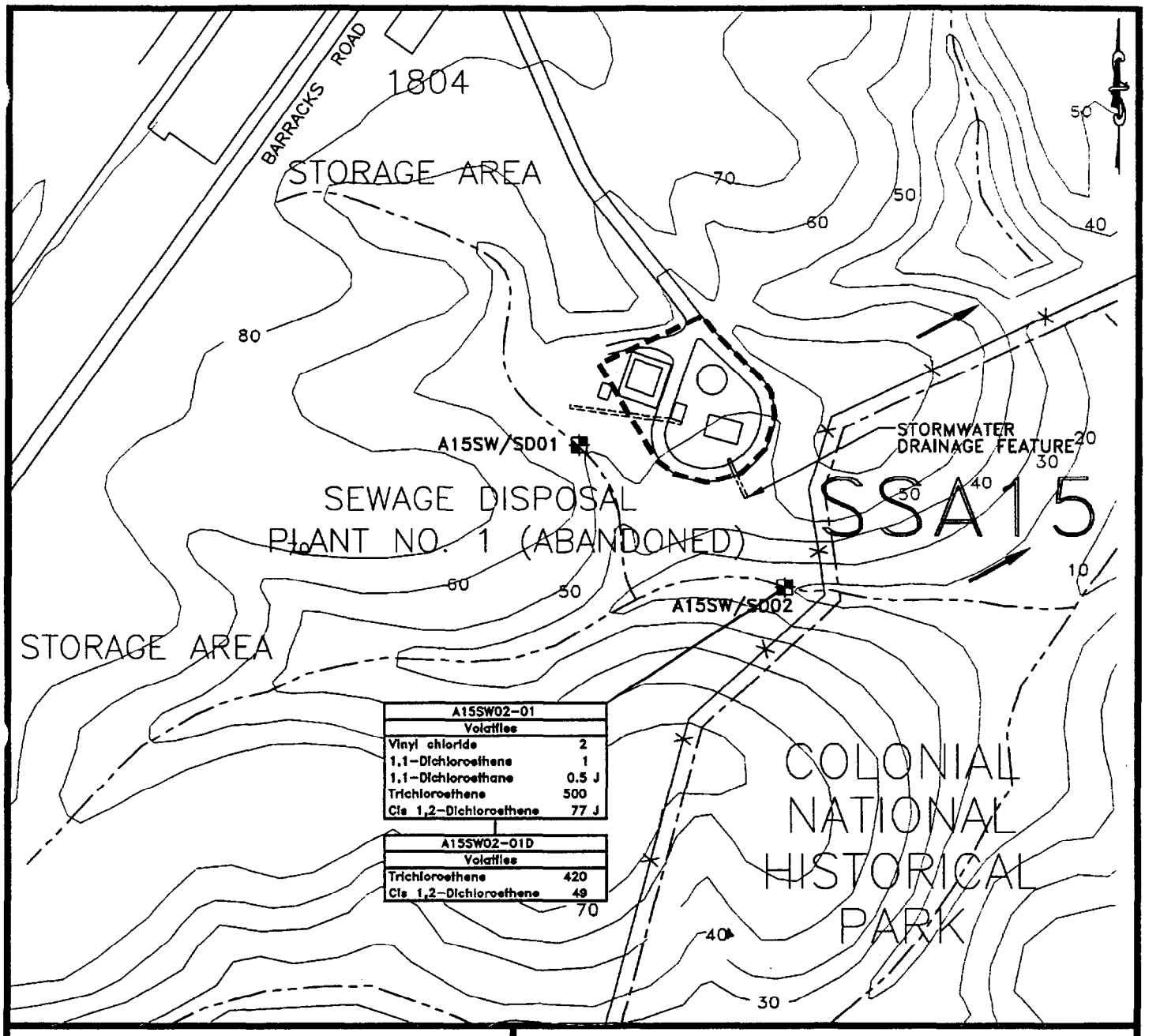
FIGURE 5-35
POSITIVE DETECTIONS OF SELECT INORGANIC ANALYTES IN GROUNDWATER
SSA 15-SEWAGE TREATMENT PLANT #1/ SLUDGE DRYING BEDS AND DISCHARGE AREA
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



A15SW02-01	
Volatiles	
Vinyl chloride	2
1,1-Dichloroethene	1
1,1-Dichloroethane	0.5 J
Trichloroethene	500
Cis 1,2-Dichloroethene	77 J

A15SW02-01D	
Volatiles	
Trichloroethene	420
Cis 1,2-Dichloroethene	49

200 0 100 200

1 inch = 200 ft.

INSTALLATION BOUNDARY
DRAINAGE
EDGE OF PAVEMENT
SITE SCREEENING AREA BOUNDRY
A15SW/SD01 SURFACE WATER/ SEDIMENT SAMPLE LOCATION
30 GROUND SURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)
J ESTIMATED CONCENTRATION
COMPOUND CONCENTRATIONS EXPRESSED IN ug/L.
FENCE
STRUCTURE
APPROXIMATE LOCATION OF SEWAGE TREATMENT PLANT DISCHARGE LINE
APPROXIMATE LOCATION OF STORM DRAINAGE LINE
ASSUMED GROUNDWATER FLOW DIRECTION

NOTE:
SUBSURFACE SOIL SAMPLING LOCATIONS SHOWN WITHOUT CONCENTRATIONS INDICATES NON-DETECTABLE LEVELS. SEE TABLES IN TEXT.

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994. 22827355

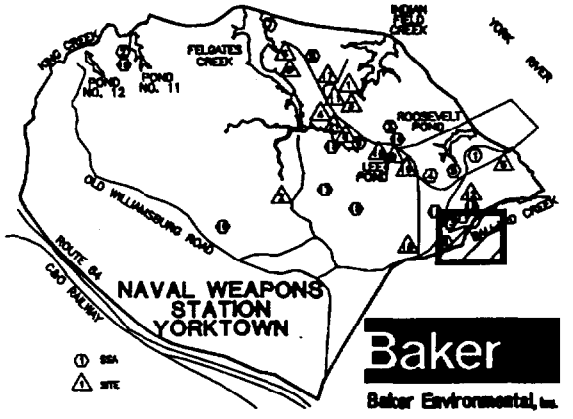


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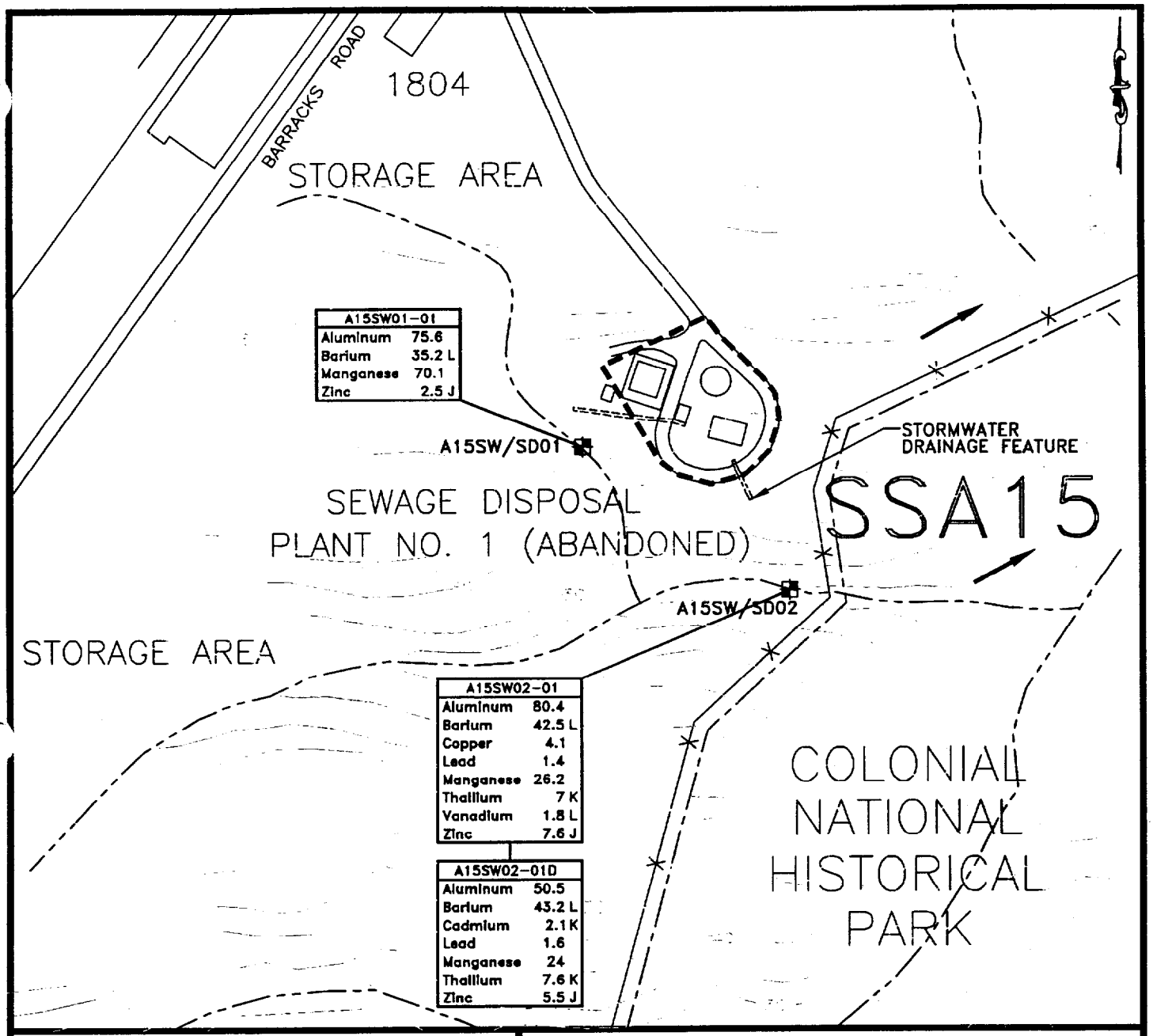
FIGURE 5-36
POSITIVE DETECTIONS OF ORGANIC COMPOUNDS IN SURFACE WATER
SSA 15-SEWAGE TREATMENT PLANT #1/ SLUDGE DRYING BEDS AND DISCHARGE AREA
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



200 0 100 200

1 inch = 200 ft.

Baker

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INSTALLATION BOUNDARY

DRAINAGE

EDGE OF PAVEMENT

SITE SCREEENING AREA BOUNDRY

A15SW/SD01 SURFACE WATER/ SEDIMENT SAMPLE LOCATION

GROUND SURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)

FENCE

STRUCTURE

APPROXIMATE LOCATION OF SEWAGE TREATMENT PLANT DISCHARGE LINE

APPROXIMATE LOCATION OF STORM DRAINAGE LINE

ASSUMED GROUNDWATER FLOW DIRECTION

DATA QUALIFIERS

J ESTIMATED CONCENTRATION

K BIASED HIGH

L BIASED LOW

COMPOUND CONCENTRATIONS EXPRESSED IN ug/L.

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994.

22827455

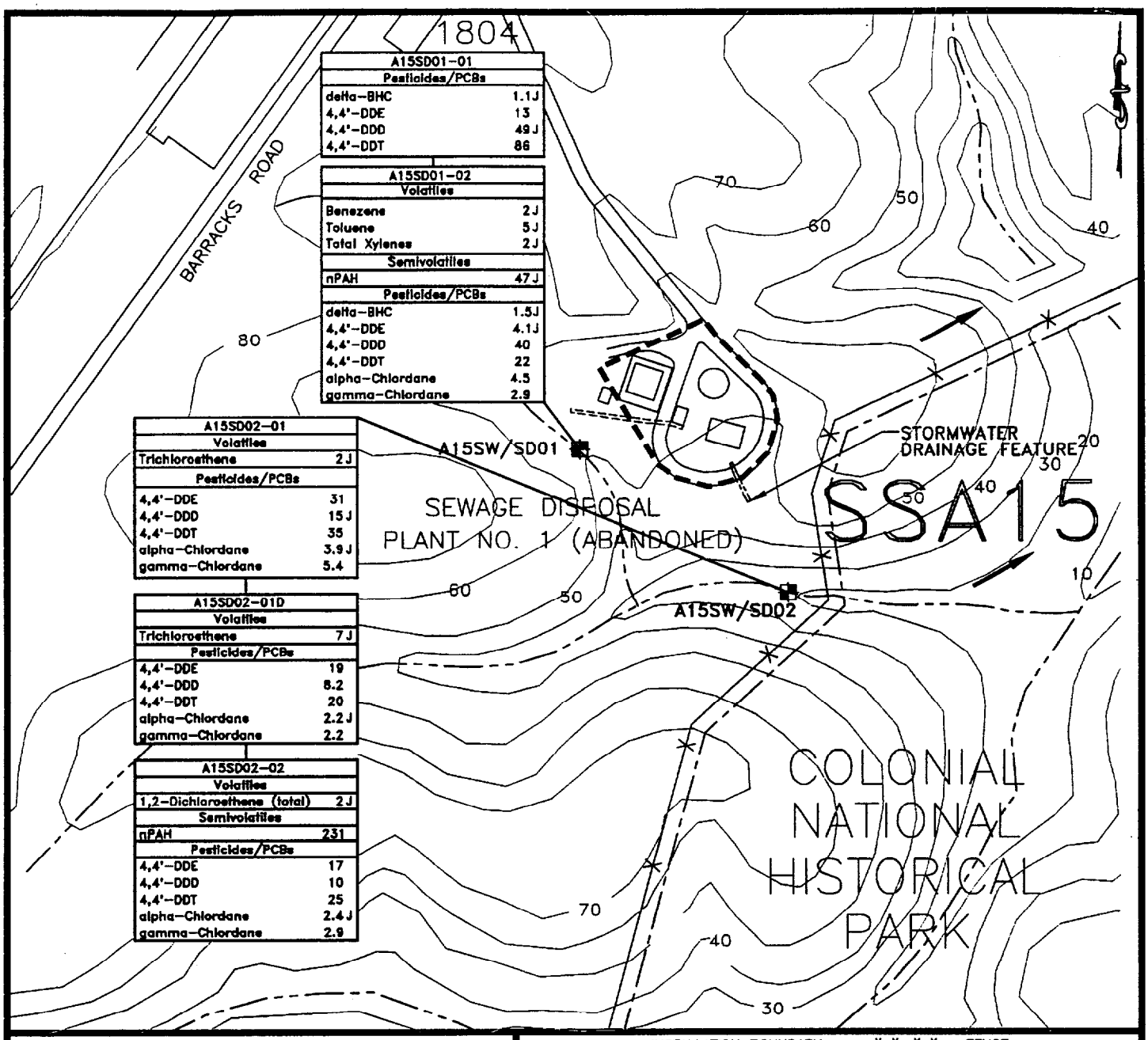
FIGURE 5-37

POSITIVE DETECTIONS OF SELECT INORGANIC ANALYTES IN SURFACE WATER

SSA 15-SEWAGE TREATMENT PLANT #1/ SLUDGE DRYING BEDS AND DISCHARGE AREA

NAVAL WEAPONS STATION YORKTOWN

YORKTOWN, VIRGINIA



200 0 100 200

1 inch = 200 ft.

INSTALLATION BOUNDARY
DRAINAGE
EDGE OF PAVEMENT
SITE SCREEENING AREA BOUNDRY
A15SW/SD01 SURFACE WATER/ SEDIMENT SAMPLE LOCATION
30 GROUND SURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)
J ESTIMATED CONCENTRATION
cPAH POLYCYCLIC AROMATIC HYDROCARBONS (CARCINOGENS)
nPAH POLYCYCLIC AROMATIC HYDROCARBONS (NON-CARCINOGENS)

FENCE
STRUCTURE
APPROXIMATE LOCATION OF SEWAGE TREATMENT PLANT DISCHARGE LINE
APPROXIMATE LOCATION OF STORM DRAINAGE LINE
ASSUMED GROUNDWATER FLOW DIRECTION

COMPOUND CONCENTRATIONS EXPRESSED IN ug/Kg.

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1994.

22627SSS

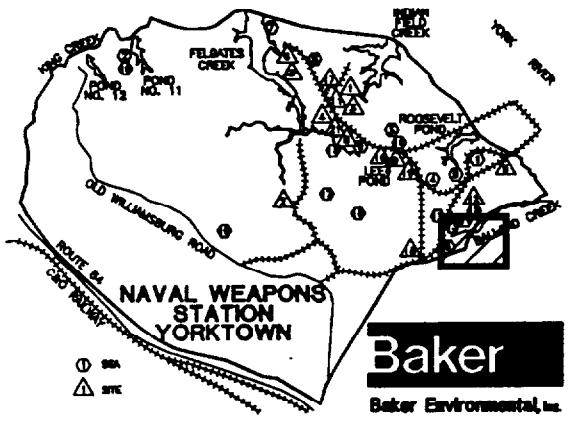
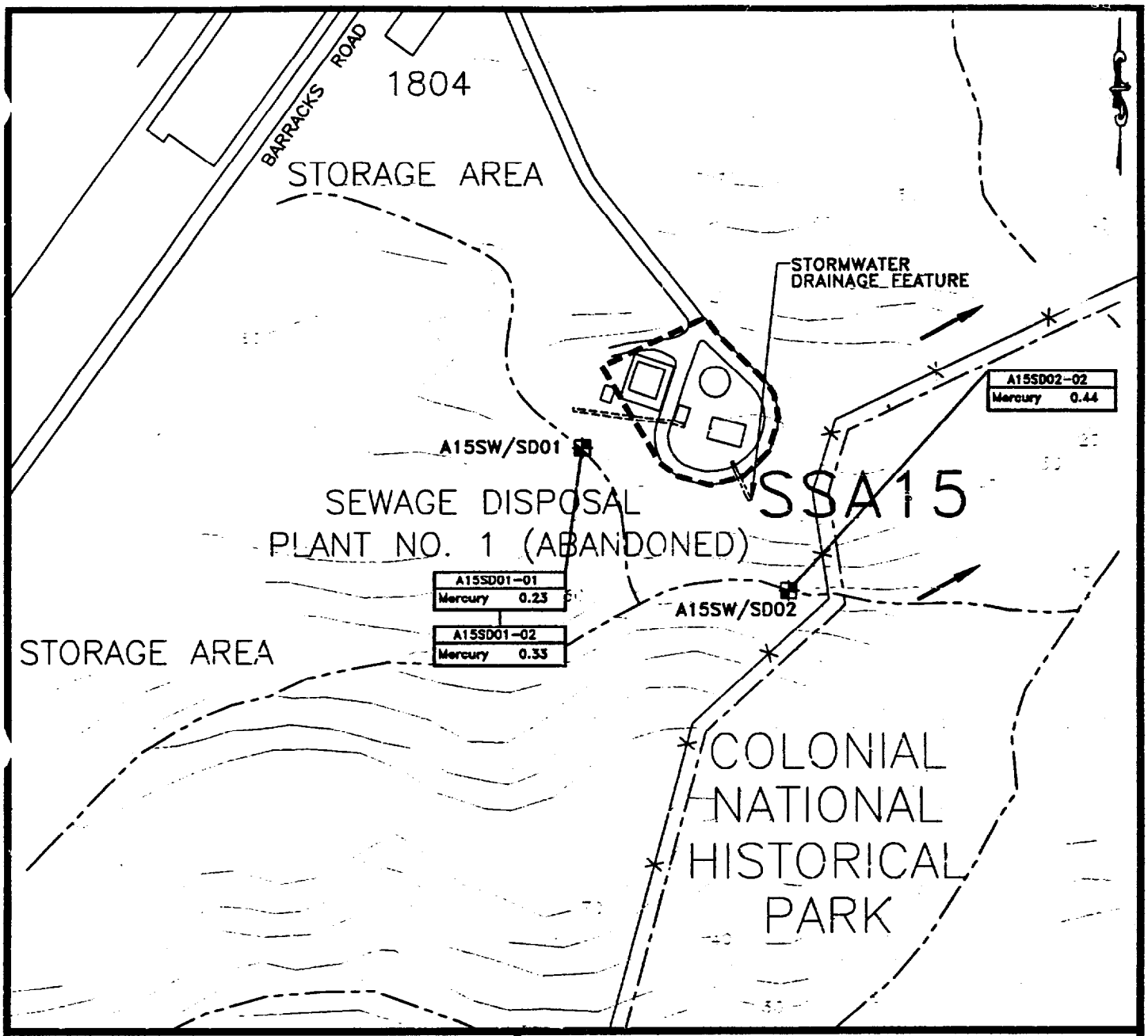
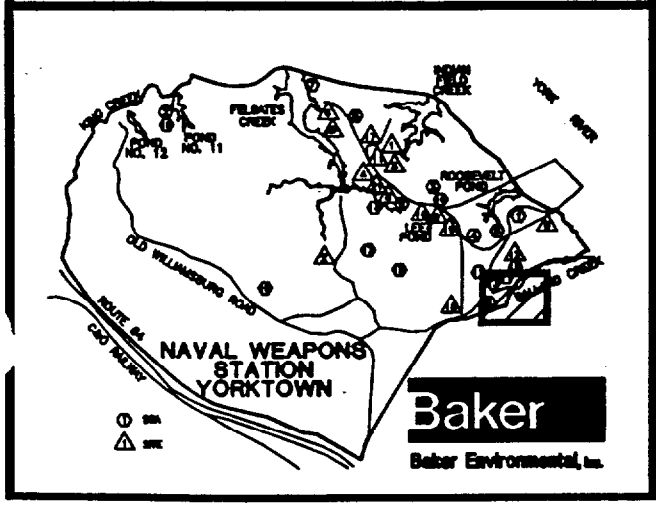


FIGURE 5-38
POSITIVE DETECTIONS OF SELECT ORGANIC COMPOUNDS IN SEDIMENT
SSA 15-SEWAGE TREATMENT PLANT #1/ SLUDGE DRYING BEDS AND DISCHARGE AREA
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



200 0 100 200

1 inch = 200 ft.



INSTALLATION BOUNDARY
DRAINAGE
EDGE OF PAVEMENT
SITE SCREEENING AREA BOUNDRY
A15SW/SD01 SURFACE WATER/ SEDIMENT SAMPLE LOCATION
GROUND SURFACE ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)

FENCE
STRUCTURE
APPROXIMATE LOCATION OF SEWAGE TREATMENT PLANT DISCHARGE LINE
APPROXIMATE LOCATION OF STORM DRAINAGE LINE
ASSUMED GROUNDWATER FLOW DIRECTION

DATA QUALIFIERS

J ESTIMATED CONCENTRATION
L BIASED LOW

COMPOUND CONCENTRATIONS EXPRESSED IN Mg/Kg.

SOURCE OF BASE MAPPING: HOGGARD/EURE ASSOCIATES, FEB. 1984.

FIGURE 5-39
POSITIVE DETECTIONS OF SELECT INORGANIC ANALYTES IN SEDIMENT
SSA 15-SEWAGE TREATMENT PLANT #1/ SLUDGE DRYING BEDS AND DISCHARGE AREA
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

6.0 HUMAN HEALTH AND ECOLOGICAL RISK SCREENING

The purpose of human health and ecological risk screening is to determine whether contaminants detected in environmental media pose unacceptable risks to human receptors and/or the environment. SSAs for which unacceptable human health and/or environmental risks are derived may be nominated by the USEPA Region III, Commonwealth of Virginia, and Navy project managers as a site under the IRP. SSAs nominated as IRP sites will be ranked, prioritized, and included in subsequent SMP updates. The risk screening process will contain the same primary steps as a baseline risk assessment, as follows:

- Selection of chemicals of potential concern
- Exposure assessment
- Toxicity assessment
- Risk characterization
- Uncertainty analysis

6.1 Identification of Chemicals of Potential Concern

COPCs are defined as chemicals detected at a given SSA that are selected on a medium-specific basis to quantitatively and qualitatively estimate the potential for the occurrence of adverse effects to human and/or ecological receptors subsequent to exposure. For this human health and ecological risk screening, COPCs were identified using selection criteria and methodologies that are consistent with the USEPA Region III technical guidance entitled: Selecting Exposure Routes and Contaminants of Concern by Risk-Based Screening (SCCRBS) dated January 1993 (USEPA, 1993), and the USEPA's Risk Assessment Guidance for Superfund, Human Health Evaluation Manual, Volume I, Part A, Interim Final (USEPA, 1989).

The COPC selection criteria and methodologies for human health risk screening included comparisons of maximum detected concentrations of chemicals in soil and groundwater to corresponding USEPA Region III COC screening values, Federal Safe Drinking Water Act maximum contaminant levels (MCLs) and Commonwealth of Virginia primary maximum contaminant levels (PMCLs). The COPC selection criteria and methodologies for ecological risk screening included comparisons of maximum detected concentrations of chemicals in surface water

and sediment to corresponding Federal ambient water quality criteria (AWQCs), Commonwealth of Virginia water quality standards (VWQSs) and sediment screening values (SSVs). Exceedences of applicable criteria and/or standards resulted in the retention of the chemical as a COPC.

In addition to data comparisons to the aforementioned criteria and standards, the following were also evaluated: prevalence (frequencies of detection), detected chemicals in associated blanks, and site history. Also, since toxicity data are unavailable for essential nutrients such as calcium, sodium, potassium, and magnesium, these elements were not retained in the risk screening. The following section discusses these criteria and methodologies in greater detail.

6.1.1 COPC Selection Criteria

USEPA Region III COC Screening Concentrations - Risk-Based COC Screening Concentrations (COC screening concentrations) were derived by USEPA Region III in January of 1993, and provided in tabular format to support selection of COPCs and address two major limitations in the COPC selection process presented in RAGS. First, using COC screening concentrations prioritizes chemical toxicity and focuses the risk assessment on those COPCs and potential exposure routes. Second, using the COC screening concentrations provides an absolute comparison of potential risks associated with the presence of a COPC in a given medium.

COC screening concentrations were derived using conservative USEPA promulgated default values and the most recent toxicological criteria available. COC screening concentrations for potentially carcinogenic and noncarcinogenic chemicals were individually derived based on a target incremental lifetime cancer risk (ICR) of 1×10^{-06} and a target hazard quotient (HQ) of 0.1, respectively. For potential carcinogens, the toxicity criteria applicable to the derivation of COC screening concentrations are chronic oral and inhalation cancer slope factors; for noncarcinogens, they are oral and inhalation reference doses. These toxicity criteria are subject to change as more updated information and results from the most recent toxicological/epidemiological studies become available. Therefore, the use of toxicity criteria in the derivation of COC screening concentrations requires that the screening concentrations be updated periodically to reflect changes in the toxicity criteria.

In March of 1994, the USEPA Region III published a second COC Screening Table (COC values) which were also based on an ICR of 1×10^{-06} and a target HQ of 0.1. Subsequent publications of the table (i.e., Risk-Based Concentrations [RBCs]) have included an ICR of 1×10^{-06} but an HQ of 1.0, rather than 0.1. However, since the RBCs are derived using similar equations and USEPA promulgated default exposure assumptions that were used to derive the original set of COC screening concentrations (USEPA, 1993) and COC values (USEPA, 1994a), updated COC values can be obtained by using the carcinogenic RBCs issued semi-annually by USEPA Region III and dividing the accompanying noncarcinogenic RBCs by a factor of 10. An updated set of COC values can, therefore, be obtained each time the RBC Tables are updated. The COC values used in this baseline RA were derived from the RBC values issued by the USEPA Region III on March 7, 1995 (USEPA, 1995c).

If the maximum detected concentration of a detected constituent in a soil or groundwater sample exceeded the corresponding COC value, that compound was retained as a COPC for further evaluation in the risk screening. If the maximum detected concentration was less than the COC value, that compound was eliminated from further consideration. However, in accordance with the SCCRBS guidelines, chemicals may have been reincluded as COPCs if certain conditions existed which warranted chemical reinclusion such as the potential for bioaccumulation or other Commonwealth and Federal criteria exceedences.

Federal Maximum Contaminant Levels (MCLs) and Virginia Primary Maximum Contaminant Levels (PMCLs) - MCLs and PMCLs are enforceable standards for public water supplies promulgated under the Federal Safe Drinking Water Act and by the Commonwealth of Virginia, respectively, and are designed for the protection of human health. MCLs have been adopted as enforceable standards for public drinking water systems, and apply to drinking water supplies consumed by a minimum of 25 persons. They have been developed for the prevention of human health effects associated with lifetime exposure (70 year lifetime) of an average adult (70 kg) consuming 2 liters of water per day. MCLs also consider the technical and economic feasibility of removing the constituent from a public water supply (USEPA, 1995a).

Federal Ambient Water Quality Criteria (AWQCs) - The AWQCs are values published and updated periodically by the United States Environmental Protection Agency (USEPA, 1990). They are not promulgated standards; therefore, they do not have regulatory impact. The criteria were created to

present scientific data and guidance on the environmental effects of pollutants and can be used to derive regulatory requirements based on considerations of water quality impacts (USEPA, 1990).

In this risk screening process, the AWQCs are used in the ecological risk screening. There are four categories grouped under the AWQCs that apply specifically to the protection of aquatic organisms. These four categories include freshwater acute, freshwater chronic, saltwater acute, and saltwater chronic. For the purposes of this SSP, the surface water analytical data from SSAs 1 and 15 were evaluated against appropriate freshwater acute and freshwater chronic values. The surface water analytical data from SSA 7 was evaluated against saltwater acute and saltwater chronic values. There was no surface water data for SSA 6.

Virginia Water Quality Standards (VWQSs) - The Virginia State Water Control Board has promulgated Virginia Water Quality Standards (VWQSs) (VASWCB, 1992). These VWQS meet the requirements of both Federal and State law and are enforceable regulations. VWQS are used to evaluate the water quality in Virginia.

Sediment Screening Values (SSVs) - SSVs are values used to evaluate the potential for chemical constituents in sediment to cause adverse biological effects (Long et al, 1995). This screening method was developed through evaluation of biological effects data for aquatic (marine and freshwater) organisms that were obtained through equilibrium partitioning calculations, spiked-sediment bioassays, and concurrent biological and chemical field surveys. For each constituent having sufficient data available, the concentrations causing adverse biological effects were arrayed and the lower 10 percentile (called an Effects Range-Low, or ER-L) and the median, or 50th percentile (called an Effects Range-Median, or ER-M) were determined. If contaminant concentrations are below the ER-L then conditions exist in which effects would rarely be observed. Concentrations equal to and exceeding the ER-L but below the ER-M, represent a possible-effects range within which effects would occasionally occur. If contaminant concentrations are above the ER-M, adverse effects on the biota are considered probable. Those chemicals exceeding their corresponding toxicity data, standards, or criteria will be retained as ecological COPCs.

