

REVISED FINAL
INSTALLATION RESTORATION PROGRAM
PHOTOGRAPH ALBUM
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA
CONTRACT TASK ORDER 0385
MARCH 16, 1999

Prepared for:

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Prepared by:

BAKER ENVIRONMENTAL, INC.
Coraopolis, Pennsylvania

NAVAL WEAPONS STATION YORKTOWN INSTALLATION RESTORATION PROGRAM SITE AND SITE SCREENING AREA PHOTOGRAPH ALBUM

This album, developed and maintained by the Naval Weapons Station Yorktown (WPNSTA Yorktown), in Yorktown, Virginia presents a photographic perspective for Installation Restoration Program (IRP) sites and site screening areas (SSAs) at the Station. Sites and SSAs are currently under investigation to determine potential threat to human health and the environment and if necessary, environmental cleanup alternatives. Figures 1, 2, and 3 present the locations of the areas of investigation (Sites and SSAs).

INSTALLATION RESTORATION PROGRAM HISTORY

Activities at WPNSTA Yorktown have generated a variety of wastes including: solvents, nitramines/nitroaromatics (explosives), packaging, oils, scrap metal, lumber and missile hardware. WPNSTA Yorktown followed conventional, accepted disposal practices (land filling) from 1918 until the late 1970s. Many landfills were undeveloped natural depressions filled with debris, then covered and seeded with grasses.

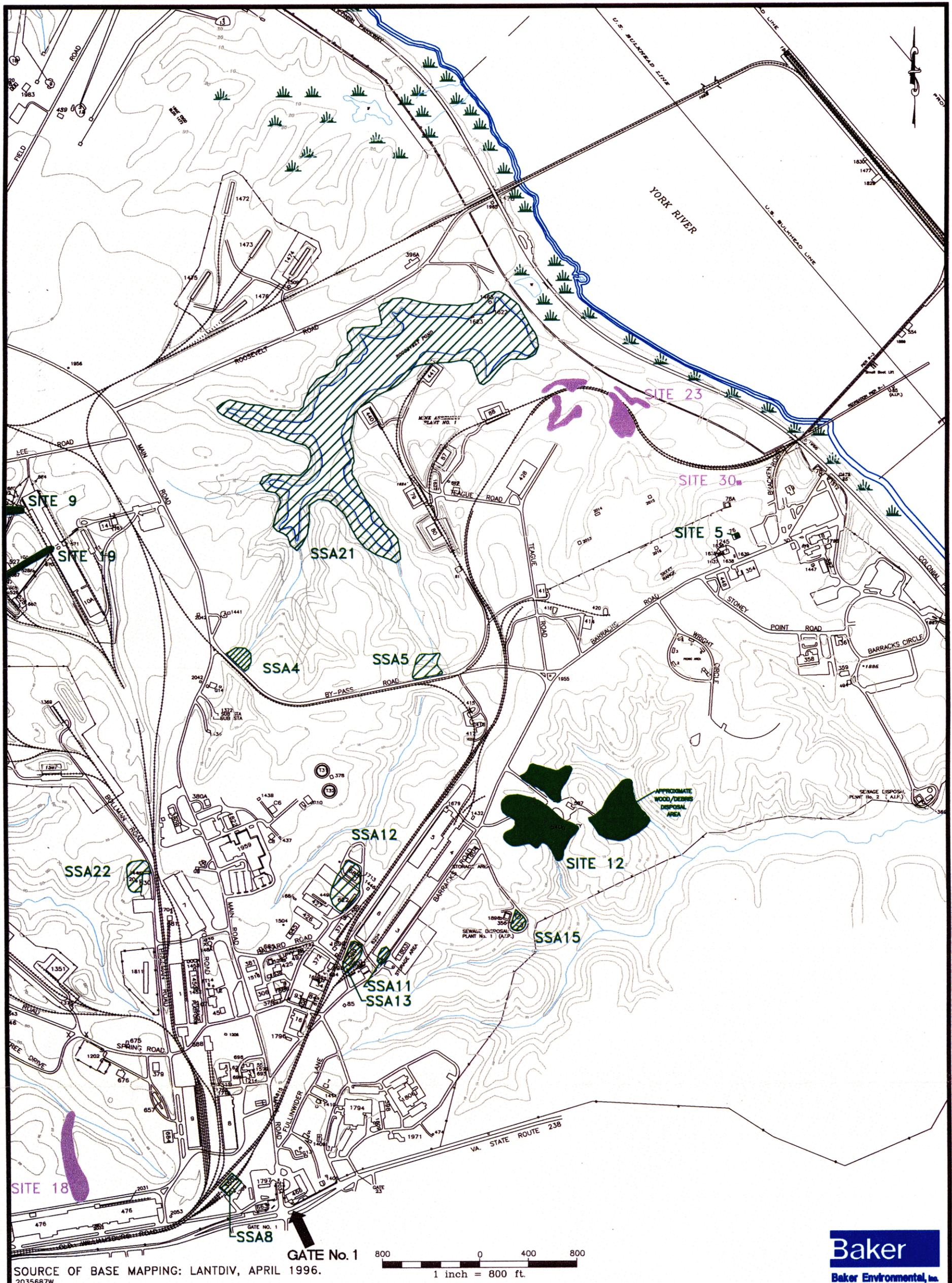
In 1975, the Department of Defense (DoD) began a program to assess past hazardous and toxic materials storage and disposal activities. The goal of this program, the DoD's IRP, was and is to address uncontrolled hazardous waste sites by mitigating hazards to health and welfare.

In 1981, the DoD's IRP was re-issued, with additional responsibilities and authorities delegated to the Secretary of Defense. As a result, the Navy initiated the Navy Assessment and Control of Installation Pollutants (NACIP) Program to comply with DoD's new IRP requirements. The NACIP Program utilized a three-phased approach, including an Initial Assessment Study (IAS), Confirmation and Characterization Studies, and Remedial Measures.

To comply with Federal laws, the Navy restructured the IRP. The current IRP is consistent with applicable Commonwealth and Federal environmental laws.

LIST OF ACRONYMS

AST	Aboveground Storage Tank
DoD	Department of Defense
EOD	Explosives Ordnance Disposal
FFA	Federal Facilities Agreements
FS	Feasibility Study
HRSD	Hampton Roads Sanitation District
IAS	Initial Assessment Study
IRP	Installation Restoration Program
NACIP	Navy Assessment and Control of Installation Pollutants
NEDED	Naval Explosives Development Engineering Department
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
PA/SI	Preliminary Assessment/Site Inspection
PAH	Polynuclear Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
PRAP	Proposed Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
SI	Site Inspection
SSA	Site Screening Area
SSP	Site Screening Process
TRC	Technical Review Committee
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
WPNSTA Yorktown	Naval Weapons Station Yorktown



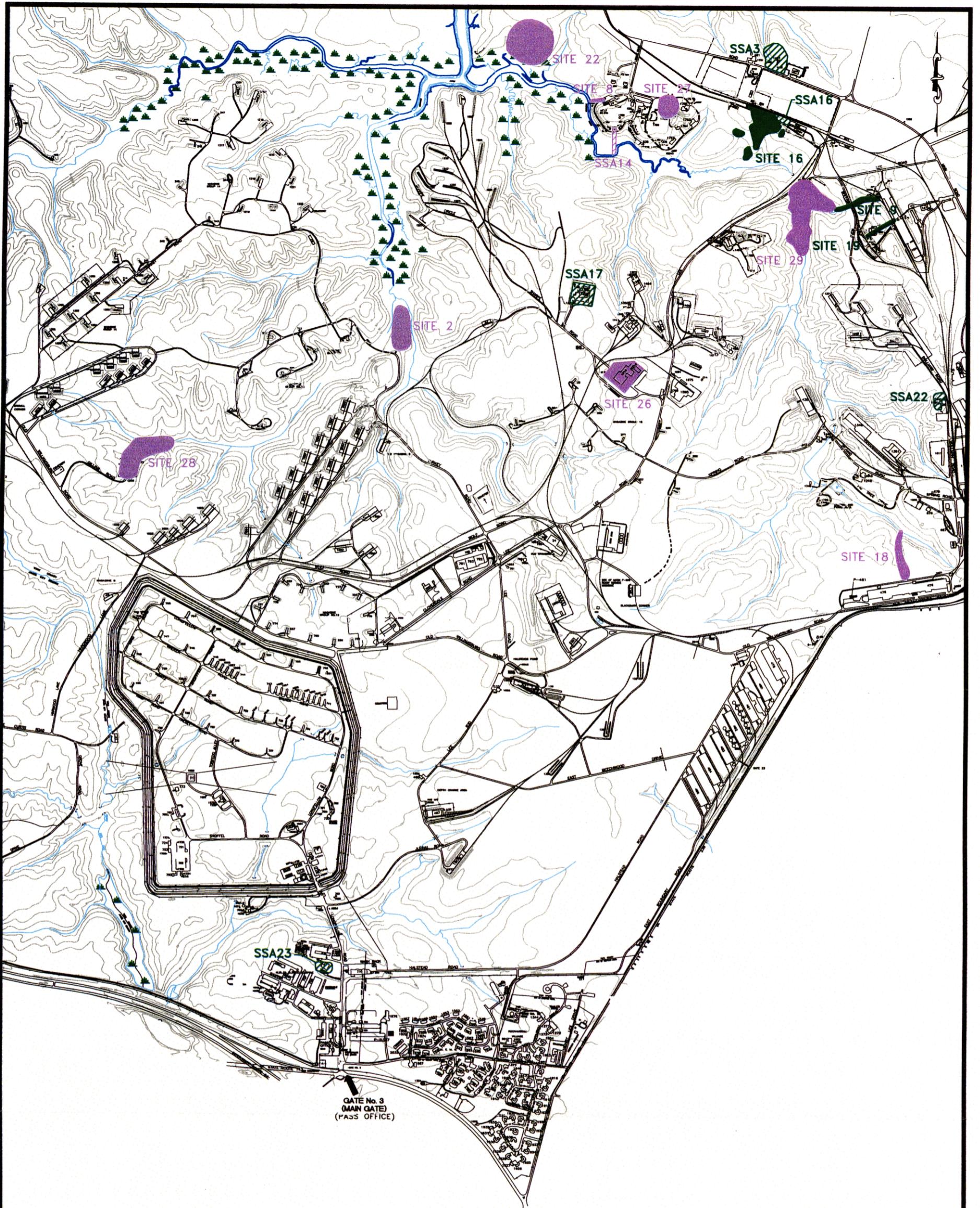
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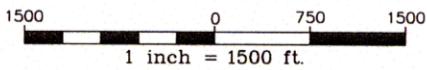
LEGEND

