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350SERBSF10,620

Site Name (Subject):	SOUTHERN WOOD PIEDMONT COMPANY
Site ID (Document ID):	NCD058517467
Document Name (DocType):	Preliminary Assessment/Site Inspection (PA/SI)
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SOUTHERN WOOD PIEDMONT COMPANY
SITE INSPECTION PRIORITIZATION
NCD 058 517 467
REFERENCES
(2 - 12)
JANUARY 1995

Southern Wood Piedmont Company

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Ref. 2

LATITUDE AND LONGITUDE CALCULATION WORKSHEET #2
LI USING ENGINEER'S SCALE (1/60)

SITE NAME: Southern Wood Piedmont Wilmington CERCLIS #: NCD. 058-517.467

AKA: SSID:

ADDRESS: Greenfield Street

CITY: Wilmington NC STATE: NC ZIP CODE: 28401

SITE REFERENCE POINT: Geometric Center

USGS QUAD MAP NAME: Wilmington TOWNSHIP: ____ N/S RANGE: ____ E/W

SCALE: 1:24,000 MAP DATE: 1970/79 SECTION: ____ 1/4 ____ 1/4 ____ 1/4

MAP DATUM: (1927) 1983 (CIRCLE ONE) MERIDIAN:

COORDINATES FROM LOWER RIGHT (SOUTHEAST) CORNER OF 7.5' MAP (attach photocopy):

LONGITUDE: 77 ° 52 ' 30 " LATITUDE: 34 ° 07 ' 30 "

COORDINATES FROM LOWER RIGHT (SOUTHEAST) CORNER OF 2.5' GRID CELL:

LONGITUDE: 77 ° 55 ' 00 " LATITUDE: 34 ° 12 ' 30 "

CALCULATIONS: LATITUDE (7.5' QUADRANGLE MAP)

A) NUMBER OF RULER GRADUATIONS FROM LATITUDE GRID LINE TO SITE REF POINT: 75

B) MULTIPLY (A) BY 0.3304 TO CONVERT TO SECONDS:

A x 0.3304 = 24.8 "

C) EXPRESS IN MINUTES AND SECONDS (1'= 60"): 0 ' 25 . 0 "

D) ADD TO STARTING LATITUDE: 34 ° 12 ' 30 . 0 " + 0 ' 25 . 0 =

SITE LATITUDE: 34 ° 12 ' 55 . 0 "

CALCULATIONS: LONGITUDE (7.5' QUADRANGLE MAP)

A) NUMBER OF RULER GRADUATIONS FROM RIGHT LONGITUDE LINE TO SITE REF POINT: 367

B) MULTIPLY (A) BY 0.3304 TO CONVERT TO SECONDS:

A x 0.3304 = 121.3 "

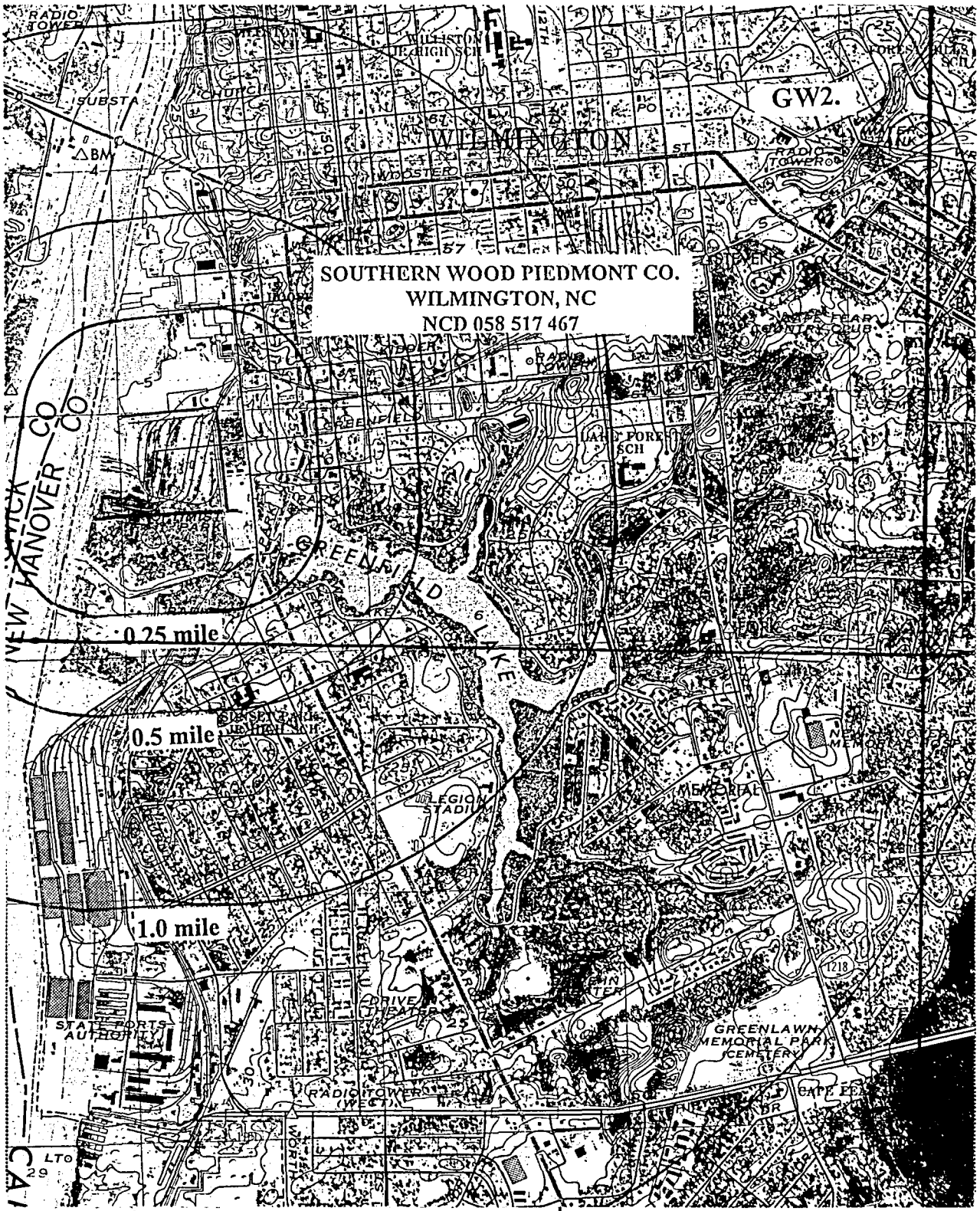
C) EXPRESS IN MINUTES AND SECONDS (1'= 60"): 2 ' 1 . 3 "

D) ADD TO STARTING LONGITUDE: 77 ° 55 ' 00 . 0 " + 2 ' 1 . 3 =

SITE LONGITUDE: 77 ° 57 ' 1 . 5 "

INVESTIGATOR: [illegible] DATE: 7/15/94

SITE NAME: Southern Wood Piedmont Wilmington NUMBER: NCD 058517467



TOPOGRAPHIC MAP QUADRANGLE NAME: WILMINGTON SCALE: 1:24,000

COORDINATES OF LOWER RIGHT-HAND CORNER OF 2.5-MINUTE GRID:

LATITUDE: 34° 12' 30" LONGITUDE: 77° 55' 0"

NORTH CAROLINA ATLAS

PORTRAIT OF A CHANGING SOUTHERN STATE

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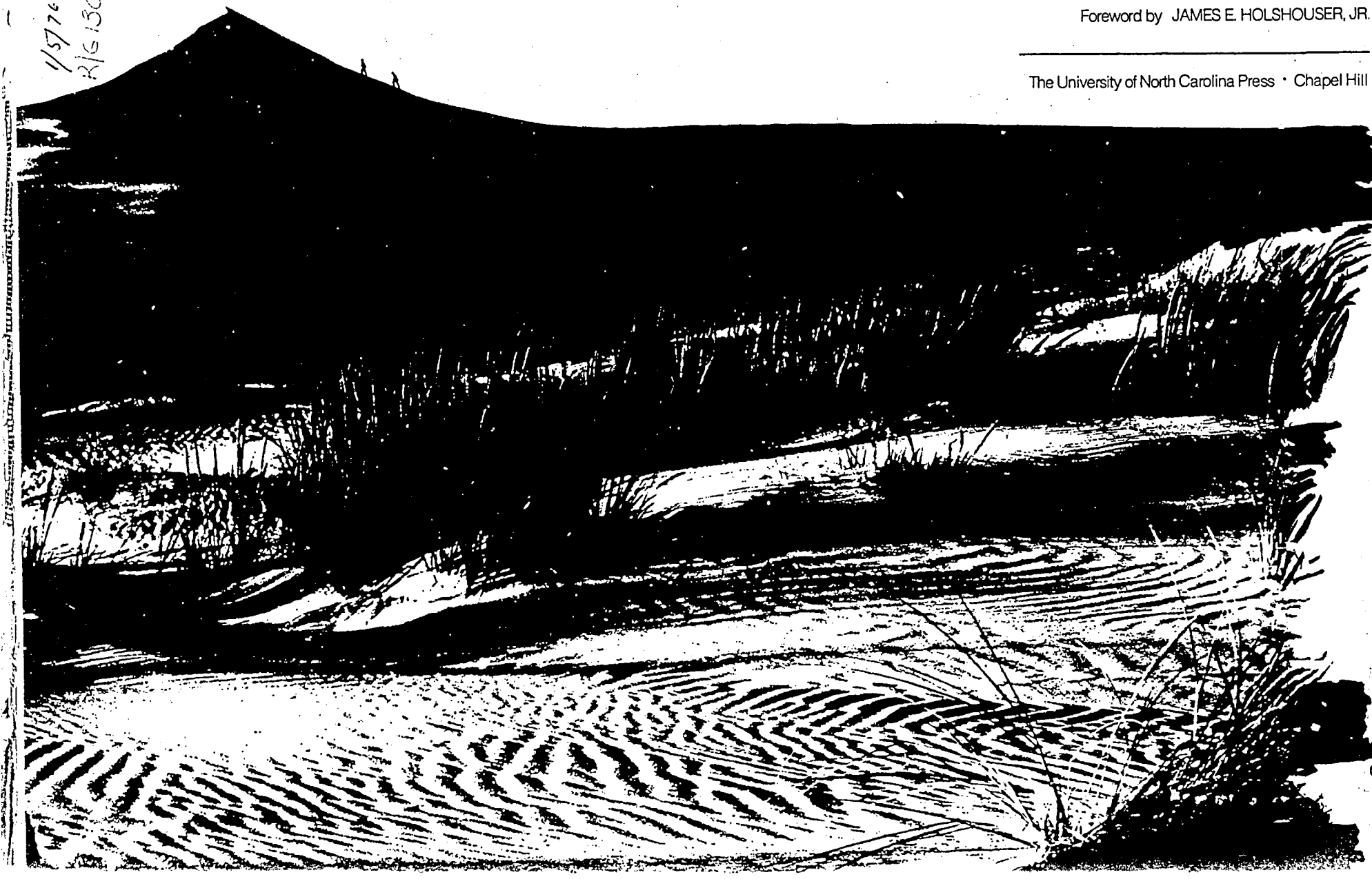
Edited by JAMES W. CLAY
DOUGLAS M. ORR, JR.
ALFRED W. STUART

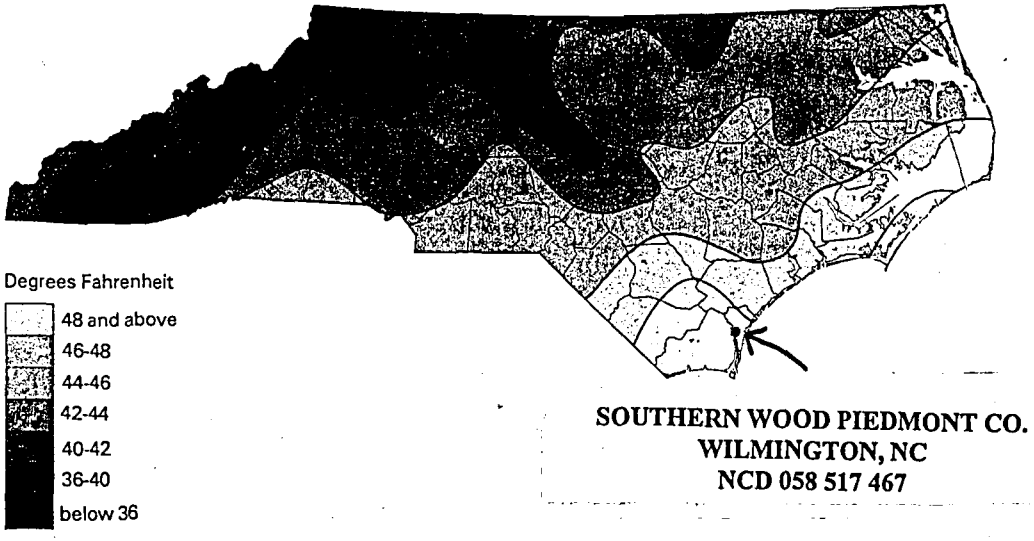
Foreword by JAMES E. HOLSHOUSER, JR.

The University of North Carolina Press · Chapel Hill



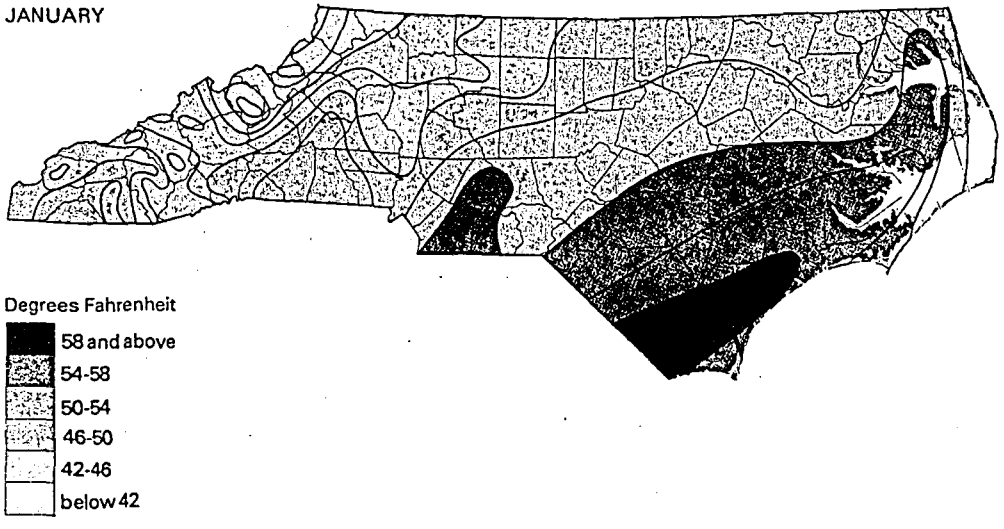
Ref 3

ure Average January Temperatures in N.C.



Source: U.S. Department of Commerce, *Weather and Climate in North Carolina,* 1972.

Figure 5.3. Mean Maximum Temperature in N.C.



Source: U.S. Department of Commerce, *Weather and Climate in North Carolina,* 1972.

Seasonal Changes in Climate

Winter The alternate passage of low- and high-pressure systems over the state during winter months results in changing weather conditions. Moisture and warmer temperatures are characteristically associated with frequently passing low-pressure cells. Lows are followed by polar highs, which bring lower temperatures and clear skies. However, even when under the influence of these polar highs, temperatures seldom fall below 10° F., and midday temperatures reach into the forties, making the winter season very tolerable by northern standards.

January average temperatures shown in Figure 5.2 illustrate the mildness of winters. Only at the highest elevations do temperatures average below freezing. The mean temperature for January at Mount Mitchell is 28.7° F., the lowest in the state. Yet, at Asheville, located on the lee side of the mountains, temperatures for January average 39.4° F.

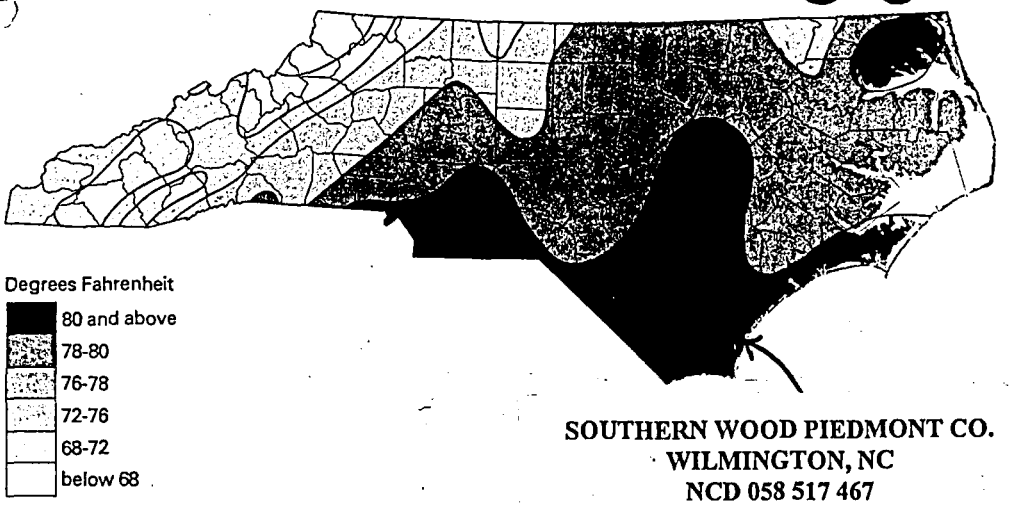
Nowhere else in North Carolina is the local contrast in temperatures as great as in the western counties. Temperature contrasts are least where the climate is mildest. Hatteras, on the Outer Banks, has a January mean of 48.0° F., and only thirteen days each year when temperatures of 32° F. and below are recorded.

The tendency for January isotherms to parallel the coast shows the influence of the Atlantic Ocean. Wilmington, in southeastern North Carolina, the most subtropical area in the state, exemplifies the maritime effect. This coastal city has a January mean temperature of 47.8° F., and an average of only eight days during January when temperatures dip to 32° F. or less, as compared with eighteen days at Raleigh and nineteen at Asheville.

In the Piedmont, latitude is the primary control on temperature, and the isotherms maintain a zonal pattern. As might be expected, temperature averages lie between those exhibited by the surrounding regions. Charlotte has a mean January temperature of 42.3° F., Greensboro, 39.0° F., and Raleigh, 42.7° F.

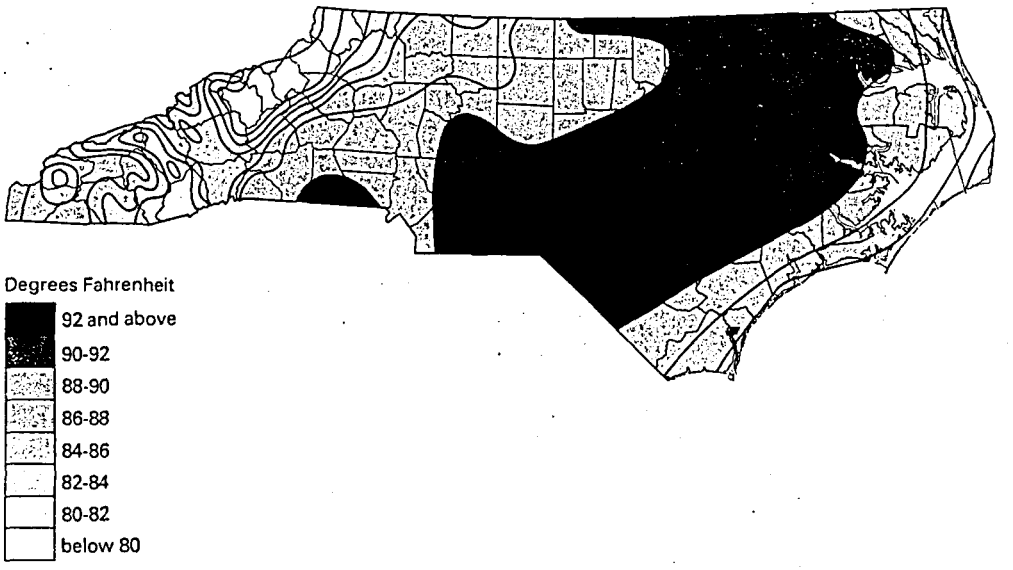
However, whereas Asheville averages eighty-three days each year when temperatures drop below freezing, Winston-Salem has freezing temperatures eighty-eight days annually, and Greensboro has eighty-four days with freezing temperatures.

Figure 5.9. Average July Temperature in N.C.



Source: U.S. Department of Commerce, *Weather and Climate in North Carolina,* 1972.

Figure 5.10. Mean Maximum July Temperature in N.C.



Source: U.S. Department of Commerce, *Weather and Climate in North Carolina,* 1972.

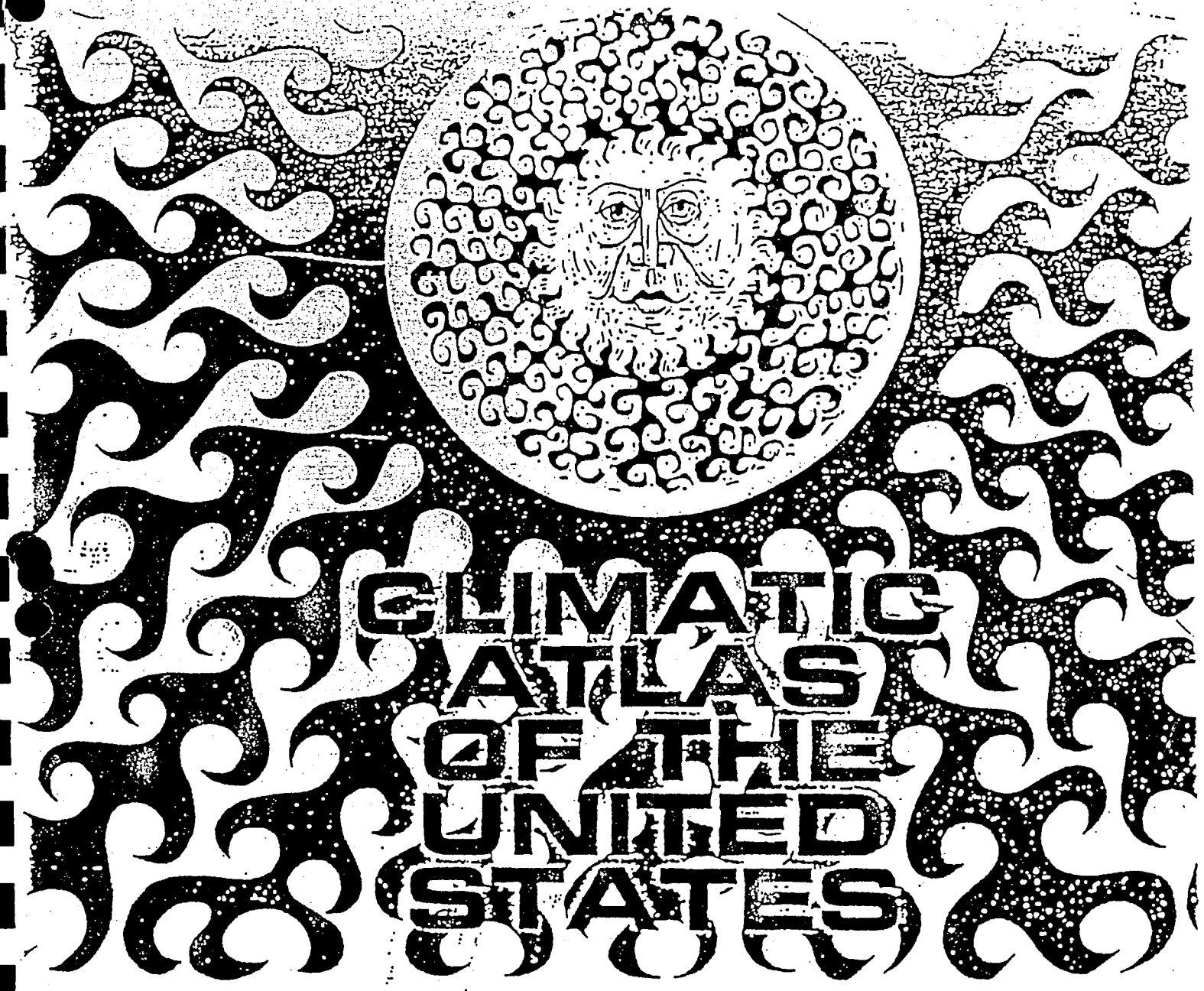
These strip-like regions have longer fre[illegible]-fre[illegible]easons and thereby show earlier dates for the [illegible] of t[illegible]eeze period than their surroundings. They support frost-susceptible vegetation long after the greenery has disappeared in nearby areas. Often in early winter or even in midwinter a contrasting belt of green flanked above and below by brown may be seen. These green belts are characteristically located along slopes that face the winter sun, are protected from cold northern winds, and have cold air drainage to lower valleys. The blossoming of dogwood and redbud moves across the state in a pattern similar to that of the end of the freeze season to blanket North Carolina with color and beauty.

Summer Summer is characterized by its high temperatures, high humidities, high amounts of rainfall, and high physiological stress. Except for the amelioration of these climatic elements in the Mountains, and the relief afforded by sea breezes along the coast, elsewhere in the state summer is a season of extremes. Mean monthly minimum temperatures for July and August are in the upper seventies and eighties and mean maximum temperatures reach into the nineties.

However, to quote a popular adage, "it's not the heat but the humidity," and North Carolina's temperatures in combination with the high water vapor amounts prevalent during the summer months are definitely uncomfortable. In addition, high sunshine percentages and a predominance of southerly winds tend to aggravate an already unpleasant climatic condition. Only the periodic passage of cool, dry air masses from the north and sea breezes in the coastal areas alleviate the discomfort of summer weather for North Carolina's low-lying counties.

July Average Temperatures The pattern of mean temperatures in July is similar to the pattern in January (Figure 5.9). However, in the Piedmont and Coastal Plain, isotherms are fewer in number and farther apart. In the Mountains, the reverse is true. The widespread isotherms east of the Mountains indicate that temperature averages across central and eastern North Carolina exhibit little contrast. From the western Piedmont to the coast, the difference in mean temperatures is only 4° F. Although the influence of the ocean is not evident in the arrangement of isotherms, the high temperatures of the Coastal Plain are made less severe by the cooling power of the sea breeze. Hatteras, on the Outer Banks, records a temperature of 90° F. on the average of only one day each year, while Wilmington, a short distance from the coast, has an occurrence of 90° F. temperatures about twenty-four days annually. In contrast with these locations, Raleigh and Winston-Salem mean temperatures for July are slightly lower, but the average number of days on which a temperature of 90° F. or above is experienced increases to more than forty.

Ref. 4



CLIMATIC ATLAS OF THE UNITED STATES

RCE . Environmental Science Services Administration . Environmental Data Service

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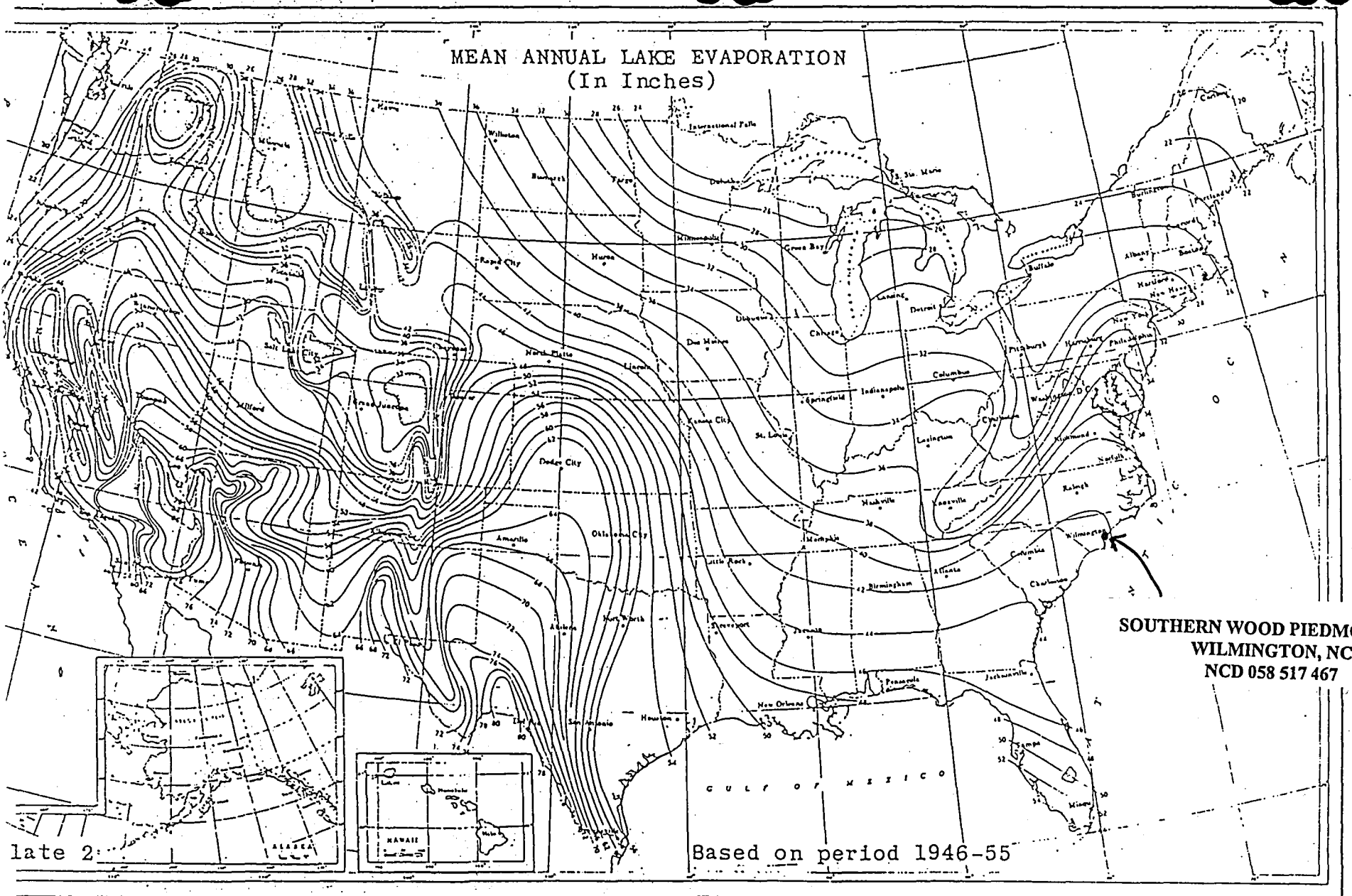
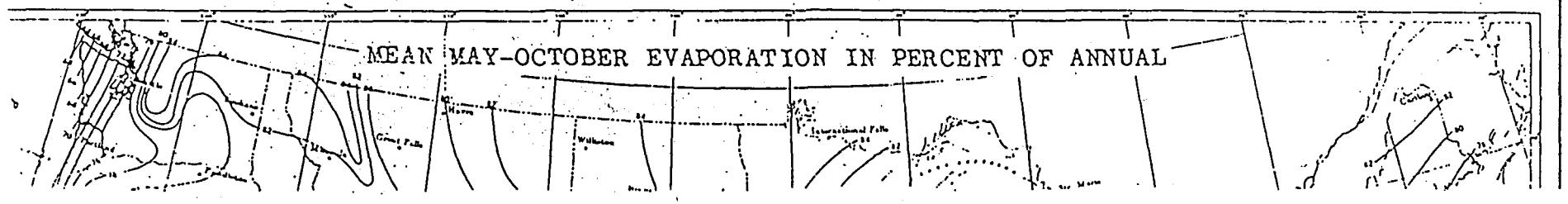
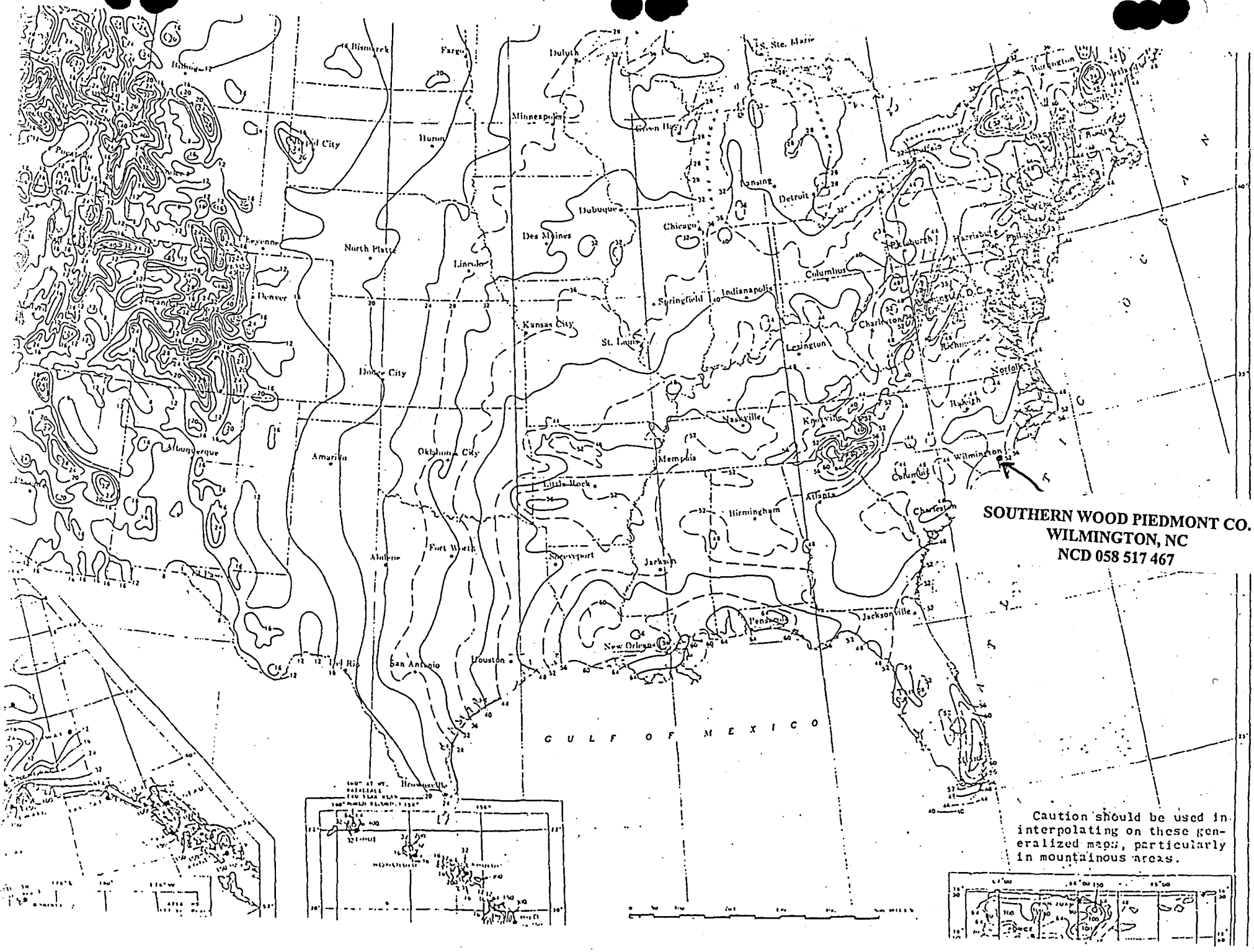


SOUTHERN WOOD PIEDMONT CO.
WILMINGTON, NC
NCD 058 517 467

late 2



MEAN ANNUAL TOTAL PRECIPITATION (INCHES)



SOUTHERN WOOD PIEDMONT CO.
WILMINGTON, NC
NCD 058 517 467

Caution should be used in interpolating on these generalized maps, particularly in mountainous areas.

Ref. 5

FIT R-586-4-6-17

SITE SCREENING INVESTIGATION
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

Prepared Under
TDD NO. F4-8411-0#
CONTRACT NO. 68-01-6699

Revision 0

FOR THE

AIR AND WASTE MANAGEMENT DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

APRIL 18, 1986

NUS CORPORATION
SUPERFUND DIVISION

CERCLA

Prepared By	Reviewed By	Approved By
B. Hansen Benoy	Philip Blackwell	Murray Warner, P.E.
Chemist	Assistant Regional Project Manager	Regional Project Manager

THEY DESCRIBED THE SAME 4 SAMPLING POINTS ON CAPE FEAR RIVER THAT ARE ON FILE AT DENR.

A PARTIALLY PAVED ROAD THAT TURNS 90° LEFT FROM SITE ENTRANCE BECOMES A NARROW DIRT ROAD (FLOODED DURING HIGH TIDE) WHICH RUNS DOWN TO THE MOUTH OF GREENFIELD CREEK, WHERE IT ENTERS CAPE FEAR RIVER. A TIDAL GATE IS REPORTEDLY INSTALLED THERE. THE ROAD IS POSTED WITH DANGER SIGNS DUE TO FLOODING, SNAKES, AND ALLIGATORS, etc.

NO STRUCTURES ON SITE, ONLY CONCRETE SLABS IN A FEW PLACES. ONE CIRCULAR SLAB IN S CTR OF THE SITE WAS FORMERLY BASE OF ~~BOILER~~ / DIESEL FUEL TANK FOR BOILER/GENERATOR. SOME RR TIES STILL IN GROUND NEAR THE WATERFRONT.

EXAMINED DRAINAGE DITCH ON SE CORNER OF SITE — NO SHEENS / STAINS, OR APPARENT CONTAMIN. THICK VEGETATION.

~~CAPE~~ DITCH WAS FULL BUT NOT VISIBLY

A J Kay 8/2/94

FLOWING. DITCH FLOWS TO GREENFIELD CREEK AND IS REPORTEDLY INFLUENCED BY TIDES, THOUGH THE TIDE GATE (RECENTLY CONSTRUCTED) LIMITS THIS, ALSO TO SWP PERSONNEL.

RAYMOND KNOX GAVE US A COPY OF THEIR PHASE ~~III~~ FINAL GW EVALUATION REPORT. THIS REPORT, NOT ON FILE W/ SUPERFUND, ~~REPORT~~ IS LOADED WITH CLP DATA. KNOX AND ~~[illegible]~~ INDICATED THEY WOULD FREELY SHARE ANY OF THE REFERENCED DATA WITH US

IGUD MET WITH H LAMBIN BEDSOLE, STATE PORT AUTHORITY ABOUT SITE AT HIS OFFICE — HE WAS CURIOUS ABOUT POTENTIAL REPERCUSSIONS FOR SWP, IE. LIKELIHOOD THAT STATE/FEDS WILL ENFORCE THE CLEANUP WITH SWP.

REPORTS HAVE GONE TO D HOLLYFIELD DIR. OF RISK ASSESS FOR LFARMS AREAS ETC. OTHER REPS

SFR PHOTOGRAPHED SITE FEATURES, EXAMINED LOCAL INDUSTRIES AND LEFT SITE.

A J Kay 8/2/94

Ref. 6

THEY DESCRIBED THE SAME 4 SAMPLING POINTS ON CAPE FEAR RIVER THAT ARE ON FILE AT DENR.

A PARTIALLY PAVED ROAD THAT TURNS 90° LEFT FROM SITE ENTRANCE BECOMES A NARROW DIRT ROAD (FLOODED DURING HIGH TIDE) WHICH RUNS DOWN TO THE MOUTH OF GREENFIELD CREEK, WHERE IT ENTERS CAPE FEAR RIVER. A TIDAL GATE IS REPORTEDLY INSTALLED THERE. THE ROAD IS POSTED WITH DANGER SIGNS DUE TO FLOODING, SNAKES, AND ALLIGATORS, etc.

NO STRUCTURES ON SITE, ONLY CONCRETE SLABS IN A FEW PLACES. ONE CIRCULAR SLAB IN S CTR OF THE SITE WAS FORMERLY BASE OF ~~BOILER~~ / DIESEL FUEL TANK FOR BOILER/GENERATOR. SOME RR TIES STILL IN GROUND NEAR THE WATERFRONT.

EXAMINED DRAINAGE DITCH ON SE CORNER OF SITE — NO SHEENS / STAINS, OR APPARENT CONTAMIN. THICK VEGETATION.

~~CAPE~~ DITCH WAS FULL BUT NOT VISIBLY

A J Ley 8/2/94

FLOWING. DITCH FLOWS TO GREENFIELD CREEK AND IS REPORTEDLY INFLUENCED BY TIDES, THROUGH THE TIDE GATE (RECENTLY CONSTRUCTED) LIMITS DIG, AND TO SWP PERSONNEL.

RAYMOND KNOX GAVE US A COPY OF THEIR PHASE III FINAL GW EVALUATION REPORT. THIS REPORT, NOT ON FILE W/ SUPERFUND, REPORT IS LOADED WITH CLP DATA. KNOX AND ~~[illegible]~~ INDICATED THEY WOULD FREELY SHARE ANY OF THE REFERENCED DATA WITH US.

IBUD MET WITH H LAYTON BEDSOLE, STATE PORT AUTHORITY ABOUT SITE AT HIS OFFICE — HE WAS CURIOUS ABOUT POTENTIAL REPERCUSSIONS FOR SWP, IE) LIKELIHOOD THAT STATE/FEDS WILL ENFORCE THE CLEANUP WITH SWP.

TRANSMISSION TO NEIGHBORING BLOBS TO EAST ARE GREENFIELD + LOCKE MPS REPORTS HAVE GONE TO DHHS/FED PRIOR TO FISH ADVISORY FOR LFANNIE AREAS OTHER NEIS

SFP PHOTOGRAPHED SITE FEATURES, EXAMINED LOCAL WATERWAYS AND LEFT SITE.

A J Ley 8/2/94

Ref. 7

PHASE III GROUNDWATER QUALITY ASSESSMENT WILMINGTON, NORTH CAROLINA FACILITY

Prepared For

SOUTHERN WOOD PIEDMONT COMPANY SPARTANBURG, SOUTH CAROLINA

Prepared By The

ViroGroup
Air • Water • Soil
TECHNOLOGY

ETE Division

ViroGroup Job No. 12-53015.00
530\15\PHASEIIIL.RPT

PHASE III GROUNDWATER QUALITY ASSESSMENT
SOUTHERN WOOD PIEDMONT
WILMINGTON, NORTH CAROLINA FACILITY

1.0 BACKGROUND

The Southern Wood Piedmont (SWP) facility is located in an industrialized area adjacent to the eastern bank of the Cape Fear River within the city limits of Wilmington, North Carolina (Figure 1). The facility is bounded to the north by Amerada Hess Corporation Fuel Tank Farm and to the south by Greenfield Creek. Across Greenfield Creek from the facility is the Poctank, Inc. Tank Farm. Optimist Park and residential areas are located to the east of the facility and the Cape Fear River is located to the west. Greenfield street, which runs in an east-west direction, terminates at the SWP facility.

The facility is situated on two parcels of land that are currently leased to Southern Wood Piedmont. The southern parcel is owned by the North Carolina Ports Authority and the northern parcel by the City of Wilmington. A topographic map for the site and adjacent properties has been prepared and is presented in Figure 2. Wetland areas and existing structures are shown on the topographic map.

1.1 Site History

Prior to 1921, E.R. Eubank Sawmill may have occupied the site. Early Sanborn maps indicate that Newport Shipbuilding Company was operating on-site in 1921. In 1932, the North State Treating Company leased the property. Taylor Colquitt Company acquired the property in 1935 and continued to treat wood products with creosote. In 1964, Taylor Colquitt Company changed names to Taylor Piedmont. International Telephone & Telegraph (ITT) purchased Taylor Piedmont in 1969. Early in 1971, ITT changed the company name to Southern Wood Piedmont. Southern Wood Piedmont operated the wood preserving facility until June 1983. At this time wood treating operations ceased and closure operations commenced at the facility.

The wood preservatives used during plant operations included creosote coal tar, pentachlorophenol (PCP), and copper, chromate, and arsenate (CCA). Creosote was used throughout wood preserving operations, whereas, CCA treatment was added by SWP in the early 1970's followed by pentachlorophenol in the late 1970's. Wood-preserving chemicals were stored on-site in aboveground storage tanks adjacent to the respective treating facilities. Additional tanks for creosote storage were located in the southwestern portion of the facility adjacent to the Cape Fear River.

2.0 PREVIOUS SITE ACTIVITIES

This section provides an overview of previous site activities. Previous site activities include a soil and groundwater investigation completed by the City of Wilmington on their parcel of land,

the construction and operation of an on-site landfarm by SWP through an Administrative Order of Consent with the North Carolina Department of Health, Environment, and Natural Resources, a site-wide near-surface soil investigation, and Phase I and II groundwater quality investigations at the facility.

2.1 City of Wilmington Investigation

Five soil borings were advanced on the City of Wilmington parcel to a depth of approximately 50 feet below land surface by Soil and Materials Engineers, Inc., (SME) during 1981. Lithologic logs indicate that a surficial aquifer of sandy fill material, which varies from less than 1 foot to 18 feet in thickness, is present beneath the City of Wilmington parcel. Below this sandy material is a layer consisting of dark brown, organic-rich silt and peat, which contains traces of fine sand and roots. This layer ranges in thickness from 5 to 19 feet and increases in thickness towards the Cape Fear River to the west. Fine to medium sands extend from below the organic-rich layer to a depth of 42 to 45.5 feet below land surface. A marl is present below this depth.

Each of the five exploratory soil borings were converted to monitoring wells (designated City monitoring wells [CW] on the site map; Figure 3). Four of the monitoring wells (CW-1, CW-2, CW-3, and CW-4) were screened above the organic layer (peat) and one well (CW-5) was screened in the sand below the organic layer. Groundwater samples were collected for inorganic and volatile priority pollutants. Wood-preserving constituents were detected in CW-2 adjacent to the wood treating facility.

Based on their observations, SME concluded that the dominant direction of shallow groundwater flow at the site was to the south, parallel to the Cape Fear River. For additional information on the City of Wilmington investigation, please refer to the report by Soil and Materials Engineers, Inc. entitled: GEOTECHNICAL INVESTIGATION REPORT, CITY OF WILMINGTON PROPERTY LEASED BY SOUTHERN WOOD PIEDMONT, WILMINGTON, NORTH CAROLINA, dated 1981.

2.2 State of North Carolina Administrative Order of Consent

On May 20, 1985, Southern Wood Piedmont Company and the Solid and Hazardous Waste Management Branch, Environmental Health Section, Division of Health Services, Department of Human Resources of the State of North Carolina entered into an Administrative Order of Consent. The Administrative Order of Consent addressed soil and groundwater contamination at the site and provided clean-up/remedial action which should minimize the site's impact on the environment and public health in a manner which is consistent with the State and Federal hazardous waste laws and rules.

The Administrative Order of Consent allowed land treatment (landfarm) of preservative residuals in contaminated soil to reduce the residuals to an acceptable level. The location of the landfarm was selected to be in a previous treated pole storage area where there are presently low levels of preservative residuals in the soil.

Pursuant to the terms of the Administrative Order of Consent, soil containing preservative residuals were excavated from the covered sludge ditch, the track area in front of the treatment cylinder, the area in the vicinity of the treatment buildings, and the large storage tank containment area and placed in the landfarm for on-site treatment. The treated pole storage areas not used for landfarming were tilled in place. Soil in the vicinity of the CCA storage tank area was excavated and sent off-site to a permitted land disposal facility and the CCA storage tank sludge was disposed in a hazardous waste landfill. The sludge from the bottom of the various oil storage tanks was placed in an approved landfill or burned for fuel recovery in an off-site location.

Once the terms of the Administrative Order of Consent have been met, the properties will be returned to the City of Wilmington and the North Carolina Ports Authority for development.

2.2.1 Landfarm Operation

In cooperation with the North Carolina Department of Human Resources, Solid and Hazardous Waste Management Branch, SWP operated a landfarm to remediate soil containing wood-preserving residuals. Following the removal of the existing railroad spurs and plant buildings at the facility, a 5-acre area was bermed and ditched for landfarm operations. Excavated wood preserving constituent influenced soil was landfarmed between July 1984 and April 1990. Landfarm treatment included the placement of influenced soil in 2-inch lifts on the landfarm. Each lift was treated by weekly tilling and adding irrigation water, fertilizer, and chicken and turkey manure to promote microbial growth and wood preserving constituent degradation. The landfarm is located on the northwest portion of the site in the area bounded by monitoring wells MW-6, MW-7, MW-8, and MW-9 (Figure 3).

Soil samples were collected periodically between September 1985 to April 1990 throughout the active period of landfill operation. The soil samples were analyzed for soil nutrients, pentachlorophenol, PAHs, phenol, and microbial counts. The soil sampling results indicated that the landfarms were effective and that constituents of concern were not leaching into the substrate soils. Subsequent to active landfarm operations, Geraghty & Miller, Inc. collected soil samples in October 1990 and again in October 1991. Analytical results from the post-operational soil sampling indicated minimal migration of constituents of concern into the substrate soils from the landfarm. For further information on the landfarm activities and findings please refer to the reports by Geraghty & Miller, Inc. entitled: DATA SUMMARY REPORT FOR THE 1990 LANDFARM AREA SAMPLING, SOUTHERN WOOD PIEDMONT COMPANY,

WILMINGTON, NORTH CAROLINA and DATA SUMMARY REPORT FOR THE 1991 LANDFARM AREA SAMPLING AND COMPARISON OF 1990 AND 1991 SOIL AND GROUND-WATER DATA, SOUTHERN WOOD PIEDMONT COMPANY, WILMINGTON, NORTH CAROLINA dated September 1993.

2.2.2 Landfarm Groundwater Monitoring

In September, 1985, Law Environmental Services (LES) installed four groundwater monitoring wells around the limits of the landfarm (MW-6, MW-7, MW-8, and MW-9). Each well was installed to an approximate depth of 20 feet below land surface such that the upper portion of the screen bracketed the contact between the fine to medium upper sands and the underlying peat.