Blank Concentrations - If a chemical is detected in both the environmental sample and a blank sample, it may not be retained as a COPC in accordance with RAGS depending on the concentration of the chemical in the media. Therefore, blank data were compared with results from environmental

samples. If the blanks contained detectable results for common laboratory contaminants (i.e., acetone, 2-butanone, methylene, chloride, toluene, and phthalate esters), environmental sample results were considered as positive results only if they exceed 10 times the maximum amount detected in the associated blank. If the chemical detected in the blank(s) is not a common laboratory contaminant, environmental sample results were considered as positive results only if they exceeded five times the maximum amount detected in the associated blank(s). Furthermore, the elimination of an environmental sample result would directly correlate to a reduction in the prevalence of the contaminant in that media.

When assessing soil and sediment concentrations, the Contract Required Quantitation Limits (CRQLs) and percent moisture are accounted for in order to correlate solid and aqueous quantitation limits. For example, when assessing semivolatile, pesticide, PCB, and nitramine contaminants the CRQL for solid samples is 33 to 66 times (depending on the contaminant) that of the aqueous samples; this correction is not necessary for the evaluation of volatile COPCs. Therefore, in order to assess contaminant levels in solid samples using an aqueous blank concentration, the concentration was multiplied by 5 or 10 (noncommon or common laboratory contaminants, respectively) and then multiplied by 33 to correct for the variance in the CRQL. Accounting for multipliers greater than 33 or the percent moisture was not necessary for this data set. Associated blanks for SSAs 1, 6, 7, and 15 included trip blanks and rinsate blanks. Table 5-1 provides a summary of the maximum detected blank data and the concentrations used for comparison to environmental sample results.

The aforementioned methodologies for evaluating blanks are usually implemented during third party analytical data validation prior to the selection of COPCs in the risk assessment.

Prevalence - The prevalence of a chemical in an environmental medium can be described by the frequency and concentration with which it is detected. A detection frequency greater than, or equal to 5 percent (e.g., 1 positive detection in 20 samples) was considered the minimum criteria for the selection of COPCs in data sets comprised of 20 or more samples. Data sets with fewer than 20 samples were evaluated for any positive detections to determine whether the chemical should be included as a COPC (USEPA, 1989). Furthermore, chemicals may be eliminated from consideration as COPCs if their frequency of detection is less than five percent; are not site/SSA-related; are not

considered to be degradation products of site/SSA-related contamination; and are not present as a "hot spot."

6.1.2 Selection of COPCs

Four environmental media (soil, groundwater, surface water, and sediment) were investigated at SSAs 1, 7 and 15. Only soil and groundwater were investigated at SSA 6. The selection of soil COPCs was stratified to include the surface soil (0- to 6-inches bgs) and the subsurface soil (greater than 6-inches bgs to the water table); each of these two intervals was evaluated individually.

Prior to the selection of inorganic groundwater COPCs, a comparison between the filtered and unfiltered samples was conducted. Groundwater samples obtained using temporary piezometer techniques would likely contain high suspended solids, therefore, filtered (dissolved) inorganic results were compared to unfiltered (total) results to determine whether a COPC is associated with groundwater or is present as a result of suspended solids. If an inorganic COPC was detected in the unfiltered groundwater sample and was not detected in the filtered groundwater sample, it was assumed that the presence of the COPC was likely due to the presence of suspended solids and the chemical may not have been retained for further evaluation. However, if unfiltered analytical results were significant enough to warrant further consideration and cannot be eliminated as a COPC by a comparison to filtered results, they would likely be included as COPCs regardless of the filtered sample results.

Tables 6-1 through 6-20 present data and COPC selection summaries for all investigated environmental media. Each table presents ranges of detected concentrations, frequencies of detection, comparisons of sample concentrations with appropriate criteria/standards, frequencies of exceedences of appropriate criteria/standards, and the selection of COPCs based on the previously mentioned information. Information is presented in these tables only for those constituents detected at least once, in the medium of interest.

The following paragraphs present the rationale for selection of COPCs. Sample locations, analytical results, and corresponding figures are presented in Section 5.0. In discussions below, frequencies of detection are provided in parentheses as the number of detected concentrations over the total number of samples analyzed.

6.1.2.1 SSA 1

COPCs were identified in surface soil, subsurface soil, groundwater (unfiltered and filtered), surface water, and sediment investigated at SSA 1. Tables 6-1 through 6-5 present data and COPC selection summaries for each of the aforementioned environmental media. Discussions of the selection of COPCs for each medium in SSA 1 are provided in the following subsections.

Surface Soil

Table 6-1 presents the data and COPC selection summary for the surface soil samples collected from SSA 1. VOCs, SVOCs, pesticides, nitramine compounds and inorganics were detected in the SSA 1 surface soils.

VOCs were not retained as surface soil COPCs since detected concentrations did not exceed their corresponding COC screening levels.

The SVOCs benzo(a)anthracene (19/64), benzo(b)fluoranthene (27/64), benzo(k)fluoranthene (30/64), benzo(a)pyrene (27/64), indeno(1,2,3-cd)pyrene (19/64), and dibenz(a,h)anthracene (14/64) were retained as COPCs since their concentrations exceeded their corresponding COC values.

Three pesticides, dieldrin (2/64), 4,4'-DDE (1/64), and 4,4'-DDT (3/64) were detected in the surface soil at SSA 1. DDE and DDT did not exceed their corresponding COC value and were not retained as COPCs. Dieldrin did exceed its corresponding COC value but was detected at a frequency less than 5%, and was not detected in any other environmental media at SSA 1. Therefore, it was not retained as a surface soil COPC at SSA 1.

Four nitramines, 1,3-dinitrotoluene (1/64), 2,4,6-trinitrotoluene (5/64), 2,4-dinitrotoluene (1/64), and 1,3,5-trinitrobenzene (4/64) were detected in the surface soils at SSA 1. However, only 1,3,5-trinitrobenzene (4/64) was retained as a COPC since its concentration exceeded its corresponding COC value.

Aluminum (64/64), arsenic (36/64), beryllium (42/64), cadmium (6/64), lead (60/64), and manganese (64/64) were detected at concentrations exceeding their respective COC values, and therefore, were retained as surface soil COPCs for SSA 1.

Subsurface Soil

Table 6-2 presents the data and COPC selection summary for the subsurface soil samples collected from SSA 1. VOCs, SVOCs, pesticides, Aroclor-1260, nitramine compounds, and inorganics were detected in the SSA 1 subsurface soils. VOCs, pesticides, Aroclor-1260, and nitramine compounds were not retained as subsurface soil COPCs since detected concentrations did not exceed their corresponding COC screening levels.

The SVOCs benzo(a)anthracene (10/39), benzo(b)fluoranthene (9/39), benzo(k)fluoranthene (10/39), benzo(a)pyrene (10/39), indeno(1,2,3-cd)pyrene (9/39), and dibenzo(a,h)anthracene (4/39) were retained as COPCs since their concentrations exceeded their corresponding COC values.

Aluminum (39/39), arsenic (36/39), beryllium (31/39), manganese (38/39) and thallium (5/39) were detected at concentrations exceeding their respective COC values, and therefore, were retained as subsurface soil COPCs for SSA 1.

Groundwater

Table 6-3 presents the data and human health COPC selection summary for groundwater samples collected at SSA 1. Only the VOC chloroform, nitramine compounds, and unfiltered (total) and filtered (dissolved) inorganics were detected in the groundwater samples.

Chloroform (1/10) was the only VOC detected in the SSA 1 groundwater samples. The concentration of chloroform (0.6J) exceeded the corresponding COC value; however, the chloroform concentration did not exceed five times the maximum concentration detected in associated blank(s) and was therefore, not retained as a groundwater COPC (refer to Table 5-1).
2,4,6-Trinitrotoluene (1/10), 4-amino-2,6-dinitrotoluene (1/10), and RDX (3/10) were detected at concentrations exceeding their respective COC values. As a result, these compounds were retained as groundwater COPCs for SSA 1.

Concentrations of unfiltered aluminum (10/10), barium (10/10), cadmium (1/10), manganese (10/10), and vanadium (9/10) exceeded corresponding tapwater COC values and were retained as inorganic COPCs for SSA 1. Unfiltered antimony (2/6), arsenic (9/10), beryllium (10/10), chromium (9/10), lead (9/10), and nickel (9/10) also were detected at concentrations exceeding available standards and criteria; however, the presence of these inorganics may be due to suspended solids since they were not detected in the filtered groundwater samples. Therefore, these unfiltered inorganics were not retained as COPCs. Detected concentrations of dissolved manganese (8/10) and thallium (4/10) also were retained as groundwater COPCs since they exceeded corresponding standards and criteria.

Surface Water

Table 6-4 presents the data and ecological chemicals of concern (ECOCs) selection summary for surface water samples collected from SSA 1. Only 4-amino-2,6-dinitrotoluene, 2,4,6-trinitrotoluene, and inorganics were detected in the surface water samples. Neither of the nitrotoluene compounds, which were each detected in one out of five samples analyzed, were retained as surface water ECOCs since they were detected at concentrations less than available standards and criteria.

Of the inorganics detected in the surface water samples, cadmium (1/5), chromium (5/5), copper (5/5), iron (5/5), lead (5/5), mercury (3/5), and zinc (5/5) were retained as surface water COPCs in SSA 1 since they were detected at concentrations exceeding available standards and criteria.

Sediment

Table 6-5 presents the data and ECOC selection summary for sediment samples collected from SSA 1. Only SVOCs, pesticides, and inorganics were detected in the sediment samples. Of these constituents, only benzo(b)fluoranthene (2/9), 4,4,'-DDT (2/9), and mercury (1/9) were retained as sediment ECOCs since they were detected at concentrations exceeding their respective ER-Ls.

6.1.2.2 SSA 6

COPCs were identified in surface soil, subsurface soil, and groundwater (unfiltered and filtered) samples collected at SSA 6. Tables 6-6 through 6-9 present data and COPC selection summaries

for all environmental media investigated at SSA 6. Discussions of the selection of COPCs for each medium in SSA 6 are provided in the following subsections.

Surface Soil

Table 6-6 presents the data and COPC selection summary for surface soil samples collected from SSA 6. VOCs, SVOCs, pesticides, Aroclor-1254, and inorganics were detected in SSA 6 surface soil.

None of the detected VOCs were retained as surface soil COPCs since detected concentrations did not exceed the corresponding COC values. Of the SVOCs detected, only one potentially carcinogenic PAH compound, benzo(a)pyrene (5/31), was retained as a surface soil COPC since four of the five detected concentrations exceeded the corresponding COC value. One detected concentration of alpha-chlordane (3/31), dieldrin (3/31), gamma-chlordane (3/31), and Aroclor-1254 (1/31) exceeded the respective COC values. Due to these exceedences, alpha-chlordane, dieldrin, and gamma-chlordane were retained as surface soil COPCs in SSA 6. Though detected at a concentration exceeding its respective COC value, Aroclor-1254 was detected at a frequency of less than 5 percent and not retained as a COPC. However, since past activities at SSA 6 included the storage of PCB-coated cables, Aroclor-1254 was reincluded as a COPC.

Aluminum (31/31), antimony (3/31), arsenic (31/31), beryllium (31/31), cadmium (16/31), manganese (31/31), and mercury (4/31) also were detected at concentrations exceeding their respective COC values, and therefore, were retained as surface soil COPCs for SSA 6.

Subsurface Soil - Soil Borings

Table 6-7 presents the data and human health COPC selection summary for subsurface soil samples collected from soil borings at SSA 6. VOCs, SVOCs, nitramine compounds, pesticides, and inorganics were detected in SSA 6 subsurface soil.

VOCs, SVOCs, and pesticides were not retained as subsurface soil COPCs since detected concentrations did not exceed the corresponding residential COC values (PCBs were not detected at SSA 6).

One nitramine compound, 1,3,5-trinitrobenzene, was retained as a COPC since detected concentrations exceeded the corresponding COC value.

Aluminum (42/42), antimony (2/30), arsenic (42/42), beryllium (31/42), manganese (42/42), mercury (6/42), thallium (2/42), and vanadium (42/42) were detected at concentrations exceeding their respective COC values and were retained as subsurface soil COPCs for SSA 6.

Subsurface Soil - Test Pits

Table 6-8 presents the data and COPC selection summary for subsurface soils collected from the test pits at SSA 6. VOCs, SVOCs, pesticides, PCBs, nitramine compounds, and inorganics were detected in SSA 6 subsurface soil from the test pits.

VOCs and SVOCs were not retained as subsurface soil COPCs since detected concentrations did not exceed the corresponding COC values.

Of the pesticides detected, dieldrin (2/17) and alpha-chlordane (2/17) were retained as subsurface soil COPCs since detected concentrations exceeded their corresponding COC values.

One nitramine compound, 1,3,5-trinitrobenzene (1/17), was retained as a subsurface soil COPC since its concentration exceeded its COC value.

Aluminum (17/17), arsenic (17/17), beryllium (10/17), cadmium (7/17), and manganese (17/17) also were detected at concentrations exceeding their respective COC values, and therefore were retained as subsurface soil COPCs from the test pits for SSA 6.

Groundwater

Table 6-9 presents the data and COPC selection summary for groundwater samples collected at SSA 6. VOCs, nitramine compounds, pesticides, and unfiltered and filtered inorganics were detected in the groundwater samples.

Ethylbenzene (1/11), cis-1,2-dichloroethene (3/11), and trichloroethene (1/11) were the only VOCs detected in the SSA 6 groundwater samples. The concentration of cis-1,2-dichloroethene exceeded the corresponding COC value; therefore, this VOC was retained as a groundwater COPC.

Neither of the two detected pesticides, beta-BHC (1/11) or delta-BHC (2/11), were retained as groundwater COPCs since their concentrations did not exceed COC values or other applicable standards and criteria.

2,4,6-Trinitrotoluene (1/11), 4-amino-2,6-dinitrotoluene (1/11), and nitrobenzene (1/11) were detected in the SSA 6 groundwater samples; however, only the detected concentration of nitrobenzene exceeded its respective COC value. As a result, nitrobenzene was retained as a groundwater COPC for SSA 6.

Concentrations of unfiltered aluminum (11/11), arsenic (11/11), barium (11/11), beryllium (10/11), cadmium (5/11), chromium (11/11), lead (11/11), manganese (11/11), nickel (11/11), and vanadium (11/11) exceeded corresponding tapwater COC values and were retained as inorganic COPCs for SSA 6. Unfiltered antimony (6/10) and selenium (5/11) also were detected at concentrations exceeding available standards and criteria; however, the presence of these inorganics may be due to suspended solids since they were not detected in the filtered groundwater samples. Therefore, unfiltered antimony and selenium were not retained as groundwater COPCs. Detected concentrations of dissolved beryllium (6/11) and manganese (11/11) exceeded their respective COC screening levels, and detected concentrations of dissolved thallium (2/11) exceeded the Federal MCL and the COC value. Therefore, dissolved beryllium, manganese, and thallium also were retained as groundwater COPCs for SSA 6.

6.1.2.3 SSA 7

Organic and/or inorganic constituents were detected in surface soil, subsurface soil, groundwater (unfiltered and filtered), surface water, and sediment investigated at SSA 7. Tables 6-10 through 6-15 present data and COPC selection summaries for all environmental media investigated at SSA 7. Discussions of the selection of COPCs for each medium in SSA 7 are provided in the following subsections.

Surface Soil

Table 6-10 presents the data and human health COPC selection summary for surface soil samples collected from SSA 7. VOCs, SVOCs, pesticides, and inorganics were detected in SSA 7 surface soil. Of the detected VOCs and pesticides, none were retained as surface soil COPCs since their detected concentrations did not exceed the corresponding COC values.

Of the SVOCs detected in SSA 7 surface soil, only the maximum detected concentration of the potentially carcinogenic PAH, benzo(a)pyrene (2/5), exceeded the corresponding COC value. Therefore, benzo(a)pyrene was retained as a surface soil COPC for SSA 7.

Aluminum (5/5), arsenic (5/5), beryllium (5/5), and manganese (5/5) also were detected at concentrations exceeding their respective COC values, and therefore, were retained as surface soil COPCs for SSA 7.

Subsurface Soil - Soil Borings

Table 6-11 presents the data and human health COPC selection summary for subsurface soil samples collected from SSA 7 soil borings. Methylene chloride (a common volatile organic laboratory contaminant), SVOCs, pesticides, Aroclor-1260, nitramine compounds, and inorganics were detected in SSA 7 subsurface soil. Of the detected organics, only Aroclor-1260 was retained as a subsurface soil COPC since detected concentrations exceeded its corresponding COC value. Aluminum (27/27), antimony (1/20), arsenic (26/27), beryllium (26/27), manganese (27/27), and thallium (5/27) were detected at concentrations exceeding their respective COC values, and therefore, were retained as subsurface soil COPCs for SSA 7.

Subsurface Soil - Test Pits

Table 6-12 presents the data and COPC selection summary for the subsurface soil samples collected from the test pits at SSA 7. VOCs, SVOCs, pesticides, Aroclor-1260, nitramine compounds, and inorganics were detected in the SSA 7 subsurface soils from the test pits. VOCs, SVOCs, pesticides, and 2,4,6-trinitrotoluene were not retained as subsurface soil COPCs since detected concentrations did not exceed their corresponding COC values.

Aroclor-1260 (1/7) was retained as a COPC since its concentration exceeded its corresponding COC value.

Aluminum (7/7), arsenic (7/7), beryllium (4/7) and manganese (7/7) also were detected at concentrations exceeding their respective COC values, and therefore, were retained as subsurface soil COPCs for the test pits at SSA 7.

Groundwater

Table 6-13 presents the data and human health COPC selection summary for groundwater samples collected at SSA 7. VOCs, SVOCs, pesticides, nitramine compounds, and unfiltered and dissolved inorganics were detected in the groundwater samples.

Of the VOCs detected in the SSA 7 groundwater samples, 1,1-dichloroethene (4/7) and 1,1,1-trichloroethane (5/7) were the only VOCs retained as COPCs since their detected concentrations exceeded corresponding COC values, as well as Federal MCLs and Commonwealth of Virginia PMCLs.

Carbazole (1/7) was the only SVOC retained as a groundwater COPC for SSA 7 since its detected concentration exceeded the corresponding COC value.

Four pesticides, aldrin (1/6), alpha-BHC (1/6), delta-BHC, (1/6), and dieldrin (1/6) were detected in the groundwater samples collected from SSA 7 monitoring well locations. Of these four pesticides, the detected concentrations of aldrin, alpha-BHC, and dieldrin exceeded corresponding COC values. Therefore, these compounds were retained as groundwater COPCs for SSA 7.

Of the nitramine compounds analyzed in the groundwater samples collected from SSA 7, only the nitroaromatic compound, HMX (3/7), and the nitramine compound, RDX (3/7), were detected. However, only RDX was retained as a COPC since all three detected concentrations of this compound exceeded its respective COC value.

Concentrations of unfiltered aluminum (7/7), antimony (7/7), arsenic (7/7), barium (7/7), copper (7/7), manganese (7/7), nickel (7/7), thallium (6/7), vanadium (7/7), and zinc (7/7) exceeded

corresponding tapwater COC values and MCLs. Therefore, these inorganics were retained as COPCs for SSA 7. Unfiltered beryllium (7/7), cadmium (6/7), chromium (7/7), lead (7/7), and selenium (6/7) also were detected at concentrations exceeding available standards and criteria; however, the presence of these inorganics may be due to suspended solids since they were not detected in the filtered groundwater samples. Therefore, these unfiltered inorganics were not retained as groundwater COPCs. Detected concentrations of dissolved antimony (1/7), arsenic (1/7), manganese (6/7), and thallium (5/7) exceeded their respective COC value and/or Federal MCLs. Therefore, dissolved antimony, arsenic, manganese, and thallium also were retained as groundwater COPCs at SSA 7.

Surface Water

Table 6-14 presents the data and ECOC selection summary for surface water samples collected from SSA 7. Only inorganics were detected in the surface water samples. None of the detected concentrations of inorganics exceeded corresponding AWQCs or VWQSs; therefore, no constituents were retained as surface water ECOCs for SSA 7.

Sediment

Table 6-15 presents the data and ECOC selection summary for sediment samples collected from SSA 7. Only SVOCs and inorganics were detected in the sediment samples. Of these constituents, only benzo(k)fluoranthene (1/9), arsenic (9/9), and nickel (9/9) were retained as ECOCs in SSA 7 sediment since they were detected at concentrations exceeding their respective ER-Ls.

6.1.2.4 SSA 15

Organic and/or inorganic constituents were detected in surface soil, subsurface soil, groundwater (unfiltered and filtered), surface water, and sediment investigated at SSA 15. Tables 6-16 through 6-20 present data and COPC selection summaries for all environmental media investigated at SSA 15. Discussions of the selection of COPCs for each medium in SSA 15 are provided in the following subsections.

Surface Soil

Table 6-16 presents the data and human health COPC selection summary for surface soil samples collected from SSA 15. SVOCs, pesticides, and inorganics were detected in SSA 15 surface soil. SVOCs and pesticides were not retained as surface soil COPCs since their detected concentrations did not exceed the corresponding COC values.

Antimony (1/6), arsenic (6/6), beryllium (6/6), and manganese (6/6) were detected at concentrations exceeding their respective COC values. Therefore, these inorganics were retained as surface soil COPCs at SSA 15.

Subsurface Soil

Table 6-17 presents the data and human health COPC selection summary for subsurface soil samples collected from SSA 15. Methylene chloride and acetone (two common volatile organic laboratory contaminants), SVOCs, pesticides, and inorganics were detected in SSA 15 subsurface soil. Detected organic compounds were not retained as subsurface soil COPCs because detected concentrations did not exceed the corresponding residential COC values.

Aluminum (13/13), antimony (4/13), arsenic (13/13), beryllium (13/13), manganese (13/13), and thallium (1/13) were detected at concentrations exceeding their respective COC values, and therefore, were retained as subsurface soil COPCs for SSA 15.

Groundwater

Table 6-18 presents the data and human health COPC selection summary for groundwater samples collected at SSA 15. VOCs, pesticides, and unfiltered and dissolved inorganics were detected in the groundwater samples.

Of the VOCs detected in the SSA 15 groundwater samples, 1,1-dichloroethene 0.6J µg/L (1/5), bromodichloromethane 0.5J µg/L (1/5), chloroform 4 µg/L (4/5), and trichloroethene 7 µg/L (1/5) were detected at concentrations which exceeded corresponding COC values or other applicable criteria or standards. Of these four constituents only 1,1-dichloroethene and trichloroethene were

retained as COPCs, since bromodichloromethane and chloroform did not exceed five times the maximum concentration detected in associated blank(s) (refer to Table 5-1).

Four pesticides, beta-BHC (1/5), 4,4'-DDD (2/5), 4,4'-DDE (2/5), and 4,4'-DDT (2/5) were detected in the groundwater samples collected from SSA 15. Of these four pesticides, only detected concentrations of beta-BHC and 4,4'-DDT exceeded corresponding COC values or other applicable standards and criteria. Therefore, these compounds were retained as groundwater COPCs for SSA 15.

Concentrations of unfiltered barium (5/5), chromium (5/5), nickel (5/5), and vanadium (5/5) exceeded corresponding tapwater COC values and/or other applicable standards or criteria. Therefore, these inorganics were retained as COPCs for SSA 15. Unfiltered aluminum (5/5), antimony (3/5), arsenic (5/5), cadmium (1/5), lead (5/5), thallium (4/5), and vanadium (5/5) also were detected at concentrations exceeding available standards and criteria; however, the presence of these inorganics may have been due to sedimentation since they were not detected in the filtered groundwater samples. Therefore, these unfiltered inorganics were not retained as groundwater COPCs. Detected concentrations of dissolved manganese (5/5) exceeded the corresponding COC value. Therefore, dissolved manganese also was retained as a groundwater COPC for SSA 15.

Surface Water

Table 6-19 presents the data and ECOC selection summary for surface water samples collected from SSA 15. Five VOCs, 1,1-dichloroethene (1/3), 1,1-dichloroethane (1/3), trichlorethene (2/3), vinyl chloride (1/3), and cis-1,2-dichloroethene (2/3) were detected in surface water samples. 1,1-Dichloroethene and trichloroethene were also detected in the SSA 15 groundwater water samples at concentrations exceeding the corresponding COC values or other applicable criteria or standards. Therefore, each of the volatile constituents detected in surface water samples, (all considered to be degradation products of trichloroethene), were retained as surface water COPCs. Of the detected inorganic compounds, none exceeded corresponding AWQCs or VWQSs; therefore, no inorganic constituents were retained as surface water ECOCs for SSA 15.

Sediment

Table 6-20 presents the data and ECOC selection summary for sediment samples collected from SSA 15. VOCs, SVOCs, pesticides, and inorganics were detected in the sediment samples. Of these constituents, only 4,4'-DDD (5/5), 4,4'-DDE (5/5), 4,4'-DDT (5/5), alpha-chlordane (4/5), gamma-chlordane (4/5), and mercury (3/5) were retained as sediment ECOCs for SSA 15 since they were detected at concentrations exceeding their respective ER-Ls. Trichloroethene (2/5) was reincluded as a COPC due to its carcinogenicity and its presence in sediment at SSA 15.

6.1.2.5 Summary of COPCs

The following paragraphs summarize by media the COPCs and ECOCs selected for quantitative evaluation at each SSA. Italicized COPC or ECOC names indicate that detected concentrations fall within the range of background concentrations as presented in the Final Summary of Background Constituent Concentrations and Characterization of the Biotic Community from the York River Drainage Basin (Baker, 1995). Because surface water bodies at SSA 1 and SSA 15 are intermittent in nature and frequently go dry, comparisons to available background freshwater creek data was not considered appropriate.

SSA 1

Surface Soil COPCs: Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene Benzo(a)pyrene, Indeno (1,2,3-cd)pyrene, Dibenz(a,h)anthracene, 1,3,5-trinitrobenzene, *aluminum*, *arsenic*, *beryllium*, cadmium, lead, and *manganese*.

Subsurface Soil COPCs: Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenzo(a,h)anthracene, *Aluminum*, *Arsenic*, *Beryllium*, *Manganese*, and Thallium.

Groundwater COPCs: 2,4,6-Trinitrotoluene, 4-Amino-2,6-Dinitrotoluene, RDX, Aluminum, Barium, Cadmium, Manganese, Vanadium, Dissolved Manganese, and Dissolved Thallium.

Surface Water ECOCs: Cadmium, Chromium, Copper, Iron, Lead, Mercury, and Zinc.

Sediment ECOCs: Benzo(b)fluoranthene, 4,4'-DDT, and Mercury.

SSA 6

Surface Soil COPCs: Benzo(a)pyrene, alpha-Chlordane, Dieldrin, gamma-Chlordane, Aroclor-1254, *Aluminum*, Antimony, *Arsenic*, *Beryllium*, Cadmium, *Manganese*, and Mercury.

Subsurface Soil COPCs - Soil Borings: 1,3,5-Trinitrobenzene, *Aluminum*, *Antimony*, Arsenic, *Beryllium*, *Manganese*, Mercury, Thallium, Vanadium.

Subsurface Soil COPCs - Test Pits: Dieldrin, alpha-Chlordane, Aroclor-1254, Aroclor-1260, 1,3,5-Trinitrobenzene, *Aluminum*, *Arsenic*, *Beryllium*, Cadmium, and *Manganese*.

Groundwater COPCs: cis-1,2-Dichloroethene, Nitrobenzene, Aluminum, Arsenic, Barium, Beryllium, Cadmium, Chromium, Lead, Manganese, Nickel, Vanadium, Dissolved Beryllium, *Dissolved Manganese*, and *Dissolved Thallium*.

SSA 7

Surface Soil COPCs: Benzo(a)pyrene, *Aluminum*, *Arsenic*, *Beryllium*, and *Manganese*.

Subsurface Soil COPCs - Soil Borings: Aroclor-1260, *Aluminum*, *Antimony*, *Arsenic*, *Beryllium*, *Manganese*, and Thallium.

Subsurface Soil COPCs - Test Pits: Aroclor-1260, *Aluminum*, *Arsenic*, *Beryllium*, and *Manganese*.

Groundwater COPCs: 1,1-Dichloroethene, 1,1,1-Trichloroethane, Carbazole, Aldrin, alpha-BHC, Dieldrin, RDX, Aluminum, Antimony, Arsenic, Barium, Copper, Manganese, Nickel, Thallium, Vanadium, Zinc, *Dissolved Antimony*, Dissolved Arsenic, Dissolved Manganese, and *Dissolved Thallium*.

Surface Water ECOCs: No ECOCs were retained for this medium.

Sediment ECOCs: Benzo(k)fluoranthene, Arsenic, and *Nickel.*

SSA 15

Surface Soil COPCs: *Antimony, Arsenic, Beryllium,* and *Manganese.*

Subsurface Soil COPCs: *Aluminum, Antimony, Arsenic, Beryllium, Manganese,* and Thallium.

Groundwater COPCs: 1,1-Dichloroethene, Trichloroethene, beta-BHC, 4,4'-DDT, Barium, Chromium, Nickel, Vanadium, and Dissolved Manganese.

Surface Water ECOCs: 1,1-Dichloroethene, 1,1-Dichloroethane, Trichloroethene, Vinyl chloride, cis-1,2-Dichloroethene.

Sediment ECOCs: Trichloroethene, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, alpha-Chlordane, gamma-Chlordane, and Mercury.

6.2 Exposure Assessment

The exposure assessment identifies pathways and routes by which SSA related constituents may reach potential receptors. The following four elements were considered to ascertain whether a complete exposure pathway was present (USEPA, 1989):

- A source and potential mechanism of chemical release
- An environmental retention or transport medium
- A point of potential human contact with the contaminated medium
- An exposure route (e.g., ingestion) at the contact point

When all four of these components are present, the exposure pathway is considered complete. Complete exposure pathways, coupled with specific toxicological information, allow for the assessment of potential human health risk.

WPNSTA Yorktown, will continue to function as one of the key Naval ordnance installations on the East Coast for the foreseeable future. Station housing for enlisted personnel is limited to areas around the golf course; Mason Row (senior officers quarters), which overlooks the York River; and cottage-style homes scattered throughout the Station. Housing for most enlisted personnel at WPNSTA Yorktown is situated in the Skiffes Creek area south of the Station and Highway 143. There is currently no Station housing of enlisted personnel at any of the SSAs.

The Station has been divided by the Navy into three basic land use areas: (1) explosive/ordnance storage, (2) ordnance loading/maintenance, and (3) non-explosive and support functions (DoN, 1991). Categorized from an "explosives" standpoint, two general land use types emerge: real estate encumbered by the Explosive Safety Quantity Distance (ESQD) arc and that which is not encumbered. SSAs 6 and 7 are situated in an area encumbered by the ESQD arc and therefore, cannot be developed for Station housing of enlisted personnel. The area also is restricted, and only individuals having the proper clearance or Station passes are allowed in the area. Although future residential development of any of the SSAs is highly unlikely, future residential exposure to potential adult and child receptors was considered for this risk screening.