- SSA IN PROGRESS
- SITE IN PROGRESS
- SSA COMPLETE
- SITE COMPLETE

FIGURE 1
LOCATION OF SITES AND SSAS
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



SOURCE OF BASE MAPPING: LANTDIV, APRIL 1996.



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Baker
Baker Environmental, Inc.

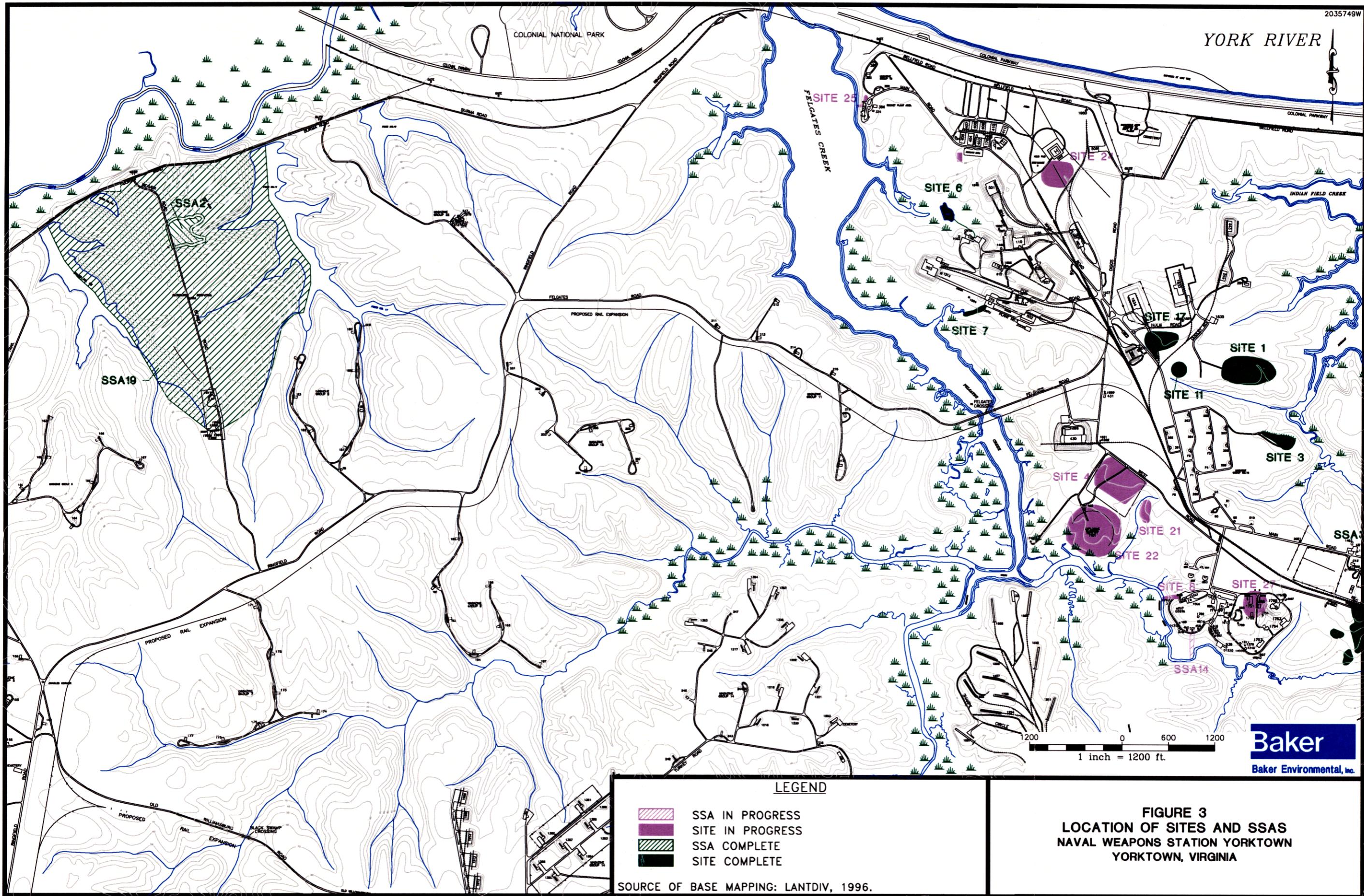
LEGEND

-  SSA IN PROGRESS
-  SITE IN PROGRESS
-  SSA COMPLETE
-  SITE COMPLETE

FIGURE 2
LOCATION OF SITES AND SSAS
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

YORK RIVER

COLONIAL NATIONAL PARK



LEGEND

	SSA IN PROGRESS
	SITE IN PROGRESS
	SSA COMPLETE
	SITE COMPLETE

SOURCE OF BASE MAPPING: LANTDIV, 1996.

FIGURE 3
LOCATION OF SITES AND SSAS
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA



IRP History at WPNSTA Yorktown

On October 15, 1992, WPNSTA Yorktown was included on the National Priorities List (NPL) primarily because of the facility's proximity to wetlands and the potential impact on the surrounding environment.

Investigation reports completed to date through the IRP include an Initial Assessment Study (July 1984), two Confirmation Study Reports (June 1986 and June 1988), a Remedial Investigation Interim Report (July 1991), a Site 21 Site Inspection Report (February 1992), a Focused Biological Sampling and Risk Evaluation Report (April 1993), a Round One RI Report (focused on Sites 1-9, 11, 12, 16-19, and 21) (July 1993), a Round Two RI Report (focused on Site 6 and SSA 16) (July 1995), a Round Two RI Report (focused on Site 12) (June 1996), a Round Two RI Report (focused on Sites 9 and 19) (January, 1997), a Round Two RI Report (focused on Sites 1 and 3) (July, 1997), a Round One RI Report (focused on Sites 23, 24, 25, and 26) (January 1999), a Site Screening Process (SSP) Report for Site Screening Areas (SSAs) 1, 6, 7, and 15 (March, 1996), a SSP Report for SSAs 2, 17, 18, and 19 (March, 1996), a SSP Report for SSAs 8, 11, 12, 13 (July 1997), an Area of Concern (AOC) Report (October, 1997), a Round Two Report (focused on Sites 6 and 7) (May 1998), a Round Two RI (focused on Sites 4, 21, and 22) (November 1997), a Round Two RI (focused on Sites 2, 8, 18, and SSA 14) (July 1998), and a Round Two RI (focused on Sites 11 and 17) (August 1998). The following paragraphs briefly describe the most important investigations conducted at WPNSTA Yorktown.

Initial Assessment Study

The purpose of the IAS was to identify and assess sites posing a potential threat to human health and/or the environment due to contamination from past operations. A total of 19 potentially contaminated sites was identified based on information from historical records, aerial photographs, field inspections, and personnel interviews. Each site was evaluated for the type of contamination, migration pathways, and pollutant receptors. The IAS concluded that 15 of the 19 sites were of sufficient threat to human health or the environment to warrant Confirmation Studies.

**IRP History at
WPNSTA Yorktown**

Confirmation Study

Two rounds of data were obtained during the Confirmation Study. During the first round of sampling, conducted in the winter of 1986, environmental samples were collected from the 15 sites identified in the IAS. This effort was documented in the "Confirmation Study Step IA (Verification), Round One." The initial sampling effort included:

- Installation and sampling of 26 monitoring wells
- Collection of 21 surface water and sediment samples
- Collection of 26 surface soil samples
- Chemical analysis of the samples collected

The second round of sampling was conducted during November and December 1987. The Round Two effort included:

- Collection of 26 groundwater samples from the previously installed wells
- Collection of 26 surface water and 32 sediment samples
- Collection of 12 surface soil samples
- Chemical analysis of the samples collected

The results of the analyses and comparisons with appropriate regulatory standards were presented in the "Confirmation Study Step IA (Verification), Round Two." The results of these field efforts were combined and summarized in the Draft RI Interim Report. This report was subsequently revised by Versar in 1991 to incorporate comments from the Technical Review Committee (TRC); this report is referred to as the RI Interim Report. The RI Interim Report recommended that further RI activities be completed at 14 of the 15 sites for which data were available.

