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ST JULIENS CREEK
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AERIAL PHOTOGRAPHIC SITE ANALYSIS NORFOLK NAVAL SHIPYARD ANNEX AREAS ST JULIENS CREEK ANNEX VA
02/01/1995
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Environmental Protection
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TS-PIC-94161
February 1995

Research and Development

EPA

Aerial Photographic Site Analysis Norfolk Naval Shipyard: Annex Areas Norfolk, Virginia

LEGEND

CL - Clearing
CT - Coarse-Textured
D - Drums
DB - Debris
DG - Disturbed Ground
DK - Dark-Toned
EX - Excavation
EXT - Extraction
FA - Fill Area
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GS - Ground Scar
HT - Horizontal Tank
IM - Impoundment
LQ - Liquid
LT - Light-Toned
M - Material
MM - Mounded Material
MT - Medium-Toned
O - Object
OS - Open Storage Area
ST - Stain
SW - Solid Waste
TR - Trench
UST - Underground Storage Tank
VT - Vertical Tank
WDA - Waste Disposal Area
WG - Wet Ground
WWTP- Waste Water Treatment Plant

- Berm
- Drainage (Channelized)
- Drainage (Natural)
- Feature Boundary
- Fence
- Site Boundary

EPA Region 3

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Aerial Photographic Site Analysis
Norfolk Naval Shipyard: Annex Areas
Norfolk, Virginia

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NOTICE

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ABSTRACT

An analysis of aerial photography was performed on St. Helena, Southgate and St. Julian Creek Annex Areas of the Norfolk Naval Shipyard, located in Norfolk, Virginia. The Environmental Protection Agency's (EPA) Region 3 requested this analysis to support remedial investigations of waste disposal activities at Federal Facilities within the region.

According to collateral information supplied by EPA Region 3, storage is the primary use of the three Annex Areas. Reportedly, there is one site, Site No. 9, at Southgate Annex where acetylene sludge was stored temporarily in a lagoon from 1942 until acetylene production was discontinued in 1971. Aerial photography disputes the reported period of activity of Site No. 9 as 1942 through 1971. There is no evidence of the acetylene waste lagoon from 1937-1964. The first year the lagoon is visible on the available aerial photography is 1970, indicating that it was constructed between 1964 and 1970.

Minimal potential waste disposal activity is noted within St. Helena and Southgate Annex Areas. Potential waste disposal activity identified in two primary areas at St. Julian Creek Annex includes waste disposal areas with solid waste and debris; possible and probable waste disposal areas; disturbed ground; staining; trenches; an impoundment; a berm with a pit; mounded material; possible excavations; a large pit with liquid waste; objects mixed with material and three fill areas with mounded material and disturbed ground.

The EPA's Environmental Photographic Interpretation Center in Warrenton, Virginia, a branch of the Monitoring Sciences Division of the Environmental Monitoring Systems Laboratory in Las Vegas, Nevada, performed this analysis at the request of the Superfund Support Section of EPA Region 3 in Philadelphia, Pennsylvania, and the Office of Emergency and Remedial Response in Washington, D.C.

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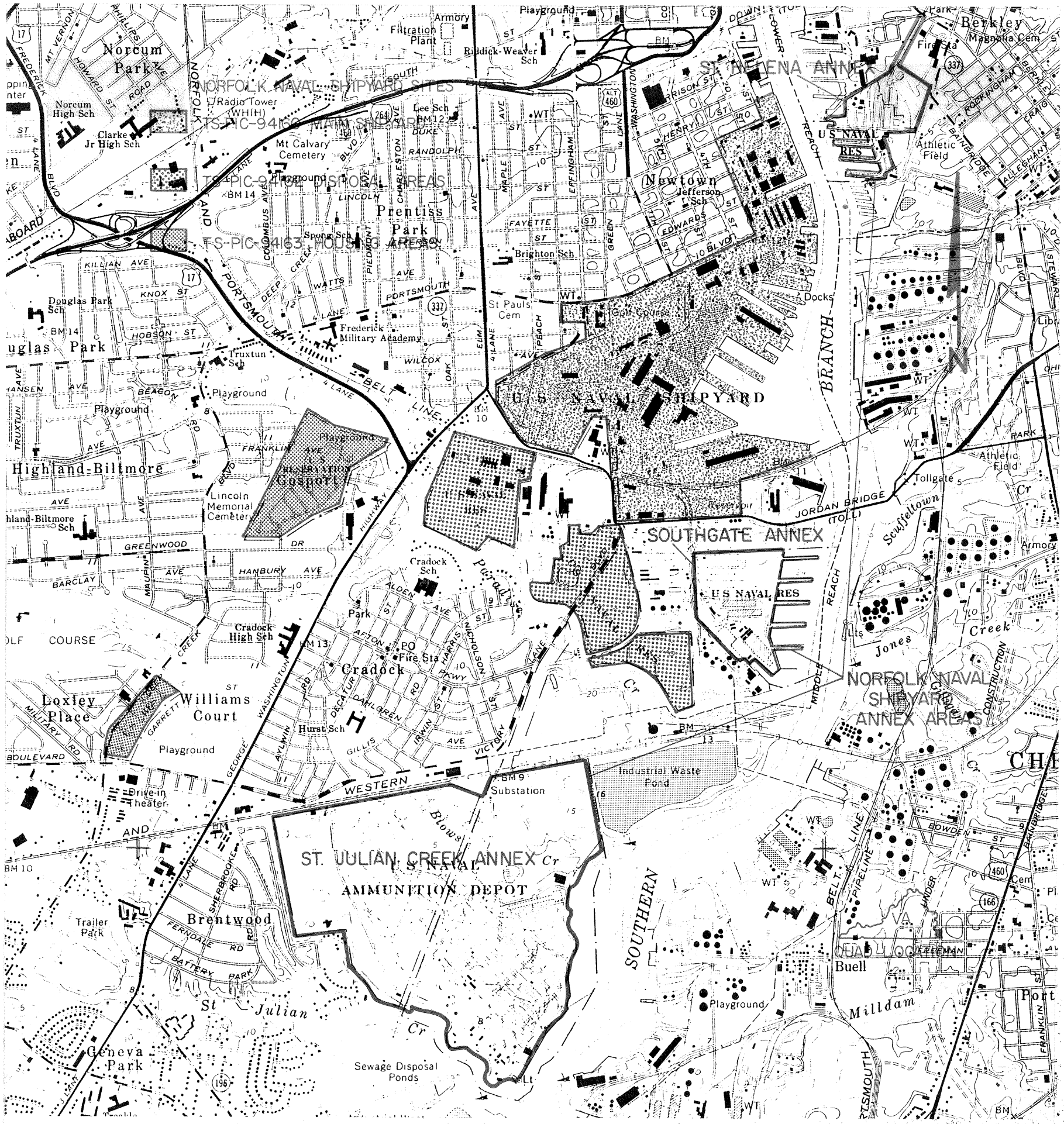

FIGURE 1
NORFOLK NAVAL SHIPYARD/
ANNEX AREAS

LOCATION MAP
NORFOLK SOUTH, VA QUAD

APPROX. SCALE 1:24,000

INTRODUCTION

This report presents an analysis of aerial photography of the St. Helena, Southgate and St. Julian Creek Annex Areas of the Norfolk Naval Shipyard, located along the Southern Branch of the Elizabeth River in Norfolk, Virginia. The Environmental Protection Agency's (EPA) Region 3 requested this analysis to support CERCLA remedial investigations of waste disposal activities at Federal Facilities within the region. The Norfolk Naval Shipyard: Annex Areas analysis is one of four aerial photographic analyses relating to the Norfolk Naval Shipyard facility. The other analyses cover the following noncontiguous areas along the Southern Branch of the Elizabeth River: TS-PIC-94160, the Main Shipyard; TS-PIC-94162, the Disposal Areas; and TS-PIC-94163, the Housing Areas, including New Gosport Housing and Stanley Court Housing.

Figure 1 shows the location of the Annex Areas, as well as the other Norfolk Naval Shipyard sites, keyed to a photocopy of a U.S. Geological Survey (USGS) 1:24,000-scale topographic map. The site boundaries or areas depicted on Figure 1 were determined from collateral data supplied by EPA Region 3 and do not necessarily denote legal property lines or ownership.

Aerial photography of St. Helena Annex, Southgate Annex, and St. Julian Creek Annex was obtained to represent the period 1937 to 1990.[1] Select dates of photography were reproduced for this report to illustrate significant findings from the analysis of the Annex Areas. Any significant changes noted in years of photography analyzed but not reproduced will be annotated and discussed with the following or previous year of photography reproduced in this report unless noted otherwise.

According to collateral information supplied by EPA Region 3, the primary use of St. Helena Annex is to store large deactivated ships, while Southgate Annex and St. Julian Creek Annex are primarily used for storage. Reportedly, there is one

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[1]A complete listing of maps and photography used in this report is provided in the References section.

site, Site No. 9, at Southgate Annex where acetylene sludge was stored temporarily in a lagoon from 1942 until acetylene production was discontinued in 1971.