6.2.1 Exposure Pathways

The following paragraphs discuss the exposure pathways considered as part of the risk screening conducted for SSAs 1, 6, 7, and 15. Exposure pathways evaluated as part of the risk screening process do not consider total site risk or exposure by every possible receptor, human or ecological. The conservative nature of the risk screening should account for some of the receptors or pathways not considered otherwise.

6.2.1.1 Potential Human Exposure Pathways

Potential human exposure pathways, evaluated as part of the risk screening process, are limited to those pathways considered int he derivation of USEPA Region III RBC values. USEPA Region III RBC values consider the age adjusted ingestion of COPCs in soils and groundwaters by future potential residents.

Currently, human exposure to COPCs is limited to Station personnel who may, during the course of daily work assignments, contact affected soils by accidental ingestion and dermal exposure pathways. Current human exposure to COPCs in groundwater is negligible because groundwater at the Station is not used for potable purposes. As such, risk screening is a conservative evaluation of potential human health risks despite the absence of the dermal exposure pathway component. The lack of a dermal exposure component and assessments of other environmental media exposure (i.e., dermal contact and accidental ingestion of surface waters/sediments) will be addressed in Section 6.7.

6.2.1.2 Potential Ecological Exposure Pathways

Potential ecological exposure pathways evaluated as part of the risk screening process are limited to aquatic receptors potentially exposed to ECOCs in surface water or sediments. The terrestrial component of the risk screening process will be addressed qualitatively because modeling is required to derive a dose, to which, a terrestrial receptor could be exposed. The lack of a quantitative terrestrial component will be addressed in the uncertainties section of this document. Because water bodies at SSA 1 and SSA 15 are intermittent in nature, and do not sustain edible fish populations, affects such as uptake were not evaluated.

6.3 Toxicity Assessment

The purpose of this section is to identify the potential human health and ecological effects associated with potential exposure to the COPCs. A toxicological evaluation characterizes the inherent toxicity of a compound. It consists of the review of scientific data to determine the nature and extent of the potential human health and environmental effects associated with potential exposure to the various chemicals. The end product is a collection of toxicological profiles for the COPCs. These toxicological profiles provide the qualitative weight-of-evidence (WOE) that demonstrate whether the COPCs pose any actual or potential human health and ecological effects. The human health and ecological toxicological profiles addressing the COPCs at SSAs 1, 6, 7, and 15 are presented in Appendices K and L, respectively. Table 6-21 presents the weight-of-evidence categories as currently defined by USEPA. Table 6-22 contains a summary of RBC values for the COPCs identified at SSAs 1,6, 7, and 15. Table 6-23 contains a summary of ER-Ls and AWQCs for ECOCs.

6.4 Risk Characterization

For the risk screening, risk characterization consisted of calculating a ratio between the exposure point concentration in the appropriate medium and corresponding RBC values, which were taken directly from the Region III, March 7, 1995 RBC Table. These values were not divided by a factor of 10. For human health, carcinogenic and noncarcinogenic effects were evaluated separately for exposure to soil and groundwater. For ecological receptors, ratios were calculated to determine the potential effects from exposures to both surface water and sediment. The algorithms were taken from the risk screening approach presented in the Final Site Screening Process Guidelines (Baker, 1994c) and are presented in the following sections. Table 6-22 provides a summary of the RBC values, WOE, target organ, and critical effect for each of the COPCs. Table 6-24 provides a summary of the AWQCs and ER-Ls for each ECOC.

6.4.1 Human Health Effects - Carcinogens

Compounds potentially resulting in carcinogenic effects were evaluated using the following equation:

$$ICR = \sum (C_m / RBC) \times 10^{-06}$$

Where:

ICR	=	Incremental Lifetime Cancer Risk
C_m	=	The concentration term for a medium (mg/kg, µg/L)
RBC	=	Risk-Based Concentration value (mg/kg, µg/L)
10^{-6}	=	Risk assessment point of departure

Multiplying the C_m/RBC ratio by USEPA's point of departure risk level, 10^{-06}, produced a risk value for the detected chemical. The ICR values for all COPCs were summed to account for potential carcinogenic effects associated with multiple chemical exposures.

Carcinogenic effects are expressed as incremental lifetime risks while noncarcinogenic effects are expressed as hazard indices. Cancer effects are expressed as risk (ICRs) because the expression of cancer does not occur immediately after exposure but typically occurs years after the exposure. The total ICR value was assessed relative to the USEPA's generally acceptable target cancer risk range

of 10^{-04} to 10^{-06} (USEPA, 1990). The target risk range represents the range of acceptable human health cancer risks considered to be generally acceptable by USEPA. A 1 x 10^{-04} ICR value corresponds to one potential additional cancer in an exposed population of ten thousand individuals; a 1 x 10^{-06} ICR value indicates that one potential additional cancer could occur in an exposed population of one million individuals.

6.4.2 Human Health Effects - Noncarcinogens

Compounds potentially resulting in noncarcinogenic (systemic) effects were evaluated using the following equation:

$$HQ = C_m / RBC$$

$$HI = \sum HQ$$

Where:

HQ	=	Hazard Quotient
C_m	=	The concentration term for a medium (mg/kg, µg/L)
RBC	=	Risk-Based Concentration value (mg/kg, µg/L)
HI	=	Hazard Index

Noncarcinogenic health effects usually occur subsequent to exposure if a threshold intake level is exceeded. Therefore, the Hazard Index (HI) value for each environmental medium was compared to unity. An HI that is less than or equal to unity (1.0) indicates that noncarcinogenic effects are not expected to occur subsequent to exposure (USEPA, 1990). An HI value that exceeds unity indicates that noncarcinogenic health effects may occur subsequent to exposure. However, since the USEPA incorporates uncertainty ("safety") factors in the derivation of the RBC values to ensure that it is well below the dose at which adverse effects might be observed, the expression of adverse effects may not be observed even with an HI estimate greater than 1.0. Risk estimates and hazard indices are not intended as a true indication of actual exposure; they are intended to provide decision makers with useful information regarding the significance of the observed contamination.

6.4.3 Ecological Effects

Compounds potentially resulting in ecological effects were evaluated using the following equation:

$$EQ = C_m / (AWQC \text{ or } ER\text{-}L)$$

$$EI = \sum EQ$$

Where:

EQ	=	Ecological Quotient
C_m	=	The concentration term for a medium (mg/kg, µg/L)
AWQC	=	Ambient Water Quality Criteria (µg/L)
ER-L	=	Sediment screening value, Effects Range-Low value (mg/kg)
EI	=	Ecological Index

The Ecological Index (EI) values for surface water and sediment were compared to unity. An EI less than or equal to unity (1.0) suggests that adverse ecological effects are not expected to occur. An EI value that exceeds unity suggests that the potential for adverse ecological effects may exist.

6.4.4 The Concentration Term (Cm)

The manner in which environmental data are represented depends on the number of samples and sampling locations available for a given area and a given medium. Ninety-fifth percent (95%) Upper Confidence Limit (UCL) values for the arithmetic mean were used as exposure point concentrations for media based on the following rationale. If the number of samples in a sample set is greater than or equal to ten, the 95% UCL is used as the exposure point concentration. This is provided that there are no hot spots, and sampling is representative of the entire SSA. If the sample set for a given media numbers between five and nine samples, then discretion must be used in selecting the 95% UCL or maximum detected concentration. The decision will depend on such things as the size of the SSA and/or the type of medium being considered. For sample sets consisting of less than five samples, the maximum detected concentration should be used. However, if the 95% UCL exceeded the maximum detected concentration of a COPC, the maximum detected concentration of that COPC was utilized (USEPA, 1992).

The following briefly summarizes by SSA the rationale for choosing between the normal 95% UCL or maximum detected concentrations:

- The 95% UCL was used for all media in SSA 1. In the instances where the 95% UCL exceeded the maximum detected concentration, the maximum was used. No data sets contained less than five samples in SSA 1.

- Exposure point concentrations used in SSA 6 were normal 95% UCL values, or maximum values if the UCL was exceeded. All data sets for SSA 6 consist of more than ten samples.

- Concentration values used in subsurface soil and sediment for SSA 7 were normal 95% UCL values, or maximum values if the UCL was exceeded. Concentration values used in surface soil, groundwater, and surface water were maximum detected concentrations because of the relatively small (less than 5) sample size.

- Exposure point concentrations used in all media except surface water for SSA 15 were normal 95% UCL values, or maximum values if the UCL was exceeded. The maximum detected concentration was used for SSA 15 surface water because of the small size of the data set (three samples).

The 95% UCL was calculated using the following equation (USEPA, 1992):

$$95\%\ UCL = \bar{x} + t(s/\sqrt{n})$$

Where:

$\bar{x}$ = mean
t = Student t statistic
s = standard deviation
n = number of samples

For results reported as "nondetect" (i.e., results flagged with the following validation qualifiers: U, UJ, UL, and UK), a value of one half of the sample-specific detection limit was used to calculate the 95% UCL. A value of half the detection limit was assigned to nondetects when estimating the 95% UCL because the actual value could be between zero and a value just below the detection limit. Ninety-five percent UCLs were calculated only for the constituents detected in at least one sample

collected from the environmental medium of interest. Estimated concentrations also were used to calculate the 95% UCL, such as "J"-qualified (estimated), "L"-qualified (estimated, biased low) and "K"-qualified (estimated, biased high) data. Reported concentrations qualified with an "R" (rejected) were not used in the statistical evaluation.

B-qualified data were not used in the derivation of the 95% UCL.

According to the Region III Modifications to the National Functional Guidelines (NFGs), reported organic and inorganic concentrations were evaluated against the available field and laboratory blanks. For constituents considered by RAGS to be common laboratory blanks, chemicals were qualified "B" if their concentration were less than or equal to 10 times the maximum blank concentration. For constituents not considered to be common laboratory contaminants, chemicals were qualified "B" if their concentration were less than or equal to 5 times the maximum blank concentration.

6.5 Potential Human Health and Ecological Effects

Table 6-24 and 6-25 present summaries of total human health and ecological risks, respectively, for each SSA. Total ICRs and HIs take into account the use of filtered and unfiltered groundwater data. Risk values for filtered groundwater are indicated in parentheses.

6.5.1 SSA 1 - Building 428 and the Teague Road Disposal Area

Surface soil is the only medium producing an unacceptable lifetime human health cancer risk (ILCR = 1.1×10^{-4}) at SSA 1. Contaminants detected in SSA 1 surface soils accounting for more than 95 percent of the ILCR value include the cPAHs (benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenz(a,h) anthracene, chrysene and indeno(1,2,3-cd)pyrene)) and arsenic. Arsenic accounts for approximately 22 percent of the ILCR and was detected in SSA 1 soils at concentrations ranging from 0.19K mg/k to 52.7 L mg/kg (95% UCL value for normal distribution of 8.51 mg/kg). These concentrations fall within the range of station-wide surface soil concentrations of 0.46L mg/kg to 63.9 mg/kg and could be attributable to background conditions. The cPAHs were detected throughout the SSA in areas where concrete

rubble, wood pilings, drums, and scrap metal were removed and produced an ILCR value of 8.1×10^{-5}, which falls within USEPAs generally acceptable target range (10-4 to 10-6).

Groundwater at SSA 1 is the only medium producing a noncarcinogenic hazard indices exceeding unity (11.0 using unfiltered analytical data and 1.6 using filtered groundwater data). Elevated HIs produced by the presence of manganese (HQ = 8.6), aluminum (HQ = 1.3) and vanadium (HQ = 0.45) in unfiltered groundwater samples.

In filtered groundwater samples only manganese (HQ = 0.3) and thallium (HQ = 1.3) were retained as COPCs. Thallium was not detected in unfiltered groundwater samples, but was detected in 4 of 10 filtered groundwater with concentrations ranging from 4.7K µg/L to 5.4 µg/L. Thallium was not detected in filtered background groundwater samples and cannot be attributed to station background conditions at this time.

Total EI values for surface water and sediment in the unnamed stream which bisects the eastern portion of SSA 1 were 110 and 3.0, respectively. The EI derived for surface water is elevated because of the presence of cadmium (1.9%), chromium (1.5%), lead (30.8%), mercury (23%) and iron (34%), in excess of their corresponding freshwater AWQC values. The sediment EI value is elevated because of the presence of benzo(b)fluoranthene (34%), 4,4'-DDT (35.3%) and mercury (30.7%), in sediment samples exceeding the corresponding ER-L values.

6.5.2 SSA 6 - Former Aviation Field and Environs

SSA 6 subsurface soil (taken from test pits in areas of geophysical anomalies) and unfiltered groundwater produce ILCR values which exceed USEPAs generally acceptable target risk range (1.9×10^{-4} and 3.8×10^{-3}, respectively).

PCB-1254 and PCB-1260 are responsible for approximately 90 percent of the elevated subsurface soil ILCR value. Arsenic accounts for approximately 9 percent of the remaining subsurface soil ILCR value but falls within the range of station-wide background concentrations.

The presence of arsenic and beryllium in unfiltered SSA 6 groundwater samples account for 100 percent of the ILCR value. Arsenic was not detected in filtered groundwater samples which

produced an ILCR value of 1.4×10^{-5}. The filtered groundwater ILCR value falls within the generally acceptable risk range of 10^{-4} to 10^{-6}.

Subsurface soils and groundwaters also produce HI values exceeding 1.0. The presence of PCB-1254 (HQ = 8.5) and cadmium (HQ = 3.5) account for approximately 96 percent of the elevated HI value for soils. The presence of thallium in SSA 6 filtered groundwater produces an HQ value of 1.1. Again, thallium was not detected in unfiltered groundwater samples obtained from SSA 6.

Because SSA 6 does not contain a surface water feature and groundwaters at SSA 6 do not interconnect with a surface water feature in near proximity, EI values could not be derived for SSA 6.

6.5.3 SSA 7 - Building 373 Rocket Plant/Group 18 Magazines/Main Road Disposal Area

SSA 7 groundwaters produced ILCR values exceeding USEPAs target risk range of 10^{-4} to 10^{-6}. Both filtered (ILCR = 3×10^{-3}) and unfiltered (ILCR = 2.4×10^{-2}) groundwaters produced unacceptable ILCR values because of the presence 1,1-dichloroethene which produces an individual cancer risk of 2.5×10^{-3}. The presence of 1,1-dichloroethene and other chlorinated volatile contaminants detected in SSA 7 groundwater appears to be related to the UST near Building 373. Groundwaters away from the UST do not appear to be affected by SSA activities.

HI values exceed 1.0 for surface soils (HI = 1.1), subsurface soils (HI = 1.2, 1.6) and groundwater (HI = 11). Surface soils and subsurface soils produced elevated HI values because of aluminum, arsenic, and manganese. The concentrations of these elements; however, fall within the range of concentrations observed in station-wide background surface and subsurface soil samples.

The EI value for sediments exceeded unity because of benzo(k)fluoranthene, arsenic, and nickel. Nickel concentrations detected in SSA 7 sediment samples were similar to concentrations detected in background freshwater/tidal streams in near proximity to WPNSTA Yorktown. Arsenic values detected in SSA 7 sediments were only slightly higher than representative background values.

ECOCs were not retained in surface water samples obtained at SSA 7; therefore, no EI value could be calculated.

Table 6-25 shows that the total ICRs for the filtered (2.4×10^{-3}) and unfiltered (3.1×10^{-3}) groundwater scenarios exceed USEPA's target risk range of 1×10^{-4} to 1×10^{-6}. The medium contributing most predominantly to risk was groundwater. For the unfiltered groundwater scenario the constituent associated with most risk was arsenic (825 µg/L). For the filtered groundwater scenario the constituent contributing most predominantly to risk was 1,1-dichloroethene (110 µg/L).

6.5.4 SSA 15 - Sewage Treatment Plant #1/Sludge Drying Beds and Discharge Area

Only subsurface soil samples obtained from SSA 15 produced an HI (2.0) value exceeding 1.0. Manganese (HQ = 1.1) and arsenic (HQ = 0.65) were responsible for the elevated HI value. Concentrations of arsenic and manganese detected in SSA 15 subsurface soil samples were similar to those detected in station-wide background samples. The presence of these elements in subsurface soils at SSA 15 could, therefore, be related to background conditions and not past practices at the SSA.

Relatively low levels of 1,1-dichloroethene and trichloroethene were detected in SSA 15 groundwater samples. The presence of these constituents did not produce unacceptable risks to future potential residents who may use shallow groundwater for drinking.

EI values for SSA 15 sediments and surface waters were 99.0 and 0.03, respectively. The elevated EI in SSA 15 sediments was driven primarily by the presence of the DDT series pesticides (DDT, DDD, DDE), whose past legal application for insect control was common at WPNSTA Yorktown. The chlorinated organic contaminant trichloroethene was detected in SSA 15 surface waters at a maximum concentration of 500 µg/L. The corresponding EQ value for trichloroethene is 0.023, accounting for approximately 80 percent of the surface water EI value.

Because trichloroethene was not detected in other SSA 15 media at higher concentrations, SSA 15 is probably not responsible for the presence of trichloroethene in adjacent surface water features. Other sources of trichloroethene may be present upgradient in the vicinity of the industrial area.

6.5.5 Risk Summary Combining Baker and Black and Veatch Data

In addition to the samples collected by Baker during this investigation, Black and Veatch Waste Science, Inc. (B&V), the USEPA Region III subcontractor, also collected samples at SSA 15. Their sample set consisted of two surface soil samples (EPA-S12-S07 and EPA-S12-S02), one surface water sample (EPA-S12-SW02), and one sediment sample (EPA-S12-SED03). It should be noted that data for one of the surface soil samples (EPA-S12-S07) was unavailable at the time of this writing; therefore, it was not evaluated.

To further evaluate the potential for environmental contaminants at SSA 15 to pose unacceptable risks to human receptors and/or the environment, the data obtained from Baker's field effort and B&V's field effort (which consisted of additional surface soil, surface water, and sediment data), was combined. This combination of data resulted in a new database, which was once again subjected to the COPC/ECOC selection process, separate from the existing evaluation. The outcome of this evaluation was a new list of COPCs for surface soils and ECOCs for surface water (the ECOCs for sediment were not affected). This new list was then re-evaluated according to the risk screening process to develop new ICR and HI values. This process consisted of a calculation of the ratio between the exposure point concentration and the corresponding RBC value for surface soil, and the exposure point concentration and the corresponding AWQC value for surface water. The concentration term selected, was consistent with the term used in the original assessment. The end result of this re-evaluation was an increase in the surface soil HI value from 0.95 to 5.0, and an increase in the surface water HI value from 0.03 to 10. The increase in the surface soil HI value is attributable to the presence of cadmium, chromium, mercury, silver, and vanadium in one surface soil sample (EPA-S12-S02) collected by B&V in the "drying beds" at SSA 15. The increase in the surface water HI value is attributable to the presence of silver and in one of the surface water samples (EPA-S12-SW02) collected by B&V. B&V data and the re-calculated risk screening information are included in Appendix N.1.

It is important to note that the analytical data provided by B&V has been evaluated in this Site Screening Process for comparative purposes only. Verification of sample collection procedures or sample quality, via an independent third party data validation process, has not been provided. Therefore, the recommendations presented in Section 7.0 are based on the analytical data provided by Baker, and do not incorporate the B&V data.

6.6 Uncertainty Analysis

The results of the risk assessment are presented in terms of the potential for adverse effects based upon a number of very conservative assumptions. The tendency to be conservative is an effort to err on the side of the protection of health. The risks are indicators of possible risk, not a true measurement of actual risk. Risk screening, conducted as part of the SSP is intended to contribute to the decision-making process and the management of the identified SSAs at WPNSTA Yorktown.

Uncertainties are encountered throughout the process of performing the risk screening. This section discusses sources of uncertainty inherent in the following elements of the risk screening evaluation performed for SSAs 1, 6, 7, and 15.

- Sampling and analysis
- Selection of COPCs
- Risk Screening Process
- Chemicals not quantitatively evaluated

General uncertainties associated with the risk screening will be qualitatively evaluated to determine the conservatism of the approach. Factors which may contribute to uncertainty include the use of RBC age-adjusted ingestion and inhalation rates, the use of toxicity information provided by ECAO when not available from the IRIS database or in HEAST, and the lack of dermal or inhalation estimates.

The variation of any factor used in the calculation of the exposure concentration will have an impact on the total carcinogenic and noncarcinogenic risk. Uncertainties associated with this risk screening are presented in Table 6-27 and discussed in the following paragraphs.

6.6.1 Sampling and Analysis

The development of a risk screening report depends on the reliability of the analytical data available to the risk assessor. These, in turn, are dependent on the operating procedures and techniques applied to the collection of environmental samples in the field and their subsequent analyses in the laboratory. To minimize the uncertainties associated with sampling and analysis at SSAs 1, 6, 7,

and 15 USEPA approved sampling and analytical methods were employed. Data was generated following USEPA's Statement of Work for Contract Laboratory Program (CLP). Samples were analyzed for TCL volatile and semivolatile organics (plus nitramine compounds), and TAL inorganics. Samples were taken from locations specified in the approved Work Plan along with the necessary QA/QC samples.

Analytical data are limited by the precision and accuracy of the methods of analysis which are reflected by the Relative Percent Difference (RPD) of duplicate analyses and the percent (%) recovery of spikes, respectively. In addition, the statistical methods used to compile and analyze the data (mean concentrations, detection frequencies) are subject to the overall uncertainty in data measurement. Furthermore, chemical concentrations in environmental media fluctuate over time and with respect to sampling location. Analytical data must be sufficient to consider the temporal and spatial characteristics of contamination at the site with respect to exposure.

Estimating the contaminant concentration in a given medium to which a human receptor could potentially be exposed can be as simple as deriving the 95% UCL of the arithmetic mean for a data set in an effort to analyze central tendencies and upper limits of probability. This means that, in general, an attempt was made to err conservatively. More complex methods of deriving the contaminant concentration are necessary when exposure to COPCs in the medium occur subsequent to release from another medium and analytical data are not available to characterize the release. The 95% UCL for the arithmetic mean concentration was used as the exposure point concentration for each media; however, if the 95% UCL exceeded the maximum detected concentration of a COPC, the maximum detected concentration of that COPC was utilized (USEPA, 1992).

Analytical results for the soil and groundwater samples obtained during the SSA field investigation were subjected to an independent third party data validation. TCL organics and TAL inorganic data were qualified "J" (estimated) for a number of quality control reasons, therefore, in some instances the maximum concentrations used could be biased high. This was considered to be an acceptable bias, in this case, since conservative risk scenarios were desired for evaluation.

6.6.2 Selection of COPCs

The selection of COPCs is performed in a risk screening following the evaluation of data. Analytical data also must be comprehensive in order to address the COPCs associated with the site. Types of COPCs encountered at SSAs 1, 6, 7, and 15 include VOCs (in the groundwater), SVOCs (in the surface soils, subsurface soils, and sediments), pesticides/PCBs (in the surface soil, subsurface soil, groundwater, and sediment), and nitramines (in the surface soil, subsurface soil, and groundwater). Inorganic constituents were detected in every medium investigated; they were the most dominant class of chemicals detected at the SSAs. A summary of the COPC selection criteria is presented below.

- Soil COPCs were selected based on comparisons of the maximum detected concentration with Region III residential soil COC values.

- Groundwater COPCs were selected based on comparisons of the maximum detected concentration with Region III tap water COC values, Federal MCLs, and Commonwealth groundwater standards.

- Surface water ECOCs were selected based on comparisons of the maximum detected concentration to Federal and Commonwealth Water Quality Criteria as well as the Region III tap water COC value.

- Sediment ECOCs were selected based on comparisons of the maximum detected concentration to SSVs.

Region III COC values are based on exposure assumptions and equations that are intended to introduce conservatism in the risk assessment process by changing the COPC screening method from a relative toxicity screen as presented in RAGS, to an absolute comparison of risk. However, the use of the Region III COC values which incorporate a set of non-site-specific assumptions in the selection of COPCs at SSAs 1, 6, 7, and 15 adds conservatism to the site screening.

Currently, no Station closures are planned for WPNSTA Yorktown and future residential development is not considered an expected land use for the area. The application of the residential

COC values to soil and groundwater COPC selections would, therefore, tend to result in a list of COPCs that could be considered conservative for a military base. The use of conservative COPC selections in the site screening ensures the protection of public health in that the results of the risk screening are incorporated into the determination of remedial action.

6.6.3 Uncertainties in Toxicity

In making quantitative estimates of the toxicity of varying dosages of compounds to human receptors, uncertainties arise from two sources. First, data related to human exposure and the subsequent effects are usually insufficient, if they are at all available. Human exposure data usually lack adequate concentration estimations and suffer from inherent temporal variability. Therefore, animal studies often are used and new uncertainties arise from the process of extrapolating animal results to humans. Second, to obtain observable effects with a manageable number of experimental animals, high doses of a compound often are used. In this situation, a high dose means that high exposures are used in the experiment with respect to most environmental exposures. Therefore, when applying the results of the animal experiment to the human condition, the effects at high doses must be extrapolated to approximate effects at lower doses.

6.6.4 Risk Screening Process

The process of risk screening involves evaluating 95% UCL values or maximum detected concentrations of COPCs against age adjusted USEPA Region III RBC values. Risk screening produces conservative but incomplete risk estimates posed by chemicals detected in limited sampling and analyses of environmental media. The conservatism is derived primarily by the use of residential RBCs despite the fact that current exposure to human receptors is limited to station personnel working at WPNSTA Yorktown. Furthermore, groundwater is not likely to be used for potable purposes, but risk screening assumes that this is likely in the future. This conservatism may account for pathways not otherwise considered in risk screening such as dermal exposure to soils or groundwater or accidental ingestion and dermal contact with COPCs in surface water and sediment.

Conservatism is also necessary in the evaluation of ecological receptors because risk screening is unable to address potential affects to terrestrial organisms which may contact ECOCs in soils,

surface waters, and sediments. A certain degree of conservatism is inherent in deriving EI values from chronic AWQC values and ER-Ls for surface waters and sediments, respectively.

From an ecological perspective, SSAs such as SSA 6 are; therefore, more affected by limitations of the risk screening process because no surface water feature exists to derive EI values.

6.6.5 COPCs Not Quantitatively Evaluated

The inorganic COPC lead and the nitramine COPC 4-amino-2,6-dinitrotoluene were not quantitatively evaluated in the risk screening. Lead is currently considered a B2 - probable human carcinogen, as well as a developmental toxin in young children. The lack of promulgated toxicological indices/RBCs for lead and 4-amino-2,6-dinitrotoluene does not have significant effects on the underestimation of risk due to the presence of relatively high levels of other inorganic and nitramine COPCs in environmental media, such as arsenic and 2,4,6-trinitrotoluene, respectively. The COPC trichloroethene was not quantitatively evaluated in the SSA 15 sediment risk calculations due to the lack of promulgated toxicity criteria. However, it was quantitatively evaluated in SSA 15 surface water and found not to produce elevated risk. Although these constituents were not quantitatively evaluated, this risk screening has been performed using conservative exposure point concentrations, exposure scenarios, and available toxicological information.

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SECTION 6.0 TABLES

TABLE 6-1

SSA 1
SURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Region III Criteria	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential[2] COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Volatiles:							
Methylene Chloride	85	2/64	0.150L - 0.150L	1/13	0.007J	0	No
Carbon Disulfide	780	3/64	0.001J - 0.009	0/13	ND	0	No
Chloroform	100	1/64	0.001J	0/13	ND	0	No
Trichloroethylene	58	20/64	0.001L - 0.004J	0/13	ND	0	No
Benzene	22	1/64	0.001J	0/13	ND	0	No
Methyl-iso-butylketone	630	1/64	0.004J	0/13	ND	0	No
Tetrachloroethene	12	2/64	0.011J - 0.012	0/13	ND	0	No
1,1,2,2-Tetrachloroethane	3.2	1/64	0.007	0/13	ND	0	No
Toluene	1,600	8/64	0.012J - 0.220J	0/13	ND	0	No
Styrene	1,600	2/64	0.007 - 0.011J	0/13	ND	0	No
Semivolatiles:							
Phenol	4,700	3/64	0.079J - 2.3	0/13	ND	0	No
1,4-Dichlorobenzene	27	1/64	0.670J	0/13	ND	0	No
2-Methylphenol	390	1/64	0.047J	0/13	ND	0	No
2,2'-oxybis(1-chloropropene)	9.1	1/64	2.0J	0/13	ND	0	No
4-Methylphenol	39	5/64	0.040J - 1.3	0/13	ND	0	No
Naphthalene	310	3/64	0.042J - 1.8J	0/13	ND	0	No
2-Methylnaphthalene	310[4]	2/64	0.110J - 1.6J	0/13	ND	0	No
Acenaphthylene	310[4]	21/64	0.066J - 4.7J	0/13	ND	0	No
Acenapthene	470	4/64	0.08J - 0.860J	0/13	ND	0	No
Dibenzofuran	31	4/64	0.050J - 2.3J	0/13	ND	0	No

TABLE 6-1 (Continued)

SSA 1
SURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Region III Criteria	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential[2] COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
2,4-Dinitrotoluene	16	2/64	0.069J - 0.430	0/13	ND	0	No
Fluorene	310	5/64	0.061J - 0.720J	0/13	ND	0	No
Phenanthrene	310[4]	27/64	0.039J - 43	0/13	ND	0	No
Anthracene	2,300	26/64	0.007J - 130	0/13	ND	0	No
Carbazole	32	15/64	0.045J-10	0/13	ND	0	No
Fluoranthene	310	31/64	0.029J - 88	4/13	0.12J - 0.43	0	No
Pyrene	230	31/64	0.039J - 72	3/13	0.16J - 0.32J	0	No
3,3'-Dichlorobenzidine	1.4	1/64	0.044J	0/13	ND	0	No
Benzo(a)anthracene	0.88	27/64	0.028J - 27	2/13	0.12J - 0.24J	14	Yes
Chrysene	88	28/64	0.037J - 63	3/13	0.15J - 0.27J	0	No
Bis(2-ethylhexyl)phthalate	46	1/64	0.240J	0/13	ND	0	No
Benzo(b)fluoranthene	0.88	30/64	0.038J - 49J	3/13	0.23J - 0.5	19	Yes
Benzo(k)fluoranthene	8.8	24/64	0.024J - 39J	2/13	0.12J - 0.13J	6	Yes
Benzo(a)pyrene	0.088	27/64	0.036J - 26J	2/13	0.14J - 0.18J	23	Yes
Indeno(1,2,3-cd)pyrene	0.88	19/64	0.091J - 110J	1/13	0.16J	8	Yes
Dibenz(a,h)anthracene	0.088	14/64	0.110J - 53J	0/13	ND	14	Yes
Benzo(g,h,i)perylene	310[4]	18/64	0.080J - 100J	0/13	ND	0	No
Pesticides/PCBs:							
Dieldrin	0.04	2/64	0.086 - 0.087			2	Yes
4,4-DDE	1.9	1/64	0.011J			0	No
4,4-DDT	1.9	3/64	0.031 - 0.056			0	No

TABLE 6-1 (Continued)

SSA 1
SURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Region III Criteria	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential[2] COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Nitramines:							
1,3,5,-Trinitrobenzene	0.39	4/64	00.1J - 1.1	1/13	1.0J	5	Yes
1,3-dinitrobenzene	0.78	1/64	0.170J	0/13	ND	0	No
2,4,6-Trinitrotoluene	21	5/64	0.74 - 5.9	0/13	ND	0	No
2,4-Dinitrotoluene	16	1/64	0.85	1/13[9]	1.3J[9]	0	No
Inorganics:							
Aluminum	7,800	64/64	299 - 12,300J[10]	44/44	1,960 - 19,200	2	Yes
Antimony	3.1	1/43	0.85[10]	2/42	9.2L - 11L	0	No
Arsenic (carc./noncarc.)	0.37/2.3	36/64	0.185K - 52.7L[10]	44/44	0.46L - 63.9	33/27	Yes
Barium	55	59/64	7 - 166	44/44	4.2J - 80.2	0	No
Beryllium	0.15	42/64	(0.73)[10]	31/44	0.23J - 0.93J	32	Yes
Cadmium	3.9	6/64	0.096 - 6.65	2/44	1.3K - 1.5	1	Yes
Calcium+	--	59/64	196 - 121,000J	44/44	39.4 - 7,820	--	No
Chromium[7]	39	42/64	1.13 - 32L	44/44	2.6 - 18.3	0	No
Cobalt	470	8/64	1.38 - 5.35[10]	42/44	1.0J - 6.7J	0	No
Copper	290	10/64	1.73 - 211	35/44	1.2J - 24.4	0	No
Iron+	--	63/64	943 - 33,200	44/44	1,440 - 19,900	--	No
Lead	400[5]	60/64	2.2K - 457	44/44	6.4 - 43.1	1	Yes
Magnesium+	--	48/64	80.1 - 2,370L	44/44	61.5J - 1,610	--	No
Manganese	39	64/64	4.4 - 347[10]	44/44	7.6L - 491	59	Yes
Mercury	2.3	39/64	0.02 - 0.773	0/44	ND	0	No
Nickel	160	56/64	0.308 - 8.29	36/44	3.8J - 11.9	0	No
Potassium+	--	61/64	76.9 - 1,960	15/44	398J - 1,640	--	No

TABLE 6-1 (Continued)

SSA 1
SURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Region III Criteria	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential[2] COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Selenium	39	1/57	30.6L	23/44	0.26L - 0.55L	0	No
Silver	39	2/64	0.262L - 1.56L[10]	2/44	1J - 2.1J	0	No
Sodium+	--	3/64	6.97 - 57.6[10]	44/44	13.9J - 115J	--	No
Thallium	0.63[6]	2/64	0.22 - 0.22	0/44	ND	0	No
Vanadium	55	33/64	1.73 - 29.5[10]	44/44	6.1J - 34.7	0	No
Zinc	2,300	53/64	6.33 - 733J	44/44	3.2KJ - 48.4	0	No
Cyanide	160	39/64	0.131 - 1.79	NA	NA	0	No

(1) Organic concentrations converted to mg/kg, Inorganic concentrations reported in mg/kg.
(2) COC = USEPA Region III COC screening value (USEPA, 1993a)
(3) L = Estimated value, biased low
J = Analyte was positively identified. Reported value may not be accurate or precise.
K = Value estimated; biased high
(4) Naphthalene COC value used as a surrogate
(5) Action level for residential soils (USEPA, 1994c)
(6) As thallium acetate/carbonate/sulfate
(7) Chromium (VI) COC value used for chromium.
(8) Chromium (VI) COC value used for chromium.
(9) Isomeric mixture of DNTs.
(10) Concentrations fall within the range of stationwide background.