In order to evaluate the direction of groundwater flow within the uppermost aquifer LES collected water table elevations from 8 of the existing monitoring wells and the Cape Fear River at the facility. Based on this data groundwater flow around the limits of the landfarm appeared to be northwest, west, and southwest toward the Cape Fear River.

Hydraulic conductivity testing was also conducted by LES on monitoring wells MW-6 through MW-9. Horizontal hydraulic conductivity values ranged from 3×10^{-5} cm/sec to 1×10^{-6} cm/sec, which is typical of silty sediments (the peat unit at the facility is comparable in hydraulic conductivity to silty sediments). Also, the average groundwater flow velocity was evaluated to be 0.1 feet per year for the screened interval.

Additional information on the groundwater monitoring in the landfarm area can be found in the Law Environmental Services report entitled: MONITORING WELL INSTALLATIONS AND HYDROGEOLOGIC REPORT dated November 27, 1985.

2.2.3 Risk Assessment of Landfarm Areas

A risk assessment has been conducted by Geraghty & Miller, Inc. for the two landfarm treatment areas at the former SWP wood treating facility. The purpose of the risk assessment was to evaluate the wood-preserving constituents remaining in the landfarms and any potential risk to public health and/or the environment. It was assumed that the site will be used for future industrial development (deed restriction) and that several feet of fill and/or pavement will cover the landfarm.

As a result of the assumed future site use and development, the only exposure to constituents remaining in the landfarm soils would occur during the construction period. Therefore, the risk assessment evaluated the potential exposure to a site construction worker. Constituent intake was evaluated for incidental soil ingestion, dermal contact, and inhalation of dust. An exposure

period of 13 weeks, 6 days per week, and 8 hours per day was evaluated. Thirteen weeks was selected as a reasonable maximum period required for grading, filling, and paving the site.

Constituents of concern (COCs) included in the risk assessment were PAHs, phenol, dimethylphenol, trichlorophenol, tetrachlorophenol, pentachlorophenol, arsenic, copper and chromium. The analytical results of 70 samples were utilized during the risk assessment.

Risk estimates for the site construction worker were compared to USEPA target risk criteria to determine if the terms of the Administrative Order of Consent had been met. The USEPA currently uses a target excess lifetime cancer risk (ELCR) range of 1×10^{-4} to 1×10^{-6} and a hazard index (HI) of 1 to indicate if remediation is required. The total ELCR for the construction worker was calculated to be 6×10^{-6} and is within the target risk range; the HI is 0.5 and is below the target value of 1. These results indicate that the proposed development of the site could proceed without posing a significant risk to human health and the environment. For additional information regarding the landfarm risk assessment, please refer to the report by Geraghty & Miller, Inc. entitled: RISK ASSESSMENT REPORT FOR LANDFARM AREAS, SOUTHERN WOOD PIEDMONT COMPANY, WILMINGTON, NORTH CAROLINA dated December 1993.

2.3 Treated and Non-Treated Wood Storage Area Soil Sampling

Between February 26 and March 1, 1991, Geraghty & Miller, Inc. completed 92 soil borings and collected 48 soil samples from treated and non-treated wood storage areas at the facility. Each of the soil borings were completed to a depth of 18-inches below land surface and visually assessed for the degree of staining and odor. Randomly selected soil boring locations were sampled for select semi-volatile organic constituents and the metals, arsenic, chromium, and copper at depth intervals of 0- to 6-inches and 12- to 18-inches below land surface. A summary of the results of this investigation can be found in the letter report submitted to SWP on June 17, 1992 entitled: WILMINGTON, NORTH CAROLINA SOIL SAMPLING INVESTIGATION.

2.4 Phase I Groundwater Quality Assessment

During February 1992, Environmental Technology Engineering, Inc. (ETE) initiated field activities directed at characterizing the site hydrogeology and evaluating potential groundwater degradation associated with past wood preserving activities at the site. Activities completed during the Phase I groundwater quality assessment include monitoring well installation, visual soil quality evaluation, lithologic interpretation, groundwater flow/tidal influence evaluation, and groundwater sampling.

2.4.1 Monitoring Well Installation

During the Phase I groundwater quality assessment ETE installed 13 groundwater monitoring wells within the upper aquifer (Figure 3). Five of these monitoring wells (B2, B3, B4, B5, and B6) were installed as temporary monitoring wells to aid in groundwater flow and quality interpretation. The remaining 8 monitoring wells (MW-10 through MW-17) were installed as permanent wells in the upper aquifer. Monitoring well MW-14 brackets the contact between the upper sand and the underlying peat, whereas, the other monitoring wells bracket the water table. The temporary monitoring wells were installed such that the base of the screen rested on top of the peat.

2.4.2 Visual Soil Quality

During installation of the monitoring wells, a log of visibly stained sediments was maintained. No visible staining was observed in boreholes B2, B3, B5, B6, or MW-10. Visible wood preserving constituent staining was observed in the soil from boreholes B4, MW-11, MW-12, MW-13, and MW-14. Borehole B4 has visible wood preserving constituent staining near the surface of the borehole and again near the bottom of the borehole. Boreholes MW-11 and MW-12 were observed to have visible wood preserving constituent staining from approximately 3 feet below land surface to the upper sand and peat contact. Visible wood preserving constituent staining was present only near the surface of borehole MW-13. Visible wood preserving constituent staining was encountered near the surface at MW-14 and continued to be observed below the upper sand and peat contact to a depth approximately 14 feet below land surface.

Diesel stained sediments were observed at MW-15, MW-16, and MW-17 located in the southwestern portion of the site in the vicinity of previous aboveground diesel storage tanks. Soils from boreholes MW-15, MW-16 and MW-17 were diesel stained near the surface of the borehole to a depth of approximately 5 feet below land surface.

2.4.3 Site Geology

Soil borings completed during the Phase I monitoring well installation activities indicate that the site is underlain by a brown, fine to medium sand from the land surface to approximately 10 to 15 feet below land surface. A dark brown to black peat with varying amounts of wood and root fragments is present beneath the sand. Based on a single boring (MW-14), the peat unit appears to be approximately 10 to 11.5 feet thick. Underlying the peat is a brown, medium to coarse sand. The thickness of the underlying sand and the depth to the next confining unit was not evaluated during the Phase I groundwater quality assessment.

2.4.4 Site Hydrogeology

In order to characterize groundwater flow changes due to tidal influences at the site, a 12-hour groundwater elevation evaluation was conducted on April 1, 1992 utilizing all existing monitoring wells and 2 staff gauges, one located in the Cape Fear River and one in the on-site drainage ditch. Water level measurements were taken every 2 hours from each monitoring well and the staff gauges. Please refer to Attachment A for a tabulated historical groundwater elevation summary table.

The groundwater flow evaluation indicated that the tidal cycle does affect the groundwater elevations in the monitoring wells located at the site. At times when the tidal stage exceeds mean sea level (the time interval when the tide is approaching and receding high tide) during the tidal cycle, groundwater "stagnation lines" occur along the bank of the Cape Fear River and along the on-site drainage ditch. This zone of stagnation is the result of the surface water in the Cape Fear River and the on-site drainage ditch moving into the aquifer material (recharge) and becoming opposed by groundwater discharging from the aquifer towards the Cape Fear River and the drainage ditch. When the tidal stage is below mean sea level during the tidal cycle, the groundwater flows in a radial pattern from the center of the site and discharges into the Cape Fear River and the surrounding drainage features the circumscribe the site. The tidal cycle appears to only slightly influence water levels in the center of the site. A delayed effect was observed, in that, the highest groundwater elevation in the center portion of the site occurred at a time after high tide within the Cape Fear River.

2.4.5 Groundwater Quality

The quality of the groundwater was evaluated by collecting groundwater samples from all of the existing monitoring wells at the facility that did not contain separate phase fluids. The monitoring wells were sampled on March 13, 1992 and were analyzed for site-specific metals, semi-volatiles, and volatiles. Please refer to Attachment A for tabulated historical groundwater sample analytical results.

Concentrations of wood-preserving metals were detected in all groundwater samples before filtration. However, after filtration all metal concentrations were below detection limits, except for temporary well B5. Groundwater from this well yielded a concentration of 0.006 mg/l for dissolved copper.

The analytical results indicated that wood-preserving constituents were present in the upper sand beneath the facility. The wood preserving constituent plume was partially defined in the northern, eastern, and western portions of the site. However, the southern edge of the plume was not defined. The total organic wood-preserving constituent concentrations were highest in temporary monitoring well B4 with a value of 28.222 mg/l. Monitoring wells MW-13 and MW-

14 yielded the next highest concentrations with values of 6.335 mg/l and 6.268 mg/l, respectively. Lower concentrations of organic wood-preserving constituents were detected in monitoring wells MW-15, MW-16, MW-17, and temporary well B6. Trace amounts of heavy separate phase fluids were detected in monitoring wells MW-11 and MW-12.

Further information on the Phase I groundwater quality assessment is presented in the ETE, Inc. report entitled: SOUTHERN WOOD PIEDMONT GROUNDWATER QUALITY ASSESSMENT - WILMINGTON NORTH CAROLINA FACILITY dated August 3, 1992.

2.5 Phase II Groundwater Quality Assessment

Data collected during the Phase I groundwater quality assessment was utilized by ETE, Inc. in the preparation of recommendations for a Phase II groundwater quality assessment. The purpose of the Phase II groundwater quality assessment was to further define the hydrogeology and groundwater quality with respect to past wood preserving activities at the facility. Phase II groundwater quality assessment activities included the abandonment of five temporary monitoring wells, installation of 12 monitoring wells, groundwater flow evaluation, groundwater sampling, soil sampling, slug testing, and the preparation of an aerial photograph and topographic map depicting the site. For a complete description of the Phase II groundwater quality assessment proposed activities, please refer to the letter report submitted to SWP entitled: RECOMMENDATIONS FOR A PHASE II GROUNDWATER QUALITY ASSESSMENT - SOUTHERN WOOD PIEDMONT COMPANY-WILMINGTON, NORTH CAROLINA dated August 10, 1992.

2.5.1 Temporary Monitoring Well Abandonment

The five Phase I temporary monitoring wells B2, B3, B4, B5, and B6 were abandoned by over-reaming and pressure grouting the borehole to land surface.

2.5.2 Monitoring Well Installation

Based on the data collected during the Phase I groundwater quality assessment, it was determined that additional monitoring wells were necessary to properly define the horizontal and vertical extent of dissolved and separate phase fluid plumes present beneath the facility. Twelve additional monitoring wells were installed between September 28 and October 8, 1992 as part of Phase II groundwater quality assessment activities.

Nine monitoring wells (MW-18 through MW-26) were completed in the upper aquifer and three monitoring wells (MW-8A, MW-11A, and MW-19A) were completed in the lower aquifer at the site during the Phase II investigation.

2.5.3 Site Geology

The site is underlain by a brown, fine to medium sand (upper sand) to a depth of 7 to 16 feet below land surface. Present beneath the upper sand is a 13 to 15 feet thick, dark brown to black clayey peat to peaty clay (peat) with varying amounts of wood and root fragments. Underlying the peat is a 14 to 18 feet thick, light brown, medium to coarse sand (lower sand). Underlying the lower sand is a 2.5 to 4 feet thick, firm, tight, olive gray silty clay with 5 to 10 percent phosphate and glauconite grains (lower clay). Beneath the lower clay is a very dense, light gray sandy shell mold limestone and sand with alternating cemented shell molds and friable silt to large pebble sand laminae. The thickness of this limestone unit is currently unknown but, based on geologic literature, is estimated to be on the order of 650 to 700 feet in thickness.

2.5.4 Site Hydrogeology

Three aquifers and two confining units have been encountered beneath the facility. The upper sand (upper aquifer) is under water table conditions and, as such, is an unconfined or water table aquifer. The upper aquifer at the site is bounded on all sides by groundwater discharge boundaries (e.g. Cape Fear River, on-site drainage ditches, and Greenfield Creek). Groundwater within the upper aquifer migrates from the center of the facility and discharges to these boundaries. The peat, located beneath the upper aquifer, is a leaky confining unit that separates the upper and lower aquifers at the facility. Visual observation of the peat indicates that it is water saturated throughout its entire thickness. The lower sand (lower aquifer) at the facility is bounded above by the leaky peat and below by the lower silty clay and is therefore, a semi-confined aquifer. The groundwater flow direction within the lower aquifer appears to be controlled by the Cape Fear River. Beneath the lower aquifer at the facility is a silty clay. This silty clay is a confining layer at the facility. The third and lowermost aquifer encountered beneath the SWP facility is the Peedee Limestone Formation. The unit is a confined aquifer and is a major source of groundwater in this area.

Groundwater elevations from all of the monitoring wells and surface water elevations from the staff gauges were collected at low tide at the facility on October 15, 1992 (Attachment A). A water table mound was observed beneath the center of the site in the upper aquifer. From this mound groundwater flows to the east and north towards the on-site drainage ditches, to the south towards Greenfield Creek, and to the west towards the Cape Fear River. The average horizontal hydraulic gradient for the upper aquifer was 0.0015 ft/ft. The potentiometric surface for the lower aquifer beneath the facility was evaluated utilizing the three lower aquifer monitoring wells. The groundwater flow direction in the lower aquifer was to the northwest with a horizontal hydraulic gradient of 0.0002 ft/ft.

The vertical hydraulic gradients between the upper and lower aquifers were evaluated by comparing the groundwater elevations in the three well clusters at the facility. An upward

vertical hydraulic gradient of 0.02 ft/ft exists at the MW-8 well cluster and downward vertical hydraulic gradients of 0.012 ft/ft and 0.003 ft/ft exist at MW-11 and MW-19 well clusters, respectively. Please refer to Attachment A for a tabulated historical vertical hydraulic gradient summary.

Slug tests to evaluate the hydraulic conductivity of the upper aquifer, peat, and lower aquifer were completed at 15 monitoring well locations. The average horizontal hydraulic conductivity measured in the upper aquifer is 5.06×10^{-4} cm/sec, in the peat is 3.2×10^{-5} cm/sec, and in the lower aquifer is 4.05×10^{-3} cm/sec.

The horizontal hydraulic gradient and horizontal hydraulic conductivity were utilized to evaluate the groundwater seepage velocity for the upper aquifer, peat and lower aquifer at the facility. The average seepage velocity for the upper aquifer is 0.8 m/year, for the peat is 0.02 m/year, and for the lower aquifer is 0.85 m/year.

2.5.5 Soil Quality

During installation of the monitoring wells, close attention was given to the condition of the soils encountered. Soil observations included visible staining of the soil, odor, total organic vapor screening (OVA), and laboratory soil sampling. Soil observations during the Phase I and II groundwater quality assessments indicate that three main source areas exist (Figure 4). One source is the wood treatment area, which includes the former creosote treatment area, former CCA treatment area and the former sludge ditch. The second source is the former large storage tank containment area and the third source is the former diesel storage tank areas.

Visible staining of the soils in the vicinity of the wood treatment area was observed from 3 feet below land surface to the top of the peat (13 feet below land surface) at MW-11 and to 8 feet below the top of the peat in MW-14 (16 feet below land surface). At MW-26, visible staining first occurs at a depth of 10 feet below land surface and is present to a depth of 1 foot below the top of the peat (17 feet below land surface).

In the vicinity of the large storage tank source area visibly stained soils are present near MW-13 from 3 feet below land surface to a depth of 8 feet below land surface. Visibly stained soils are present in monitoring well MW-22 from 3 feet below land surface to a depth of 9 feet below land surface.

The diesel tank source areas are indicated by monitoring wells MW-15, MW-16, and MW-17. At MW-16 and MW-17, diesel stained soils were observed from the surface to a depth of 5 feet below land surface with a diesel odor occurring to the top of the peat. In the vicinity of MW-15, diesel stained soils were observed to a depth of 5 feet below land surface. Diesel odors were also observed near the surface in monitoring well MW-22.

On December 9 and 14, 1992, ETE collected 11 soil samples along the on-site drainage ditch and along the north bank of Greenfield Creek (Figure 3). Each boring was advanced to an approximate depth of 2 feet below land surface. The sample retrieved from each borehole was analyzed for the Wilmington site-specific metals, semi-volatiles and volatiles. Please refer to Attachment A for a tabulated historical soil sample summary table.

The highest levels of arsenic detected were present in off-site samples SS-1 at 3.5 mg/kg, SS-2 at 5.2 mg/kg, and on-site samples SS-4 at 3.6 mg/kg, SS-5 at 1.5 mg/kg, and SS-7 at 2.3 mg/kg. The highest detected levels of chromium occurred in off-site samples SS-1 at 5.5 mg/kg, SS-2 at 14 mg/kg and in on-site samples SS-4 at 11 mg/kg and SS-7 at 9.2 mg/kg. The highest detected copper and lead concentrations, respectively, occurred in off-site samples SS-1 at 6.1 and 14 mg/kg, SS-2 at 46 and 290 mg/kg, SS-3 at 8 and 61 mg/kg, and in on-site samples SS-4 at 14 and 25 mg/kg. The two highest lead concentrations, 290 and 61 mg/kg occurred in off-site samples.

The CCA and diesel source areas at the site are located roughly 400 to 600 feet northwest of soil samples SS-5 and SS-6. In all cases, the lowest metal concentrations on-site occurred in soil samples SS-5 and SS-6, which are the closest soil sample locations to the source area. Therefore, the laboratory detected values most probably represent naturally occurring background levels or another off-site source. The on-site soil sampling by Geraghty & Miller in 1991 also suggested that the on-site metal concentration results most probably represented background levels for metals.

The soil samples were also analyzed for semi-volatile and volatile organic wood-preserving constituents. The lowest organic wood preserving constituent concentrations occurred at locations SS-2, SS-3, SS-8 and SS-11 with concentrations of 3.25 mg/kg, ND, 1.0 mg/kg, and ND, respectively. Moderate values occurred in soil samples SS-1 at 9.936 mg/kg and SS-4 at 17.691 mg/kg. High concentrations occurred in SS-5 at 167.0724 mg/kg, SS-6 at 150.4248, SS-7 at 203.259 mg/kg, and SS-9 at 357.3546 mg/kg. The highest concentration of organic wood-preserving constituents occurred in SS-10 with a concentration of 6,110.008 mg/kg. As demonstrated by the detected constituents, wood-preserving activities may have contributed to the observed organics in the soil. The on-site source of wood-preserving constituents is located roughly 400 feet northwest of soil sample location SS-5 and SS-6. High concentrations of detected organics occurred at these locations. Further from the source, at SS-1, SS-2, SS-3, SS-4, and SS-8, the concentrations of organic wood-preserving constituents have decreased considerably. The soil samples along Greenfield Creek (SS-1, SS-9, and SS-10) have detectable organic concentration levels, both upstream and downstream from the on-site drainage ditch. The detection along Greenfield Creek may suggest that additional off-site sources of these compounds are present.

2.5.6 Groundwater Quality

Between October 13 and 16, 1992, ETE collected 21 groundwater samples from the existing monitoring wells at the facility. The groundwater samples were analyzed by the laboratory for dissolved and total arsenic, chromium, copper, and lead and semi-volatile and volatile organics. Please refer to Attachment A for a tabulated historical groundwater sample parameter summary.

All dissolved metal concentrations were listed below detection limits, except for monitoring wells MW-15, MW-17, and MW-22. Groundwater from these wells yielded a dissolved arsenic concentration of 0.023 mg/l, 0.0057 mg/l, and 0.013 mg/l, respectively.

The areas of separate phase fluids and areas of greatest organic wood preserving constituent concentrations occurred in close relation to the source areas (large storage tank area, diesel storage tank area, and the wood treatment area). The greatest concentration of organic wood-preserving constituents occurred at MW-13, MW-14 and MW-22, with concentrations of total PAH's of 8.130 mg/l, 8.973 mg/l, and 13.358 mg/l, respectively. Heavy separate phase fluids were present in MW-11, MW-12, and MW-26. For additional information on the Phase II assessment activities please refer to the report by ViroGroup, Inc. entitled: PHASE II GROUNDWATER QUALITY ASSESSMENT WILMINGTON, NORTH CAROLINA FACILITY, dated February 26, 1993.

2.6 Cape Fear River Surface Water Sampling

Surface water samples have been collected from the Cape Fear River adjacent to the former wood treating facility since December 1985. Two upgradient and two downgradient samples are collected along the east bank of the Cape Fear River during each sampling event (Figure 22). The upgradient surface water samples are located near the U.S. Highway #74 bridge and near an old slip at the former wood treating facility. The downgradient surface water samples are located near the mouth of Greenfield Creek and near the North Carolina State Ports Authority. A total of 14 routine sampling events have occurred through July 1993. One resampling event, to evaluate a detection during the routine June 1989 sampling event occurred in July 1989.

The upgradient sample location near U.S. Highway #74 has been below laboratory detection limits for the Wilmington site-specific constituents since initiation of surface water sampling activities. Surface water samples collected near the old slip have also been below laboratory detections limits for the Wilmington site-specific constituents, except on two occasions. Copper was detected at 0.02 mg/l in June 1988 and chromium was detected at 0.011 mg/l in January 1990 near the old slip.

Wilmington site-specific constituents were detected on two occasions at the downgradient location near the mouth of Greenfield Creek. Naphthalene was detected at a concentration of

0.050 mg/l during the June 1989 sampling event. To evaluate the detection of naphthalene, a second sample was immediately collected near the mouth of Greenfield Creek in July 1989. The July 1989 surface water sample near the mouth of Greenfield Creek was below laboratory detection limits for the Wilmington site-specific constituents. During the July 1990 sampling event chromium was detected at 0.046 mg/l and copper was detected at 0.052 mg/l near the mouth of Greenfield Creek. The downgradient sample location near the North Carolina State Ports Authority has been below laboratory detection limits for the Wilmington site-specific constituents since initiation of sampling in December 1985. Please refer to Attachment A for the historical surface water sample parameter summary table for the Cape Fear River.

Multiple sources of potential contamination to the Cape Fear River exist in this vicinity because of heavy industrialization along its banks and along the banks of tributary creeks. Urbanization along Greenfield Creek, including a City water treatment facility and a fuel tank farm present potential sources of contamination that may discharge to the Cape Fear River. The distribution of various constituents detected in soil samples collected along Greenfield Creek suggested the likelihood that multiple sources exist.

3.0 PHASE III GROUNDWATER QUALITY ASSESSMENT

Data collected during the Phase I and Phase II groundwater quality assessments was utilized in the preparation of recommendations for a Phase III groundwater quality assessment. The purpose of the Phase III groundwater quality assessment was to further define the hydrogeology and groundwater quality with respect to past wood preserving activities at the facility. Phase III activities included the abandonment of one monitoring well, installation of six upper aquifer monitoring wells and seven lower aquifer monitoring wells, groundwater sampling, soil sampling, and collection of sequential groundwater elevations from each monitoring well at the site to evaluate the tidal effects on the upper and lower aquifer flow regimes. For a complete description of the proposed Phase III groundwater quality assessment activities, please refer to the letter submitted to SWP entitled: RECOMMENDATIONS FOR A PHASE III GROUNDWATER QUALITY ASSESSMENT - SOUTHERN WOOD PIEDMONT COMPANY WILMINGTON, NORTH CAROLINA dated February 11, 1993. Presented below is ViroGroup, Inc. - ETE Division's summary of findings for the Phase III groundwater quality assessment.

3.1 Monitoring Well Abandonment

During the Phase II groundwater quality assessment, monitoring well MW-24 was installed adjacent to an on-site road that is used by the public for access to the Cape Fear River. This well was vandalized on several occasions. In order to prevent additional vandalism, this well was abandoned and reinstalled approximately 60 feet west in a less visible, wooded area. The designation for the replacement monitoring well is MW-24R. Monitoring well MW-24 was abandoned by over-reaming to below the well depth and removing all well materials from the

borehole. The resultant borehole was then abandoned by pressure grouting with a cement/bentonite (6% bentonite) grout to land surface using the tremie pipe method. Please refer to Attachment B for the MW-24 well abandonment record.

3.2 Monitoring Well Installation

Phase I and II activities included the installation of 17 upper aquifer and 3 lower aquifer monitoring wells at the facility. Based on this data, additional monitoring wells were necessary to properly define the plumes present within the upper and lower aquifers beneath the site. Twelve additional monitoring wells were installed between October 26 and November 13, 1993 as part of the Phase III groundwater quality assessment activities. Please refer to Figure 3 for the locations of the newly installed monitoring wells.

In order to install the proposed monitoring wells, appropriate permits were required. ViroGroup, Inc. contacted the State of North Carolina Department of Health, Environment, and Natural Resources (NCDHENR) officials to notify them of our intent to install monitoring wells in North Carolina. Diane Rossi of the Wilmington Division of NCDHENR stated that current regulations stipulate that well permits are not required if the monitoring wells are located on-site and are not to be used for production or recovery.

Monitoring wells MW-28 and MW-28A were installed on a parcel of land adjacent to the Atlantic Coast Line Railroad located along the eastern property boundary. Access to this parcel could only be accomplished by driving along the railroad track easement. A right-of-entry permit was acquired through H.C. Worsham, Public Project Engineer of CSX Transportation, allowing the transport of the drilling rig and equipment along the railroad easement for monitoring well installation. Please refer to Attachment C for a copy of the letter requesting the Right-of-Entry permit and a copy of the permit issued by CSX Transportation allowing access to the parcel of land.

One upper aquifer monitoring well (MW-27) was installed in a wetland area. Due to the location of the well, it was necessary to notify the U.S. Army Corps of Engineers of the intent to install the well. Please refer to Attachment C for a copy of the letter notifying the Corps of Engineers and a copy of the letter from the Corps of Engineers approving the installation of the monitoring well.

Arrangements were made with the City of Wilmington to provide potable water for well installation through an on-site water hydrant.

In order to better define the horizontal extent of the plumes in the upper aquifer, ViroGroup, Inc. installed 5 additional monitoring wells during the Phase III assessment. One upper aquifer monitoring well (MW-27) is located in the northern portion of the site, adjacent to the Amerada

Hess facility monitoring well. Three of the monitoring wells, designated MW-28 through MW-30, were installed along the eastern property boundary and the southern perimeter of the wetland area. The fifth monitoring well (MW-24R) was installed as a replacement well for abandoned well MW-24.

ViroGroup, Inc. also completed 7 monitoring wells (MW-11B, MW-14A, MW-20A, MW-22A, MW-24A, MW-28A and MW-29A) in the lower aquifer at the site. These lower aquifer monitoring wells were used to evaluate the thickness of the peat, the nature of the aquifer materials underlying the peat, the presence of a lower confining layer, the groundwater quality within the lower aquifer, and the lower aquifer groundwater flow direction(s) and hydraulic gradients.

The monitoring wells were installed using an all-terrain vehicle (ATV) mounted drilling rig. Using the ATV rig allowed the installation of the monitoring wells without the build up of extensive roadways. To ensure representative soil sample collection, the monitoring wells were installed using the mud-rotary drilling technique. All of the monitoring wells were installed according to SWP specifications (Figure 5) with the exception of not using a surface casing during construction of the upper aquifer monitoring wells. A surface casing was not set during completion of the upper aquifer monitoring wells due to the upper aquifer being less than ten feet thick and the water table being located approximately 1 foot below land surface.

The upper aquifer monitoring wells were installed by advancing the borehole to the top of the peat. Borehole depths ranged from 7 to 14 feet below land surface. The borehole for the lower aquifer monitoring wells was advanced to the top of the lower clay. Borehole depths for the lower aquifer monitoring wells ranged from 40 to 46 feet below land surface.

During advancement of the soil borings, split-spoon samples were collected. A representative sample from each split spoon was placed in a zip-lock bag with adequate head space and screened with a photoionization detector (PID) organic vapor analyzer. All observations were recorded and the soil classified using the Unified Soil Classification System.

Except for monitoring well MW-27, all upper aquifer monitoring wells were installed so the base of the screen rests on top of the peat. The screen of monitoring well MW-27 was installed to bracket the water table.

To install the lower aquifer monitoring wells, a 10-inch diameter borehole was advanced into the underlying peat unit to a depth of approximately 20 feet below land surface. A 6-inch diameter PVC surface casing was installed into the open borehole. A grout mixture of cement and bentonite was placed by the tremie method in the annular space around the surface casing and the grout allowed to set a minimum of 24 hours. Within the surface casing, a 3.875-inch

diameter borehole was drilled to the top of the lower confining clay. Split-spoons were collected continuously to a depth of 20 feet, thereafter, they were collected on five-foot centers.

All monitoring wells were constructed using 2-inch diameter, 10-foot sections of flush joint, threaded, PVC riser with a 5-foot section of factory slotted (0.01 inch) stainless steel well screen. A 10-foot screen was used in the completion of monitoring well MW-27 to allow for bracketing the water table which fluctuates due to tidal influences. Well construction included the placement of a sand filter from the base of the well screen to a height of two feet above the top of the screen. A two-foot bentonite plug was placed on top of the sand pack and a bentonite grout was placed in the remaining annular space to land surface.

To prevent cross-contamination during drilling operations, all construction materials and downhole drill equipment were steam cleaned between each borehole. All decontamination fluids were contained in a lined pit on-site.

To maintain the integrity of the wells after installation, each well was secured with a protective pad, aluminum casing, and keyed-alike locks.

Upon completion, all of the newly installed monitoring wells were developed by the swab and pump method.

All soil removed during the advancement of the boreholes, all decontamination fluids, all development fluids, and other drilling derived waste was disposed in labeled roll-off containers and solidified for proper off-site disposal.

The precise location and elevation of the ground surface and top of casing (TOC) of the newly installed monitoring wells were determined by direct field survey.

A well construction summary table and boring logs illustrating the sediments encountered, OVA screening, visual observations, olfactory observations, and monitoring well construction is presented in Attachment D of this report.

3.3 Regional and Site Geologic Conditions

3.3.1 Regional Geology

The SWP Wilmington, North Carolina facility is situated on relatively flat-lying Cretaceous and younger sediments of the Coastal Plain Physiographic Province that extends from the "Fall Line" to the continental margin (Soller and Mills, 1991). Approximately 1,500 feet of Coastal Plain sediments overlie pre-Mesozoic crystalline basement rock in the vicinity of the site (North

Carolina Geological Survey, 1985). Area lithology consists of sands indicative of Post-Miocene surficial deposits overlying sediments of the Upper Cretaceous Peedee Formation (Berry, 1949).

The surficial soils in the site area typically consist of 5 to 60 feet of fine sands. The sands are tan to white in well-drained upland areas, while they are brown to black and contain several feet of organics in low lying or poorly-drained areas. The soils have been eroded and redeposited many times, resulting in buried stream channels, swamps and marsh areas, often containing soft organic silts, clays, and peat (Berry, 1949).

Beneath the surficial soil are sediments of the Peedee Formation that typically range from 650 to 700 feet in thickness. The Peedee soils generally consist of dense to very dense sand with zones of cemented sands and impure limestones. The sands have a characteristic salt and pepper appearance and the Peedee Formation is considered a major aquifer in this area (Blevins and Bradbourne, 1985).

3.3.2 Site Geology

The site is underlain by a very loose to loose, brown, fine to medium sand with a trace of coarse sand and small pebbles to a depth of 7 to 16 feet below land surface. This unit, for the purpose of this report, will be termed the upper sand. Encountered in every boring beneath the upper sand is a 13 to 16 feet thick, very loose, dark brown to black clayey peat to peaty clay with varying amounts of wood and root fragments. The maximum depth below land surface in which the peat was observed was 27.5 feet in monitoring well MW-11A. This unit will be termed the peat. The contact between the upper sand and the underlying peat is sharp. Underlying the peat is a 14 to 18 feet thick, very loose to loose, light brown to brown, medium to coarse sand. This unit has a sharp contact with the overlying peat and was observed to occur to a maximum depth of 44 feet below land surface at monitoring well MW-11A. For this report the lower sandy unit will be termed the lower sand. Encountered in all deep monitoring well borings beneath the lower sand is a 2.5 to 4 feet thick, firm, tight, olive-gray silty clay with 5 to 10% phosphate and glauconite grains. This unit is termed the lower clay. The contact between the lower sand and the top of the lower clay is also sharp. Beneath the lower clay is a very dense, light gray sandy shell mold limestone and sand with alternating cemented shell molds and friable silt to large pebble sand laminae. The thickness of this limestone unit is currently unknown but, based on geologic literature, is estimated to be on the order of 650 to 700 feet in thickness.

Dr. Victor A. Zullo of the University of North Carolina Geology Department located in Wilmington, North Carolina was contacted on November 9, 1992, to discuss the most likely depositional and age history of the units encountered beneath the facility. In order of decreasing age (decreasing depth), the limestone unit encountered may be the top portion of the middle to upper Peedee Formation (65 millon years before present) and has been named the Scotts Hill Member. These sandy limestones are shelf deposits and contain a large fauna that is usually

dominated by pelecypods. In these limestones, the aragonitic shelled mollusc have either been replaced by calcite or, when dissolved, occur as external molds. The locally occurring olive gray clay that caps the limestone at the site is marine in origin and is also most likely part of the upper Peedee Formation (Sohl and Owens, 1991). The Eocene Castle Hayne Limestone is commonly present on top of the Peedee Formation in the North Carolina coastal plain, however in the Wilmington vicinity of the Cape Fear River, the Castle Hayne Formation is missing (Harris and Zullo, 1991). The lower sand at the site is most likely a Pleistocene (10,000 years before present) fluvial deposit occurring as a point bar, cut-off meander or an old oxbow lake sequence. The peat at the site probably occurred as the result of filling an oxbow lake with marsh and swamp type sediments. As a result, the peat at the facility is probably regionally discontinuous in its lateral extent, even though it appears to be continuous beneath the entire facility (Zullo, verbal communication, 1992). The upper sand appears to have been deposited as aeolian sand dunes during the Holocene (Soller and Mills, 1991) or as fill material.

3.4 Site Hydrogeology

3.4.1 Aquifers and Confining Units

Based on the borehole data collected to date, it appears that three aquifers and two confining units have been encountered beneath the facility. The upper sand (upper aquifer) beneath the SWP facility is under water table conditions and should be termed an unconfined or water table aquifer. This aquifer is not likely to be considered a major source of groundwater, except for minor local uses. The upper aquifer at the site appears to be bounded on all sides by groundwater discharge boundaries as shown by the upper aquifer water table flow map to be discussed later in this section. The upper aquifer discharge boundaries include: the Cape Fear River to the west, the drainage ditches located along the north and east property boundaries, and Greenfield Creek along the southern property boundary at the facility. Groundwater in the upper aquifer migrating from the center of the facility discharges to these boundaries rather than migrating beyond their locations.

The peat is located beneath the upper aquifer. This unit consists of silt and clay with varying amounts of wood and root fragments. The nature of the materials making up the peat suggest that this unit should be termed a leaky confining unit that separates the upper and lower aquifers at the facility. Visual observation of the peat indicates that it is water saturated throughout its entire thickness, thereby demonstrating a hydraulic connection between the upper and lower aquifers.

The lower aquifer at the facility consists of a permeable sand material that should, at the facility, be termed a semi-confined aquifer. This lower aquifer is also probably considered a minor source of groundwater in this area, except for local uses. Evidence that the lower aquifer is semi-confined relative to the upper aquifer is elucidated by the facts that the peat is completely

water saturated; the difference in direction of groundwater flow within the lower aquifer relative to the upper aquifer; and by the differences in the elevation head (vertical hydraulic gradient) of the groundwater in the upper and lower aquifers at the facility. The groundwater flow direction and gradients in the lower aquifer appears to be controlled by the surface water elevation of the Cape Fear River. Conversations with the local Corps of Engineers indicated that the Cape Fear River is dredged to the top of the limestone in the vicinity of Wilmington. This dredging of the river allows the lower aquifer to be in complete hydraulic interconnection with the Cape Fear River. The vertical hydraulic gradients, as will be discussed later in this section, indicate that the upper and lower aquifers are to a small degree hydraulically connected.

Beneath the lower aquifer at the facility is an olive gray silty clay of marine origin that acts as a confining unit. This clay is 4 feet thick and on visual observation appears tight and dry.

The third and lowermost aquifer encountered beneath the facility is the Peedee Limestone Formation. The unit is a confined aquifer and is a major source of groundwater in this area.

3.4.2 Groundwater Flow Directions

Groundwater levels were collected from 35 monitoring wells and surface water levels from 3 staff gauges at the facility on November 16 and again on November 19, 1993. Multiple groundwater levels were collected from each monitoring well and staff gauge to evaluate the effect of tidal influences on the groundwater flow direction(s) in the upper and lower aquifers. In addition, the influence of the installation of a tidal flood-control gate at the confluence of Greenfield Creek and the Cape Fear River located at the southwestern edge of the property was evaluated. One set of groundwater levels was collected at low tide; a second set of levels was collected at a time that represents one quarter of a full tidal cycle (one-quarter low tide); a third set of levels was collected at a time that represents three quarters of a full tidal cycle (three-quarter high tide), and; the last set of levels was collected at high tide (Attachment E). The tidal stage and fluctuation in the Cape Fear River, in Greenfield Creek, and in the on-site drainage ditches do not coincide. Therefore, the tidal stage referred to during this evaluation is the tidal stage in the Cape Fear River.

The collected water level measurements were used to develop a series of water table surface maps for the upper aquifer (Figures 6 through 9). The figures progress from low tide conditions to high tide conditions at the site. The data used to construct the water table maps was collected by measuring the depth to water from the top of casing in all monitoring wells screened in the upper aquifer and the staff gauges that exist in the surface water bodies. The elevation of the top of casing was surveyed by a registered land surveyor to within 0.01 feet mean sea level (MSL). The depth to water in each well was subtracted from the top of casing elevation at each respective well to yield the elevation of the water table at that location. The groundwater elevations were plotted on a scaled site map and contoured. Groundwater flow directions are

depicted by arrows showing flow from areas of higher groundwater elevation to areas of lower groundwater elevation.

As illustrated on the low tide upper aquifer water table map (Figure 6), an elongate water table mound exists that is at its highest elevation in the northeast corner of the site. From this location the groundwater mound extends along the central portion of the site to the south with local highs in the center of the site in the vicinity of MW-12 and along the wetland area to the southeast. From this elongate groundwater mound, the groundwater flows off in all directions toward the on-site drainage ditches, Greenfield Creek, and the Cape Fear River. The horizontal hydraulic gradient at low tide is 0.0015 ft/ft along the northern property boundary toward the Cape Fear River; 0.0032 ft/ft in the central portion of the site toward the on-site drainage ditches; 0.0025 ft/ft in the central portion of the site toward the Cape Fear River, and; 0.0017 ft/ft in the southeastern portion of the site toward Greenfield Creek. Local curvatures in the groundwater isoelevation lines result from the groundwater in the upper aquifer discharging to the on-site drainage ditches, Greenfield Creek, and the Cape Fear River. Groundwater within the upper aquifer from off-site in the vicinity of Optimist Park is flowing to the west towards the on-site drainage ditch near monitoring well MW-28 located to the east of the site. Both the Cape Fear River and the on-site drainage ditch staff gauges are at the lowest elevation observed during this flow evaluation. This suggests that the tidal gate is open allowing Greenfield Creek and the on-site drainage ditches to discharge to the Cape Fear River.

To keep reiteration to a minimum, only changes to the upper aquifer water table maps for the remainder of the tidal cycle will be highlighted in the following discussions. At one-quarter low tide the groundwater mound in the central portion of the site and along the eastern flank adjacent to the on-site drainage ditch has decreased in elevation. Groundwater elevations in the upper aquifer immediately adjacent to the Cape Fear River have begun to increase in elevation. The horizontal hydraulic gradients have remained the same, except for a slight decrease to 0.0016 ft/ft in the central portion of the site toward the Cape Fear River. A groundwater deflection line developed along the on-site drainage ditch. This inflection line occurs when the surface water elevation in the on-site drainage ditch is greater than the groundwater elevation in the upper aquifer adjacent to the ditch due to the rising tide. At this tidal stage, the surface water in the ditch is flowing into the upper aquifer and encountering the groundwater flow from the central groundwater mound. These two opposing forces encounter each other and result in an inflection of approximately 90 degree in flow direction and an order of magnitude decrease in gradient near the drainage ditch. As a result, groundwater and constituents in the groundwater can be smeared with the direction of flow along the inflection line. The surface water elevations in the Cape Fear River and in the on-site drainage ditch are approximately the same indicating that the tide control gate is open.

At three-quarter high tide the central groundwater mound and the eastern flank have begun to increase slightly in elevation. A large increase in groundwater elevation of 0.65 feet has occurred adjacent to the Cape Fear River at monitoring well MW-22. The horizontal hydraulic gradients are approximately the same, except for a decrease in gradient to 0.0005 ft/ft from the central portion of the site toward the Cape Fear River. A groundwater inflection line developed in the upper aquifer that reaches from the northern portion of the site along the Cape Fear River to the southeastern corner of the site along the confluence of Greenfield Creek and the on-site drainage ditch. The elevation of the groundwater along the inflection line is approximately 1.88 feet above mean sea level at MW-18 to the north and approximately 0.96 feet above mean sea level at MW-29 to the southeast. This change in elevation (horizontal hydraulic gradient of 0.0003 ft/ft) along the inflection line indicates that a minor groundwater flow component exists to the south along the Cape Fear River and to the east along Greenfield Creek during the formation of the inflection line. The surface water elevation in the on-site drainage ditch is now much lower than the surface water elevation in the Cape Fear River indicating that the tide control gate is now closed preventing flow from the Cape Fear River to Greenfield Creek.

Groundwater flow at high tide in the upper aquifer is similar to three-quarter high tide. The central groundwater mound has increased in elevation very slightly and the groundwater inflection line has migrated further east into the site. The horizontal hydraulic gradients are the same as the three-quarter high tide. The surface water elevation has increased in the on-site drainage ditch either because of increased discharge flow from the upper aquifer due to increased groundwater elevation or less probable, the tide control gate may have just been opened. An important observation is that the groundwater elevations in the central portion of the site are at their highest during low tide in the Cape Fear River. This most likely is the result of the delayed propagation of increased groundwater elevation from high tide along the Cape Fear River migrating to the central portion of the site.

A series of potentiometric surface maps for the lower aquifer have also been constructed (Figures 10 through 13) to evaluate the tidal effects on the lower aquifer flow regime. At low tide a central groundwater mound is also present in the lower aquifer at the site. Groundwater along this mound is divided and flows off in three directions. Lower aquifer groundwater in the western portion of the site flows toward the Cape Fear River; in the eastern portion of the site toward the drainage ditches, and; the southern portion of the site toward Greenfield Creek. At low tide, horizontal groundwater flow in the lower aquifer discharges to the Cape Fear River in the western portion of the site and flows to the east and south under the on-site drainage ditches and Greenfield Creek in the eastern portion of the site. The horizontal hydraulic gradient to the west is 0.0001 ft/ft, to the east is 0.0008 ft/ft, and to the south is 0.0003 ft/ft. Vertical hydraulic gradients between the upper and lower aquifer are downward along the Cape Fear River and in the central portion of the site ranging between 0.013 ft/ft near the Cape Fear River to 0.016 ft/ft near the wetland area in the central portion of the site (Attachment E). Upward vertical hydraulic gradients are present along the eastern portion of Greenfield Creek and along

the on-site drainage ditches. The upward vertical hydraulic gradients ranged from 0.004 ft/ft near the upper reaches of the on-site drainage ditch to 0.036 ft/ft near the confluence of the on-site drainage ditches.

The vertical hydraulic gradients between the upper and lower aquifers were evaluated by comparing the groundwater elevations in the well clusters at the facility (e.g. MW-28 and MW-28A). The vertical hydraulic gradient is calculated by dividing the difference in groundwater elevation in each well in the well cluster by the difference in the mid-point elevation of each well screen in the well cluster. Downward vertical hydraulic gradients exist in areas of flow from the upper aquifer to the lower aquifer and upward vertical hydraulic gradients exist in areas of flow from the lower aquifer to the upper aquifer.

At one-quarter low tide the potentiometric head along the western flank and the central portion of the groundwater mound have increased. The groundwater divide disappeared and flow in the western portion of the site has reversed and is now flowing toward the southeast. A minor component of flow still exists to the west, however, in a narrow band immediately adjacent to the Cape Fear River. The horizontal gradient across the site to the southeast has decreased to 0.0005 ft/ft. The vertical gradient between the upper and lower aquifer along the western flank has also reversed (MW-8/MW-8A) and is now upward at 0.022 ft/ft. The vertical hydraulic gradient has remained downward in the central portion of the site but has decreased to an average gradient of 0.008 ft/ft. Upward vertical hydraulic gradients are still present along the eastern portion of Greenfield Creek and along the on-site drainage ditches. These upward gradients have increased slightly to an average vertical gradient of 0.029 ft/ft.

During three-quarter high tide the potentiometric head along the Cape Fear River has continued to increase. All flow in the lower aquifer is now to the southeast. The minor flow component to the west toward the Cape Fear River has reversed. The horizontal hydraulic gradient across the site to the southeast has increased to 0.0008 ft/ft. The upward vertical hydraulic gradient has increased to 0.035 ft/ft along the Cape Fear River and has decreased to an average of 0.025 ft/ft along the on-site drainage ditches. Downward vertical hydraulic gradients remain approximately the same in the central portion of the site with an average gradient of 0.008 ft/ft.

The groundwater flow at high tide is similar to three-quarter high tide in the lower aquifer, except that the potentiometric head along the western and central portion of the site has increased. As a result, the horizontal hydraulic gradient to the southeast has also increased to 0.0009 ft/ft. The upward vertical hydraulic gradient increased along the Cape Fear River to 0.042 ft/ft and to an average of 0.027 ft/ft along the on-site drainage ditches. Downward vertical gradients are present in the central portion of the site throughout the tidal cycle with the lowest downward vertical gradients occurring at high tide at an average of 0.005 ft/ft.

3.5 Soil Quality

During installation of the monitoring wells, close attention was given to the condition of the soils encountered. The soil observations were made by collecting split-spoon soil samples continuously from land surface to the bottom of the borehole in the upper aquifer monitoring wells. The soils in the lower aquifer monitoring well boreholes were observed by collecting split-spoon soil samples continuously from land surface to the bottom of the peat, followed by five-foot intervals below the peat to the bottom of the borehole. Soil observations included visible staining of the soil, odor, total organic vapor screening (OVA) using a photoionization detector, and laboratory analyses.

Soil observations during the Phase I and II groundwater quality assessments indicate three main source areas exist (Figure 4). The first area is the wood treatment source area, and includes the former creosote treatment area, former CCA treatment area and the former sludge ditch. The contaminants from these areas appear to have coalesced and are following the same migration pathways in the subsurface. The second source is the large storage tank area. Contaminants from this area are separated from the other areas and appear to be following a different migration pathway. The third source is the diesel storage tank areas. This source can be separated by its location on the site and the physical behavior of the contaminants in the subsurface. The diesel contaminants are less dense than water and tend to float when present as a separate phase. In addition, the dissolved phase associated with diesel does not tend to display a large degree of vertical movement into the subsurface. Wood-preserving constituents are more dense than water and are, therefore, more likely to more downward into the subsurface.

For clarity, soil quality observations will be addressed by source area and will include only observations made during the Phase III groundwater quality assessment. For a review of the observations from previous assessments, please refer to the boring logs in Attachment D or the previously referenced Phase II groundwater quality assessment report.

Visible staining of the soils in the vicinity of the wood treatment source area were further evaluated by Phase III monitoring wells MW-11B, MW-14A, MW-20A, MW-24A, MW-28A, MW-29A, and MW-30. Monitoring well MW-11B is located in the area formerly occupied by the creosote treatment facility. Wood-preserving constituents were observed in the soil from 5 feet below land surface to 17 feet below land surface at this location. Staining was observed to a depth of 1 foot below the top of the peat. Monitoring well MW-14A is located hydraulically downgradient from the former wood treating facility at the upper reaches of the former sludge ditch. Staining was observed at a depth of 3 feet to 22 feet below land surface. Staining was present to a depth of 14.5 feet below the top of peat at MW-14A. Monitoring well MW-20A is located upgradient of the former wood treatment facility. No staining or odors were detected in this boring, however, organic vapors were detected by the OVA in a thin zone on top of the

peat. Monitoring well MW-24A, located downgradient to the south of the former wood treatment facility, had stained sediments from 7 to 12 feet below land surface. Located to the east of the former sludge ditch and across the on-site drainage ditch is monitoring well MW-28A. No staining or odors were detected in this boring. Elevated OVA readings, however, were detected in the upper aquifer and in the peat at this location. Monitoring well MW-29A is located near the confluence of the on-site drainage ditch and Greenfield Creek in the southeastern portion of the property. No visible wood-preserving constituents were present at this location, however, a moderate odor and elevated OVA results were detected in the lower aquifer on top of the lower clay at a depth from 34 to 38 feet below land surface. Monitoring well MW-29A appeared clean until a depth of 34 feet below land surface. This suggests that dissolved constituents have migrated from the wood preserving source area through the upper aquifer, peat, and the upper portion of the lower aquifer and are now being detected downgradient of the source on top of the lower clay. Monitoring well MW-30 is also located downgradient of the wood preserving source area adjacent to the on-site wetland area. No staining was observed, however, a moderate odor and elevated OVA results were detected in the upper aquifer immediately on top of the peat.

Monitoring well MW-22A is completed in the vicinity of the former large storage tank containment area adjacent to the Cape Fear River. Visible staining was observed at a depth from 4 to 6 feet below land surface. A slight diesel odor was observed in the upper 4 feet of the borehole followed by a wood preserving constituent odor from 4 to 14 feet below land surface in the upper aquifer. A slight wood preserving constituent odor and elevated OVA results were also detected in the upper portion of the lower aquifer at MW-22A.

The Amerada Hess Corporation petroleum tank farm is located adjacent to the northern property boundary. A truck fueling and wash area is located near the northeast portion of the City of Wilmington property. Amerada Hess corporation investigated and documented a release in this portion of the site. In addition, Hess installed a monitoring well on the City of Wilmington property. In order to further investigate this release area, monitoring well MW-27 was installed during the Phase III assessment activities. Diesel stained soils, odors, and elevated OVA results were detected to a depth of 6 feet below land surface at this location.