This report documents activity at the three Annex Areas. Aerial photography disputes the reported period of activity of Site No. 9, as 1942 through 1971. There is no evidence of the acetylene waste lagoon from 1937-1964. The first year the lagoon is visible is 1970, indicating that it was constructed between 1964 and 1970. Minimal potential waste disposal activity is noted within St. Helena and Southgate Annex Areas. Potential waste disposal activity is identified in two primary areas at St. Julian Creek Annex, the northeast portion of the site and an area in the southwest portion of the site, near an inlet of St. Julian Creek. Waste disposal areas with solid waste and debris; possible and probable waste disposal areas; disturbed ground; staining; trenches; an impoundment; a berm with a pit; mounded material; possible excavations; a large pit with liquid waste; and objects mixed with material were identified at several locations within the northeast portion of the site. Three fill areas with mounded material and disturbed ground were identified in the southwest portion along the inlet of St. Julian Creek.

The EPA's Environmental Photographic Interpretation Center in Warrenton, Virginia, a branch of the Monitoring Sciences Division of the Environmental Monitoring Systems Laboratory in Las Vegas, Nevada, performed this analysis at the request of the Superfund Support Section of EPA Region 3 in Philadelphia, Pennsylvania and the Office of Emergency and Remedial Response in Washington, D.C.

METHODOLOGY

A search of government and commercial sources was undertaken to obtain the best suited aerial photography of the site spanning the desired time frame. The photography and other sources of information used in this report are listed in the References section.

The analysis was performed by viewing backlit transparencies of aerial photography through stereoscopes. Stereoscopic viewing creates a perceived three-dimensional effect which, when combined with viewing at various magnifications, enables the analyst to identify signatures associated with different features and environmental conditions. The term "signature" refers to a combination of visible characteristics (such as color, tone, shadow, texture, size, shape, pattern, and association) which permit a specific object or condition to be recognized on aerial photography.

The terms "possible" and "probable" are used to indicate the degree of certainty of signature identification. "Possible" is used when only a few characteristics are discernible or these characteristics are not unique to a signature. "Probable" is used when incrementally more characteristics are discernible. No qualifying terms are used when the characteristics of a signature allow for a definite feature identification.

Photographic prints were made from those years of aerial photographic coverage that reveal significant information about the site. Overlays to the prints and/or base maps serve to locate significant features; additional observations and analysis are discussed in the text. Site boundaries or areas used in this analysis were determined from observations made from the aerial photography in conjunction with collateral data supplied by EPA Region 3 and do not necessarily denote legal property lines or ownership.

Due to factors inherent in the photographic printing process, prints do not exhibit the level of detail that is visible in the original aerial photography. Therefore, some features identified from the aerial photography may not be clearly discernible, or even visible, on the photographic prints presented in this report.

AERIAL PHOTO SITE ANALYSIS

St. Helena Annex

The site boundary supplied through collateral data is included on all figures; however, activity possibly associated with St. Helena Annex occurs outside of the boundary. While the focus of the site analysis is on the area within the boundary, easily accessible potential disposal areas located outside of the boundary have been annotated. A decrease in the size of the St. Helena Annex site boundary is indicated on a 1986 photorevision of the topographic map.

MAY 20, 1937 (FIGURE 2)

This is the first year of available aerial photography covering St. Helena Annex, and minimal activity is noted within the site boundary. The future dock area is a cove on the Southern Branch of the Elizabeth River with two drainage channels leading into the cove. The overall direction of drainage on and around St. Helena Annex flows west into the Southern Branch of the Elizabeth River, which flows north. Drainage features will be annotated when visible but will not be discussed further unless a significant change is noted.

A possible waste disposal area (WDA) with dark-toned (DK) material (M) or objects (O) is present at the north edge of the future site. A fill area (FA), light-toned (LT) mounded material (MM), two open storage areas (OS) and probable debris (DB) are also noted. The two open storage areas consist of neatly stacked piles of light-toned square objects, possibly building materials or containers.

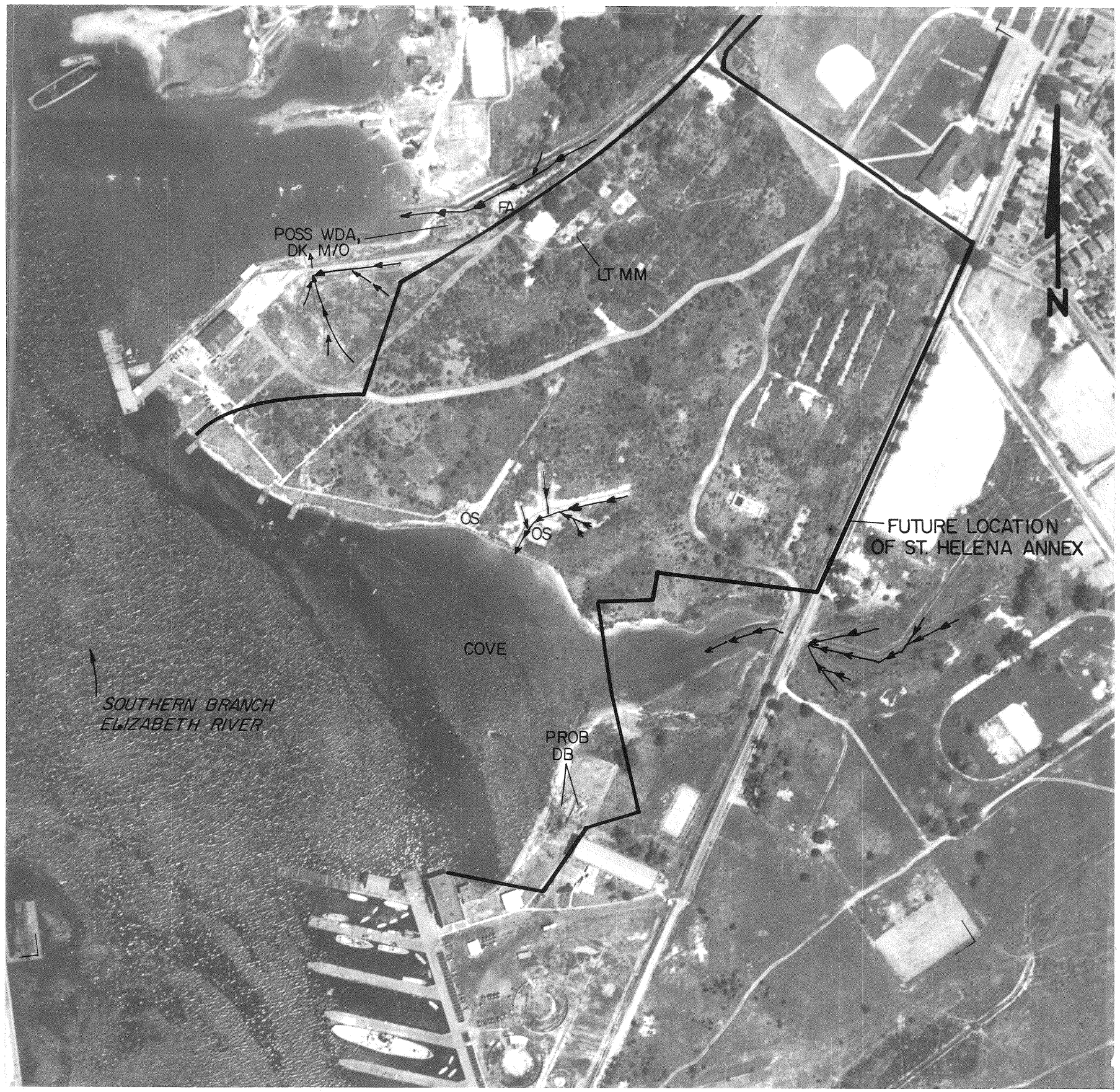


FIGURE 2
NORFOLK NAVAL SHIPYARD
ANNEX AREAS

ST. HELENA ANNEX
MAY 20, 1937

APPROX. SCALE 1:3,300

APRIL 9, 1949 (FIGURE 3)

The 1949 analysis includes annotated findings from the 1944 aerial photography.

By 1944 the site was completely developed, with a portion of land mass created by backfilling the cove inlet. The docks had been constructed in the former cove. Numerous boats, along with an assortment of objects and containers were neatly stored throughout the study area. Overall housekeeping practices in the abundant storage areas exhibit good organization throughout the period of analysis. These areas will not be individually annotated or discussed. Disorderly and/or transition areas potentially associated with disposal activity, contained debris mixed with mounded material, medium-toned (MT) mounded material and a ground scar (GS) with mounded material in 1944; and debris, medium-toned material and light-toned material in 1949.

An underground storage tank (UST) was first noted in the northern portion of the site in 1944 and remains in 1949. Two vertical tanks (VT) were present within a revetment and remain throughout the period of analysis.