-- = No criteria published
+ = Essential Nutrients

NA - Not analyzed
ND - Not detected

Note: Background data obtained from the Final Summary of Background Constituent Concentrations and Characterization of the York River Drainage Basin (Baker, July 1995).

TABLE 6-2

SSA 1
SUBSURFACE SOIL DATA AND COPC SELECTION SUMMARY
FREQUENCY, RANGE OF POSITIVE DETECTIONS, AND COMPARISON WITH
USEPA REGION III RESIDENTIAL COC SCREENING VALUE
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

	Region III Criteria	Contaminant Frequency/Range[3]		Comparison to Criteria	COPC Selection
Contaminant[1]	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Volatiles:					
2-Butanone	4,700	1/38	0.011J	0	No
Ethylbenzene	780	1/38	0.004J	0	No
Methylene Chloride	85	10/38	0.001J - 0.017	0	No
Tetrachloroethene	12	3/38	0.005J - 0.019	0	No
Toluene	1,600	2/38	0.009 - 0.033	0	No
Trichloroethene	58	1/38	0.001J	0	No
Xylenes (total)	16,000	1/38	0.019	0	No
Semivolatiles:					
4-Methylphenol	39	1/39	0.15J	0	No
Dimethylphthalate	78,000	1/39	0.14J	0	No
Acenaphthylene	310[4]	7/39	0.073J - 0.38J	0	No
Acenaphthene	470	4/39	0.066J - 0.5	0	No
Dibenzofuran	31	2/39	0.068J - 0.23J	0	No
Fluorene	310	4/39	0.058J - 0.34J	0	No
Phenanthrene[4]	310	10/39	0.049J - 1.1	0	No

TABLE 6-2 (Continued)

SSA 1
SUBSURFACE SOIL DATA AND COPC SELECTION SUMMARY
FREQUENCY, RANGE OF POSITIVE DETECTIONS, AND COMPARISON WITH
USEPA REGION III RESIDENTIAL COC SCREENING VALUE
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

	Region III Criteria	Contaminant Frequency/Range[3]		Comparison to Criteria	COPC Selection
Contaminant[1]	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Antharcene	2,300	9/39	0.055J - 0.57	0	No
Carbazole	32	4/39	0.084J - 0.15	0	No
Di-n-Butyl Phthalate	7,800	3/39	0.037J - 0.057J	0	No
Fluoranthene	310	10/39	0.16J - 5	0	No
Pyrene	230	10/39	0.13J - 6.2	0	No
Benzo(a)anthracene	0.88	10/39	0.059J - 2.7	3	Yes
Chrysene	88	10/39	0.084J - 4.9	0	No
bis(2-ethylhexyl) phthalate	46	16/39	0.055J - 0.27J	0	No
Benzo(b)fluoranthene	0.88	9/39	0.054J - 5.1	5	Yes
Benzo(k)fluoranthene	8.8	10/39	0.06J - 12	1	Yes
Benzo(a)pyrene	0.088	10/39	0.078J - 3.7	9	Yes
Indeno(1,2,3)-cd)pyrene	0.88	9/39	0.11J - 0.89	1	Yes
Dibenzo(a,h)anthracene	0.088	4/39	0.062J - 0.28J	3	Yes
Benzo(g,h,i)perylene[4]	310	10/39	0.075J - 0.99J	0	No

TABLE 6-2 (Continued)

SSA 1
SUBSURFACE SOIL DATA AND COPC SELECTION SUMMARY
FREQUENCY, RANGE OF POSITIVE DETECTIONS, AND COMPARISON WITH
USEPA REGION III RESIDENTIAL COC SCREENING VALUE
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

	Region III Criteria	Contaminant Frequency/Range[3]		Comparison to Criteria	COPC Selection
Contaminant[1]	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Pesticides/PCBs:					
Heptachlor Epoxide	0.07	1/39	0.00076J	0	No
4,4'-DDE	1.9	2/39	0.0014J - 0.0016J	0	No
Endosulfan Sulfate	47	1/39	0.0015J	0	No
4,4'-DDT	1.9	3/39	0.0024J - 0.0038J	0	No
Methoxychlor	39	3/39	0.0058J - 0.027J	0	No
Endrin Ketone	2.3	2/39	0.0067 - 0.0084J	0	No
Aroclor-1260	0.083	1/39	0.012J	0	No
Nitramines/Nitroaromatics:					
1,3,5-Trinitrobenzene	0.39	1/39	0.25	0	No
2,4,6-Trinitrotoluene	21	1/39	0.91	0	No
Inorganics:					
Aluminum	7,800	39/39	242 - 8,300	3	Yes
Arsenic (carc./noncarc.)	0.37/2.3	36/39	0.752 - 24.8	36/27	Yes
Barium	550	39/39	0.78 - 61	0	No
Beryllium	0.15	31/39	0.07L - 3.8J	28	Yes

TABLE 6-2 (Continued)

SSA 1
SUBSURFACE SOIL DATA AND COPC SELECTION SUMMARY
FREQUENCY, RANGE OF POSITIVE DETECTIONS, AND COMPARISON WITH
USEPA REGION III RESIDENTIAL COC SCREENING VALUE
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

	Region III Criteria	Contaminant Frequency/Range[3]		Comparison to Criteria	COPC Selection
Contaminant[1]	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Cadmium	3.9	4/39	0.33 - 0.58	0	No
Calcium+	--	38/39	46.2 - 181,000	--	No
Chromium	39[9]	32/39	3 - 30.3	0	No
Cobalt	470	36/39	0.41L - 12.3L	0	No
Copper	290	28/39	1.3 - 16.2	0	No
Iron+	--	39/39	303 - 34,600	--	No
Lead	400[5]	39/39	0.65 - 43.7	0	No
Magnesium+	--	39/39	15.3 - 2,620	--	No
Manganese	39	38/39	2.4 - 351	31	Yes
Mercury	2.3	12/39	0.014 - 0.21K	0	No
Nickel	160	35/39	1.8J - 13.5	0	No
Potassium+	--	36/39	101 - 2,710	--	No
Sodium+	--	29/39	25.9 - 1,030	--	No

TABLE 6-2 (Continued)

SSA 1
SUBSURFACE SOIL DATA AND COPC SELECTION SUMMARY
FREQUENCY, RANGE OF POSITIVE DETECTIONS, AND COMPARISON WITH
USEPA REGION III RESIDENTIAL COC SCREENING VALUE
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

	Region III Criteria	Contaminant Frequency/Range[3]		Comparison to Criteria	COPC Selection
Contaminant[1]	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Thallium[6]	0.63	5/39	1K - 1.6K	5	Yes
Vanadium	55	39/39	0.38 - 21.7L	0	No
Zinc	2,300	37/39	1.9K - 315L	0	No
Cyanide	160	2/30	0.226	0	No

(1) Organic concentrations converted to mg/kg (except nitramine compounds), inorganic concentrations reported in mg/kg.
(2) COC = USEPA Region III COC screening value (USEPA, 1993a).
(3) J = Analyte was positively identified. Reported value may not be accurate or precise.
K = Value estimated; biased high.
L = Estimated value, biased low.
(4) Naphthalene COC value used as a surrogate.
(5) Action level for residential soils (USEPA, 1994c).
(6) As thallium acetate/carbonate/sulfate.
(7) Endosulfan COC value used as a surrogate.
(8) Endrin COC value used as a surrogate.
(9) Chromium (VI) COC value used for chromium.

-- = No criteria published
+ = Essential Nutrients

TABLE 6-3

SSA 1
GROUNDWATER DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Groundwater Criteria[2]			Frequency/Range[3]		Background		Comparison to Criteria			COPC Selection
	Federal MCL (µg/L)	USEPA Region III Tapwater COC Value (µg/L)	Virginia PMCLs (µg/L)	No. of Positive Detects/No. of Samples	Concentration Range (µg/L)	No. of Positive Detctions/ No. of Samples	Range of Positive Detections (µg/L)	No. of Detects Above MCL	No. of Detects Above COC Value	No. of Detects Above Virginia Criteria	Retained as a COPC?
Volatiles:											
Chloroform	100	0.15	--	1/10	0.6J[8]	3/18	1.0 - 6.0	--	1	--	No[6]
Nitramines:											
2,4,6-Trinitrotoluene	--	2.2	--	1/10	4.6	0/18	ND	--	1	--	Yes
4-Amino-2,6-Dinitrotoluene	--	--	--	1/10	9.4	0/18	ND	--	--	--	Yes[7]
RDX	--	0.61	--	3/10	1.3 - 15	0/18	ND	--	3	--	Yes
Inorganics (Total):											
Aluminum	--	3,700	--	10/10	771 - 76,300	18/18	44.9J - 14,600L	--	9	--	Yes
Antimony	6	1.5	--	2/6	14.1L - 18.8	1/18	16.4K	2	2	--	No[4]
Arsenic (as carcinogen)	50	0.038	50	9/10	12.3 - 64.4	6/18	3.5J - 36.4	2	9	2	No[4]
Barium	2,000	260	1,000	10/10	65.3 - 820	18/18	13J - 97.5J	0	1	0	Yes
Beryllium	4	0.016	--	9/10	0.89 - 9.2	8/18	0.22J - 1.5J	4	9	--	No[4]
Cadmium	5	1.8	10	1/10	2.7	0/18	ND	0	1	0	Yes[4]
Calcium+	--	--	--	10/10	137,000 - 265,000	17/18	768 - 530,000	--	--	--	No
Chromium	100	18[5]	50	9/10	40.7 - 197	14/18	1.6J - 49.6	4	9	8	No[4]
Cobalt	--	220	--	9/10	9.9 - 79.9	8/18	2.5J - 22.4	--	0	--	No
Copper	1,300	140	1,300	10/10	3.9 - 70.3	17/18	1.3J - 14.6J	0	0	0	No
Iron+	--	--	--	10/10	1,730 - 159,000	18/18	483 - 48,200	--	--	--	No
Lead	15	--	15	9/10	12 - 236	5/18	1.8L - 12.8	7	--	7	No[4]

TABLE 6-3 (Continued)

SSA 1
GROUNDWATER DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Groundwater Criteria[2]			Frequency/Range[3]		Background		Comparison to Criteria			COPC Selection
	Federal MCL (µg/L)	USEPA Region III Tapwater COC Value (µg/L)	Virginia PMCLs (µg/L)	No. of Positive Detects/No. of Samples	Concentration Range (µg/L)	No. of Positive Detctions/ No. of Samples	Range of Positive Detections (µg/L)	No. of Detects Above MCL	No. of Detects Above COC Value	No. of Detects Above Virginia Criteria	Retained as a COPC?
Magnesium+	--	--	--	10/10	3,560 - 29,800	18/18	489J - 9,770	--	--	--	No
Mercury	2	1.1	2	1/10	0.21K	0/18	ND	0	0	0	No
Manganese	--	18	--	10/10	14.6 - 4,350	18/18	4.5J - 413	--	9	--	Yes
Nickel	100	73	--	9/10	18 - 91.3	2/18	7.9J - 27.6J	0	2	--	No [4]
Potassium+	--	--	--	10/10	4,260 - 21,400	18/18	557J - 17,000	--	--	--	No
Selenium	50	18	10	2/10	3.8L - 4K	1/18	2.9J	0	0	0	No
Sodium+	--	--	--	10/10	5,530 - 26,900	18/18	3,670J - 27,200	--	--	--	No
Vanadium	--	26	--	9/10	3.7L - 182L	17/18	2.9J - 66.6	--	8	--	Yes
Zinc	--	1,100	--	9/10	77J - 413	18/18	5.9J - 99.1	--	0	--	No
Inorganics (Dissolved):											
Aluminum	--	3,700	--	1/10	20.2[8]	6/18	12.9J - 212	--	0	--	No
Barium	2,000	260	1,000	10/10	13.3 - 92.2	18/18	5.9J - 73.4J	0	0	0	No
Calcium+	--	--	--	10/10	67,800 - 229,000	18/18	611J - 129,000	--	--	--	No
Copper	1,300	140	1,000	7/10	2.1 - 14.6	12/18	1.1J - 4J	0	0	0	No
Iron+	--	--	--	3/10	3.6 - 46.7[8]	15/18	2.4J - 347	--	--	--	No
Magnesium+	--	--	--	10/10	1,310 - 22,300[8]	18/18	70.2J - 9,810	--	--	--	No
Manganese	--	18	--	8/10	0.76 - 173	15/18	1.1J - 54.4	--	2	--	Yes
Potassium+	--	--	--	10/10	920 - 5,200[8]	18/18	430J - 17,900	--	--	--	No
Sodium+	--	--	--	10/10	4,000 - 26,300[8]	18/18	3,690J - 27,800	--	--	--	No

TABLE 6-3 (Continued)

SSA 1
GROUNDWATER DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Groundwater Criteria[2]			Frequency/Range[3]		Background		Comparison to Criteria			COPC Selection
	Federal MCL (µg/L)	USEPA Region III Tapwater COC Value (µg/L)	Virginia PMCLs (µg/L)	No. of Positive Detects/No. of Samples	Concentration Range (µg/L)	No. of Positive Detctions/ No. of Samples	Range of Positive Detections (µg/L)	No. of Detects Above MCL	No. of Detects Above COC Value	No. of Detects Above Virginia Criteria	Retained as a COPC?
Thallium	2	0.29	--	4/10	4.7K - 5.4K	0/18	ND	4	4	--	Yes
Vanadium	--	26	--	4/10	1.4 - 2.3[8]	10/18	1.8J - 10.2J	--	0	--	No

(1) All concentrations reported in µg/L
(2) Federal MCL - Federal Safe Drinking Water Act Maximum Contaminant Level (USEPA, 1994a; Drinking Water Regulations and Health Advisories)
Virginia Drinking Water Standards - PMCLs - Primary Maximum Contaminant Levels (Bureau of National Affairs - December, 1994)
COC values - USEPA Region III COC screening value (USEPA, 1993a)
(3) J = Analyte was positively identified, value is estimated
L = Value estimated; biased low
K = Value estimated; biased high
(4) Constituent not included as a COPC since it was not detected in the dissolved sample. Total inorganic result assumed to be due to the presence of suspended solids.
(5) Chromium (VI) COC value was used for chromium.
(6) Concentration below 5 times the maximum detected blank concentration.
(7) 4-Amino - 2,6 - Dinitrotoluene reincluded as a COPC because it is a degradation product of 2,4,6 - trinitrotoluene and the dinitrotoluenes.
(8) Concentrations fall within the range of station-wide background.

-- = No criteria published
+ = Essential Nutrient
ND - Not detected

Note: Background data obtained from the Final Summary of Background Constituent Concentrations and Characterization of the York River Drainage Basin (Baker, July 1995).

TABLE 6-4

SSA 1
SURFACE WATER DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Federal/State Criteria[2]				Frequency/Range[3]		COPC Selection
	AWQC Freshwater Acute (µg/L)	AWQC Freshwater Chronic (µg/L)	Virginia Freshwater Acute (µg/L)	Virginia Freshwater Chronic (µg/L)	No. of Positive Detects/No. of Samples	Concentration Range (µg/L)	Retained as a COPC?
Nitramines:							
4-Amino-2,6-Dinitrotoluene	330[4]	230[4]	--	--	1/5	3.6	No
2,4,6-Trinitrotolune	--	--	--	--	1/5	2.9	No
Inorganics (Total):							
Aluminum	750	87	--	--	5/5	1,840 - 13,600	No
Arsenic (III)	360	190	360	190	4/5	2.8 - 23.8	No
Barium	--	--	--	--	5/5	53.7 - 240	No
Beryllium	130[4]	5.3[4]	--	--	5/5	0.1 - 1.1	No
Cadmium	3.9*	1.1*	3.9*	1.1*	1/5	2.4	Yes
Calcium+	--	--	--	--	5/5	120,000 - 138,000	No
Chromium	16	11	16	11	5/5	2.5L - 25.6L	Yes
Cobalt	--	--	--	--	5/5	2.4 - 16.8	No
Copper	18*	12*	18*	12*	5/5	2.2 - 57.5	Yes
Iron+	--	1000	--	--	5/5	4,610 - 39,500	Yes
Lead	82*	3.2*	82*	3.2*	5/5	4.5K - 112	Yes
Magnesium+	--	--	--	--	5/5	2,550 - 4,820	No
Manganese	--	--	--	--	5/5	142 - 584	No
Mercury	2.4	0.012	2.4	0.012	3/5	0.21 - 0.31	Yes
Nickel	1,400*	160*	1,400*	160*	2/5	9.8 - 11.7	No
Potassium+	--	--	--	--	5/5	2,260 - 4,430	No
Sodium+	--	--	--	--	5/5	6,250 - 6,950	No

TABLE 6-4 (Continued)

SSA 1
SURFACE WATER DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Federal/State Criteria[2]				Frequency/Range[3]		COPC Selection
	AWQC Freshwater Acute (µg/L)	AWQC Freshwater Chronic (µg/L)	Virginia Freshwater Acute (µg/L)	Virginia Freshwater Chronic (µg/L)	No. of Positive Detects/No. of Samples	Concentration Range (µg/L)	Retained as a COPC?
Thallium	1,400[4]	40[4]	--	--	2/5	5.2K - 5.6K	No
Vanadium	--	--	--	--	5/5	5.2 - 35.4	No
Zinc	120*	110*	120*	110*	5/5	10.3J - 551J	Yes

(1) All concentrations reported in µg/L
(2) Water Quality Criteria (WQC) freshwater acute and chronic and Virginia Water Standards freshwater acute and chronic (Bureau of National Affairs - 1993)
(3) J = Analyte was positively identified, value is estimated
K = Value estimated; biased high
L = Value is estimated; biased low
(4) = Lowest Observed Effect Level (LOEL)

-- = No criteria published
+ = Essential Nutrient
* = Hardness dependent criteria (100 mg/L $CaCO_3$ used)

TABLE 6-5

SSA 1
SEDIMENT DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Sediment Criteria[2]		Contaminant Frequency/Range[3]		Comparison to Criteria		COPC Selection
	SSV ER-M (mg/kg)	SSV ER-L (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above ER-M	Positive Detects Above ER-L	Retained as a COPC?
Semivolatiles:							
Benzo(a)anthracene	1.6	0.261	2/9	0.086J - 0.1J	0	0	No
Benzo(a)pyrene	1.6	0.43	2/9	0.11J - 0.17J	0	0	No
Benzo(b)fluoranthene[4]	1.6	0.261	2/9	0.14J - 0.27J	0	1	Yes
Benzo(k)fluoranthene[4]	1.6	0.261	2/9	0.11J - 0.16J	0	0	No
Bis(2-ethylthexyl)phthalate	--	5.3[5]	2/9	0.12J - 0.21J	--	0	No
Butyl benzyl phthalate	--	5.3[5]	1/9	1.2	--	0	No
Chrysene	2.8	0.384	2/9	0.12J - 0.17J	0	0	No
Di-n-butylphthalate	--	--	1/9	4	--	--	No
Fluoranthene	5.1	0.60	4/9	0.054J - 0.17J	0	0	No
Indeno(1,2,3-cd)pyrene [4]	1.6	0.261	1/9	0.12J	0	0	No
Pyrene	2.6	0.665	4/9	0.053J - 0.22J	0	0	No
Pesticides:							
delta-BHC	--	--	2/9	0.001J - 0.0021J	--	--	No
gamma-BHC	--	--	1/9	0.00061J	--	--	No
4,4'-DDT (as total DDT)	0.0461	0.00158	2/9	0.0016J - 0.0017J	0	2	Yes
Endosulfan Sulfate	--	--	2/9	0.0013J - 0.0016J	--	--	No

TABLE 6-5 (Continued)

SSA 1
SEDIMENT DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Sediment Criteria[2]		Contaminant Frequency/Range[3]		Comparison to Criteria		COPC Selection
	SSV ER-M (mg/kg)	SSV ER-L (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above ER-M	Positive Detects Above ER-L	Retained as a COPC?
Methoxychlor	--	--	5/9	0.0015J - 0.006J	--	--	No
Inorganics:							
Aluminum	--	--	9/9	507 - 4,570	--	--	No
Arsenic	70	8.2	7/9	0.75 - 3.8	0	0	No
Barium	--	--	9/9	3.8 - 90.9	--	--	No
Beryllium	--	--	8/9	0.03 - 0.3	--	--	No
Cadmium+	9.6	1.2	1/9	0.54	0	0	No
Calcium+	--	--	9/9	583J - 5,080J	--	--	No
Chromium	370	81	9/9	1.2L - 8.4L	0	0	No
Cobalt	--	--	4/9	0.77 - 2.6	--	--	No
Copper	270	34	9/9	0.5 - 9.4	0	0	No
Iron+	--	--	9/9	854 - 9,440	--	--	No
Lead	218	46.7	9/9	2J - 24.1J	0	0	No
Magnesium+	--	--	9/9	43.8 - 411	--	--	No
Manganese	--	--	9/9	5.8 - 70.7	--	--	No
Mercury	0.71	0.15	1/9	0.3	0	1	Yes
Nickel	51.6	20.9	3/9	1.7 - 3.3	0	0	No

TABLE 6-5 (Continued)

SSA 1
SEDIMENT DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Sediment Criteria[2]		Contaminant Frequency/Range[3]		Comparison to Criteria		COPC Selection
	SSV ER-M (mg/kg)	SSV ER-L (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above ER-M	Positive Detects Above ER-L	Retained as a COPC?
Potassium+	--	--	2/9	340 - 399	--	--	No
Sodium+	--	--	9/9	29.3 - 101	--	--	No
Thallium	--	--	1/9	1.3K	--	--	No
Vanadium	--	--	9/9	1.1 - 10.3	--	--	No
Zinc	410	150	9/9	2.6J - 79.9J	0	0	No

(1) Organic concentrations converted to mg/kg, Inorganic concentrations reported in mg/kg.
(2) SSV = Sediment Screening Value (Long, et al, 1995), Region IV NOAA SSV, Region III BTAG Screening Levels
(3) L = Estimated value, biased low
J = Analyte was positively identified. Reported value may not be accurate or precise.
K = Estimated value, biased high.
(4) SSV was not published; therefore the benzo(a)anthracene SSV (the most conservative PAH SSV) was used as a surrogate.
(5) Region III BTAG Screening Levels range from 5.3 mg/kg (diethylphthalate) to 260 mg/kg (n-butylphthalate). The more conservative value for diethylphthalate was used.

-- = No criteria published
+ = Essential Nutrients

TABLE 6-6

SSA 6
SURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Soil Criteria[2]	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detection (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detection (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Volatiles:							
2-Butanone	4700	3/22	0.004J - 0.006J	0/13	ND	0	No
Acetone	780	2/31	0.003J	2/13	8J - 13	0	No
Chlorobenzene	160	1/31	0.001J	0/13	ND	0	No
Methylene Chloride	85	6/31	0.002J - 0.006J	1/13	7J	0	No
Tetrachloroethene	12	1/31	0.002J	0/13	ND	0	No
Toluene	1600	2/31	0.001J	0/13	ND	0	No
Semivolatiles:							
1,4-Dichlorobenzene	27	1/31	0.052J	0/13	ND	0	No
4-Chloroaniline	31	2/31	0.180J - 0.950	0/13	ND	0	No
Benzo(a)anthracene	0.88	4/31	0.040J - 0.100J	2/13	0.12J - 0.24J	0	No
Benzo(a)pyrene	0.088	5/31	0.040J - 0.150J	2/13	0.14J - 0.18J	4	Yes
Benzo(b)fluoranthene	0.88	4/31	0.046J - 0.250J	3/13	0.23J - 0.5	0	No
Benzo(k)fluoranthene	8.8	4/31	0.050J - 0.160J	2/13	0.12J - 0.13J	0	No
Benzo(g,h,i)perylene	310[6]	7/31	0.048J - 0.870J	0/13	ND	0	No
Bis(2-ethylhexyl)phthalate	46	8/31	0.038J - 3.6	0/13	ND	0	No

TABLE 6-6 (Continued)

SSA 6
SURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Soil Criteria[2]	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detection (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detection (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Butylbenzylphthalate	1600	3/31	0.130J - 0.780	0/13	ND	0	No
Chrysene	88	4/31	0.058J - 0.170J	3/13	0.15J - 0.27J	0	No
Di-n-Butylphthalate	780	29/31	0.036J - 4.6	0/13	ND	0	No
Di-n-Octylphthalate	160	1/31	0.098J	0/13	ND	0	No
Fluoranthene	310	4/31	0.088J - 0.230J	4/13	0.12J - 0.43	0	No
Indeno (1,2,3-cd) pyrene	0.88	3/31	0.063J - 0.110J	1/13	0.16J	0	No
Phenanthrene	310	3/31	0.064J - 0.083J	0/13	ND	0	No
Pyrene	230	5/31	0.057J - 0.240J	3/13	0.16J - 0.32J	0	No
Pesticides/PCBs:							
alpha-Chlordane	0.49[7]	3/31	0.026J - 1.7J	0/13	ND	1	Yes
beta-BHC	0.35	1/31	0.0048J	0/13	ND	0	No
4,4 - DDD	2.7	5/31	0.00078J - 0.350J	0/13	ND	0	No
4,4'-DDE	1.9	8/31	0.0006J - 0.110J	0/13	ND	0	No
4,4'-DDT	1.9	6/31	0.00093J - 0.200J	0/13	ND	0	No
delta-BHC	0.35	2/31	0.0014J - 0.029J	0/13	ND	0	No
Dieldrin	0.04	3/31	0.0057J - 0.079J	0/13	ND	1	Yes

TABLE 6-6 (Continued)

SSA 6
SURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Soil Criteria[2]	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detection (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detection (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Endosulfan sulfate	47[8]	1/31	0.0072J	0/13	ND	0	No
Endrin aldehyde	2.3[9]	1/31	0.0095J	0/13	ND	0	No
gamma-BHC	0.49	1/31	0.0039J	0/13	ND	0	No
gamma-Chlordane	0.49[7]	3/31	0.019J - 1.7	0/13	ND	1	Yes
Heptachlor Epoxide	0.07	1/31	0.037J	0/13	ND	0	No
Methoxychlor	39	2/31	0.0025J - 0.0031J	0/13	ND	0	No
Aroclor-1254	0.16	1/31	4.2J	0/13	ND	1	Yes*
Aroclor-1260	0.083	1/31	0.024J	0/13	ND	0	No
Inorganics:							
Aluminum	7800	31/31	1,760 - 12,600[11]	44/44	1,960 - 19,200	2	Yes
Antimony	3.1	3/31	2.9L - 11.9L	2/42	9.26 - 11.0L	1	Yes
Arsenic (carc./noncarc.)	0.37/2.3	31/31	0.64 - 3[11]	44/44	0.46L - 63.9	31/4	Yes
Barium	550	31/31	16.3 - 63.1[11]	44/44	4.2J - 80.2	0	No
Beryllium	0.15	21/31	0.07 - 0.36[11]	31/44	0.23J - 0.93J	17	Yes
Cadmium	3.9	15/31	0.32 - 4.3	2/44	1.3K - 1.5	1	Yes
Calcium+	--	31/31	71.2 - 1,280[11]	44/44	39.4 - 7,820	--	No

TABLE 6-6 (Continued)

SSA 6
SURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Soil Criteria[2]	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detection (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detection (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Chromium	39[5]	31/31	2.5 - 15.3[11]	44/44	2.6 - 18.3	0	No
Cobalt	470	31/31	0.79 - 5.1[11]	42/44	1.0J - 6.7J	0	No
Copper	290	22/31	1.1 - 139	35/44	1.2J - 24.4	0	No
Cyanide (total)	160	2/31	2.7L - 15.5L	NA	NA	0	No
Iron+	--	31/31	1,510 - 15,300	44/44	1,440 - 19,900	--	No
Lead	400[4]	31/31	3.3 - 73.7	44/44	6.4 - 43.1	0	No
Magnesium+	--	31/31	133 - 591[11]	44/44	61.5J - 1,610	--	No
Manganese	39	31/31	8.1 - 221[11]	44/44	7.6L - 491	25	Yes
Mercury	2.3	4/31	0.11L - 4.7	0/44	ND	1	Yes
Nickel	160	21/31	1.2 - 7.2[11]	36/44	3.8J - 11.9	0	No
Potassium+	--	18/31	123 - 538[11]	15/44	3,98J - 1,640	--	No
Selenium	39	5/31	0.58K - 0.97K	23/44	0.26L - 0.55L	0	No
Silver	39	3/31	2 - 37.6	2/44	1J - 2.1J	0	No
Sodium+	--	31/31	15.5 - 78.4[11]	44/44	13.9J - 115J	--	No
Vanadium	55	31/31	3.7 - 22.1[11]	44/44	6.1J - 34.7	0	No
Zinc	2,300	31/31	4.9J - 108J	44/44	3.2KJ - 48.4	0	No

TABLE 6-6 (Continued)

SSA 6
SURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

(1) Organic and inorganic concentrations reported in mg/kg.
(2) COC = USEPA Region III COC screening value (USEPA, 1993a)
(3) J = Analyte was positively identified, value is estimated.
L = Estimated value, biased low.
K = Estimated value, biased high.
(4) Action level for residential soils (USEPA, 1994c)
(5) Chromium (VI) COC value used for chromium.
(6) Naphthalene was used as a surrogate for the COC value.
(7) Chlordane was used as a surrogate for the COC value.
(8) Endosulfan was used as a surrogate for the COC value.
(9) Endrin was used as a surrogate for the COC value.
(10) Concentrations fall within the range of station-wide background.