Soil sampling completed during the Phase II groundwater quality assessment indicated high constituent levels in the vicinity of SS-10 along Greenfield Creek (Figure 3). This soil sample was suspect because the laboratory results were a magnitude higher than the other samples collected and the field observations were not indicative of high levels of contamination. Therefore, ViroGroup, Inc. collected a second soil sample (SS-10A) at this location to compare to the original soil sampling results.

To collect the soil sample, a pre-cleaned hand auger was used to advance a borehole into the sediment along the on-site side of Greenfield Creek. The hand auger boring was conducted at

low tide so that the boring could be completed in the creekbed. The boring was advanced to a depth of approximately 2 feet below land surface with the deepest sample retrieved from the borehole sent to the laboratory for analysis of Wilmington site-specific constituents (Attachment F). The sample was removed from the hand auger with a clean stainless-steel spoon and placed in respective clean sample containers provided by the laboratory. All soil excavated during completion of the soil boring was containerized in a roll-off container for proper disposal.

The sediment encountered in the borehole was a fine to very coarse, dark brown sand. No visible staining or odor was present in the soil sample. Please refer to the soil sample collection summary sheet located in Attachment F of this report.

Of the Wilmington site-specific list of constituents analyzed, only a fraction of the constituents were detected. The semi-volatile organics that were detected in the soil included: acenaphthene at 3.3 mg/kg dw, benzo(a)anthracene at 7.3 mg/kg dw, benzo(a)pyrene at 2.6 mg/kg dw, benzo(b)fluoranthene at 6 mg/kg dw, benzo(k)fluoranthene at 2.1 mg/kg dw, chrysene at 9 mg/kg dw, and fluoranthene at 15 mg/kg dw, (7 out of 23 constituents were detected). No volatile organics were detected in soil sample SS-10A. Arsenic was detected at a concentration of 13 mg/kg dw, chromium at 38 mg/kg dw and copper at 34 mg/kg dw. Please refer to Attachment F for a summary of the detected constituents in SS-10A.

Results from the second soil sample collected at location SS-10 are much lower than the first sample collected. The summed total for detected semi-volatile organics in the first sample, SS-10 is 6,110 mg/kg dw and for the second sample SS-10A is 45.3 mg/kg dw. As shown, the first sample is suspect. Please refer to Attachment A for a tabulated historical soil sample parameter summary from the Phase II assessment.

At completion of field activities, the roll-offs containing all assessment derived wastes were solidified by mixing the materials with kiln dust. Following solidification, a composite soil sample was collected for analysis by the Toxicity Characteristic Leaching Procedure (TCLP) to evaluate disposal options for the soil. The soil sample was analyzed for arsenic, chromium, lead, mercury; benzene, methyl ethyl ketone, o-cresol, m+p cresol, hexachlorobenzene, pentachlorophenol, pyridine, 2,4,5-trichlorophenol, and 2,4,6-trichlorophenol. All analytical results were below laboratory detection limits. Please refer to Attachment F for a summary table for the TCLP analysis and for the soil sample collection sheet.

3.6 Groundwater Quality

On November 16 through 19, 1993, ViroGroup collected 31 groundwater samples from the existing monitoring wells at the facility. Groundwater samples were not collected from monitoring wells MW-11, MW-14, MW-22, or MW-26 because a heavy (sinker) separate phase fluid was observed in these monitoring wells. Separate phase fluid thickness measurements were

collected from these monitoring wells using an interface probe. A thickness of 0.01 feet at MW-11, 0.41 feet at MW-14, 0.23 feet at MW-22 and 5.24 feet at MW-26 was measured during the Phase III assessment. A trace of heavy separate phase fluid was present in MW-12. A trace light (floating) sheen was observed in monitoring wells MW-12, MW-13, MW-16, MW-17, and MW-28.

Subsequent to the separate phase fluid evaluation, representative groundwater samples were collected from the remaining monitoring wells utilizing a clean disposable bailer to evacuate a minimum of three well volumes of groundwater from the well. The salinity, pH, conductivity, and temperature of the groundwater at each well were recorded and the groundwater sample placed into respective sterile groundwater sample containers for each well. The containers were labeled according to owner, site name, well number, date, time, and type of analysis to be performed. The collected samples were kept cool by placing the samples immediately into a cooler chilled to 4°C with ice. The sealed samples were then shipped with the appropriate chain-of-custody form via Federal Express overnight to Savannah Laboratories and Environmental Services, Inc. for analysis. The groundwater samples were analyzed for the Wilmington site-specific constituent list (Attachment G). Standard groundwater sampling protocol was followed as documented in the report entitled: SAMPLING AND ANALYSIS PLAN FOR GROUNDWATER MONITORING - SOUTHERN WOOD PIEDMONT COMPANY revised October 1991. Please refer to the groundwater sample collection summary sheets located in Attachment G for a listing of water level, well depth, sample appearance, volume purged, temperature, conductivity, pH, salinity, the presence of separate phase fluids and additional observations made during this groundwater sampling event for each monitoring well at the facility.

All purge water was containerized in a labeled roll-off container for proper disposal.

Temperature-compensated salinity measurements were collected in the field at each monitoring well at the facility using a YSI Model 33 SCT meter. Please refer to Attachment G for the salinity measurement summary table and Figure 14 for the upper aquifer salinity isoconcentration map. The EPA recommended limit for chloride concentration is 250 mg/l. At chloride concentration above 250 mg/l water begins to have an objectional taste. As shown on the upper aquifer salinity isoconcentration map, a mound a fresh water (salinity < 250 mg/l) is present in the northern portion of the site. This mound becomes elongate to the south reaching into the wetland area in the southeastern portion of the property. Brackish water is present in the upper aquifer along the Cape Fear River, Greenfield Creek, and the on-site drainage ditches.

Slightly saline groundwater is also present in the lower aquifer at 200 mg/l in MW-22A adjacent to the Cape Fear River and in MW-29A adjacent to Greenfield Creek. Otherwise, the lower aquifer appears to contain freshwater.

The groundwater samples were analyzed by the laboratory for Wilmington site-specific wood preserving metals, semi-volatiles and volatiles. These constituents were selected to evaluate potential groundwater contamination from the former wood treating facility at the site. Please refer to the groundwater sample parameter summary tables presented in Attachment G for a listing of the individual constituents that were detected at each monitoring well at the facility. Presented below is a summary of the detected constituents at the facility.

The groundwater samples for metals were analyzed after filtration (dissolved metals) and with no filtration (total metals). After filtration, all dissolved arsenic, chromium, and copper concentrations were below laboratory detection limits.

Total arsenic, chromium and copper concentrations were detected in many of the monitoring wells in the upper aquifer at the facility. Total arsenic concentrations in the upper aquifer ranged from ND (non-detected) to 0.088 mg/l. The highest level of total arsenic detected was present at MW-15 in close proximity to the CCA treatment area. Concentrations of total chromium ranged from ND to 4.6 mg/l. The highest detected level of chromium occurred along the northern property boundary at MW-18. Total copper concentrations ranged from ND to 0.058 mg/l. The highest area of detected total copper occurred in the vicinity of the large storage tank area at MW-13. No concentrations of total arsenic, chromium or copper were detected in the lower aquifer at the facility.

Groundwater samples were also analyzed for semi-volatile and volatile organic wood-preserving constituents. Please refer to the Wilmington site-specific groundwater sample list located in Attachment G for a complete listing of the semi-volatile and volatile constituents. From the entire list of constituents analyzed, only a small fraction of the constituents were detected. The semi-volatile organics that were detected in the groundwater included: acenaphthene, anthracene, carbazole, fluoranthene, naphthalene, and phenanthrene (6 out of 23 constituents were detected). The volatile organics that were detected in the groundwater during Phase III include: benzene, ethyl benzene, m/p xylene, o-xylene, and toluene (5 out 30 constituents were detected).

For simplification the organic wood preserving constituent concentrations in each well are summed to arrive at a total organic wood preserving constituent concentration. This total concentration is used to produce organic wood preserving constituent isoconcentration maps for the upper and lower aquifers depicted in Figures 15 and 16.

The areas of separate phase fluid and elevated dissolved constituent concentrations occur in close relation to the source areas (large storage tank area, diesel storage tank area, and the wood treatment area). As demonstrated by the concentration of organic constituents in the source areas, relative to the rest of the site, and by the list of detected constituents, wood-preserving activities most likely contributed to the observed organics in the groundwater at the site.

In the upper aquifer at the facility, heavy separate phase fluids are present in monitoring wells MW-11, MW-14, MW-22, and MW-26. The highest detected dissolved concentrations of total organic wood-preserving constituents are present in MW-12 at 5.155 mg/l and MW-13 at 5.289 mg/l. An east to west trending band of dissolved and free-phase organics occurs along the southern City of Wilmington property boundary between the Cape Fear River to the west and the on-site drainage ditch to the east. Along this band, dissolved organics from the former wood treatment area and sludge ditch migrate to the east toward the on-site drainage ditch and then turn to the south toward Greenfield Creek. Once the dissolved organics approached the area where the stagnation line occurs, the dissolved organics are smeared to the north and south parallel to the on-site drainage ditch. The dissolved organics do not appear to migrate off-site to the east due to the westerly direction of groundwater flow toward the on-site drainage ditch in the vicinity of Optimist Park. Segments of the dissolved plume emanating from the former wood treatment area are also migrating to the southwest toward monitoring well MW-19 and MW-24 and to the west toward MW-17. The dissolved organics in the vicinity of the former diesel storage tanks and the large storage tank area are migrating to the west toward the Cape Fear River.

The lateral extent of the upper aquifer dissolved organic wood preserving constituent plume is defined in the northern portion of the site. The southern portion of the site and the areas off-site to the east of the drainage ditch are defined to low concentrations of wood-preserving constituents.

The dissolved organic wood preserving constituent plume has also migrated vertically through the peat and into the lower aquifer at the facility. Wood-preserving constituents entered the lower aquifer in the vicinity of former wood treatment area, former sludge ditch and the former large storage tank area. In the vicinity of the former wood treatment area and the sludge ditch the dissolved constituents in the lower aquifer have migrated to the east toward the on-site drainage ditch, then to the south toward Greenfield Creek and finally turning southwest toward the Cape Fear River. Near the large storage tank source area, the wood preserving constituents in the lower aquifer are migrating to the west toward the Cape Fear River.

The lateral extent of the lower aquifer dissolved wood preserving constituent plume is defined to the north and west in the central portion of the site and to the east in the vicinity of MW-28A. The downgradient southeastern portion of the site has been defined to low concentrations of wood-preserving constituents.

In order to further investigate the documented release from Amerada Hess Corporation located to the north of the site, groundwater samples for hydrocarbons were collected from monitoring wells MW-6, MW-18, and MW-27. The groundwater samples were analyzed for hydrocarbons as gasoline, as kerosene, as heavy oils, as mineral spirits, as varsol, and as fuel oil/diesel. All

hydrocarbon analyses were below laboratory detection limits for these constituents. Please refer to Attachment G for a summary of the hydrocarbon analyses.

The concentration of each organic wood preserving constituent was compared to the Environmental Protection Agency's Drinking Water Regulations and Health Advisories (EPA, 1993). The EPA lists a maximum contaminant level (MCL) for several of the organic wood-preserving constituents. The MCL for constituents analyzed during the Phase III groundwater quality assessment are: 0.001 mg/l pentachlorophenol, 0.0002 mg/l benzo(a)pyrene, 0.005 mg/l 1,1,2-trichloroethane, 0.002 mg/l vinyl chloride, 0.005 mg/l benzene, 0.005 mg/l carbon tetrachloride, 0.005 mg/l 1,2-dichloroethane, 0.005 mg/l dichloromethane, 0.005 mg/l 1,2-dichloropropane, 0.7 mg/l ethyl benzene, 10 mg/l total xylenes, 1 mg/l toluene, 0.1 mg/l trans-1,2-dichloroethylene, and 0.2 mg/l 1,1,1 trichloroethane. Out of all the constituents analyzed at each monitoring well, only benzene exceeded its MCL. The benzene concentration exceeded the MCL at MW-19 at 0.0055 mg/l and at MW-13 at 0.046 mg/l in the vicinity of the former diesel storage tanks and the former large storage tank area (Figure 17). The laboratory detection limits of 0.05 mg/l pentachlorophenol and 0.01 mg/l benzo(a)pyrene used during the Phase III assessment were not low enough to compare the results to the MCLs for these constituents. However, at the quantitation limit used for the Phase III assessment no pentachlorophenol or benzo(a)pyrene was detected at the facility. Groundwater samples were not collected from monitoring wells that contained separate phase constituents.

3.7 Surface Water Quality

Surface water samples were collected along the east bank of the Cape Fear River adjacent to the former wood treating facility on January 18, 1994. Two upgradient and two downgradient samples were collected. The upgradient surface water samples are located near the U.S. Highway #74 bridge and near the old slip at the former wood treating facility (Figure 22). The downgradient surface water samples are located near the mouth of Greenfield Creek and near the North Carolina State Ports Authority. Both the upgradient and downgradient surface water samples were below laboratory detection limits for the Wilmington site-specific constituents. Please refer to Attachment G for the Phase III surface water sample parameter summary table and laboratory data for the Cape Fear River surface water samples.

4.0 SUBSURFACE WOOD PRESERVING CONSTITUENT MIGRATION

Wood-preserving constituents (creosote/coal tar) are considered to be dense non-aqueous phase liquids (DNAPLS). As a whole, wood-preserving constituents are slightly heavier than water, have a high viscosity, and a low dissolved phase mobility (Cherry, 1992). Because wood-preserving constituents are heavier than water, gravity and interfacial tension between the DNAPL and groundwater play an important role in the migration of the DNAPL. The DNAPL will continue to migrate vertically downward in the subsurface until it intercepts a barrier to its

vertical migration. The barrier to migration could be a fine-grained layer or a clay or any material in which the pore spaces are smaller than that of the host material. If the barrier is flat lying, the DNAPL will begin to pool and spread laterally on this barrier until a critical pool height is encountered. The critical pool height is the height of the DNAPL pool required to exceed the entry pressure (capillary pore pressure and interfacial tension) within the pores of the material restricting the movement of the DNAPL. Once this critical pool height is reached, the DNAPL will then begin to flow through the original barrier to flow (Kueper, 1992). Once the entrance pressure is achieved and flow through the barrier has begun, the reduced interfacial tension can allow the entire free product pool to drain leaving only residual DNAPL behind. If the barrier encountered is sloping, the DNAPL will most likely flow by gravity downslope until another barrier to flow is encountered causing the DNAPL to pool. This can continue until the required entry pressure cannot be met or until the separate phase fluid volume is reduced to residual concentrations.

As the DNAPL is migrating through porous media, residual DNAPL is left behind the trailing edge of the moving DNAPL body due to snap-off and by-passing mechanisms. It can be expected that an estimated 20 percent of the DNAPL body will be left behind as residual during free-phase migration (U.S. EPA, 1993). After a certain distance of migration, the free phase will be reduced to just residual concentrations (Kueper, 1992).

At the Wilmington, North Carolina facility it appears that the concepts presented above exist (Figures 18, 19, 20, and 21). Wood-preserving constituents entered the subsurface at the former wood treatment area (MW-11), along the former sludge ditch (MW-14), and at the confluence of the on-site drainage ditches near (MW-26). In the subsurface, the free-phase wood-preserving constituents migrated to the top of the peat. Once the free-phase wood-preserving constituents encountered the peat, the product began to pool near MW-11 adjacent to a mound in the peat at MW-14. As the pool height increased, its width began to migrate to the northwest toward MW-12 and MW-17, to the southwest toward MW-19 and MW-24, and to the east toward MW-26. For a period of time, the fine-grained nature and the sloping surface of the peat prevented the downward infiltration of free-phase wood-preserving constituents into the peat. However, the pool height continued to increase until the critical pool height was reached. At that time, the free-phase wood-preserving constituents migrated into the peat at MW-11 and MW-14. Because the entry pressure into the peat was exceeded, the pool drained into the peat and migrated to the east toward MW-26 and the on-site drainage ditch. Presently, it appears that the migration of free-phase wood-preserving constituents has reached a standstill by pooling beneath the confluence of the on-site drainage ditches near MW-26. Free-phase measurements indicate that residual concentrations are present in the upper aquifer near MW-11 at 0.01 feet, in MW-12 at trace levels and in the peat near MW-14 at 0.41 feet. Residual concentrations in these areas indicate that the free-phase constituents have migrated from this area leaving a trail of residual concentrations behind. The free-phase constituents appear to have become stationary and are pooled near MW-26 at a thickness of 5.24 feet.

Free-phase wood-preserving constituents also entered the subsurface near the former large storage tank area (MW-13). Once in the subsurface, the free-phase constituents migrated to the west toward the Cape Fear River. It appears that these constituents did not pool on top of the peat as indicated by residual concentrations of 0.23 feet at MW-22.

5.0 REFERENCES

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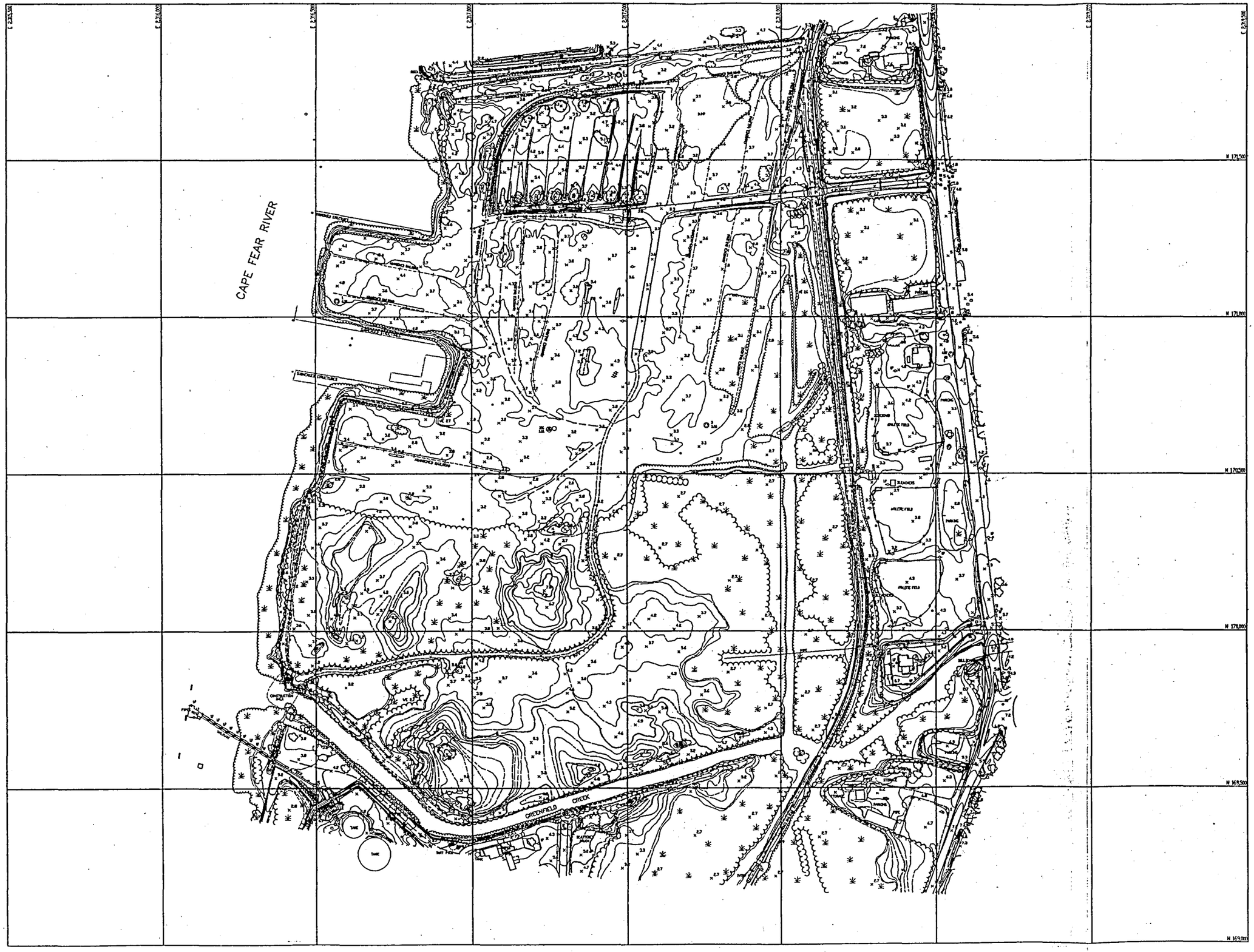

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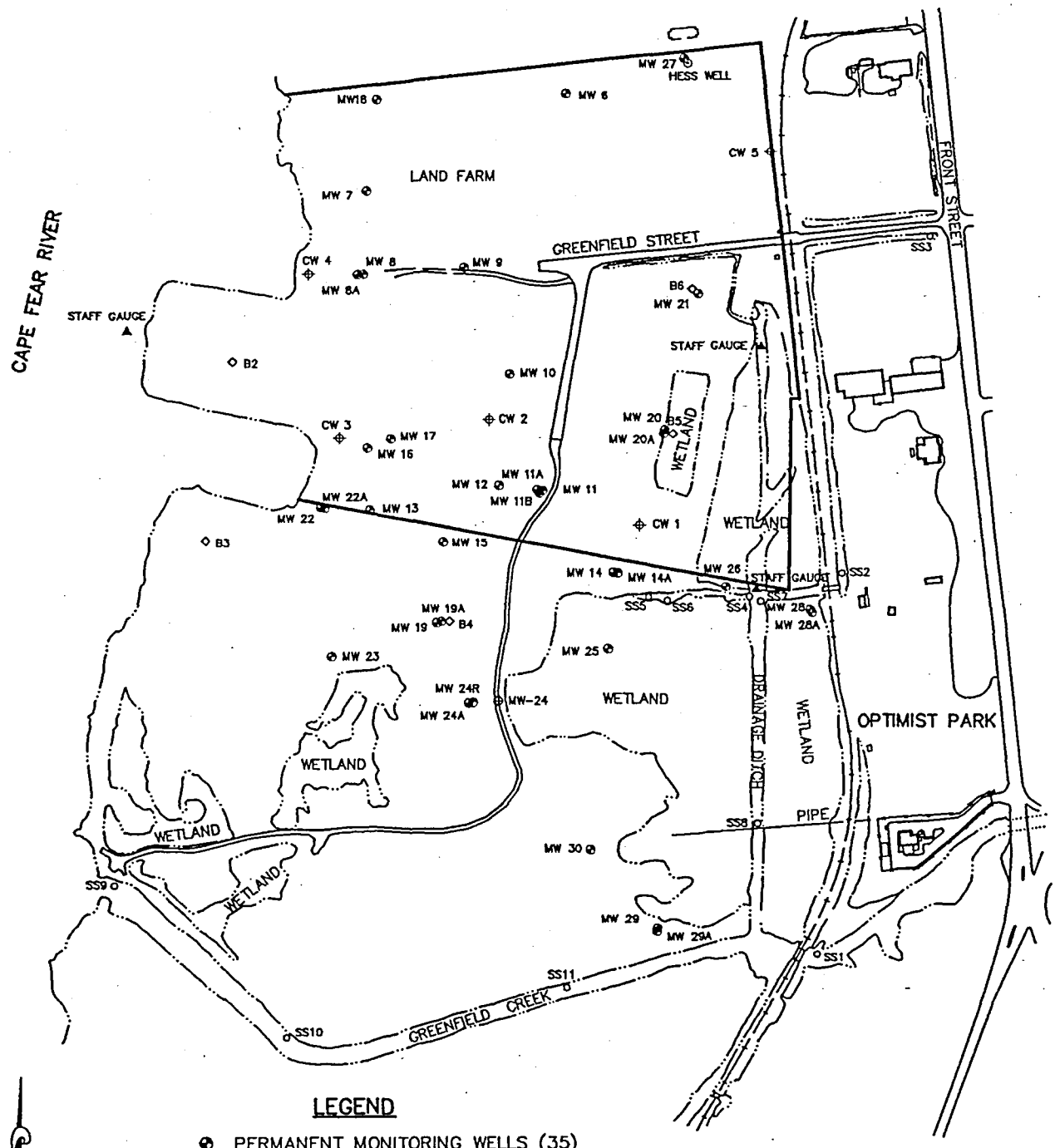
(803) 957-4270

0' 150' 300' 600'
SCALE: 1"=300' CONTOUR INTERVAL:1/2'
DATE OF PHOTOGRAPHY: 24-FEB-93

FIGURE 2

SITE TOPOGRAPHIC MAP

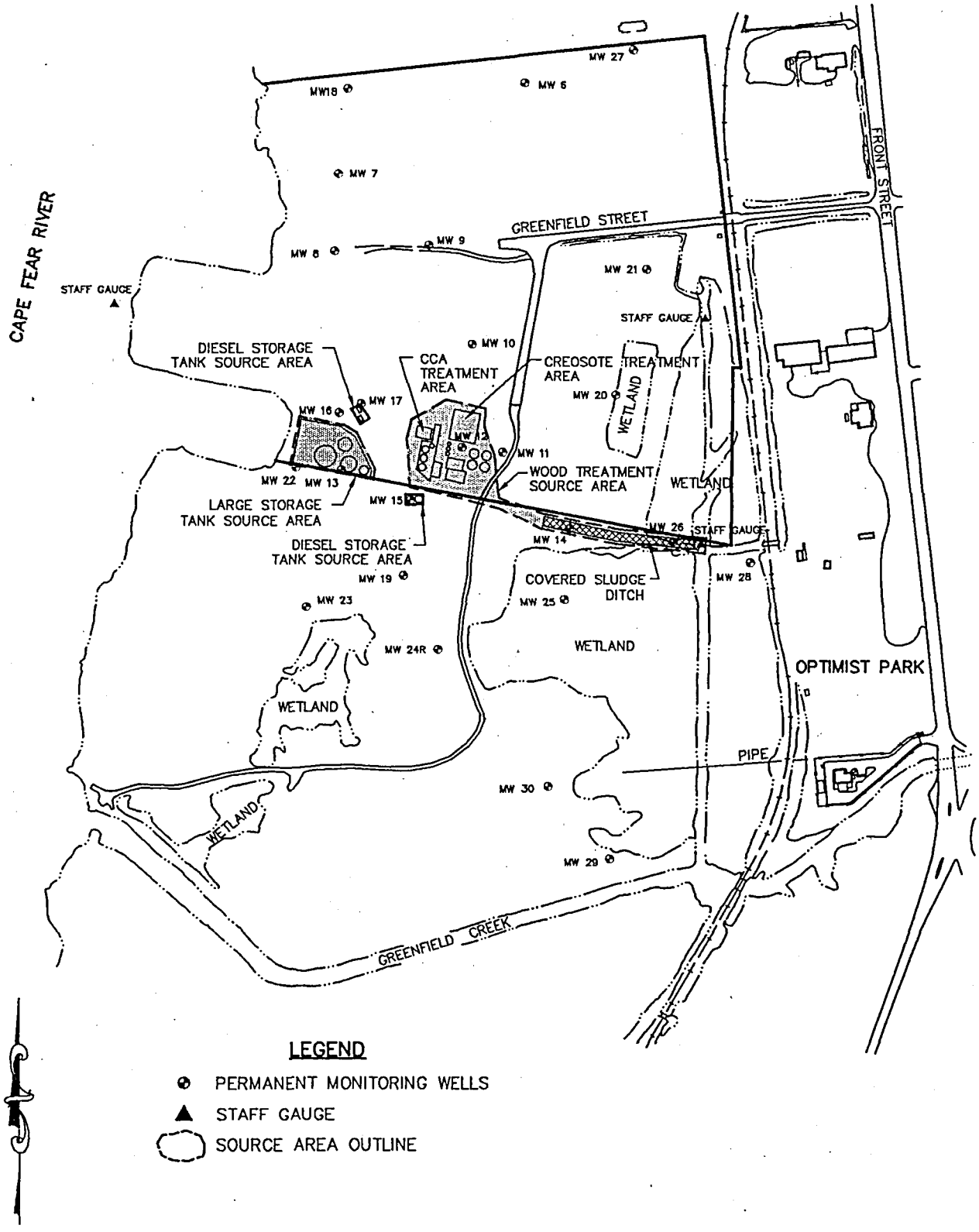
SOUTHERN WOOD PIEDMONT
WILMINGTON, N.C. FACILITY



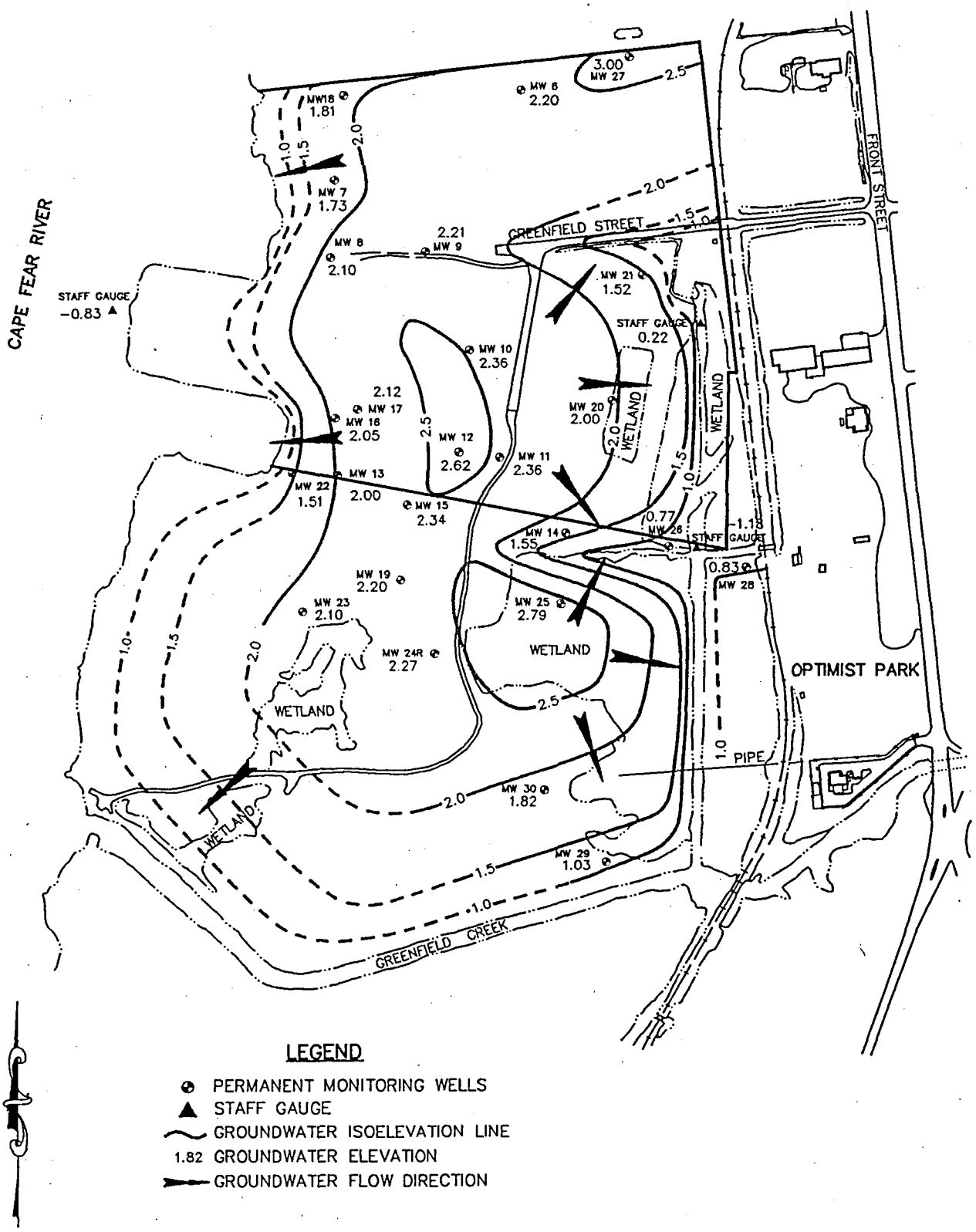
LEGEND

- PERMANENT MONITORING WELLS (35)
- STAFF GAUGE (3)
- SOIL SAMPLES (11)
- ABANDONED TEMPORARY MONITORING WELLS (5)
- CITY WELLS (5)
- HESS WELLS (1)
- ABANDONED MONITORING WELL (1)

ViroGroup ETE, Division P.O. Box 1867 • 1445 Plaugh Church Rd. • Lexington, S.C. 29072 (803) 957-6270	SCALE 1"=400' DRAWN BY CAB CHECKED BY GBK DATE 2/11/94	SITE MAP SOUTHERN WOOD PIEDMONT/ WILMINGTON, N.C. FACILITY	FIGURE NO. 3 CADD NO. G:5301501B PROJECT NO. 12-53015.00



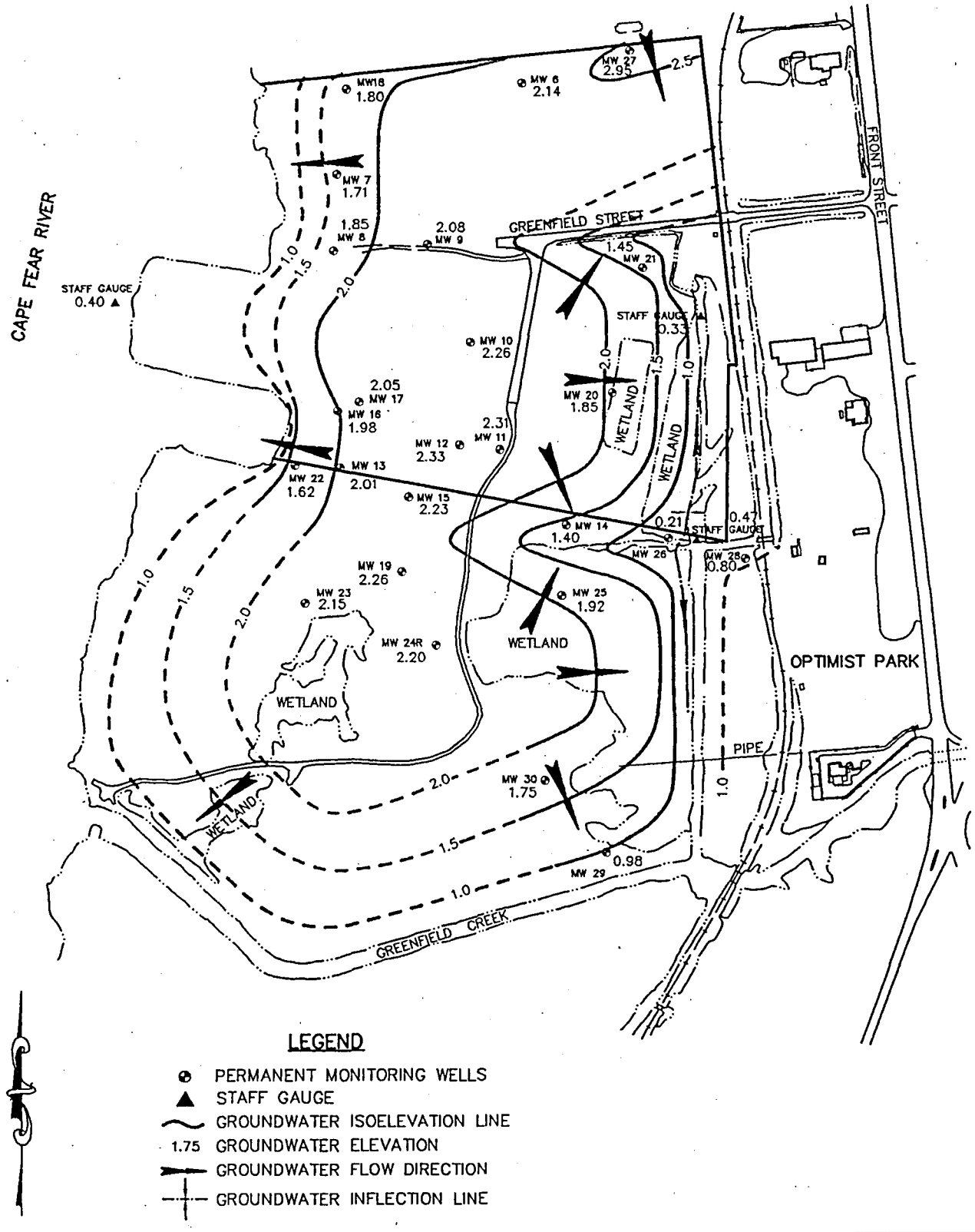
ViroGroup ETE, Division P.O. Box 1867 • 1445 Plaqch Church Rd. • Lexington, S.C. 29072 (803) 957-6270	SCALE 1"=400' DRAWN BY CAB CHECKED BY GBK DATE 2/11/94	SOURCE AREA LOCATION MAP SOUTHERN WOOD PIEDMONT/ WILMINGTON, N.C. FACILITY	FIGURE NO. 4 CADD NO. G:5301501B PROJECT NO. 12-53015.00



LEGEND

- ⊕ PERMANENT MONITORING WELLS
- ▲ STAFF GAUGE
- ~ GROUNDWATER ISOELEVATION LINE
- 1.82 GROUNDWATER ELEVATION
- ➤ GROUNDWATER FLOW DIRECTION

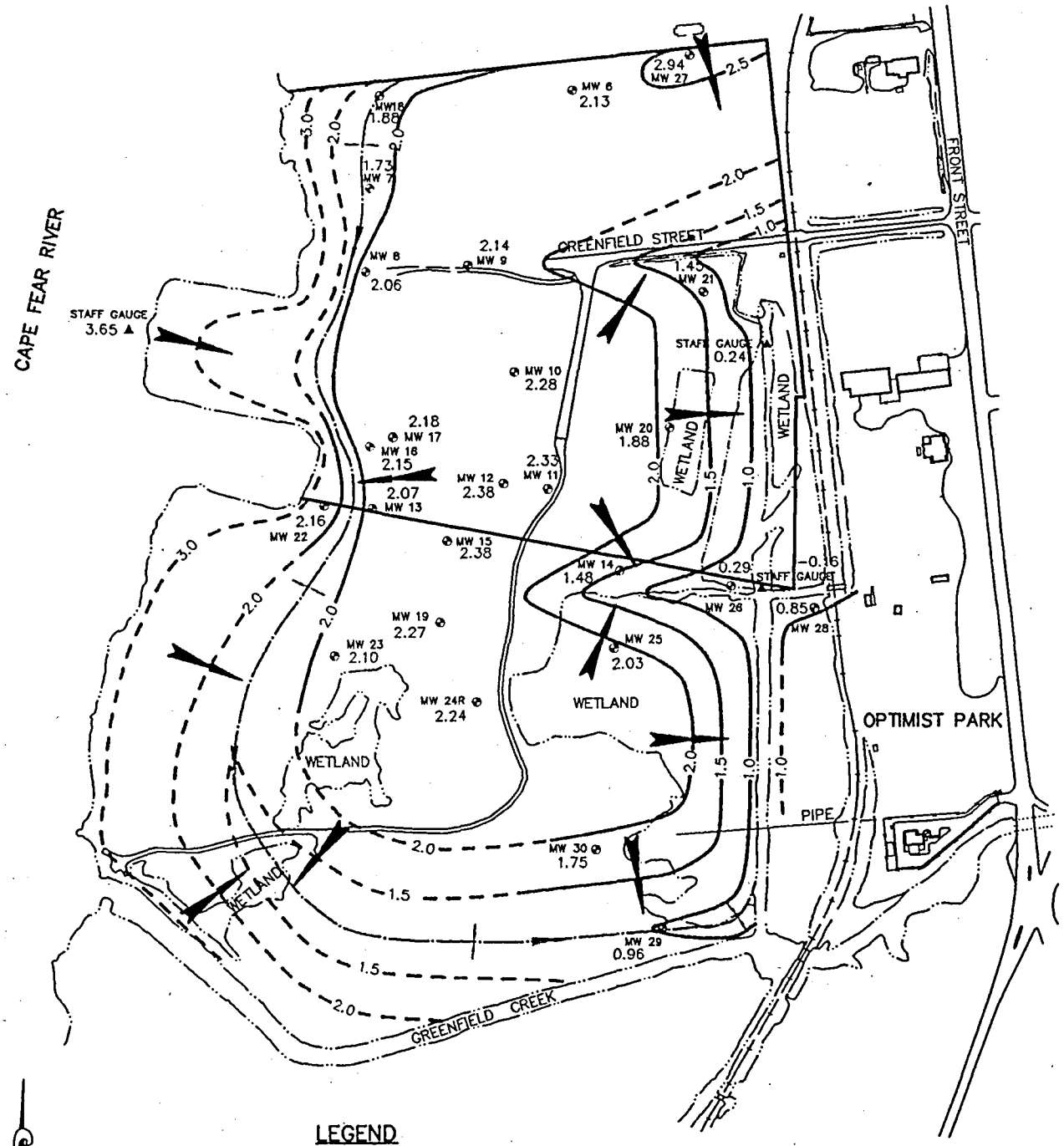
ViroGroup ETE Division P.O. Box 1867 • 1445 Plaugh Church Rd. • Lexington, S.C. 29072 (803) 957-8270	SCALE 1"=400' DRAWN BY CAB CHECKED BY GBK DATE 2/11/94	LOW TIDE UPPER AQUIFER WATER TABLE MAP SOUTHERN WOOD PIEDMONT/ WILMINGTON, N.C. FACILITY	FIGURE NO. 6 CADD NO. G:5301501A PROJECT NO. 12-53015.00



LEGEND

- PERMANENT MONITORING WELLS
- STAFF GAUGE
- GROUNDWATER ISOELEVATION LINE
- 1.75 GROUNDWATER ELEVATION
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER INFLECTION LINE

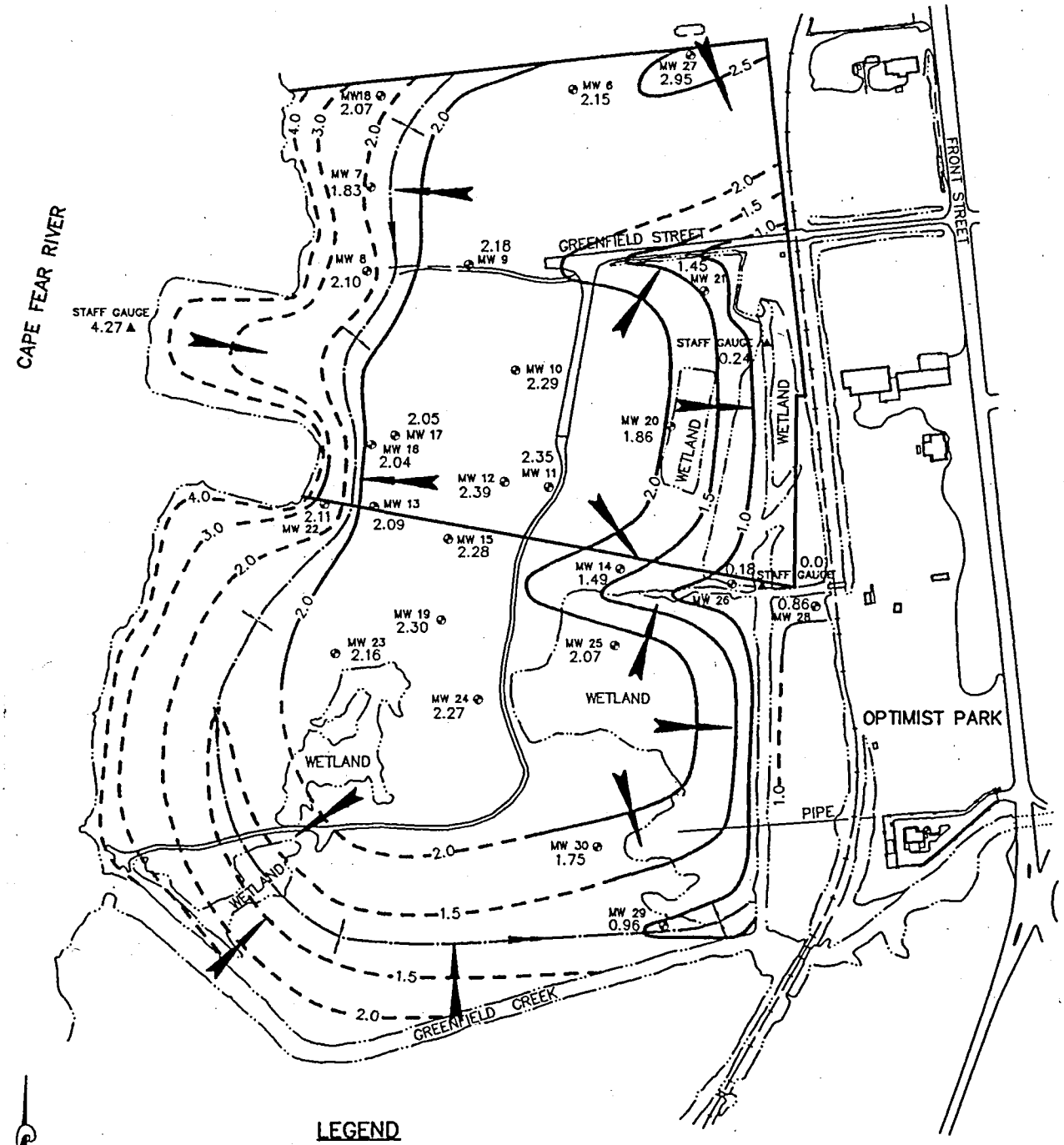
ViroGroup ETG, Division P.O. Box 1867 • 1445 Pisgah Church Rd. • Lexington, S.C. 29072 (803) 957-8270	SCALE 1"=400' DRAWN BY CAB CHECKED BY GBK DATE 2/11/94	ONE QUARTER LOW TIDE UPPER AQUIFER WATER TABLE MAP SOUTHERN WOOD PIEDMONT/ WILMINGTON, N.C. FACILITY	FIGURE NO. 7 CADD NO. G: 5301501A PROJECT NO. 12-53015.00



LEGEND

- PERMANENT MONITORING WELLS
- STAFF GAUGE
- GROUNDWATER ISOELEVATION LINE
- 1.75 GROUNDWATER ELEVATION
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER INFLECTION LINE

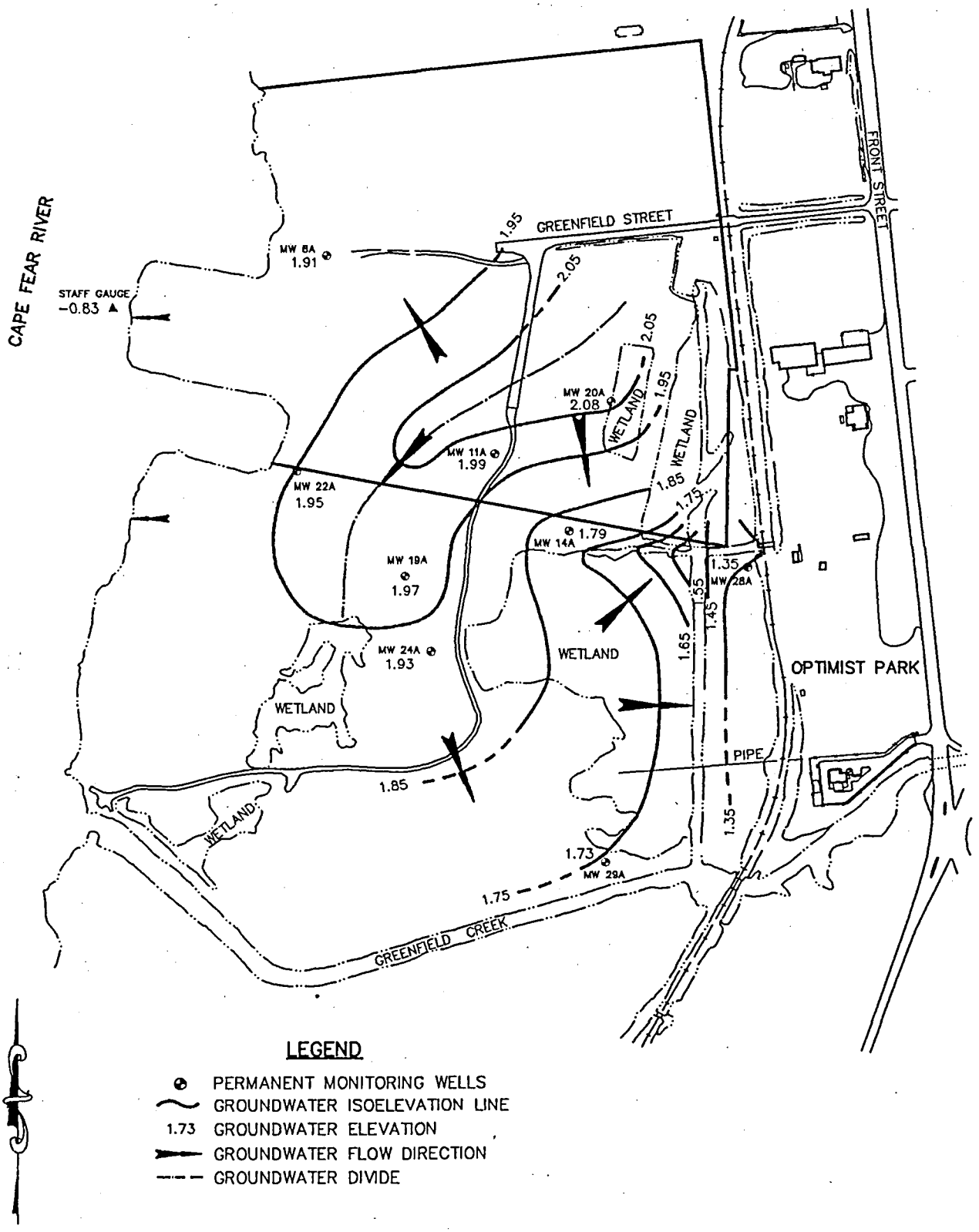
ViroGroup ETE Division P.O. Box 1867 • 1445 Peach Church Rd. • Lexington, S.C. 29072 (803) 957-8270	SCALE 1"=400' DRAWN BY CAB CHECKED BY GBK DATE 2/11/94	THREE QUARTER HIGH TIDE UPPER AQUIFER WATER TABLE MAP SOUTHERN WOOD PIEDMONT/ WILMINGTON, N.C. FACILITY	FIGURE NO. 8 CADD NO. G:5301501A PROJECT NO. 12-53015.00