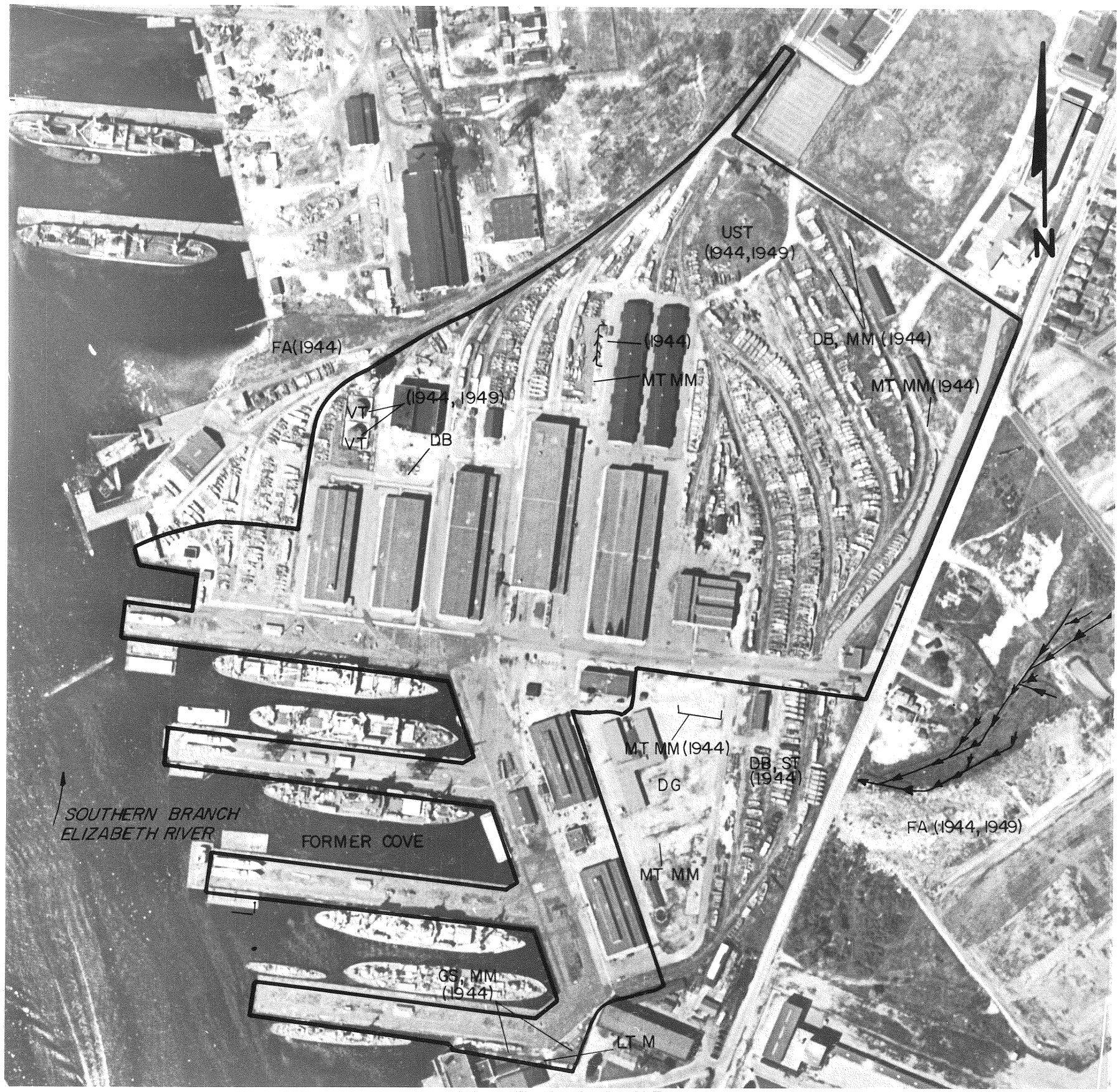


FIGURE 3
NORFOLK NAVAL SHIPYARD/
ANNEX AREAS

ST. HELENA ANNEX
APRIL 9, 1949

APPROX. SCALE 1:3,100

OCTOBER 10, 1974 (FIGURE 4)

The 1974 analysis includes annotated findings from the 1958 and 1964 aerial photography.

In 1958 and 1964 minimal activity was evident at St. Helena Annex. Several buildings had been dismantled and the open storage areas previously filled with boats, objects and containers were nearly empty.

Stains (ST) were observed in each year. Medium-toned mounded material was noted on a former building foundation in the northeast corner of the site in 1964 and is also visible in 1974.

In 1974 the network of railway systems has diminished. Staining is evident in the revetment surrounding the vertical tanks, suggesting the possibility of a leak. Debris and light-toned mounded material are noted nearby.

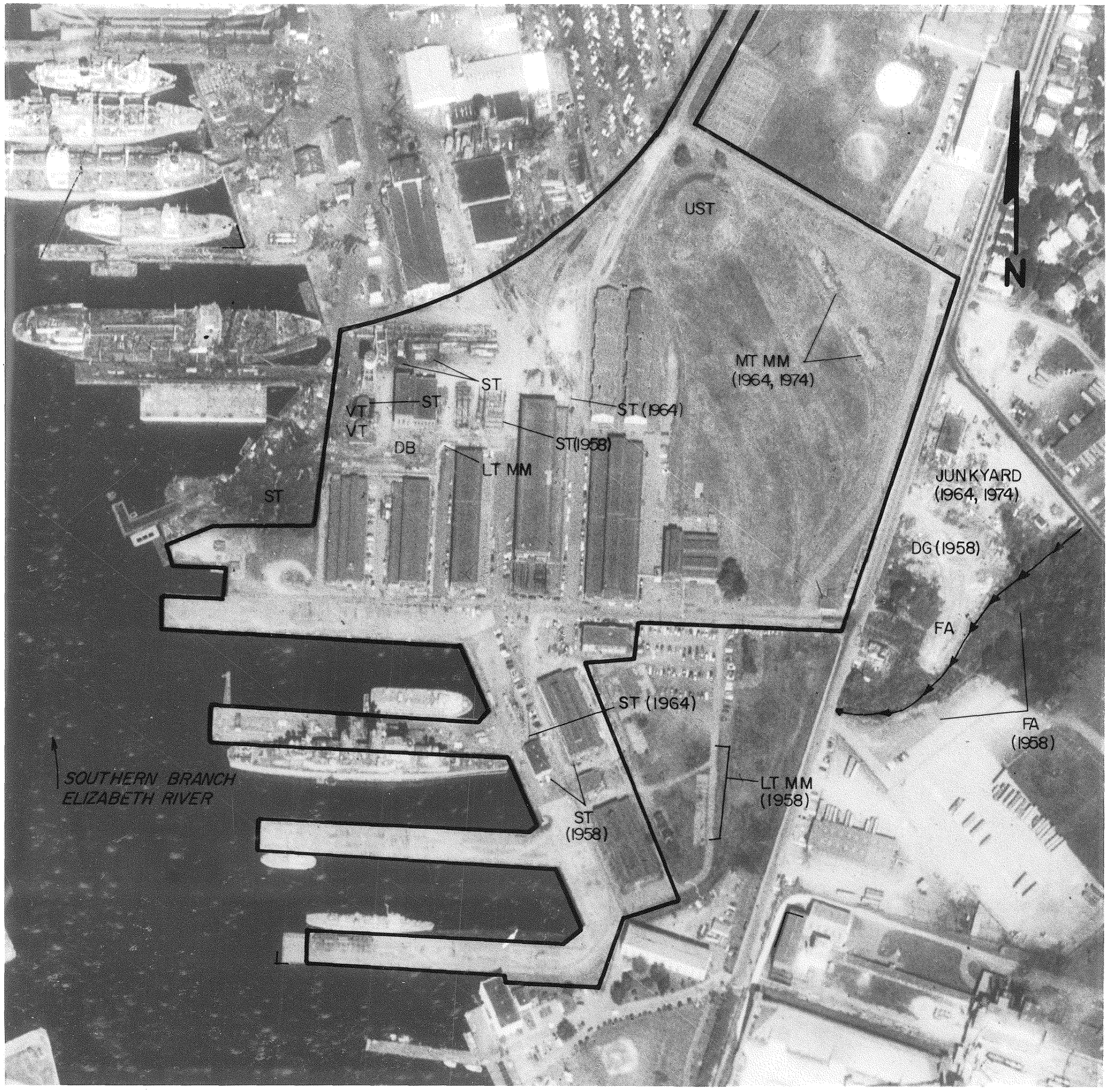


FIGURE 4
NORFOLK NAVAL SHIPYARD/
ANNEX AREAS

ST. HELENA ANNEX
OCTOBER 10, 1974

APPROX. SCALE 1:3,300

APRIL 24, 1982 (FIGURE 5)

Overall activity has increased at St. Helena Annex. Two large buildings and the underground storage tank are no longer present. The area where they were previously located is now a large fenced open storage area. Overall housekeeping practices are more haphazard, with an assortment of objects, materials, containers and scrap piles located in numerous open storage areas and along the sides of buildings and fences.

Potential disposal-related features include light-toned mounded material, ground scars, debris intermixed with mounded material, disturbed ground (DG), a three-sided bin containing solid waste (SW), drums (D)and two excavations (EX).

Stains are abundant throughout the study area. Some staining as well as the numerous piles of dark-toned mounded material may be coal and coal-related activity.

FIGURE 5
NORFOLK NAVAL SHIPYARD/
ANNEX AREAS

ST. HELENA ANNEX
APRIL 24, 1982

APPROX. SCALE 1:3,300

FEBRUARY 9, 1985 (FIGURE 6)

Open storage activity continues in a haphazard fashion. Potential disposal-related features include numerous piles of debris and mounded material, separately as well as mixed together. Several dumpsters or railroad cars are filled and partially filled with debris. Probable drums mixed with debris are noted near the two revetted vertical tanks. Disturbed ground and stains are also visible onsite.