-- = No criteria published
+ = Essential Nutrients
ND = Not Detected

Note: Background data obtained from the Final Summary of Background Constituent Concentrations and Characterization of the York River Drainage Basin (Baker, July 1995).

TABLE 6-7

SSA 6
SUBSURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Region III Criteria[2]	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Volatiles:							
1,1,2,2-Tetrachloroethane	3.2	1/42	0.002J	NA	NA	0	No
Acetone	780	3/42	0.002J - 0.009J	NA	NA	0	No
Methylene Chloride	85	15/42	0.003J - 0.14	NA	NA	0	No
Carbon Disulfide	780	2/42	0.002J	NA	NA	0	No
Total Xylenes	16,000	1/42	0.002J	NA	NA	0	No
Semivolatiles:				NA	NA		
2,4-Dinitrotoluene	16	2/42	0.110J			0	No
bis(2-ethylhexyl)phthalate	46	22/42	0.045J - 0.47	NA	NA	0	No
Butyl Benzyl Phthalate	1,600	4/42	0.15J - 1.2	NA	NA	0	No
Di-n-butylphthalate	780	39/42	0.043J - 6.2	NA	NA	0	No
Nitramines:				NA	NA		
1,3,5-Trinitrobenzene	0.39	2/42	0.66 - 1.2	NA	NA	2	Yes
2,4-Dinitrotoluene	16	4/42	0.3 - 0.68	NA	NA	0	No
2,4,6-Trinitrotoluene	21	3/42	1.2 - 3.4	NA	NA	0	No
4-Amino-2,6-Dinitrotoluene	--	2/42	0.37 - 0.37	NA	NA	--	No
2,6-Dinitrotoluene	7.8	2/42	0.5 - 0.73	NA	NA	0	No

TABLE 6-7 (Continued)

SSA 6
SUBSURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Region III Criteria[2]	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Pesticides/PCBs:							
alpha-BHC	0.10	1/42	0.0019L - 0.0019L	NA	NA	0	No
alpha-Chlordane	0.49[6]	4/41	0.005 - 0.25	NA	NA	0	No
beta-BHC	0.35	3/42	0.0011L - 0.0054	NA	NA	0	No
4,4 - DDD	2.7	6/42	0.0013L - 0.062J	NA	NA	0	No
4,4'-DDE	1.9	7/42	0.00067J - 0.038	NA	NA	0	No
4,4'-DDT	1.9	5/42	0.0014L - 0.042	NA	NA	0	No
delta-BHC	0.35	1/41	0.004J	NA	NA	0	No
Dieldrin	0.04	5/42	0.0017L - 0.032	NA	NA	0	No
Endosulfan I	47[7]	2/41	0.0013J - 0.0015J	NA	NA	0	No
gamma-BHC	0.49	1/41	0.00048J	NA	NA	0	No
gamma-chlordane	0.49[6]	3/41	0.0083 - 0.23	NA	NA	0	No
Heptachlor Epoxide	0.07	1/41	0.0051J	NA	NA	0	No
Methoxychlor	39	1/41	0.0011J	NA	NA	0	No
Inorganics:							
Aluminum	7,800	42/42	2,350 - 10,300[8]	16/16	2,710 - 28,200	6	Yes
Antimony	3.1	2/30	3.7L - 4.6L[8]	2/13	8.5L - 31.3L	2	Yes
Arsenic (c/n)	0.37/2.3	42/42	1 - 49.5	16/16	0.23J - 42.7	42/26	Yes

TABLE 6-7 (Continued)

SSA 6
SUBSURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Region III Criteria[2]	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Barium	550	42/42	8.9 - 86.9	16/16	10.6J - 66.9	0	No
Beryllium	0.15	31/42	0.06 - 2.1[8]	13/16	0.3J - 9.8	23	Yes
Cadmium	3.9	6/42	0.36 - 0.85	0/16	ND	0	No
Calcium+	--	42/42	186 - 230,000[8]	16/16	28.9J - 233,000	--	No
Chromium	39[5]	42/42	3 - 30.9L[8]	16/16	5.2L - 33.5	0	No
Cobalt	470	42/42	0.8 - 12.3[8]	12/16	0.97J - 156	0	No
Copper	290	40/42	0.86 - 37.5	16/16	2J - 15	0	No
Iron+	--	42/42	1,720 - 35,800[8]	16/16	385J - 510,005	--	No
Lead	400[4]	42/42	3.9 - 47	16/16	3.6L - 25.5L	0	No
Magnesium+	--	42/42	183 - 3,510	16/16	136J - 2,940	--	No
Manganese	39	42/42	4.7 - 269[8]	16/16	3.5J - 2,940	24	Yes
Mercury	2.3	6/42	0.56K - 2.9K	0/16	ND	1	Yes
Nickel	160	32/42	1.2 - 26.7[8]	13/16	4.2J - 145	0	No
Potassium+	--	41/42	102 - 2,740	13/16	392J - 2,560	--	No
Selenium	39	2/42	0.95K - 1.1K	10/16	0.26L - 0.75L	0	No
Silver	39	6/42	1.2 - 13.5	15/16	17.2J - 2,180	0	No
Sodium+	--	42/42	19.8 - 1,580	15/16	17.2J - 2,180	--	No
Thallium	0.63	2/42	1 - 1.2	1/16	0.44K	2	Yes

TABLE 6-7 (Continued)

SSA 6
SUBSURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Region III Criteria[2]	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Vanadium	55	42/42	4.3 - 99.3	15/16	7.8J - 70.3L	1	Yes
Zinc	2,300	42/42	5J - 76J	16/16	3.6J - 330	0	No
Cyanide	160	2/42	3.1L - 3.51	1/16	0.6K	0	No

(1) Organic concentrations converted to mg/kg (except nitramine compounds), inorganic concentrations reported in mg/kg.
(2) COC = USEPA Region III COC screening value (USEPA, 1993a)
(3) L = Estimated value, biased low
J = Analyte was positively identified. Reported value may not be accurate or precise.
B = Detected in associated blank(s)
(4) Action level for residential soils (USEPA, 1994c)
(5) Evaluated as chromium (VI).
(6) Chlordane was used as a surrogate for the COC value.
(7) Endosulfan was used as a surrogate for the COC value.
(8) Concentrations fall within the range of station-wide background.

-- = No criteria published
+ = Essential Nutrients

Note: Background data obtained from the Final Summary of Background Constituent Concentrations and Characterization of the York River Drainage Basin (Baker, July 1995).

TABLE 6-8

SSA 6
SUBSURFACE SOIL DATA AND COPC SELECTION SUMMARY - TEST PITS
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

	Region III Criteria	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
Contaminant[1]	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Volatiles:							
Methylene Chloride	85	8/17	0.003J - 0.028	NA	NA	0	No
Acetone	780	2/17	0.046 - 0.090	NA	NA	0	No
Carbon Tetrachloride	4.9	1/17	0.002J	NA	NA	0	No
Tetrachloroethene	12	1/17	0.002J	NA	NA	0	No
Xylenes (total)	16,000	1/17	0.001J	NA	NA	0	No
Semivolatiles:							
1,4-Dichlorobenzene	27	1/17	0.057J	NA	NA	0	No
2-Chloronaphthalene	630	1/17	0.071J	NA	NA	0	No
N-nitrosodiphenylamine	130	1/17	0.093J	NA	NA	0	No
Phenanthrene[4]	310	1/17	0.049J	NA	NA	0	No
Di-n-ButylPhthalate	780	12/17	0.042J - 3.2	NA	NA	0	No
Fluoranthene	310	1/17	0.088J	NA	NA	0	No
Pyrene	230	1/17	0.068J	NA	NA	0	No
Butyl Benzyl Phthalate	1,600	1/17	0.062J	NA	NA	0	No
Benzo(a)anthracene	0.88	1/17	0.042J	NA	NA	0	No
Chrysene	88	1/17	0.05J	NA	NA	0	No
bis(2-Ethylhexyl)phthalate	46	6/17	0.048J-2	NA	NA	0	No
Benzo(b)fluoranthene	0.88	1/17	0.056J	NA	NA	0	No
Benzo(k)fluoranthene	8.8	1/17	0.046J	NA	NA	0	No
Pesticides/PCBs:							
beta-BHC	0.35	1/17	0.0016L	NA	NA	0	No
delta-BHC	0.35	1/17	0.00084J	NA	NA	0	No
Dieldrin	0.04	2/17	0.0073J - 0.090J	NA	NA	1	Yes

TABLE 6-8 (Continued)

SSA 6
SUBSURFACE SOIL DATA AND COPC SELECTION SUMMARY - TEST PITS
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Region III Criteria	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Endrin	2.3	1/17	0.029	NA	NA	0	No
Endosulfan Sulfate	47[6]	1/17	0.0036L	NA	NA	0	No
alpha-Chlordane	0.49[8]	2/17	0.0098J - 1.2J	NA	NA	1	Yes
gamma-Chlordane	0.49[8]	1/17	0.037J	NA	NA	0	No
Aroclor - 1254	0.16	5/17	0.033J - 79	NA	NA	4	Yes
Aroclor - 1260	0.083	3/17	0.19J - 4.9	NA	NA	3	Yes
Nitramines:							
1,3,5 - Trinitrobenzene	0.39	1/17	0.45J	NA	NA	1	Yes
2,4,6 - Trinitrotoluene	21	1/17	4.1J	NA	NA	0	No
2,6 - Dinitrotoluene	7.8	1/17	0.28J	NA	NA	0	No
2,4 - Dinitrotoluene	16	1/17	2.1J	NA	NA	0	No
Inorganics:							
Aluminum	7,800	17/17	3,340 - 11,600[9]	16/16	2,710 - 28,200	4	Yes
Arsenic (carc./noncarc.)	0.37/2.3	17/17	0.79K - 20.1[9]	16/16	0.23J - 42.7	17/8	Yes
Barium	550	17/17	15.7 - 327	16/16	10.6J - 66.9	0	No
Beryllium	0.15	10/17	0.16 - 0.84[9]	13/16	0.3J - 9.8	10	Yes
Cadmium	3.9	7/17	0.66 - 786	0/16	ND	3	Yes
Calcium+	--	17/17	432 - 196,000[9]	16/16	28.9J - 283,000	--	No
Chromium	39[7]	17/17	4.3L - 28.3	16/16	5.2L - 33.5	0	No
Cobalt	470	17/17	(7.26)[9]	12/16	0.97J - 156	0	No
Copper	290	15/17	0.72 - 181	16/16	2J - 15	0	No
Iron+	--	17/17	2,480J - 26,900[9]	16/16	385J - 51,100J	--	No
Lead	400[5]	17/17	3.1 - 344	16/16	3.6L - 25.5	0	No
Magnesium+	--	17/17	128 - 2,020[9]	16/16	136J - 2,870	--	No

TABLE 6-8 (Continued)

SSA 6
SUBSURFACE SOIL DATA AND COPC SELECTION SUMMARY - TEST PITS
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Region III Criteria	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Manganese	39	17/17	8.8J - 144J[9]	16/16	3.5J - 2,940	10	Yes
Mercury	2.3	3/17	0.15 - 1.3	0/16	ND	0	No
Nickel	160	17/17	1.2 - 62[9]	13/16	4.2J - 145	0	No
Potassium+	--	17/17	159 - 1,240[9]	13/16	392J - 2,560	--	No
Silver	39	2/17	1.9 - 8.8	5/16	1.1J - 2.4J	0	No
Sodium+	--	17/17	19.6 - 1,170[9]	15/16	17.2J - 2,180	--	No
Vanadium	55	17/17	6.5 - 25.3[9]	15/16	7.85 - 70.3L	0	No
Zinc	2,300	17/17	6J - 1,580	16/16	3.6J - 330	0	No

(1) Organic concentrations converted to mg/kg (except nitramine compounds), inorganic concentrations reported in mg/kg.
(2) COC = USEPA Region III COC screening value (USEPA, 1993a)
(3) L = Estimated value, biased low
J = Analyte was positively identified. Reported value may not be accurate or precise.
B = Detected in associated blank(s)
(4) Naphthalene COC value used as a surrogate
(5) Action level for residential soils (USEPA, 1994c)
(6) Endosulfan COC value used as a surrogate.
(7) Chromium (VI) COC value used for chromium.
(8) Chlordane COC value used as a surrogate.
(9) Concentrations fall within the range of station-wide background.

-- = No criteria published
+ = Essential Nutrients

Note: Background data obtained from the Final Summary of Background Constituent Concentrations and Characterization of the York River Drainage Basin (Baker, July 1995).

TABLE 6-9

SSA 6
GROUNDWATER DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Groundwater Criteria[2]			Frequency/Range[3]		Background		Comparison to Criteria			COPC Selection
	Federal MCL (µg/L)	USEPA Region III Tapwater COC Value (µg/L)	Virginia PMCLs (µg/L)	No. of Positive Detects/No. of Samples	Concentration Range (µg/L)	No. of Positive Detections/ No. of Samples	Range of positive Detections (µg/L)	No. of Detects Above MCL	No. of Detects Above COC Value	No. of Detects Above Virginia Criteria	Retained as a COPC?
Volatiles:											
Ethylbenzene	700	130	--	1/11	0.8J	0/18	ND	0	0	--	No
cis-1,2-Dichloroethene	70	6.1	--	3/11	3 - 10	0/18	ND	0	1	--	Yes
Trichloroethene	5	1.6	5	1/11	1	0/18	ND	0	0	0	No
Nitramines/Nitroaromatics:											
2,4,6-Trinitrotoluene	--	2.2	--	1/11	0.73	0/18	ND	--	0	--	No
4-Amino-2,6-Dinitrotoluene	--	--	--	1/11	1.7	1/18	0.016	--	--	--	No
Nitrobenzene	--	0.34	--	1/11	3.2	0/18	ND	--	1	--	Yes
Pesticides:											
beta-BHC	--	0.037	--	1/11	0.026J	0/18	ND	--	0	--	No
delta-BHC	--	0.037	--	2/11	0.029J	0/18	ND	0	--	--	No
Inorganics (Total):											
Aluminum	--	3,700	--	11/11	4,580 - 98,800J	18/18	44.9J - 14,600L	--	11	--	Yes
Antimony	6	1.5	--	6/10	12.7L - 28.3L	1/18	16.4K	6	6	--	No[5]
Arsenic (as carcinogen)	50	0.038	50	11/11	5.8 - 436	6/18	3.5J - 36.4	4	11	4	Yes
Barium	2,000	260	1,000	11/11	37.7 - 474	18/18	13J - 97.5J	0	1	0	Yes
Beryllium	4	0.016	--	10/11	1.1 - 7.8	8/18	0.22J - 1.5J	2	10	--	Yes
Cadmium	5	1.8	10	5/11	1.7 - 27.1	0/18	ND	1	3	1	Yes

TABLE 6-9 (Continued)

SSA 6
GROUNDWATER DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Groundwater Criteria[2]			Frequency/Range[3]		Background		Comparison to Criteria			COPC Selection
	Federal MCL (µg/L)	USEPA Region III Tapwater COC Value (µg/L)	Virginia PMCLs (µg/L)	No. of Positive Detects/No. of Samples	Concentration Range (µg/L)	No. of Positive Detections/ No. of Samples	Range of positive Detections (µg/L)	No. of Detects Above MCL	No. of Detects Above COC Value	No. of Detects Above Virginia Criteria	Retained as a COPC?
Calcium+	--	--	--	11/11	8,640 - 2,350,000	17/18	768J - 530,000	--	--	--	No
Chromium	100	18[6]	50	11/11	15.8 - 500	14/18	1.6J - 49.6	4	10	7	Yes
Cobalt	--	220	--	11/11	9.4 - 87.2	8/18	2.5J - 22.4J	--	0	--	No
Copper	1,300	140	--	11/11	7.4 - 107	17/18	1.3J - 14.3J	0	0	--	No
Cyanide	--	73	--	3/11	5.2 - 6.8	NA	NA	--	0	--	No
Iron+	--	--	--	11/11	13,900 - 279,000	18/18	483 - 48,200	--	--	--	No
Lead	15	--	50	11/11	4.2 - 113	5/18	1.8L - 12.8	8	--	3	Yes
Magnesium+	--	--	--	11/11	4,250 - 76,000	18/18	489J - 9,770	--	--	--	No
Manganese	--	18	--	11/11	116 - 1,690	18/18	4.5J - 413	--	11	--	Yes
Nickel	100	73	--	11/11	8.9 - 237	2/18	7.9J - 27.6J	1	3	--	Yes
Potassium+	--	--	--	11/11	3,990 - 42,900	18/18	557J - 17,000	--	--	--	No
Selenium	50	18	10	5/11	2.8 - 28.4	1/18	2.9J	0	1	1	No[5]
Sodium+	--	--	--	11/11	4,710 - 17,400[7]	18/18	3,670J - 27,200	--	--	--	No
Vanadium	--	26	--	11/11	13.2L - 603	17/18	2.9J - 66.6	--	9	--	Yes
Zinc	--	1,100	--	10/11	41J - 618J	18/18	5.9J - 99.1	--	0	--	No
Inorganics (Dissolved)											
Aluminum	--	3,700	--	1/11	20.3[7]	6/18	12.9J - 212	--	0	--	No
Barium	2,000	260	1,000	11/11	9.9 - 63.4[7]	18/18	5.9J - 73.4J	0	0	0	No
Beryllium	4	0.016	--	7/11	0.11 - 0.23	0/18	ND	0	6	--	Yes

TABLE 6-9 (Continued)

SSA 6
GROUNDWATER DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Groundwater Criteria[2]			Frequency/Range[3]		Background		Comparison to Criteria			COPC Selection
	Federal MCL (µg/L)	USEPA Region III Tapwater COC Value (µg/L)	Virginia PMCLs (µg/L)	No. of Positive Detects/No. of Samples	Concentration Range (µg/L)	No. of Positive Detections/ No. of Samples	Range of positive Detections (µg/L)	No. of Detects Above MCL	No. of Detects Above COC Value	No. of Detects Above Virginia Criteria	Retained as a COPC?
Calcium+	--	--	--	11/11	7,920 - 141,000	18/18	611J - 129,000	--	--	--	No
Cobalt	--	220	--	2/11	2.1 - 2.2[7]	2/18	3.2J - 4.6J	--	0	--	No
Copper	1,300	140	--	11/11	1.5 - 15.6	12/18	1.1J - 4.0J	0	0	--	No
Iron+	--	--	--	2/11	66.1 - 3,080	15/18	2.4J - 347	--	--	--	No
Magnesium+	--	--	--	11/11	2,170 - 5,720[7]	18/18	78.2J - 9,810	--	--	--	No
Manganese	--	18	--	11/11	3.7 - 76.7	15/18	1.1J - 54.4	--	6	--	Yes
Nickel	100	73	--	6/11	4.4 - 9.3	0/18	ND	0	0	--	No
Potassium+	--	--	--	11/11	1,430 - 6,640[7]	18/18	430J - 17,900	--	--	--	No
Sodium+	--	--	--	11/11	4,090 - 8,110[7]	18/18	3,690J - 27,800	--	--	--	No
Thallium	2	0.29[4]	--	2/11	4.4 - 5.3	0/18	ND	2	2	--	Yes
Vanadium	--	26	--	1/11	1.9[7]	10/18	1.8J - 10.2J	--	0	--	No

(1) All concentrations reported in µg/L
(2) Federal MCL - Federal Safe Drinking Water Act Maximum Contaminant Level (USEPA, 1994a; Drinking Water Regulations and Health Advisories)
Virginia Drinking Water Standards - PMCLs - Primary Maximum Contaminant Levels (Bureau of National Affairs - December, 1994)
COC values - USEPA Region III COC screening value (USEPA, 1993a)
(3) J = Analyte was positively identified, value is estimated
L = Value estimated; biased low
K = Value estimated; biased high
(4) Thallium carbonate was used as a surrogate for the COC value.
(5) Constituent was not included as a COPC since it was not detected in the dissolved sample. Total inorganic result assumed to be due to the presence of suspended solids.
(6) Chromium (VI) COC value was used for chromium.
(7) Concentrations fall within the range of station-wide background.

-- = No criteria published
+ = Essential Nutrient

Note: Background data obtained from the Final Summary of Background Constituent Concentrations and Characterization of the York River Drainage Basin (Baker, July 1995).

TABLE 6-10

SSA 7
SURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Region III Criteria[2]	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detection (mg/kg)	No. of Postiive Detections/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detects Above Residential COC Value	Selected as a COPC?
Volatiles:							
Methylene Chloride	85	3/5	0.004J-0.009J	1/13	0.007J	0	No
Semivolatiles:							
Acenaphthylene	310[8]	1/5	0.05J	0/13	ND	0	No
Benzo(a)anthracene	0.88	2/5	0.049J-0.15J[9]	2/13	0.12J - 0.24J	0	No
Benzo(a)pyrene	0.088	2/5	0.043J-0.17J[9]	2/13	0.14J - 0.18J	1	Yes
Benzo(b)fluoranthene	0.88	2/5	0.046J-0.34J[9]	3/13	0.23J - 0.50	0	No
Benzo(k)fluoranthene	8.8	2/5	0.041J-0.26J	2/13	0.12J - 0.13J	0	No
Bis(2-ethylhexyl)phthalate	46	1/5	0.062J	0/13	ND	0	No
Chrysene	88	2/5	0.058J-0.24J[9]	3/13	0.15J - 0.27J	0	No
Di-n-Butylphthalate	780	1/5	0.45	0/13	ND	0	No
Fluoranthene	310	3/5	0.064J-0.3J[9]	4/13	0.12J - 0.43	0	No
Indeno (1,2,3-cd) pyrene	0.88	1/5	0.055J[9]	1/13	0.16J	0	No
Phenanthrene	310[8]	2/5	0.051J-0.09J	0/13	ND	0	No
Pyrene	230	3/5	0.047J-0.17J[9]	3/13	0.16J - 0.32J	0	No

TABLE 6-10 (Continued)

SSA 7
SURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Region III Criteria[2]	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detection (mg/kg)	No. of Postiive Detections/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detects Above Residential COC Value	Selected as a COPC?
Pesticides/PCBs:							
4,4'-DDT	1.9	1/5	0.0071	0/13	ND	0	No
Endosulfan Sulfate	47[5]	1/5	0.0011J	0/13	ND	0	No
Endrin Ketone	2.3[6]	1/5	0.0023J	0/13	ND	0	No
Methoxychlor	39	1/5	0.01J	0/13	ND	0	No
Inorganics:							
Aluminum	7800	5/5	2,230 - 8,270[9]	44/44	1,960 - 19,200	1	Yes
Arsenic (carc./noncarc.)	0.37/2.3	5/5	1.1J - 2.7[9]	44/44	0.46L - 63.9	5/2	Yes
Barium	550	5/5	13.4 - 36.5[9]	44/44	4.2J - 80.2	0	No
Beryllium	0.15	5/5	0.07K - 0.33L[9]	31/44	0.23J - 0.93J	4	Yes
Calcium+	--	5/5	209 - 578[9]	44/44	39.4 - 7,820	--	No
Chromium[7]	39[7]	5/5	3.2 - 11[9]	44/44	2.6 - 18.3	0	No
Cobalt	470	5/5	1.3 - 2.7L[9]	42/44	1.0J - 6.7J	0	No
Copper	290	5/5	1.7 - 4.9[9]	35/44	1.2J - 24.4	0	No
Iron+	--	5/5	4,120 - 13,800[9]	44/44	1,440 - 19,900	--	No
Lead	400[4]	5/5	4.2 - 16.2[9]	44/44	6.4 - 43.1	0	No
Magnesium+	--	5/5	176 - 533[9]	44/44	61.5J - 1,610	--	No

TABLE 6-10 (Continued)

SSA 7
SURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Region III Criteria[2]	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detection (mg/kg)	No. of Postiive Detections/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detects Above Residential COC Value	Selected as a COPC?
Manganese	39	5/5	9.1 - 328L[9]	44/44	7.6L - 491	4	Yes
Nickel	160	4/5	1.4J - 2.6J[9]	36/44	3.8J - 11.94	0	No
Potassium+	--	5/5	115 - 220[9]	15/44	398J - 1,640	--	No
Selenium	39	1/5	0.81K	23/44	0.26L - 0.55L	0	No
Sodium+	--	5/5	22.6 - 73[9]	44/44	13.9J - 115J	--	No
Vanadium	55	5/5	4.2 - 25.8[9]	44/44	6.1J - 34.7	0	No
Zinc	2,300	5/5	6.8J - 21.9L[9]	44/44	3.2KJ - 48.4	0	No

(1) Organic concentrations reported in µg/kg, Inorganic concentrations reported in mg/kg.
(2) COC = USEPA Region III COC screening value (USEPA, 1993a)
(3) J = Analyte was positively identified, value is estimated.
K = Estimated value, biased high
L = Estimated value, biased low
(4) Action level for residential soils (USEPA, 1994c)
(5) Endosulfan was used as a surrogate for the COC value.
(6) Endrin was used as a surrogate for the COC value.
(7) Chromium (VI) COC value was used for chromium.
(8) Naphthalene was used as a surrogate for the COC value.
(9) Concentrations fall within the range of station-wide background.

-- = No criteria published
+ = Essential Nutrients
NA = Not Analyzed
ND = Not Detected

Note: Background data obtained from the Final Summary of Background Constituent Concentrations and Characterization of the York River Drainage Basin (Baker, July 1995).

TABLE 6-11

SSA 7
SUBSURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Region III Criteria	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Volatiles:							
Methylene Chloride	85	9/27	0.002J - 0.024	NA	NA	0	No
Semivolatiles:							
bis(2-ethylhexyl)phthalate	46	8/27	0.059J - 0.45	NA	NA	0	No
Di-n-butylphthalate	780	11/27	0.057J - 0.49	NA	NA	0	No
Butyl benzyl phthalate	1600	1/27	0.38J	NA	NA	0	No
Di-n-octyl phthalate	160	1/27	0.14J	NA	NA	0	No
1,4-Dichlorobenzene	27	1/27	0.049J	NA	NA	0	No
2-Methylnaphthalene	310[4]	1/27	4	NA	NA	0	No
Naphthalene	310	1/27	0.81	NA	NA	0	No
Phenanthrene	310[4]	1/27	2.6	NA	NA	0	No
Pyrene	230	1/27	0.17J	NA	NA	0	No
Pesticides/PCBs:							
beta-BHC	0.35	1/27	0.00057J	NA	NA	0	No
gamma-Chlordane	0.49[6]	1/27	0.0048J	NA	NA	0	No
Endrin	2.3	1/27	0.00051J	NA	NA	0	No
Endrin Aldehyde	2.3[7]	2/27	0.0068J - 0.25	NA	NA	0	No

TABLE 6-11 (Continued)

SSA 7
SUBSURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Region III Criteria	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Methoxychlor	39	1/27	0.0036J	NA	NA	0	No
Aroclor-1260	0.083	2/26	0.21J - 5.7K	NA	NA	2	Yes
Nitramines:							
HMX	390	3/27	0.52 - 30	NA	NA	0	No
RDX	5.8	1/27	0.58	NA	NA	0	No
Inorganics:							
Aluminum	7,800	27/27	1,510 - 13,300[9]	16/16	2,710 - 28,200	11	Yes
Antimony	3.1	1/20	2.9L[9]	2/13	8.5L - 31.3L	1	Yes
Arsenic (carc./noncarc.)	0.37/2.3	27/27	1.6 - 23.2[9]	16/16	0.23J - 42.7	27/25	Yes
Barium	550	27/27	12.4 - 59[9]	16/16	10.6J - 66.9	0	No
Beryllium	0.15	26/27	0.14K - 1.9L[9]	13/16	0.3J - 9.8	25	Yes
Cadmium	3.9	3/27	0.34 - 0.58	0/16	ND	0	No
Calcium+	--	27/27	510 - 280,000	16/16	28.9J - 233,000	--	No
Chromium	39[8]	27/27	4.4 - 30.8[9]	16/16	5.2L - 33.5	0	No
Cobalt	470	27/27	1.3 - 35.7L[9]	12/16	0.97J - 156	0	No
Copper	290	27/27	1.3 - 8.6[9]	16/16	2J - 15	0	No
Iron+	--	27/27	4,890 - 53,700	16/16	385J - 51,100J	--	No
Lead	400[5]	27/27	2.5 - 10.9[9]	16/16	3.6L - 25.5L	0	No
Magnesium+	--	27/27	334 - 4,050	16/16	136J - 2,870	--	No

TABLE 6-11 (Continued)

SSA 7
SUBSURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Region III Criteria	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Manganese	39	27/27	30.5 - 752[9]	16/16	3.5J - 2,940	22	Yes
Nickel	160	27/27	1.3 - 61.9J[9]	13/16	4.2J - 145	0	No
Potassium+	--	27/27	134J - 6,470	13/16	392J - 2,560	--	No
Selenium	39	3/27	0.69K - 0.89K	10/16	0.26L - 0.75L	0	No
Sodium+	--	27/27	24.9 - 1920[9]	15/16	17.2L - 2,180	--	No
Thallium	0.63	5/27	1K - 2K	1/16	0.44K	5	Yes
Vanadium	55	27/27	5.2 - 38.4[9]	15/16	7.8J - 70.3L	0	No
Zinc	2300	27/27	9.2L - 137L[9]	16/16	3.6J - 330	0	No

(1) Organic concentrations converted to mg/kg (except nitramine compounds), inorganic concentrations reported in mg/kg.
(2) COC = USEPA Region III COC screening value (USEPA, 1993a)
(3) J = Analyte was positively identified. Reported value may not be accurate or precise.
K = Estimated value, biased high.
L = Estimated value, biased low.
(4) Naphthalene COC value used as a surrogate
(5) Action level for residential soils (USEPA, 1994c)
(6) Chlordane was used as a surrogate for the COC value.
(7) Endrin was used as a surrogate for the COC value.
(8) Chromium (VI) COC value was used for chromium.
(9) Concentrations fall within the range of station-wide background.