**IRP History at
WPNSTA Yorktown**

Site 21 Site Investigation

In November 1990, WPNSTA Yorktown personnel identified an additional site (Site 21, the Battery and Drum Disposal Area) that had not been included in the previous investigations. A Site Investigation (SI) at Site 21 was conducted in October 1991. Three monitoring wells were installed and sampled, and surface and subsurface soil samples were collected. The results of this investigation were presented in the "Draft Final Site Inspection Report, Site 21-Battery and Drum Disposal Area, Naval Weapons Station Yorktown, Yorktown, Virginia."

Focused Biological Sampling and Preliminary Risk Evaluation

The Focused Biological Sampling and Preliminary Risk Evaluation Report summarized the results of a limited biological tissue, surface water, and sediment sampling effort conducted in October 1992. The primary object of the sampling program was to evaluate the potential human health risk associated with consumption of fish and shellfish taken from select waters within WPNSTA Yorktown.

Round One RI

The RI Interim Report recommended that 14 of the 15 sites be included for further study. However, based on evaluation of the available data, all 15 (Sites 109, 11, 12, 16-19) sites were recommended for further study during the Round One RI. In addition, based on the data obtained from the SI at Site 21, this site also was included in the Round One study.

The Round One RI sampling effort for Sites 1-9, 11, 12, 16-19 and 21 included:

- Geophysical investigations
- Biota investigations
- Tidal investigations
- Aquifer testing
- Monitoring well installation (23 wells)
- Collection of 51 groundwater samples (22 new wells, 29 existing wells; one newly installed well was dry)

**IRP History at
WPNSTA Yorktown**

- Collection of 196 surface water and sediment samples
- Collection of 115 surface soil samples
- Collection of 48 subsurface soil samples
- Chemical analysis of the samples collected

The results of the Round One RI indicated that further investigation was needed at all of the 16 sites, with the exception of Site 5, to better define the nature and/or extent of contamination associated with each site. A No Action Record of Decision was finalized in September, 1994 for Site 5.

A second Round One RI was completed in 1998 for four additional sites, Site 23, 24, 25, and 26. Activities completed for the Sites 23, 24, 25, and 26 Round One RI were as follows:

- Aquifer Testing
- Monitoring Well Installation (19 wells)
- Collection of 19 groundwater samples
- Collection of 8 surface water samples
- Collection of 32 sediment samples
- Collection of 45 surface soil samples
- Collection of 62 subsurface soil samples
- Chemical analysis of the samples collected

The Round One RI for Sites 23, 24, 25, and 26 indicated that further study will not be necessary and that a Feasibility Study will be completed in 1999.

Round Two RIs/SSA Investigations

The Round Two RI field investigation was conducted for: (1) Sites 6, 7, 12, 16 and SSA 16 and Background for the York River Drainage Area in 1994; (2) Sites 9 and 19 in 1995 to supplement the Round One RI; (3) and Sites 1 and 3 in 1996 to supplement the Round One RI; (4) Sites 11 and 17 in 1996 to supplement the Round One RI; (5) Sites 2, 8, 18, and SSA 14 in 1998 to supplement the Round One RI; and (6) Sites 4, 21, and 22 in 1996 to supplement the Round One RI. Additional soil, subsurface soil, surface water, sediment and groundwater samples and biota were collected.

IRP History at WPNSTA Yorktown

In addition to the Round Two RI, SSAs 1, 3, 6, 7, 12, and 15 were investigated during 1994. Environmental media including surface soil, subsurface soil, groundwater, surface water, and sediment were investigated at those SSAs having potential impacts to these media. SSAs 2, 17, 18, and 19 were investigated in early 1995 and SSAs 8, 11, 12, and 13 were investigated in early 1996. In 1997 and 1998, SSAs 3, 4, 5, 9, 10, 20, 21, 22, 23, and 24 were investigated. Again, surface soil, subsurface soil, groundwater, surface water and sediment were investigated where applicable.

Based on the results of the Site Screening Process (SSP), SSAs 1, 6, 7, 9, 10, 18, 20, and 24 will be retained as Sites 23, 24, 25, 26, 27, 28, 29, and 30, respectively for additional RI/FS efforts. These SSAs posed unacceptable human health and/or ecological risk as a result of risk screening.

Most of the Sites and SSAs are still in the IRP process. The SSAs may be eliminated from further investigation or may be nominated to become a Site. Table 1 presents the list of sites and SSAs evaluated during these investigations. As part of this photograph album, site and SSA descriptions are provided.

Site descriptions describe the history of the disposal practices at each of the recently investigated RI/FS sites included in the Federal Facilities Agreement (FFA), the four newly added sites which were former SSAs, and the site which has been added for investigation and evaluation which was not included in the FFA. The information presented is from previous studies and has been updated based on additional historical review and discussions with WPNSTA Yorktown personnel. The site descriptions are presented in numerical order for ease of reference.

SSA descriptions describe the history of past disposal practices at each of the SSAs currently included in the FFA and the four SSAs which have been added for investigation and evaluation which were not included in the FFA. As these are newly identified areas, there is limited information available. The information contained in the following sections has been adapted from United States Environmental Protection Agency (USEPA) Region III's "Resource Conservation and Recovery Act (RCRA) Solid Waste Management Unit Investigation," and "Study Area Analysis, Yorktown Naval Weapons Station Yorktown, Yorktown, Virginia," Volume 1.

**Table 1: IRP Site and
SSA Summary**

Site	Name
1	Dudley Road Landfill
2	Turkey Road Landfill
3	Group 16 Magazine Landfill
4	Burning Pad Residue Landfill
5	Surplus Transformer Storage Area
6	Explosives-Contaminated Wastewater Impoundment
7	Plant 3 Explosives-Contaminated Wastewater Discharge Area
8	NEDED Explosives-Contaminated Wastewater Discharge Area
9	Plant 1 Explosives-Contaminated Wastewater Discharge Area
10 *	Felgates Creek Fill Area
11	Abandoned Explosives Burning
12	Barracks Road Landfill
13 *	Building Rubble Disposal Site
14 *	Aviation Field
15 *	Electric Shop Disposal Area
16	West Road Landfill
17	Holm Road Landfill
18	Building 476 Discharge Area
19	Conveyor Belt Soils at Building 10
21	Battery and Drum Disposal Area
22	Burn Pad
23	Building 428 Teague Road Disposal Area
24	Aviation Field
25	Building 373 Rocket Plant
26	Building 1816 Mark 48 Waste Otto Fuel
27	Building 1751 Chemistry Laboratory Neutralization Unit and Drainage Area
28	Building 28 X-Ray Facility Tank Drain Field
29	Lee Pond
30	Bracken Road Incinerator and Environs

**Table 1: IRP Site and
SSA Summary**

SSA	Name
1	(became Site 23)
2	Former EOD Burning/Disposal Area
3	Fire Training Pits and Vicinity
4	Weapons Casing/Drum Disposal Area
5	Bypass Road Landfill
6	(became Site 24)
7	(became Site 25)
8	Building 350 Rail Roundhouse Maintenance Area Trench Outfall
9	(became Site 27)
10	(became Site 28)
11	Building 3 Neutralization Unit
12	Public Works Storage Yard/Building 683 Vicinity
13	Building 529 Battery Drainage Area
14	Building 537 Discharge to Felgates Creek
15	Sewage Treatment Plant #1/Sludge Drying Beds and Discharge Area
16	Building 402 Metal Disposal Area and Environs
17	Building 1456 Mark 46 Waste Otto Fuel
18	(became Site 26)
19	Beaver Road/Ponds 11 and 12 Drainage Area and Environs
20	(became Site 29)
21	Roosevelt Pond
22	Sand Blasting Grit Pile
23	Coal Storage Area
24	(became Site 30)

* Determined in the Initial Assessment Study as not posing a hazard to human health or the environment. No further study was recommended.

These sites and SSAs appear in numeric order.

**IRP History at
WPNSTA Yorktown**

Area of Concern (AOC) Report

Twenty-one AOCs were identified in the FFA. A "desk-top" evaluation was conducted which involved a thorough review of all existing and obtained documentation and discrete sampling efforts. Based on this evaluation only two AOCs were nominated as SSAs for further investigation and possible inclusion as IRP sites. All remaining AOCs require no further action. The rationale for no further action is presented in the Final AOC Report (Baker, 1997).

**Additional Sources of
Information**

If you would like to learn more about the Installation Restoration Program at the WPNSTA Yorktown, you may review the Community Relations Plan and any of the reports in one of the Information Repositories listed below. The Station contact is Ms. Kay Phillips, Public Affairs Officer at the WPNSTA Yorktown (757) 887-4939.