FIGURE 6
NORFOLK NAVAL SHIPYARD/
ANNEX AREAS

ST. HELENA ANNEX
FEBRUARY 9, 1985

APPROX. SCALE 1:3,100

MARCH 4, 1990 (FIGURE 7)

Routine open storage remains the primary onsite activity, and the items in storage are generally more organized than in 1985. Due to a recent rainfall, staining cannot be distinguished from wet ground.

Potential disposal-related features include disturbed ground, mounded material and debris.

FIGURE 7
NORFOLK NAVAL SHIPYARD/
ANNEX AREAS

ST. HELENA ANNEX
MARCH 4, 1990

APPROX. SCALE 1:3,100

Southgate Annex

MAY 20, 1937 (FIGURE 8)

This is the first year of available aerial photography covering Southgate Annex, which is located on the west bank of the Southern Branch of the Elizabeth River. Paradise Creek is south of the Southgate Annex and flows east into the Southern Branch of the Elizabeth River. Minimal drainage features are evident within the nearly flat study area throughout the period of analysis. The overall direction of drainage on and around the Southgate Annex is presumably east into the Southern Branch of the Elizabeth River, which flows north. Drainage features will be annotated when visible but will not be further discussed unless a significant change is noted.

The southern portion of the site is developed and supports several buildings. Ground scars and disturbed ground indicate the possibility of fill activity in the central portion of the site. Some of the activity appears to be associated with ground preparation for future construction.

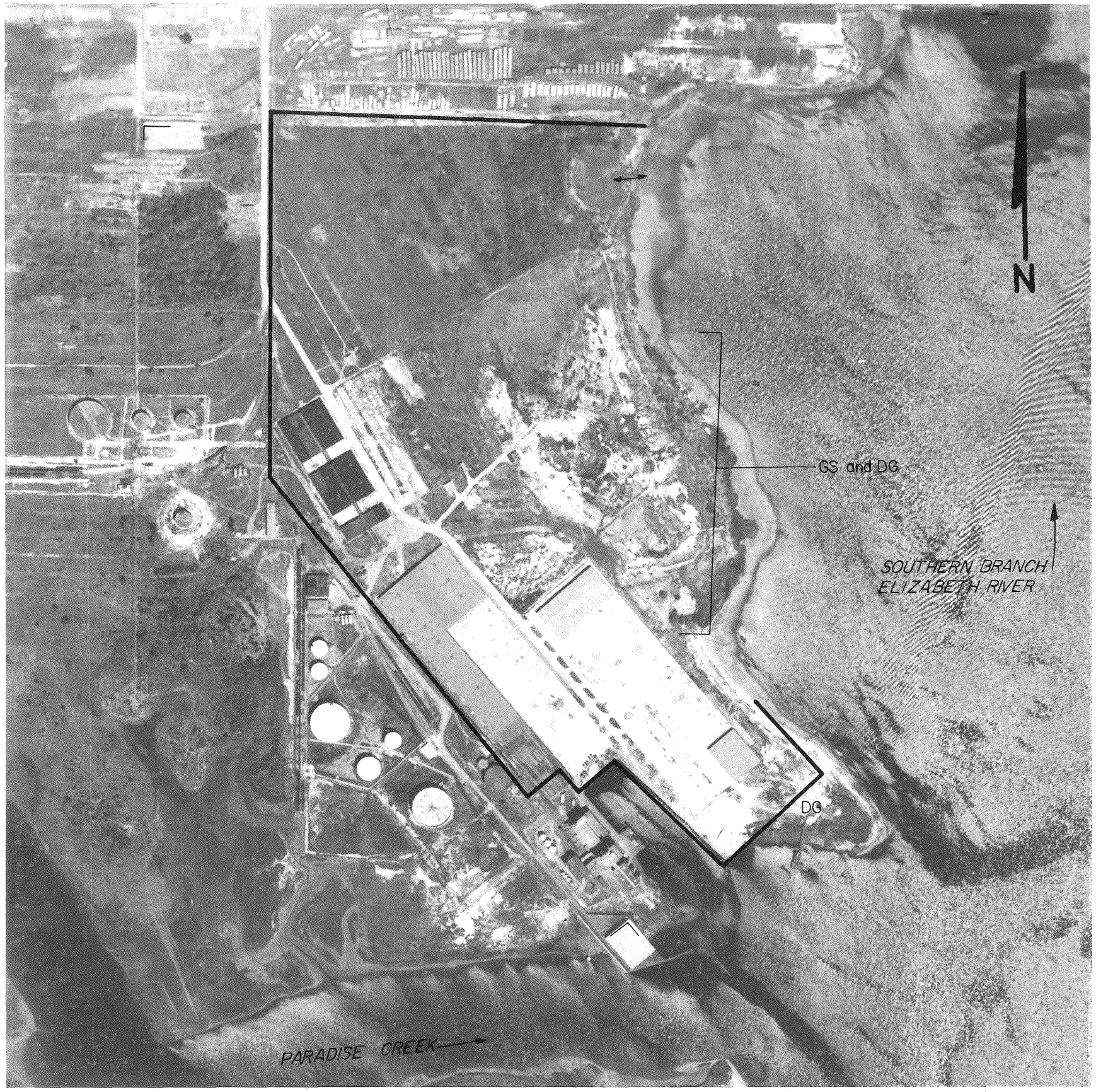


FIGURE 8
NORFOLK NAVAL SHIPYARD/
ANNEX AREAS

SOUTHGATE ANNEX
MAY 20, 1937

APPROX. SCALE 1:3,700

AUGUST 25, 1944 (FIGURE 9)

Land mass has been created in the northeast portion of the site by backfilling part of a cove. Most of Southgate Annex is actively in use for open storage. An assortment of containers and objects is neatly stacked throughout the site. Since the primary activity at Southgate Annex is open storage and the overall housekeeping practices exhibit good organization throughout the period of analysis, open storage areas will not be individually annotated or discussed.

A light-toned object rises from the center of a probable excavation located in the northeast portion of the site. According to collateral information, Site No. 9, an acetylene waste lagoon was built in the northeast section of Southgate Annex in 1942 and remained in use until 1971. The probable excavation is the only feature evident during 1944 that conceivably correlates to acetylene waste disposal. Debris, dark-toned material, staining, and two large piles of coarse-textured (CT) mounded material are noted nearby.

The entire fill area is a potential waste disposal area. Coarse-textured mounded material, as well as debris and disturbed ground are additional features noted which may be associated with waste disposal activity.

FIGURE 9
NORFOLK NAVAL SHIPYARD/
ANNEX AREAS

SOUTHGATE ANNEX
AUGUST 25, 1944

APPROX. SCALE 1:3,600

APRIL 9, 1949 (FIGURE 10)

The site is fully developed by 1949. The probable excavation seen in 1944 is no longer visible, however, disturbed ground and mounded material are noted nearby. The northeast corner of the site has been expanded slightly by backfilling the remainder of the cove. A fenced area installed in the northeast corner encloses disturbed ground with scattered cylindrical light-toned objects. Recent grading (GR) is evident south of the fenced area.

FIGURE 10
NORFOLK NAVAL SHIPYARD/
ANNEX AREAS

SOUTHGATE ANNEX
APRIL 9, 1949

APPROX. SCALE 1:3,800

MAY 4, 1958 (FIGURE 11)

Open storage has decreased since 1949. The former fenced area has been opened up and several small buildings are located in the northeast portion of the site. Disturbed ground and stains are visible in the same location where disturbed ground was seen in 1949. This area may be associated with acetylene waste disposal.

Grading activity and possible staining are also noted.