-- = No criteria published
+ = Essential Nutrients
NA = Not Analyzed
ND = Not Detected

Note: Background data obtained from the Final Summary of Background Constituent Concentrations and Characterization of the York River Drainage Basin (Baker, July 1995).

TABLE 6-12

SSA 7
SUBSURFACE SOIL DATA AND COPC SELECTION SUMMARY - TEST PITS
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

	Region III Criteria	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
Contaminant[1]	Residential[2] COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detections/ No. of Samples	Range of Postiive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Volatiles:							
Methylene chloride	85	5/7	0.003J - 0.012J	NA	NA	0	No
Styrene	1,600	1/7	0.004J	NA	NA	0	No
Semivolatiles:							
Phenanthrene	310	1/7	0.130J	NA	NA	0	No
Di-n-Butylphthalate	780	4/7	0.037J - 2.9	NA	NA	0	No
Fluoranthene	310	1/7	0.080J	NA	NA	0	No
Pyrene	230	1/7	0.059J	NA	NA	0	No
Butyl Benzyl Phthalate	1,600	1/7	0.170J	NA	NA	0	No
bis(2-Ethylhexyl)Phthalate	46	1/7	0.097J	NA	NA	0	No
Benzo(k)fluoranthene	8.8	1/7	0.058J	NA	NA	0	No
Pesticides/PCBs:							
Heptachlor	0.14	1/7	0.00061J	NA	NA	0	No
Endrin	2.3	1/7	0.012J	NA	NA	0	No
Endrin aldehyde	2.3[6]	1/7	0.034J	NA	NA	0	No
Aroclor-1260	0.083	1/7	0.980J	NA	NA	1	Yes
Nitramines:							
2,4,6-Trinitrotoluene	21	1/5	0.39	NA	NA	0	No

TABLE 6-12 (Continued)

SSA 7
SUBSURFACE SOIL DATA AND COPC SELECTION SUMMARY - TEST PITS
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Region III Criteria	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential[2] COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detections/ No. of Samples	Range of Postiive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Inorganics:							
Aluminum	7,800	7/7	4,980 - 13,600[8]	16/16	2,710 - 28,200	4	Yes
Arsenic (carc./noncarc.)	0.37/2.3	7/7	1.9 - 5.6[8]	16/16	0.23J - 31.3L	7/6	Yes
Barium	550	7/7	14.9 - 83.9	16/16	10.6J - 66.9	0	No
Beryllium	0.15	4/7	0.15 - 0.78[8]	13/16	0.3J - 9.8	3	Yes
Calcium+	--	7/7	427 - 1,470[8]	16/16	28.9J - 233,000	--	No
Chromium	39[7]	7/7	8.1 - 16.7[8]	16/16	5.2L - 33.5	0	No
Cobalt	470	7/7	1.3 - 6.6[8]	12/16	0.97J - 156	0	No
Copper	290	7/7	1.7 - 6.8[8]	16/16	2J - 15	0	No
Iron+	--	7/7	7,400 - 18,100[8]	16/16	385J - 51,100J	--	No
Lead	400[5]	7/7	3.6 - 25.3[8]	16/16	3.6L - 25.5L	0	No
Magnesium+	--	7/7	350 - 1,420[8]	16/16	136J - 2,870	--	No
Manganese	39	7/7	26.3 - 443[8]	16/16	3.5J - 2,940	5	Yes
Nickel	160	7/7	1.6 - 8.5[8]	13/16	4.2J - 145	0	No

TABLE 6-12 (Continued)

SSA 7
SUBSURFACE SOIL DATA AND COPC SELECTION SUMMARY - TEST PITS
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

	Region III Criteria	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
Contaminant[1]	Residential[2] COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detections/ No. of Samples	Range of Postiive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Potassium+	--	7/7	282 - 1,230[8]	13/16	392J - 2,560	--	No
Sodium+	--	7/7	23.5 - 103[8]	15/16	17.2L - 2,180	--	No
Vanadium	55	7/7	10.1 - 24.1[8]	15/16	7.8J - 70.3L	0	No
Zinc	2,300	7/7	8.7 - 64.5[8]	16/16	3.6J - 330	0	No

(1) Organic concentrations converted to mg/kg (except nitramine compounds), inorganic concentrations reported in mg/kg.
(2) COC = USEPA Region III COC screening value (USEPA, 1993a)
(3) J = Analyte was positively identified. Reported value may not be accurate or precise.
K = Value estimated; biased high
L = Estimated value, biased low
(4) Naphthalene COC value used as a surrogate
(5) Action level for residential soils (USEPA, 1994c)
(6) Endrin COC value used as a surrogate.
(7) Chromium (VI) COC value used for chromium.
(8) Concentrations fall within the range of station-wide background.

-- = No criteria published
+ = Essential Nutrients

Note: Background data obtained from the Final Summary of Background Constituent Concentrations and Characterization of the York River Drainage Basin (Baker, July 1995).

TABLE 6-13

SSA 7
GROUNDWATER DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Groundwater Criteria[2]			Frequency/Range[3]		Background		Comparison to Criteria			COPC Selection
	Federal MCL (µg/L)	USEPA Region III Tapwater COC Value (µg/L)	Virginia PMCLs (µg/L)	No. of Positive Detects/No. of Samples	Concentration Range (µg/L)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (µg/L)	No. of Detects Above MCL	No. of Detects Above COC Value	No. of Detects Above Virginia Criteria	Retained as a COPC?
Volatiles:											
Acetone	--	370	--	2/2	5J-12J[9]	1/1	15J	--	0	--	No
1,1-Dichloroethene	7	0.044	7	4/7	32J-120	0/18	ND	4	4	4	Yes
1,1-Dichloroethane	--	81	--	3/6	4-15	0/18	ND	--	0	--	No
Ethylbenzene	700	130	--	4/7	0.6J-2	0/18	ND	0	0	--	No
Toluene	1,000	75	--	1/7	0.6J	0/18	ND	0	0	--	No
1,1,1-Trichloroethane	200	130	200	5/7	450-700	0/18	ND	5	5	5	Yes
Trichloroethene	5	1.6	5	3/7	0.7J-1	0/18	ND	0	0	0	No
Semivolatiles:											
Acenaphthene	--	220	--	1/7	5J	0/18	ND	--	0	--	No
Bis(2-ethylhexyl)phthalate	--	4.8	--	1/7	1J	0/18	ND	--	0	--	No
Carbazole	--	3.4	--	1/7	4J	0/18	ND	--	1	--	Yes
Dibenzofuran	--	15	--	1/7	8J	0/18	ND	--	0	--	No
Diethylphthalate	--	2,900	--	1/7	5J	0/18	ND	--	0	--	No
Fluorene	--	150	--	1/7	8J	0/18	ND	--	0	--	No
2-Methylnaphthalene	--	150[4]	--	1/7	68	0/18	ND	--	0	--	No
Naphthalene	--	150	--	1/7	29	0/18	ND	--	0	--	No
Phenanthrene	--	150[4]	--	1/7	11	0/18	1.0J	--	0	--	No

TABLE 6-13 (Continued)

SSA 7
GROUNDWATER DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Groundwater Criteria[2]			Frequency/Range[3]		Background		Comparison to Criteria			COPC Selection
	Federal MCL (µg/L)	USEPA Region III Tapwater COC Value (µg/L)	Virginia PMCLs (µg/L)	No. of Positive Detects/No. of Samples	Concentration Range (µg/L)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (µg/L)	No. of Detects Above MCL	No. of Detects Above COC Value	No. of Detects Above Virginia Criteria	Retained as a COPC?
Pesticides:											
Aldrin	--	0.004	--	1/6	0.026L	0/18	ND	--	1	--	Yes
alpha-BHC	0.2[5]	0.011	4[5]	1/6	0.042L	0/18	ND	0	1	0	Yes
delta-BHC	0.2[5]	0.052[5]	4[5]	1/6	0.029L	1/18	0.016J	0	0	0	No
Dieldrin	--	0.0042	--	1/6	0.033L	0/18	ND	--	1	--	Yes
Nitramines:											
HMX		180	--	3/7	22-39	0/18	ND	--	0	--	No
RDX		0.61	--	3/7	25-48	0/18	ND	--	3	--	Yes
Inorganics (Total):											
Aluminum	--	3,700	--	7/7	17,000-206,000	18/18	44.9J - 14,600L	--	7	--	Yes
Antimony	6	1.5	--	7/7	20.6L-53.4L	1/18	16.4K	7	7	0	Yes
Arsenic (as carcinogen)	50	0.038	50	7/7	106-825	6/18	3.5J - 36.4	7	7	7	Yes
Barium	2,000	260	1,000	7/7	87.5L-972	18/18	13J - 97.5J	0	6	0	Yes
Beryllium	4	0.016	--	7/7	2.6L-17.4	8/18	0.22J - 1.5J	5	7	--	No[6]
Cadmium	5	1.8	10	6/7	5.4K-24.8	0/18	ND	6	6	5	No[6]
Calcium+	--	--	--	7/7	106,000-1,430,000	17/18	768 - 530,000	--	--	---	No
Chromium	100	18[7]	50	7/7	96.9-1,020	14/18	1.6J - 49.6	6	7	7	No[6]
Cobalt	--	220	--	7/7	38.4-174	8/18	2.5J - 22.4	--	0	--	No
Copper	1,300	140	1,000	7/7	26.8-182	17/18	1.3J - 14.6J	0	2	0	Yes

TABLE 6-13 (Continued)

SSA 7
GROUNDWATER DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Groundwater Criteria[2]			Frequency/Range[3]		Background		Comparison to Criteria			COPC Selection
	Federal MCL (µg/L)	USEPA Region III Tapwater COC Value (µg/L)	Virginia PMCLs (µg/L)	No. of Positive Detects/No. of Samples	Concentration Range (µg/L)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (µg/L)	No. of Detects Above MCL	No. of Detects Above COC Value	No. of Detects Above Virginia Criteria	Retained as a COPC?
Iron+	--	--	--	7/7	49,900L-620,000	18/18	483 - 48,200	--	--	--	No
Lead	15	--	50	7/7	19.1-236	5/18	1.8L - 12.8	7	--	7	No[6]
Magnesium+	--	--	--	7/7	8,240-377,000	18/18	489J - 9,770	--	--	--	No
Manganese	--	18	--	7/7	240-3,950	18/18	4.5J - 413	--	7	--	Yes
Nickel	100	73	--	7/7	53.8L-391	2/18	7.9J - 27.6J	6	6	--	Yes
Potassium+	--	--	--	7/7	6,350-59,600	18/18	557J - 17,000	--	--	--	No
Selenium	50	18	10	6/7	3.4K-13.8	1/18	2.9J	0	0	2	No[6]
Sodium+	--	--	--	7/7	3,830-30,100	18/18	3,670J - 27,200	--	--	--	No
Thallium	2	0.29[8]	--	6/7	6.3K-15.5	0/18	ND	6	6	--	Yes
Vanadium	--	26	--	7/7	141L-1,100L	17/18	2.9J - 66.6	--	7	--	Yes
Zinc	--	1,100	--	7/7	129L-1,130	18/18	5.9J - 99.1J	--	1	--	Yes
Inorganics (Dissolved)											
Aluminum	--	3,700	--	1/7	52.6[9]	6/18	12.9J - 212	--	0	--	No
Antimony	6	1.5	--	1/7	13.7[9]	5/18	16.7J - 21.1J	1	1	--	Yes
Arsenic (carcinogen)	50	0.038	50	1/7	14.6	2/18	3.0L - 5.5L	0	1	0	Yes
Barium	2,000	260	1,000	7/7	11.8-53.7[9]	18/18	5.9J - 73.4J	0	0	0	No
Calcium+	--	--	--	7/7	99,200-167,000	18/18	611J - 129,000	--	--	--	No
Cobalt	--	220	--	1/7	3.6[9]	8/18	3.2J - 4.6J	--	0	--	No
Copper	1,300	140	1,000	7/7	1.9-21.8	12/18	1.1J - 4J	0	0	0	No

TABLE 6-13 (Continued)

SSA 7
GROUNDWATER DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Groundwater Criteria[2]			Frequency/Range[3]		Background		Comparison to Criteria			COPC Selection
	Federal MCL (µg/L)	USEPA Region III Tapwater COC Value (µg/L)	Virginia PMCLs (µg/L)	No. of Positive Detects/No. of Samples	Concentration Range (µg/L)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (µg/L)	No. of Detects Above MCL	No. of Detects Above COC Value	No. of Detects Above Virginia Criteria	Retained as a COPC?
Iron+	--	--	--	5/7	2.8-1,370	15/18	2.4J - 247	--	--	--	No
Magnesium+	--	--	--	7/7	1,370-5,410[9]	18/18	70.2J - 9,810	--	--	--	No
Manganese	--	18	--	6/7	4.3-1,020	15/18	1.1J - 54.4	--	3	--	Yes
Nickel	100	73	--	3/7	4.6-6.1[9]	0/18	ND	0	0	--	No
Potassium+	--	--	--	4/7	744-1,690[9]	18/18	430J - 17,900	--	--	--	No
Sodium+	--	--	--	7/7	3,540-18,700[9]	18/18	3,690J - 27,800	--	--	--	No
Thallium	2	0.29	--	5/7	4.4-7.3K	0/18	ND	5	5	--	Yes
Vanadium	--	26	--	2/7	1.6-1.7[9]	10/18	1.8J - 10.2J	--	0	--	No
Zinc	--	1,100	--	1/7	3.2[9]	18/18	2.9J - 15.6J	--	0	--	No

(1) All concentrations reported in µg/L
(2) Federal MCL - Federal Safe Drinking Water Act Maximum Contaminant Level (USEPA, 1994a; Drinking Water Regulations and Health Advisories)
Virginia Drinking Water Standards - PMCLs - Primary Maximum Contaminant Levels (Bureau of National Affairs - December, 1994)
COC values - USEPA Region III COC screening value (USEPA, 1993a)
(3) J = Analyte was positively identified, value is estimated
K = Value estimated; biased high
L = Value estimated; biased low
(4) Naphthalene used as a surrogate
(5) Lindane used as a surrogate
(6) Constituent not included as a COPC since it was not detected in the dissolved sample. Total inorganic results assumed to be due to the presence of suspended solids.
(7) Chromium (VI) COC value was used for chromium.
(8) Thallium carbonate used a surrogate.
(9) Concentrations fall within the range of station-wide background.

-- = No criteria published
+ = Essential Nutrient

Note: Background data obtained from the Final Summary of Background Constituent Concentrations and Characterization of the York River Drainage Basin (Baker, July 1995).

TABLE 6-14

SSA 7
SURFACE WATER DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Federal/State Criteria[2]				Frequency/Range[3]		Background		COPC Selection
	AWQC Saltwater Acute (µg/L)	AWQC Saltwater Chronic (µg/L)	Virginia Saltwater Acute (µg/L)	Virginia Saltwater Chronic (µg/L)	No. of Positive Detects/ No. of Samples	Concentration Range (µg/L)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (µg/L)	Retained as a COPC?
Inorganics (Total):									
Aluminum	--	--	--	--	4/4	75.1J-116J[5]	17/17	171J - 5,600	No
Barium	--	--	--	--	4/4	22.9L-23.4L[5]	17/17	26.6J - 49.9J	No
Beryllium	--	--	--	--	1/4	0.1L	0/17	ND	No
Calcium+	--	--	--	--	4/4	175,000-182,000[5]	17/17	29,200J - 198,000J	No
Copper	18	12	2.9	2.9	1/4	2.4J[5]	4/17	5.6J - 6.7J	No
Iron+	--	--	--	--	4/4	130L-167L[5]	17/17	289J - 6,650	No
Magnesium+	--	--	--	--	4/4	544,000-562,000[5]	17/17	23,000 - 656,000	No
Manganese	--	--	--	--	4/4	8.1J-9.1J[5]	17/17	33.1 - 37.9	No
Potassium+	--	--	--	--	4/4	196,000-202,000[5]	17/17	8,210 - 220,000	No
Sodium+	--	--	--	--	4/4	4,990,000-5,180,000[5]	16/17	180,000 - 5,760,000	No
Thallium	2,130[4]	--	--	--	4/4	4.6K-10K	0/17	ND	No

TABLE 6-14 (Continued)

SSA 7
SURFACE WATER DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Federal/State Criteria[2]				Frequency/Range[3]		Background		COPC Selection
	AWQC Saltwater Acute (µg/L)	AWQC Saltwater Chronic (µg/L)	Virginia Saltwater Acute (µg/L)	Virginia Saltwater Chronic (µg/L)	No. of Positive Detects/ No. of Samples	Concentration Range (µg/L)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (µg/L)	Retained as a COPC?
Vanadium	--	--	--	--	4/4	4.1L-6.8L[5]	11/17	5J - 14.4J	No
Zinc	95	86	95	86	4/4	2.2J-6.1J	9/17	7.9J - 20.2	No

(1) All concentrations reported in µg/L
(2) Water Quality Criteria (WQC) saltwater acute and chronic, and Virginia Water Standards saltwater acute and chronic (Bureau of National Affairs - December 1993)
(3) B = Detected in associated blank(s)
J = Analyte was positively identified, value is estimated
L = Value is estimated; biased low
(4) Lowest Observed Effect Level (LOEL)
(5) Concentrations fall within the range of station-wide background.

-- = No criteria published
+ = Essential Nutrient

Note: Background data obtained from the Final Summary of Background Constituent Concentrations and Characterization of the York River Drainage Basin (Baker, July 1995).

TABLE 6-15

SSA 7
SEDIMENT DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Sediment Criteria[2]		Contaminant Frequency/Range[3]		Background		Comparison to Criteria		COPC Selection
	SSV ER-M (mg/kg)	SSV ER-L (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above ER-M	Positive Detects Above ER-L	Retained as a COPC?
Semivolatiles:									
Benzo(a)anthracene	1.6	0.261	1/9	0.26J	0/25	ND	0	0	No
Benzo(b)fluoranthene	--	3.2	1/9	0.44J	0/25	ND	--	0	No
Benzo(k)fluoranthene[4]	1.6	0.261	1/9	0.34J	0/25	ND	0	1	Yes
Benzo(a)pyrene	1.6	0.43	1/9	0.3J	0/25	ND	0	0	No
Bis (2-ethylhexyl)phthalate	--	5.3[5]	4/9	0.22J-2.3	1/25	290J	--	0	No
Butyl benzyl phthalate	--	5.3[5]	4/9	0.6J-2.3	0/25	ND	--	0	No
Chrysene	2.8	0.384	1/9	0.36J	0/25	ND	0	0	No
Di-n-butyl phthalate	--	--	6/9	5.1-14	0/25	ND	--	--	No
Fluoranthene	5.1	0.6	1/9	0.36J	0/25	ND	0	0	No
Indeno(1,2,3-cd)pyrene	--	0.6	1/9	0.19J	0/25	ND	0	0	No
Pyrene	2.6	0.665	1/9	0.47J	0/25	ND	0	0	No
Inorganics:									
Aluminum	--	--	9/9	2,550-20,800	25/25	1,510 - 40,500	0	1.125	No
Arsenic	70	8.2	9/9	5.4-17.1	25/25	1.4J - 13.1	0	0	Yes
Barium	--	--	9/9	4.8-42.1	25/25	3.6J - 93.2J	--	--	No
Beryllium	--	--	9/9	0.33L-1.1L	23/25	0.55J - 1.6J	--	--	No

TABLE 6-15 (Continued)

SSA 7
SEDIMENT DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Sediment Criteria[2]		Contaminant Frequency/Range[3]		Background		Comparison to Criteria		COPC Selection
	SSV ER-M (mg/kg)	SSV ER-L (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above ER-M	Positive Detects Above ER-L	Retained as a COPC?
Calcium+	--	--	9/9	1,640-22,500J	25/25	217J - 4,220	--	--	No
Chromium	370	81	9/9	7.9L-40.5[6]	25/25	3.8 - 66.1	0	0	No
Cobalt	--	--	9/9	3-10.7[6]	24/25	3.8J - 15J	--	--	No
Copper	270	34	9/9	2.1-23[6]	24/25	3.7J - 43.1	0	0	No
Iron+	--	--	9/9	10,800-35,800[6]	25/25	3,060 - 46,000	--	--	No
Lead	218	46.7	9/9	3.3J-36[6]	25/25	3.4 - 51.6	0	0	No
Magnesium+	--	--	9/9	1,470-7,240[6]	25/25	292J - 9,720K	--	--	No
Manganese	--	--	9/9	30.1-252[6]	25/25	7.4 - 1,980	--	--	No
Nickel	51.6	20	9/9	4.4-21.9[6]	23/25	9.3K - 55.2	0	1	Yes
Potassium+	--	--	9/9	1,830-4,320[6]	23/25	1,200J - 6,080	--	--	No
Selenium	--	--	1/9	2.2K	17/25	0.46L - 1.5L	--	--	No
Silver	3.7	1	1/9	0.82[6]	1/25	2.2L	0	0	No
Sodium+	--	--	9/9	1,600-12,900[6]	25/25	177J - 16,700	--	--	No
Thallium	--	--	1/9	0.98K	0/25	ND	--	--	No
Vanadium	--	--	9/9	7.9-55.8[6]	25/25	4.8J - 67.6	--	--	No
Zinc	410	150	9/9	16.6J-137J	25/25	4J - 202J	0	0	No

TABLE 6-15 (Continued)

SSA 7
SEDIMENT DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

(1) Organic concentrations converted to mg/kg, Inorganic concentrations reported in mg/kg.
(2) SSV = Sediment Screening Value (Long, et al, 1995)
(3) J = Analyte was positively identified. Reported value may not be accurate or precise.
K = Estimated value, biased high
L = Estimated value, biased low
(4) SSV was not published; therefore, the benzo(a)anthracene SSV (the most conservative PAH SSV) was used as a surrogate.
(5) Region III BTAG Screening Levels range from 5.3 mg/kg (diethylphthalate) to 260 mg/kg (n-butylphthalate). The more conservative value for diethylphthalate was used.
(6) Concentrations fall within the range of station-wide background.

-- = No criteria published
+ = Essential Nutrients
NA = Not Analyzed
ND = Not Detected

Note: Background data obtained from the Final Summary of Background Constituent Concentrations and Characterization of the York River Drainage Basin (Baker, July 1995).

TABLE 6-16

SSA 15
SURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Region III Criteria[2]	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detection (mg/kg)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detects Above Residential COC Value	Selected as a COPC?
Semivolatiles:							
4-Chloroaniline	31	1/6	0.110J	0/13	ND	0	No
4-Chloro-3-methylphenol	--	1/6	0.350J	0/13	ND	0	No
Benzo(g,h,i)perylene	310[5]	1/6	0.100J	0/13	ND	0	No
bis(2-ethylhexyl)phthalate	46	3/6	0.067J - 1.5J	0/13	ND	0	No
Butylbenzylphthalate	1,600	1/6	0.120J	0/13	ND	0	No
Di-n-Butylphthalate	780	2/6	0.130J - 0.470	0/13	ND	0	No
Pesticides:							
alpha-Chlordane	0.49[6]	3/6	0.0021J - 0.280	0/13	ND	0	No
gamma-Chlordane	0.49[6]	1/6	0.26	0/13	ND	0	No
4,4 - DDD	2.7	3/6	0.0019J - 0.110	0/13	ND	0	No
4,4'-DDE	1.9	6/6	0.0082J - 0.020	0/13	ND	0	No
4,4'-DDT	1.9	6/6	0.0024J - 0.082	0/13	ND	0	No
Dieldrin	0.04	11/6	0.0092	0/13	ND	0	No
Endosulfan Sulfate	47[7]	1/6	0.0085J	0/13	ND	0	No

TABLE 6-16 (Continued)

SSA 15
SURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Region III Criteria[2]	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detection (mg/kg)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detects Above Residential COC Value	Selected as a COPC?
Inorganics:							
Aluminum	7,800	6/6	1290 - 6330[9]	44/44	1,960 - 19,200	0	No
Antimony	3.1	1/6	4L[9]	2/42	9.2L - 11L	1	Yes
Arsenic (carc./noncarc.)	0.37/2.3	6/6	2.4 - 19.2[9]	44/44	0.46L - 63.9	6/6	Yes
Barium	550	6/6	10.8 - 27.8[9]	44/44	4.2J - 80.2	0	No
Beryllium	0.15	6/6	0.06 - 0.61[9]	31/44	0.23J - 0.93J	4	Yes
Cadmium	3.9	2/6	0.38 - 0.51[9]	2/44	1.3K - 1.5	0	No
Calcium+	--	6/6	154 - 6,490[9]	44/44	39.4J - 7,820	--	No
Chromium	39[8]	6/6	3.3 - 20.4	44/44	2.6 - 18.3	0	No
Cobalt	470	6/6	0.53 - 6[9]	42/44	1J - 6.7J	0	No
Copper	290	6/6	3.2 - 14.3[9]	35/44	1.2J - 24.4	0	No
Cyanide (total)	160	2/4	2.9K - 4.6L	NA	NA	0	No
Iron+	--	6/6	3,770 - 23,900	44/44	1,440 - 19,900	--	No
Lead	400[4]	6/6	9.1 - 227	44/44	6.4 - 43.1	0	No
Magnesium+	--	6/6	83.3 - 446[9]	44/44	61.5J - 1,610	--	No

TABLE 6-16 (Continued)

SSA 15
SURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

	Region III Criteria[2]	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
Contaminant[1]	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detection (mg/kg)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detects Above Residential COC Value	Selected as a COPC?
Manganese	39	6/6	8.4 - 175[9]	44/44	7.6L - 491	3	Yes
Mercury	2.3	1/6	0.59K	0/44	ND	0	No
Nickel	160	5/6	1 - 5[9]	36/44	3.8J - 11.9	0	No
Potassium+	--	6/6	94.1J - 692[9]	15/44	398J - 1,640J	--	No
Selenium	39	3/6	0.67K - 1.1K	23/44	0.26L - 0.55L	0	No
Silver	39	1/6	5.3	2/44	1J - 2.1J	0	No
Sodium+	--	6/6	15.8 - 121	44/44	13.9J - 115J	--	No
Vanadium	55	6/6	7.4 - 39.2	44/44	6.1J - 34.7	0	No
Zinc	2,300	6/6	13.1J - 43.6J[9]	44/44	3.2KJ - 48.4	0	No

(1) Organic concentrations reported in µg/kg, Inorganic concentrations reported in mg/kg.
(2) COC = USEPA Region III COC screening value (USEPA, 1994a)
(3) J = Analyte was positively identified, value is estimated.
K = Estimated value, biased high
L = Estimated value, biased low
(4) Action level for residential soils (USEPA, 1994c)
(5) Naphthalene was used as a surrogate for the COC value.
(6) Chlordane was used as a surrogate for the COC value.
(7) Endosulfan was used as a surrogate for the COC value.
(8) Chromium (VI) COC value was used for chromium.
(9) Concentrations fall within the range of station-wide background.

-- = No criteria published
+ = Essential Nutrients
NA = Not Analyzed
ND = Not Detected

Note: Background data obtained from the Final Summary of Background Constituent Concentrations and Characterization of the York River Drainage Basin (Baker, July 1995).

TABLE 6-17

SSA 15
SUBSURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Region III Criteria	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Volatiles:							
Methylene Chloride	85	1/14	0.001J	NA	NA	0	No
Acetone	780	1/14	0.022	NA	NA	0	No
Semivolatiles:							
1,4-Dichlorobenzene	27	2/13	0.073J - 0.089J	NA	NA	0	No
Benzo(a)anthracene	0.88	1/13	0.043J	NA	NA	0	No
Chrysene	88	1/13	0.041J	NA	NA	0	No
Di-n-butylphthalate	780	4/12	2.8 - 5.7	NA	NA	0	No
Fluoranthene	310	1/13	0.095J	NA	NA	0	No
Phenanthrene	310[6]	1/13	0.087J	NA	NA	0	No
Pyrene	230	1/13	0.110J	NA	NA	0	No
Pesticides:							
4,4'-DDD	2.7	1/12	0.046J	NA	NA	0	No
4,4'-DDE	1.9	3/12	0.0011J - 0.3J	NA	NA	0	No
4,4'-DDT	1.9	2/11	0.051J - 0.190L	NA	NA	0	No

TABLE 6-17 (Continued)

SSA 15
SUBSURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Region III Criteria	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Inorganics:							
Aluminum	7800	13/13	1700 - 9280	16/16	2,710 - 28,200	2	Yes
Antimony	3.1	4/13	3.2L - 4.7L	2/13	8.5L - 31.3L	2	Yes
Arsenic (carc./noncarc.)	0.37/2.3	13/13	1.1 - 29.2[8]	16/16	0.23J - 42.7	13/8	Yes
Barium	550	13/13	12.3 - 33.8[8]	16/16	10.6J - 66.9	0	No
Beryllium	0.15	13/13	0.17 - 2.1	13/16	0.3J - 9.8	13	Yes
Cadmium	3.90	1/13	0.34	0/16	ND	0	No
Calcium+	--	13/13	32.3 - 265,000	16/16	28.9J - 233,000	--	No
Chromium	39[7]	13/13	4.8 - 33.5[8]	16/16	5.2L - 33.5	0	No
Cobalt	470	13/13	1.8 - 58[8]	12/16	0.97J - 156	0	No
Cyanide (total)	160	1/1	31	1/16	0.6K	0	No
Iron+	--	13/13	6,180 - 73,500	16/16	385 - 51,100J	--	No
Lead	400[4]	13/13	2.6 - 229	16/16	3.6L - 25.5L	0	No
Magnesium+	--	13/13	235 - 2,760[8]	16/16	126J - 2,870	--	No
Manganese	39	13/13	5.3J - 1300J[8]	16/16	3.5J - 2,940	12	Yes
Nickel	160	13/13	1.1 - 21.6[8]	13/16	4.2J - 145	0	No
Potassium+	--	13/13	183 - 1,780[8]	13/16	392J - 2,560	--	No

TABLE 6-17 (Continued)

SSA 15
SUBSURFACE SOIL DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Region III Criteria	Contaminant Frequency/Range[3]		Background		Comparison to Criteria	COPC Selection
	Residential COC Value (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above Residential COC Value	Selected as a COPC?
Selenium	39	7/13	0.57K - 1.4K	10/16	0.26L - 0.75L	0	No
Sodium+	--	13/13	22.4 - 1,880[8]	15/16	17.2J - 2,180	--	No
Thallium	0.63[5]	1/13	1.3L	1/16	0.44K	1	Yes
Vanadium	55	13/13	3.5 - 36.8[8]		7.8J - 70.3L	0	No
Zinc	2,300	13/13	9.8J - 80.3J[8]	16/16	3.6J - 330	0	No

(1) Organic concentrations converted to mg/kg, Inorganic concentrations reported in mg/kg.
(2) COC = USEPA Region III COC screening value (USEPA, 1994a)
(3) J = Analyte was positively identified. Reported value may not be accurate or precise
K = Estimated value, biased high
L = Estimated value, biased low
(4) Action level for residential soils (USEPA, 1994c)
(5) Thallium carbonate was used as a surrogate for the COC value.
(6) Napthalene was used as a surrogate for the COC value.
(7) Chromium (VI) COC value was used for chromium.
(8) Concentrations fall within the range of station-wide background.