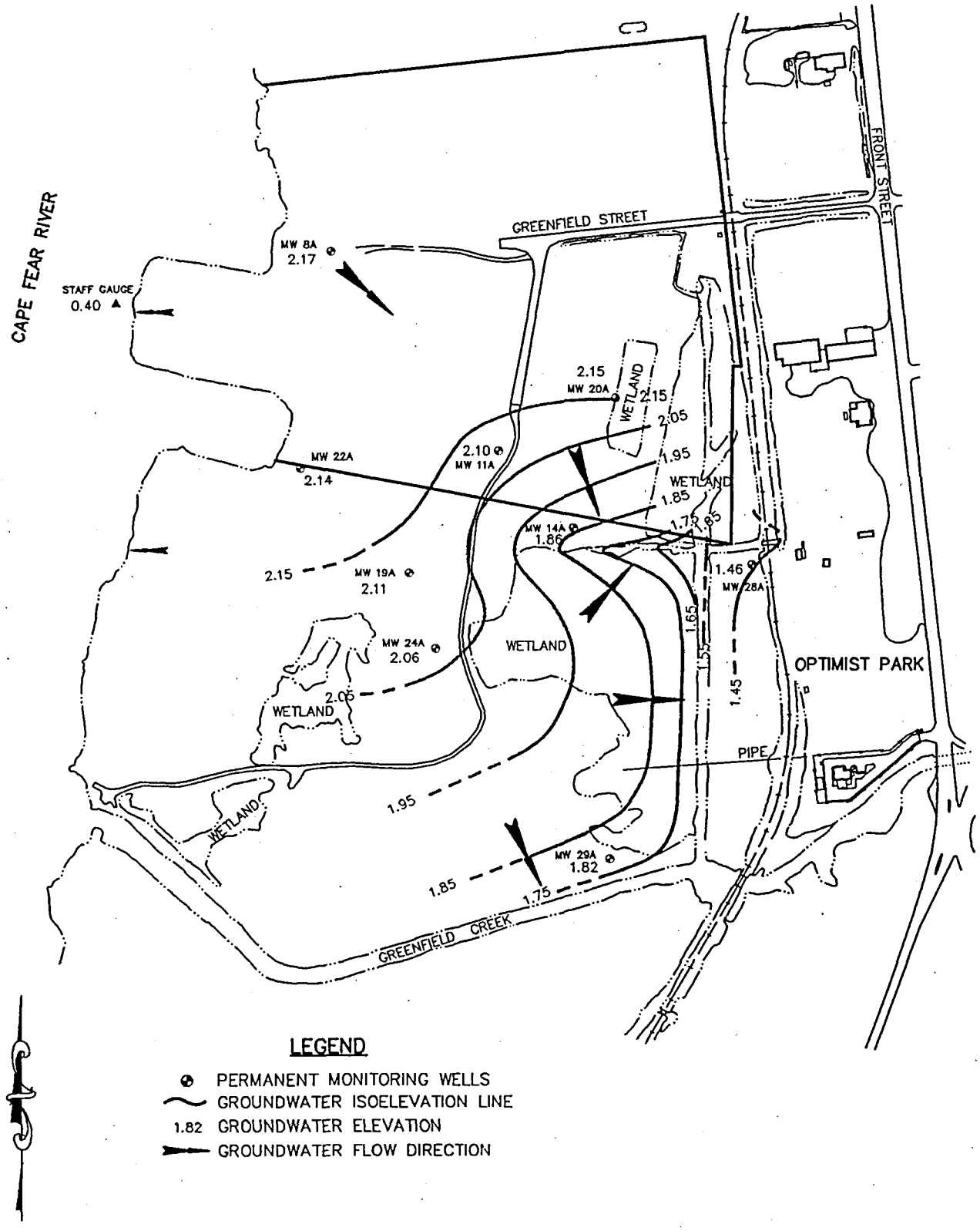
LEGEND

- PERMANENT MONITORING WELLS
- STAFF GAUGE
- GROUNDWATER ISOELEVATION LINE
- 1.75 GROUNDWATER ELEVATION
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER INFLECTION LINE

ViroGroup ETG Division P.O. Box 1867 • 1445 Pleasant Church Rd. • Lexington, S.C. 29072 (803) 957-8270	SCALE 1"=400' DRAWN BY CAB CHECKED BY GBK DATE 2/11/94	HIGH TIDE UPPER AQUIFER WATER TABLE MAP SOUTHERN WOOD PIEDMONT/ WILMINGTON, N.C. FACILITY	FIGURE NO. 9 CADD NO. G:5301501A PROJECT NO. 12-53015.00



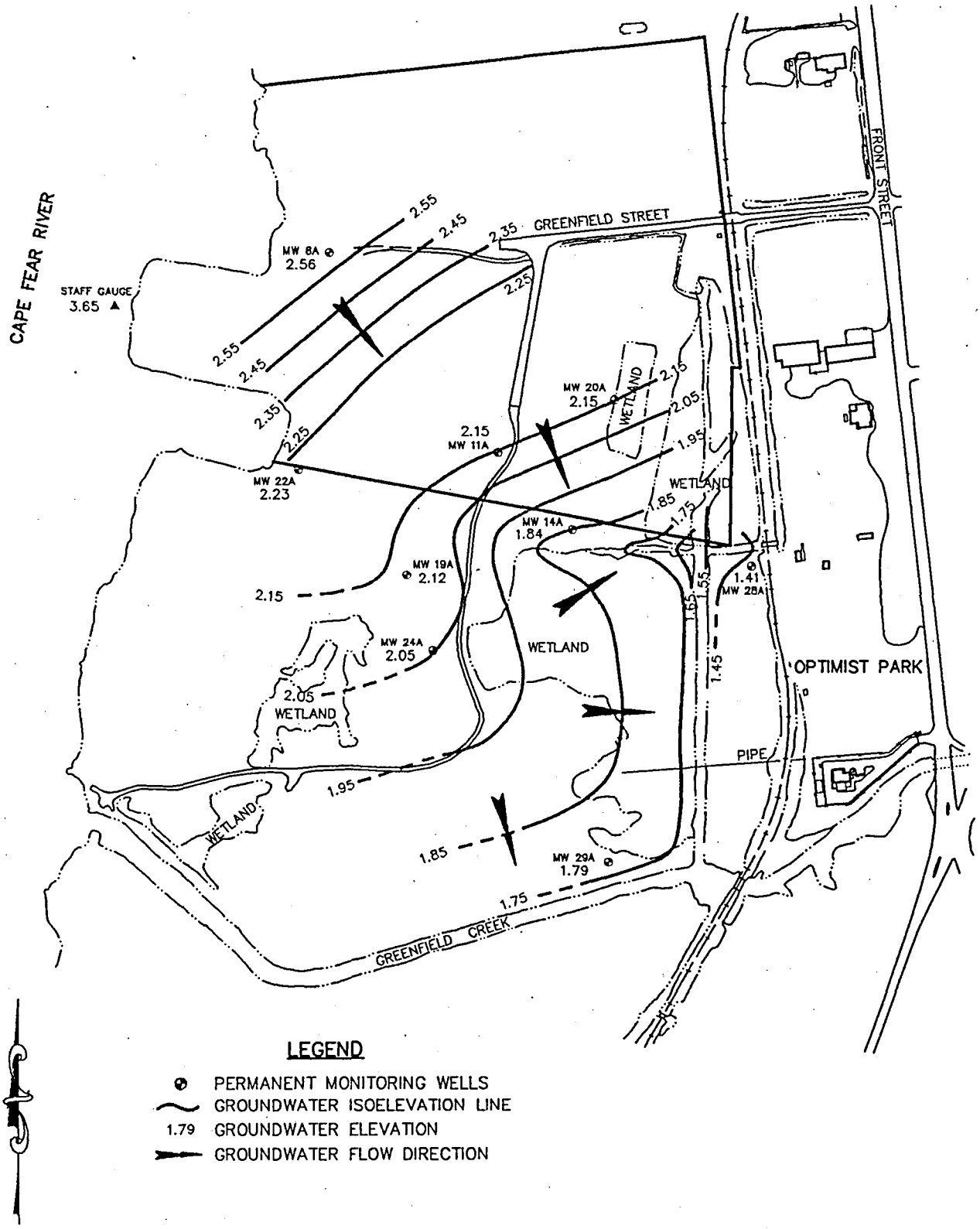
ViroGroup ETE Division P.O. Box 1667 • 1445 Pisgah Church Rd. • Lexington, S.C. 29072 (803) 957-8270	SCALE 1"=400' DRAWN BY CAB CHECKED BY GBK DATE 2/11/94	LOW TIDE LOWER AQUIFER POTENTIOMETRIC MAP SOUTHERN WOOD PIEDMONT/ WILMINGTON, N.C. FACILITY	FIGURE NO. 10 CADD NO. G:5301501B PROJECT NO. 12-53015.00



LEGEND

- PERMANENT MONITORING WELLS
- GROUNDWATER ISOELEVATION LINE
- 1.82 GROUNDWATER ELEVATION
- GROUNDWATER FLOW DIRECTION

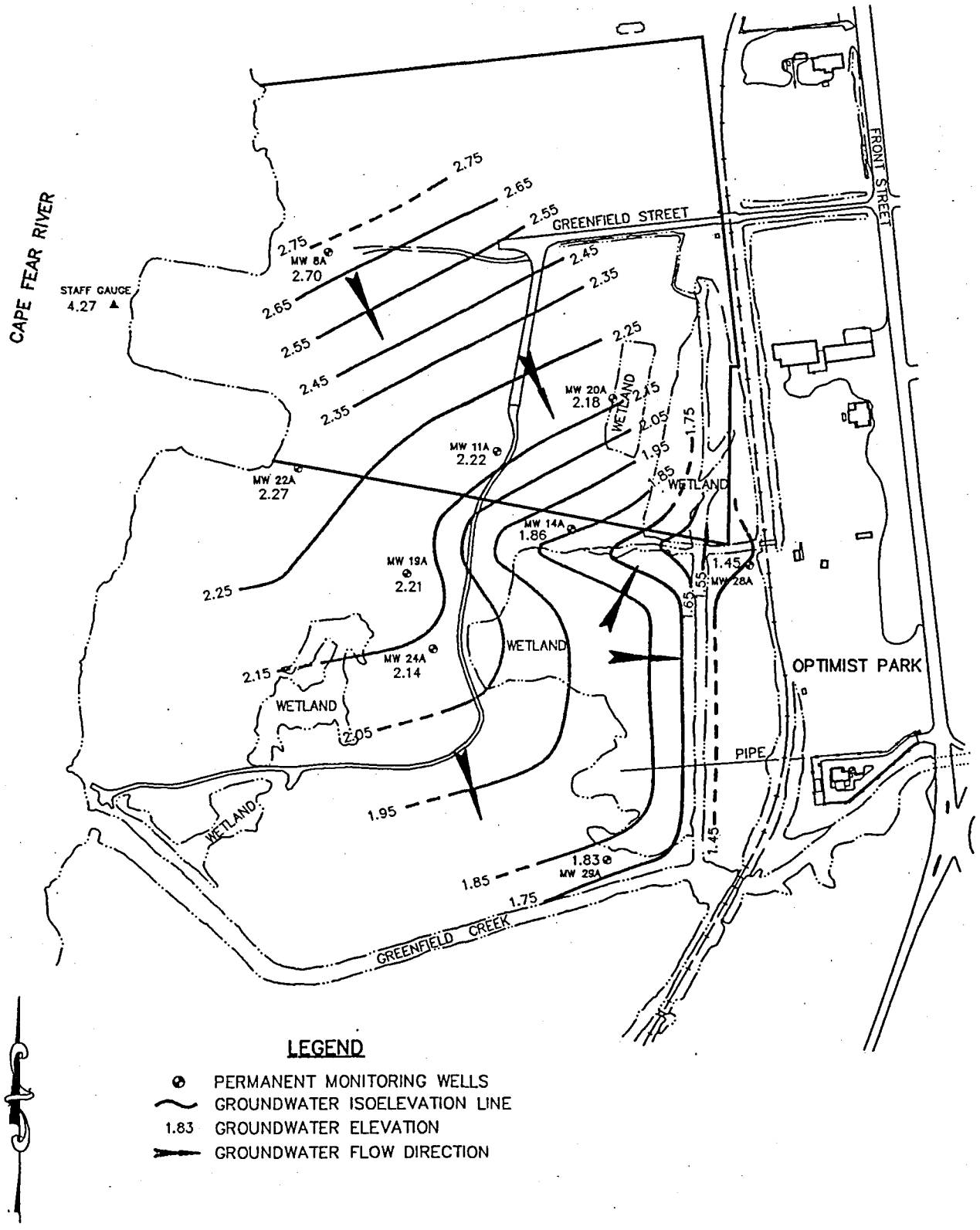
ViroGroup ETE Division P.O. Box 1867 • 1445 Plaugh Church Rd. • Lexington, S.C. 29072 (803) 957-8270	SCALE 1"=400' DRAWN BY CAB CHECKED BY GBK DATE 2/11/94	ONE QUARTER LOW TIDE LOWER AQUIFER POTENTIOMETRIC MAP SOUTHERN WOOD PIEDMONT/ WILMINGTON, N.C. FACILITY	FIGURE NO. 11 CADD NO. G: 5301501B PROJECT NO. 12-53015.00



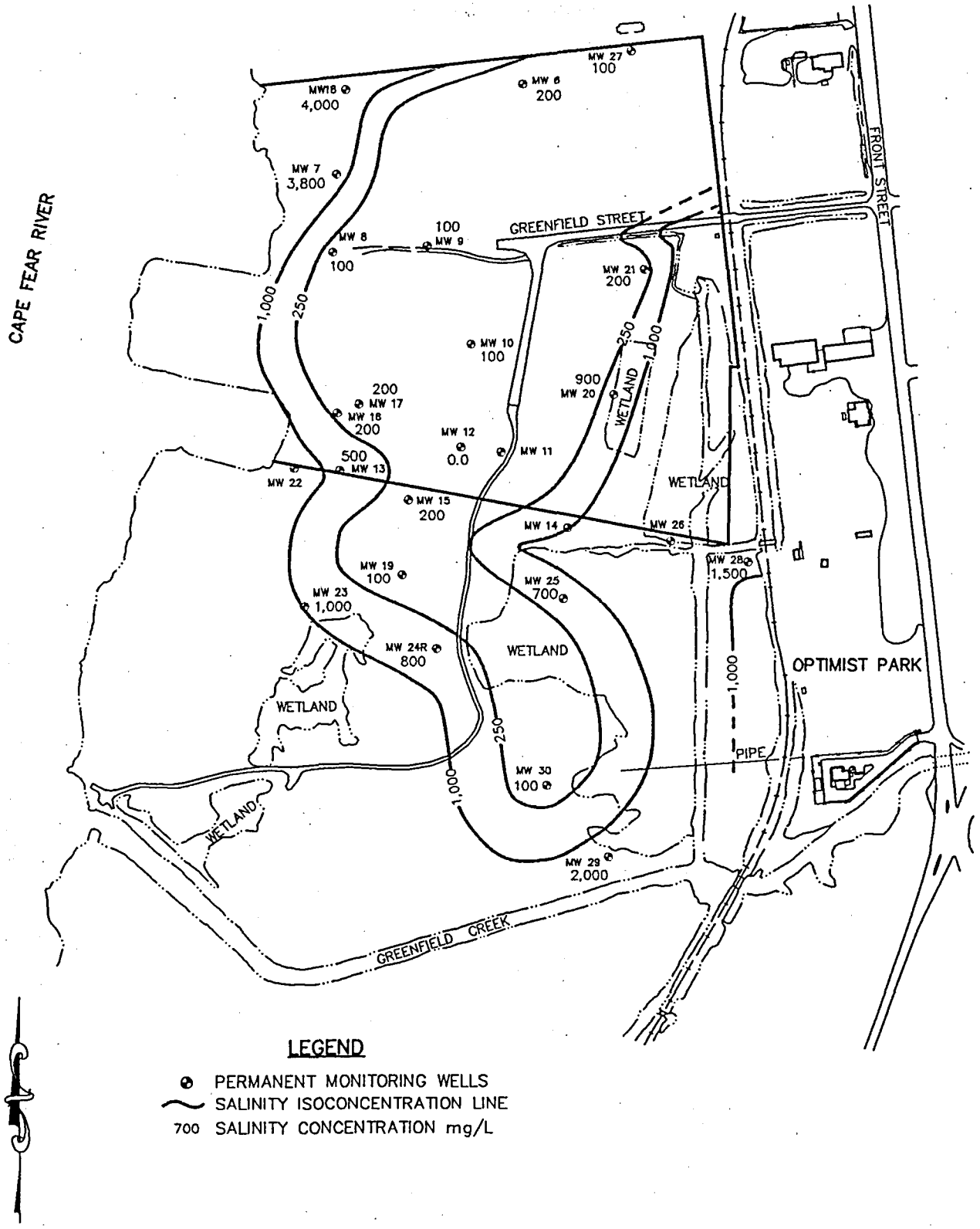
LEGEND

- PERMANENT MONITORING WELLS
- GROUNDWATER ISOELEVATION LINE
- 1.79 GROUNDWATER ELEVATION
- GROUNDWATER FLOW DIRECTION

ViroGroup ETE Division P.O. Box 1867 • 1445 Plaugh Church Rd. • Lexington, S.C. 29072 (803) 957-8270	SCALE 1"=400' DRAWN BY CAB CHECKED BY GBK DATE 2/11/94	THREE QUARTER HIGH TIDE LOWER AQUIFER POTENTIOMETRIC MAP SOUTHERN WOOD PIEDMONT/ WILMINGTON, N.C. FACILITY	FIGURE NO. 12 CADD NO. G:5301501B PROJECT NO. 12-53015.00



ViroGroup ETS, Division P.O. Box 1867 • 1445 Plaugh Church Rd. • Lexington, S.C. 29072 (803) 957-8270	SCALE 1"=400' DRAWN BY CAB CHECKED BY GBK DATE 2/11/94	HIGH TIDE LOWER AQUIFER POTENTIOMETRIC MAP SOUTHERN WOOD PIEDMONT/ WILMINGTON, N.C. FACILITY	FIGURE NO. 13 CADD NO. G:5301501B PROJECT NO. 12-53015.00



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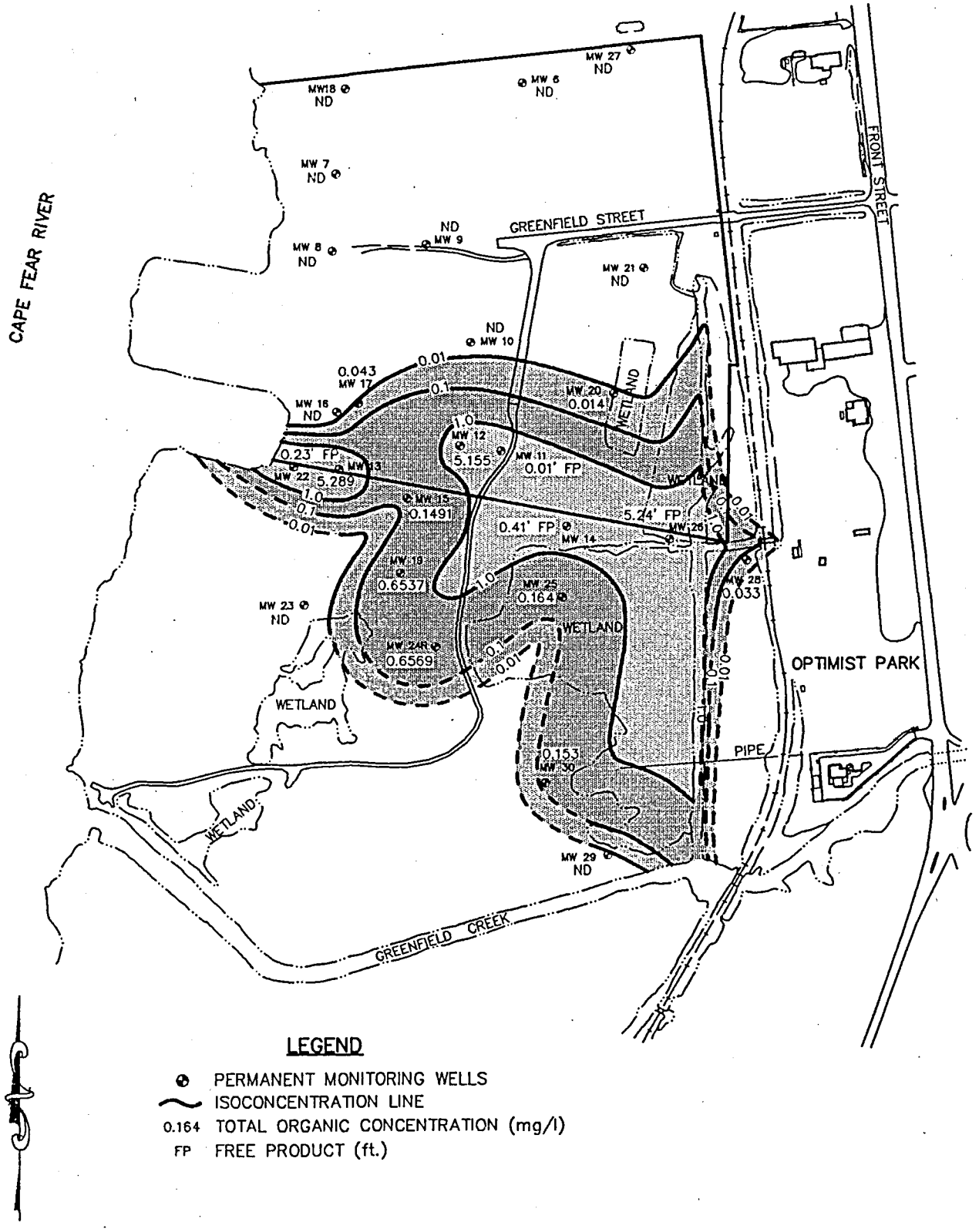
SCALE 1"=400'	UPPER AQUIFER SALINITY ISOCONCENTRATION MAP	FIGURE NO. 14
DRAWN BY CAB	SOUTHERN WOOD PIEDMONT/ WILMINGTON, N.C. FACILITY	CADD NO. G:5301501A
CHECKED BY GBK		PROJECT NO. 12-53015.00
DATE 2/11/94		



LEGEND

- PERMANENT MONITORING WELLS
- ISOCONCENTRATION LINE
- 0.164 TOTAL ORGANIC CONCENTRATION (mg/l)
- FP FREE PRODUCT (ft.)

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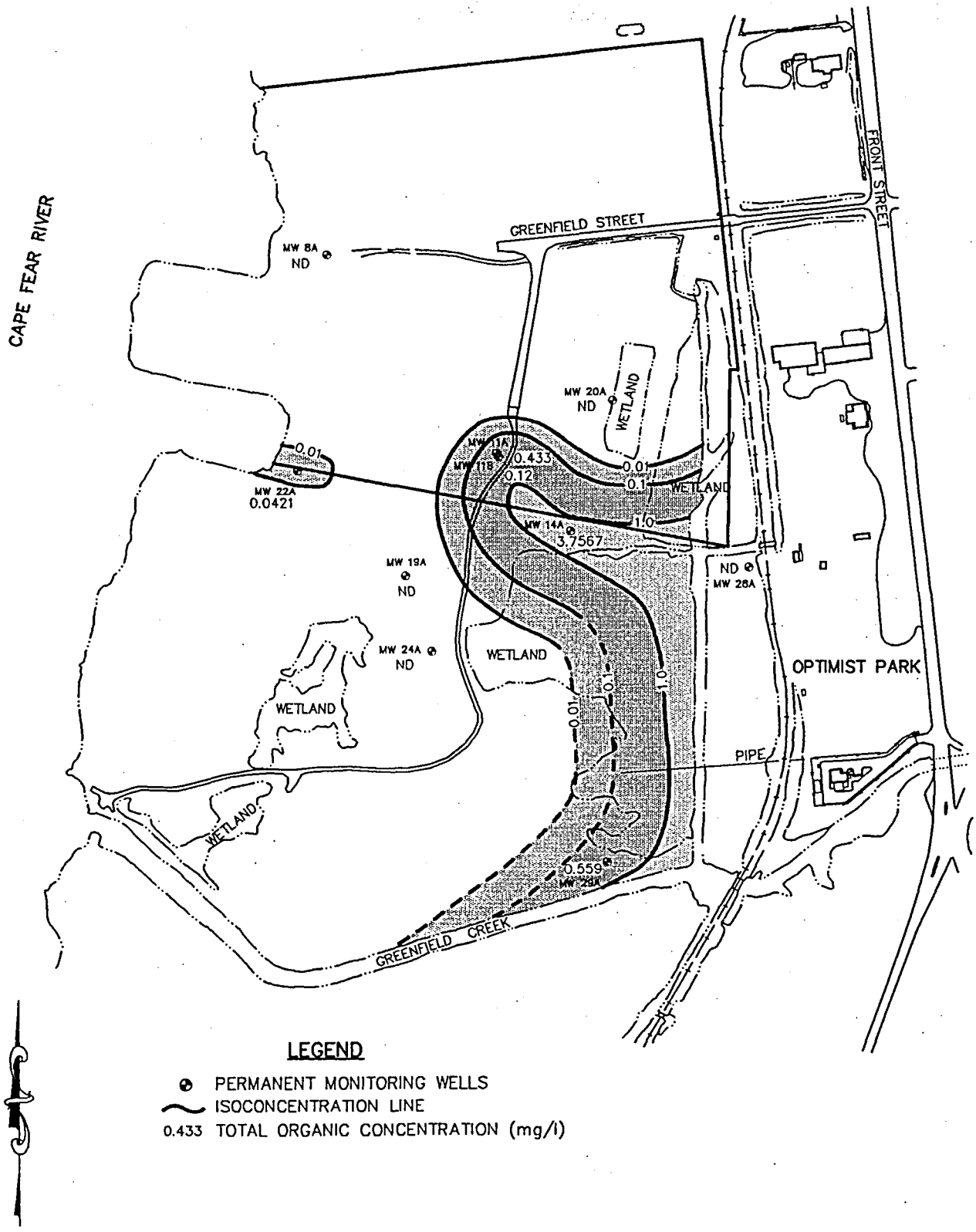
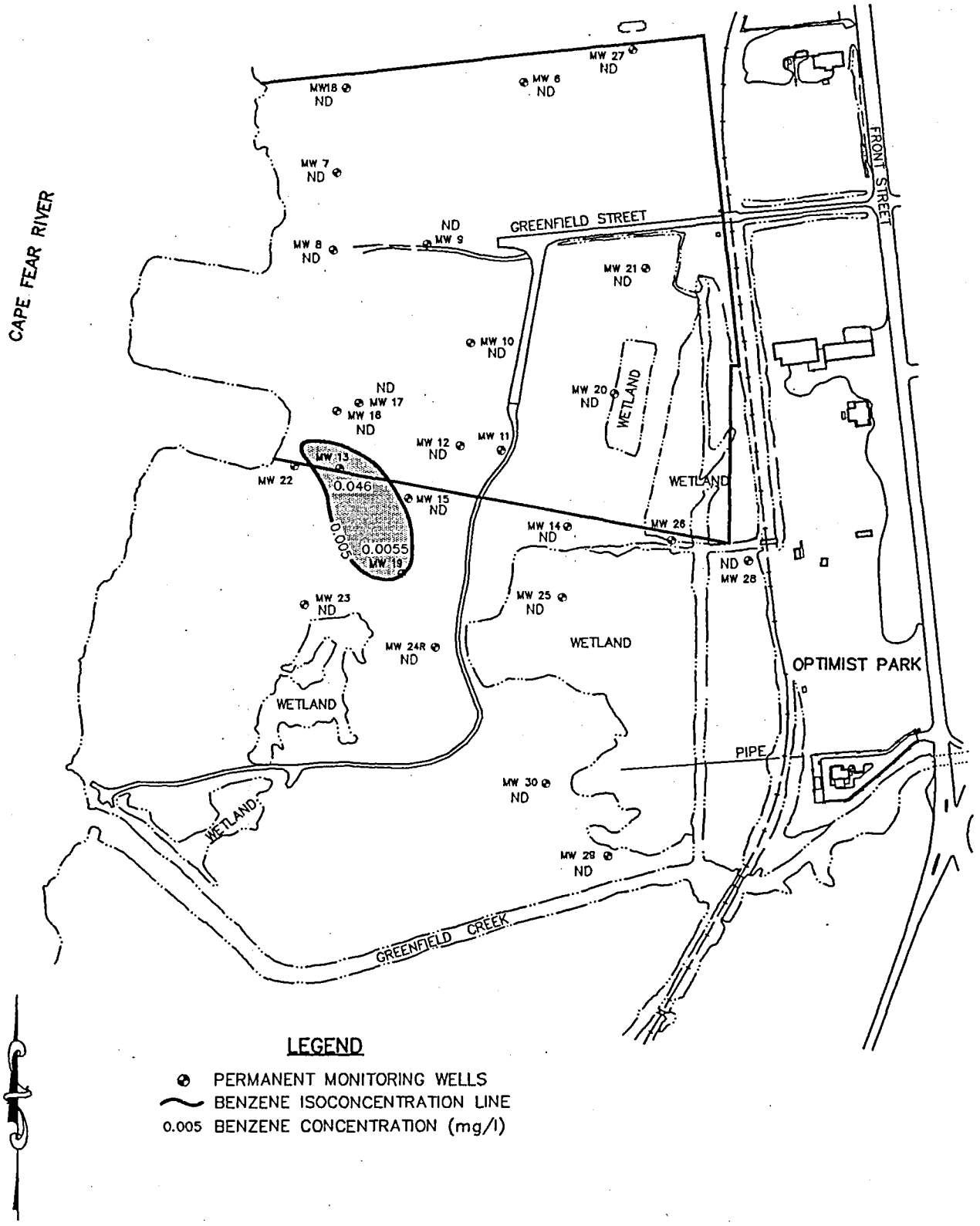
SCALE	1"=400'
DRAWN BY	CAB
CHECKED BY	GBK
DATE	2/11/94

UPPER AQUIFER ORGANIC WOOD PRESERVING CONSTITUENTS ISOCONCENTRATION MAP
SOUTHERN WOOD PIEDMONT/ WILMINGTON, N.C. FACILITY

FIGURE NO.	15
CADD NO.	G:5301501A
PROJECT NO.	12-53015.00

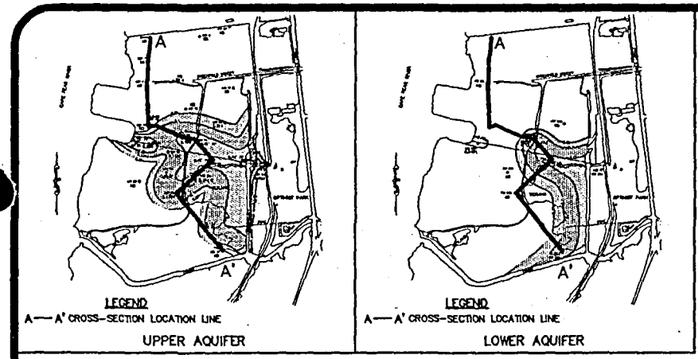


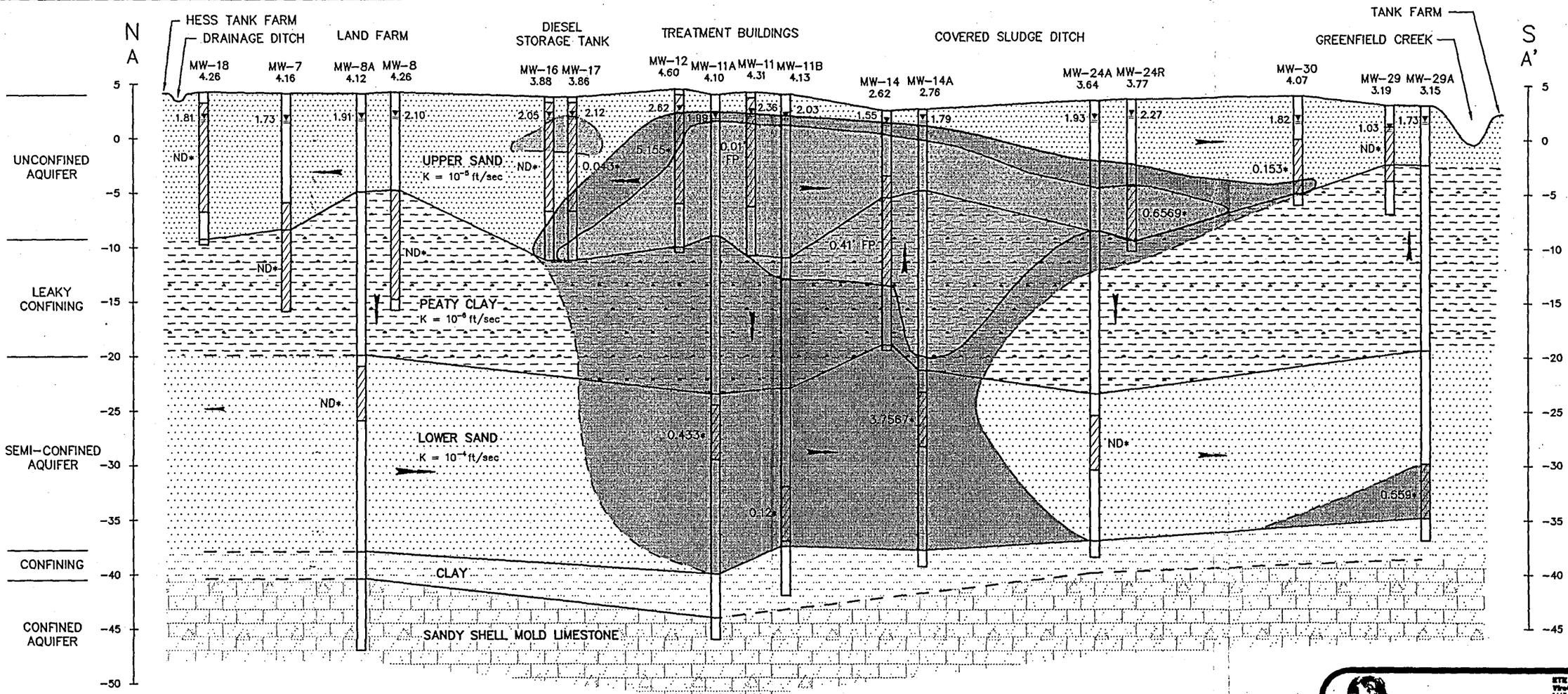
ViroGroup ETE, Division P.O. Box 1867 • 1445 Plaugh Church Rd. • Lexington, S.C. 29072 (803) 957-8270	SCALE 1"=400' DRAWN BY CAB CHECKED BY GBK DATE 2/11/94	LOWER AQUIFER ORGANIC WOOD PRESERVING CONSTITUENTS ISOCONCENTRATION MAP SOUTHERN WOOD PIEDMONT/ WILMINGTON, N.C. FACILITY	FIGURE NO. 16 CADD NO. G:5301501B PROJECT NO. 12-53015.00



ViroGroup ETE Division P.O. Box 1867 • 1445 Pleasant Church Rd. • Lexington, S.C. 29072 (803) 957-8270	SCALE 1"=400' DRAWN BY CAB CHECKED BY GBK DATE 2/11/94	UPPER AQUIFER BENZENE ISOCONCENTRATION MAP SOUTHERN WOOD PIEDMONT/ WILMINGTON, N.C. FACILITY	FIGURE NO. 17 CADD NO. G:5301501A PROJECT NO. 12-53015.00

NO.	REVISION	DATE	BY





LEGEND

- UPPER SAND
- PEATY CLAY
- LOWER SAND
- CLAY
- SANDY SHELL MOLD LIMESTONE
- RESIDUAL & POOLED WOOD PRESERVING CONSTITUENTS
- RESIDUAL DIESEL CONSTITUENTS
- DISSOLVED WOOD PRESERVING CONSTITUENTS ORGANIC PLUME
- SCREEN INTERVAL
- 0.98 ▼ GROUNDWATER ELEVATION
- ND* DISSOLVED ORGANICS (mg/l)
- 0.01' FP FREE PRODUCT (FT.)
- K HYDRAULIC CONDUCTIVITY
- GROUNDWATER GRADIENT

SCALE

HORIZONTAL: 1" = 300'
VERTICAL: 1" = 10'

NOTE:
HORIZONTAL SPACING BETWEEN WELLS IN THE WELL CLUSTERS ARE NOT TO SCALE, (IE: MW-11, MW-11A, & MW-11B).

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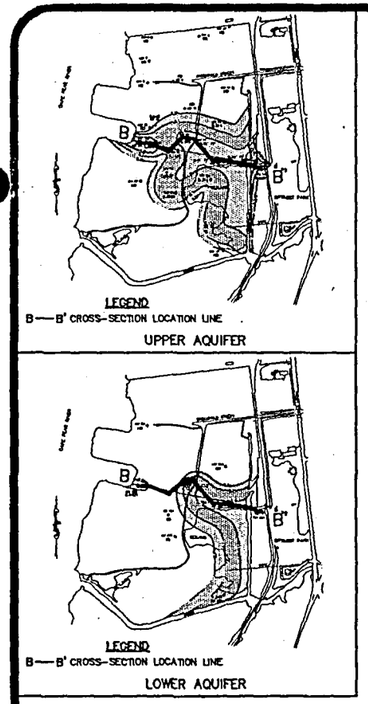
Wats 1-800-786-0654

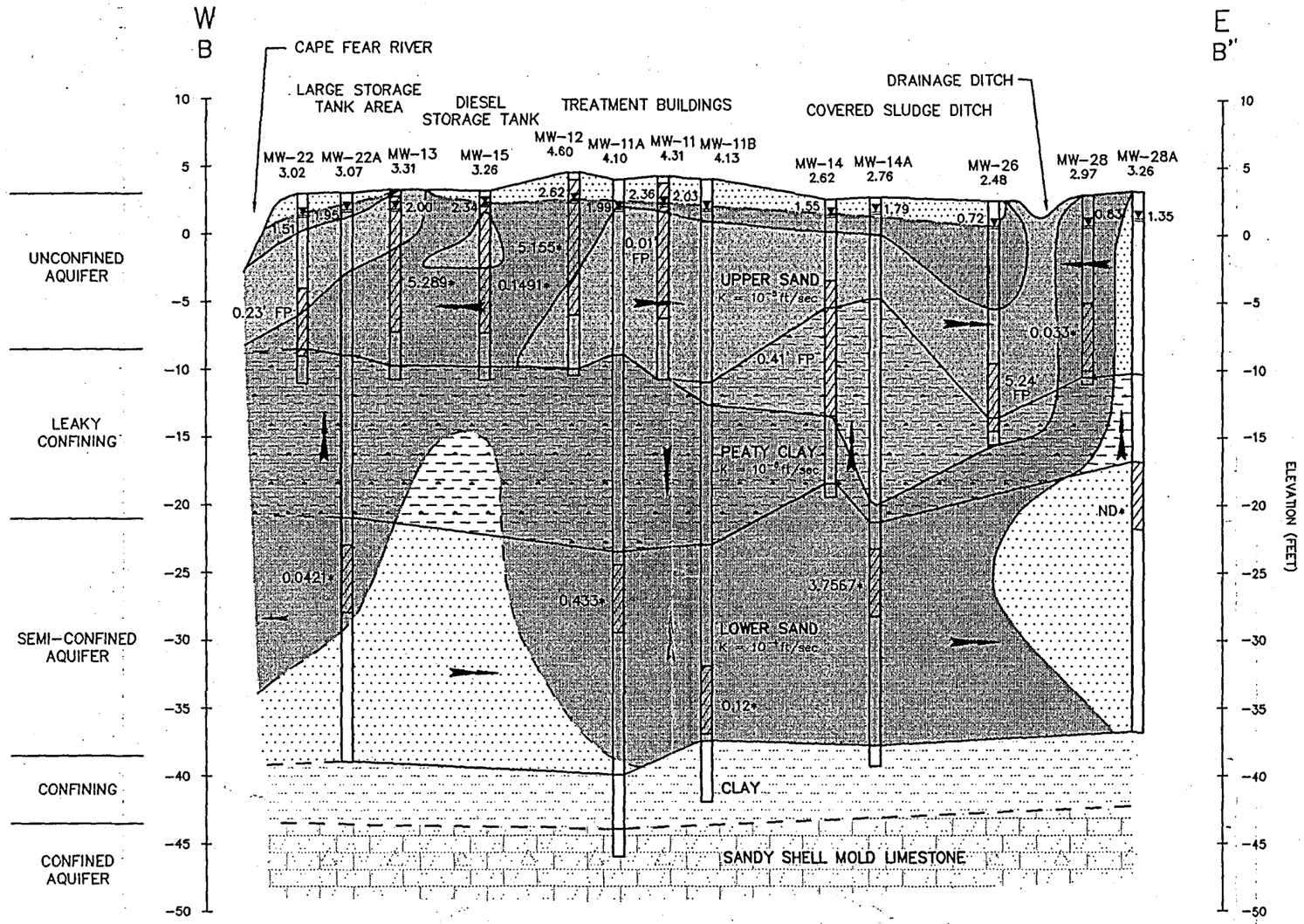
HYDROGEOLOGIC CROSS-SECTION A – A'

SOUTHERN WOOD PIEDMONT/ WILMINGTON, N.C. FACILITY

DRAWN BY:	CAB	DATE:	3/2/94
DESIGNED BY:	GBK	CADD NO:	G:530AA
APPROVED BY:		PROJECT NO:	12-53015.00
SCALE:	AS SHOWN	FIGURE NO:	18

NO.	REVISION	DATE	BY





LEGEND

- UPPER SAND
- PEATY CLAY
- LOWER SAND
- CLAY
- SANDY SHELL MOLD LIMESTONE
- RESIDUAL & POOLED WOOD PRESERVING CONSTITUENTS
- RESIDUAL DIESEL CONSTITUENTS
- DISSOLVED WOOD PRESERVING CONSTITUENTS ORGANIC PLUME
- SCREEN INTERVAL
- 0.98 ▼ GROUNDWATER ELEVATION
- ND* DISSOLVED ORGANICS (mg/l)
- 0.01' FP FREE PRODUCT (FT.)
- K HYDRAULIC CONDUCTIVITY
- GROUNDWATER GRADIENT

SCALE

HORIZONTAL: 1" = 300'
VERTICAL: 1" = 10'

NOTE:
HORIZONTAL SPACING BETWEEN WELLS IN THE WELL CLUSTERS ARE NOT TO SCALE, (IE: MW-11, MW-11A, & MW-11B).

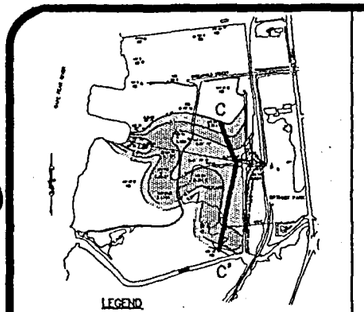
ViroGroup Air•Water•Soil TECHNOLOGY
ETE Division
ViroGroup, Inc.
1445 Mepah Church Road
Lexington, SC 29072
Phone 803-957-8270
FAX 803-957-3845
Watts 1-800-786-0654

HYDROGEOLOGIC CROSS-SECTION B – B'

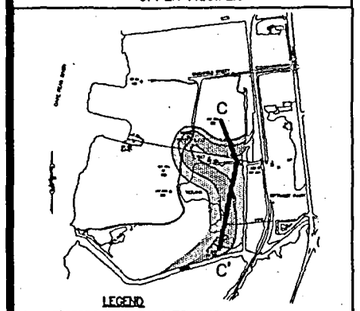
SOUTHERN WOOD PIEDMONT/ WILMINGTON, N.C. FACILITY

DRAWN BY:	CAB	DATE:	3/2/94
DESIGNED BY:	GBK	CADD NO:	G:53088
APPROVED BY:		PROJECT NO:	12-53015.00
SCALE:	AS SHOWN	FIGURE NO:	19

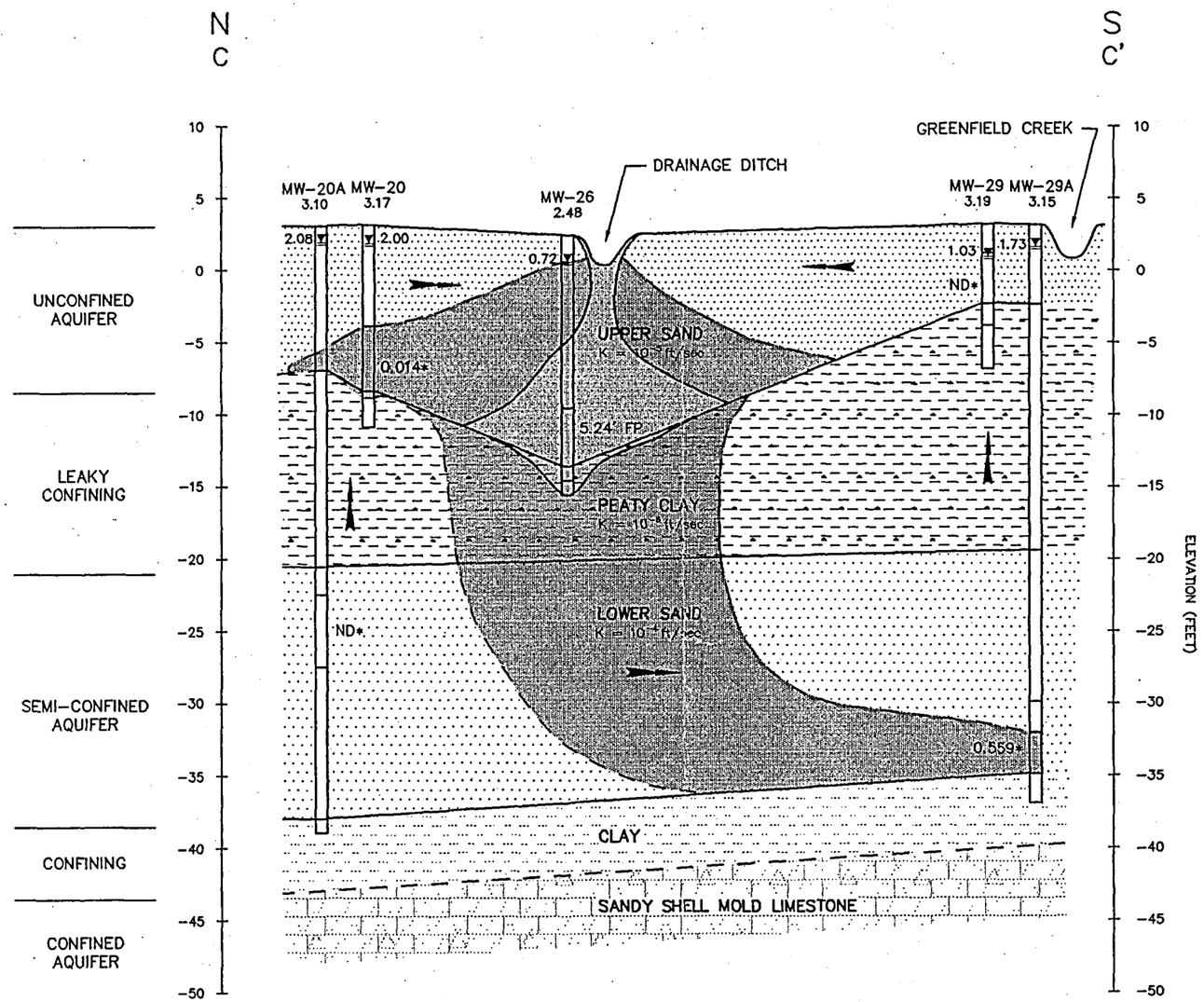
NO.	REVISION	DATE	BY



UPPER AQUIFER



LOWER AQUIFER



LEGEND

- UPPER SAND
- PEATY CLAY
- LOWER SAND
- CLAY
- SANDY SHELL MOLD LIMESTONE
- RESIDUAL & POOLED WOOD PRESERVING CONSTITUENTS
- RESIDUAL DIESEL CONSTITUENTS
- DISSOLVED WOOD PRESERVING CONSTITUENTS ORGANIC PLUME
- SCREEN INTERVAL
- 0.98 ▼ GROUNDWATER ELEVATION
- ND* DISSOLVED ORGANICS (mg/l)
- 0.01' FP FREE PRODUCT (FT.)
- K HYDRAULIC CONDUCTIVITY
- ◄ GROUNDWATER GRADIENT

SCALE

HORIZONTAL: 1" = 300'
VERTICAL: 1" = 10'

NOTE:
HORIZONTAL SPACING BETWEEN WELLS IN THE WELL CLUSTERS ARE NOT TO SCALE, (IE: MW-11, MW-11A, & MW-11B).