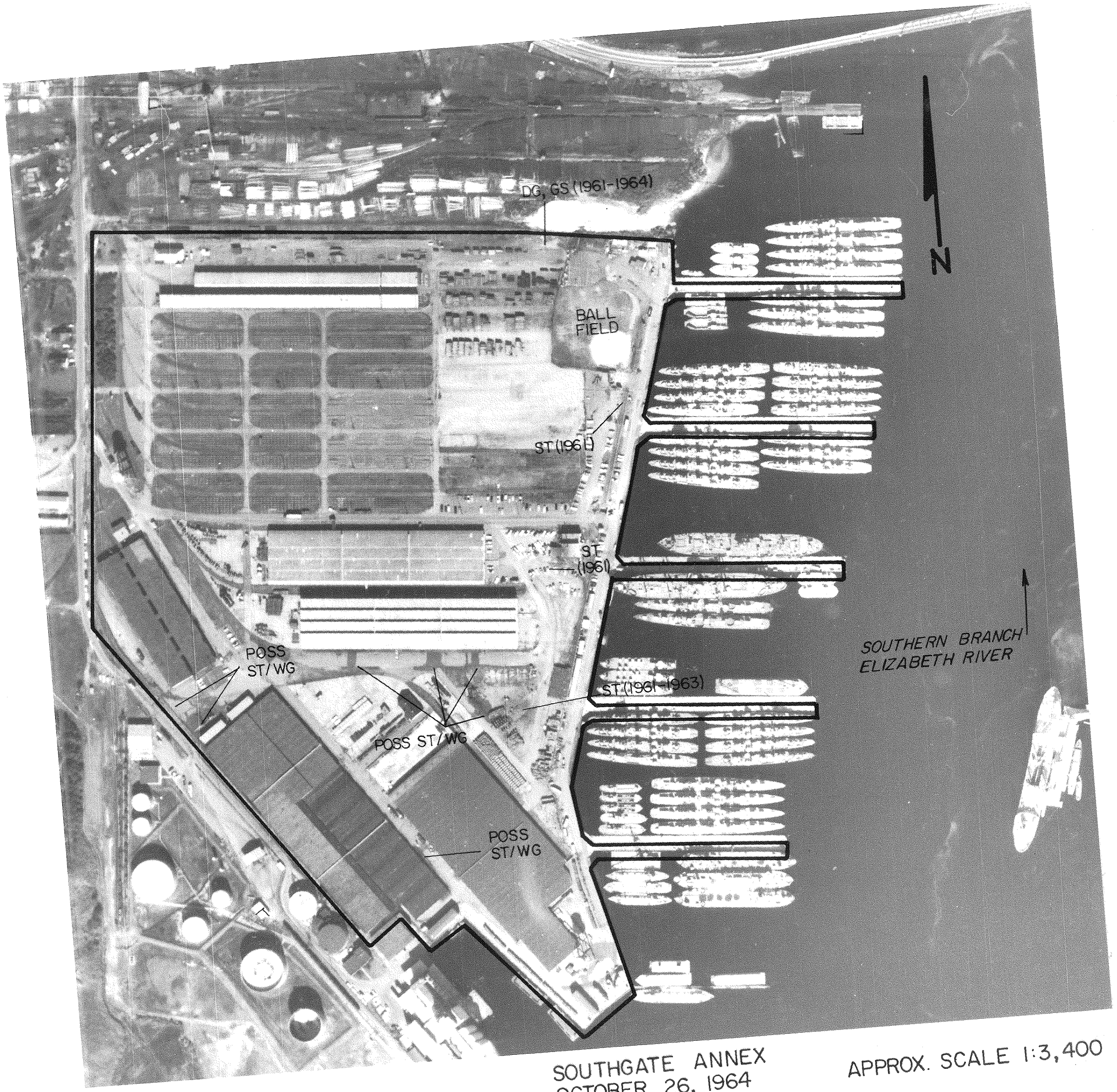
FIGURE 11
NORFOLK NAVAL SHIPYARD/
ANNEX AREAS

SOUTHGATE ANNEX
MAY 4, 1958

APPROX. SCALE 1:3,700

OCTOBER 26, 1964 (FIGURE 12)

This analysis includes annotated findings from the 1961 and 1963 aerial photography. Open storage activity continued on a reduced scale in all three years. Potentially environmentally significant findings from the analysis of these three years include disturbed ground and ground scars in the area possibly associated with acetylene waste; stains; possible stains and/or wet ground (WG).



SOUTHGATE ANNEX
OCTOBER 26, 1964

APPROX. SCALE 1:3,400

FIGURE 12
NORFOLK NAVAL SHIPYARD/
ANNEX AREAS

OCTOBER 10, 1974 (FIGURE 13)

This analysis includes annotated findings from the 1970 aerial photography. In 1970 open storage activity remained at a low level. A large rectangular lagoon, presumably the acetylene waste lagoon, was visible in the northeast section of the site. The lagoon appeared to be newly-constructed; distinct edges exhibited minimum signs of deterioration, which would be expected from long-term use. Light-toned material was seen inside and around the edges of the lagoon. A large area of disturbed ground, possibly a fill area, was north of the lagoon. Possible stains and/or wet ground were again visible throughout the site.

In 1974 there is a considerable increase in open storage activity. The inner area of the acetylene waste lagoon appears smaller and the shape is more irregular. Possible staining and disturbed ground are also noted.

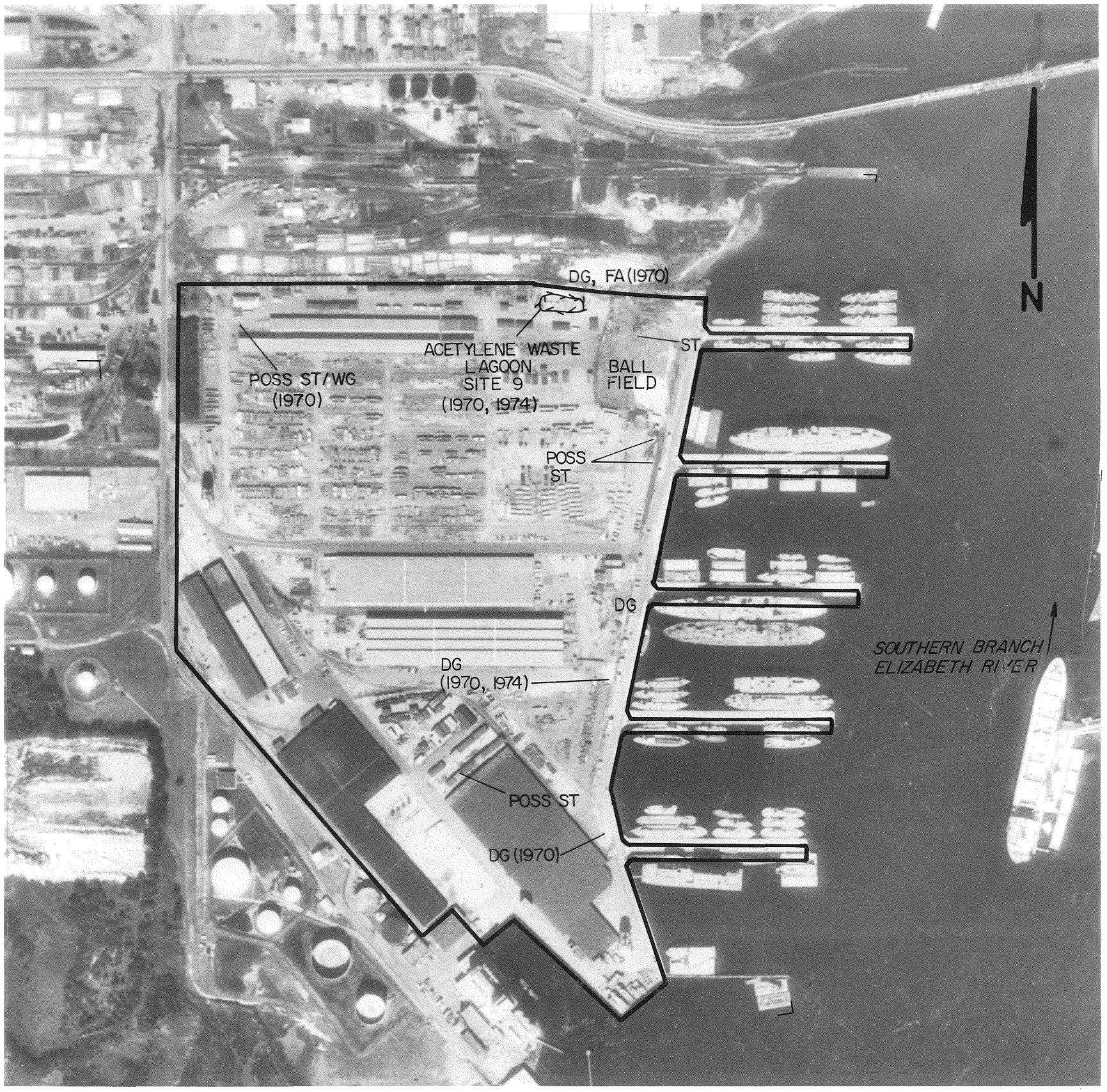


FIGURE 13
NORFOLK NAVAL SHIPYARD/
ANNEX AREAS

SOUTHGATE ANNEX
OCTOBER 10, 1974

APPROX. SCALE 1:4,100

APRIL 24, 1982 (FIGURE 14)

Open storage continues to be the primary activity at Southgate Annex. The acetylene waste lagoon remains visible, although the level of current use cannot be determined. Disturbed ground is visible north of the acetylene waste lagoon. A large pile of debris is east of the lagoon. Numerous cylindrical objects, possibly drums, are in the pile. A scrap pile and possible staining are also noted.