Site 4 - facing east. Burning Pad Residue Landfill Post Removal Action (April 1997)



Sites 4, 21, and 22 - facing northeast. Biocell (May 1997)

01292K024

Site 6 - Explosives-Contaminated Wastewater Impoundment

Site 6 contains a 3-acre, unlined, surface impoundment located adjacent to wetlands along a small tributary to the main branch of Felgates Creek. This area was in use between 1942 and 1975 and received contaminated wastewater from the explosives reclamation facility at Building 109 and from weapons loading operations at Building 110 (AOC C and SWMU 179). The impoundment area was used as a settling basin for spent chlorinated solvents such as trichloroethene and nitramine-contaminated washdown water. In 1975, a carbon adsorption tower was installed to treat the contaminated wastewater prior to discharge into the drainage way. A National Pollutant Discharge Elimination System (NPDES) permit was granted by USEPA Region III to allow this discharge. In 1986, the effluent from the tower was diverted to the sanitary sewer and ultimately to the Hampton Roads Sanitation District (HRSD). Currently, the impoundment collects only surface runoff from the area between Buildings 109 and 110 (Building 109, pipes and wires have been identified in the FFA for additional RI/FS activities). In addition, north of the impoundment and northwest of Building 1249, a previously excavated area has been identified via aerial photography. This area is currently wooded, but a concrete foundation and concrete rubble are evident.

Remediation of the flume area and a portion of the impoundment area was initiated in October 1998. Additional remediation photos are forthcoming.



Site 6 - Concrete Flume (August 1997)



Site 6 - looking east. Concrete Flume Discharge Area (August 1997)



Site 6 - SWMU 179. Trenches Outside of Building 109 (August 1998)



Site 6 - SWMU 179. Trenches and Piping Outside of Building 109 (August 1998)



Site 6 - SWMU 179. Trenches and Piping Outside of Building 109 (August 1998)

**Site 7 - Plant 3 Explosives-Contaminated
Wastewater Discharge Area**

Site 7 is a 300-foot long (approximately) drainage area located adjacent to wetlands and along a small tributary to Felgates Creek, approximately one mile upstream from the confluence of Felgates Creek and the York River. This drainage area received nitramine-contaminated wastewater from Loading Plant 3 between the years 1945 and 1975. In 1975, a carbon adsorption tower was installed to treat the contaminated wastewater prior to discharge into the drainage way. An NPDES permit was granted by the USEPA Region III to allow this discharge. In 1986, the effluent from the tower was diverted to the sanitary sewer and ultimately to HRSD. Currently, the site has reverted to a natural drainage area and receives no discharge from the Plant 3 complex.

In December 1996, a field-scale Pilot Study was completed using J. R. Simplot Company's Simplot Anaerobic Bioremediation Process (SABRE™) technology to remediate explosives-contaminated soil which was excavated from Site 7. The biocell treatment system was constructed at another site at the Station (Site 22) and a total of 770 cubic yards of soil from Site 7 was treated in the biocell.



Site 7 - Before Removal Action After Grubbing (September 1996)



Site 7 - Removal Action (September 1996)

01292KB44



Site 7 - Site Restoration with Rip Rap Drainage Channel (October 1996)



Site 7 - Site Restoration Rip Rap Drainage Channel (December 1996)



Site 7 - facing north. Plant 3 Explosives-Contaminated Wastewater Discharge Area and Felgates Creek (April 1997)



Site 7 - facing northeast. Plant 3 Explosives Contaminated Wastewater Discharge Area (April 1997)



Site 8 in background - facing north (April 1997)

**Site 9 - Plant 1 Explosives-Contaminated
Wastewater Discharge Area**

Site 9 is a 600-foot drainage ditch located just east of Lee Pond, which empties into the eastern branch of Felgates Creek and topographically downslope from Site 19. This area was reportedly in use from the late 1930s to 1975. Contaminants in the wastewater from Plant 1 (Building 10) included nitramine compounds as well as organic solvents. During the more than 40 years that the drainage area was used, an estimated 6,800 pounds of nitramine- and solvent-contaminated material may have been discharged to the area. A carbon adsorption tower was installed in 1975 to treat the contaminated wastewater prior to discharge into the drainage area. An NPDES permit was granted by USEPA Region III to allow this discharge. In 1986, the effluent from the tower was diverted to the sanitary sewer and ultimately to HRSD. Currently, the site has reverted to a natural drainage way for surface runoff from surrounding areas and receives no discharge from the Plant 1 complex. A limited removal action was conducted for hard waste present at Site 9 in the natural drainage way between Bollman Road and Lee Pond during the summer and early fall of 1994.

A No Further Action Record of Decision was signed in 1997 Pending the results of additional Lee Pond investigation (Baker, 1997) (DYNAMAC, 1998). Preliminary results obtained from DYNAMAC and Baker indicate that no additional actions will be necessary pending agreement by USEPA Region III and Commonwealth of Virginia personnel.

Site 12 - Barracks Road Landfill

Site 12 is a 4-acre landfill located east of Barracks Road, north of the community of Lackey, and northwest of the Colonial National Historical Park along a drainage swale leading to Ballard Creek. This area was in operation from approximately 1925 to the mid-1960s. Wastes reported to have been disposed include refuse, scrap wood, and nitramine-contaminated packaging. Because this facility was the predecessor to the Dudley Road Landfill (Site 1), it is likely that wastes similar to those identified at Site 1, including solvents, also were disposed in this area. The landfill received an estimated 1,400 tons of waste during the time the site was in use. Adjacent to the landfill are two incinerators (SWMU 142 and SWMU 143) formerly used to burn a variety of waste, both industrial and nonindustrial. Incineration ash from incineration activities was disposed on the hillside behind the incinerator buildings. Scrap metal, charred wood and cloth, and medicine bottles were observed in the ash. Located approximately 400 feet east of Site 12 is the Wood/Debris Disposal Area (formerly SWMU 164 and now considered a part of Site 12), which is approximately 4 acres in size. This area consists of a steep ravine in which wooden pallets and construction debris were disposed.

Remediation activities depicted included demolition of the incinerator buildings and the regrading of the two acre area. An impermeable soil cover was added to create a barrier, then regraded soil and topsoil were placed on the synthetic cover. Trilock[®] block was used to create an erosion resistant drainage way directed toward Ballard Creek through which water was rechanneled for protection of the soil cover. A small wetland was created at the terminal end of the drainage way to slow the movement of water off of the area. The entire area has been revegetated using native grasses since completion of the remediation efforts. Long term monitoring of surface water and sediment will be performed to evaluate the efficacy of the remedy at the site.



Site 12 Area A
Ash Excavation
(August 1997)

01792 VBEV



Site 12 Area A
Placement of Geosynthetic
Clay Liner
(August 1997)



Site 12 - Looking Southeast
Placement of the trilock block
in drainageway
(August 1997)



Site 12 - looking north. Remedial Action Showing Ash (August 1997)



Site 12 - Remedial Action Showing Trilock Blocks (August 1997)



Site 12 Remedial Action. Trilock Block Drainage Way (August 1997)



Site 12 - Area A. Remedial Action Showing Placement of Geosynthetic Clay Liner (August 1997)



Site 12 - During a Storm Event. Trilock Block in Drainage Way; Erosion Control Measure on Sides of the Landfill (February 1998)



Site 12 - Ponded Area Downstream of Area A Showing Culvert Connecting to Ballard Creek (August 1997)



Site 12 - Drainage Way from Site 12 to Ballard Creek (August 1997)



Site 12 - Culvert in tributary downgradient of Area A (August 1997)



Site 12 - During a Storm Event. Silt Fence as an Erosion Control Measures on Park Property (February 1998)



Site 12 - During a Storm Event. Drainage from Site 12; Poned Area and Culvert (February 1998)



Site 17 - Portion of unexploded ordnance that has since been removed

Site 18 - Building 476 Discharge Area

Site 18 is a one-quarter mile long, unlined drainage ditch located north of Building 476 in the southeastern area of the Station along a small tributary leading to Lee Pond. This area was in use for approximately 20 years from the 1940s to the 1960s. The discharge into the area reportedly contained battery acid waste, consisting of hydrochloric acid or calcium hydroxide and dissolved metals such as lead, cadmium, nickel, and antimony. An estimated 100 to 200 pounds of metal may have been discharged during the operational period. Battery acid waste is no longer discharged from Building 476 into this drainage way. Based on the results of Rounds One and Two Remedial Investigations, a No Action Record of Decision is expected to be signed by January 2000.



Site 18 - facing south. Building 476 Discharge Area (April 1997)

01292K064

**Site 19 - Conveyor Belt Soils at
Building 10**

Site 19 is a 500-foot long soil strip located beneath and around Building 10, approximately 300 feet from Site 9 and connected to Site 9 via a concrete drainage channel. Nitramine-contaminated soil was reported beneath the conveyor belt between Buildings 10 and 98. In 1973/1974, soil below the conveyor belt was removed; however, later tests indicated that contamination remained.