ViroGroup Air•Water•Soil TECHNOLOGY
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1445 Piegon Church Road
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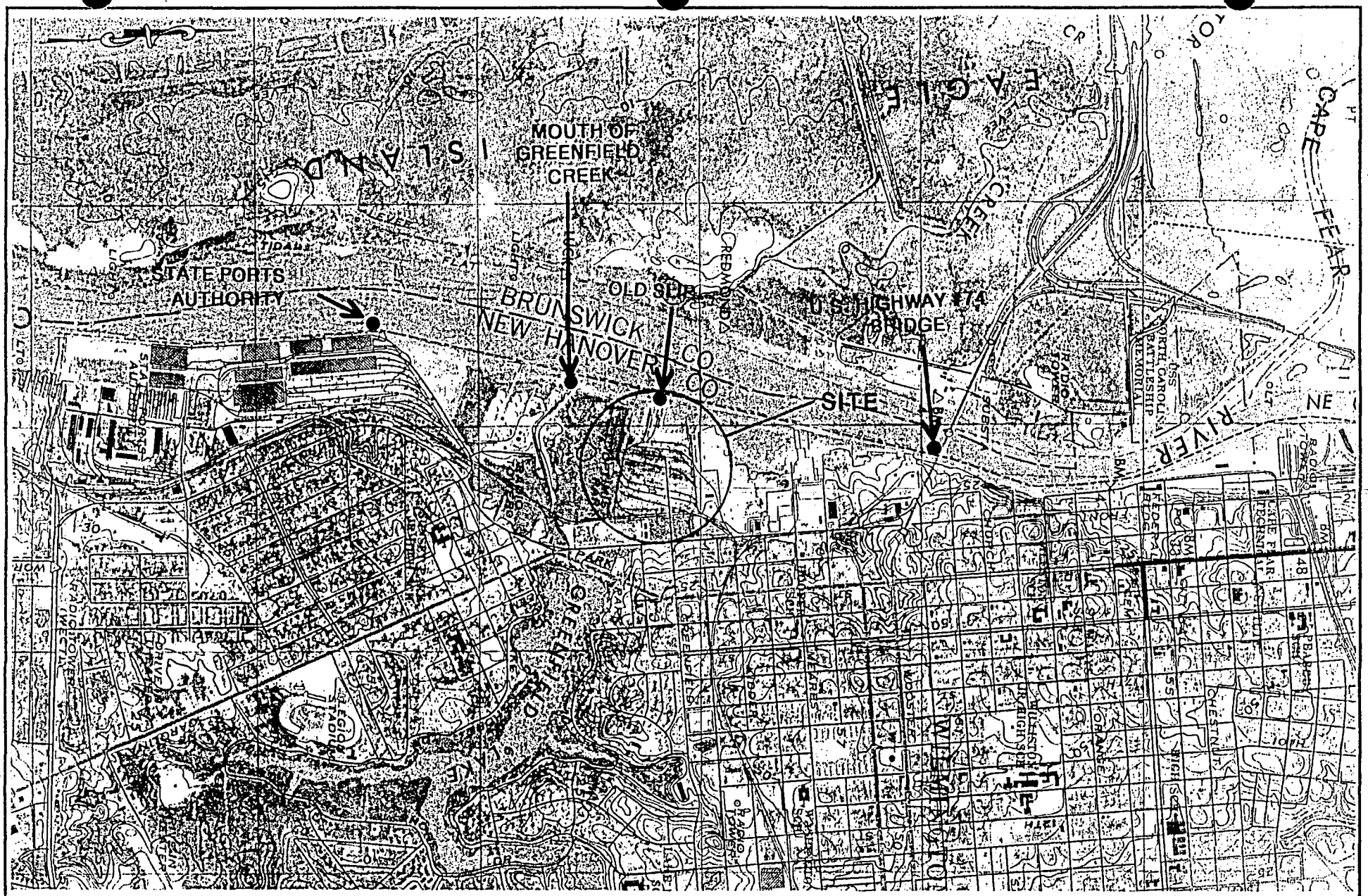
HYDROGEOLOGIC CROSS-SECTION C – C'

SOUTHERN WOOD PIEDMONT/ WILMINGTON, N.C. FACILITY

DRAWN BY:	CAB	DATE:	3/2/94
DESIGNED BY:	GBK	CADD NO:	G:53000
APPROVED BY:		PROJECT NO:	12-53015.00
SCALE:	AS SHOWN	FIGURE NO.	20



ViroGroup Air•Water•Soil TECHNOLOGY ETE Division ViroGroup, Inc. 1445 Pisgah Church Road Lexington, SC 29072 Phone 803-957-6270 FAX 803-957-3845 Watts 1-800-786-0654	SCALE 1:24,000 DRAWN BY CAB CHECKED BY GBK DATE 7/8/94	CAPE FEAR RIVER SURFACE WATER SAMPLE LOCATION MAP SOUTHERN WOOD PIEDMONT/ WILMINGTON, N.C. FACILITY	FIGURE NO. 22 CADD NO. G:5301501 PROJECT NO. 12-53015.00

ATTACHMENT A

HISTORICAL GROUNDWATER ELEVATION SUMMARY TABLE
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

WELL #	DATE	TIME	RISER ELEV	DEPTH TO WATER	GROUNDWATER ELEVATION
Ditch Staff Gauge	4-1-92	7:00	6.64	1.90	1.88
	4-1-92	9:00	6.64	2.40	2.38
	4-1-92	11:00	6.64	2.13	2.11
	4-1-92	13:00	6.64	0.20	0.18
	4-1-92	15:00	6.64	0.10	0.08
	4-1-92	17:00	6.64	0.26	0.24
	4-1-92	19:00	6.64	1.85	1.83
	10-13-92		6.64	-0.05	-0.07
River Staff Gauge	4-1-92	7:00	5.93	4.70	3.97
	4-1-92	9:00	5.93	4.75	4.02
	4-1-92	11:00	5.93	3.20	2.47
	4-1-92	13:00	5.93	1.65	0.92
	4-1-92	15:00	5.93	0.60	-0.13
	4-1-92	17:00	5.93	2.80	2.07
	4-1-92	19:00	5.93	4.80	4.07
	10-13-92		5.93	-0.41	-1.14
B-2	4-1-92	7:00	6.96	5.45	1.51
	4-1-92	9:00	6.96	5.30	1.66
	4-1-92	11:00	6.96	5.45	1.51
	4-1-92	13:00	6.96	5.72	1.24
	4-1-92	15:00	6.96	5.87	1.09
	4-1-92	17:00	6.96	5.78	1.18
	4-1-92	19:00	6.96	5.40	1.56
B-3	4-1-92	7:00	5.13	3.00	2.13
	4-1-92	9:00	5.13	2.67	2.46
	4-1-92	11:00	5.13	3.12	2.01
	4-1-92	13:00	5.13	3.70	1.43
	4-1-92	15:00	5.13	3.96	1.17
	4-1-92	17:00	5.13	3.78	1.35
	4-1-92	19:00	5.13	2.98	2.14
B-4	4-1-92	7:00	4.18	1.47	2.71
	4-1-92	9:00	4.18	1.45	2.73
	4-1-92	11:00	4.18	1.43	2.75
	4-1-92	13:00	4.18	1.40	2.78
	4-1-92	15:00	4.18	1.38	2.80
	4-1-92	17:00	4.18	1.38	2.80
	4-1-92	19:00	4.18	1.41	2.77
B-5	4-1-92	7:00	5.79	3.38	2.41
	4-1-92	9:00	5.79	3.36	2.43
	4-1-92	11:00	5.79	3.41	2.38
	4-1-92	13:00	5.79	3.38	2.41
	4-1-92	15:00	5.79	3.36	2.43
	4-1-92	17:00	5.79	3.36	2.43
	4-1-92	19:00	5.79	3.38	2.41

WELL #	DATE	TIME	RISER ELEV	DEPTH TO WATER	GROUNDWATER ELEVATION
B-6	4-1-92	7:00	6.06	4.20	1.86
	4-1-92	9:00	6.06	4.17	1.89
	4-1-92	11:00	6.06	4.13	1.93
	4-1-92	13:00	6.06	4.12	1.94
	4-1-92	15:00	6.06	4.14	1.92
	4-1-92	17:00	6.06	4.16	1.90
	4-1-92	19:00	6.06	4.19	1.87
MW-6	4-1-92	7:00	5.07	2.78	2.29
	4-1-92	9:00	5.07	2.76	2.31
	4-1-92	11:00	5.07	2.72	2.35
	4-1-92	13:00	5.07	2.72	2.35
	4-1-92	15:00	5.07	2.70	2.37
	4-1-92	17:00	5.07	2.73	2.34
	4-1-92	19:00	5.07	2.74	2.33
	10-13-92		5.07	2.55	2.52
MW-7	4-1-92	7:00	6.03	4.34	1.69
	4-1-92	9:00	6.03	4.22	1.81
	4-1-92	11:00	6.03	4.19	1.84
	4-1-92	13:00	6.03	4.30	1.73
	4-1-92	15:00	6.03	4.37	1.66
	4-1-92	17:00	6.03	4.40	1.63
	4-1-92	19:00	6.03	4.28	1.75
	10-13-92		6.03	3.66	2.37
MW-8	4-1-92	7:00	6.80	4.68	2.12
	4-1-92	9:00	6.80	4.64	2.16
	4-1-92	11:00	6.80	4.62	2.18
	4-1-92	13:00	6.80	4.58	2.22
	4-1-92	15:00	6.80	4.55	2.25
	4-1-92	17:00	6.80	4.55	2.25
	4-1-92	19:00	6.80	4.52	2.28
	10-13-92		6.80	4.22	2.58
MW-8A	10-13-92		6.43	3.43	3.00
MW-9	4-1-92	7:00	6.43	4.28	2.15
	4-1-92	9:00	6.43	4.26	2.17
	4-1-92	11:00	6.43	4.19	2.24
	4-1-92	13:00	6.43	4.16	2.27
	4-1-92	15:00	6.43	4.14	2.29
	4-1-92	17:00	6.43	4.16	2.27
	4-1-92	19:00	6.43	4.19	2.24
	10-13-92		6.43	3.82	2.61
MW-10	4-1-92	7:00	7.41	4.85	2.56
	4-1-92	9:00	7.41	4.84	2.57
	4-1-92	11:00	7.41	4.82	2.59
	4-1-92	13:00	7.41	4.80	2.61
	4-1-92	15:00	7.41	4.78	2.63
	4-1-92	17:00	7.41	4.80	2.61
	4-1-92	19:00	7.41	4.83	2.58
	10-13-92		7.41	4.56	2.85

WELL #	DATE	TIME	RISER ELEV'	DEPTH TO WATER	GROUNDWATER ELEVATION
MW-11	4-1-92	7:00	8.02	5.34	2.68
	4-1-92	9:00	8.02	5.33	2.69
	4-1-92	11:00	8.02	5.31	2.71
	4-1-92	13:00	8.02	5.27	2.75
	4-1-92	15:00	8.02	5.22	2.80
	4-1-92	17:00	8.02	5.20	2.82
	4-1-92	19:00	8.02	5.26	2.76
	10-13-92		8.02	5.19	2.83
MW-11A	10-13-92		6.38	3.89	2.49
MW-12	4-1-92	7:00	8.22	5.55	2.67
	4-1-92	9:00	8.22	5.55	2.67
	4-1-92	11:00	8.22	5.51	2.71
	4-1-92	13:00	8.22	5.49	2.73
	4-1-92	15:00	8.22	5.45	2.77
	4-1-92	17:00	8.22	5.45	2.77
	4-1-92	19:00	8.22	5.50	2.72
	10-13-92		8.22	5.46	2.76
MW-13	4-1-92	7:00	6.97	4.75	2.22
	4-1-92	9:00	6.97	4.55	2.42
	4-1-92	11:00	6.97	4.55	2.42
	4-1-92	13:00	6.97	4.65	2.32
	4-1-92	15:00	6.97	4.68	2.29
	4-1-92	17:00	6.97	4.72	2.25
	4-1-92	19:00	6.97	4.65	2.32
	10-13-92		6.97	4.49	2.48
MW-14	4-1-92	7:00	6.30	4.38	1.92
	4-1-92	9:00	6.30	4.28	2.02
	4-1-92	11:00	6.30	4.15	2.15
	4-1-92	13:00	6.30	4.12	2.18
	4-1-92	15:00	6.30	4.09	2.21
	4-1-92	17:00	6.30	4.12	2.18
	4-1-92	19:00	6.30	4.18	2.12
	10-13-92		6.30	4.00	2.30
MW-15	4-1-92	7:00	7.07	4.51	2.56
	4-1-92	9:00	7.07	4.47	2.60
	4-1-92	11:00	7.07	4.43	2.64
	4-1-92	13:00	7.07	4.41	2.66
	4-1-92	15:00	7.07	4.38	2.69
	4-1-92	17:00	7.07	4.38	2.69
	4-1-92	19:00	7.07	4.44	2.63
	10-13-92		7.07	4.50	2.57
MW-16	4-1-92	7:00	7.69	5.50	2.19
	4-1-92	9:00	7.69	5.40	2.29
	4-1-92	11:00	7.69	5.42	2.27
	4-1-92	13:00	7.69	5.50	2.19
	4-1-92	15:00	7.69	5.53	2.16
	4-1-92	17:00	7.69	5.55	2.14
	4-1-92	19:00	7.69	5.50	2.19
	10-13-92		7.69	5.04	2.65

WELL #	DATE	TIME	RISER ELEV	DEPTH TO WATER	GROUNDWATER ELEVATION
MW-17	4-1-92	7:00	7.65	5.40	2.25
	4-1-92	9:00	7.65	5.35	2.30
	4-1-92	11:00	7.65	5.32	2.33
	4-1-92	13:00	7.65	5.35	2.30
	4-1-92	15:00	7.65	5.38	2.27
	4-1-92	17:00	7.65	5.40	2.25
	4-1-92	19:00	7.65	5.35	2.30
	10-13-92		7.65	4.99	2.66
MW-18	10-13-92		6.61	4.14	2.47
MW-19	10-13-92		5.44	2.92	2.52
MW-19A	10-13-92		5.25	2.91	2.34
MW-20	10-13-92		5.44	2.80	2.64
MW-21	10-13-92		5.34	3.22	2.12
MW-22	10-13-92		5.26	3.02	2.24
MW-23	10-13-92		4.96	4.56	0.40
MW-24	10-13-92		5.98	**3.48	5.98
MW-25	10-13-92		4.96	1.63	3.33
MW-26	10-13-92		4.91	4.01	0.90

*Staff Gauge Elevation : Riser Elevation – (6.66 – Depth to Water)

** Well has been abandoned

HISTORICAL SOIL SAMPLE PARAMETER SUMMARY TABLE
METALS
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

	SS-1		SS-2		SS-3		SS-4		SS-5		SS-6		SS-7		SS-8		SS-9		SS-10		SS-11	
METALS	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*
Arsenic	3.5	1.2	5.2	1.2	ND	1.2	3.6	1.2	1.5	1.2	ND	1.2	2.3	1.2	ND	1.2	ND	1.2	ND	1.2	ND	1.2
Chromium	5.5	0.75	14.0	0.75	2.1	0.75	11.0	0.75	5.2	0.75	3.1	0.75	9.2	0.75	4.2	0.75	4.1	0.75	2.6	0.75	1.3	0.75
Copper	6.1	0.75	46.0	0.75	8.0	0.75	14.0	0.75	2.4	0.75	2.8	0.75	5.1	0.75	1.9	0.75	4.4	0.75	3.9	0.75	1.0	0.75
Lead	14.0	5.0	290.0	5.0	61.0	5.0	25.0	5.0	3.4	1.2	3.1	1.1	6.3	5.0	2.3	1.2	6.9	5.0	6.2	5.0	1.9	5.0

NOTE: All units in mg/kg dw
R = Laboratory Analytical Result
DL = Laboratory Detection Limit

HISTORICAL SOIL SAMPLE PARAMETER SUMMARY TABLE
VOLATILES
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

	SS-1		SS-2		SS-3		SS-4		SS-5		SS-6		SS-7		SS-8		SS-9		SS-10		SS-11	
VOLATILES	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*
Benzene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Bromodichloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Bromomethane	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.001
Carbon Tetrachloride	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.005
Chlorobenzene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Chloroethane	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.001
2-Chloroethylvinyl Ether	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.005
Chloroform	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Chloromethane	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.001
Cis-1,3-Dichloropropene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.005
Dibromochloromethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
1,2-Dibromomethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.005	ND	0.001	ND	0.005	ND	0.001	ND	0.001
Dichlorodifluoromethane	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005
1,1-Dichloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.005
1,2-Dichloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
1,1-Dichloroethene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Dichloromethane	0.024	0.001	0.0064	0.001	0.015	0.001	0.017	0.001	0.012	0.001	0.014	0.001	0.059	0.001	0.007	0.001	0.020	0.001	0.008	0.001	0.0068	0.001
1,2-Dichloropropane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Ethyl Benzene	ND	0.001	ND	0.001	ND	0.02	ND	0.001	ND	0.001	ND	0.001	0.15	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Fluorotrichloromethane	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.001
M/P-Xylene	0.0025	0.001	ND	0.001	ND	0.02	0.001	0.001	0.0011	0.001	0.0014	0.001	0.084	0.001	ND	0.001	0.0071	0.001	ND	0.001	ND	0.005
Methyl-T-Butyl Ether (Mtbe)	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.001
o-Xylene	0.0011	0.001	ND	0.001	ND	0.02	ND	0.001	ND	0.001	ND	0.001	0.069	0.001	ND	0.001	0.0075	0.001	ND	0.001	ND	0.005
1,1,2,2-Tetrachloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Toluene	0.0024	0.001	ND	0.001	ND	0.001	ND	0.001	0.0013	0.001	0.0034	0.001	0.016	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Trans-1,2-Dichloroethylene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
1,1,1-Trichloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
1,1,2-Trichloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Trichloroethene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Vinyl Chloride	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005

NOTE: DL = Laboratory Detection Limit

All units in mg/kg dw

HISTORICAL SOIL SAMPLE PARAMETER SUMMARY TABLE
SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

	SS-1		SS-2		SS-3		SS-4		SS-5		SS-6		SS-7		SS-8		SS-9		SS-10		SS-11	
SEMI-VOLATILES	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*
Acenaphthene	0.51	0.33	ND	0.33	ND	0.33	0.59	0.33	4.4	0.33	2.9	0.33	44.0	0.33	1.0	0.33	32.0	0.33	ND	0.33	ND	0.33
Anthracene	ND	0.33	ND	0.33	ND	0.33	ND	0.33	45.0	0.33	36.0	0.33	10.0	0.33	ND	0.33	49.0	0.33	ND	0.33	ND	0.33
Benzo(a)Anthracene	1.1	0.33	0.54	0.33	ND	0.33	1.1	0.33	5.8	0.33	7.4	0.33	3.2	0.33	ND	0.33	26.0	0.33	730.0	0.33	ND	0.33
Benzo(a)Pyrene	0.42	0.33	ND	0.33	ND	0.33	2.0	0.33	3.1	0.33	1.9	0.33	0.64	0.33	ND	0.33	9.0	0.33	660.0	0.33	ND	0.33
Benzo(b)Fluoranthene	ND	0.33	0.75	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	15.0	0.33	1600.0	0.33	ND	0.33
Benzo(k)Fluoranthene	1.5	0.33	ND	0.33	ND	0.33	4.9	0.33	3.80	0.33	3.6	0.33	1.2	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33
Bis(2-Chloroethyl)Ether	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33
Carbazole	ND	0.33	ND	0.33	ND	0.33	ND	0.33	16.0	0.33	4.4	0.33	17.0	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33
4-Chloro-3-Methylphenol	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33
2-Chlorophenol	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33
Chrysene	1.1	0.33	0.53	0.33	ND	0.33	1.6	0.33	4.5	0.33	5.5	0.33	1.90	0.33	ND	0.33	22.0	0.33	920.0	0.33	ND	0.33
Dibenzo(a,h)Anthracene	ND	0.33	ND	0.33	ND	0.33	3.7	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	0.94	0.33	ND	0.33	ND	0.33
2,4-Dimethylphenol	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33
2,4-Dinitrophenol	ND	1.60	ND	1.60	ND	1.60	ND	1.60	ND	1.60	ND	1.60	ND	1.60	ND	1.60	ND	1.60	ND	1.60	ND	1.60
Fluoranthene	3.8	0.33	0.87	0.33	ND	0.33	1.8	0.33	38.0	0.33	52.0	0.33	26.0	0.33	ND	0.33	130.0	0.33	1300.0	0.33	ND	0.33
Indeno(1,2,3-cd)Pyrene	ND	0.33	ND	0.33	ND	0.33	2.0	0.33	0.67	0.33	0.72	0.33	ND	0.33	ND	0.33	3.4	0.33	680.0	0.33	ND	0.33
Naphthalene	ND	0.33	ND	0.33	ND	0.33	ND	0.33	1.8	0.33	ND	0.33	44.0	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33
Pentachlorophenol	ND	1.60	ND	1.60	ND	1.60	ND	1.60	ND	1.60	ND	1.60	ND	1.60	ND	1.60	ND	1.60	ND	1.60	ND	1.60
Phenanthrene	1.5	0.33	0.56	0.33	ND	0.33	ND	0.33	42.0	0.33	36.0	0.33	55.0	0.33	ND	0.33	70.0	0.33	ND	0.33	ND	0.33
Phenol	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33
Tetrachlorophenol	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33
2,4,5-Trichlorophenol	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33
2,4,6-Trichlorophenol	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33	ND	0.33

NOTE: DL = Laboratory Detection Limit

All units in mg/kg dw

HISTORICAL GROUNDWATER SAMPLE PARAMETER SUMMARY TABLE
METALS
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

	B-2		B-3		B-4		B-5		B-6		MW-6			
	3/92		3/92		3/92		3/92		3/92		3/92		10/92	
METALS	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*
Arsenic (Total)	0.11	0.025	0.049	0.005	0.031	0.025	ND	0.005	0.051	0.025	ND	0.005	ND	0.005
Arsenic (Dissolved)	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005
Chromium (Total)	0.10	0.006	0.095	0.006	0.19	0.006	0.006	0.006	0.066	0.006	ND	0.006	ND	0.01
Chromium (Dissolved)	ND	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.01
Copper (Total)	0.05	0.006	0.085	0.006	0.13	0.006	0.014	0.006	0.056	0.006	0.012	0.006	ND	0.025
Copper (Dissolved)	ND	0.006	ND	0.006	ND	0.006	0.0064	0.006	ND	0.006	ND	0.006	ND	0.025
Lead (Total)	0.35	0.25	0.12	0.025	0.21	0.05	0.01	0.005	0.1	0.05	0.0092	0.005	ND	0.005
Lead (Dissolved)	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005

	MW-7				MW-8				MW-8A		MW-9			
	3/92		10/92		3/92		10/92		10/92		3/92		10/92	
METALS	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*
Arsenic (Total)	0.0062	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005
Arsenic (Dissolved)	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005
Chromium (Total)	0.031	0.006	0.014	0.01	0.015	0.006	0.024	0.01	ND	0.01	ND	0.006	ND	0.01
Chromium (Dissolved)	ND	0.006	ND	0.01	ND	0.006	ND	0.01	ND	0.01	ND	0.006	ND	0.01
Copper (Total)	0.012	0.006	ND	0.025	0.012	0.006	0.026	0.025	ND	0.025	0.007	0.006	ND	0.025
Copper (Dissolved)	ND	0.006	ND	0.025	ND	0.006	ND	0.025	ND	0.025	ND	0.006	ND	0.025
Lead (Total)	0.023	0.005	0.0097	0.005	0.016	0.005	0.038	0.01	ND	0.005	ND	0.005	ND	0.005
Lead (Dissolved)	ND	0.005	ND	0.005	ND	0.005	ND	0.01	ND	0.005	ND	0.005	ND	0.005

	MW-10				MW-11A		MW-13				MW-14			
	3/92		10/92		10/92		3/92		10/92		3/92		10/92	
METALS	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL	RESULT	DL*	RESULT	DL*	RESULT	DL*
Arsenic (Total)	0.077	0.05	0.048	0.005	ND	0.005	0.05	0.025	0.048	0.005	0.01	0.005	0.018	0.005
Arsenic (Dissolved)	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005
Chromium (Total)	0.059	0.006	0.019	0.01	0.012	0.01	0.059	0.006	0.039	0.01	0.033	0.006	0.069	0.01
Chromium (Dissolved)	ND	0.006	ND	0.01	ND	0.01	ND	0.006	ND	0.01	ND	0.006	ND	0.01
Copper (Total)	0.091	0.006	ND	0.025	ND	0.025	0.08	0.006	0.061	0.025	0.023	0.006	0.059	0.025
Copper (Dissolved)	ND	0.006	ND	0.025	ND	0.025	ND	0.006	ND	0.025	ND	0.006	ND	0.025
Lead (Total)	0.084	0.05	0.018	0.005	0.0095	0.005	0.14	0.05	0.120	0.05	0.029	0.01	0.05	0.015
Lead (Dissolved)	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.05	ND	0.005	ND	0.015

	MW-15				MW-16				MW-17				MW-18	
	3/92		10/92		3/92		10/92		3/92		10/92		10/92	
METALS	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*
Arsenic (Total)	0.10	0.05	0.110	0.05	0.027	0.005	ND	0.005	0.14	0.05	0.04	0.005	0.0058	0.005
Arsenic (Dissolved)	ND	0.005	0.023	0.05	ND	0.005	ND	0.005	ND	0.005	0.0057	0.005	ND	0.005
Chromium (Total)	0.051	0.006	0.031	0.01	0.120	0.006	ND	0.01	0.18	0.006	0.035	0.01	0.67	0.01
Chromium (Dissolved)	ND	0.006	ND	0.01	ND	0.006	ND	0.01	ND	0.006	ND	0.01	ND	0.01
Copper (Total)	0.086	0.006	0.05	0.025	0.14	0.006	0.03	0.025	0.40	0.006	0.054	0.025	0.051	0.025
Copper (Dissolved)	ND	0.006	ND	0.025	ND	0.006	ND	0.025	ND	0.006	ND	0.025	ND	0.025
Lead (Total)	0.094	0.05	0.042	0.015	0.064	0.025	0.012	0.005	0.39	0.25	0.045	0.01	0.081	0.05
Lead (Dissolved)	ND	0.005	ND	0.015	ND	0.005	ND	0.005	ND	0.005	ND	0.01	ND	0.05

	MW-19		MW-19A		MW-20		MW-21		MW-22		MW-23		MW-24		MW-25	
	10/92		10/92		10/92		10/92		10/92		10/92		10/92		10/92	
METALS	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*
Arsenic (Total)	ND	0.005	0.005	0.005	0.01	0.005	0.028	0.005	0.033	0.005	ND	0.005	0.0064	0.005	0.012	0.005
Arsenic (Dissolved)	ND	0.005	ND	0.005	ND	0.005	ND	0.005	0.013	0.005	ND	0.005	ND	0.005	ND	0.005
Chromium (Total)	0.03	0.01	0.011	0.01	ND	0.01	0.032	0.01	0.200	0.01	ND	0.01	0.018	0.01	0.031	0.01
Chromium (Dissolved)	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Copper (Total)	ND	0.025	ND	0.025	0.032	0.025	0.035	0.025	0.038	0.025	ND	0.025	0.027	0.025	0.041	0.025
Copper (Dissolved)	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025	ND	0.025
Lead (Total)	0.005	0.005	0.011	0.005	0.012	0.005	0.061	0.05	0.037	0.01	ND	0.005	0.071	0.05	0.036	0.01
Lead (Dissolved)	ND	0.005	ND	0.005	ND	0.005	ND	0.05	ND	0.01	ND	0.005	ND	0.05	ND	0.01

NOTE: DL = Laboratory Detection Limit

All units in mg/l

HISTORICAL GROUNDWATER SAMPLE PARAMETER SUMMARY TABLE
SEMI–VOLATILES
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

	B-2		B-3		B-4		B-5		B-6		MW-6				MW-7				MW-8				MW-8A	
	3/92		3/92		3/92		3/92		3/92		3/92		10/92		3/92		10/92		3/92		10/92		10/92	
SEMI–VOLATILES	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*
Acenaphthene	ND	0.01	ND	0.01	3.0	0.01	ND	0.01	0.022	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Anthracene	ND	0.01	ND	0.01	0.94	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Benzo(a)Anthracene	ND	0.01	ND	0.01	0.42	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Benzo(a)Pyrene	ND	0.01	ND	0.01	0.11	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Benzo(b)Fluoranthene	ND	0.01	ND	0.01	0.21	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Benzo(k)Fluoranthene	ND	0.01	ND	0.01	0.056	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Bis(2–Chloroethyl)Ether	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Carbazole	ND	0.01	ND	0.01	0.36	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
4–Chloro–3–Methylphenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
2–Chlorophenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Chrysene	ND	0.01	ND	0.01	0.34	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Dibenzo(a,h)Anthracene	ND	0.01	ND	0.01	0.011	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
2,4–Dimethylphenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
2,4–Dinitrophenol	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05
Fluoranthene	ND	0.01	ND	0.01	2.7	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Indeno(1,2,3–cd)Pyrene	ND	0.01	ND	0.01	0.035	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Naphthalene	ND	0.01	ND	0.01	14.0	0.01	ND	0.01	0.052	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Pentachlorophenol	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05
Phenanthrene	ND	0.01	ND	0.01	5.8	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Phenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Tetrachlorophenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
2,4,5–Trichlorophenol	ND	0.01	ND	0.01	ND	0.01	ND	0.05	ND	0.05	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
2,4,6–Trichlorophenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01

NOTE: DL = Laboratory Detection Limit

All units in mg/l

HISTORICAL GROUNDWATER SAMPLE PARAMETER SUMMARY TABLE
SEMI–VOLATILES
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

	MW–9				MW–10				MW–11A		MW–13				MW–14				MW–15				MW–16			
	3/92		10/92		3/92		10/92		10/92		3/92		10/92		3/92		10/92		3/92		10/92		3/92		10/92	
SEMI–VOLATILES	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*
Acenaphthene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	0.05	0.001	1.1	0.01	1.10	0.2	0.74	0.01	0.81	0.01	0.15	0.01	0.14	0.01	ND	0.01	ND	0.01
Anthracene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	0.02	0.001	0.13	0.01	0.26	0.2	0.11	0.01	0.26	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Benzo(a)Anthracene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	0.057	0.01	0.12	0.01	0.037	0.01	0.14	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Benzo(a)Pyrene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.001	0.02	0.01	0.04	0.01	0.011	0.01	0.05	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Benzo(b)Fluoranthene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.001	0.037	0.01	0.06	0.01	0.021	0.01	0.11	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Benzo(k)Fluoranthene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	0.01	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Bis(2–Chloroethyl)Ether	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.001	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Carbazole	ND	0.01	ND	0.01	ND	0.01	ND	0.01	0.04	0.001	0.067	0.01	0.32	0.2	0.11	0.01	0.19	0.01	0.021	0.01	0.03	0.01	ND	0.01	ND	0.01
4–Chloro–3–Methylphenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
2–Chlorophenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.001	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Chrysene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.001	0.057	0.01	0.10	0.01	0.036	0.01	0.09	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Dibenzo(a,h)Anthracene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
2,4–Dimethylphenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	0.063	0.01	0.01	0.01	0.37	0.1	ND	0.01	0.044	0.01	0.03	0.01	ND	0.01	ND	0.01
2,4–Dinitrophenol	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.001	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05
Fluoranthene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	0.01	0.001	0.56	0.01	0.76	0.2	0.38	0.01	0.78	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Indeno(1,2,3–cd)Pyrene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.001	ND	0.01	0.02	0.01	ND	0.01	0.02	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Naphthalene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.001	2.6	0.01	3.50	0.2	3.1	0.01	4.90	0.01	0.11	0.01	ND	0.01	ND	0.01	ND	0.01
Pentachlorophenol	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.001	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05
Phenanthrene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	0.06	0.001	1.2	0.01	1.60	0.2	1.1	0.01	1.40	0.01	0.023	0.01	0.05	0.01	ND	0.01	ND	0.01
Phenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Tetrachlorophenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.001	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
2,4,5–Trichlorophenol	ND	0.05	ND	0.01	ND	0.05	ND	0.01	ND	0.005	ND	0.01	ND	0.01	ND	0.05	ND	0.01	ND	0.05	ND	0.01	ND	0.05	ND	0.01
2,4,6–Trichlorophenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.001	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01

NOTE: DL = Laboratory Detection Limit

All units in mg/l

HISTORICAL GROUNDWATER SAMPLE PARAMETER SUMMARY TABLE
SEMI–VOLATILES
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

	MW-17				MW-18		MW-19		MW-19A		MW-20		MW-21		MW-22		MW-23		MW-24		MW-25	
	3/92		10/92		10/92		10/92		10/92		10/92		10/92		10/92		10/92		10/92		10/92	
SEMI–VOLATILES	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*
Acenaphthene	0.024	0.01	ND	0.01	ND	0.01	0.18	0.01	ND	0.01	0.05	0.01	ND	0.01	2.50	0.01	ND	0.01	0.11	0.01	0.12	0.01
Anthracene	0.023	0.01	0.02	0.01	ND	0.01	0.01	0.01	ND	0.01	ND	0.01	ND	0.01	0.18	0.01	ND	0.01	ND	0.01	0.07	0.01
Benzo(a)Anthracene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	0.13	0.01	ND	0.01	ND	0.01	0.05	0.01
Benzo(a)Pyrene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	0.06	0.01	ND	0.01	ND	0.01	0.02	0.01
Benzo(b)Fluoranthene	ND	0.01	0.01	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	0.12	0.01	ND	0.01	ND	0.01	0.04	0.01
Benzo(k)Fluoranthene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Bis(2–Chloroethyl)Ether	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Carbazole	ND	0.01	ND	0.01	ND	0.01	0.07	0.01	ND	0.01	ND	0.01	ND	0.01	0.19	0.01	ND	0.01	0.03	0.01	0.02	0.01
4–Chloro–3–Methylphenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
2–Chlorophenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Chrysene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	0.10	0.01	ND	0.01	ND	0.01	0.04	0.01
Dibenzo(a,h)Anthracene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
2,4–Dimethylphenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	0.03	0.01	ND	0.01	ND	0.01	ND	0.01
2,4–Dinitrophenol	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05
Fluoranthene	0.065	0.01	0.08	0.01	ND	0.01	0.02	0.01	ND	0.01	0.012	0.01	ND	0.01	1.70	0.01	ND	0.01	ND	0.01	0.16	0.01
Indeno(1,2,3–cd)Pyrene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	0.02	0.01	ND	0.01	ND	0.01	ND	0.01
Naphthalene	ND	0.01	ND	0.01	ND	0.01	0.30	0.1	ND	0.01	0.04	0.01	ND	0.01	4.50	0.01	ND	0.01	ND	0.01	ND	0.01
Pentachlorophenol	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.05
Phenanthrene	0.06	0.01	0.06	0.01	ND	0.01	0.08	0.01	ND	0.01	0.05	0.01	ND	0.01	3.70	0.01	ND	0.01	0.02	0.01	0.19	0.01
Phenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Tetrachlorophenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
2,4,5–Trichlorophenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
2,4,6–Trichlorophenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01

NOTE: DL = Laboratory Detection Limit

All units in mg/l

HISTORICAL GROUNDWATER SAMPLE PARAMETER SUMMARY TABLE
VOLATILES
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

	B-2		B-3		B-4		B-5		B-6		MW-6				MW-7				MW-8				MW-8A	
	3/92		3/92		3/92		3/92		3/92		3/92		10/92		3/92		10/92		3/92		10/92		10/92	
VOLATILES	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*
Benzene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Bromodichloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Bromomethane	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.001	ND	0.005
Carbon Tetrachloride	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.005	ND	0.001
Chlorobenzene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Chloroethane	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.001	ND	0.005
2-Chloroethylvinyl Ether	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.005	ND	0.001
Chloroform	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	0.002	0.001
Chloromethane	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.001	ND	0.005
Cis-1,3-Dichloropropene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.005	ND	0.001
Dibromochloromethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
1,2-Dibromomethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.005	ND	0.001	ND	0.005	ND	0.001	ND	0.001	ND	0.005
Dichlorodifluoromethane	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.001
1,1-Dichloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.005	ND	0.001
1,2-Dichloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
1,1-Dichloroethene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Dichloromethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	0.002	0.001	ND	0.001
1,2-Dichloropropane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Ethyl Benzene	ND	0.001	ND	0.001	0.110	0.02	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Fluorotrichloromethane	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.001	ND	0.005
M/P-Xylene	ND	0.001	ND	0.001	0.09	0.02	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.005	ND	0.001
Methyl-T-Butyl Ether (Mtbe)	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.001	ND	0.005
o-Xylene	ND	0.001	ND	0.001	0.04	0.02	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.005	ND	0.001
1,1,2,2-Tetrachloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Tetrachloroethene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001			ND	0.001			ND	0.001				
Toluene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Trans-1,2-Dichloroethylene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
1,1,1-Trichloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
1,1,2-Trichloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Trichloroethene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Vinyl Chloride	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005

NOTE: DL = Laboratory Detection Limit

All units in mg/l

HISTORICAL GROUNDWATER SAMPLE PARAMETER SUMMARY TABLE
VOLATILES
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

	MW-9				MW-10				MW-11A		MW-13				MW-14				MW-15				MW-16			
	3/92		10/92		3/92		10/92		10/92		3/92		10/92		3/92		10/92		3/92		10/92		3/92		10/92	
VOLATILES	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*
Benzene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	0.003	0.001	0.073	0.01	0.1	0.01	0.03	0.01	0.019	0.005	ND	0.005	0.005	0.001	ND	0.001	ND	0.001
Bromodichloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.01	ND	0.001	ND	0.005	ND	0.005	ND	0.001	ND	0.001	ND	0.001
Bromomethane	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.05	ND	0.005	ND	0.025	ND	0.025	ND	0.005	ND	0.005	ND	0.005
Carbon Tetrachloride	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.01	ND	0.001	ND	0.005	ND	0.005	ND	0.001	ND	0.001	ND	0.001
Chlorobenzene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.01	ND	0.001	ND	0.005	ND	0.005	ND	0.001	ND	0.001	ND	0.001
Chloroethane	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.05	ND	0.005	ND	0.025	ND	0.025	ND	0.005	ND	0.005	ND	0.005
2-Chloroethylvinyl Ether	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.01	ND	0.001	ND	0.005	ND	0.005	ND	0.001	ND	0.001	ND	0.001
Chloroform	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.01	0.0011	0.001	ND	0.005	ND	0.005	ND	0.001	ND	0.001	ND	0.001
Chloromethane	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.05	ND	0.005	ND	0.025	ND	0.025	ND	0.005	ND	0.005	ND	0.005
Cis-1,3-Dichloropropene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.01	ND	0.001	ND	0.005	ND	0.005	ND	0.001	ND	0.001	ND	0.001
Dibromochloromethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.01	ND	0.001	ND	0.005	ND	0.005	ND	0.001	ND	0.001	ND	0.001
1,2-Dibromomethane	ND	0.001	ND	0.005	ND	0.001	ND	0.005	ND	0.005	ND	0.001	ND	0.05	ND	0.001	ND	0.025	ND	0.005	ND	0.005	ND	0.001	ND	0.005
Dichlorodifluoromethane	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.05	ND	0.005	ND	0.025	ND	0.025	ND	0.005	ND	0.005	ND	0.005
1,1-Dichloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.01	ND	0.001	ND	0.005	ND	0.005	ND	0.001	ND	0.001	ND	0.001
1,2-Dichloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.005	ND	0.001	ND	0.001	ND	0.001
1,1-Dichloroethene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.01	ND	0.001	ND	0.005	ND	0.005	ND	0.001	ND	0.001	ND	0.001
Dichloromethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.01	ND	0.001	ND	0.005	ND	0.005	ND	0.001	ND	0.001	0.001	0.001
1,2-Dichloropropane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.01	ND	0.001	ND	0.005	ND	0.005	ND	0.001	ND	0.001	ND	0.001
Ethyl Benzene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	0.004	0.001	0.041	0.01	0.04	0.01	0.067	0.01	0.06	0.005	0.008	0.005	0.008	0.001	0.0027	0.001	ND	0.001
Fluorotrichloromethane	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.05	ND	0.005	ND	0.025	ND	0.025	ND	0.005	ND	0.005	ND	0.005
M/P-Xylene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	0.007	0.001	0.044	0.01	0.05	0.01	0.073	0.01	0.078	0.005	0.006	0.005	0.006	0.001	0.0037	0.001	ND	0.001
Methyl-T-Butyl Ether (Mtbe)	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.05	ND	0.005	ND	0.025	ND	0.025	ND	0.005	ND	0.005	ND	0.005
o-Xylene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	0.003	0.001	0.025	0.01	0.02	0.01	0.036	0.01	0.036	0.005	ND	0.005	0.003	0.001	0.0032	0.001	ND	0.001
1,1,2,2-Tetrachloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.01	ND	0.001	ND	0.005	ND	0.005	ND	0.001	ND	0.001	ND	0.001
Tetrachloroethene	ND	0.001			ND	0.001					ND	0.001			ND	0.001			ND	0.005			ND	0.001		
Toluene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	0.001	0.001	0.031	0.01	0.01	0.01	0.045	0.01	0.028	0.005	0.006	0.005	ND	0.001	ND	0.001	ND	0.001
Trans-1,2-Dichloroethylene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.01	ND	0.001	ND	0.005	ND	0.005	ND	0.001	ND	0.001	ND	0.001
1,1,1-Trichloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.01	ND	0.001	ND	0.005	ND	0.005	ND	0.001	ND	0.001	ND	0.001
1,1,2-Trichloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.01	ND	0.001	ND	0.005	ND	0.005	ND	0.001	ND	0.001	ND	0.001
Trichloroethene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.01	ND	0.001	ND	0.005	ND	0.005	ND	0.001	ND	0.001	ND	0.001
Vinyl Chloride	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.05	ND	0.005	ND	0.025	ND	0.025	ND	0.005	ND	0.005	ND	0.005

NOTE: DL = Laboratory Detection Limit

All units in mg/l

HISTORICAL GROUNDWATER SAMPLE PARAMETER SUMMARY TABLE
VOLATILES
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

	MW-17				MW-18		MW-19		MW-19A		MW-20		MW-21		MW-22		MW-23		MW-24		MW-25	
	3/92		10/92		10/92		10/92		10/92		10/92		10/92		10/92		10/92		10/92		10/92	
VOLATILES	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*
Benzene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	0.005	0.001	ND	0.001	ND	0.001	ND	0.001
Bromodichloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Bromomethane	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005
Carbon Tetrachloride	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Chlorobenzene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Chloroethane	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005
2-Chloroethylvinyl Ether	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Chloroform	ND	0.001	ND	0.001	ND	0.001	ND	0.001	0.001	0.001	ND	0.001	0.001	0.001	0.004	0.001	ND	0.001	ND	0.001	ND	0.001
Chloromethane	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005
Cis-1,3-Dichloropropene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Dibromochloromethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
1,2-Dibromomethane	ND	0.001	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005
Dichlorodifluoromethane	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005
1,1-Dichloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
1,2-Dichloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
1,1-Dichloroethene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Dichloromethane	ND	0.001	0.003	0.001	0.002	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	0.002	0.001	0.003	0.001	ND	0.001	ND	0.001
1,2-Dichloropropane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Ethyl Benzene	0.0039	0.001	0.006	0.001	ND	0.001	0.011	0.001	ND	0.001	ND	0.001	ND	0.001	0.037	0.001	ND	0.001	0.002	0.001	ND	0.001
Fluorotrichloromethane	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005
M/P-Xylene	0.0088	0.001	0.016	0.001	ND	0.001	0.007	0.001	ND	0.001	ND	0.001	ND	0.001	0.048	0.001	ND	0.001	0.002	0.001	ND	0.001
Methyl-T-Butyl Ether (Mtbe)	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005
o-Xylene	0.0046	0.001	0.01	0.001	ND	0.001	0.005	0.001	ND	0.001	ND	0.001	ND	0.001	0.023	0.001	ND	0.001	0.001	0.001	ND	0.001
1,1,2,2-Tetrachloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Tetrachloroethene	ND	0.001																				
Toluene	0.0011	0.001	0.017	0.001	ND	0.001	0.001	0.001	ND	0.001	ND	0.001	ND	0.001	0.011	0.001	ND	0.001	ND	0.001	ND	0.001
Trans-1,2-Dichloroethylene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
1,1,1-Trichloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
1,1,2-Trichloroethane	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Trichloroethene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Vinyl Chloride	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005

NOTE: DL = Laboratory Detection Limit

All units in mg/l

HISTORICAL SURFACE WATER SAMPLE PARAMETER SUMMARY TABLE
SEMI–VOLATILES AND METALS
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

	U.S. HIGHWAY #74 BRIDGE																											
	12/85		6/86		1/87		7/87		1/88		6/88		1/89		6/89		1/90		7/90		12/91		6/92		1/93		7/93	
SEMI–VOLATILES	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*
Acenaphthene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Acenaphthylene	NA	--	NA	--	NA	--	NA	--	NA	--	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Anthracene	ND	0.01	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Benzo(a)Anthracene	ND	0.01	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Benzo(a)Pyrene	ND	0.01	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Benzo(b,k)Fluoranthene	ND	0.01	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Carbazole	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
2–Chlorophenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Chrysene	ND	0.01	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Dibenzo(a,h)Anthracene	ND	0.02	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
2,4–Dimethylphenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
2,4–Dinitrophenol	ND	0.02	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.05	ND	0.05	ND	0.050	ND	0.05	ND	0.050	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Fluoranthene	ND	0.01	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Indeno(1,2,3–cd)pyrene	ND	0.02	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Naphthalene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
p–chloro–m–cresol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Pentachlorophenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.050	ND	0.05	ND	0.050	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Phenanthrene	ND	0.01	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Phenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Tetrachlorophenols	ND	0.01	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.050	ND	0.050	ND	0.050
Trichlorophenols	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
METALS																												
Arsenic	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	--	ND	0.010	ND	0.010	ND	0.010
Chromium	ND	0.01	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	--	ND	0.010	ND	0.010	ND	0.010
Copper	ND	0.01	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.025	ND	--	ND	0.025	ND	0.025	ND	0.025

NOTE: R* = Laboratory Result
DL* = Detection Limit
ND = Below Laboratory Detection Limit
NA = Not Analyzed
All units in mg/l

HISTORICAL SURFACE WATER SAMPLE PARAMETER SUMMARY TABLE
SEMI–VOLATILES AND METALS
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

	OLD SUP																											
	12/85		6/86		1/87		7/87		1/88		6/88		1/89		6/89		1/90		7/90		12/91		6/92		1/93		7/93	
SEMI–VOLATILES	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*
Acenaphthene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Acenaphthylene	NA	--	NA	--	NA	--	NA	--	NA	--	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Anthracene	ND	0.01	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Benzo(a)Anthracene	ND	0.01	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Benzo(a)Pyrene	ND	0.01	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Benzo(b,k)Fluoranthene	ND	0.01	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Carbazole	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
2–Chlorophenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Chrysene	ND	0.01	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Dibenzo(a,h)Anthracene	ND	0.02	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
2,4–Dimethylphenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
2,4–Dinitrophenol	ND	0.02	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.05	ND	0.05	ND	0.050	ND	0.05	ND	0.050	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Fluoranthene	ND	0.01	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Indeno(1,2,3–cd)pyrene	ND	0.02	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Naphthalene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
p–chloro–m–cresol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Pentachlorophenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.050	ND	0.05	ND	0.050	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Phenanthrene	ND	0.01	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Phenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Tetrachlorophenols	ND	0.01	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.050	ND	0.050	ND	0.050
Trichlorophenols	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
METALS																												
Arsenic	ND	0.01	NA	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	--	ND	0.010	ND	0.010	ND	0.010
Chromium	ND	0.01	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.01	ND	0.010	ND	0.010	ND	0.010	0.011	0.010	ND	--	ND	0.010	ND	0.010	ND	0.010
Copper	ND	0.01	ND	0.05	ND	0.05	ND	0.05	ND	0.05	0.02	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.025	ND	--	ND	0.025	ND	0.025	ND	0.025

NOTE: R* = Laboratory Result
DL* = Detection Limit
ND = Below Laboratory Detection Limit
NA = Not Analyzed
All units in mg/l

HISTORICAL SURFACE WATER SAMPLE PARAMETER SUMMARY TABLE
SEMI–VOLATILES AND METALS
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

	GREENFIELD CREEK																											
	12/85		6/86		1/87		7/87		1/88		6/88		1/89		6/89		7/89		1/90		7/90		12/91		6/92		1/93		7/93	
SEMI–VOLATILES	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*
Acenaphthene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Acenaphthylene	NA	--	NA	--	NA	--	NA	--	NA	--	ND	0.01	ND	0.01	ND	0.010	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Anthracene	ND	0.01	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.01	ND	0.01	ND	0.010	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Benzo(a)Anthracene	ND	0.01	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.01	ND	0.01	ND	0.010	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Benzo(a)Pyrene	ND	0.01	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.01	ND	0.01	ND	0.010	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Benzo(b,k)Fluoranthene	ND	0.01	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.01	ND	0.01	ND	0.010	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Carbazole	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
2–Chlorophenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Chrysene	ND	0.01	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.01	ND	0.01	ND	0.010	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Dibenzo(a,h)Anthracene	ND	0.02	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.01	ND	0.01	ND	0.010	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
2,4–Dimethylphenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
2,4–Dinitrophenol	ND	0.02	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.05	ND	0.05	ND	0.050	ND	0.050	ND	0.05	ND	0.050	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Fluoranthene	ND	0.01	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.01	ND	0.01	ND	0.010	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Indeno(1,2,3–cd)pyrene	ND	0.02	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.01	ND	0.01	ND	0.010	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Naphthalene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	0.050	0.010	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
p–chloro–m–cresol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Pentachlorophenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.050	ND	0.050	ND	0.05	ND	0.050	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Phenanthrene	ND	0.01	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.01	ND	0.01	ND	0.010	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Phenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Tetrachlorophenols	ND	0.01	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.01	ND	0.01	ND	0.010	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.050	ND	0.050	ND	0.050
Trichlorophenols	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
METALS																														
Arsenic	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	--	ND	0.010	ND	0.010	ND	0.010
Chromium	ND	0.01	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	0.046	0.010	ND	--	ND	0.010	ND	0.010	ND	0.010
Copper	ND	0.01	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	0.052	0.025	ND	--	ND	0.025	ND	0.025	ND	0.025