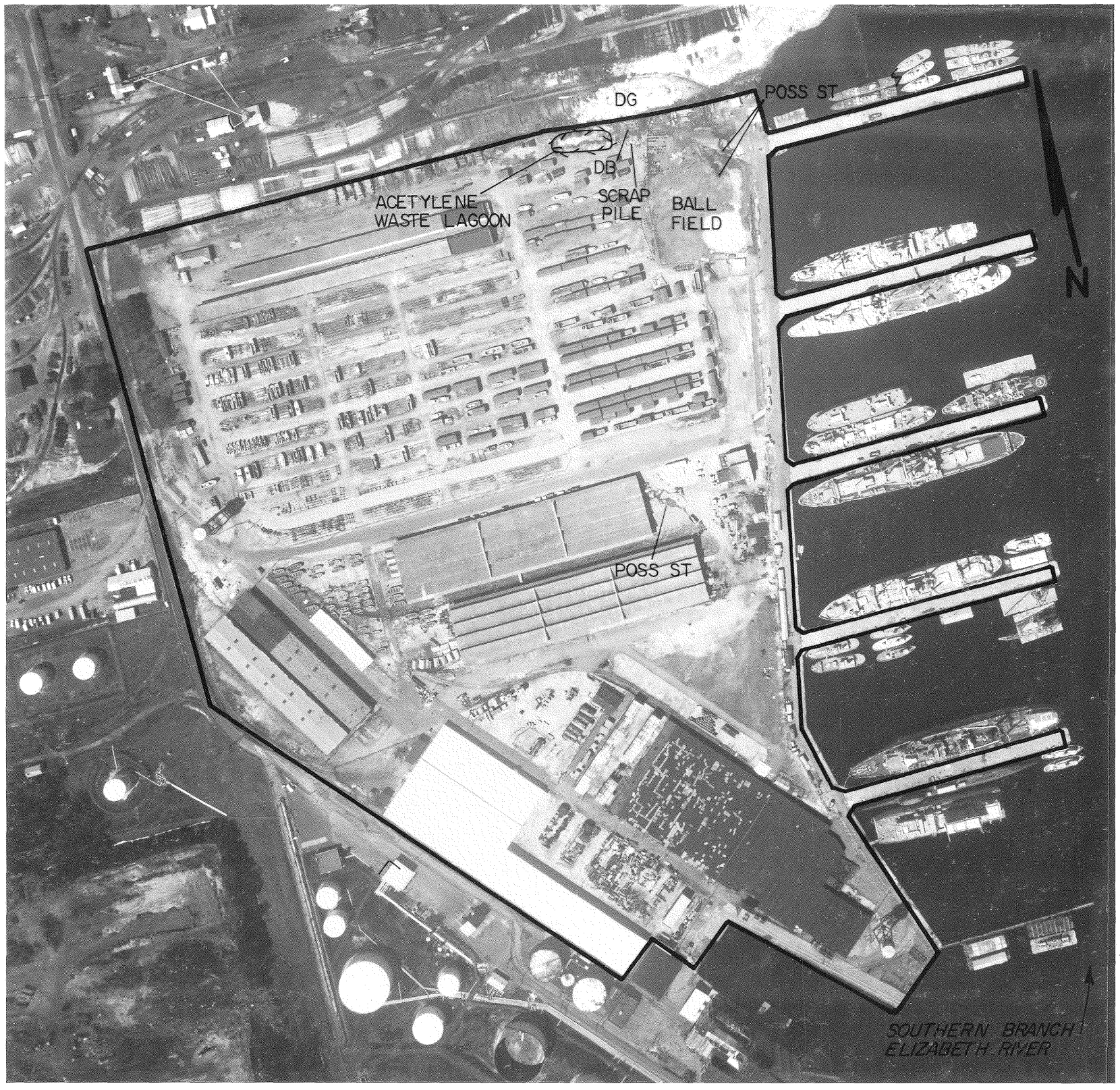


FIGURE 14
NORFOLK NAVAL SHIPYARD/
ANNEX AREAS

SOUTHGATE ANNEX
APRIL 24, 1982

APPROX. SCALE 1:3,100

St. Julian Creek Annex

MAY 20, 1937 (FIGURE 15)

This is the first year of available aerial photography covering St. Julian Creek Annex, which is located on the west bank of the Southern Branch of the Elizabeth River. St. Julian Creek and a smaller creek, Blows Creek, flow southeast into the Southern Branch of the Elizabeth River, which flows north. Drainage features will be annotated when visible but will not be discussed further unless a significant change is noted.

The site is partially developed. The lettering "HI-X" is noted at intervals around the perimeter of the developed portion of the site, presumably as a warning about high explosives. Individual open storage areas will be identified, however due to good overall housekeeping practices throughout the period of analysis, they will not be discussed unless a significant change occurs.

A clearing (CL) with possible waste disposal activity and a probable fill area are visible in the northern undeveloped portion of the site. Deposition of hydraulic spoil has occurred in the northeast corner of the site.

A possible waste disposal area with disturbed ground is visible in a low area adjacent to an inlet of St. Julian Creek. Light-toned mounded material and several clearings are noted nearby.

Additional potentially environmentally significant features include possible staining and possible excavations.

LEGEND

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MT - Medium-Toned
O - Object
OS - Open Storage Area
ST - Stain
SW - Solid Waste
TR - Trench
UST - Underground Storage Tank
VT - Vertical Tank
WDA - Waste Disposal Area
WG - Wet Ground
WWTP- Waste Water Treatment Plant

- Berm
- Drainage (Channelized)
- Drainage (Natural)
- Feature Boundary
- Fence
- Site Boundary

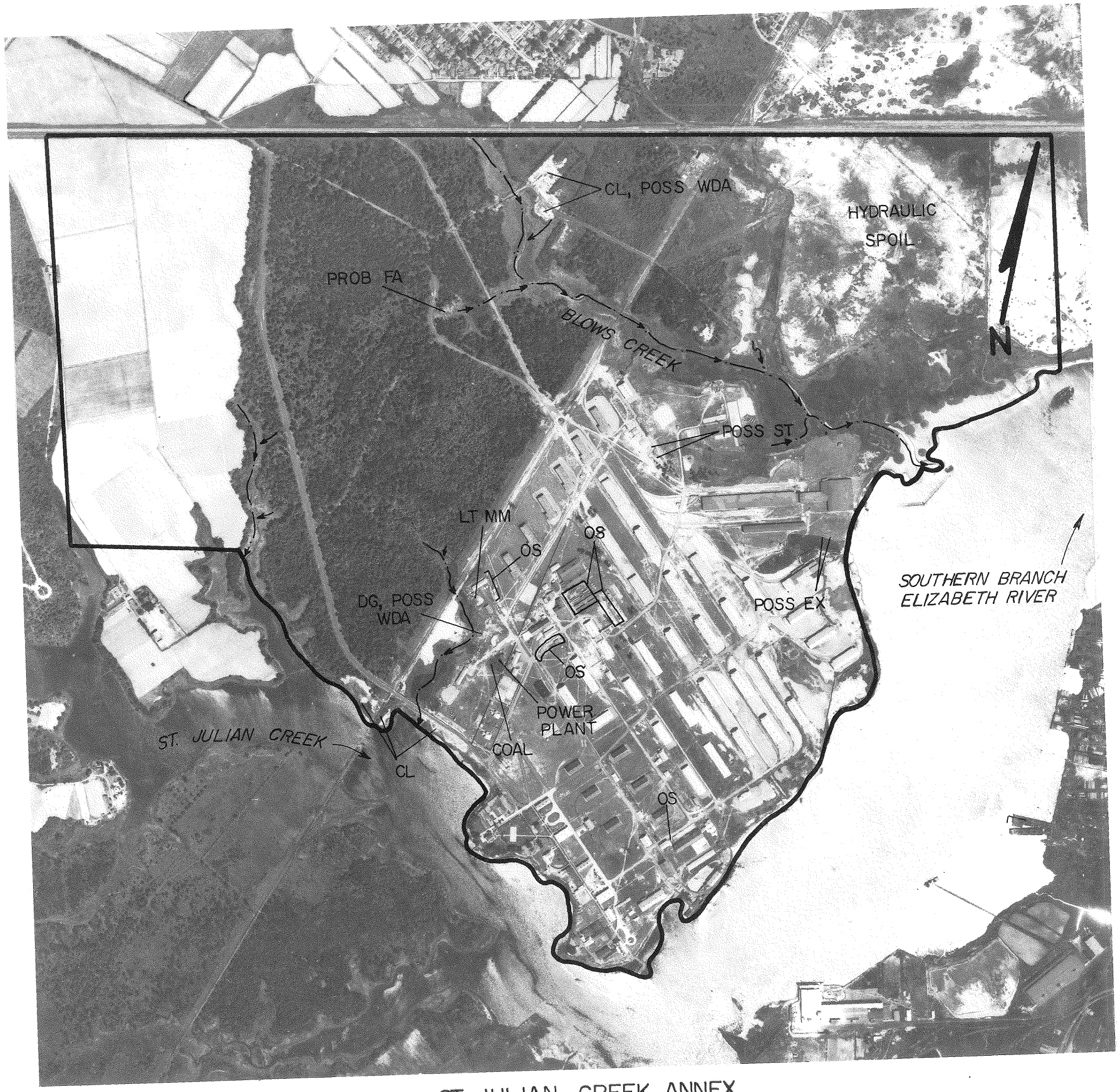

FIGURE 15
NORFOLK NAVAL SHIPYARD/
ANNEX AREAS

ST. JULIAN CREEK ANNEX
MAY 20, 1937

APPROX. SCALE 1:9,300

APRIL 9, 1949 (FIGURE 16)

Development of the northern and western portions of the site has occurred and includes two large underground storage tanks and a waste water treatment plant (WWTP). Many of the open storage areas contain linear objects.

A stain appears to originate from a small building in the northern portion of the site. Disturbed ground is noted at the end of an access road atop the historical hydraulic spoil disposal area.

Additional potentially environmentally significant activity includes three fill areas along tributaries of Blows Creek, light-toned mounded material and disturbed ground. Two of the fill areas are on either side of a bridge and may simply be riprap for erosion control. The disturbed ground is noted at the St. Julian Creek inlet where disturbed ground and a possible waste disposal area were previously seen.