In 1998, the conveyor belt was dismantled and the metallic components were heat decontaminated to remove residual explosives. Asbestos components of the conveyor belt were double bagged and sent to an appropriate special waste landfill. Soil from beneath the conveyor belt was excavated and treated at the Site 22 biocell using J.R. Simplot's SABRE® technology. The former site of the conveyor belt has been revegetated.



Site 19 - During Remediation
Conveyor Belt Terminus
(August 1998)



Site 19 - Conveyor Belt Demolition (August 1998)



Site 19 - Demolition. Conveyor Belt Water Line (August 1998)



Site 19 - Post Construction. Conveyor Belt Area (August 1998)



Site 19 - Building 10. Former Point of Connection with Conveyor Belt (August 1998)



Left: Site 19 - Conveyor Belt Area Post Remediation (August 1998)

Below: Site 19 - Building #527 Aluminum Powder Building and Conveyor Area (August 1998)

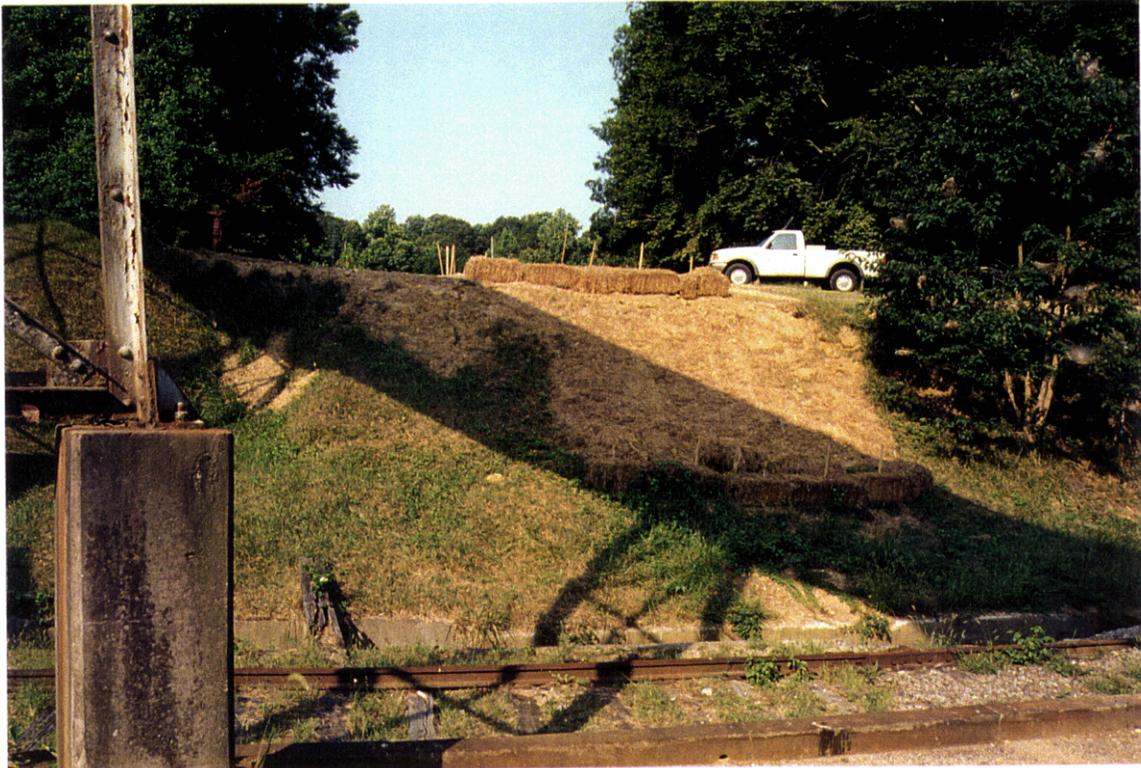




Site 19 - Post Remediation. Extra Soil Excavated Around the Origin of the Conveyor Belt (August 1998)



Site 19 - Post Removal. Contaminated Soil Area Around Bunker (August 1998)



Site 19 - Post Remediation. Former Site of Concrete Brace for Conveyor (August 1998)



Site 19 - Aluminum Powder Building #527 (August 1998)

Site 22 - Burn Pad

Site 22, the former Burn Pad, covers approximately 9 acres and is located in the central portion of the Station between Sites 4 and 21. A circular array of 11 steel burning pans were used for burning waste plastic explosives and spent solvents. The pans surround a 150-foot diameter area.

The burning pans have been removed and the area has been converted to a site for treating contaminated soil. A biocell was constructed at Site 22 for the treatment of explosives contaminated soil. It began operation in 1996 and has been used to treat soil from Sites 7 and 19. The biocell was constructed specifically for J.R. Simplot's Sabre® technology but could be used for any biological treatment technology employing soil slurry kinetics.



Site 22 - Biocell. Simplot Gantry Mixer System (August 1998)



Site 22 - Contaminated Soil Stockpile (August 1998)

01797488V



Site 22 - looking north. Biocell (August 1997)



Site 22 - Biocell. Maintenance Prior to Remediation of Site 19 Soil (August 1998)



Site 22 - Biocell. Loading Soil into the Trommel Screen (August 1998)



Site 22 - Trommel Screen Terminus (August 1998)



Site 22 - Biocell. Upsizing Biocell Previous to Site 19 Soil Remediation (August 1998)



Site 22 - Soil Screen (August 1998)

**Site 23 - Building 428 Teague Road
Disposal Area**

Site 23 is comprised of five small areas of former SSA 1. It is approximately 2.8 acres in size and is located northeast of Building 428, in the northeast portion of the Station along the Station boundary. The York River is located to the north of Site 23 and Roosevelt Pond bounds the area to the west/northwest. The area is both wooded with some open fields generally where it is bisected by a railroad track. The track was constructed in 1919 and is still operational today. Disposal activities reportedly began in 1940 and ceased in 1960. A pier fire occurred in the mid-1950s and debris from this fire was disposed in this area (1955 to 1957). Aerial photography suggests that past waste storage practices occurred at Site 23 (primarily in 1945). From 1960 to the present there is no evidence of additional waste storage or release. However, a land survey, conducted in the Fall of 1993 as part of a removal action, indicated discrete piles of debris that appear to have been dumped on top of native soil, while other areas of debris appear to be partially buried. The debris was identified as concrete rubble; scrap metal; wooden pilings and railroad ties; empty fuel cans; empty, open, and corroded drums; asbestos pipe insulation; and shingles. A removal action was conducted during the Summer and early Fall of 1994 to remove surface debris present at Site 23. Items removed included two 55-gallon drums of paint cans/spilled paint, 443 tons of wooden creosote timbers (remains of the burnt pier), 763 tons of ordinary non-hazardous debris, 1,119 tons of debris containing non-friable asbestos, 1,680 pounds of pipe wrapped with friable asbestos, 31 tons of recyclable metal, and two truck batteries. Approximately 5,800 tons of TNT and trinitrobenzene contaminated ash/soil also was removed from an area north of the railroad tracks at the northeast portion of the site. Contaminants of potential concern at Site 23 include polynuclear aromatic hydrocarbons (PAHs) that may be associated with former disposal activities. Additional IRP activities included investigation of subsurface contamination, impacts on shallow groundwater and an ecological evaluation/habitat evaluation of the unnamed ditch. The draft RI report was submitted to regulators and the Navy by Baker in early 1999 and a Feasibility Study will be conducted in the Fall of 1999 for this site.

Site 24 - Aviation Field

Site 24 (a portion of former SSA 6) is an area (approximately 15 acres in size) located around the helicopter landing pad. It is bounded by Bellfield Road to the north, railroad tracks to the east, Main Road to the south, and storage areas to and west. The site is an open grassy area around the helicopter landing pad where mine components coated with PCB-1254 containing antifoulant were discovered in the subsurface soil. Historically, the area was used as an aviation field until 1927, after which it was used for storage of munitions in underground caches. Aerial photography indicates that peak storage activity on the ground surface occurred in 1968. No storage of liquid or hazardous waste was reported or observed. In addition, this area may also have been used briefly as an explosives burning area although available data do not indicate the presence of nitramines/nitroaromatics. A Round One RI has been completed at Site 24 focusing on potential migration and exposure pathways for PCBs, and a Feasibility Study will follow in 1999.

Currently, construction of an above-ground bioremediation cell is underway. It will employ T.R. Grace's Daramend® technology to bioremediate explosives contaminated soil and sediment that has been excavated from Site 6.

**Site 25 - Building 373 Rocket
Plant**

Site 25 (a portion of former SSA 7), the Rocket Plant, is approximately 0.14 acres in size and is located immediately northwest of Building 373. Site 25 consisted of a 500-gallon (approximately) precast concrete pipe, which was used as an underground storage tank (UST), and the associated cast iron piping. The concrete pipe was installed vertically into the ground with a bottom section cast to the concrete pipe. A 500 gallon fuel oil UST was also removed from Site 25 in 1998 under a separate UST program. The UST is not considered to be a part of Site 25.