NOTE: R* = Laboratory Result
DL* = Detection Limit
ND = Below Laboratory Detection Limit
NA = Not Analyzed
All units in mg/l

HISTORICAL SURFACE WATER SAMPLE PARAMETER SUMMARY TABLE
SEMI–VOLATILES AND METALS
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

	STATE PORTS AUTHORITY																											
	12/85		6/86		1/87		7/87		1/88		6/88		1/89		6/89		1/90		7/90		12/91		6/92		1/93		7/93	
SEMI–VOLATILES	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*	R*	DL*
Acenaphthene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Acenaphthylene	NA	--	NA	--	NA	--	NA	--	NA	--	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Anthracene	ND	0.01	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Benzo(a)Anthracene	ND	0.01	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Benzo(a)Pyrene	ND	0.01	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Benzo(b,k)Fluoranthene	ND	0.01	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Carbazole	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
2–Chlorophenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Chrysene	ND	0.01	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Dibenzo(a,h)Anthracene	ND	0.02	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
2,4–Dimethylphenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
2,4–Dinitrophenol	ND	0.02	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.05	ND	0.05	ND	0.050	ND	0.05	ND	0.050	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Fluoranthene	ND	0.01	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Indeno(1,2,3–cd)pyrene	ND	0.02	ND	0.03	ND	0.03	ND	0.03	ND	0.03	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Naphthalene	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
p–chloro–m–cresol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Pentachlorophenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.050	ND	0.05	ND	0.050	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Phenanthrene	ND	0.01	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Phenol	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Tetrachlorophenols	ND	0.01	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.050	ND	0.050	ND	0.050
Trichlorophenols	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010
METALS																												
Arsenic	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	--	ND	0.010	ND	0.010	ND	0.010
Chromium	ND	0.01	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	--	ND	0.010	ND	0.010	ND	0.010
Copper	ND	0.01	ND	0.05	ND	0.05	ND	0.05	ND	0.05	ND	0.01	ND	0.010	ND	0.010	ND	0.010	ND	0.025	ND	--	ND	0.025	ND	0.025	ND	0.025

NOTE: R* = Laboratory Result
DL* = Detection Limit
ND = Below Laboratory Detection Limit
NA = Not Analyzed
All units in mg/l

ATTACHMENT D

WELL LOG DATABASE

SOUTHERN WOOD PIEDMONT – WILMINGTON, NORTH CAROLINA FACILITY

PLANT	WELL	INST DAT	BORING TERM	SURFACE ELEV	RISER ELEV	BOTTOM ELEV	WELL DEPTH	RISER DEPTH	COORDINATES NORTHING	COORDINATES EASTING
WIL	MW–6	09/05/85	20.00	3.40	5.07	–16.38	19.78	21.45	171759.04	2317555.49
WIL	MW–7	09/06/85	19.80	3.87	6.03	–15.65	19.52	21.68	171516.87	2317057.66
WIL	MW–8	09/09/85	19.20	4.16	6.80	–14.86	19.02	21.66	171308.46	2317048.69
WIL	MW–8A	10/01/92	51.00	4.12	6.43	–26.63	30.75	33.06	171307.81	2317034.99
WIL	MW–9	09/10/85	19.40	4.26	6.43	–14.96	19.22	21.39	171324.83	2317300.56
WIL	MW–10	02/18/92	13.00	3.63	7.41	–6.87	10.50	14.28	171060.33	2317416.43
WIL	MW–11	02/18/92	13.00	4.31	8.02	–6.19	10.50	14.21	170769.34	2317497.46
WIL	MW–11A	10/01/92	50.00	4.10	6.38	–29.79	33.89	36.17	170771.95	2317484.42
WIL	MW–11B	10/31/93	46.00	4.13	6.26	–38.06	42.19	44.32	170762.69	2317489.76
WIL	MW–12	02/18/92	12.00	4.60	8.22	–5.90	10.50	14.12	170782.73	2317389.15
WIL	MW–13	02/18/92	12.00	3.31	6.97	–7.19	10.50	14.16	170721.30	2317066.52
WIL	MW–14	02/19/92	22.00	2.62	6.30	–13.38	16.00	19.68	170565.41	2317675.19
WIL	MW–14A	11/02/93	42.00	2.76	5.05	–28.39	31.15	33.44	170564.17	2317685.19
WIL	MW–15	02/19/92	13.00	3.26	7.07	–7.24	10.50	14.31	170641.86	2317249.76
WIL	MW–16	02/19/92	13.00	3.88	7.69	–6.62	10.50	14.31	170875.45	2317059.82
WIL	MW–17	02/19/92	15.00	3.86	7.65	–6.64	10.50	14.29	170899.08	2317118.35
WIL	MW–18	10/07/92	14.00	4.26	6.61	–6.87	11.13	13.48	171744.30	2317083.05
WIL	MW–19	10/06/92	14.00	3.19	5.44	–9.68	12.87	15.12	170439.85	2317232.30
WIL	MW–19A	10/02/92	43.17	3.15	5.25	–28.02	31.17	33.27	170443.47	2317244.14
WIL	MW–20	10/07/92	14.00	3.17	5.44	–9.13	12.30	14.57	170921.86	2317799.93
WIL	MW–20A	11/08/93	42.00	3.10	5.23	–27.88	30.98	33.11	170913.19	2317797.41
WIL	MW–21	10/07/92	10.00	3.17	5.34	–3.62	6.79	8.96	171260.09	2317881.59
WIL	MW–22	10/07/92	14.00	3.02	5.26	–8.09	11.11	13.35	170728.25	2316945.44
WIL	MW–22A	11/02/93	42.00	3.07	5.32	–28.79	31.86	34.11	170726.23	2316955.36
WIL	MW–23	10/08/92	12.00	2.67	4.96	–6.39	9.06	11.35	170355.68	2316972.19
WIL	MW–24	10/05/92	12.00	3.58	5.79	–8.02	11.06	13.81	170245.75	2317388.60
WIL	MW–24R	11/12/93	14.00	3.77	5.98	–9.63	13.40	15.61	170242.09	2317324.15
WIL	MW–24A	11/01/93	42.00	3.64	5.81	–30.64	34.28	36.45	170240.18	2317313.97
WIL	MW–25	10/08/92	13.00	1.78	4.96	–10.27	12.05	15.23	170374.77	2317662.47
WIL	MW–26	10/05/92	18.00	2.48	4.91	–15.14	17.62	20.05	170529.26	2317951.33
WIL	MW–27	11/13/93	9.00	3.22	5.41	–1.90	5.12	7.31	171848.14	2317846.63
WIL	MW–28	11/10/93	14.00	2.97	5.18	–8.10	11.07	13.28	170473.09	2318157.25
WIL	MW–28A	11/10/93	40.00	3.26	5.47	–22.42	25.68	27.89	170465.44	2318161.94
WIL	MW–29	11/12/93	7.00	3.19	5.32	–4.04	7.23	9.36	169681.45	2317783.77
WIL	MW–29A	11/09/93	40.00	3.15	5.14	–35.83	38.98	40.97	169673.28	2317782.13
WIL	MW–30	11/12/93	10.00	4.07	6.26	–4.95	9.02	11.21	169874.49	2317618.08
WIL	SG*–Cape Fear	10/12/92			5.93	–0.73			171166.75	2316464.93
WIL	SG*–North	10/12/92			6.64	–0.02			171129.56	2318037.12
WIL	SG*–South	11/09/93			2.13	–1.20			170523.78	2318024.91

* SG = Staff Gauge

Boring Logs

ENVIRONMENTAL TECHNOLOGY ENGINEERING, INC.
CONSULTING ENGINEERS, SURVEYORS AND HYDROGEOLOGISTS
HYDROGEOLOGIC SERVICES

TEST BORING LOG

BORING NO. B-2

PROJECT: SOUTHERN WOOD PIEDMONNT – WILMINGTON, NC		SHEET NO. 1 OF 1	
CLIENT: SOUTHERN WOOD PIEDMONT	DATE FINISHED 2-19-92	JOB NO. 530-06-501	
BORING CONTRACTOR: ETE	DRILLER C. AARON	ELEVATION	
RIG USED MOBILE B-57	INSPECTOR K. ANDERSON	DATE STARTED 2-19-92	

WELL CONSTRUCTION	DEPTH FEET	SAMPLE: LITHOLOGY	No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
CLAY; PLUG; SAND PACK; SAND PACK	0–5		1	SS		Medium to coarse brown SAND	Water saturated OVA = 0.0
	5–10		2	SS		Same as above	No visual contamination OVA = 0.0
	10–15		3	SS		Brown to black PEAT with root fragments	No visual contamination OVA = 2.0
	15–50						

H:530501B2

ENVIRONMENTAL TECHNOLOGY ENGINEERING, INC.
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HYDROGEOLOGIC SERVICES

TEST BORING LOG

BORING NO. B-3

PROJECT: SOUTHERN WOOD PIEDMONT – WILMINGTON, NC		SHEET NO. 1 OF 1	
CLIENT: SOUTHERN WOOD PIEDMONT	DATE FINISHED 2-20-92	JOB NO. 530-06-50	
BORING CONTRACTOR: ETE	DRILLER C. AARON	ELEVATION	
RIG USED MOBILE B-57	INSPECTOR K. ANDERSON	DATE STARTED 2-20-92	

WELL CONSTRUCTION	DEPTH FEET	SAMPLE: No.	SAMPLE: TYPE	SAMPLE: BLOWS PER 6"	CLASSIFICATION	REMARKS
	0					
	5	1	SS		Fine to medium brown SAND with small wood fragments at 4.5 feet	Water saturated OVA = 3.1
CLAY / PLUG		2	SS		Same as above	No visual contamination OVA = 0.9
SAND PACK / SAND PACK	10					
	15	3	SS		Dark brown to black PEAT with wood fragments	No visual contamination OVA = 0.8
	20					
	25					
	30					
	35					
	40					
	45					
	50					

H:53050183

ENVIRONMENTAL TECHNOLOGY ENGINEERING, INC.
CONSULTING ENGINEERS, SURVEYORS AND HYDROGEOLOGISTS
HYDROGEOLOGIC SERVICES

TEST BORING LOG

BORING NO. B-4

PROJECT: SOUTHERN WOOD PIEDMONT – WILMINGTON, NC		SHEET NO. 1 OF 1	
CLIENT: SOUTHERN WOOD PIEDMONT	DATE FINISHED 2-20-92	JOB NO. 530-06-501	
BORING CONTRACTOR: ETE	DRILLER C. AARON	ELEVATION	
RIG USED MOBILE B-57	INSPECTOR K. ANDERSON	DATE STARTED 2-20-92	

WELL CONSTRUCTION	DEPTH FEET	SAMPLE: LITHOLOGY	No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
	0						Visual creosote at top of hole
			1	SS		Fine to medium brown SAND with wood fragments	No visual contamination OVA = 1.7
CLAY / PLUG	5						
SAND PACK / SAND PACK			2	SS		Same as above	No visual contamination OVA = 5.1
	10						
			3	SS			Visual creosote in sand above PEAT
	15					Dark brown to black PEAT with wood fragments	OVA = 98.9
	20						
	25						
	30						
	35						
	40						
	45						
	50						

H:53050184

ENVIRONMENTAL TECHNOLOGY ENGINEERING, INC.
CONSULTING ENGINEERS, SURVEYORS AND HYDROGEOLOGISTS
HYDROGEOLOGIC SERVICES

TEST BORING LOG

BORING NO. B-5

PROJECT: SOUTHERN WOOD PIEDMONT – WILMINGTON, NC		SHEET NO. 1 OF 1	
CLIENT: SOUTHERN WOOD PIEDMONT	DATE FINISHED 2-20-92	JOB NO. 530-06-501	
BORING CONTRACTOR: ETE	DRILLER C. AARON	ELEVATION	
RIG USED MOBILE B-57	INSPECTOR K. ANDERSON	DATE STARTED 2-20-92	

WELL CONSTRUCTION	DEPTH FEET	SAMPLE: UNIFIED	SAMPLE: NO.	SAMPLE: TYPE	SAMPLE: BLOWS PER 6"	CLASSIFICATION	REMARKS
	0		1	SS		Fine to medium brown SAND	Water saturated No visual contamiation OVA = 54.3
CLAY / PLUG	5						
SAND PACK / SAND PACK			2	SS		Same as above	OVA = 21.7
	10						
			3	SS		Dark black to brown PEAT with wood fragments	No visual contamination OVA = 3.9
	15						
	20						
	25						
	30						
	35						
	40						
	45						
	50						

H:53050185

ENVIRONMENTAL TECHNOLOGY ENGINEERING, INC.
CONSULTING ENGINEERS, SURVEYORS AND HYDROGEOLOGISTS
HYDROGEOLOGIC SERVICES

TEST BORING LOG

BORING NO. B-6

PROJECT: SOUTHERN WOOD PIEDMONT – WILMINGTON, NC		SHEET NO. 1 OF 1	
CLIENT: SOUTHERN WOOD PIEDMONT	DATE FINISHED 2-20-923	JOB NO. 530-06-501	
BORING CONTRACTOR: ETE	DRILLER C. AARON	ELEVATION	
RIG USED MOBILE B-57	INSPECTOR K. ANDERSON	DATE STARTED 2-20-92	

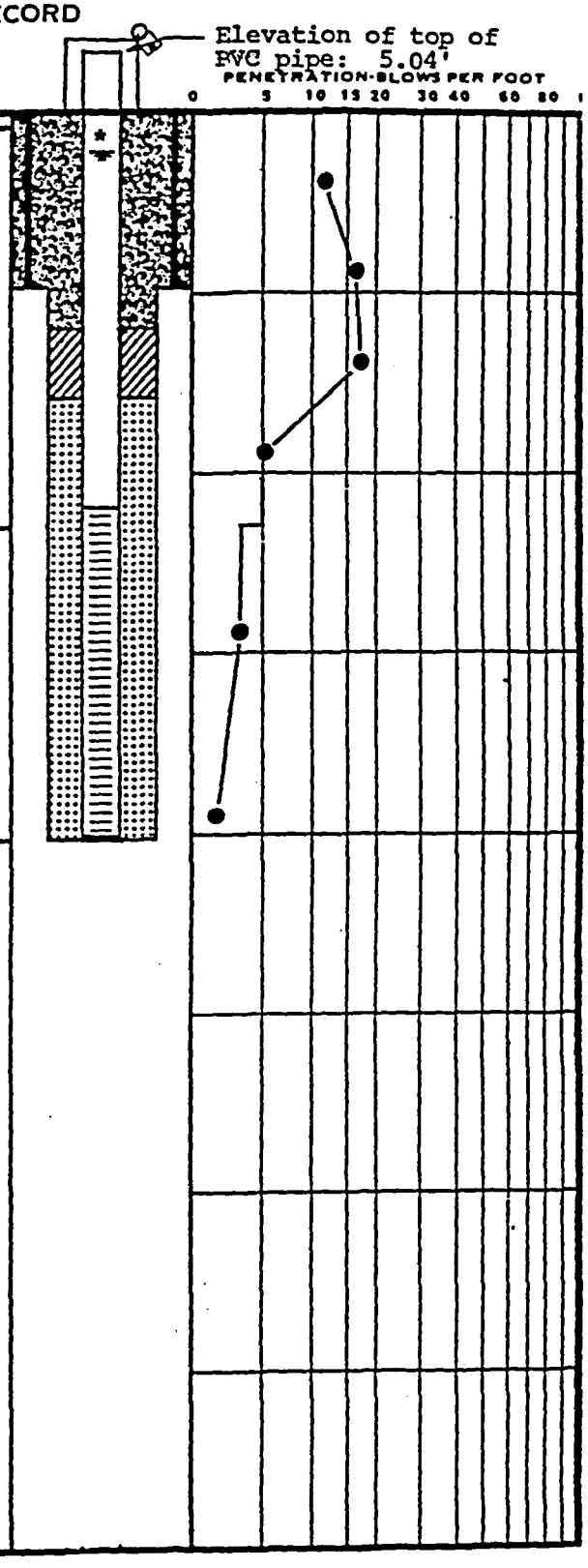
WELL CONSTRUCTION	DEPTH FEET	SAMPLE: Interval	No.	Type	Blows per 6"	CLASSIFICATION	REMARKS
CLAY; PLUG; SAND PACK; SAND PACK	0						
	5		1	SS		Fine to mdedium brown SAND	Water saturated No visual contamination OVA = 1.7
			2	SS		Dark brown to black PEAT with wood fragments	OVA = 1.0
	10						
	15						
	20						
	25						
	30						
	35						
	40						
	45						
	50						

H:530501B6

TEST BORING RECORD

Elevation of top of PVC pipe: 5.04'

ELEV.	DEPTH FEET	DESCRIPTION
3.46	0.0	
	0.5	FILL: Dark brown and black CINDERS and silty fine to medium SAND
-1.54		Firm to loose dark to light brownish-gray/grayish-brown fine to medium SAND with traces of silt
-6.54		
	11.5	
-11.54		Soft to very soft dark brown PEAT and ORGANIC SILT with wood and root fragments
-16.54	20.0	BORING TERMINATED
-21.54		



REMARKS:

* Water level on 9-19-85

1) Wash drilled with 10-inch wing bit using a bentonite and potable water drilling fluid mixture to 4.8 feet; Wash drilled with 5 7/8-inch rotary bit using a bentonite and potable water drilling fluid mixture from 4.8 to 20.0 feet

2) Well developed on 9-10-85

DRILLED BY L.S.
LOGGED BY J.T.B.
CHECKED BY C.A.S.

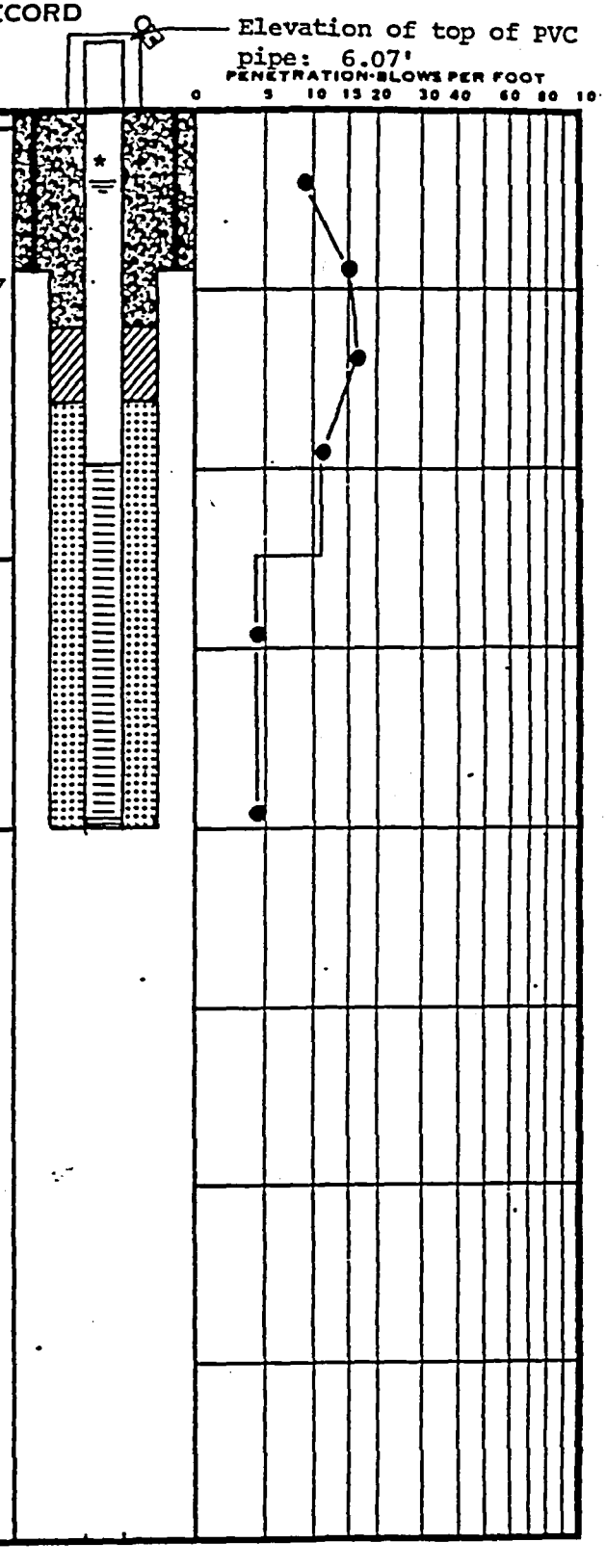
BORING NUMBER MW-6
DATE STARTED 9-4-85
DATE COMPLETED 9-5-85
JOB NUMBER HA-5276

SWP - Wilmington

TEST BORING RECORD

Elevation of top of PVC pipe: 6.07'

ELEV.	DEPTH FEET	DESCRIPTION
4.16	0.0	FILL: Brown slightly silty fine SAND with cinders
	0.5	
-0.84		Loose to firm brown slightly silty fine to medium SAND to fine to medium SAND with traces of silt
-5.84		
	12.5	
-10.84		Soft to firm dark brown PEAT and ORGANIC SILT with wood and root fragments becoming predominantly wood in last sample
-15.84	20.0	BORING TERMINATED
-20.84		



REMARKS:

* Water level on 9-19-85

1) Wash drilled with 10-inch wing bit using a bentonite and potable water drilling fluid mixture to 4.5 feet; wash drilled with 5 7/8-inch roller bit using a bentonite and potable water drilling fluid mixture from 4.5 to 20.0 feet

2) Well developed on 9-11-85

DRILLED BY L.S.
LOGGED BY J.T.B.
CHECKED BY C.A.S.

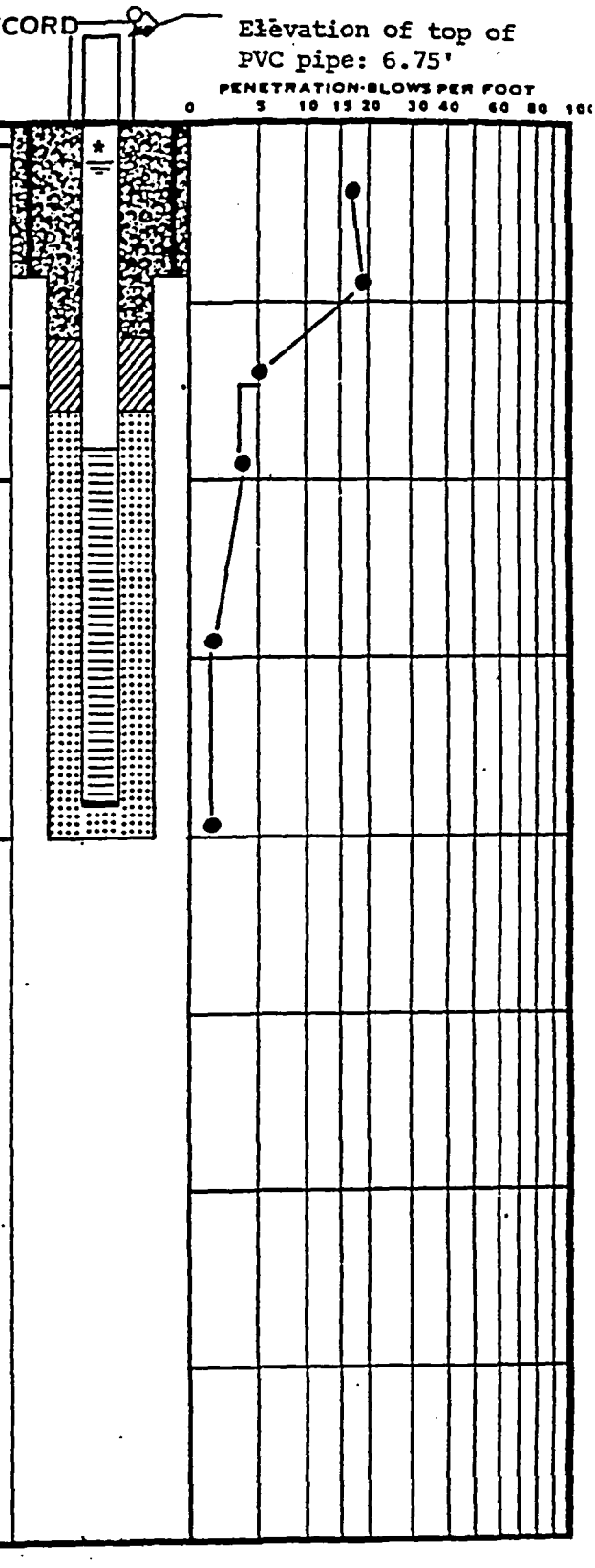
BORING NUMBER MW-7
DATE STARTED 9-4-85
DATE COMPLETED 9-6-85
JOB NUMBER HA-5276

SWP - Wilmington

TEST BORING RECORD

Elevation of top of PVC pipe: 6.75'

ELEV.	DEPTH FEET	DESCRIPTION
4.26	0.0	
	0.7	FILL: Dark brown silty fine SAND with occasional coarse sand
-0.74		Firm to loose dark brown to grayish-brown and brown slightly silty fine to medium SAND with traces of coarse sand
	7.4	
		Buried log from 7.4 to 10.0 feet
-5.74	10.0	
-10.74		Very soft to soft dark brown PEAT and ORGANIC SILT with wood and root fragments
-15.74	20.0	
		BORING TERMINATED
-20.74		



REMARKS:

* Water level on 9-19-85

1) Wash drilled with 10-inch wing bit using a bentonite and potable water drilling fluid mixture to 4.5 feet; wash drilled with 5 7/8-inch roller bit using a bentonite and potable water drilling fluid mixture from 4.5 to 20.0 feet

2) Well developed on 9-11-85

DRILLED BY L.S.
LOGGED BY J.T.B.
CHECKED BY C.A.S.

BORING NUMBER MW-8
DATE STARTED 9-4-84
DATE COMPLETED 9-9-85
JOB NUMBER HA-5276

SWP - Wilmington

ENVIRONMENTAL TECHNOLOGY ENGINEERING, INC.
CONSULTING ENGINEERS, SURVEYORS AND HYDROGEOLOGISTS
HYDROGEOLOGIC SERVICES

TEST BORING LOG

BORING NO. MW-8A

PROJECT: SOUTHERN WOOD PIEDMONT-WILMINGTON		SHEET NO. 1 OF 1	
CLIENT: CHUCK DAVIS	DATE FINISHED 10-1-92	JOB NO. 530-06-503	
BORING CONTRACTOR: ETE	DRILLER T. COPPIN	ELEVATION 4.12	
RIG USED ATV MUD ROTARY	INSPECTOR G.KUNTZ	DATE STARTED 9-28-92	

WELL CONSTRUCTION: GROUT; 6" PVC CASING; 2" PVC CASING; 6" PVC CASING; GROUT; CLAY; PLUG; SAND PACK; SAND PACK

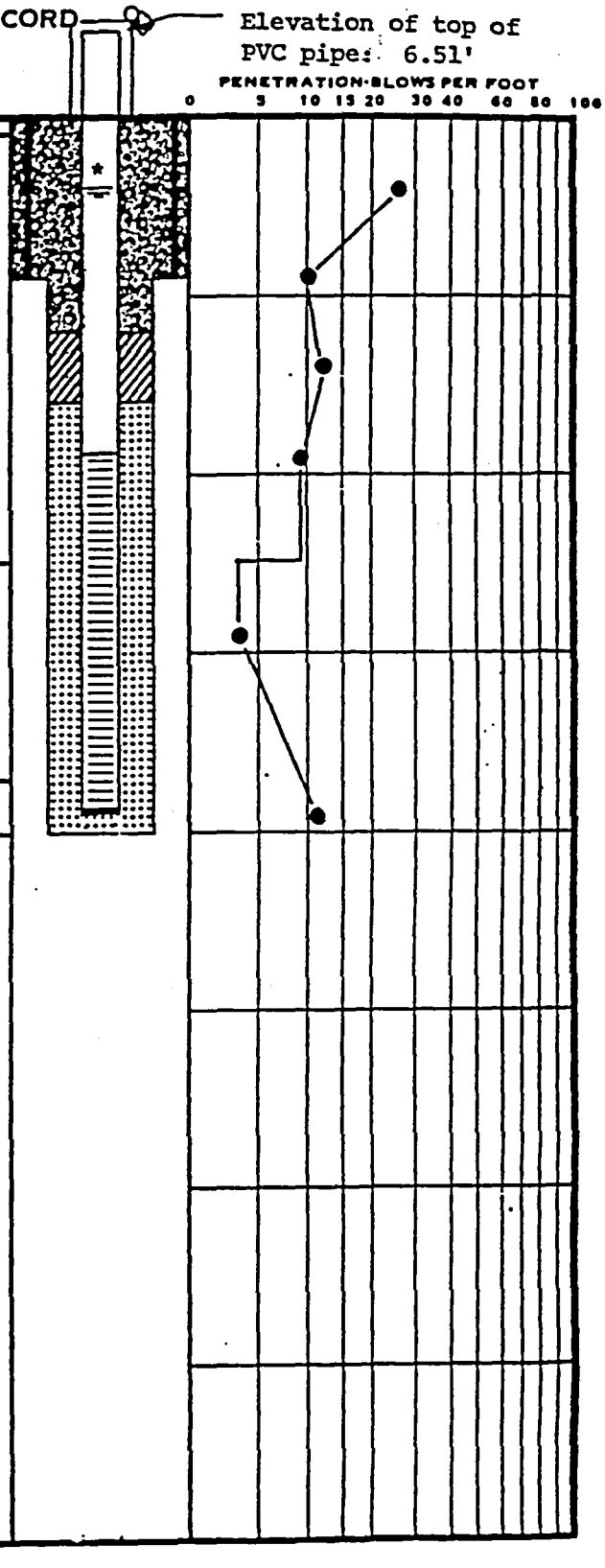
DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	SS	7-6 / 6-11	Loose, yellowish brown SAND, fine to coarse, 5% clay	16" recovery; No odor; OVA = 114 ppm
	2	SS	5-10 / 18-16	Firm, brownish gray SAND, fine to coarse	18" recovery; No odor; OVA = 38.1 ppm
5	3	SS	14-15 / 16-20	Firm, brownish black organic rich silty SAND, silt to medium, 10% small pebble, 5% clay, 5% organics	8" recovery; No odor; OVA = 25.6 ppm
	4	SS	2-3 / 4-4	Very loose, brown SAND, fine to coarse	8" recovery; No odor; OVA = 38.6 ppm
10	5	SS	1-1 / 1-1	Very loose, same to 9 feet, then dark brown CLAY, trace coarse to small pebble, 10% wood	12" recovery; No odor; OVA = 32.7 ppm
	6	SS	1-1 / 1-1	Very loose, same as above	8" recovery; No odor; OVA = 28.4 ppm
	7	SS	1-1 / 1-2	Very loose, dark brown peaty CLAY, 30% wood	14" recovery; No odor; OVA = 25.7 ppm
15	8	SS	1-1 / 1-1	Very loose, same as above, 40% wood	12" recovery; No odor; OVA = 20.8 ppm
	9	SS	1-1 / 1-1	Very loose, dark brown peaty CLAY, 50% wood	10" recovery; No odor; OVA = 6.0 ppm
	10	SS	1-1 / 6-2	Loose, dark brown clayey PEAT, 35% clay	18" recovery; No odor; OVA = 14.3 ppm
20	11	SS	1-0 / 1-1	Very loose, same as above	12" recovery; No odor; OVA = 3.9 ppm
	12	SS	1-1 / 1-1	Very loose, PEAT, large wood chunk blocked shoe	2" recovery; No odor; OVA = 7.3 ppm
25	13	SS	1-5 / 7-8	Loose, brown SAND, fine to coarse, well sorted coarse	10" recovery; Very slight odor; OVA = 78.6 ppm
	14	SS	6-7 / 6-6	Loose, same as above	18" recovery; Very slight odor; OVA = 99.2 ppm
30	15	SS	1-0 / 4-5	Very loose, brown SAND, fine to coarse, moderately sorted medium, trace granule, 2% phosphate	16" recovery; No odor; OVA = 53.7 ppm
35	16	SS	6-4 / 3-3	Very loose, brown SAND, well sorted medium, 2% phosphate	10" recovery; No odor; OVA = 42.6 ppm
40	17	SS	2-2 / 1-1	Very loose, brown SAND, fine to coarse, poorly sorted, 10% granule to medium pebble, 2% phosphate, trace lignite	12" recovery; No odor; OVA = 9.5 ppm
	18	SS	12-22 / 36-50	Dense, olive gray CLAY to 44.5 feet with 5% phosphate and glauconite then light gray sandy shell mold LIMESTONE and SAND, alternating cemented shell molds and friable sand laminae, silt to large pebble	24" recovery; No odor; OVA = 2.5 ppm
45					24" recovery; No odor; OVA = 1.1 ppm
50	19	SS	15-35 / 48-15	Dense, same as above	TD = 51 feet

H:530MW8A

TEST BORING RECORD

Elevation of top of PVC pipe: 6.51'

ELEV.	DEPTH FEET	DESCRIPTION
4.46	0.0	
	0.5	FILL: Dark brown silty fine SAND with occasional coarse sand
-0.54		Very firm to loose gray to grayish-brown fine to medium SAND with traces of silt
-5.54		
	12.5	
-10.54		Soft dark brown PEAT and ORGANIC SILT with root and wood fragments
	18.5	
-15.54	20.0	Buried log from 18.5 to 20.0 feet
		BORING TERMINATED
-20.54		



REMARKS:

* Water level on 9-19-85

1) Wash drilled with 10-inch wing bit using a bentonite and potable water drilling fluid mixture to 4.5 feet; wash drilled with 5 7/8-inch roller bit using a bentonite and potable water drilling fluid mixture from 4.5 to 20.0 feet

2) Well developed on 9-11-85

DRILLED BY L.S.
LOGGED BY J.T.B.
CHECKED BY C.A.S.

BORING NUMBER MW-9
DATE STARTED 9-5-85
DATE COMPLETED 9-10-85
JOB NUMBER HA-5276

SWP - Wilmington

ENVIRONMENTAL TECHNOLOGY ENGINEERING, INC.
CONSULTING ENGINEERS, SURVEYORS AND HYDROGEOLOGISTS
HYDROGEOLOGIC SERVICES

TEST BORING LOG

BORING NO. MW-10

PROJECT: SOUTHERN WOOD PIEDMONT – WILMINGTON, NC		SHEET NO. 1 OF 1	
CLIENT: SOUTHERN WOOD PIEDMONT	DATE FINISHED 2-18-92	JOB NO. 530-06-501	
BORING CONTRACTOR: ETE	DRILLER C. AARON	ELEVATION	
RIG USED MOBILE B-57	INSPECTOR K. ANDERSON	DATE STARTED 2-18-92	

WELL CONSTRUCTION: CLAY; PLUG; SAND PACK; SAND PACK

DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	SS	06-10 / 10-15	Black – tan fine to meduium SAND	Saturated with water OVA = 0.0
5	2	SS	04-26 / 50	Tan fine to medium SAND	Saturated with water; OVA = 0.0
10	3	SS		Tan fine to medium SAND in upper portion of spoon; Dark brown to black PEAT at bottom of spoon	Boring terminated at 13.0 ft. OVA = 0.0
15					
20					
25					
30					
35					
40					
45					
50					

H:53050110

ENVIRONMENTAL TECHNOLOGY ENGINEERING, INC.
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TEST BORING LOG

BORING NO. MW-11

PROJECT: SOUTHERN WOOD PIEDMONT – WILMINGTON, NC			SHEET NO. 1 OF 1
CLIENT: SOUTHERN WOOD PIEDMONT	DATE FINISHED	2-18-92	JOB NO. 530-06-501
BORING CONTRACTOR: ETE	DRILLER	C. AARON	ELEVATION
RIG USED MOBILE B-57	INSPECTOR	K. ANDERSON	DATE STARTED 2-18-92

WELL CONSTRUCTION: CLAY; SAND PACK; PLUG; SAND PACK

DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0					
	1	SS		Hit concrete and other buried debris	
5	2	SS	10-05 05-05	Brown-tan fine to medium SAND	Saturated with Creosote from 5 to 7 feet: OVA = 34.
	3	SS	02-02 02-01	Brown-tan fine to medium SAND	Saturated with Creosote OVA = 38.1
10					
	4	SS		Brown-tan fine to medium SAND in upper spoon; Encountered a dark brown to black PEAT with roots at 15.0'	Sand unit saturated with Creosote; OVA = 69.8
15					
20					
25					
30					
35					
40					
45					
50					

H:53050111

ENVIRONMENTAL TECHNOLOGY ENGINEERING, INC.
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HYDROGEOLOGIC SERVICES

TEST BORING LOG

BORING NO. MW-11A

PROJECT: SOUTHERN WOOD PIEDMONT-WILMINGTON		SHEET NO. 1 OF 1	
CLIENT: CHUCK DAVIS	DATE FINISHED 10-1-92	JOB NO. 530-06-503	
BORING CONTRACTOR: ETE	DRILLER T. COPPIN	ELEVATION 4.10	
RIG USED ATV MUD ROTARY	INSPECTOR G. KUNTZ	DATE STARTED 9-29-92	

WELL CONSTRUCTION: GROUT; 6" PVC CASING; 2" PVC CASING; 6" PVC CASING; GROUT; CLAY; PLUG; SAND PACK; SAND PACK

DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	SS	8-8 10-24	Loose, brown SAND, fine to coarse, well sorted medium	18" recovery No odor OVA = 124 ppm
	2	SS	7-7 10-22	Loose, brown SAND, fine to coarse, 5% wood. At 3 feet visually stained soil.	12" recovery Strong odor OVA = 877
5	3	SS	2-1 1-1	Very loose, brown SAND, fine to coarse, 5% wood, 2" dark brown CLAY layer at 5 feet. Visually stained soil.	8" recovery Strong odor OVA = 89.1 ppm
	4	SS	6-8 1-1	Very loose, brown SAND, fine to coarse, trace wood, 8-inch dark brown peaty CLAY lense at 6 feet. Visually stained soil.	24" recovery Strong odor OVA = 153 ppm
	5	SS	4-4 5-7	Loose, brown SAND, fine to coarse, 5% wood, visually stained soils to 8.5' then 1/4" seams of stained soil	24" recovery Strong odor OVA = 113 ppm
10	6	SS	2-4 5-4	Very loose, brown SAND, fine to coarse. Visually stained soils.	12" recovery Strong odor OVA = 186 ppm
	7	SS	2-2 3-2	Very loose, same as above to 13 feet, then dark brown peaty CLAY, 30% wood. Visually stained soils in sands, no visual staining in peaty clay.	10" recovery Strong odor OVA = 131
15	8	SS	2-3 2-3	Very loose, dark brown PEAT, 20% clay	24" recovery Strong odor OVA = 66.2 ppm
	9	SS	2-4 2-3	Very loose, brownish black peaty CLAY, 30% peat	10" recovery Strong odor OVA = 98.1 ppm
	10	SS	2-2 3-2	Very loose, same as above, 40% wood	16" recovery Strong odor OVA = 113 ppm
20	11	SS	50	Grout	3" recovery
	12	SS	6-2 3-2	Very loose, brownish black peaty CLAY, 25% wood	4" recovery Moderate odor OVA = 112 ppm
25	13	SS	0-0 0-0	Very loose, same as above	24" recovery No odor OVA = 17.3 ppm
	14	SS	2-2 4-6	Very loose, same to 27.5 feet, then dark brown SAND, fine to coarse, well sorted medium	24" recovery Very slight odor OVA = 34.3 ppm
	15	SS	3-4 7-8	Loose, same as above, 10% wood	12" recovery Very slight odor OVA = 26.9 ppm
30	16	SS	5-8 7-14	Loose, light brown SAND, very fine to medium, well sorted fine, 2% phosphate	12" recovery No odor OVA = 18.6 ppm
35	17	SS	4-8 8-12	Loose, brown SAND, fine to granule, poorly sorted, 5% small pebble, 2% phosphate	12" recovery No odor OVA = 12.8 ppm
40	18	SS	25-22 20-28	Firm, brown SAND, fine to granule to 44 feet, then olive gray CLAY, 5% phosphate and glauconite, tight and dry	24" recovery No odor OVA = 7.2 ppm
45				Dense, lt gray shell mold	14" recovery
50	19	SS	48-26 50+	LIMESTONE and SAND, alternating lenses of indurated cemented shell molds and friable sand, silt to very coarse, 10% granule	No odor OVA = 10.8 ppm TD = 50 feet

H:530MW11A

ENVIRONMENTAL TECHNOLOGY ENGINEERING, INC.
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HYDROGEOLOGIC SERVICES

TEST BORING LOG

BORING NO. MW-11B

PROJECT: SOUTHERN WOOD PIEDMONT-WILMINGTON		SHEET NO. 1 OF 1	
CLIENT: T.M. DAVIS	DATE FINISHED 10-31-93	JOB NO. 12-53015.00	
BORING CONTRACTOR: ETE	DRILLER LAYNE ENVIRONMENTAL	ELEVATION 4.13	
RIG USED ATV MUD ROTARY	INSPECTOR G. KUNTZ	DATE STARTED 10-26-93	

WELL CONSTRUCTION: 6" PVC; 2" PVC; 6" PVC; GROUT; CLAY; PLUG; SAND PACK

DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	PH		Loose, brown SAND, fine to coarse, well sorted medium, trace wood & organics	No odor OVA = 0.0 ppm
	2	PH		Loose, brown SAND, fine to coarse, well sorted medium, 5% wood	Slight odor OVA = 87.0 ppm
5	3	SS	2-3 / 4-6	Loose, brown SAND, fine to coarse, 5% wood. Visual staining starting @ 5'.	14" recovery Strong odor OVA = 177 ppm
	4	SS	5-7 / 7-8	Firm, brown SAND, fine to coarse, 15% wood, 6" dark brown PEAT lense. Visual staining.	14" .recovery Strong odor OVA = 253 ppm
	5	SS	3-4 / 4-5	Loose, brown SAND, fine to coarse, 5% wood to 9', then peaty CLAY, 50% peat. Visually stained.	14" recovery Strong odor OVA = 405 ppm
10	6	SS	5-6 / 6-7	Firm, brown SAND, fine to coarse. Visually stained.	14" recovery Strong odor OVA = 418 ppm
	7	SS	3-2 / 2-2	Very loose, same as above to 13 feet, then dark brown peaty CLAY, 50% peat. Visually stained in sands.	24" recovery Strong odor OVA = 187 ppm
15	8	SS	1-1 / 1-2	Very loose, dark brown PEAT, 20% clay. 8" sand lense. Visual staining in sand.	14" recovery Strong odor OVA = 592 ppm
	9	SS	2-3 / 2-2	Very loose, brownish black peaty CLAY, 50% peat. Visual staining to 17'.	18" recovery Strong odor OVA = 370 ppm
	10	SS	2-1 / 1-4	Loose, same as above, 40% peat. Pit casing to 20'	16" recovery Strong odor OVA = 372 ppm
20	11	SS	2-1 / 1-2	Very loose, brownish black peaty CLAY, 25% peat	4" recovery Slight odor OVA = 139 ppm
	12	SS	1-1 / 1-3	Very loose, brownish black peaty CLAY, 25% peat	24" recovery Slight odor OVA = 78.7 ppm
25	13	SS	1-1 / 1-2	Very loose, same as above, 35% peat	8" recovery Slight odor OVA = 40.1 ppm
	14	SS	2-4 / 4-5	Very loose, same to 27 feet, then dark brown SAND, fine to coarse, trace very coarse to granule	24" recovery Slight odor OVA = 56.9 ppm
30	15	SS	2-4 / 8-9	Firm, dark brown SAND, fine to medium, well sorted	12" recovery Very slight odor OVA = 65.6 ppm
35	16	SS	2-3 / 3-7	Loose, brown SAND, fine to coarse, coarse dominant	12" recovery No odor OVA = 58.6 ppm
40	17	SS	6-5 / 8-7	Firm, brown SAND, fine to granule, 10% granule to small pebble, poorly sorted, to 41.5', then olive gray marine CLAY, 5% phosphate and glauconite. Sheen appeared in drilling mud when hit top of clay	12" recovery No odor OVA = 63.3 ppm
	18	SS	9-15 / 13-17	Very stiff, olive gray CLAY, 10% phosphate & glauconite, 1% mollusc fragments	24" recovery Slight odor OVA = 78.4 ppm
45	19	SS	15-26 / 22-24	Hard, olive gray CLAY, 15% silt to very fine sand, 10% phosphate and glauconite	24" recovery No odor OVA = 20.3 ppm TD = 46 feet
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TEST BORING LOG

BORING NO. MW-12

PROJECT: SOUTHERN WOOD PIEDMONT – WILMINGTON, NC		SHEET NO. 1 OF 1	
CLIENT: SOUTHERN WOOD PIEDMONT	DATE FINISHED 2-18-92	JOB NO. 530-06-501	
BORING CONTRACTOR: ETE	DRILLER C. AARON	ELEVATION	
RIG USED MOBILE B-57	INSPECTOR K. ANDERSON	DATE STARTED 2-18-92	

WELL CONSTRUCTION: CLAY; PLUG; SAND PACK; SAND PACK

DEPTH FEET	LITHOLOGY	SAMPLE No.	SAMPLE TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0						
		1	SS	19-14 06-07	Brown-tan fine to medium well sorted SAND	No visual Creosote OVA = 13.3
5						
		2	SS	03-05 10-18	Same as above except Sand is saturated with Creosote	OVA = 72.7
10						
		3	SS	08-11 19-28	Same as above	OVA = 45.1
					Organic rich dark brown to black PEAT with roots	
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ENVIRONMENTAL TECHNOLOGY ENGINEERING, INC.
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TEST BORING LOG

BORING NO. MW-13

PROJECT: SOUTHERN WOOD PIEDMONT – WILMINGTON, NC		SHEET NO. 1 OF 1	
CLIENT: SOUTHERN WOOD PIEDMONT	DATE FINISHED 2-18-92	JOB NO. 530-06-501	
BORING CONTRACTOR: ETE	DRILLER C. AARON	ELEVATION	
RIG USED MOBILE B-57	INSPECTOR K. ANDERSON	DATE STARTED 2-18-92	

WELL CONSTRUCTION: CLAY; SAND PACK; PLUG; SAND PACK

DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0					
5	1	SS	03-01 01-0	Brown-tan fine to medium SAND	Visual Creosote encountered in borehole immediately upon drilling OVA = 102.0
10	2	SS	05-07 12	Same as above	No visual Creosote; OVA = 47.8
15	3	SS		Dark brown to balck organic rich PEAT	No visual Creosote OVA = 3.0
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TEST BORING LOG

BORING NO. MW-14

PROJECT: SOUTHERN WOOD PIEDMONT – WILMINGTON, NC			SHEET NO. 1 OF 1
CLIENT: SOUTHERN WOOD PIEDMONT	DATE FINISHED	2-19-92	JOB NO. 530-06-501
BORING CONTRACTOR: ETE	DRILLER	C. AARON	ELEVATION
RIG USED MOBILE B-57	INSPECTOR	K. ANDERSON	DATE STARTED 2-19-92

WELL CONSTRUCTION: CLAY; PLUG; SAND PACK; SAND PACK

DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	SS	2-5 / 6-5	Dark brown-black Fill material	OVA = 0.0
	2	SS	9-5 / 4-3	Brown-tan fine to medium SAND	Visual Creosote OVA = 0.0
5	3	SS	2-2 / 4-3	Same as above	Visual Creosote OVA = 19.3
	4	SS	3-3 / 4-10	Same as above	Visual Creosote OVA = 34.7
	5	SS		Black-brown organic rich PEAT with roots	Visual Creosote OVA = 27.1
10	6	SS		Same as above with large wood fragments throughout	Visual Creosote OVA = 9.6
	7	SS		Black PEAT with brown-orange wood fragment at end of spoon	Visual Creosote OVA = 25.3
15	8	SS		Black-brown PEAT with root fragments	Visual Creosote OVA = 19.4
	9	SS		No sample retrieved	
	10	SS		Black-brown PEAT with root fragments	No visual Creosote OVA = 8.0
20	11	SS		Black-brown PEAT to approximately 21.5 ft bgs; Brown-tan medium to coarse SAND below peat	No visual Creosote OVA = 5.2
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TEST BORING LOG

BORING NO. MW-14A

PROJECT: SOUTHERN WOOD PIEDMONT-WILMINGTON		SHEET NO. 1 OF 1	
CLIENT: T.M. DAVIS	DATE FINISHED 11-2-93	JOB NO. 12-53015.00	
BORING CONTRACTOR: ETE	DRILLER LAYNE ENVIRONMENTAL	ELEVATION 2.76	
RIG USED ATV MUD ROTARY	INSPECTOR G. KUNTZ	DATE STARTED 10-27-93	