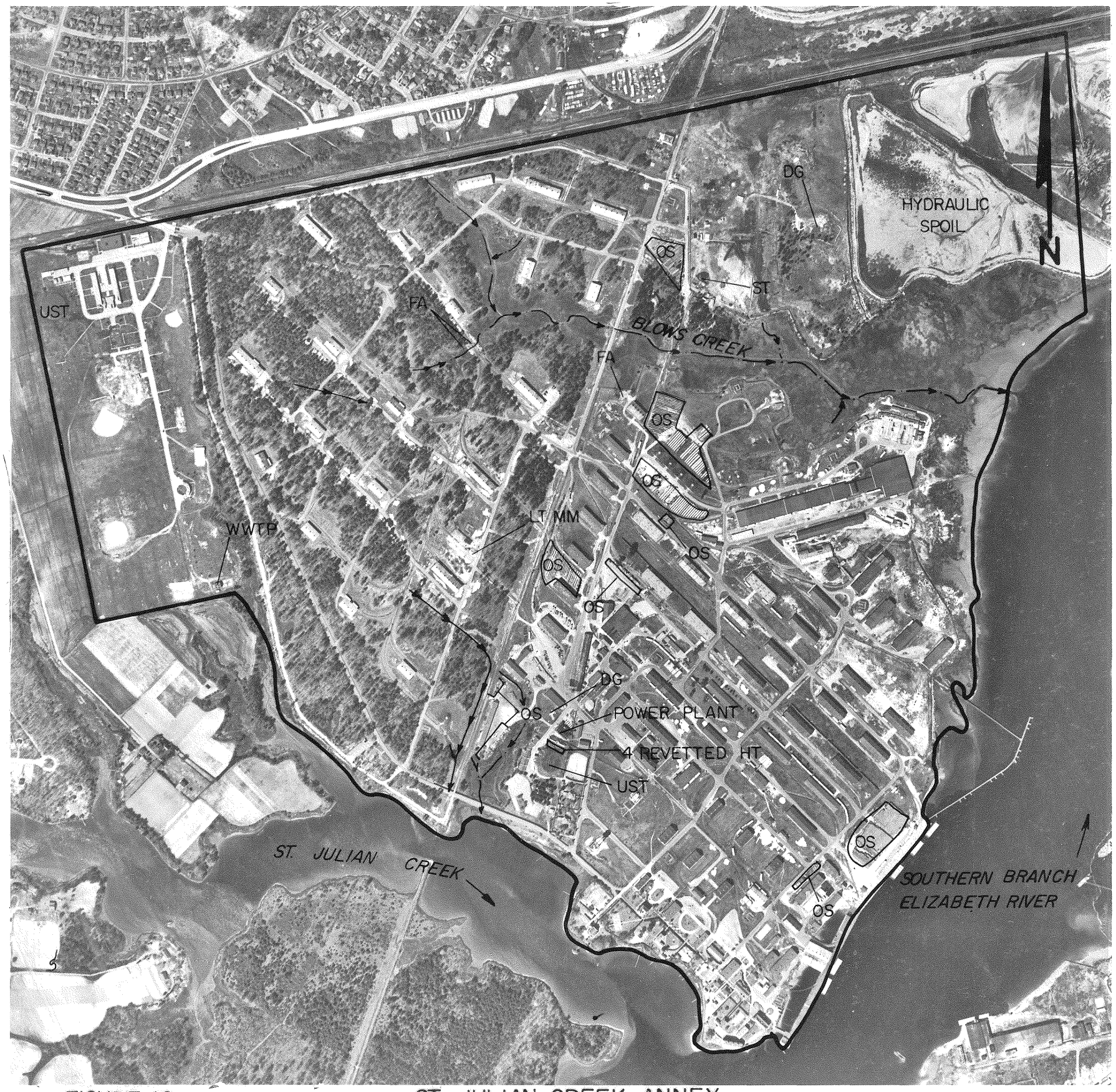

FIGURE 16
NORFOLK NAVAL SHIPYARD/
ANNEX AREAS

ST. JULIAN CREEK ANNEX
APRIL 9, 1949

APPROX. SCALE 1:8,500

MAY 4, 1958 (FIGURE 17)

Minimal site development has occurred since 1949 and open storage has decreased significantly. Stains and/or wet ground are noted in numerous locations onsite, however no distinction can be made between stains and/or wet ground from a recent rainfall.

A probable waste disposal area consisting of a probable pit and a berm is evident in the northeast corner of the site. A trench (TR) and disturbed ground are visible along nearby access roads.

Ground scarring and possible discarded objects are present immediately north of the waste water treatment plant. Discarded objects may be related to the construction of the building west of the treatment plant.

Light-toned mounded material, most likely fill dirt, has been deposited along the borders of the St. Julian Creek inlet in the southwest portion of the site.

FIGURE 17 ST. JULIAN CREEK ANNEX
NORFOLK NAVAL SHIPYARD/ MAY 4, 1958 APPROX. SCALE 1:9,000
ANNEX AREAS

OCTOBER 26, 1964 (FIGURE 18)

The 1964 analysis includes findings from the 1961 aerial photography.

The majority of the open storage areas are concentrated in the southern half of the site in 1961 and 1964. No other significant findings were noted in this portion of the site in 1961.

In 1961 a pit and mounded material were visible within the bermed area at the probable waste disposal area in the northeast corner of the site. This area remained in 1964, although it appeared less active. A possible fire training area, possible excavations and two waste disposal areas were also observed in the northeast portion of the site. The possible fire training area is characterized by a typical signature pattern where an access road enters a central point with four pathways which extend outward to stained areas. A similar feature was observed at this location in 1958; however, it could not be determined what type of activity was underway at that time. The possible excavations consisted of a row of rectangular excavations, approximately the size of a medium-sized car, and were located west of a solitary tree. Dark-toned piles of material and/or objects are visible in the two waste disposal areas which are located north of Blows Creek.

Two probable waste disposal areas were evident south of Blows Creek in 1961.

In 1961 a large area of dark-toned mounded material, possibly coal, was west of a revetment with six possible horizontal tanks (HT). In 1964 the area of dark-toned mounded material was smaller and the six possible horizontal tanks were no longer present within the revetment.

In 1964 three fill areas are noted along the St. Julian Creek inlet. Disturbed ground is also noted nearby. No evidence of disposal activities are observed at any of these locations. A heavily stained area is noted to the north along a rail spur between two buildings.

FIGURE 18
NORFOLK NAVAL SHIPYARD/
ANNEX AREAS

ST. JULIAN CREEK ANNEX
OCTOBER 26, 1964

APPROX. SCALE 1:8,100

OCTOBER 10, 1974 (FIGURE 19)

The 1974 analysis includes findings from the 1970 and 1976 aerial photography. All open storage areas annotated, except one active only in 1976, were present in all three years.

In 1970 a large pit containing liquid (LQ), an impoundment (IM) and two waste disposal areas were evident in the northeast section of the site. In 1974 the pit and impoundment are no longer visible, and a dark-toned stain/material is noted. A tower located nearby in 1974 and 1976 remains throughout the analysis. In 1976 the surrounding ground exhibits a damp patchy signature with undistinguishable objects/material along the edge. A possible waste disposal area nearby lies in the center of a circular mound of material in both 1974 and 1976.

In 1974 a new waste disposal area along a tributary of Blows Creek is characterized by an elongate, partially vegetated mound of light-toned material. Several nearby fill areas are revegetated by 1976.

In 1970 the waste disposal areas north of Blows Creek were enlarged, contained considerable amount of solid waste, and by 1974 they have merged into one. A pile of solid waste and a trench containing solid waste are present. In 1976 mounds of material, possibly cover material, are noted on the surface.

No significant changes are noted at the possible fire training area in 1970 and 1974; in 1976 wet ground/staining is noted along the access road into the area.

In 1970 a material storage area was present near the center of the site, and in 1974 pooled liquid borders one of the cells. A partially vegetated mound of light-toned material is at the southeast end of the material storage area. In 1970 coarse-textured, medium-toned mounded material was visible where dark-toned material (possibly coal) was in 1964. In 1974 and 1976 these features remain, with the exception of the pool of liquid.

In 1970 filling continued along the St. Julian Creek inlet, a mound of coarse-textured material was seen to the north and staining was again noted along the rail spur. These features remain visible in 1974 and 1976.