Prior to the 1960s, wash/rinse water from the cleanup of formulation/pouring equipment drained into a settling basin within the building for removal of suspended solids. The solids were open burned at Site 22, and ash was disposed of at Site 4 (Burning Pad Residue Landfill). The wash/rinse water subsequently was discharged into Felgates Creek. The discharge line to the creek was plugged in the early 1960s and a 500-gallon UST was installed to contain the wash/rinse water. From the 1960s to 1980s, the UST received batch wastes from NEDED assembly operations of 2.75-inch rockets as well as the wash/rinse waters. Once the tank was filled, the water was filtered through a carbon unit and discharged to the sanitary sewer system. The UST was closed in the early 1980s when the current aboveground storage tank (AST) was installed. Materials contained within the tanks consisted of binders, curatives, catalysts, stabilizers, and explosives.

In addition to the above areas, USEPA Region III personnel reportedly found "hard waste" (empty mine casings and other miscellaneous wastes) in the woods south/southeast of SSA 7. A removal was conducted in June/July of 1996 to remove the 500-gallon UST and associated piping. During the removal action, the bottom section, which had been cast to the concrete pipe, was heavily stained. The soil from beneath the UST was removed. There were no visible signs of staining along the sides of the UST or in the soil surrounding the sides of the UST. A strong solvent odor was prominent during the removal activities.

A Round One RI was conducted and a Feasibility Study is forthcoming in 1999.



Left: Site 25 - Tank Removal
in Western Area (June 1996)

Below: Site 25 - Tank
Removal in Western Area
(June 1996)



01292489V



Site 25 - Main Road Mine Removal (July 1996)



Site 25 - Removal Action Debris at Building 24 (July 1996)



Site 25 - UST and Associated Lines Removal (June 1996)



Site 25 - Main Road Mine Removal (June 1996)

**Site 26 - Building 1816 Mark 48
Waste Otto Fuel Tank**

Site 26 (formerly SSA 18) is approximately 6.7 acres in size and is located in the central portion of the Station at Building 1816 north of Sharpe Road and west of the intersection of Sharpe Road and Lee Road. A 2,500-gallon concrete UST and network of ancillary drain pipes that was used formerly to store waste Otto fuel was located within this area. This fuel consists of a mixture of Otto fuel and water, which may have also contained oil, denatured ethyl alcohol, detergent, and trace amounts of cyanide, halogenated hydrocarbons, and heavy metals. In late 1987, waste Otto fuel was discovered leaking from the tank. The fuel was removed, the tank was cleaned, and a RCRA closure permit was filed. In March 1995, the 2,500-gallon waste Otto fuel UST was removed along with an 8,000-gallon UST located in the vicinity. Site 26 was retained as an IRP site because of chlorinated volatiles detected in shallow groundwater. An RI focusing on potential groundwater contamination associated with the former UST was conducted in 1997 and a Feasibility Study is forthcoming in 1999.

**Site 27 - Building 1751 Chemistry Laboratory
Neutralization Unit and Drainage Area**

Site 27 (formerly SSA 9) occupies an area of approximately 1.9 acres, and is located adjacent to Building 1751 in the north central portion of the Station (near Site 8, the NEDED Explosives-Contaminated Wastewater Discharge Area). This SSA consists of a below-grade cylindrical unit into which acids from the Chemistry Lab are discharged for neutralization. The integrity of the unit is unknown, it is below ground. In addition, there are four underground septic tanks in the area. Additional investigation of conditions at Site 27 is scheduled for Summer 1999.



Site 27 - Facing North
Building 1751 Chemistry
Laboratory; Neutralization
Unit and Drainage Area
(April 1997)



Site 27 - facing northwest. Building 1751 - Neutralization Unit Location (October 1995)



Site 27 - facing east - southeast. Steam line and HydroPunch™ locations, Building 1753 (October 1995)



Site 27 - Manhole in leach field near steam lines (October 1995)



Site 27 - facing east. Steam line and Hydropunch locations in leach field (October 1995)



Site 27 - facing north. Streamline and HydroPunch™ locations in leach field (October 1995)

**Site 28 - Building 28 X-Ray
Facility Tank Drain Field**

Site 28 (formerly SSA 10) is located at Building 28 in the south central portion of the Station and occupies an area of approximately 5.8 acres. The area consists of a septic tank drain field that receives sanitary wastewater from the X-Ray Facility at Building 28. Before silver recovery units were installed, the tanks may have received silver and other inorganic containing wastes. Sanitary wastewater from the X-Ray Facility has been redirected to HRSD. Some stressed vegetation was noted in this area. Additional investigative activities are scheduled for Summer 1999 at Site 28.



Site 28 - facing northwest. Building 28 Septic Tank Cover (October 1995)



Site 28 - Facing East
Building 28 X-ray Facility
Tank Drain Field
(May 1997)

Site 29 - Lee Pond

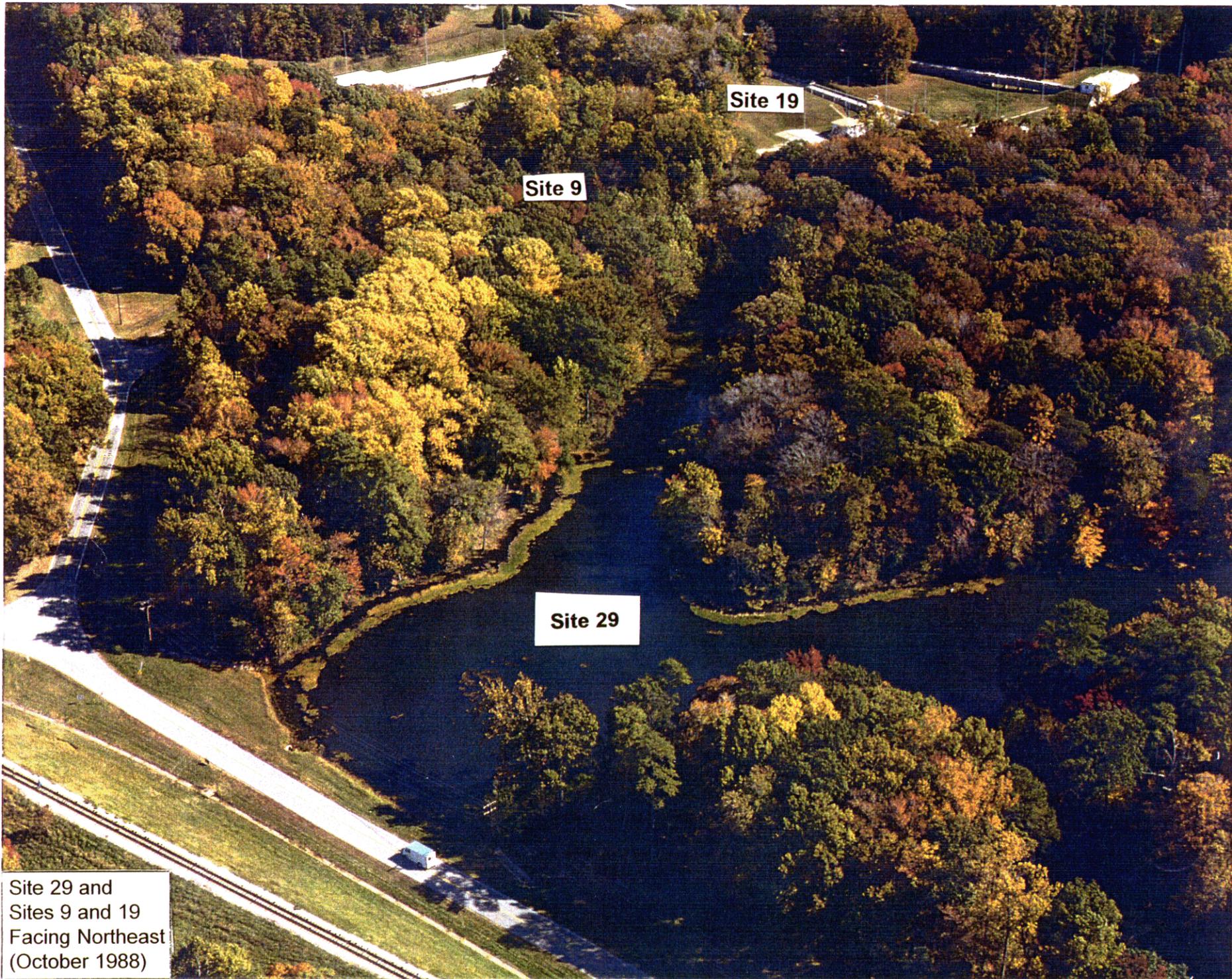
Formerly known as SSA 20, Site 29 - Lee Pond is an approximately 4.1 acre pond located in the east central portion of the Station. The pond receives drainage from Building 10 at Site 9 located due east of the pond. The drainage area is approximately 500 to 600 feet in length and was subjected to a limited removal action in 1994. Lee Pond also receives stormwater runoff from the industrial area and sites therein such as Sites 18 and 19 and SSAs 8 and 22.

Lee Pond empties into a channel which in turn flows around the Site 16/SSA 16 study area into Felgates Creek. The pond has been subjected to limited investigations by the Commonwealth of Virginia in 1994 and a Focused Biological Sampling and Preliminary Risk Evaluation. Water levels in Lee Pond are raised and lowered during summer and winter respectively for support of the local ecology.