WELL CONSTRUCTION: GROUT; 6" PVC; 2" PVC; 6" PVC; GROUT; CLAY; PLUG; SAND PACK; SAND PACK

DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	PH		Loose, brown SAND, fine to coarse, coarse dominant, fill, trace granule	No odor OVA = 26.1 ppm
	2	PH		Loose, brown SAND, very fine to coarse, medium dominant. Visual staining @ 3'.	Strong odor OVA = 94.3 ppm
5	3	SS	2-8 1-3	Very loose, brown SAND and PEAT, 50% peat, 3" wood fragment. Visual staining.	6" recovery Strong odor OVA = 88.3 ppm
	4	SS	2-1 1-3	Very loose, brown SAND, fine to coarse to 7.5', then dark brown CLAY. Visual staining in sand.	14" recovery Strong odor OVA = 149 ppm
	5	SS	1-1 1-1	Very soft, dark brown CLAY to 8.5', then dark brown PEAT	18" recovery Moderate odor OVA = 85.3 ppm
10	6	SS	1-1 1-1	Very soft, dark brown clayey PEAT, 30% clay	24" recovery Slight odor OVA = 89.5 ppm
	7	SS	1-1 1-1	Very soft, dark brown peaty CLAY, 50% peat	24" recovery Very slight odor OVA = 82.8 ppm
15	8	SS	1-1 3-5	Firm, dark brown peaty CLAY, 35% peat Pit casing to 16'	18" recovery Very slight odor OVA = 65.1
	9	SS	1-1 1-3	Soft, brownish black peaty CLAY, 25% peat	4" recovery Moderate odor OVA = 116 ppm
	10	SS	2-2 2-4	Firm, same as above. Slight sheen in drilling mud.	4" recovery Moderate odor OVA = 88.1 ppm
20	11	SS	3-1 1-2	Soft, same as above. Sheen in drilling mud.	2" recovery Moderate odor OVA = 107 ppm
	12	SS	2-2 3-5	Firm, brownish black peaty CLAY, 50% peat. Little visual staining.	18" recovery Moderate odor OVA = 137 ppm
25	13	SS	3-2 2-3	Loose, brown SAND, fine to coarse, 5% very coarse, trace wood.	18" recovery Moderate odor OVA = 447 ppm
	14	SS	4-5 5-6	Firm, same as above.	18" recovery Moderate odor OVA = 69.4 ppm
30	15	SS	2-1 3-5	Loose, brown SAND, fine to granule, 5% granule to small pebble	18" recovery Slight odor OVA = 62.0 ppm
35	16	SS	3-6 6-6	Firm, brown SAND, fine to coarse, well sorted medium	12" recovery Slight odor OVA = 28.5 ppm
40	17	SS	3-7 6-8	Firm, same sand as above to 40.5', then olive gray CLAY	24' recovery Slight odor OVA = 27.6 ppm TD = 42'
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TEST BORING LOG

BORING NO. MW-15

PROJECT: SOUTHERN WOOD PIEDMONT – WILMINGTON, NC		SHEET NO. 1 OF 2	
CLIENT: SOUTHERN WOOD PIEDMONT	DATE FINISHED 2-19-92	JOB NO. 530-06-501	
BORING CONTRACTOR: ETE	DRILLER C. AARON	ELEVATION	
RIG USED MOBILE B-57	INSPECTOR K. ANDERSON	DATE STARTED 2-19-92	

WELL CONSTRUCTION: CLAY PLUG; SAND PACK; SAND PACK

DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	SS	1-1 / 4-4	Fine to medium, loose to very loose brown SAND	Visual oil; diesel fuel odor OVA = 58.3
5	2	SS		Fine to medium, brown SAND	No visual oil; OVA = 15.6
10	3	SS		Fine to medium, brown SAND in upper spoon; Dark brown to black PEAT with root fragments in lower part of spoon	No visual oil OVA = 5.4
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TEST BORING LOG

BORING NO. MW-16

PROJECT: SOUTHERN WOOD PIEDMONT – WILMINGTON, NC		SHEET NO. 1 OF 1	
CLIENT: SOUTHERN WOOD PIEDMONT	DATE FINISHED 2-19-92	JOB NO. 530-06-501	
BORING CONTRACTOR: ETE	DRILLER C. AARON	ELEVATION	
RIG USED MOBILE B-57	INSPECTOR K. ANDERSON	DATE STARTED 2-19-92	

WELL CONSTRUCTION: CLAY; PLUG; SAND PACK; SAND PACK

DEPTH FEET	SAMPLE No.	SAMPLE TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	SS		Fine to medium, brown SAND	Saturated with diesel fuel OVA = 104
5	2	SS		Medium tan to brown SAND with some wood fragments	Little odor OVA = 42.6
10				Same as above	Slight diesel odor OVA = 32.5
15	3	SS		Dark brown to black PEAT contact at 15.0 ft.	
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TEST BORING LOG

BORING NO. MW-17

PROJECT: SOUTHERN WOOD PIEDMONT – WILMINGTON, NC		SHEET NO. 1 OF 1	
CLIENT: SOUTHERN WOOD PIEDMONT	DATE FINISHED 2-19-92	JOB NO. 530-06-501	
BORING CONTRACTOR: ETE	DRILLER C. AARON	ELEVATION	
RIG USED MOBILE B-57	INSPECTOR K. ANDERSON	DATE STARTED 2-19-92	

WELL CONSTRUCTION: CLAY PLUG; SAND PACK; SAND PACK

DEPTH FEET	LITHOLOGY	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0						
		1	SS	10-2 / 2-2	Fine to medium brown SAND with wood fragment at bottom of spoon	Saturated with diesel fuel: OVA = 118
5						
		2	SS	2-2 / 2-2	Wood fragments in upper portion of spoon with a fine to medium brown SAND in bottom of spoon	Diesel fuel odor OVA = 57.1
10						
		3	SS		Fine to medium brown SAND	Saturated with diesel fuel; OVA = 72.3
15		4	SS		Dark Brown PEAT with root fragments	No visual oil OVA = 39.1
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TEST BORING LOG

BORING NO. MW-18

PROJECT: SOUTHERN WOOD PIEDMONT-WILMINGTON			SHEET NO. 1 OF 1
CLIENT: CHUCK DAVIS	DATE FINISHED	10-7-92	JOB NO. 530-06-503
BORING CONTRACTOR: ETE	DRILLER	T. COPPIN	ELEVATION 4.26
RIG USED ATV MUD ROTARY	INSPECTOR	G. KUNTZ	DATE STARTED 10-6-92

WELL CONSTRUCTION: CLAY; PLUG; SAND PACK; SAND PACK

DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	SS	0-0 / 0-0	Very loose, brown SAND, fine to medium, 5% coarse to granule	14" recovery No odor OVA = 30 ppm
	2	SS	4-4 / 10-13	Loose, brown SAND, fine to coarse, 5% granule, poorly sorted	18" recovery Slight diesel odor OVA = 35.3 ppm
5	3	SS	3-2 / 3-2	Very loose, brown SAND, fine to coarse, coarse dominant, 20% very coarse	14" recovery No odor OVA = 27.9 ppm
	4	SS	4-5 / 6-7	Loose, same as above, 35% very coarse to granule, 2% small pebble	18" recovery Slight diesel odor OVA = 20.6 ppm
10	5	SS	6-12 / 12-10	Firm, brown pebbly SAND, fine to coarse, 30% granule to small pebble	12" recovery No odor OVA = 9.9 ppm
	6	SS	4-6 / 5-11	Loose, brown SAND, fine to coarse, medium dominant	18" recovery No odor OVA = 6.6 ppm
	7	SS	6-8 / 10-9	Loose, brown pebbly SAND, very fine to coarse, 30% granule to small pebble to 13.5 feet, then dark brown clayey PEAT, 30% clay	24" recovery No odor OVA = 5.1 ppm TD = 14 feet
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TEST BORING LOG

BORING NO. MW-19

PROJECT: SOUTHERN WOOD PIEDMONT-WILMINGTON		SHEET NO. 1 OF 1	
CLIENT: CHUCK DAVIS	DATE FINISHED	10-6-92	JOB NO. 530-06-503
BORING CONTRACTOR: ETE	DRILLER	T. COPPIN	ELEVATION 3.19
RIG USED ATV MUD ROTARY	INSPECTOR	G. KUNTZ	DATE STARTED 10-6-92

WELL CONSTRUCTION: GROUT; 2" STAINLESS STEEL; GROUT; CLAY; PLUG; SAND PACK; SAND PACK

DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	SS	0-0 / 0-0	Very loose, dark brown SAND, fine to coarse, 5% granule	8" recovery No odor OVA = 201 ppm
	2	SS	4-4 / 5-5	Loose, brown SAND, fine to coarse, poorly sorted	18" recovery No odor OVA = 276 ppm
5	3	SS	6-7 / 5-7	Loose, brown SAND, fine to medium, well sorted medium	12" recovery No odor OVA = 92.4 ppm
	4	SS	5-5 / 6-8	Loose, brown SAND, fine to coarse, poorly sorted	18" recovery No odor OVA = 69.6 ppm
	5	SS	6-7 / 8-9	Loose, same as above, 10% wood	24" recovery Slight odor OVA = 183 ppm
10	6	SS	3-3 / 3-1	Very loose, same as above, 20% wood. Visually stained soil 11.5 to 12 feet.	24" recovery Strong odor OVA = 210 ppm
	7	SS	1-1 / 1-1	Very loose, brownish black clayey PEAT, 25% clay	18" recovery Moderate odor OVA = 45.6 ppm TD = 14 feet
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TEST BORING LOG

BORING NO. MW-19A

PROJECT: SOUTHERN WOOD PIEDMONT-WILMINGTON		SHEET NO. 1 OF 1	
CLIENT: CHUCK DAVIS	DATE FINISHED 10-2-92	JOB NO. 530-06-503	
BORING CONTRACTOR: ETE	DRILLER T. COPPIN	ELEVATION 3.15	
RIG USED ATV MUD ROTARY	INSPECTOR G. KUNTZ	DATE STARTED 9-30-92	

WELL CONSTRUCTION: GROUT; 6" PVC CASING; 2" PVC CASING; 6" PVC CASING; GROUT; CLAY; PLUG; SAND PACK; SAND PACK

DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	SS	3-2 / 2-3	Very loose, brown SAND, fine to coarse	16" recovery No odor OVA = 214 ppm
	2	SS	8-7 / 6-8	Loose, brown pebbly SAND, fine to coarse, 25% small pebble	8" recovery No odor OVA = 290 ppm
5	3	SS	4-5 / 6-8	No recovery	
	4	SS	6-8 / 8-9	Loose, brown SAND, fine to coarse, 5% wood	16" recovery No odor OVA = 89.5 ppm
	5	SS	4-4 / 3-1	Very loose, same as above	12" recovery Slight odor OVA = 183 ppm
10	6	SS	5-4 / 3-1	Very loose, same as above to 11.5 feet, then 1-inch dark brown clay lense followed by same sand to 12 feet	18" recovery Visual creosote 11.5' to 12' OVA = 210 ppm
	7	SS	1-1 / 1-2	Very loose, brownish black clayey PEAT, 25% clay	18" recovery Moderate odor OVA = 42.3 ppm
15	8	SS	1-1 / 1-1	Very loose, brownish black peaty CLAY, 30% peat	24" recovery No odor OVA = 19.0 ppm
	9	SS	1-1 / 1-1	Very loose, same as above, 50% wood	18" recovery No odor OVA = 10.1 ppm
	10	SS	1-2 / 1-0	Same as above	14" recovery No odor OVA = 8.6 ppm
20	11	SS	5-1 / 1-2		No recovery
	12	SS	0-0 / 2-3	Very loose, dark brown peaty CLAY, 30% wood	12" recovery No odor OVA = 11.9 ppm
25	13	SS	1-2 / 2-4	Very loose, same as above to 25 feet, then brown SAND, fine to coarse, poorly sorted	24" recovery No odor OVA = 8.6 ppm
30	14	SS	6-9 / 7-7	Loose, light brown SAND, fine to coarse, well sorted medium	12" recovery No odor OVA = 9.8 ppm
35	15	SS	5-3 / 3-2	Very loose, brown SAND, fine to granule, moderately sorted medium, 2% phosphate	12" recovery No odor OVA = 4.6 ppm
40	16	SS	0-0 / 12-16	Firm, olive gray CLAY, 5% phosphate and glauconite, tight and dry	24" recovery No odor OVA = 4.9 ppm
	17	SS	8-27 / 27-26	Firm, same as above, 10% phosphate and glauconite	24" recovery No odor OVA = 5.2 ppm
	18	SS	65	Very dense, light gray sandy shell mold LIMESTONE, 35% sand	2" recovery No odor OVA = 3.1 ppm TD = 43 feet 2 inches
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H:530MW19A

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TEST BORING LOG

BORING NO. MW-20

PROJECT: SOUTHERN WOOD PIEDMONT-WILMINGTON			SHEET NO. 1 OF 1
CLIENT: CHUCK DAVIS	DATE FINISHED	10-7-92	JOB NO. 530-06-503
BORING CONTRACTOR: ETE	DRILLER	T. COPPIN	ELEVATION 3.17
RIG USED ATV MUD ROTARY	INSPECTOR	G. KUNTZ	DATE STARTED 10-7-92

WELL CONSTRUCTION: GROUT; CLAY; SAND PACK; 2" PVC CASING; GROUT; PLUG; SAND PACK

DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	SS	1-0, 0-0	Very loose, black clayey PEAT to 1 foot then brown SAND, fine to coarse	18" recovery; Slight odor; OVA = 120 ppm
	2	SS	5-5, 7-11	Loose, brown SAND, fine to coarse, poorly sorted	24" recovery; Very slight odor; OVA = 66.0 ppm
5	3	SS	0-0, 5-5	Very loose, same as above	18" recovery; Very slight odor; OVA = 106 ppm
	4	SS	5-5, 5-6	Loose, same as above	18" recovery; No odor; OVA = 43.5 ppm
10	5	SS	4-2, 1-2	Very loose, brown SAND, very fine to medium, 10% coarse, 1/4" dark gray clay lense at 10 feet	14" recovery; No odor; OVA = 57.1 ppm
	6	SS	1-0, 1-2	Very loose, brownish gray silty SAND, silt to medium, 35% silt, 10% clay, 1-inch dark gray lense at 11.5 feet	20" recovery; No odor; OVA = 9.8 ppm
	7	SS	1-2, 1-2	Very loose, brownish black peaty CLAY, 25% wood	24" recovery; Very slight odor; OVA = 15.7 ppm; TD = 14 feet
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ENVIRONMENTAL TECHNOLOGY ENGINEERING, INC. CONSULTING ENGINEERS, SURVEYORS AND HYDROGEOLOGISTS HYDROGEOLOGIC SERVICES		TEST BORING LOG BORING NO. MW-20A
PROJECT: SOUTHERN WOOD PIEDMONT-WILMINGTON		SHEET NO. 1 OF 1
CLIENT: T.M. DAVIS	DATE FINISHED 11-8-93	JOB NO. 12-53015.00
BORING CONTRACTOR: ETE	DRILLER LAYNE ENVIRONMENTAL	ELEVATION 3.10
RIG USED ATV MUD ROTARY	INSPECTOR G. KUNTZ	DATE STARTED 10-29-93

WELL CONSTRUCTION: GROUT; 6" PVC; 2" PVC; 6" PVC; GROUT; CLAY; PLUG; SAND PACK; SAND PACK

DEPTH FEET	SAMPLE NO.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	PH		Very loose, black clayey PEAT to 1', then brown SAND, fine to coarse, coarse dominant	No odor OVA = 75.8 ppm
	2	PH		Very loose, brown SAND, fine to coarse	No odor OVA = 35.4 ppm
5	3	SS	2-1 1-2	Very loose, brown SAND, fine to coarse	14" recovery No odor OVA = 131 ppm
	4	SS	3-2 2-5 4-5	Loose, brown SAND, fine to coarse to 7.5', then brownish gray sandy SILT, 30% very fine to fine sand, 5% clay, trace mica, multiple 1/4" lignite laminae	18" recovery No odor OVA = 225 ppm 24" recovery
	5	SS	5-4	Loose, same to 9.5', then brownish black peaty CLAY, 40% peat	No odor OVA = 190 ppm 20" recovery
10	6	SS	3-5 5-2	Loose, dark brown peaty CLAY, 30% peat	No odor OVA = 236 ppm
	7	SS	2-4 2-2	Very loose, brownish black PEAT and CLAY	12" recovery No odor OVA = 164 ppm
15	8	SS	2-2 1-1	Very loose, dark brown peaty CLAY, 30% peat Pit casing to 16'	18" recovery No odor OVA = 121 ppm
	9	SS	2-1 1-3	Grout in spoon	No recovery
	10	SS	3-4 3-3	Grout in spoon	No recovery
20	11	SS	2-2 2-4	Firm, dark brown peaty CLAY, 25% peat	4" recovery No odor OVA = 24.3 ppm
	12	SS	3-7 5-5	Loose, brownish black PEAT to 23.5', then brown SAND, fine to coarse, coarse dominant	18" recovery No odor OVA = 33.0 ppm
25	13	SS	6-3 3-5	Loose, dark brown SAND, fine to very coarse, 10% very coarse, 5% wood	18" recovery No odor OVA = 35.4 ppm
30	14	SS	3-4 4-8	Firm, brown SAND, fine to coarse	10" recovery No odor OVA = 42.4 ppm
35	15	SS	5-6 6-7	Firm, whitish brown SAND, fine to coarse, 2" gray clay lense at 36'	8" recovery No odor OVA = 47.1 ppm
40	16	SS	3-4 5-7	Firm, brown SAND, fine to granule, 25% very coarse to granule to 41', then olive gray CLAY, 10% glauconite and phosphate	18" recovery No odor OVA = 41.1 ppm TD = 42'
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ENVIRONMENTAL TECHNOLOGY ENGINEERING, INC.
CONSULTING ENGINEERS, SURVEYORS AND HYDROGEOLOGISTS
HYDROGEOLOGIC SERVICES

TEST BORING LOG

BORING NO. MW-21

PROJECT: SOUTHERN WOOD PIEDMONT-WILMINGTON		SHEET NO. 1 OF 1	
CLIENT: CHUCK DAVIS	DATE FINISHED	10-7-92	JOB NO. 530-06-503
BORING CONTRACTOR: ETE	DRILLER	T. COPPIN	ELEVATION 3.17
RIG USED ATV MUD ROTARY	INSPECTOR	G. KUNTZ	DATE STARTED 10-7-92

WELL CONSTRUCTION: CLAY; 2" PVC; PLUG; SAND PACK; SAND PACK

DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	SS	1-1 / 1-1	Very loose, brownish black clayey PEAT to 6", then brown SAND, fine to coarse	18" recovery No odor OVA = 43.2 ppm
	2	SS	5-3 / 6-8	Loose, brown SAND, fine to coarse, coarse dominant	18" recovery No odor OVA = 86.6 ppm
5	3	SS	4-2 / 2-2	Very loose, brown SAND, fine to coarse, medium dominant	12" recovery No odor OVA = 52.6 ppm
	4	SS	1-3 / 7-8	Loose, same to 7', then 4" dark gray clay lense, then peaty CLAY, 30% wood	24" recovery No odor OVA = 20.6 ppm
	5	SS	1-1 / 0-1	Very loose, brownish black peaty CLAY, 30% wood	24" recovery No odor OVA = 10.8 ppm TD= 10 feet
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H:530MW21

ENVIRONMENTAL TECHNOLOGY ENGINEERING, INC.
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HYDROGEOLOGIC SERVICES

TEST BORING LOG

BORING NO. MW-22

PROJECT: SOUTHERN WOOD PIEDMONT-WILMINTON		SHEET NO. 1 OF 1	
CLIENT: CHUCK DAVIS	DATE FINISHED 10-7-92	JOB NO. 530-06-503	
BORING CONTRACTOR: ETE	DRILLER T. COPPIN	ELEVATION 3.02	
RIG USED ATV MUD ROTARY	INSPECTOR G. KUNTZ	DATE STARTED 10-7-92	

WELL CONSTRUCTION: GROUT; 2" STAINLESS STEEL; GROUT; CLAY; PLUG; SAND PACK; SAND PACK

DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	SS	5-4	Loose, black organic rich SAND, silt to coarse, 20% clay, 15% plant and wood material to 1.5', then brown SAND	18" recovery Slight diesel odor OVA = 109 ppm
			6-5		
	2	SS	5-6	Loose, brown SAND, fine to coarse	24" recovery Creosote stained soil at 3' OVA = 87.7 ppm
			6-4		
5	3	SS	4-2	Very loose, same as above	14" recovery Creosote stained soils OVA = 107 ppm
			4-3		
	4	SS	4-2	Loose, brown SAND, fine to coarse, well sorted medium	24" recovery Creosote stained soils OVA = 157 ppm
			6-9		
	5	SS	4-3	Very loose, same as above	20" recovery Creosote stained soils to 9' OVA = 75.6 ppm
			4-4		
10	6	SS	2-3	Loose, brown SAND, fine to coarse, poorly sorted, few 1/2" dark brown clay lenses at 11.5'	18" recovery Moderate odor OVA = 84.7 ppm
			6-7		
	7	SS	1-1	Very loose, brownish black clayey PEAT, 35% clay	24" recovery Slight creosote odor OVA = 25.5 ppm TD = 14 feet
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H:530MW22

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HYDROGEOLOGIC SERVICES

TEST BORING LOG

BORING NO. MW-22A

PROJECT: SOUTHERN WOOD PIEDMONT-WILMINGTON		SHEET NO. 1 OF 1	
CLIENT: T.M. DAVIS	DATE FINISHED 11-3-93	JOB NO. 12-53015.00	
BORING CONTRACTOR: ETE	DRILLER LAYNE ENVIRONMENTAL	ELEVATION 3.07	
RIG USED ATV MUD ROTARY	INSPECTOR G. KUNTZ	DATE STARTED 10-29-93	

WELL CONSTRUCTION: GROUT; 6" PVC; 2" PVC; 6" PVC; GROUT; CLAY; PLUG; SAND PACK; SAND PACK

DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	PH		Loose, dark brown SAND, fine to coarse. Diesel staining.	Slight diesel odor OVA = 32.9 ppm
	2	PH		Loose, brown SAND, fine to coarse, trace granule. Visual staining.	Strong odor OVA = 32.5 ppm
5	3	SS	2-3 / 3-8	Firm, grayish brown SAND, very fine to very coarse. Multiple 1/4" visually stained seams.	24" recovery Strong odor OVA = 63.4 ppm
	4	SS	3-2 / 2-4	Loose, brown SAND, very fine to very coarse	18" recovery Moderate odor OVA = 58.6 ppm
	5	SS	3-6 / 4-5	Loose, brown SAND, fine to coarse	12" recovery Slight odor OVA = 25.2 ppm
10	6	SS	2-4 / 3-3	Loose, same, two 1/8" clayey SAND laminae	14" recovery Slight odor OVA = 63.5 ppm
	7	SS	1-1 / 2-1	Very soft, brownish black clayey PEAT, 25% clay	24" recovery Very slight odor OVA = 88.4 ppm
15	8	SS	1-1 / 1-2	Very soft, brownish black peaty CLAY, 45% peat Pit casing to 16'	18" recovery No odor OVA = 86.2 ppm
	9	SS	1-1 / 1-2	Very soft, brownish black peaty CLAY, 25% peat	4" recovery Very slight odor OVA = 68.4 ppm
	10	SS	3-4 / 4-6	Grout in spoon	No recovery
20	11	SS	6-5 / 2-1	Grout in spoon	No recovery
	12	SS	3-5 / 5-5	Loose, brownish black peaty CLAY	12" recovery No odor OVA = 49.3 ppm
25	13	SS	2-3 / 2-4	Loose, brown peaty SAND, fine to coarse, 30% large wood fragments	6" recovery No odor OVA = 108 ppm
	14	SS	4-5 / 4-6	Loose, brown SAND, medium to coarse, well sorted coarse	18" recovery Slight odor OVA = 189 ppm
30	15	SS	3-5 / 5-4	Loose, brown SAND, medium to coarse, 10% very coarse	14" recovery Very slight odor OVA = 159 ppm
35	16	SS	6-5 / 5-3	Loose, brown SAND, medium to coarse, 30% very coarse to small pebble	14" recovery No odor OVA = 165 ppm
40	17	SS	3-7 / 7-9	Firm, brown pebbly SAND, medium to coarse, 30% very coarse to small pebble. Small pebble laminae between 41' and 41'4", then sharp contact to olive gray CLAY at 42'	24" recovery No odor OVA = 105 ppm TD = 42'
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TEST BORING LOG

BORING NO. MW-23

PROJECT: SOUTHERN WOOD PIEDMONT-WILMINGTON		SHEET NO. 1 OF 1	
CLIENT: CHUCK DAVIS	DATE FINISHED 10-8-92	JOB NO. 530-06-503	
BORING CONTRACTOR: ETE	DRILLER T. COPPIN	ELEVATION 2.67	
RIG USED ATV MUD ROTARY	INSPECTOR G. KUNTZ	DATE STARTED 10-8-92	

WELL CONSTRUCTION: GROUT; CLAY; 2" PVC; GROUT; PLUG; SAND PACK; SAND PACK

DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	SS	2-50	Very loose, brownish black PEAT to 6", then brown SAND, fine to coarse, 5% granule, wood fragment blocked shoe	8" recovery Very slight odor OVA = 12.2 ppm
	2	SS	0-2 1-0	Very loose, brownish gray SAND, silt to coarse, 20% clay	12" recovery No odor OVA = 12.7 ppm
5	3	SS	2-4 3-4	Very loose, brownish gray CLAY to 5', then brown SAND, fine to coarse, well sorted coarse	20" recovery No odor OVA = 14.6 ppm
	4	SS	3-4 4-4	Very loose, same as above	24" recovery No odor OVA = 16.2 ppm
	5	SS	1-1 1-1	Very loose, same as above to 9', then PEAT, 20% clay	14" recovery No odor OVA = 16.2 ppm
10	6	SS	2-2 2-2	Very loose, brownish black clayey PEAT, 35% clay	18" recovery No odor OVA =13.4 ppm TD = 12 feet
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H:530MW23

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TEST BORING LOG

BORING NO. MW-24

PROJECT: SOUTHERN WOOD PIEDMONT-WILMINGTON		SHEET NO. 1 OF 1	
CLIENT: CHUCK DAVIS	DATE FINISHED	10-5-92	JOB NO. 530-06-503
BORING CONTRACTOR: ETE	DRILLER	T. COPPIN	ELEVATION 3.58
RIG USED ATV MUD ROTARY	INSPECTOR	G. KUNTZ	DATE STARTED 10-5-92

WELL CONSTRUCTION: GROUT; 2" PVC; GROUT; CLAY; PLUG; SAND PACK; SAND PACK

DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	SS	6-8, 8-7	Loose, dark brown with black SAND, silt to coarse, 10% clay, 10% organics, 2% small pebble	18" recovery No odor OVA = 36.2 ppm
	2	SS	7-9, 7-9	Loose, light brown SAND, fine to coarse, 5% clay, trace small pebble	18" recovery No odor OVA = 47.1 ppm
5	3	SS	5-6, 4-3	Very loose, light grayish brown SAND, very fine to medium, 5% heavy minerals	12" recovery No odor OVA = 52.9 ppm
	4	SS	3-3, 3-2	Very loose, brown SAND, fine to coarse	12" recovery Very slight odor OVA = 105 ppm
	5	SS	4-2, 2-1	Very loose, same as above	6" recovery Very slight odor OVA = 71.3 ppm
10	6	SS	4-3, 2-3	Very loose, same as above to 11.5 feet, then brownish black clayey PEAT, 35% clay	18" recovery Very slight odor OVA = 104 ppm TD = 12 feet
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H:530MW24

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TEST BORING LOG

BORING NO. MW-24A

PROJECT: SOUTHERN WOOD PIEDMONT-WILMINGTON			SHEET NO. 1 OF 1
CLIENT: T.M. DAVIS	DATE FINISHED	11-1-93	JOB NO. 12-53015.00
BORING CONTRACTOR: ETE	DRILLER	LAYNE ENVIRONMENTAL	ELEVATION 3.64
RIG USED ATV MUD ROTARY	INSPECTOR	G. KUNTZ	DATE STARTED 10-28-93

WELL CONSTRUCTION: GROUT; 6" PVC; 2" PVC; 6" PVC; GROUT; CLAY; PLUG; SAND PACK; SAND PACK

DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	PH		Very loose, brown SAND, fine to coarse	No odor OVA = 129 ppm
	2	PH		Very loose, same as above	Slight odor OVA = 148 ppm H20 at 3'
5	3	SS	2-2 1-2	Very loose, brown SAND, fine to coarse, multiple 1/4" to 1/8" brown clay laminae	14" recovery Slight odor OVA = 204 ppm
	4	SS	2-3 3-4	Loose, brown SAND as above to 7', then dark gray CLAY to 7.5', then brown SAND, fine to coarse. Visual in lower sand.	24" recovery Moderate odor OVA = 199 ppm
	5	SS	4-5 5-8	Firm, dark gray CLAY with 1/4" wood laminae to 9', then brown SAND, fine to coarse, 1/8" coarse grained sand laminae. Visual staining in wood laminae and in lower sand.	24" recovery Strong odor OVA = 308 ppm
10	6	SS	2-3 2-2	Very loose, brown SAND, fine to coarse to 12', few 1/4" clay laminae	12" recovery Moderate odor OVA = 191 ppm
	7	SS	3-4 4-2	Loose, brownish black peaty CLAY, 30% peat	18" recovery Slight odor OVA = 207 ppm
15	8	SS	2-4 3-5	Loose, brownish black peaty CLAY, 30% peat	10" recovery Very slight odor OVA = 175 ppm
	9	SS	2-4 4-3	No recovery. Grout in spoon. Blow counts suggest PEAT.	Pit casing to 16'
	10	SS	2-8 8-9	Same as above	
20	11	SS	1-1 1-1	Very loose, dark brown peaty CLAY, 25% wood fragments	6" recovery No odor OVA = 58.4 ppm
	12	SS	1-1 1-3	Very loose, dark brown peaty CLAY, 25% wood	18" recovery No odor OVA = 31.8 ppm
25	13	SS	3-4 8-11	Firm, same as above	18" recovery No odor OVA = 52.3 ppm
	14	SS	2-2 4-7	Firm, same to 27', then sharp contact to brown SAND, fine to coarse, 5% very coarse, 5% wood	16" recovery No odor OVA = 54.0 ppm
30	15	SS	2-4 6-8	Firm, brown SAND, fine to coarse, trace very coarse to granule	18" recovery No odor OVA = 45.3 ppm
35	16	SS	3-4 4-6	Loose, brown SAND, very fine to medium, 20% silt	18" recovery No odor OVA = 31.6 ppm
40	17	SS	6-8 8-10	Firm, brown SAND, fine to very coarse, 5% small pebble to 40.5', then sharp contact to olive gray CLAY, 5% phosphate and glauconite, 2% mollusc shells	24" recovery No odor OVA = 11.8 ppm TD = 42'
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TEST BORING LOG

BORING NO. MW-24R

PROJECT: SOUTHERN WOOD PIEDMONT-WILMINGTON		SHEET NO. 1 OF 1	
CLIENT: T.M. DAVIS	DATE FINISHED 11-12-93	JOB NO. 12-53015.00	
BORING CONTRACTOR: ETE	DRILLER LAYNE ENVIRONMENTAL	ELEVATION 3.77	
RIG USED ATV MUD ROTARY	INSPECTOR G. KUNTZ	DATE STARTED 11-12-93	

WELL CONSTRUCTION: GROUT; 2" PVC; GROUT; CLAY; PLUG; SAND PACK; SAND PACK

DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	PH		Very loose, brown SAND, fine to very coarse, 10% very coarse	Slight odor OVA = 2212 ppm
	2	PH		Very loose, grayish brown SAND, fine to coarse	Slight odor OVA = 767 ppm
5	3	SS	2-1 / 2-1	Very loose, grayish brown SAND, fine to coarse to 5.5', then brownish black CLAY	24" recovery Slight odor OVA = 570 ppm
	4	SS	1-3 / 2-2	Very loose, same CLAY to 7', then brown SAND, fine to coarse. Visual staining beginning in sand at 7'.	18" recovery Moderate odor OVA = 682 ppm
	5	SS	2-3 / 3-4	Loose, brown SAND, fine to coarse. No visual.	8" recovery Moderate odor OVA = 699 ppm
10	6	SS	3-4 / 2-2	Very loose, grayish brown SAND, fine to coarse. No visual.	24" recovery Moderate odor OVA = 640 ppm
	7	SS	2-2 / 3-3	Loose, grayish brown SAND, fine to coarse to 13', then sharp contact to brownish black, clayey, PEAT. Visual staining in SAND, no visual in peat.	24" recovery Moderate odor OVA = 463 ppm TD = 14'

15, 20, 25, 30, 35, 40, 45, 50

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TEST BORING LOG

BORING NO. MW-25

PROJECT: SOUTHERN WOOD PIEDMONT-WILMINGTON		SHEET NO. 1 OF 1	
CLIENT: CHUCK DAVIS	DATE FINISHED	10-8-92	JOB NO. 530-06-503
BORING CONTRACTOR: ETE	DRILLER	J. MASSEY	ELEVATION 1.78
RIG USED HAND AUGER	INSPECTOR	G. KUNTZ	DATE STARTED 10-8-92

WELL CONSTRUCTION	DEPTH FEET	SAMPLE: LITHOLOGY	No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
CLAY; 2" PVC CASING; PLUG; NATURAL PACK; NATURAL PACK	0		1	HA		Borehole was hand augered because well location is within a wetland area. Representative samples were not obtained during the augering process because the loose nature of the sediments prevented sample retrival. Sediments encountered are believed to be marsh mud to 2 feet, then loose brown sand to 13 feet, then the peat unit was encountered. The well was hand pushed to 13 feet using a well point and was constructed using a natural filter pack.	
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H:530MW25

ENVIRONMENTAL TECHNOLOGY ENGINEERING, INC.
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HYDROGEOLOGIC SERVICES

TEST BORING LOG

BORING NO. MW-26

PROJECT: SOUTHERN WOOD PIEDMONT-WILMINGTON			SHEET NO. 1 OF 1
CLIENT: CHUCK DAVIS	DATE FINISHED	10-5-92	JOB NO. 530-06-503
BORING CONTRACTOR: ETE	DRILLER	T. COPPIN	ELEVATION 2.48
RIG USED ATV MUD ROTARY	INSPECTOR	G. KUNTZ	DATE STARTED 10-5-92

WELL CONSTRUCTION: GROUT; 2" STAINLESS STEEL; GROUT; CLAY; PLUG; SAND PACK; SAND PACK

DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	SS	7-6, 6-5	Loose, brown SAND, fine to coarse, poorly sorted	18" recovery, No odor, OVA = 13.5 ppm
	2	SS	7-6, 6-6	Loose, brown SAND, silt to coarse, well sorted medium	18" recovery, No odor, OVA = 14.6 ppm
5	3	SS	3-3, 2-3	Very loose, brown SAND, very fine to coarse, poorly sorted	8" recovery, No odor, OVA = 14.7 ppm
	4	SS	1-1, 0-1	Very loose, same as above	10" recovery, Very slight odor, OVA = 15.1 ppm
	5	SS	1-1, 6-7	Loose, same as above	14" recovery, Creosote stained soil, OVA = 140 ppm
10	6	SS	4-4, 7-8	Loose, same as above	16" recovery, Creosote stained soil, OVA = 206 ppm
	7	SS	3-7, 50	Loose, dark brown SAND, medium to coarse, 10% wood, wood blocked shoe	14" recovery, Creosote stained soil, OVA = 236 ppm
15	8	SS	2-1, 1-1	Very loose, no recovery, pebble blocked shoe	Creosote stained soils
	9	SS	6-7, 9-8	Loose, dark blackish brown clayey PEAT grading to peaty CLAY, interval between 16' and 17' visually stained with creosote, no staining below 17'	18" recovery, Strong odor, OVA = 110 ppm, TD = 18 feet

20, 25, 30, 35, 40, 45, 50

H:530MW26

ENVIRONMENTAL TECHNOLOGY ENGINEERING, INC.
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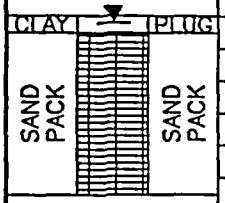
TEST BORING LOG

BORING NO. MW-27

PROJECT: SOUTHERN WOOD PIEDMONT-WILMINGTON		SHEET NO. 1 OF 1	
CLIENT: T.M. DAVIS	DATE FINISHED 11-13-93	JOB NO. 12-53015.00	
BORING CONTRACTOR: ETE	DRILLER LAYNE ENVIRONMENTAL	ELEVATION 3.22	
RIG USED ATV MUD ROTARY	INSPECTOR G. KUNTZ	DATE STARTED 11-13-93	

WELL CONSTRUCTION



DEPTH FEET	SAMPLE LITHOLOGY	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0		1	PH		Very loose, dark brown SAND, fine to granule, 10% very coarse to granule. Diesel stained.	Moderate odor OVA = 411 ppm
		2	PH		Very loose, brown SAND, fine to very coarse, 5% very coarse. Little diesel staining.	Slight diesel odor OVA = 834 ppm
		3	SS	2-1 / 1-1	Very loose, same to 4.5' then grayish brown peaty CLAY, 25% peat. Diesel staining to 3.5'.	20" recovery Very slight odor OVA = 1577 ppm
5		4	SS	1-1 / 2-1	Very loose, brown SAND, fine to very coarse, 5% very coarse, diesel stained to 6', then dark gray CLAY. No staining in clay.	24" recovery Very slight odor OVA = 1237 ppm
		5	SS	2-1 / 2-1	Very loose, CLAY as above, 10% peat	18" recovery Very slight odor OVA = 417 ppm TD = 9'
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TEST BORING LOG

BORING NO. MW-28

PROJECT: SOUTHERN WOOD PIEDMONT-WILMINGTON			SHEET NO. 1 OF 1
CLIENT: T.M. DAVIS	DATE FINISHED	11-10-93	JOB NO. 12-53015.00
BORING CONTRACTOR: ETE	DRILLER	LAYNE ENVIRONMENTAL	ELEVATION 2.97
RIG USED ATV MUD ROTARY	INSPECTOR	G. KUNTZ	DATE STARTED 11-10-93

WELL CONSTRUCTION: GROUT; 2" PVC; GROUT; CLAY; PLUG; SAND PACK; SAND PACK

DEPTH FEET	SAMPLE NO.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	PH		Loose, blackish brown SAND, fine to coarse, poorly sorted, 15% organics	No odor OVA = 1285 ppm
	2	PH		Loose, brown SAND, fine to coarse	No odor OVA = 2630 ppm
5	3	SS	2-3 3-4	Loose, grayish brown SAND, silt to coarse, 5% clay	18" recovery No odor OVA = 801 ppm
	4	SS	3-2 2-3	Loose, dark brown SAND, fine to coarse, 10% clay, scattered brick fragments	18" recovery No odor OVA = 512 ppm
	5	SS	1-3 3-5	Loose, same as above	24" recovery No odor OVA = 556 ppm
10	6	SS	2-1 3-2	Loose, brown SAND, silt to coarse, well sorted medium, brick fragments	18" recovery No odor OVA = 306 ppm
	7	SS	2-1 3-2	Loose, brown SAND, silt to granule, 5% granule, 5% silt and clay, trace small to large pebble to 13.5', then PEAT, 20% clay	24" recovery No odor OVA = 362 ppm TD = 14'

15, 20, 25, 30, 35, 40, 45, 50

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TEST BORING LOG

BORING NO. MW-28A

PROJECT: SOUTHERN WOOD PIEDMONT-WILMINGTON		SHEET NO. 1 OF 1	
CLIENT: T.M. DAVIS	DATE FINISHED 11-10-93	JOB NO. 12-53015.00	
BORING CONTRACTOR: ETE	DRILLER LAYNE ENVIRONMENTAL	ELEVATION 3.26	
RIG USED ATV MUD ROTARY	INSPECTOR G. KUNTZ	DATE STARTED 11-9-93	

WELL CONSTRUCTION: GROUT; 6" PVC; 2" PVC; 6" PVC; GROUT; CLAY; PLUG; SAND PACK; SAND PACK

DEPTH FEET	SAMPLE NO.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	PH		Loose, blackish brown SAND, fine to coarse, poorly sorted, 15% organics	No odor OVA = 1285 ppm
	2	PH		Loose, brown SAND, fine to coarse	No odor OVA = 2630 ppm
5	3	SS	2-3 3-4	Loose, grayish brown SAND, silt to coarse, 5% clay	18" recovery No odor OVA = 801 ppm
	4	SS	3-2 2-3	Loose, dark brown SAND, fine to coarse, 10% clay, scattered brick fragments	18" recovery No odor OVA = 512 ppm
	5	SS	1-3 3-5	Loose, same as above	24" recovery No odor OVA = 556 ppm
10	6	SS	2-1 3-2	Loose, brown SAND, silt to coarse, well sorted medium, brick fragments	18" recovery No odor OVA = 306 ppm
	7	SS	2-1 3-2	Loose, brown SAND, silt to granule, 5% granule, 5% silt and clay, trace small to large pebble to 13.5', then PEAT, 20% clay	24" recovery No odor OVA = 362 ppm
15	8	SS	2-1 2-3	Loose, blackish brown peaty CLAY, 25% peat	24" recovery No odor OVA = 296 ppm
	9	SS	2-3 2-4	Loose, same as above, 6" diameter wood fragment between 17.5' and 18'	24" recovery No odor OVA = 232 ppm Pit casing to 18'
20	10	SS	3-4 4-6	Loose, brown to black SAND, fine to coarse, medium dominant, 15% peat	12" recovery No odor OVA = 244 ppm
	11	SS	6-8 5-4	Loose, brown to black SAND, fine to coarse, medium dominant	20" recovery No odor OVA = 337 ppm
25	12	SS	3-4 4-5	Loose, same to 25', then sharp contact to gray CLAY, wood fragments at contact	24" recovery No odor OVA = 274 ppm
	13	SS	4-5 3-8	Firm, gray CLAY to 27', then gradational contact to gray silty SAND, silt to medium, 30% silt, 5% phosphate grains, fining downward	24" recovery No odor OVA = 267 ppm
	14	SS	6-9 11-13	Firm, greenish gray silty SAND, silt to medium, 30% silt, 5% phosphate	24" recovery No odor OVA = 123 ppm
30	15	SS	10-15 23-35	Very dense, greenish gray silty SAND, silt to medium, 25% silt, 5% phosphate	18" recovery Very slight odor OVA = 290 ppm
	16	SS	8-8 9-5	Firm, grayish brown SAND, very fine to coarse	12" recovery No odor OVA = 84.1 ppm
35	17	SS	3-7 7-8	Firm, brown SAND, very fine to coarse	16" recovery No odor OVA = 162 ppm
	18	SS	6-5 9-10	Firm, brown SAND, very fine to coarse	12" recovery No odor OVA = 137 ppm
	19	SS	8-7 7-16	Firm, same SAND to 40', then greenish gray silty CLAY	24" recovery No odor OVA = 181 ppm TD = 40'
40					
45					
50					

ENVIRONMENTAL TECHNOLOGY ENGINEERING, INC.
CONSULTING ENGINEERS, SURVEYORS AND HYDROGEOLOGISTS
HYDROGEOLOGIC SERVICES

TEST BORING LOG

BORING NO. MW-29

PROJECT: SOUTHERN WOOD PIEDMONT-WILMINGTON		SHEET NO. 1 OF 1
CLIENT: T.M. DAVIS	DATE FINISHED 11-12-93	JOB NO. 12-53015.00
BORING CONTRACTOR: ETE	DRILLER LAYNE ENVIRONMENTAL	ELEVATION 3.19
RIG USED ATV MUD ROTARY	INSPECTOR G. KUNTZ	DATE STARTED 11-12-93

WELL CONSTRUCTION: CLAY; PLUG; SAND PACK; SAND PACK

DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	PH		Very loose, blackish brown organic SAND and PEAT to 1', then brown SAND, fine to very coarse, medium dominant	No odor OVA = 210 ppm
	2	PH		Very loose, brown SAND, very fine to coarse, fine dominant	No odor OVA = 183 ppm
5	3	SS	2-2 3-3	Loose, light gray SAND, silt to medium, fine dominant, 20% silt to 5.5', then dark brown CLAY, 20% peat	12" recovery No odor OVA = 111 ppm
	4	SS	2-4 2-1	Very loose, dark brown CLAY, 20% peat	18" recovery No odor OVA = 133 ppm
10	5	SS	2-1 1-3	Very loose, large wood fragment blocked shoe.	4" recovery No odor OVA = 53.2 ppm TD = 10'

15, 20, 25, 30, 35, 40, 45, 50

ENVIRONMENTAL TECHNOLOGY ENGINEERING, INC.
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HYDROGEOLOGIC SERVICES

TEST BORING LOG

BORING NO. MW-29A

PROJECT: SOUTHERN WOOD PIEDMONT-WILMINGTON		SHEET NO. 1 OF 1	
CLIENT: T.M. DAVIS	DATE FINISHED 11-9-93	JOB NO. 12-53015.00	
BORING CONTRACTOR: ETE	DRILLER LAYNE ENVIRONMENTAL	ELEVATION 3.15	
RIG USED ATV MUD ROTARY	INSPECTOR G. KUNTZ	DATE STARTED 10-30-93	

WELL CONSTRUCTION: 6" PVC; 2" PVC; 6" PVC; GROUT; CLAY; SAND PACK; PLUG

DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	PH		Very loose, blackish brown organic SAND and PEAT to 1', then brown SAND, fine to very coarse, medium dominant	No odor OVA = 210 ppm
	2	PH		Very loose, brown SAND, very fine to coarse, fine dominant	No odor OVA = 183 ppm
5	3	SS	2-2 / 3-3	Loose, light gray SAND, silt to medium, fine dominant, 20% silt to 5.5', then dark brown CLAY, 20% peat	12" recovery No odor OVA = 111 ppm
	4	SS	2-4 / 2-1	Very loose, dark brown CLAY, 20% peat	18" recovery No odor OVA = 133 ppm
	5	SS	2-1 / 1-3	Very loose, large wood fragment blocked shoe	4" recovery No odor OVA = 53.2 ppm Pit casing to 10'
10	6	SS	2-1 / 1-3	Grout in spoon. No recovery.	
15	7	SS	2-2 / 2-4	Loose, dark gray CLAY, 10% peat	18" recovery No odor OVA = 32.7 ppm
	8	SS	2-1 / 1-2	Very loose, dark gray CLAY, 5% peat	24" recovery No odor OVA = 40.7 ppm
	9	SS	3-2 / 1-2	Very loose, dark grayish brown peaty CLAY, 25% peat	24" recovery No odor OVA = 37.8 ppm
20	10	SS	3-1 / 1-2	Very loose, same as above	12" recovery No odor OVA = 44.5 ppm
	12	SS	2-4 / 4-3	Loose, same to 22.5', then sharp contact to dark brown SAND, silt to medium, 15% peat	20" recovery No odor OVA = 49.5 ppm
25	13	SS	2-4 / 3-5	Loose, alternating peaty CLAY, 25% peat and brown SAND, fine to coarse to 25', then brown SAND, fine to coarse	18" recovery No odor OVA = 46.8 ppm
	14	SS	4-3 / 3-7	Loose, brown SAND, fine to coarse, medium dominant	14" recovery No odor OVA = 45.9 ppm
30	15	SS	3-4 / 4-5	Loose, brownish black peaty CLAY, 25% peat	18" recovery No odor OVA = 46.0 ppm
	16	SS	2-3 / 1-3	Very loose, brownish black clayey SAND, silt to medium, 25% clay, 5% peat to 33.5' then brown SAND, fine to granule, 10% very coarse to granule	20" recovery Very slight odor OVA = 49.4 ppm
35	17	SS	4-5 / 3-5	Loose, brown pebbly SAND, fine to granule, 25% granule to small pebble, 1/4" gray clay laminae at 35.5'	15" recovery Very slight odor OVA = 50.6 ppm
	18	SS	6-5 / 3-1	Very loose, brown SAND, fine to granule, 5% granule alternating with a dark brown silty SAND, 25% silt, 20% peat	24" recovery Moderate odor OVA = 53.4 ppm
	19	SS	3-7 / 9-5	Firm, brown SAND to 38', then olive gray marine silty CLAY, 25% silt	24" recovery No odor OVA = 57.6 ppm TD = 40'
40					
45					
50					

ENVIRONMENTAL TECHNOLOGY ENGINEERING, INC.
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TEST BORING LOG

BORING NO. MW-30

PROJECT: SOUTHERN WOOD PIEDMONT-WILMINGTON		SHEET NO. 1 OF 1	
CLIENT: T.M. DAVIS	DATE FINISHED 11-12-93	JOB NO. 12-53015.00	
BORING CONTRACTOR: ETE	DRILLER LAYNE ENVIRONMENTAL	ELEVATION 4.07	
RIG USED ATV MUD ROTARY	INSPECTOR G. KUNTZ	DATE STARTED 11-12-93	

WELL CONSTRUCTION: GROUT, CLAY, SAND PACK, GROUT, PLUG, SAND PACK

DEPTH FEET	SAMPLE No.	TYPE	BLOWS PER 6"	CLASSIFICATION	REMARKS
0	1	PH		Very loose, brown SAND, fine to very coarse, coarse dominant	No odor OVA = 320 ppm
	2	PH		Very loose, brown SAND, fine to coarse	No odor OVA = 357 ppm
5	3	SS	2-1 1-3	Very loose, brown SAND, very fine to coarse, few 1/8" clay laminae	24" recovery No odor OVA = 345 ppm
	4	SS	2-4 4-3	Loose, brown SAND, fine to coarse, thin organic laminae	20" recovery No odor OVA = 296 ppm
	5	SS	2-4 4-3	Loose, same as above to 9', then sharp contact to brownish black peaty CLAY, 25% peat	24" recovery Moderate odor OVA = 380 ppm TD = 10'
10					
15					
20					
25					
30					
35					
40					
45					
50					