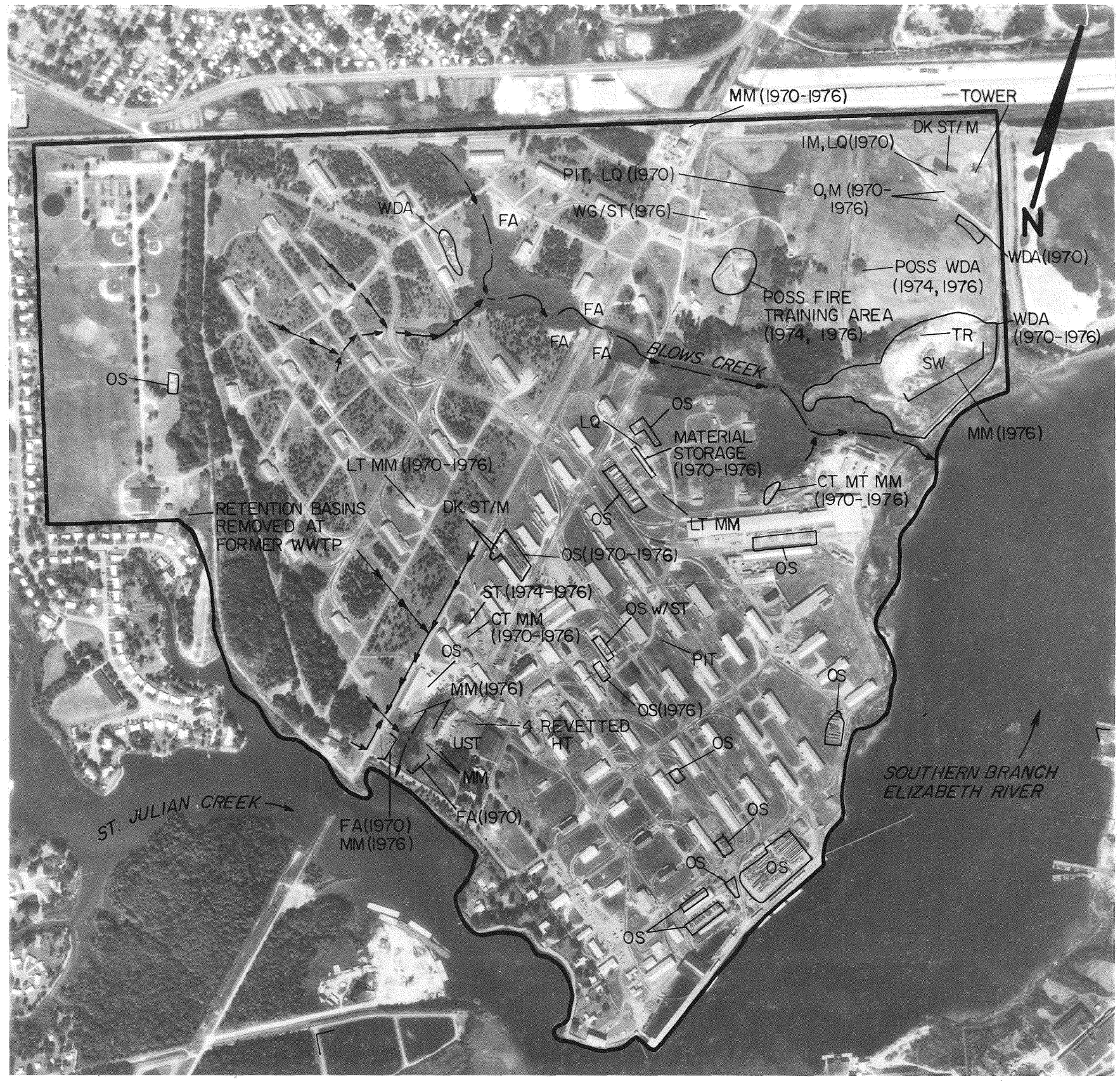

FIGURE 19
NORFOLK NAVAL SHIPYARD/
ANNEX AREAS

ST. JULIAN CREEK ANNEX
OCTOBER 10, 1974

APPROX. SCALE 1:8,800

JUNE 9, 1986 (FIGURE 20)

The 1986 analysis also includes significant findings from the 1981, 1982 and 1985 photography. The majority of the open storage areas were operative, and minimal activity was noted in the northeast corner of the site during this period (1981-1986).

Few changes were evident on the 1981 photography. The possible fire training area was no longer present in 1981. The waste disposal area north of Blows Creek remained active. The waste disposal area was graded, with several piles of light- and dark-toned material atop the graded surface in 1982. Debris was scattered across the southwestern portion of the waste disposal area and in the tidal wetlands south of the fill face. The debris remains in the tidal wetlands in 1986.

A salvage yard was first visible in the 1985 photography. Large piles of scrap were present and open storage areas were situated on the north and southeast ends of the salvage yard.

In 1985 mounded material, possibly for filling, was present along the inlet of St. Julian Creek. By 1986 this area is graded and in use for parking. Staining remained at the nearby railway spur during 1981-1986.

FIGURE 20
NORFOLK NAVAL SHIPYARD/
ANNEX AREAS

ST. JULIAN CREEK ANNEX
JUNE 9, 1986

APPROX. SCALE 1:8,000

MARCH 4, 1990 (FIGURE 21)

Few potentially environmentally significant findings were observed in the 1990 aerial photography. Due to a recent rainfall, staining cannot be distinguished from wet ground.

Probable construction materials are noted in an open storage area north of the former possible fire training area. Containers and bins are evident in an open storage area at the former waste disposal area north of Blows Creek. Debris remains in the tidal wetlands to the southwest but is overgrown with vegetation.

The salvage yard remains active with large scrap piles, and the adjacent open storage areas have expanded. Debris, vegetated mounded material and mounded material intermixed with debris are present within the vicinity of the salvage yard. The debris is located along a creek embankment and the mounded material intermixed with debris is situated beside a low-lying wet area. Light-toned mounded material, an extraction and two vertical tanks are noted to the east. The light-toned mounded material is piled against the front of a bunker, and the extraction is at an area where dark-toned mounded material was noted from 1961-1964, coarse-textured medium-toned mounded material was noted from 1970-1976 and ground scars were noted in 1986.

A long narrow building formerly located west of the underground storage tank has been removed and disturbed ground is visible nearby.

FIGURE 21
NORFOLK NAVAL SHIPYARD/
ANNEX AREAS

ST. JULIAN CREEK ANNEX
MARCH 4, 1990

APPROX. SCALE 1:7,600

REFERENCES

AERIAL PHOTOGRAPHY

Date	Agency	Mission Code	Agency Frame #	Film Type[1]	Orig. Scale	EPIC Frame #
05/20/37	NARA[2]	FG	131:78,79, 98-101	BW	1:20,000	3373:84-87, 106,107
08/25/44	NOS[3]	44C	3279-3281	BW	1:24,000	25693-25695
04/09/49	NARA	DGF	3E:66-69, 91-93	BW	1:20,000	13033:180-183, 158-160
05/04/58	ASCS[4]	DGF	2V:92-95, 131,132	BW	1:20,000	13030:55,56, 80-83
09/12/61	VDOT[5]	5-124	080:193-195	BW	1:24,000	13514-13516
03/30/63	USGS[6]	VAPM	1:113-116	BW	1:24,000	2971:177-180
10/26/64	ASCS	DGF	4EE:252-254, 213-216	BW	1:20,000	13031:007-009, 35-38
05/06/70	VDOT	DGF	369:179-183, 219,220	BW	1:20,000	42862-42868
10/11/71	VDOT	5-124	412:38-40	BW	1:6,000	13526-13528
10/10/74	NOS	74S	3960-3962	BW	1:30,000	26904-26906
02/04/76	VDOT	5-124 5-131	524:025-027; 523:198-202	BW	1:12,000	42739-42747
03/13/81	ASCS	51550	178:35-38	BW	1:40,000	13029:151-154
04/24/82 365	EPA[7]	82/130	363-365,	CC	1:6,000	82/130:363- 375-378375-378

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[1]Film type identification: B&W - Black-and-White, CIR - Color Infrared, CC - Conventional Color

[2]National Archives and Records Administration, Washington, D.C.

[3]National Ocean Survey, U.S. Department of Commerce

[4]Agricultural Stabilization and Conservation Service, U.S. Department of Agriculture

[5]Virginia Department of Transportation, Richmond, Virginia

[6]U.S. Geological Survey, U.S. Department of the Interior

[7]U.S. Environmental Protection Agency

REFERENCES (cont'd)

AERIAL PHOTOGRAPHY

Date	Agency	Mission Code	Agency Frame #	Film Type	Orig. Scale	EPIC Frame #
02/09/85	VDOT	5-122 5-124 5-131	759:221; 222,273-277; 760:20,21	BW	1:12,000	13399,13400, 13412-13416, 13442,13443
06/09/86	EPA	86/029	47-53	CC	1:12,000	86/029:47-53
03/04/90	HRPDC[1]	PDC20	214:152-155 215:146-149 216:144-147	BW	1:12,000	42884-42895

MAPS

Source	Name	Scale	Date
USGS	Norfolk South, VA	1:24,000	1986

PUBLICATIONS

Heskett, J.L. 1987. Site Analysis, Norfolk Naval Shipyard, Norfolk, Virginia. U.S. Environmental Protection Agency, Environmental Photographic Interpretation Center. Report No. TS-PIC-87103.

Heskett, J.L. 1986. Interim Facilities Inspection. U.S. Environmental Protection Agency, Environmental Photographic Interpretation Center. Report No. TS-PIC-86079.

Norton, D.J., J.L. Heskett, and S.M. Hodges. 1987. Inventory of Potential Hazardous Waste Sites, Elizabeth River Area, Virginia. U.S. Environmental Protection Agency, Environmental Photographic Interpretation Center. Report No. TS-PIC-85168.

[1]Hampton Roads Planning District Commission, Chesapeake, Virginia