-- = No criteria published
+ = Essential Nutrients
NA = Not Analyzed
ND = Not Detected

Note: Background data obtained from the Final Summary of Background Constituent Concentrations and Characterization of the York River Drainage Basin (Baker, July 1995).

TABLE 6-18

SSA 15
GROUNDWATER DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Groundwater Criteria[2]			Frequency/Range[3]		Background		Comparison to Criteria			COPC Selection
	Federal MCL (µg/L)	USEPA Region III Tapwater COC Value (µg/L)	Virginia PMCLs (µg/L)	No. of Positive Detects/No. of Samples	Concentration Range (µg/L)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (µg/L)	No. of Detects Above MCL	No. of Detects Above COC Value	No. of Detects Above Virginia Criteria	Retained as a COPC?
Volatiles:											
Acetone	--	370	--	1/1	6J	1/1	15J	--	0	--	No
1,1-Dichloroethene	7	0.044	7	1/5	0.6J	0/18	ND	0	1	0	Yes
1,1-Dichloroethane	--	81	--	3/5	1 - 2	0/18	ND	--	0	--	No
1,1,1-Trichloroethane	200	130	200	5/5	2 - 16	0/18	ND	0	0	0	No
cis,1,2-Dichloroethene	70	6.1	--	1/5	0.9J	0/18	ND	0	0	--	No
Bromodichloromethane	100	0.17	--	1/5	0.5J	0/18	ND	0	1	--	No[7]
Chloroform	100	0.15	--	4/5	0.6J - 4	3/18	1J - 6	0	4	--	No[7]
Ethylbenzene	700	130	--	1/5	0.7J	0/18	ND	0	0	--	No
Trichloroethene	5	1.6	5	1/5	7	0/18	ND	1	1	1	Yes
Pesticides:											
beta-BHC	--	0.037	--	1/5	0.05J	0/18	ND	--	1	--	Yes
4,4'-DDD	--	0.28	--	2/5	0.06J - 0.067J	0/18	ND	--	0	--	No
4,4'-DDE	--	0.2	--	2/5	0.059J - 0.06J	0/18	ND	--	0	--	No
4,4'-DDT	--	0.2	0.0059	2/5	0.12J - 0.16J	0/18	ND	--	0	2	Yes

TABLE 6-18 (Continued)

SSA 15
GROUNDWATER DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Groundwater Criteria[2]			Frequency/Range[3]		Background		Comparison to Criteria			COPC Selection
	Federal MCL (µg/L)	USEPA Region III Tapwater COC Value (µg/L)	Virginia PMCLs (µg/L)	No. of Positive Detects/No. of Samples	Concentration Range (µg/L)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (µg/L)	No. of Detects Above MCL	No. of Detects Above COC Value	No. of Detects Above Virginia Criteria	Retained as a COPC?
Inorganics (Total):											
Aluminum	--	3,700	--	5/5	10,800 - 135,000	18/18	44.9J - 14,600L	--	5	--	No[5]
Antimony	6	1.5	--	3/5	14.5L - 26.9L	1/18	16.4K	3	3	--	No[5]
Arsenic (as carcinogen)	50	0.038	50	5/5	5 - 112	6/18	3.5J - 36.4	2	5	2	No[5]
Barium	2,000	260	1,000	5/5	91.6 - 849	18/18	13J - 97.5J	0	4	0	Yes
Beryllium	4	0.016	--	4/5	2.7 - 12.3	8/18	0.22J - 1.5J	2	4	--	No[5]
Cadmium	5	1.8	10	1/5	2	0/18	ND	0	1	0	No[5]
Calcium+	--	--	--	5/5	313,000 - 1,590,000	17/18	768J - 530,000	--	--	--	No
Chromium	100	18[6]	50	5/5	33.1 - 448	14/18	1.6J - 49.6	4	5	4	No[5]
Cobalt	--	220	--	5/5	8.3 - 95.3	8/18	2.5J - 22.4J	--	0	--	No
Copper	1,300	140	1,000	5/5	9.8 - 86.2	17/18	1.3J - 14.6J	0	0	0	No
Cyanide (total)	200	73	--	1/5	5.4J	NA	NA	0	0	--	No
Iron+	--	--	--	5/5	20,200 - 355,000	18/18	483 - 48,200	--	--	--	No
Lead	15	--	50	5/5	8J - 115J	5/18	1.8L - 12.8	4	--	1	No[5]
Magnesium+	--	--	--	5/5	6800 - 44,700	18/18	489J - 9,770	--	--	--	No

TABLE 6-18 (Continued)

SSA 15
GROUNDWATER DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Groundwater Criteria[2]			Frequency/Range[3]		Background		Comparison to Criteria			COPC Selection
	Federal MCL (µg/L)	USEPA Region III Tapwater COC Value (µg/L)	Virginia PMCLs (µg/L)	No. of Positive Detects/No. of Samples	Concentration Range (µg/L)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (µg/L)	No. of Detects Above MCL	No. of Detects Above COC Value	No. of Detects Above Virginia Criteria	Retained as a COPC?
Manganese	--	18	--	5/5	128 - 3,620	18/18	4.5J - 413	--	0	--	No
Nickel	100	73	--	5/5	10.4 - 263	2/18	7.9J - 27.6J	1	2	--	Yes
Potassium+	--	--	--	5/5	5,340 - 34,200	18/18	557J - 17,000	--	--	--	No
Selenium	50	18	10	3/5	2.6K - 5.9K	1/18	2.9J	0	0	0	No
Sodium+	--	--	--	5/5	17,100 - 21,500	17/18	3,670J - 27,200	--	--	--	No
Thallium	2	0.29[4]	--	4/5	5.1L - 16.4L	0/18	ND	4	4	--	No[5]
Vanadium	--	26	--	5/5	27.1 - 329	17/18	2.9J - 66.6	--	5	--	Yes
Zinc	--	1,100	--	5/5	57.8J - 803J	18/18	5.9J - 99.1	--	0	--	No
Inorganics (Dissolved)											
Barium	2,000	260	1,000	5/5	28.7 - 54[8]	18/18	5.9J - 73.4J	0	0	0	No
Calcium+	--	--	--	5/5	102,000 - 165,000	18/18	611J - 129,000	--	--	--	No
Cobalt	--	220	--	1/5	2.6[8]	2/18	3.2J - 4.6J	--	0	--	No
Copper	1,300	140	1,000	5/5	9.4 - 13.8	12/18	1.1J - 4J	0	0	0	No
Iron+	--	--	--	3/5	4.1 - 119[8]	15/18	2.4J - 347	--	--	--	No
Magnesium+	--	--	--	5/5	2,080 - 3,760	18/18	70.2J - 9,810	--	--	--	No
Manganese	--	18	--	5/5	1.8 - 155	15/18	1.1J - 54.4	--	3	--	Yes
Nickel	100	73	--	3/5	4.4 - 10.6	0/18	ND	0	0	--	No

TABLE 6-18 (Continued)

SSA 15
GROUNDWATER DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Groundwater Criteria[2]			Frequency/Range[3]		Background		Comparison to Criteria			COPC Selection
	Federal MCL (µg/L)	USEPA Region III Tapwater COC Value (µg/L)	Virginia PMCLs (µg/L)	No. of Positive Detects/No. of Samples	Concentration Range (µg/L)	No. of Positive Detections/ No. of Samples	Range of Positive Detections (µg/L)	No. of Detects Above MCL	No. of Detects Above COC Value	No. of Detects Above Virginia Criteria	Retained as a COPC?
Potassium+	--	--	--	5/5	2,180 - 6,950	18/18	430J - 17,900	--	--	--	No
Sodium+	--	--	--	5/5	11,100 - 15,500	18/18	3,690J - 27,800	--	--	--	No
Vanadium	--	26	--	2/5	1.6 - 2.6	10/18	1.8J - 10.2J	--	0	--	No

(1) All concentrations reported in µg/L
(2) Federal MCL - Federal Safe Drinking Water Act Maximum Contaminant Level (USEPA, 1995a; Drinking Water Regulations and Health Advisories)
Virginia Drinking Water Standards - PMCLs - Primary Maximum Contaminant Levels (Bureau of National Affairs - December, 1994)
COC values - USEPA Region III COC screening value (USEPA, 1994a)
(3) J = Analyte was positively identified, value is estimated
(4) Thallium carbonate was used as a surrogate for the COC value.
(5) Constituent was not included as a COPC since it was not detected in the dissolved sample. Total inorganic result assumed to be due to the presence of suspended solids.
(6) Chromium (VI) COC value was used for chromium.
(7) Concentration below 5 times the maximum detected blank concentration.
J = Analyte was positively identified, value is estimated.
K = Value estimated; biased high
L = Value estimated; biased low
(8) Concentrations fall within the range of station-wide background.

-- = No criteria published
+ = Essential Nutrient
NA = Not Analyzed
ND = Not Detected

Note: Background data obtained from the Final Summary of Background Constituent Concentrations and Characterization of the York River Drainage Basin (Baker, July 1995).

TABLE 6-19

SSA 15
SURFACE WATER DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Federal/State Criteria[2]				Frequency/Range[3]		COPC Selection
	AWQC Freshwater Acute (µg/L)	AWQC Freshwater Chronic (µg/L)	Virginia Freshwater Acute (µg/L)	Virginia Freshwater Chronic (µg/L)	No. of Positive Detects/No. of Samples	Concentration Range (µg/L)	Retained as a COPC?
Volatiles:							
1,1-Dichloroethene[4]	--	11,600**	--	--	1/3	1	Yes
1,1-Dichloroethane	--	--	--	--	1/3	0.5J	Yes
Trichloroethene	45,000**	21,900**	--	--	2/3	420 - 500	Yes
Vinyl chloride	--	--	--	--	1/3	2	Yes
cis 1,2-Dichloroethene	--	--	--	--	2/3	49 - 77	Yes
Inorganics (Total):							
Aluminum	750	87	--	--	3/3	50.5 - 80.4	No
Barium	--	--	--	--	3/3	35.2L - 43.2L	No
Cadmium	3.9*	1.1*	13.4	2.67	1/3	2.1K	No
Calcium+	--	--	--	--	3/3	102,000 - 114,000	No
Copper	18*	12*	49.6	30.05	1/3	4.1	No
Iron+	--	1000	--	--	3/3	331L - 889L	No
Lead	83*	3.2*	327.69	12.77	2/3	1.4 - 1.6	No
Magnesium+	--	--	--	--	3/3	2,620 - 3,220	No
Manganese	--	--	--	--	3/3	24 - 70.1	No
Potassium+	--	--	--	--	3/3	1,030 - 1,560	No
Sodium+	--	--	--	--	3/3	7,020 - 9,290	No

TABLE 6-19 (Continued)

SSA 15
SURFACE WATER DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Federal/State Criteria[2]				Frequency/Range[3]		COPC Selection
	AWQC Freshwater Acute (µg/L)	AWQC Freshwater Chronic (µg/L)	Virginia Freshwater Acute (µg/L)	Virginia Freshwater Chronic (µg/L)	No. of Positive Detects/No. of Samples	Concentration Range (µg/L)	Retained as a COPC?
Thallium	1,400**	40**	--	--	2/3	7K - 7.6K	No
Vanadium	--	--	--	--	1/3	1.8L	No
Zinc	120*	110*	295.1	267.29	3/3	2.5J - 7.6J	No

(1) All concentrations reported in µg/L
(2) Water Quality Criteria (WQC) human health values (recalculated) using IRIS as of 1990, and Virginia Water Standards (Bureau of National Affairs - December 1994)
(3) B = Detected in associated blank(s)
(4) Freshwater Acute Value for dichloroethylenes
J = Analyte was positively identified, value is estimated
K = Value is estimated; biased high
L = Value is estimated; biased low

-- = No criteria published
+ = Essential Nutrient
* = Hardness dependent criteria (100 mg/L $CaCO_3$ used)
** = Insufficient data to develop criteria. Value presented is the lowest observed effect level (LOEL).

TABLE 6-20

SSA 15
SEDIMENT DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Sediment Criteria[2]		Contaminant Frequency/Range[3]		Comparison to Criteria		COPC Selection
	SSV ER-M (mg/kg)	SSV ER-L (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above ER-M	Positive Detects Above ER-L	Retained as a COPC?
Volatiles:							
1,2-Dichloroethene (total)	--	--	1/5	0.002J	--	--	No
Benzene	--	--	1/5	0.002J	--	--	No
Toluene	--	--	1/5	0.005J	--	--	No
Trichloroethene	--	--	2/5	0.002J - 0.007J	--	--	Yes[6]
Xylene (total)	--	--	1/5	0.002J	--	--	No
Semivolatiles:							
bis(2-Ethylhexyl)Phthalate	--	5.3[5]	4/5	0.11J - 0.57	--	0	No
Fluoranthene	5.1	0.6	1/5	0.099J	0	0	No
Phenanthrene	1.5	0.24	2/5	0.047J - 0.062J	0	0	No
Pyrene	2.6	0.665	1/5	0.07J	0	0	No
Pesticides:							
4,4'-DDD	0.0461	0.00158	5/5	0.0082 - 0.049J	1	5	Yes
4,4'-DDE	0.027	0.0022	5/5	0.0041J - 0.031	1	5	Yes
4,4'-DDT	0.0461	0.00158	5/5	0.02 - 0.086	1	5	Yes
delta-BHC	--	--	4/5	0.00062J - 0.0015J	--	--	No
alpha-Chlordane	0.006[4]	0.0005[4]	4/5	0.0022J - 0.0045	0	4	Yes
gamma-Chlordane	0.006[4]	0.0005[4]	4/5	0.0022 - 0.0054	0	4	Yes
Inorganics:							
Aluminum	--	--	5/5	497 - 959	--	--	No
Arsenic	70	8.2	3/5	0.72 - 1.3	0	0	No
Barium	--	--	5/5	3 - 10.4	--	--	No
Beryllium	--	--	5/5	0.02 - 0.05	--	--	No

TABLE 6-20 (Continued)

SSA 15
SEDIMENT DATA AND COPC SELECTION SUMMARY
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant[1]	Sediment Criteria[2]		Contaminant Frequency/Range[3]		Comparison to Criteria		COPC Selection
	SSV ER-M (mg/kg)	SSV ER-L (mg/kg)	No. of Positive Detects/ No. of Samples	Range of Positive Detections (mg/kg)	Positive Detects Above ER-M	Positive Detects Above ER-L	Retained as a COPC?
Cadmium+	9.6	1.2	3/5	0.38 - 0.43	0	0	No
Calcium+	--	--	5/5	682J - 4350J	--	--	No
Chromium	370	81	5/5	1.6L - 3.1L	0	0	No
Cobalt	--	--	1/5	0.82	--	--	No
Copper	270	34	5/5	1.3 - 3.5	0	0	No
Iron+	--	--	5/5	1,050 - 2,390	--	--	No
Lead	218	46.7	5/5	4.5J - 11.5J	0	0	No
Magnesium+	--	--	5/5	44.7 - 343	--	--	No
Manganese	--	--	5/5	5.20 - 37.4	--	--	No
Mercury	0.71	0.15	3/5	0.23 - 0.44	0	3	Yes
Silver	3.7	1	1/5	0.87L	0	0	No
Sodium+	--	--	5/5	30 - 49	--	--	No
Vanadium	--	--	5/5	2.3 - 4.3	--	--	No
Zinc	410	150	5/5	9.5J - 19.1	0	0	No

(1) Organic concentrations converted to mg/kg, Inorganic concentrations reported in mg/kg.
(2) SSV = Sediment Screening Value (Long, et al, 1995)
(3) J = Analyte was positively identified. Reported value may not be accurate or precise.
L = Estimated value, biased low
(4) National Oceanic and Atmospheric Administration
(5) Region III BTAG Screening Levels range from 5.3 mg/kg (diethylphthalate) to 260 mg/kg (n-butylphthalate). The more conservative value for diethylphthalate was used.
(6) Reincluded as a COPC.

-- = No criteria published
+ = Essential Nutrients

TABLE 6-21

USEPA WEIGHT-OF-EVIDENCE CATEGORIES
FOR POTENTIAL CARCINOGENS
SSAs 1, 6, 7, AND 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

USEPA Category	Description of Group	Description of Evidence
Group A	Human Carcinogen	Sufficient evidence of carcinogenicity in humans from epidemiological studies to support a causal association between exposure and carcinogenicity.
Group B1	Probable Human Carcinogen	Limited evidence of carcinogenicity in humans from epidemiological studies.
Group B2	Probable Human Carcinogen	Sufficient evidence of carcinogenicity in animals, inadequate or lack of evidence of carcinogenicity in humans.
Group C	Possible Human Carcinogen	Limited evidence of carcinogenicity in animals, inadequate or lack of evidence of carcinogenicity in humans.
Group D	Not classified as to human carcinogenicity	Inadequate evidence of carcinogenicity in animals, inadequate or lack of evidence of carcinogenicity in humans.
Group E	No evidence of carcinogenicity in humans	No evidence for carcinogenicity in at least two adequate animal tests or in both epidemiological and animal studies

TABLE 6-22

SUMMARY OF RISK-BASED CONCENTRATION VALUES FOR CHEMICALS OF POTENTIAL CONCERN
HUMAN HEALTH RISK SCREENING
SSAs 1, 6, 7, AND 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Constituents	Risk-Based Concentration Values for Residential Soil (mg/kg)[1]	Risk-Based Concentration Values for Tap Water (µg/L)[1]	WOE	Target	Critical Effect
Volatiles:					
1,1-Dichloroethene	1.1(c)	0.044(c)	C	Liver	Lesions
1,1,1-Trichloroethane	7,000(n)	1,300(n)	D	Central Nervous System/Whole Body	Hyperactivity/decreased weight
cis-1,2-Dichloroethene	780(n)	61(n)	D	Blood	Decreased hematocrit and hemoglobin
Trichloroethene	58(c)	1.6(c)	B2	Liver	Hepatotoxicity
Semivolatiles:					
Benzo(a)anthracene	0.88(c)	0.092(c)	B2	Liver, kidney, eye, skin	Effects
Benzo(k)fluoranthene	8.8(c)	0.92(c)	B2	Liver, kidney, eye, skin	Effects
Benzo(a)pyrene	0.088(c)	0.092(c)	B2	Liver, kidney, eye, skin	Effects
Carbazole	32(c)	3.4(c)	B2	Liver	Tumors
Dibenzo(a,h)anthracene	0.088(c)	0.0092(c)	B2	Liver, kidney, eye, skin	Effects
Indeno(1,2,3-cd)pyrene	0.88(c)	0.092(c)	B2	Liver, kidney, eye, skin	Effects

TABLE 6-23

SUMMARY OF AWQCs AND ER-Ls FOR ECOLOGICAL CONTAMINANTS OF CONCERN
SSAs 1, 6, 7, AND 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Chemical	AWQCs Chronic (µg/L)	ER-L (mg/kg)
Volatiles:		
1,1-Dichloroethene	11,600	NA
Tetrachloroethene	840	NA
Trichloroethene	21,900	NA
Semivolatiles:		
Benzo(b)fluoranthene	NA	0.261[1]
Benzo(k)fluoranthene	NA	0.261[1]
Pesticides:		
4,4'-DDD	NA	0.00158
4,4'-DDE	NA	0.0022
4,4'-DDT	0.001	0.00158
alpha-Chlordane	0.0043	0.0005
gamma-chlordane	0.0043	0.0005
Inorganics:		
Arsenic	190	8.2
Cadmium	1.1	1.2
Chromium[2]	11	81
Copper	12[3]	34
Iron	1,000	NA
Lead	3.2[3]	46.7
Mercury	0.012	0.15
Nickel	160	20.9
Silver	0.12	1.0
Zinc	110[3]	150

(1) SSV was not published; therefore, the benzo(a)anthracene SSV, the most conservative PAH SSV, was used as a surrogate.
(2) Chromium was evaluated in the hexavalent state.
(3) Hardness dependent criteria (100 mg/L $CaCO_3$ used).
NA = Not Available

TABLE 6-23

SUMMARY OF AWQCs AND ER-Ls FOR ECOLOGICAL CONTAMINANTS OF CONCERN
SSAs 1, 6, 7, AND 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Chemical	AWQCs Chronic (µg/L)	ER-L (mg/kg)
Semivolatiles:		
Benzo(b)fluoranthene	NA	3.2
Benzo(k)fluoranthene	NA	0.261[1]
Pesticides:		
4,4'-DDD	NA	0.00158
4,4'-DDE	NA	0.0022
4,4'-DDT	0.001	0.00158
alpha-Chlordane	0.0043	0.0005
gamma-chlordane	0.0043	0.0005
Inorganics:		
Arsenic	190	8.2
Cadmium	1.1	1.2
Chromium[2]	11	81
Copper	12[3]	34
Iron	1,000	NA
Lead	3.2[3]	46.7
Mercury	0.012	0.15
Nickel	160	20.9
Zinc	110[3]	150

(1) SSV was not published; therefore, the benzo(a)anthracene SSV, the most conservative PAH SSV, was used as a surrogate.
(2) Chromium was evaluated in the hexavalent state.
(3) Hardness dependent criteria (100 mg/L $CaCO_3$ used).
NA = Not Available

TABLE 6-24

SUMMARY OF HUMAN HEALTH RISK SCREENING
SSAs 1, 6, 7, AND 15
NAVAL WEAPONS STATION, YORKTOWN
YORKTOWN, VIRGINIA

Site Screening Area	Medium	ILCR[1] Soils and Groundwater	HI[1] Soils and Groundwater
SSA 1 - Building 428 and the Teague Road Disposal Area	Surface Soils	1.1E-04	0.77
	Subsurface Soils	3.5E-05	0.72
	Groundwater	1.1E-05 (1.1E-05)	11 (1.6)
Total:		1.6E-04 (1.6E-04)	12.5 (3.1)
SSA 6 - Aviation Field and Environs	Surface Soils	0.000014	0.79
	Subsurface Soils-Soil Borings	2.5E-05	0.89
	Subsurface Soils-Test Pits	1.9E-04	13
	Groundwater	3.8E-03 (1.4E-05)	21 (1.8)
Total:		4.0E-03 (2.4E-04)	36 (16.5)
SSA 7 - Building 373 Rocket Plant/Group 18 Magazines/Main Road Disposal Area	Surface Soils	1.1E-05	1.1
	Subsurface Soils-Soil Borings	3.7E-05	1.2
	Subsurface Soils-Test Pits	3.2E-05	1.6
	Groundwater	2.4E-02 (3.0E-03)	120 (11)
Total:		2.4E-02 (3.1E-03)	124 (15)
SSA 15 - STP #1 Sludge Drying Beds and Discharge Area	Surface Soils	4.0E-05	0.95
	Subsurface Soils	4.6E-05	2.0
	Groundwater	2.0E-05 (2.0E-05)	2.0 (0.86)
Total:		1.1E-04 (1.1E-04)	5.0 (3.8)

Notes:

(1) Total ILCRs and HIs for the filtered groundwater scenario are indicated in parentheses. HI's or ICR's exceeding their respective target values have been shaded.

TABLE 6-25

SUMMARY OF ECOLOGICAL RISK SCREENING
SSAs 1, 6, 7, AND 15
NAVAL WEAPONS STATION, YORKTOWN
YORKTOWN, VIRGINIA

Site Screening Area	Total EI Surface Water	Total EI Sediment
SSA 1 - Building 428 and the Teague Road Disposal Area	110	3.0
SSA 6 - Aviation Field and Environs	NA	NA
SSA 7 - Building 373 Rocket Plant/Group 18 Magazines/Main Road Disposal Area	(1)	3.4
SSA 15 - STP #1 Sludge Drying Beds and Discharge Area	0.03	99

Notes:

(1) COPCs were not selected in surface water samples.
NA - Not applicable. Surface water and sediment samples were not collected at SSA 6.

TABLE 6-26

SUMMARY OF UNCERTAINTIES IN THE RESULTS OF THE HUMAN HEALTH RISK ASSESSMENT SSAs 1, 6, 7, AND 15 NAVAL WEAPONS STATION YORKTOWN YORKTOWN, VIRGINIA

Uncertainty	Potential Magnitude for Over-Estimation of Risks	Potential Magnitude for Under-Estimation of Risks	Potential Magnitude for Over or Under-Estimation of Risks
Hazard Assessment and Analytical Data			
Sufficient samples may not have been taken to characterize the media being evaluated.			Moderate
Systematic or random errors in the chemical analysis may yield erroneous data.			Low
The use of the maximum detected concentration in the estimation of the HIs, ILCRs and EIs for data sets ≤5.	Moderate		
Risk Screening Process			Low
The standard assumptions provided in the RBC table regarding body weight, exposure period, life expectancy, population characteristics, and lifestyle may not be representative of the actual exposure situations.			
Not evaluating the dermal contact pathway in the determination of the ILCRs, HIs, and EIs.		Low	
Assumption of additivity in the quantification of cancer risks without consideration of synergism, antagonism, promotion, and initiation.			Moderate
Assumption of additivity in the estimation of systemic health effects without consideration of synergism, antagonism, etc.	Moderate		
Potential for underestimating potential ecological affects to terrestrial receptors by evaluating aquatic receptors only.		Moderate/High	

Notes: Low - Assumptions categorized as "low" may effect risk estimates by less than one order of magnitude.

Moderate - Assumptions categorized as "moderate" may effect estimates of risk by between one and two orders of magnitude.

High - Assumptions categorized as "high" may effect estimates of risk by more than two orders of magnitude.

Source: Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A). (USEPA, 1989).

TABLE 6-27

SUMMARY OF UNCERTAINTIES IN THE RESULTS OF THE
HUMAN HEALTH RISK ASSESSMENT
SSAs 1, 6, 7, AND 15
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Uncertainty	Potential Magnitude for Over-Estimation of Risks	Potential Magnitude for Under-Estimation of Risks	Potential Magnitude for Over or Under-Estimation of Risks
Hazard Assessment and Analytical Data			
Sufficient samples may not have been taken to characterize the media being evaluated.			Moderate
Systematic or random errors in the chemical analysis may yield erroneous data.			Low
The use of the maximum detected concentration in the estimation of the HQs, ILCRs and EQs for data sets ≤10.	Moderate		
Exposure Assessment			
Use of one representative sample location for the groundwater and surface water exposure scenarios.			Low
The standard assumptions provided in the RBC table regarding body weight, exposure period, life expectancy, population characteristics, and lifestyle may not be representative of the actual exposure situations.			Low
Not evaluating the dermal contact pathway in the determination of the ILCRs, HIs, and EIs.		Low	
Toxicological Assessment			
Toxicological indices derived from high dose animal studies, extrapolated to low dose human exposure.	Moderate		
Risk Characterization			
Assumption of additivity in the quantification of cancer risks without consideration of synergism, antagonism, promotion, and initiation.			Moderate
Assumption of additivity in the estimation of systemic health effects without consideration of synergism, antagonism, etc.			Low

Notes: Low - Assumptions categorized as "low" may effect risk estimates by less than one order of magnitude.

Moderate - Assumptions categorized as "moderate" may effect estimates of risk by between one and two orders of magnitude.

High - Assumptions categorized as "high" may effect estimates of risk by more than two orders of magnitude.

Source: Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A). (USEPA, 1989).

7.0 RESULTS AND CONCLUSIONS

The purpose of the Site Screening Process is to determine whether conditions at an SSA warrant initiation of the RI/FS process. Site Screening Process investigations were undertaken at SSAs 1, 6, 7, and 15 in late 1994, in accordance with the Final Work Plan (Baker, 1994b). This section presents the results and conclusions of Site Screening Process on an SSA basis and a recommendation for additional RI/FS activities or no action. Additional RI/FS activities could include additional sampling, removal actions or focused remedial investigations such as conducted for presumptive remedies. A recommendation of additional RI/FS activities does not necessarily mean that the SSA must be classified as an IR program site. If funding is available, the additional activities could be carried out in the short-term, circumventing potential DoD funding limitations on new investigative work.

7.1 SSA 1 - Building 428 Teague Road Disposal Area

A total of 64 surface soil, 39 subsurface soil, 9 groundwater (total and dissolved), 9 sediment (from 4 locations) and 5 surface water samples were collected and analyzed for TCL organics, nitramines/nitroaromatics (explosives) and TAL inorganics.

From a human health perspective, surface soils produced an unacceptable ICLR value (1.1×10^{-4}). The ILCR value was caused by the presence of cPAH and arsenic. Arsenic concentrations detected at SSA 1 were similar to those presented in the station-wide background study and are, therefore, not likely the result of past SSA 1 activities.

EI values for ecological receptors potentially exposed to ECOCs detected in surface water and sediments of the unnamed stream. The unnamed stream is intermittent in nature and frequently goes dry, therefore, no comparison to background freshwater stream data was conducted. Exceedances of freshwater criteria were most significant at location A01SW04. Cadmium, copper, lead, mercury and zinc were detected at their highest concentrations at this location and contributed better than 60 percent of the EI value of 110. The presence of benzo(b)fluoranthene, 4,4'-DDT and mercury in SSA 1 sediments accounted for the EI value of 3.0.