Lee Pond was investigated September 1997 by Baker and Dynamac 1998. Further investigation will be conducted by Baker in Summer 1999, but it is believed that no additional actions will be necessary to mitigate human health risks or ecological impacts associated with the site.



Site 29 - Facing West
to Site 9



Site 29 and
Sites 9 and 19
Facing Northeast
(October 1988)



Site 29 - Facing South

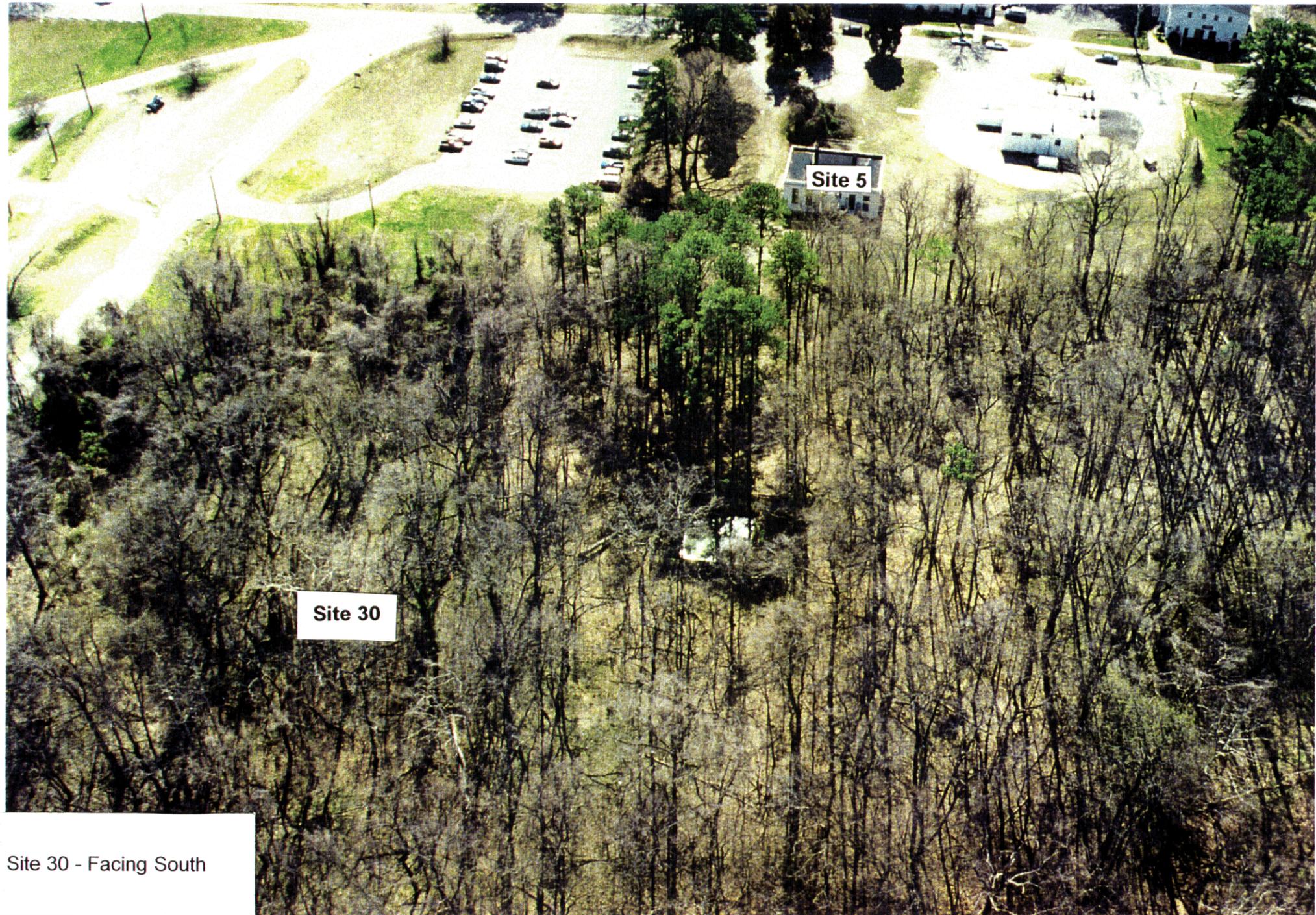
**Site 30 - Bracken Road Incinerator
and Environs**

Site 30, the Bracken Road Incinerator, (formerly SSA 24) is in as area approximately 0.1 acres located north of Site 5 (Surplus Transformer Storage Area), northeast of a cooling pond (76A), and south of railroad tracks. Reportedly, munipcle waste from the housing areas located in the vicinity of the incinerator were burned at the incinerator. The ash from the incinerator was transported to Site 23 (Teague Road Disposal Area). The USEPA conducted sampling activities and detected metals and nitramine compounds exceeding regulatory screening levels. An investigation was conducted in 1997 and further investigation will be conducted in Summer 1999.



Site 30 - Bracken Road
Incinerator

01292KB13Y



Site 5

Site 30

Site 30 - Facing South

SSA 3 - Fire Training Pits and Vicinity

SSA 3 occupies an area of approximately 2.7 acres and is located just north of Main Road and Site 16, the West Road Landfill, in the north central portion of the Station. The area consisted of three concrete oil pits; one was T-shaped and the other two were rectangular. One rectangular pit was located at the eastern end of the field, the second rectangular pit was located in the western end of the field, and the T-shaped pit was located in the central section of the field, where a patch of stressed vegetation was evident. Berms were built around each of the pit areas in 1986 and a roof was added to each area in 1991. Debris was reportedly placed in each of the pits, doused with jet fuel and set on fire. In addition, in the vicinity of the pits, there appeared to be portions of a tanker trailer that was formerly used for confined space entry training. The trailer is open on the bottom and placed directly on the soil. The inside of the trailer is blackened and burned. A removal action was conducted in 1997 to remove the fire training pits and the tanker trailer. The area has been revegetated since the removal action. Upon compilation of all SSA 3 data, a recommendation of no further action will be established for this SSA, and the Final SSP Report will be completed in the Fall of 1999.



SSA 3 - Unit used for Confined Space Entry Training - Eliminated during Removal Action (June 1996) (Mines are from Site 25)



SSA 3 - Fire training pit just prior to Removal Action (June 1996)

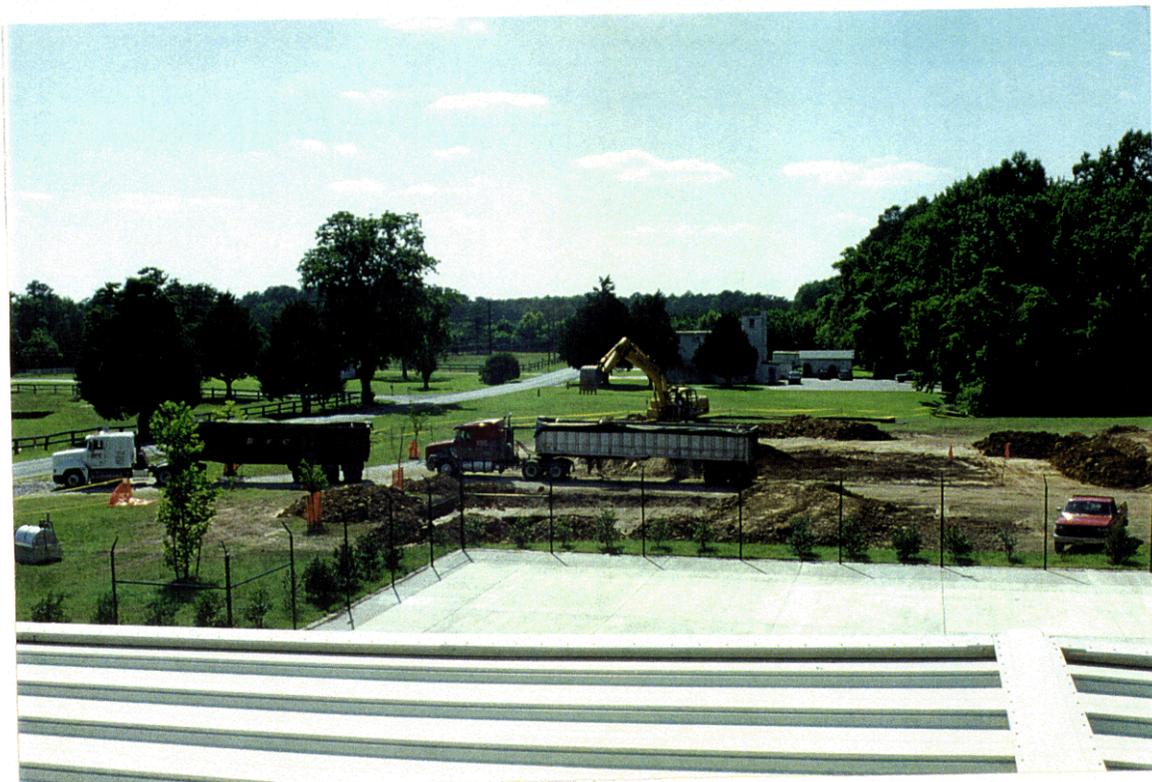
01292KB14Y



SSA 3 - Removal Action (June 1996)



SSA 3 - Removal Action (June 1996)



SSA 3 - Removal Action (June 1996)



SSA 3 - Post Removal Action (July 1996)



SSA 3 - facing west (along main road). Fire Training Pits and Vicinity Post Removal Action (April 1997)



Left: SSAs 11 and 13 - facing southeast. Drainage Outlet to Ballard Creek (February 1997)

Below: SSA 11 - facing northwest. Building 3 Neutralization Unit (April 1997)





SSA 11 - facing northwest. Building 3 - Plugged Outlet Pipe (Top) (February 1997)



SSA 11 - facing northwest. Building 3 - Outlet Pipe (February 1997)



SSA 12 - facing north. Public Works storage yard/Building 683 - Areas A, B, and C (April 1997)



SSA 12 - facing north. Area A Foreground, Area C Background (February 1997)



SSA 12 - facing northwest. Area A Foreground, Area B Right Background (February 1997)



SSA 13 - South side of Building 529; person on drainage grate (culvert) (February 1997)



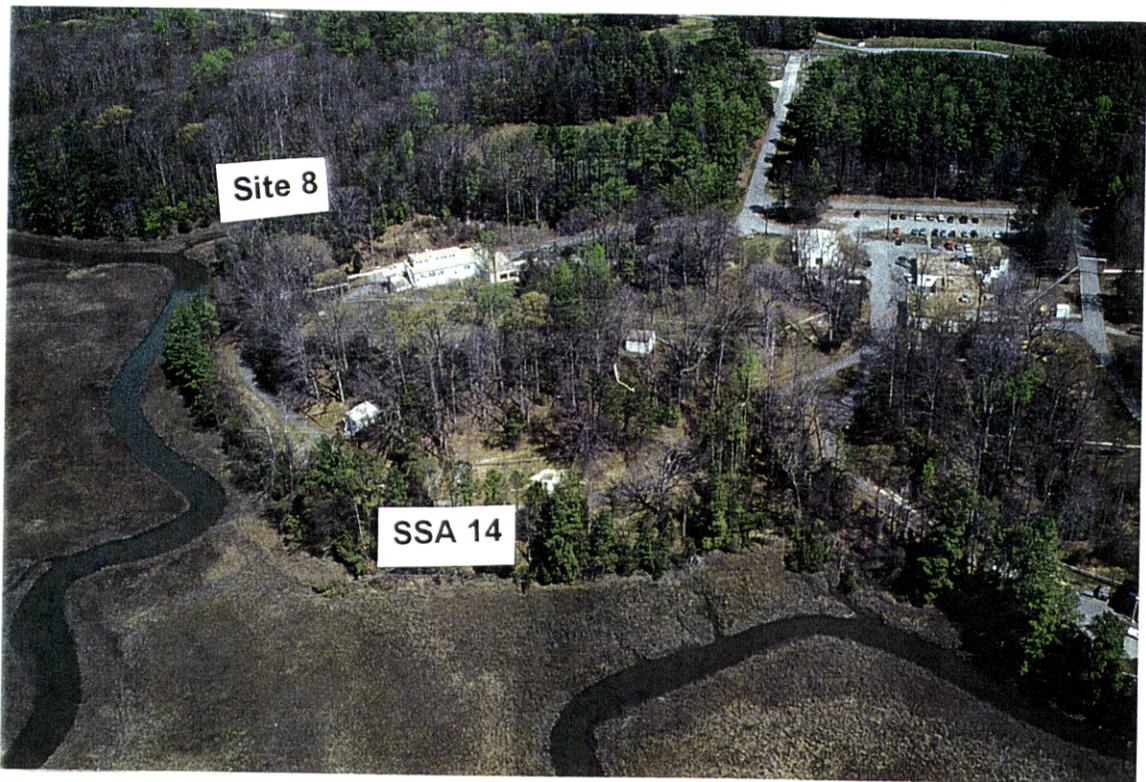
SSA 13 - facing southeast. Building 529 Battery Discharge Area (April 1997)

Left: SSA 13 - facing northeast. Building 529
(February 1997)



Below: SSA 13 - facing northeast. Culvert
Outlet and Inlet for Drainage to Ballard Creek
(February 1997)





SSA 14 (Site 8 background) - facing north. Building 573 Discharge to Felgates Creek (April 1997)



SSA 14 - facing north. Building 573 Discharge to Felgates Creek (April 1997)



SSA 14 - A Tributary of Felgates Creek



SSA 14 - A Tributary of Felgates Creek



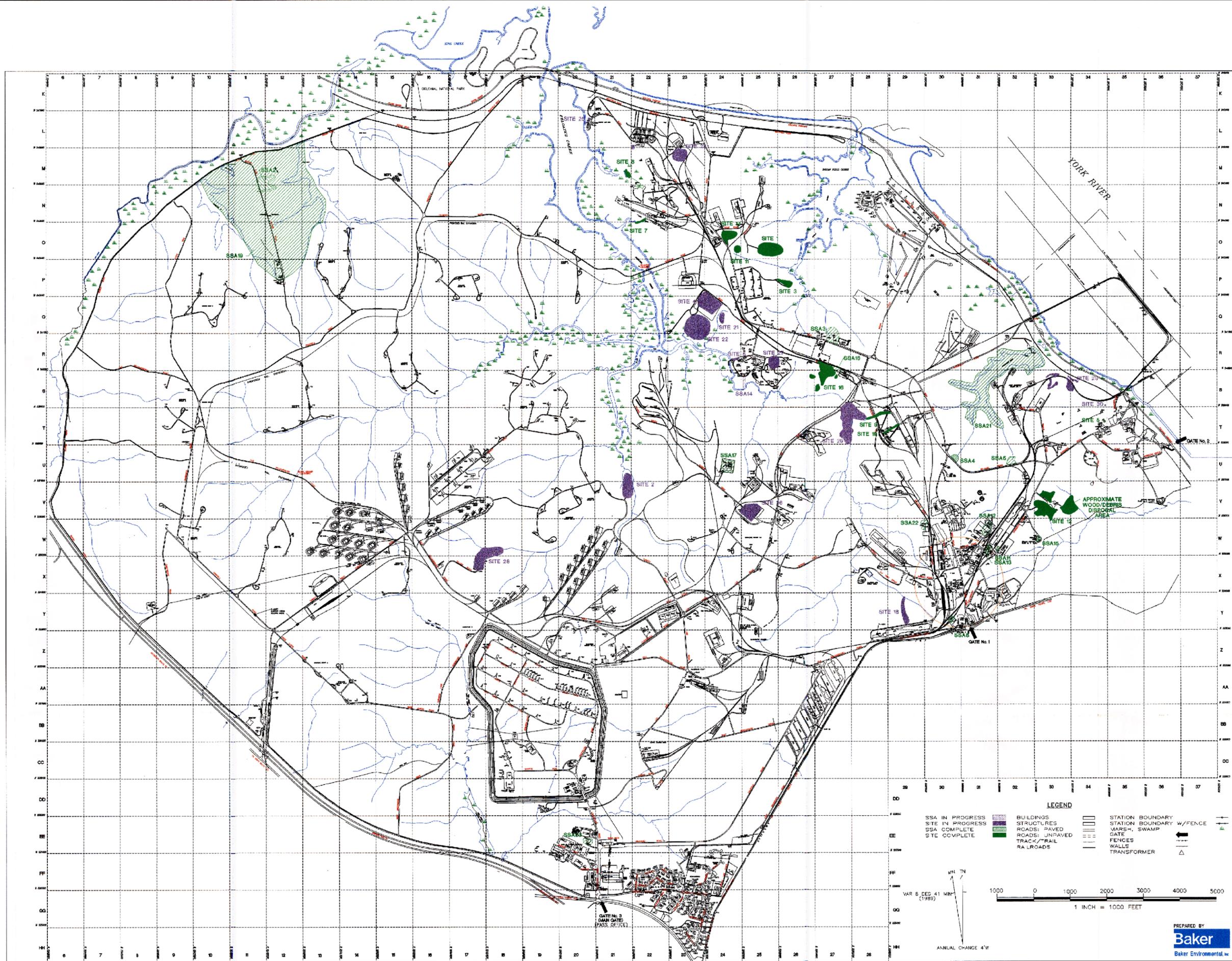
SSA 14 - facing north. Building 537 (October 1995)



SSA 15 - Facing Southwest
Sewage Treatment Plant #1
Sludge Drying Beds and
Discharge Area
(April 1997)

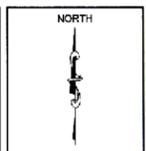


SSA 16 - Facing West
Removal action conducted
in late Summer 1994
(Fall 1995)



REVISIONS	

DRAWN	WJH
REVIEWED	KLA
S.O.#	
CADD#	2035503A.DWG



NAVAL WEAPONS STATION YORKTOWN
 YORKTOWN, VIRGINIA

BAKER ENVIRONMENTAL, Inc.
 Coraopolis, Pennsylvania



SITE AND SSA
LOCATIONS

 SCALE 1" = 1000'
 DATE 03/96

FIGURE NO.
2-1