SSA 1 is recommended for additional RI/FS efforts . As determined from the Site Screening Process, Figure 7-1 and Tables 7-1 through 7-4 present the areas of concern (AOC) and related sample concentrations. As depicted on Figure 7-1, AOC for surface soils are located at the western and eastern portion of the SSA. In addition, an ecological AOC was determined for the creek at the northeast portion of the SSA. A limited number of additional samples (focused on filling data gaps) should be obtained to define the extent of cPAH contamination in select surface subsurface soils throughout the SSA. Also, a habitat evaluation of the unnamed stream should be conducted to better define the nature of this surface water feature and identify potential exposure pathways and ecological receptors. As part of the habitat evaluation the groundwater/surface water interaction will be determined through the use of staff gauges and groundwater measurements.

Because inorganics and nitramines/nitroaromatics were detected in groundwater samples at concentrations which do not cause human health concerns, and the conservative nature of obtaining groundwater samples from temporary piezometers versus monitoring wells (i.e., higher turbidity), further groundwater investigation is not recommended as part of the additional RI/FS effort.

7.2 SSA 6 - Aviation Field and Environs

A total of 31 surface soil, 42 subsurface soil borings, 16 subsurface test pit and 10 groundwater (total and dissolved) samples were obtained from SSA 6. These samples were analyzed for TCL organics, nitramines/nitroaromatics and TAL inorganics.

PCB-1254 and PCB-1260 detected at test pit locations 2, 3, 4, and 5 account for approximately 90 percent of the ILCR value (1.9×10^{-4}) for subsurface soils. Arsenic accounts for approximately 9 percent of the remaining ICLR.

ICLR values were also elevated for unfiltered groundwater (3.8×10^{-3}) because of the presence of arsenic and beryllium. Arsenic was not detected in filtered groundwater which produced an ICR value of 1.4×10^{-5}. In addition, there are no surface water bodies at SSA 6 (the closest is the York River approximately 500 ft. north) that would be recharged by groundwater.

An AOC was determined through the site screening process as presented on Figure 7-2. Tables 7-2 through 7-6 present the media and contaminant concentrations within the AOC. This central portion

of the SSA encomposing the Helo Pad Landing area is to be subjected to additional RI/FS activities for subsurface soil and groundwater. Subsurface soil samples will be collected in the vicinity of test pits 2 and 3 (area south of helo pad) to characterize the nature and extent of subsurface PCB contamination. In addition, nitroaromatics detected in subsurface soils and groundwater warrant investigative sampling to the north of the Helo Pad area. The groundwater data obtained at SSA 6 may be helpful in evaluation of the groundwater characteristics at Sites 6 and 7 located south of the ssa.

Although organic and inorganic constituents were detected in soil and groundwater at the sludge disposal area and the current storage area, the concentrations were not excessive and did not produce an unacceptable risk to human health. Therefore, additional RI/FS efforts are not recommended for these areas.

7.3 SSA 7 - Building 373 Rocket Plant/Group 18 Magazines/Main Road Disposal Area

A total of 5 surface soil, 30 subsurface soil (18 from soil borings, 6 from hand augers and 6 from test pits) groundwater, 3 surface water and 9 sediment samples were collected at SSA 7.

Both filtered and unfiltered groundwater samples produced ILCR values exceeding USEPAs generally acceptable risk range (3×10^{-3} and 2.4×10^{-2}, respectively). The presence of 1,1-dichloroethene is responsible for an individual ILCR value of 2.5×10^{-3}. The presence of 1,1-dichlorothene and other chlorinated volatiles (trichloroethene, 1,1-dichloroethane and 1,1,1-trichloroethane is associated with the wastewater UST located just west of Building 373.

The area around the wastewater UST system was determined to be an AOC by the site screening process. Figure 7-3 graphically depicts the area and Tables 7-7 and 7-8 present the contaminant concentrations in subsurface soils and groundwater pertaining to this AOC.

Despite the proximity of the wastewater UST to Felgates Creek, organic constituents were not detected in surface water samples suggesting that organic contaminants are localized in the vicinity of the UST. Organic contaminants detected in Felgates Creek sediments do not appear to be related exclusively to SSA 7 activities (i.e., no volatile organics). EI values indicate that the potential ecological affect on receptors in the surface water and sediment of Felgates Creek are limited.

Additional RI/FS activities are proposed for subsurface soil and groundwater in the vicinity of the wastewater UST. Included in these activities is additional surface water and sediment samples within Felgates Creek adjacent to the area of the wastewater UST to access the ecological impact of past discharges.

The UST system is subject to a removal action in Fiscal Year 97. This removal action will be conducted in accordance with the Final RAC Design Package for the Removal Action at SSA 7. (Baker, 1995) As part of the removal action, confirmation samples will be collected from the bottoms and side walls of the excavation. A minimum of 5 grab samples will be collected at the bottom and sidewalls of the UST excavation and one grab sample for every 20 linear feet of pipe trench to the UST. The samples will be collected from 0 to 6 inches of depth from the bottom and sidewalls of the excavation. All sampling will be conducted according to USEPA Region III SOPs. A copy of the transmittal letter for the RAC Design package is presented in Appendix O.

7.4 SSA 15 Sewage Treatment Plan #1/Sludge Drying Beds and Discharge Area

A total of 6 surface soil, 14 subsurface, 4 groundwater (plus one duplicate), 3 surface water and 5 sediment samples were obtained from SSA 15.

Subsurface soils obtained from SSA 15 produce an HI value of 2.0 which suggests that systemic health effects could occur if subsurface soils are ingested by residents. Manganese (HQ - 1.1) and Arsenic (HQ = 0.65) are responsible for the HI value. Concentrations of arsenic and manganese and arsenic are similar to station-wide background and are likely not related to SSA 15 activities.

EI values for SSA 15 sediments and surface waters are 99.0 and 0.3, respectively. The sediment EI value occurs because of the presence of DDT series pesticides and chlordane. The past legal application of these compounds for insect control at WPNSTA Yorktown was common. The occurrence of these pesticides are, therefore, not specific to activities at SSA 15. Furthermore, pesticides such as DDT and chlordane are relatively immobile and are not likely to affect Ballard Creek which ultimately receives runoff from SSA 15 surface water features. Flow in these tributaries is intermittent and relatively slow when water is present. Although the surface water EI value does not exceed 1.0, the most significant contamination was observed in a surface water sample (A15SW02) obtained approximately 100 feet south of SSA 15. The sample contained

relatively high concentrations of trichloroethene (500 μg/L) and other chlorinated volatiles including vinyl chloride (2 μg/L) and c-1,2-dichloroethene (77 μg/L).

Environmental media (i.e., groundwater, surface soils) investigated at SSA 15 do not appear to be responsible for these elevated concentrations of contaminants in surface water, suggesting that another source of contamination may be present in the area such as the industrial area located approximately 1,000 feet to the west of SSA 15.

Because SSA 15 does not appear to be the source of contamination to adjacent surface waters and sediments, RI/FS activities are not recommended. Additional sampling at SSA 15 will be conducted in association with continued investigative activities at Site 12, located to the north of the ssa. As part of this investigation groundwater will be further assessed and surface water samples will be collected in the intermittent streams to the west and south of the ssa. This additional data will assist in decision making at Site 12 and evaluate the potential for other sources of contamination in the area.

7.5 References

Baker Environmental, Inc. 1994b. Final Work Plan for Site Screening Areas 1, 6, 7, and 15, Naval Weapons Station Yorktown, Yorktown, Virginia. November, 1994.

Baker Environmental, Inc. 1995. Final RAC Design Package for Removal Action at Site Screening Areas 3 and 7. June, 1995.

7.0 SUMMARY AND CONCLUSIONS

7.1 Investigation Results

The results of the investigation indicate the following:

- Inorganics and pesticides were detected in the majority of the samples from all media. With the exception of cadmium in SSA 6 subsurface soils obtained from test pits, neither are attributable to site operations at the SSAs. In general, the presence of inorganics is due to their natural occurrence in the various media. The presence of low concentrations of pesticides are attributable to the historical Station-wide spraying of pesticides.

- Soil, groundwater, and surface water at SSA 1 have been impacted by site operations. Nitramine compounds were detected in samples collected from these media. This is likely attributable to the TNT contaminated soil area that was located in the eastern part of the SSA. This TNT contaminated soil has been removed as part of the removal action at SSA 1.

- Surface soil, subsurface soil, and groundwater have been impacted by site operations at SSA 6. Trace levels of VOCs were detected in samples collected from these media. PCBs and cadmium were detected in elevated concentrations in subsurface soil obtained from test pits 2 and 3.

- Subsurface soil and groundwater have been impacted by the wastewater UST at SSA 7. VOCs, SVOCs, and nitramine compounds were detected in samples collected from these media in the vicinity of the UST.

- Groundwater, surface water, and sediment have been impacted by site operations at SSA 15. Low levels of VOCs were detected in groundwater samples. These compounds (and their degradation products) also were detected in the surface water and sediment samples. VOC contaminated groundwater appears to be discharging to the surface water/sediment.

7.2 Results and Conclusions from the Risk Screening Process

7.2.1 SSA 1 - Building 428 and the Teaque Road Disposal Area

Total ICRs exceeded USEPA's target risk range for both the unfiltered and filtered groundwater scenarios. The medium associated with most risk was surface soils due to the presence of benzo(a)pyrene, dibenz(a,h) anthracene and arsenic.

Total HIs exceeded unity for both the unfiltered and filtered groundwater scenarios. For the unfiltered groundwater scenario the medium contributing most predominantly to the HI was groundwater due to the presence of manganese and aluminum. The concentration of manganese in the SSA 1 groundwater was less than that detected in background groundwater which indicates that the presence of manganese may not be site-related.

For the filtered groundwater scenario the media of concern were surface and subsurface soil. The constituents contributing most predominantly to surface soil risk were arsenic and manganese. The concentration of manganese in background exceeded that in SSA 1 surface soil; therefore, the presence of manganese may not be site-related. The constituents contributing most predominantly to subsurface soil risk were benzo(a)pyrene, arsenic and manganese. The concentrations of arsenic and manganese were less than their respective background concentrations, indicating that the presence of these constituents may not be site-related.

The EI for surface water at SSA 1 exceeded unity with iron, lead and mercury being the constituents associated with most risk.

The EI for sediments at SSA 1 exceeded unity due to the presence of benzo(b)fluoranthene, 4,4'-DDT and mercury.

Additional soil sampling may be required to characterize the nature and extent of PAH contaminants in surface soil. A RI/FS is not recommended at this time.

7.2.2 SSA 6 - Former Aviation Field and Environs

Total ICRs exceeded USEPA's target concern risk range for both the unfiltered and filtered groundwater scenarios. For the unfiltered groundwater scenario, the medium associated with most risk was groundwater due to the presence of arsenic. For the filtered groundwater scenario the medium of concern was subsurface soil from the test pits due to the presence of Aroclor-1260 and arsenic.

Total HIs exceeded unity for both the unfiltered and filtered groundwater scenarios. The media associated with most risk were groundwater and subsurface soil from the test pits. For the unfiltered groundwater scenario the constituent associated with most risk was arsenic. For the filtered groundwater scenario, the subsurface soil from the test pits was the medium associated with most risk due to the presence of Aroclor-1254 and cadmium.

Additional soil sampling in the vicinity of Test Pits 2 and 3 may be required to characterize the nature and extent of PCB and cadmium contamination in the subsurface soil. A RI/FS is not recommended at this time.

7.2.3 SSA 7 - 373 Rocket Plant/Group 18 Magazines/Main Road Disposal Area

Total ICRs exceeded USEPA's target risk range for both the unfiltered and filtered groundwater scenarios. The medium associated with most risk was groundwater. For the unfiltered and filtered groundwater scenarios arsenic and 1,1-dichloroethene, respectively, were the constituents associated with most risk.

Total HI values exceeded unity for both the unfiltered and filtered groundwater scenarios. The medium contributing most predominantly to risk was groundwater. However, HIs for surface and subsurface soil also exceed unity. Arsenic was the constituent associated with most risk for the unfiltered groundwater scenario; whereas, antimony and thallium were associated with most risk for the filtered groundwater scenario. The constituent contributing most predominantly to surface soil risk was manganese. Arsenic and manganese contributed most predominantly to subsurface soil risk. For the test pits manganese was the major contributor to risk. Arsenic and manganese were

detected in concentrations lower than background. Therefore, the presence of these constituents may not be site-related.

The EI for sediments at SSA 7 exceeded unity due to the presence of 4,4'-DDT and 4,4'-DDD.

A removal action for the underground storage tank is recommended for SSA 7. As part of the removal action, an additional three soil borings should be installed in the vicinity of boring SB02 to determine the presence and extent of Aroclor 1260 in surface and subsurface soil. Draft Engineering Evaluation/Cost Analysis (EE/CA) and the 90% Removal Action Design for SSA 7 are due to Atlantic Division, Naval Facilities Engineering Command (LANTDIV), USEPA and the Commonwealth of Virginia by March 17, and March 28, 1995, respectively.

7.2.4 SSA 15 - Sewage Treatment Plant #1/Sludge Drying Beds and Discharge Area

Total ICRs exceeded USEPA's target cancer risk range for both the unfiltered and filtered groundwater scenarios. The ICRs for surface soil, subsurface soil, and groundwater did not individually exceed USEPA's target cancer risk range, but, when added together they exceeded the target risk range. Surface and subsurface soils accounted for eighty-five percent of the risk with arsenic being the constituent associated with most risk.

The HIs exceeded unity for both the unfiltered and filtered groundwater scenarios. Surface and subsurface soils were the media associated with most risk. Manganese and arsenic detected in surface and subsurface soil contributed to HI values of 1.4 and 2.0, respectively. Background concentrations of manganese and arsenic in the surface and subsurface soils were higher than those detected at SSA 15. Therefore, the presence of manganese and arsenic may not be site-related.

The EI for sediments at SSA 15 exceeded unity with 4,4'-DDT and 4,4'-DDD being the constituents associated with most risk.

Because a plume of 1,1-dichloroethene or trichloroethene is not evident in SSA 15 groundwater; arsenic is detected sporadically in surface soil samples above Station background, and ecological concerns stem from the presence of relatively low levels of DDT series pesticides and chlordane in sediment, further action is not recommended for SSA 15.

SECTION 7.0 TABLES

TABLE 7-1
POSITIVE DETECTION SUMMARY OF ORGANIC
CHEMICALS OF CONCERN IN SURFACE SOIL
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	Residential (1)	A01SS08-00	A01SS09-00	A01SS10-00	A01SS12-00	A01SS13-00	A01SS14-00	A01SS15-00
Sample Date	Soils [ug/kg]	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94	11/02/94	11/03/94
SEMIVOLATILES (ug/kg)								
Benzo(a)anthracene	880	7400 J	7000	890	1200 J	6100	2000	17000
Benzo(b)fluoranthene	880	14000	23000	1600 J	4100 UJ	16000 J	8000 J	35000
Benzo(k)fluoranthene	8800	11000	16000	1400 J	4100 UJ	14000 J	6000 J	3200
Benzo(a)pyrene	88	5100 J	12000	1000 J	4100 UJ	8700 J	3000 J	20000
Indeno(1,2,3-cd)pyrene	880	1300 J	3000 J	280 J	4100 UJ	3200 J	1700 UJ	5300 J
Dibenzo(a,h)anthracene	88	8100 U	1300 J	120 J	4100 UJ	670 J	1700 UJ	2600 J
Benzo(g,h,i)perylene	**310000**	8100 U	3100 J	330 J	4100 UJ	3300 J	1700 UJ	4300 J
NITRAMINES (ug/kg)								
1,3,5-Trinitrobenzene	**390**	280 U	280 U	210 U	270 U	280 U	260 U	230 U

Notes:

(1) EPA Region III COC Screening Values: R.L. Smith (10/20/95).

14000 = Indicates concentration exceeds criteria.

TABLE 7-1
POSITIVE DETECTION SUMMARY OF ORGANIC
CHEMICALS OF CONCERN IN SOIL
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A001SS16-00	A01SS17-00	A01SS18-00	A01SS19-00	A01SS21-00	A01SS23-00	A01SS24-00	A01SS25-00
Sample Date	11/03/94	11/03/94	11/03/94	11/04/93	11/02/94	11/02/94	11/02/94	11/02/94
SEMIVOLATILES (ug/kg)								
Benzo(a)anthracene	1200	6200	450 J	620	180 J	860	370	27000 D
Benzo(b)fluoranthene	1600	14000	1400 J	360 U	490 J	3000 J	1100 J	49000 DJ
Benzo(k)fluoranthene	1900 J	7600 J	820 J	1400	500 J	2500 J	880 J	39000 DJ
Benzo(a)pyrene	1100	7500	550 J	1000	240 J	1200 J	550 J	26000 DJ
Indeno(1,2,3-cd)pyrene	390	2400 J	170 J	330 J	370 UJ	320 J	150 J	110000 J
Dibenzo(a,h)anthracene	190 J	920 J	480 UJ	140 J	370 UJ	140 J	350 UJ	53000 J
Benzo(g,h,i)perylene	320 J	1400 J	170 J	360	370 UJ	340 J	160 J	100000 J
NITRAMINES (ug/kg)								
1,3,5-Trinitrobenzene	220 U	240 U	280 J	230 U	250 U	220 U	250 U	330 U

Notes:

(1) EPA Region III COC Screening Values: R.L. Smith (10/20/95).

14000 = Indicates concentration exceeds criteria.

TABLE 7-1
POSITIVE DETECTION SUMMARY OF ORGANIC
CHEMICALS OF CONCERN IN SOIL
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS30 -00	A01SS32-00	A01SS33-00	A01SS37-00	A01SS38-00	A01SS42-00	A01SS47-00
Sample Date	11/02/94	11/02/94	11/03/94	11/03/94	11/03/94	11/04/93	11/04/93
SEMIVOLATILES (ug/kg)							
Benzo(a)anthracene	270 J	16000	310 J	410	1400	400 J	3900
Benzo(b)fluoranthene	600 J	31000 J	760	910 J	4700 J	1100 J	19000 J
Benzo(k)fluoranthene	380 UJ	31000 J	440 J	370 UJ	2200 J	550 UJ	11000 J
Benzo(a)pyrene	320 J	20000 J	270 J	380 J	1900 J	390 J	8100 J
Indeno(1,2,3-cd)pyrene	380 UJ	6000 J	91 J	110 J	380 J	550 UJ	1800 J
Dibenzo(a,h)anthracene	380 UJ	3000 J	340 U	370 UJ	180 J	550 UJ	830 J
Benzo(g,h,i)perylene	380 UJ	53000 J	80 J	100 J	390 J	550 UJ	2200 J
NITRAMINES (ug/kg)							
1,3,5-Trinitrobenzene	230 U	260 U	240 U	250 U	1100	380 U	220 U

Notes:

(1) EPA Region III COC Screening Values: R.L. Smith (10/20/95).

14000 = Indicates concentration exceeds criteria.

TABLE 7-1
POSITIVE DETECTION SUMMARY OF ORGANIC
CHEMICALS OF CONCERN IN SOIL
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SS77-00	A01SS78-00
Sample Date	11/04/93	11/04/93
SEMIVOLATILES (ug/kg)		
Benzo(a)anthracene	460	1100
Benzo(b)fluoranthene	2300	4900
Benzo(k)fluoranthene	1400	2800
Benzo(a)pyrene	900	1900
Indeno(1,2,3-cd)pyrene	270 J	410 J
Dibenzo(a,h)anthracene	110 J	180 J
Benzo(g,h,i)perylene	300 J	460 J
NITRAMINES (ug/kg)		
1,3,5-Trinitrobenzene	290 U	100 J

Notes:

(1) EPA Region III COC Screening Values: R.L. Smith (10/20/95).
14000 = Indicates concentration exceeds criteria.

TABLE 7-2
POSITIVE DETECTION SUMMARY OF ORGANIC CHEMICALS OF CONCERN IN SUBSURFACE SOIL
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	Residential (1)	A01SB02-01	A01SB03-01	A01SB03-01D	A01SB03-02	A01SB16-01
Sampling Date	Soils	11/29/94	11/19/94	11/19/94	11/19/94	11/10/94
Depth	[ug/kg]	1-3'	1-3'	1-3'	3-5'	1-1.5
pH		7.79	7.18	7.06	8.20	NA
SEMIVOLATILES (ug/kg)						
Benzo(a)anthracene	880	610	1300	2000	240 J	480
Benzo(b)fluoranthene	880	640	3800	5100	620	1400
Benzo(k)fluoranthene	8800	440	1700	1200	440	1100
Benzo(a)Pyrene	88	600	2200	2500	300 J	520
Indeno(1,2,3-cd)pyrene	880	180 J	610	600	270 J	190 J
Dibenzo(a,h)anthracene	88	62 J	270 J	280 J	91 J	410 U

Notes:

(1) EPA Region III COC Screening Values: R.L. Smith (10/20/95).

600 = Indicates concentration exceeds criteria.

TABLE 7-2
POSITIVE DETECTION SUMMARY OF ORGANIC
CHEMICALS OF CONCERN IN SUBSURFACE SOIL
SSA-1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	A01SB17-01	A01SB18-01	A01SB33-01	A01SB96-01
Sampling Date	11/10/94	12/06/94	11/10/94	11/11/94
Depth	1-1.5	1-1.5	1.5-2	1.5-2
pH	NA	NA	NA	NA
SEMIVOLATILES (ug/kg)				
Benzo(a)anthracene	2700	730	540	230 J
Benzo(b)fluoranthene	430 U	1500	1500	450
Benzo(k)fluoranthene	12000	1100	1100	300 J
Benzo(a)Pyrene	3700	1100	590	200 J
Indeno(1,2,3-cd)pyrene	890	350 J	180 J	110 J
Dibenzo(a,h)anthracene	430 U	400 U	360 U	430 U

Notes:

(1) EPA Region III COC Screening Values: R.L. Smith (10/20/95).

600 = Indicates concentration exceeds criteria.

TABLE 7-3
POSITIVE DETECTION SUMMARY OF ORGANIC AND INORGANIC CHEMICALS OF CONCERN IN SEDIMENT
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:		A01SD01-01	A01SD02-01	A01SD02-02	A01SD03-01	A01SD03-01D
Date Sampled:		12/04/94	12/04/94	12/04/94	12/03/94	12/03/94
Depth:	SSV (1)	0-4"	0-4"	4-8"	0-4"	0-4"
pH:	ER-L (2)	7.96	7.44	7.51	7.7	7.6
Units:	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
PEST/PCB's (ug/kg)						
DELTA-BHC	---	2.2 U	1 J	2.1 J	2.5 U	2.4 U
GAMMA-BHC (LINDANE)	---	2.2 U	0.61 J	2.4 U	2.5 U	2.4 U
ENDOSULFAN SULFATE	---	4.3 U	1.6 J	4.6 U	4.8 U	1.3 J
4,4'-DDT	1.58	1.6 J	5.6 U	4.6 U	4.8 U	1.7 J
METHOXYCHLOR	---	22 U	6 J	24 U	5.3 J	3.1 J

Location		A01SD04-02
Sampling Date		12/03/94
Depth	SSV	4-8"
pH	ER-L	7.24
Units	(mg/kg)	(mg/kg)
ANALYTES		
Mercury	0.15	0.3

Notes:
--- = No Criteria Published

(1) SSV = Sediment screening value (Long et al, 1995), Region III BTAG Screening Levels.
(2) ER-L = Effects Range-Low
1.6 = Indicates concentration exceeds criteria.

TABLE 7-3
POSITIVE DETECTION SUMMARY OF ORGANIC AND INORGANIC CHEMICALS OF CONCERN IN SEDIMENT
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Sample ID:	A01SD03-02	A01SD04-01
Date Sampled:	12/03/94	12/03/94
Depth:	4-8"	0-4"
pH:	7.61	7.51
Units:	(ug/kg)	(ug/kg)
PEST/PCB's (ug/kg)		
DELTA-BHC	2.3 U	2.4 U
GAMMA-BHC (LINDANE)	2.3 U	2.4 U
ENDOSULFAN SULFATE	4.5 U	4.6 U
4,4'-DDT	4.5 U	4.6 U
METHOXYCHLOR	1.5 J	2.7 J

Location
Sampling Date
Depth
pH
Units

ANALYTES
Mercury

Notes:
—— = No Criteria Published

(1) SSV = Sediment screening value (Long et al, 1995), Region III BTAG Screening Levels.
(2) ER-L = Effects Range-Low
1.6 = Indicates concentration exceeds criteria.

TABLE 7-4
POSITIVE DETECTION SUMMARY OF INORGANIC CHEMICALS OF CONCERN IN SURFACE WATER
SSA 1
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	AWQC (1)	A01SW01-01	A01SW02-01	A01SW02-01D	A01SW03-01	A01SW04-01
Sampling Date	Fresh Water	12/03/94	12/03/94	12/03/94	12/03/94	12/03/94
pH	Chronic	4.39	4.28	4.28	7.20	6.57
Units	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
ANALYTES						
Cadmium	1.1	1.5 U	1.5 U	1.5 U	1.5 U	2.4
Chromium	11	2.5 L	25.6 L	19.4 L	3.1 L	19 L
Copper	12	2.2	14.7	12.3	15.8	57.6
Lead	3.2	4.5 K	34.9	25.9	26.9	112
Mercury	0.012	0.2 U	0.3	0.21	0.2 U	0.31
Zinc	110	10.3 J	103 J	83.8 J	70.6 J	551 J

Notes:

(1) Water Quality Criteria (WQC) freshwater chronic and Virginia water standards freshwater chronic (Bureau of National Affairs-1993).

4.5 = Indicates concentration exceeds criteria.

TABLE 7-5
POSITIVE DETECTION SUMMARY OF ORGANIC
CHEMICALS OF CONCERN IN SUBSURFACE SOILS (TEST PITS)
SSA-6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	Residential (1)	A06TP02-01	A06TP02-02	A06TP03-01	A06TP03-02	A06TP05-02
Sampling Date	Soils	11/16/94	11/16/94	11/17/94	11/17/94	11/15/94
Depth	[ug/kg]	1-9'	9-10'	0-4'	4-4.5'	2-3'
pH		6.65	7.89	6.61	6.7	5.52
PESTICIDE/PCBS (ug/kg)						
Dieldrin	40	7.3 J	90 J	3.9 U	170 U	3.7 U
alpha-Chlordane	490	4.5 U	4.5 U	9.8 J	1200 J	1.9 U
Aroclor-1254	**160**	770 J	12000 J	590	79000	37 U
Aroclor-1260	83	340	4900	190 J	1700 U	37 U
NITRAMINES (ug/kg)						
1,3,5-Trinitrobenzene	**390**	250 U	250 U	250 U	450 UJ	450 J

Notes:

(1) EPA Region III COC Screening Values: R.L. Smith (10/20/95).

340 = Indicates concentration exceeds criteria.

TABLE 7-6
POSITIVE DETECTION SUMMARY OF ORGANIC CHEMICALS OF CONCERN IN GROUNDWATER
SSA 6
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	Tap Water (1)	MCL (1)	VA MCL (1)	A06HP03-01	A06HP03-01D	A06HP04-01	A06HP05-01
Sampling Date		Groundwater	Groundwater	11/15/94	11/15/94	11/05/94	11/08/94
pH	[ug/L]	[ug/L]	[ug/L]	7.80	7.77	7.56	7.66
VOLATILES (ug/L)							
CIS 1,2-Dichloroethene	5.5	70	NA	3	10	1 U	1 U
NITRAMINES (ug/L)							
Nitrobenzene	0.34	NA	NA	0.73 U	0.73 U	3.2	0.73 U

Notes:
(1) Federal MCL - Federal Safe Drinking Water Act maximum contaminant level (USEPA, 1994; Drinking Water Regulations and Health Advisories).
Virginia Drinking Water Standards - PMCLS - primary maximum contaminant levels (Bureau of National Affairs - December, 1994).
USEPA Region III Tapwater COC value (USEPA, 1993).

4.5 = Indicates concentration exceeds criteria.

TABLE 7-7
POSITIVE DETECTION SUMMARY OF ORGANIC CHEMICALS OF CONCERN IN SUBSURFACE SOIL
SSA-7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	Residential (1)	A07SB02-01	A07SB02-06	A07SB06-05	A07HA04-03	A07HA05-03
Sampling date	Soils			11/30/94	11/28/94	11/28/94
Depth	[ug/kg]	1-3'	11-13'	9-11'	5-7'	5-7'
pH		7.04	7.33	6.58	5.94	5.87
PESTICIDE/PCBS (ug/kg)						
Aroclor-1260	83	210	5700 K	41 U	41 U	41 U
NITRAMINES (ug/kg)						
HMX	NA	500 U	500 U	520	650	3000
RDX	390	500 U	500 U	500 U	500 U	580

Notes:

(1) EPA Region III COC Screening Value : R.L. Smith (10/20/95).
210 = Indicates concentration exceeds criteria.

TABLE 7-8
POSITIVE DETECTION SUMMARY OF ORGANIC AND INORGANIC CHEMICALS OF CONCERN IN GROUNDWATER
SSA-7
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Location	Tap Water (1)	MCL (1)	VA MCL (1)	A07HP02-01	A07HP05-01	A07HP05-01D	A07HP06-01
Sampling date		Groundwater	Groundwater	11/18/94	12/01/94	12/01/94	11/30/94
pH	[ug/L]	[ug/L]	[ug/L]	7.27	6.68	6.68	N/A
VOLATILES (ug/L)							
1,1-Dichloroethene	0.044	7	7	110	82	100	32 J
1,1,1-Trichloroethane	**130**	200	200	450	630	700	520
NITRAMINES (ug/L)							
RDX	0.61	NA	NA	0.59 U	48	46	25
ANALYTES (ug/L)							
Aluminum	**3700**	NA	NA	206000	69600	101000	17000
Antimony	**1.5**	6	NA	53.4 L	32.2 L	29.1 L	21.8 L
Arsenic	0.0445	50	50	825	405	440	106
Barium	**260**	2000	1000	734	326 L	360 L	87.5 L
Copper	**150**	1300	NA	182	88.4	93.8	26.8
Manganese	**510**	NA	NA	2490	1390	1520	240
Nickel	**73**	100	NA	391	191 L	196 L	53.8 L
Thallium	0.29	2	NA	15.5	12.1 K	10.2 K	6.3 K
Vanadium	**26**	NA	NA	1100 L	537 L	612 L	141 L
Zinc	**1100**	NA	NA	1130	519 J	567 J	129 J

Notes:
(1) Federal MCL - Federal Safe Drinking Water Act maximum contaminant level (USEPA, 1994; Drinking Water Regulations and Health Advisories).
Virginia Drinking Water Standards - PMCLS - primary maximum contaminant levels (Bureau of National Affairs - December, 1994).
USEPA Region III Tapwater COC value (USEPA, 1993).

825 = Indicates concentration exceeds criteria.

SECTION 7.0 FIGURES