ATTACHMENT E

Phase III Groundwater Elevation Summary Table

PHASE III GROUNDWATER ELEVATION MEASUREMENT SUMMARY
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

WELL	RISER ELEVATION	DATE	DEPTH TO WATER	GROUNDWATER ELEVATION
MW-6	5.07	11/16/93	2.87	2.20
		11/19/93	2.93	2.14
		11/19/93	2.94	2.13
		11/19/93	2.92	2.15
MW-7	6.03	11/16/93	4.30	1.73
		11/19/93	4.32	1.71
		11/19/93	4.30	1.73
		11/19/93	4.20	1.83
MW-8	6.80	11/16/93	4.70	2.10
		11/19/93	4.95	1.85
		11/19/93	4.74	2.06
		11/19/93	4.70	2.10
MW-8A	6.43	11/16/93	4.52	1.91
		11/19/93	4.26	2.17
		11/19/93	3.87	2.56
		11/19/93	3.73	2.70
MW-9	6.43	11/16/93	4.22	2.21
		11/19/93	4.35	2.08
		11/19/93	4.29	2.14
		11/19/93	4.25	2.18
MW-10	7.41	11/16/93	5.05	2.36
		11/19/93	5.15	2.26
		11/19/93	5.13	2.28
		11/19/93	5.12	2.29
MW-11	8.02	11/16/93	5.66	2.36
		11/19/93	5.71	2.31
		11/19/93	5.69	2.33
		11/19/93	5.67	2.35
MW-11A	6.38	11/16/93	4.39	1.99
		11/19/93	4.28	2.10
		11/19/93	4.23	2.15
		11/19/93	4.16	2.22
MW-11B	6.26	11/16/93	4.23	2.03
		11/19/93	4.16	2.10
		11/19/93	4.11	2.15
		11/19/93	4.04	2.22
MW-12	8.22	11/16/93	5.60	2.62
		11/19/93	5.89	2.33
		11/19/93	5.84	2.38
		11/19/93	5.83	2.39
MW-13	6.97	11/16/93	4.97	2.00
		11/19/93	4.96	2.01
		11/19/93	4.90	2.07
		11/19/93	4.88	2.09

PHASE III GROUNDWATER ELEVATION MEASUREMENT SUMMARY
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

WELL	RISER ELEVATION	DATE	DEPTH TO WATER	GROUNDWATER ELEVATION
MW-22	5.26	11/16/93	3.75	1.51
		11/19/93	3.64	1.62
		11/19/93	3.10	2.16
		11/19/93	3.15	2.11
MW-22A	5.32	11/16/93	3.37	1.95
		11/19/93	3.18	2.14
		11/19/93	3.09	2.23
		11/19/93	3.05	2.27
MW-23	4.96	11/16/93	2.86	2.10
		11/19/93	2.81	2.15
		11/19/93	2.86	2.10
		11/19/93	2.80	2.16
MW-24	5.98	11/16/93	3.71	2.27
		11/19/93	3.78	2.20
		11/19/93	3.74	2.24
		11/19/93	3.71	2.27
MW-24A	5.81	11/16/93	3.88	1.93
		11/19/93	3.75	2.06
		11/19/93	3.76	2.05
		11/19/93	3.67	2.14
MW-25	4.96	11/16/93	2.17	2.79
		11/19/93	3.04	1.92
		11/19/93	2.93	2.03
		11/19/93	2.89	2.07
MW-26	4.91	11/16/93	4.14	0.77
		11/19/93	4.70	0.21
		11/19/93	4.62	0.29
		11/19/93	4.73	0.18
MW-27	5.41	11/16/93	2.41	3.00
		11/19/93	2.46	2.95
		11/19/93	2.47	2.94
		11/19/93	2.46	2.95
MW-28	5.18	11/16/93	4.35	0.83
		11/19/93	4.38	0.80
		11/19/93	4.33	0.85
		11/19/93	4.32	0.86
MW-28A	5.47	11/16/93	4.12	1.35
		11/19/93	4.01	1.46
		11/19/93	4.06	1.41
		11/19/93	4.02	1.45
MW-29	5.32	11/16/93	4.29	1.03
		11/19/93	4.34	0.98
		11/19/93	4.36	0.96
		11/19/93	4.36	0.96

PHASE III GROUNDWATER ELEVATION MEASUREMENT SUMMARY
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

WELL	RISER ELEVATION	DATE	DEPTH TO WATER	GROUNDWATER ELEVATION
MW-14	6.30	11/16/93	4.75	1.55
		11/19/93	4.90	1.40
		11/19/93	4.82	1.48
		11/19/93	4.81	1.49
MW-14A	5.05	11/16/93	3.26	1.79
		11/19/93	3.19	1.86
		11/19/93	3.21	1.84
		11/19/93	3.19	1.86
MW-15	7.07	11/16/93	4.73	2.34
		11/19/93	4.84	2.23
		11/19/93	4.69	2.38
		11/19/93	4.79	2.28
MW-16	7.69	11/16/93	5.64	2.05
		11/19/93	5.71	1.98
		11/19/93	5.54	2.15
		11/19/93	5.65	2.04
MW-17	7.65	11/16/93	5.53	2.12
		11/19/93	5.60	2.05
		11/19/93	5.47	2.18
		11/19/93	5.60	2.05
MW-18	6.61	11/16/93	4.80	1.81
		11/19/93	4.81	1.80
		11/19/93	4.73	1.88
		11/19/93	4.54	2.07
MW-19	5.44	11/16/93	3.24	2.20
		11/19/93	3.18	2.26
		11/19/93	3.17	2.27
		11/19/93	3.14	2.30
MW-19A	5.25	11/16/93	3.28	1.97
		11/19/93	3.14	2.11
		11/19/93	3.13	2.12
		11/19/93	3.04	2.21
MW-20	5.44	11/16/93	3.44	2.00
		11/19/93	3.59	1.85
		11/19/93	3.56	1.88
		11/19/93	3.58	1.86
MW-20A	5.23	11/16/93	3.15	2.08
		11/19/93	3.08	2.15
		11/19/93	3.08	2.15
		11/19/93	3.05	2.18
MW-21	5.34	11/16/93	3.82	1.52
		11/19/93	3.89	1.45
		11/19/93	3.89	1.45
		11/19/93	3.89	1.45

PHASE III GROUNDWATER LEVEL MEASUREMENT SUMMARY
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

WELL	RISER ELEVATION	DATE	DEPTH TO WATER	GROUNDWATER ELEVATION
MW–29A	5.14	11/16/93	3.41	1.73
		11/19/93	3.32	1.82
		11/19/93	3.35	1.79
		11/19/93	3.31	1.83
MW–30	6.26	11/16/93	4.44	1.82
		11/19/93	4.51	1.75
		11/19/93	4.51	1.75
		11/19/93	4.51	1.75
Staff Gauge Cape Fear	5.93	11/16/93	–0.1	–0.83
		11/19/93	1.13	0.40
		11/19/93	4.38	3.65
		11/19/93	5.0	4.27
Staff Gauge North Channel	6.64	11/16/93	0.24	0.22
		11/19/93	0.35	0.33
		11/19/93	0.26	0.24
		11/19/93	0.26	0.24
Staff Gauge South Channel	2.13	11/16/93	0.2	–1.18
		11/19/93	1.67	0.47
		11/19/93	1.04	–0.16
		11/19/93	1.21	0.01

NOTE: Top of Staff Gauge at Cape Fear and North Channel is 6.66
Top of Staff Gauge at South Channel is 3.33
Cape Fear River Elevation = 5.93–(6.66–Depth to water)
North Channel Elevation = 6.64–(6.66–Depth to water)
South Channel Elevation = 2.13–(3.33–Depth to water)

Wilmington Site-Specific Soil Constituent List

SITE-SPECIFIC SOIL SAMPLE LIST
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

METALS

Arsenic
Copper
Chromium

SEMI-VOLATILES

Acenaphthene
Benzo(a)anthracene
Benzo(b)fluoranthene
Bis(2-chloroethyl)ether
4-chloro-3-methylphenol
Chrysene
2,4-dimethylphenol
Fluoranthene
Naphthalene
Phenanthrene
Tetrachlorophenol
2,4,6-trichlorophenol
Anthracene
Benzo(a)pyrene
Benzo(k)fluoranthene
Carbazole
2-chlorophenol
Dibenzo(a,h)anthracene
2,4-dinitrophenol
Indeno(1,2,3-cd)pyrene
Pentachlorophenol
Phenol
2,4,5-trichlorophenol

VOLATILES

Benzene
Bromomethane
Chlorobenzene
2-chloroethylvinylether
Cis-1,3-dichloropropene
1,2-dibromomethane (Edb)
1,1-dichloroethane
1,1-dichloroethene
1,2-dichloropropane
Fluorotrichloromethane
Methyl-T-Butyl Ether (Mtbe)
1,1,2,2-tetrachloroethane
Trans-1,2-dichloroethene
1,1,2-trichloroethane
Vinyl Chloride
Bromodichloromethane
Carbon Tetrachloride
Chloroethane
Chloromethane
Dibromochloromethane
Dichlorodifluoromethane
1,2-dichloroethane
Dichloromethane
Ethyl benzene
M/P-Xylene
O-Xylene
Toluene
1,1,1-trichloroethane
Trichloroethene

Soil Sample Collection Summary Sheets

SOIL SAMPLE COLLECTION SHEET

Project Number: 12–53015.00 Date: 11/19/93

Sampled By: Kuntz Time: 10:50

Sampling Point Identification: SS–10A

Site Name/City/County: SWP–Wilmington

Weather Conditions: Clear 65

Sample Type: Soil

Sampling Method: Stainless spoon and stainless steel hand auger

Splits/Spikes/Duplicates:

Sampling Containers: (Number/Size/Type) 1/500ml/G; 2/250ml/G

Appearance of Sample: Dark Brown Sand. No odor or visual staining

Reason for Sampling: Phase III Assessment

Lab Performing Analysis: Savannah Labs

Respiratory Protection: None

SOIL SAMPLE COLLECTION SHEET

Project Number: 12–53015.00 Date: 11/19/93

Sampled By: Kuntz Time: 11:30

Sampling Point Identification: Roll–off

Site Name/City/County: SWP–Wilmington

Weather Conditions: Clear 65

Sample Type: Soil

Sampling Method: Stainless spoon and stainless steel hand auger

Splits/Spikes/Duplicates:

Sampling Containers: (Number/Size/Type) 4/500ml/G

Appearance of Sample: Brown sand and clay

Reason for Sampling: Phase III Assessment

Lab Performing Analysis: Savannah Labs

Respiratory Protection: None

Phase III Soil Sample Parameter Summary Table

Phase III Roll-Off Composite TCLP Analysis Summary Table

PHASE III SOIL SAMPLE PARAMETER SUMMARY TABLE
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

ROLLOFF – TCLP ANALYSIS

PARAMETER	DL*	R*
Arsenic	0.20	ND
Chromium	0.05	ND
Lead	0.20	ND
Mercury	0.02	ND
Benzene	0.02	ND
Methyl ethyl ketone	0.05	ND
Cresol (ortho)	0.05	ND
Cresol m & p	0.05	ND
Hexachlorobenzene	0.05	ND
Pentachlorophenol	0.25	ND
Pyridine	1.00	ND
2,4,5–Trichlorophenol	0.05	ND
2,4,6–Trichlorophenol	0.05	ND

NOTE: All units in mg/l
DL = Laboratory Detection Limit
R = Laboratory Analytical Result

Phase III Soil Sample Laboratory Analytical Data and QA/QC

SL SAVANNAH LABORATORIES
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JDW
MAS
Greg K.

RECEIVED
JAN 06 1994
ENVIRONMENTAL AFFAIRS

LOG NO: S3-46613

Received: 20 NOV 93

Ms. Sandra Watson
Southern Wood Piedmont (WI)
P.O. Box 5477, I-85 and Sigsbee Rd.
Spartanburg, SC 29304

Project: Wilmington
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE SAMPLED
46613-1	SS-10A (# 11504)	11-19-93

PARAMETER	46613-1
Semivolatile Organics (8270)	
bis(2-Chloroethyl)ether, mg/kg dw	ND
Naphthalene, mg/kg dw	ND
Acenaphthene, mg/kg dw	3.3
Phenanthrene, mg/kg dw	ND
Anthracene, mg/kg dw	ND
Fluoranthene, mg/kg dw	15
Chrysene, mg/kg dw	9.0
Benzo(a)Anthracene, mg/kg dw	7.3
Benzo(b)fluoranthene, mg/kg dw	6.0
Benzo(k)fluoranthene, mg/kg dw	2.1
Benzo(a)pyrene, mg/kg dw	2.6
Indeno(1,2,3-cd)pyrene, mg/kg dw	ND
Dibenz(a,h)anthracene, mg/kg dw	ND
2-Chlorophenol, mg/kg dw	ND
Phenol, mg/kg dw	ND
2,4-Dimethylphenol, mg/kg dw	ND
2,4,6-Trichlorophenol, mg/kg dw	ND
4-Chloro-3-methylphenol, mg/kg dw	ND
2,4-Dinitrophenol, mg/kg dw	ND
Pentachlorophenol, mg/kg dw	ND
2,4,5-Trichlorophenol, mg/kg dw	ND
Carbazole, mg/kg dw	ND
Tetrachlorophenols, mg/kg dw	ND

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Southern Wood Piedmont (WI)
P.O. Box 5477, I-85 and Sigsbee Rd
Spartanburg, SC 29304

Project: Wilmington
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE SAMPLED
46613-1	SS-10A (# 11504)	11-19-93

PARAMETER	46613-1
Volatiles by GC/MS	
Chloromethane, mg/kg dw	ND
Bromomethane, mg/kg dw	ND
Vinyl Chloride, mg/kg dw	ND
Chloroethane, mg/kg dw	ND
Methylene Chloride (Dichloromethane), mg/kg dw	ND
1,1-Dichloroethene, mg/kg dw	ND
1,1-Dichloroethane, mg/kg dw	ND
Trans-1,2-Dichloroethylene, mg/kg dw	ND
1,2-Dichloroethane, mg/kg dw	ND
1,1,1-Trichloroethane, mg/kg dw	ND
Carbon Tetrachloride, mg/kg dw	ND
Bromodichloromethane, mg/kg dw	ND
1,1,2,2-Tetrachloroethane, mg/kg dw	ND
1,2-Dichloropropane, mg/kg dw	ND
Trichloroethene, mg/kg dw	ND
Dibromochloromethane, mg/kg dw	ND
1,1,2-Trichloroethane, mg/kg dw	ND
Benzene, mg/kg dw	ND
Cis-1,3-Dichloropropene, mg/kg dw	ND
2-Chloroethylvinyl Ether, mg/kg dw	ND
Toluene, mg/kg dw	ND
Chlorobenzene, mg/kg dw	ND
Ethylbenzene, mg/kg dw	ND

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Spartanburg, SC 29304

Project: Wilmington
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE SAMPLED
46613-1	SS-10A (# 11504)	11-19-93

PARAMETER	46613-1
o-Xylene, mg/kg dw	ND
m&p-Xylene, mg/kg dw	ND
1,2-Dibromoethane (EDB) , mg/kg dw	ND
Methyl-Tert-Butyl-Ether (MTBE), mg/kg dw	ND
Fluorotrichloromethane, mg/kg dw	ND
Dichlorodifluoromethane, mg/kg dw	ND
Arsenic (7060), mg/kg dw	13
Chromium (6010), mg/kg dw	38
Copper (6010), mg/kg dw	34
Percent Solids, %	24

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ENVIRONMENTAL AFFAIRS

LOG NO: S3-46613

Received: 20 NOV 93

Ms. Sandra Watson
Southern Wood Piedmont (WI)
P.O. Box 5477, I-85 and Sigsbee Rd
Spartanburg, SC 29304

Project: Wilmington
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE SAMPLED
46613-2	Rolloff (# 11483)	11-19-93

PARAMETER	46613-2
Arsenic (TCLP), mg/l	ND
Chromium (TCLP), mg/l	ND
Lead (TCLP), mg/l	ND
Mercury (TCLP - 7470), mg/l	ND
Benzene (TCLP), mg/l	ND
Methyl ethyl ketone (TCLP), mg/l	ND
Cresol (ortho) (TCLP), mg/l	ND
Cresol m & p (TCLP), mg/l	ND
Hexachlorobenzene (TCLP), mg/l	ND
Pentachlorophenol (TCLP), mg/l	ND
Pyridine (TCLP), mg/l	ND
2,4,5-Trichlorophenol (TCLP), mg/l	ND
2,4,6-Trichlorophenol (TCLP), mg/l	ND

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Spartanburg, SC 29304

Project: Wilmington
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE SAMPLED
46613-3	Rolloff (# 11483) Matrix Spike % Rec.	11-19-93

PARAMETER	46613-3
Arsenic (TCLP)	99 %
Chromium (TCLP)	83 %
Lead (TCLP)	88 %
Mercury (TCLP - 7470)	89 %
Benzene (TCLP)	88 %
Methyl ethyl ketone (TCLP)	60 %
Cresol (ortho) (TCLP)	94 %
Cresol m & p (TCLP)	---
Hexachlorobenzene (TCLP)	79 %
Pentachlorophenol (TCLP)	56 %
Pyridine (TCLP)	11 %
2,4,5-Trichlorophenol (TCLP)	---
2,4,6-Trichlorophenol (TCLP)	66 %

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Spartanburg, SC 29304

Project: Wilmington
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID
46613-4	Method Blank Extraction Fluid

PARAMETER	46613-4
Arsenic (TCLP), mg/l	ND
Chromium (TCLP), mg/l	ND
Lead (TCLP), mg/l	ND
Mercury (TCLP - 7470), mg/l	ND
Benzene (TCLP), mg/l	ND
Methyl ethyl ketone (TCLP), mg/l	ND
Cresol (ortho) (TCLP), mg/l	ND
Cresol m & p (TCLP), mg/l	ND
Hexachlorobenzene (TCLP), mg/l	ND
Pentachlorophenol (TCLP), mg/l	ND
Pyridine (TCLP), mg/l	ND
2,4,5-Trichlorophenol (TCLP), mg/l	ND
2,4,6-Trichlorophenol (TCLP), mg/l	ND

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Spartanburg, SC 29304

Project: Wilmington
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID
46613-5	Detection Limits
46613-6	Accuracy (mean % recovery)
46613-7	Precision (% RPD)
46613-8	Analyst Initials
46613-9	EPA Method Numbers

PARAMETER	46613-5	46613-6	46613-7	46613-8	46613-9
Semivolatile Organics (8270)					
bis(2-Chloroethyl)ether, mg/kg dw	0.33	---	---	BK	8270
Naphthalene, mg/kg dw	0.33	---	---	BK	8270
Acenaphthene, mg/kg dw	0.33	---	---	BK	8270
Phenanthrene, mg/kg dw	0.33	---	---	BK	8270
Anthracene, mg/kg dw	0.33	---	---	BK	8270
Fluoranthene, mg/kg dw	0.33	---	---	BK	8270
Chrysene, mg/kg dw	0.33	---	---	BK	8270
Benzo(a)Anthracene, mg/kg dw	0.33	---	---	BK	8270
Benzo(b)fluoranthene, mg/kg dw	0.33	---	---	BK	8270
Benzo(k)fluoranthene, mg/kg dw	0.33	---	---	BK	8270
Benzo(a)pyrene, mg/kg dw	0.33	---	---	BK	8270
Indeno(1,2,3-cd)pyrene, mg/kg dw	0.33	---	---	BK	8270
Dibenz(a,h)anthracene, mg/kg dw	0.33	---	---	BK	8270
2-Chlorophenol, mg/kg dw	0.33	76 %	3.9 %	BK	8270
Phenol, mg/kg dw	0.33	70 %	5.7 %	BK	8270
2,4-Dimethylphenol, mg/kg dw	0.33	---	---	BK	8270
2,4,6-Trichlorophenol, mg/kg dw	0.33	---	---	BK	8270
4-Chloro-3-methylphenol, mg/kg dw	0.33	92 %	4.3 %	BK	8270
2,4-Dinitrophenol, mg/kg dw	1.7	---	---	BK	8270
Pentachlorophenol, mg/kg dw	1.7	96 %	5.1 %	BK	8270
2,4,5-Trichlorophenol, mg/kg dw	1.7	---	---	BK	8270
Tetrachlorophenols, mg/kg dw	1.7	---	---	BK	8270
Carbazole, mg/kg dw	0.33	---	---	BK	8270

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LOG NO: S3-46613

Received: 20 NOV 93

Ms. Sandra Watson
Southern Wood Piedmont (WI)
P.O. Box 5477, I-85 and Sigsbee Rd
Spartanburg, SC 29304

Project: Wilmington
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID
46613-5	Detection Limits
46613-6	Accuracy (mean % recovery)
46613-7	Precision (% RPD)
46613-8	Analyst Initials
46613-9	EPA Method Numbers

PARAMETER	46613-5	46613-6	46613-7	46613-8	46613-9
Volatiles by GC/MS					
Chloromethane, mg/kg dw	0.010	---	---	TCS	8240
Bromomethane, mg/kg dw	0.010	---	---	TCS	8240
Vinyl Chloride, mg/kg dw	0.010	---	---	TCS	8240
Chloroethane, mg/kg dw	0.010	---	---	TCS	8240
Methylene Chloride (Dichloromethane), mg/kg dw	0.0050	---	---	TCS	8240
1,1-Dichloroethene, mg/kg dw	0.0050	132 %	0.76 %	TCS	8240
1,1-Dichloroethane, mg/kg dw	0.0050	---	---	TCS	8240
Trans-1,2-Dichloroethylene, mg/kg dw	0.0050	---	---	TCS	8240
1,2-Dichloroethane, mg/kg dw	0.0050	---	---	TCS	8240
1,1,1-Trichloroethane, mg/kg dw	0.0050	---	---	TCS	8240
Carbon Tetrachloride, mg/kg dw	0.0050	---	---	TCS	8240
Bromodichloromethane, mg/kg dw	0.0050	---	---	TCS	8240
1,1,2,2-Tetrachloroethane, mg/kg dw	0.0050	---	---	TCS	8240
1,2-Dichloropropane, mg/kg dw	0.0050	---	---	TCS	8240
Trichloroethene, mg/kg dw	0.0050	134 %	1.5 %	TCS	8240
Dibromochloromethane, mg/kg dw	0.0050	---	---	TCS	8240

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Spartanburg, SC 29304

Project: Wilmington
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID
46613-5	Detection Limits
46613-6	Accuracy (mean % recovery)
46613-7	Precision (% RPD)
46613-8	Analyst Initials
46613-9	EPA Method Numbers

PARAMETER	46613-5	46613-6	46613-7	46613-8	46613-9
1,1,2-Trichloroethane, mg/kg dw	0.0050	---	---	TCS	8240
Benzene, mg/kg dw	0.0050	125 %	0.76 %	TCS	8240
Cis-1,3-Dichloropropene, mg/kg dw	0.0050	---	---	TCS	8240
2-Chloroethylvinyl Ether, mg/kg dw	0.050	---	---	TCS	8240
Toluene, mg/kg dw	0.0050	132 %	0.76 %	TCS	8240
Chlorobenzene, mg/kg dw	0.0050	134 %	0.75 %	TCS	8240
Ethylbenzene, mg/kg dw	0.0050	---	---	TCS	8240
m&p-Xylene, mg/kg dw	0.0050	---	---	TCS	8240
o-Xylene, mg/kg dw	0.0050	---	---	TCS	8240
Methyl-Tert-Butyl-Ether (MTBE), mg/kg dw	0.050	---	---	TCS	8240
Fluorotrichloromethane, mg/kg dw	0.0050	---	---	TCS	8240
1,2-Dibromoethane (EDB) , mg/kg dw	0.0050	---	---	TCS	8240
Dichlorodifluoromethane, mg/kg dw	0.0050	---	---	TCS	8240
Arsenic (7060), mg/kg dw	1.0	126 %	4.0 %	LR	7060
Chromium (6010), mg/kg dw	1.0	100 %	1.0 %	SD	6010
Copper (6010), mg/kg dw	2.5	102 %	0.98 %	SD	6010
Arsenic (TCLP), mg/l	0.20	94 %	3.2 %	DM	6010

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Project: Wilmington
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID
46613-5	Detection Limits
46613-6	Accuracy (mean % recovery)
46613-7	Precision (% RPD)
46613-8	Analyst Initials
46613-9	EPA Method Numbers

PARAMETER	46613-5	46613-6	46613-7	46613-8	46613-9
Chromium (TCLP), mg/l	0.050	94 %	5.3 %	DM	6010
Lead (TCLP), mg/l	0.20	97 %	4.1 %	DM	6010
Mercury (TCLP - 7470), mg/l	0.020	112 %	11 %	BB	7470
Benzene (TCLP), mg/l	0.020	118 %	1.7 %	KA	8240
Methyl ethyl ketone (TCLP), mg/l	0.050	---	---	KA	8240
Cresol (ortho) (TCLP), mg/l	0.050	---	---	RB	8270
Cresol m & p (TCLP), mg/l	0.050	---	---	RB	8270
Hexachlorobenzene (TCLP), mg/l	0.050	---	---	RB	8270
Pentachlorophenol (TCLP), mg/l	0.25	70 %	7.1 %	RB	8270
Pyridine (TCLP), mg/l	1.0	---	---	RB	8270
2,4,5-Trichlorophenol (TCLP), mg/l	0.050	---	---	RB	8270
2,4,6-Trichlorophenol (TCLP), mg/l	0.050	---	---	RB	8270

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RECEIVED JAN 06 1994 ENVIRONMENTAL Affairs

LOG NO: S3-46613

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Ms. Sandra Watson
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P.O. Box 5477, I-85 and Sigsbee Rd.
Spartanburg, SC 29304

Project: Wilmington
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID
46613-10	Date Extracted
46613-11	Date Analyzed

PARAMETER	46613-10	46613-11
Semivolatile Organics (8270)		
bis(2-Chloroethyl)ether	11.24.93	11.29.93
Naphthalene	11.24.93	11.29.93
Acenaphthene	11.24.93	11.29.93
Phenanthrene	11.24.93	11.29.93
Anthracene	11.24.93	11.29.93
Fluoranthene	11.24.93	11.29.93
Chrysene	11.24.93	11.29.93
Benzo(a)Anthracene	11.24.93	11.29.93
Benzo(b)fluoranthene	11.24.93	11.29.93
Benzo(k)fluoranthene	11.24.93	11.29.93
Benzo(a)pyrene	11.24.93	11.29.93
Indeno(1,2,3-cd)pyrene	11.24.93	11.29.93
Dibenz(a,h)anthracene	11.24.93	11.29.93
2-Chlorophenol	11.24.93	11.29.93
Phenol	11.24.93	11.29.93
2,4-Dimethylphenol	11.24.93	11.29.93
2,4,6-Trichlorophenol	11.24.93	11.29.93
4-Chloro-3-methylphenol	11.24.93	11.29.93
2,4-Dinitrophenol	11.24.93	11.29.93
Pentachlorophenol	11.24.93	11.29.93
2,4,5-Trichlorophenol	11.24.93	11.29.93
Carbazole	11.24.93	11.29.93
Tetrachlorophenols	11.24.93	11.29.93

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Spartanburg, SC 29304

Project: Wilmington
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID
46613-10	Date Extracted
46613-11	Date Analyzed

PARAMETER	46613-10	46613-11
Volatiles by GC/MS		
Chloromethane	---	12.02.93
Bromomethane	---	12.02.93
Vinyl Chloride	---	12.02.93
Chloroethane	---	12.02.93
Methylene Chloride (Dichloromethane)	---	12.02.93
1,1-Dichloroethene	---	12.02.93
1,1-Dichloroethane	---	12.02.93
Trans-1,2-Dichloroethylene	---	12.02.93
1,2-Dichloroethane	---	12.02.93
1,1,1-Trichloroethane	---	12.02.93
Carbon Tetrachloride	---	12.02.93
Bromodichloromethane	---	12.02.93
1,1,2,2-Tetrachloroethane	---	12.02.93
1,2-Dichloropropane	---	12.02.93
Trichloroethene	---	12.02.93
Dibromochloromethane	---	12.02.93
1,1,2-Trichloroethane	---	12.02.93
Benzene	---	12.02.93
Cis-1,3-Dichloropropene	---	12.02.93
2-Chloroethylvinyl Ether	---	12.02.93
Toluene	---	12.02.93
Chlorobenzene	---	12.02.93

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ENVIRONMENTAL AFFAIRS

LOG NO: S3-46613

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P.O. Box 5477, I-85 and Sigsbee Rd.
Spartanburg, SC 29304

Project: Wilmington
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID
46613-10	Date Extracted
46613-11	Date Analyzed

PARAMETER	46613-10	46613-11
Ethylbenzene	---	12.02.93
m&p-Xylene	---	12.02.93
o-Xylene	---	12.02.93
1,2-Dibromoethane (EDB)	---	12.02.93
Methyl-Tert-Butyl-Ether (MTBE)	---	12.02.93
Dichlorodifluoromethane	---	12.02.93
Fluorotrichloromethane	---	12.02.93
Arsenic (7060)	---	12.04.93
Chromium (6010)	---	12.05.93
Copper (6010)	---	12.05.93
Arsenic (TCLP)	---	12.01.93
Chromium (TCLP)	---	12.01.93
Lead (TCLP)	---	12.01.93
Mercury (TCLP - 7470)	---	11.30.93
Benzene (TCLP)	---	12.12.93
Methyl ethyl ketone (TCLP)	---	12.12.93
Cresol (ortho) (TCLP)	12.01.93	12.02.93
Cresol m & p (TCLP)	12.01.93	12.02.93
Hexachlorobenzene (TCLP)	12.01.93	12.02.93
Pentachlorophenol (TCLP)	12.01.93	12.02.93
Pyridine (TCLP)	12.01.93	12.02.93
2,4,5-Trichlorophenol (TCLP)	12.01.93	12.02.93
2,4,6-Trichlorophenol (TCLP)	12.01.93	12.02.93

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P.O. Box 5477, I-85 and Sigsbee Rd.
Spartanburg, SC 29304

Project: Wilmington
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
46613-12	Report Completion Date

PARAMETER	46613-12
Date Reported	12.30.93

Methods: EPA SW-846
ND = Not Detected

J. W. Andrews

J. W. Andrews, Ph. D.

Final Page Of Report

SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

05181

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☐ 2846 Industrial Plaza Drive, Tallahassee, FL 32301 — Phone: (904) 878-39[illegible] — Fax (904) 878-9504
☐ 414 Southwest 12th Avenue, Deerfield Beach, FL 33442 — Phone: (305) 421-7400 — Fax (305) 421-2584
☐ 900 Lakeside Drive, Mobile, AL 36693 — Phone: (205) 666-5633 — Fax (205) 666-6698
☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax (813) 885-7049

NALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

O. NUMBER:
PROJECT NUMBER: 12-53015.00
PROJECT NAME: SWP-Wilmington
PAGE 1 OF 1

LIENT NAME: /iro Group, Inc.
TELEPHONE/FAX NO.: 803-957-6270 / 803-957-3845
LIENT ADDRESS: 445 Pisgah Church Rd
CITY, STATE, ZIP CODE: Lexington, SC 29072
AMPLER(S) NAME(S): ory Kuntz, James Leaphart
CLIENT PROJECT MANAGER: Greg Kuntz

☒ STANDARD TAT
☐ EXPEDITED TAT *
REPORT DUE DATE _____
* SUBJECT TO RUSH FEES

SAMPLING DATE	SAMPLING TIME	SAMPLE IDENTIFICATION	AQUEOUS MATRIX	NONAQUEOUS MATRIX	OIL MATRIX	AIR MATRIX	As, Cr, Cu	VOC	SV	*TCLP Site Specific
1-19-93	10:50	SS-10A #11504	X				1	1	1	
-19-93	11:30	Roll-off #11483	↓							4

NUMBER OF CONTAINERS SUBMITTED

* TCLP Site Specific List
Arsenic
Benzene
Chromium
o-cresol
m-cresol
p-cresol
hexachlorobenzene
lead
Mercury
Methyl ethyl ketone
pentachlorophenol
pyridine
2,4,5-trichlorophenol
2,4,6-trichlorophenol

RECEIVED JAN 0 3 1994 ENVIRONMENTAL AFFAIRS

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	11/11	12:00	[signature]	11/19/93	12:57			
RECEIVED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
Gregory B. Kuntz	11/16/93	7:30	Gregory B. Kuntz	11/19/93	12:58			

FOR SAVANNAH LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	S.L. LOG NO.	LABORATORY REMARKS
[signature]	11/20/93	11:25	☑ YES ☐ NO		46613	

NOV 10 '93 03:57PM SOUTHERN WOOD BOTTLE ORDER 11/18/93

Send bottles to ETE for Mon. 11/15

SITE-SPECIFIC GROUND WATER SAMPLE LIST
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

METALS (Total + Dissolved)

Arsenic
Copper
Chromium

SEMI-VOLATILES

Acenaphthene
Benzo(a)anthracene
Benzo(b)fluoranthene
Bis(2-chloroethyl)ether
4-chloro-3-methylphenol
Chrysene
2,4-dimethylphenol
Fluoranthene
Naphthalene
Phenanthrene
Tetrachlorophenol
2,4,6-trichlorophenol
Anthracene
Benzo(a)pyrene
Benzo(k)fluoranthene
Carbazole
2-chlorophenol
Dibenzo(a,h)anthracene
2,4-dinitrophenol
Indeno(1,2,3-cd)pyrene
Pentachlorophenol
Phenol
2,4,5-trichlorophenol

VOLATILES

Benzene
Bromomethane
Chlorobenzene
2-chloroethylvinylether
Chloromethane
Dibromochloromethane
Dichlorodifluoromethane
1,2-dichloroethane
Dichloromethane
Ethyl benzene
M/P-Xylene
O-Xylene
Toluene
1,1,1-trichloroethane
Trichloroethene
Bromodichloromethane
Carbon Tetrachloride
Chloroethane
MTBE
Cis-1,3-dichloropropene
1,2-dibromomethane (Edb)
1,1-dichloroethane
1,1-dichloroethene
1,2-dichloropropane
Fluorotrichloromethane
Methyl-T-Butyl Ether (Mtbe)
1,1,2,2-tetrachloroethane
Trans-1,2-dichloroethene
1,1,2-trichloroethane
Vinyl Chloride

Postit™ brand fax transmittal memo 7671 | # of pages ▸ 1
To: Phillip L. | From: Dexter L.
Co. Singletree | Co. Sitel
Dept. | Phone #
Fax # | Fax #

19

36 H_2O's for above constituents
2 Field Blanks
2 Trip Blanks
for all constituents
3 H_2O's: Total Petroleum Hydrocarbons - gasoline
TPH - Diesel
3 soils for above site specific list

D00045

ATTACHMENT G

PHASE III VERTICAL HYDRAULIC GRADIENT SUMMARY TABLE
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

WELL PAIR	DATE	TIDE	GW ELEVATION UPPER AQUIFER	GW ELEVATION LOWER AQUIFER	MID SCREEN ELEV. UPPER AQUIFER	MID SCREEN ELEV. LOWER AQUIFER	VERT. HYDRAULIC GRADIENT
MW-8/MW-8A	11/93	Low	2.10	1.91	-9.86	-24.13	+0.013
		1/4	1.85	2.17	-9.86	-24.13	-0.022
		3/4	2.06	2.56	-9.86	-24.13	-0.035
		High	2.10	2.70	-9.86	-24.13	-0.042
MW-11/MW-11A	11/93	Low	2.36	1.99	-1.19	-27.29	+0.014
		1/4	2.31	2.10	-1.19	-27.29	+0.008
		3/4	2.33	2.15	-1.19	-27.29	+0.007
		High	2.35	2.22	-1.19	-27.29	+0.005
MW-14/MW-14A	11/93	Low	1.55	1.79	-8.38	-25.89	-0.014
		1/4	1.40	1.86	-8.38	-25.89	-0.026
		3/4	1.48	1.84	-8.38	-25.89	-0.021
		High	1.49	1.86	-8.38	-25.89	-0.021
MW-19/MW-19A	11/93	Low	2.20	1.97	-7.18	-25.52	+0.013
		1/4	2.26	2.11	-7.18	-25.52	+0.008
		3/4	2.27	2.12	-7.18	-25.52	+0.008
		High	2.30	2.21	-7.18	-25.52	+0.005
MW-20/MW-20A	11/93	Low	2.00	2.08	-6.63	-25.38	-0.004
		1/4	1.85	2.15	-6.63	-25.38	-0.016
		3/4	1.88	2.15	-6.63	-25.38	-0.014
		High	1.86	2.18	-6.63	-25.38	-0.017
MW-22/MW-22A	11/93	Low	1.51	1.95	-10.59	-26.29	-0.028
		1/4	1.62	2.14	-10.59	-26.29	-0.033
		3/4	2.16	2.23	-10.59	-26.29	-0.004
		High	2.11	2.27	-10.59	-26.29	-0.010
MW-24/MW-24A	11/93	Low	2.27	1.93	-7.13	-28.14	+0.016
		1/4	2.20	2.06	-7.13	-28.14	+0.007
		3/4	2.24	2.05	-7.13	-28.14	+0.009
		High	2.27	2.14	-7.13	-28.14	+0.006
MW-28/MW-28A	11/93	Low	0.83	1.35	-5.60	-19.92	-0.036
		1/4	0.80	1.46	-5.60	-19.92	-0.046
		3/4	0.85	1.41	-5.60	-19.92	-0.039
		High	0.86	1.45	-5.60	-19.92	-0.041
MW-29/MW-29A	11/93	Low	1.03	1.73	-1.54	-33.33	-0.022
		1/4	0.98	1.82	-1.54	-33.33	-0.026
		3/4	0.96	1.79	-1.54	-33.33	-0.026
		High	0.96	1.83	-1.54	-33.33	-0.027

NOTE: Vertical Hydraulic Gradient = $\frac{\text{Upper Aquifer Elevation} - \text{Lower Aquifer Elevation}}{\text{Upper Aquifer Mid Screen Elevation} - \text{Lower Aquifer Mid Screen Elevation}}$

- Upward Vertical Hydraulic Gradient

+ Downward Vertical Hydraulic Gradient

All Measurements in Feet

Vertical Hydraulic Gradient in ft/ft

SITE-SPECIFIC GROUNDWATER SAMPLE LIST
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

METALS

Arsenic
Copper
Chromium

SEMI-VOLATILES

Acenaphthene
Benzo(a)anthracene
Benzo(b)fluoranthene
Bis(2-chloroethyl)ether
4-chloro-3-methylphenol
Chrysene
2,4-dimethylphenol
Fluoranthene
Naphthalene
Phenanthrene
Tetrachlorophenol
2,4,6-trichlorophenol
Anthracene
Benzo(a)pyrene
Benzo(k)fluoranthene
Carbazole
2-chlorophenol
Dibenzo(a,h)anthracene
2,4-dinitrophenol
Indeno(1,2,3-cd)pyrene
Pentachlorophenol
Phenol
2,4,5-trichlorophenol

VOLATILES

Benzene
Bromomethane
Chlorobenzene
2-chloroethylvinylether
Cis-1,3-dichloropropene
1,2-dibromomethane (Edb)
1,1-dichloroethane
1,1-dichloroethene
1,2-dichloropropane
Fluorotrichloromethane
Methyl-T-Butyl Ether (Mtbe)
1,1,2,2-tetrachloroethane
Trans-1,2-dichloroethene
1,1,2-trichloroethane
Vinyl Chloride
Bromodichloromethane
Carbon Tetrachloride
Chloroethane
Chloromethane
Dibromochloromethane
Dichlorodifluoromethane
1,2-dichloroethane
Dichloromethane
Ethyl benzene
M/P-Xylene
O-Xylene
Toluene
1,1,1-trichloroethane
Trichloroethene

PHASE III GROUNDWATER SAMPLE PARAMETER SUMMARY TABLE
VOLATILES
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

VOLATILES	DL*	MW-6	MW-7	MW-8	MW-8A	MW-9	MW-10	MW-11A	MW-11B	MW-12	MW-13
Benzene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.046
Bromodichloroethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloroethylvinyl Ether	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cis-1,3-Dichloropropene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromomethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichloromethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl Benzene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.026
Fluorotrichloromethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
M/P-Xylene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	0.011	0.014
Methyl-T-Butyl Ether (Mtbe)	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	0.0066	0.013
1,1,2,2-Tetrachloroethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	0.0074	ND
Trans-1,2-Dichloroethylene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

NOTE: DL = Laboratory Detection Limit
All units in mg/l

PHASE III GROUNDWATER SAMPLE PARAMETER SUMMARY TABLE
VOLATILES
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

VOLATILES	DL*	MW-14A	MW-15	MW-16	MW-17	MW-18	MW-19	MW-19A	MW-20	MW-20A	MW-21
Benzene	0.005	ND	ND	ND	ND	ND	0.0055	ND	ND	ND	ND
Bromodichloroethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloroethylvinyl Ether	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cis-1,3-Dichloropropene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromomethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichloromethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl Benzene	0.005	0.018	0.0051	ND	ND	ND	0.0058	ND	ND	ND	ND
Fluorotrichloromethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
M/P-Xylene	0.005	0.02	ND	ND	ND	ND	0.0054	ND	ND	ND	ND
Methyl-T-Butyl Ether (Mtbe)	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	0.005	0.0087	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethylene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

NOTE: DL = Laboratory Detection Limit
All units in mg/l

PHASE III GROUNDWATER SAMPLE PARAMETER SUMMARY TABLE
VOLATILES
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

VOLATILES	DL*	MW-22A	MW-23	MW-24	MW-24A	MW-25	MW-27	MW-28	MW-28A	MW-29	MW-29A	MW-30
Benzene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloroethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloroethylvinyl Ether	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cis-1,3-Dichloropropene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromomethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichloromethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl Benzene	0.005	ND	ND	0.0089	ND	ND	ND	ND	ND	ND	ND	ND
Fluorotrichloromethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
M/P-Xylene	0.005	0.0061	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl-T-Butyl Ether (Mtbe)	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	0.005	0.006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethylene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

NOTE: DL = Laboratory Detection Limit

All units in mg/l

PHASE III GROUNDWATER SAMPLE PARAMETER SUMMARY TABLE
SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

SEMI-VOLATILES	DL*	MW-6	MW-7	MW-8	MW-8A	MW-9	MW-10	MW-11A	MW-11B	MW-12	MW-13
Acenaphthene	0.01	ND	ND	ND	ND	ND	ND	0.076	0.081	0.77	0.8
Anthracene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)Anthracene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)Pyrene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)Fluoranthene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)Fluoranthene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-Chloroethyl)Ether	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbazole	0.01	ND	ND	ND	ND	ND	ND	ND	ND	0.21	0.22
4-Chloro-3-Methylphenol	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)Anthracene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrophenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	0.31	0.3
Indeno(1,2,3-Cd)Pyrene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Napthalene	0.01	ND	ND	ND	ND	ND	ND	0.31	ND	3.1	3.1
Pentachlorophenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	0.01	ND	ND	ND	ND	ND	ND	0.047	0.039	0.74	0.77
Phenol	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachlorophenols	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

NOTE: DL = Laboratory Detection Limit

All units in mg/l.

PHASE III GROUNDWATER SAMPLE PARAMETER SUMMARY TABLE
SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

SEMI-VOLATILES	DL*	MW-14A	MW-15	MW-16	MW-17	MW-18	MW-19	MW-19A	MW-20	MW-20A	MW-21
Acenaphthene	0.01	0.41	0.074	ND	0.016	ND	0.27	ND	0.014	ND	ND
Anthracene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)Anthracene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)Pyrene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)Fluoranthene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)Fluoranthene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-Chloroethyl)Ether	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbazole	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloro-3-Methylphenol	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)Anthracene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrophenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	0.01	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-Cd)Pyrene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Napthalene	0.01	3.3	0.055	ND	ND	ND	0.29	ND	ND	ND	ND
Pentachlorophenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	0.01	ND	0.015	ND	0.017	ND	0.077	ND	ND	ND	ND
Phenol	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachlorophenols	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

NOTE: DL = Laboratory Detection Limit

All units in mg/l.

PHASE III GROUNDWATER SAMPLE PARAMETER SUMMARY TABLE
SEMI-VOLATILES
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

SEMI-VOLATILES	DL*	MW-22A	MW-23	MW-24	MW-24A	MW-25	MW-27	MW-28	MW-28A	MW-29	MW-29A	MW-30
Acenaphthene	0.01	0.012	ND	0.29	ND	0.043	ND	0.012	ND	ND	0.54	0.04
Anthracene	0.01	ND	ND	ND	ND	0.025	ND	ND	ND	ND	ND	0.026
Benzo(a)Anthracene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)Pyrene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)Fluoranthene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)Fluoranthene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-Chloroethyl)Ether	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbazole	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.019	0.013
4-Chloro-3-Methylphenol	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)Anthracene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrophenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	0.01	ND	ND	ND	ND	0.034	ND	ND	ND	ND	ND	0.016
Indeno(1,2,3-Cd)Pyrene	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Napthalene	0.01	0.018	ND	0.29	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	0.01	ND	ND	0.068	ND	0.062	ND	0.021	ND	ND	ND	0.058
Phenol	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachlorophenols	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

NOTE: DL = Laboratory Detection Limit

All units in mg/l.

PHASE III GROUNDWATER SAMPLE PARAMETER SUMMARY TABLE
METALS
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

METALS	DL*	MW-6	MW-7	MW-8	MW-8A	MW-9	MW-10	MW-11A	MW-11B	MW-12	MW-13
Arsenic	0.01	ND	ND	ND	ND	0.049	0.05	ND	ND	0.029	0.049
Arsenic (Dissolved)	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	0.01	ND	ND	ND	ND	ND	ND	ND	ND	0.024	0.04
Chromium (Dissolved)	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	0.025	ND	ND	ND	ND	ND	ND	ND	ND	0.043	0.058
Copper (Dissolved)	0.025	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

METALS	DL*	MW-14A	MW-15	MW-16	MW-17	MW-18	MW-19	MW-19A	MW-20	MW-20A	MW-21
Arsenic	0.01	ND	0.088	ND	0.023	0.016	ND	ND	ND	ND	0.019
Arsenic (Dissolved)	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	0.01	ND	ND	ND	0.012	4.6	ND	ND	ND	ND	0.016
Chromium (Dissolved)	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	0.025	ND	ND	ND	0.025	0.05	ND	ND	ND	ND	ND
Copper (Dissolved)	0.025	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

METALS	DL*	MW-22A	MW-23	MW-24	MW-24A	MW-25	MW-27	MW-28	MW-28A	MW-29	MW-29A	MW-30
Arsenic	0.01	ND	ND	ND	ND	ND	0.014	ND	ND	ND	ND	ND
Arsenic (Dissolved)	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	0.01	ND	ND	0.01	ND	0.011	ND	ND	ND	ND	ND	0.024
Chromium (Dissolved)	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	0.025	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper (Dissolved)	0.025	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

NOTE: DL = Laboratory Detection Limit
All units in mg/l.

PHASE III GROUNDWATER SAMPLE PARAMETER SUMMARY TABLE
HYDROCARBONS
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

HYDROCARBONS	DL*	MW–6	MW–18	MW–27
Hydrocarbons as Gasoline	0.05	ND	ND	ND
Hydrocarbons as Kerosene	0.3	ND	ND	ND
Hydrocarbons as Heavy Oils	1.0	ND	ND	ND
Hydrocarbons as Mineral Spirits	0.3	ND	ND	ND
Hydrocarbons as Varsol	0.3	ND	ND	ND
Hydrocarbons as Fuel Oil/Diesel	0.3	ND	ND	ND

NOTE: DL = Laboratory Detection Limit
All units in mg/l

PHASE III GROUNDWATER SAMPLE PARAMETER SUMMARY TABLE
HYDROCARBONS
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

HYDROCARBONS	DL*	MW-6	MW-18	MW-27
Hydrocarbons as Gasoline	0.05	ND	ND	ND
Hydrocarbons as Kerosene	0.3	ND	ND	ND
Hydrocarbons as Heavy Oils	1.0	ND	ND	ND
Hydrocarbons as Mineral Spirits	0.3	ND	ND	ND
Hydrocarbons as Varsol	0.3	ND	ND	ND
Hydrocarbons as Fuel Oil/Diesel	0.3	ND	ND	ND

NOTE: DL = Laboratory Detection Limit
All units in mg/l

Phase III Groundwater Sample Laboratory Analytical Data and QA/QC

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LOG NO: S3-46553

Received: 18 NOV 93

Ms. Sandra Watson
Southern Wood Piedmont (WI)
P.O. Box 5477, I-85 and Sigsbee Rd.
Spartanburg, SC 29304

Project: Wilmington, NC
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
46553-1	MW-7 (# 11437)	11-17-93
46553-2	MW-8A (# 11438)	11-17-93
46553-3	MW-8 (# 11439)	11-17-93
46553-4	MW-9 (# 11440)	11-17-93
46553-5	MW-10 (# 11441)	11-17-93

PARAMETER	46553-1	46553-2	46553-3	46553-4	46553-5
Semivolatile Organics (8270)					
bis(2-Chloroethyl)ether, mg/l	ND	ND	ND	ND	ND
Naphthalene, mg/l	ND	ND	ND	ND	ND
Acenaphthene, mg/l	ND	ND	ND	ND	ND
Phenanthrene, mg/l	ND	ND	ND	ND	ND
Anthracene, mg/l	ND	ND	ND	ND	ND
Fluoranthene, mg/l	ND	ND	ND	ND	ND
Chrysene, mg/l	ND	ND	ND	ND	ND
Benzo(a)Anthracene, mg/l	ND	ND	ND	ND	ND
Benzo(b)fluoranthene, mg/l	ND	ND	ND	ND	ND
Benzo(k)fluoranthene, mg/l	ND	ND	ND	ND	ND
Benzo(a)pyrene, mg/l	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene, mg/l	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene, mg/l	ND	ND	ND	ND	ND
2-Chlorophenol, mg/l	ND	ND	ND	ND	ND
Phenol, mg/l	ND	ND	ND	ND	ND
2,4-Dimethylphenol, mg/l	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol, mg/l	ND	ND	ND	ND	ND
4-Chloro-3-methylphenol, mg/l	ND	ND	ND	ND	ND
2,4-Dinitrophenol, mg/l	ND	ND	ND	ND	ND
Pentachlorophenol, mg/l	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol, mg/l	ND	ND	ND	ND	ND
Carbazole, mg/l	ND	ND	ND	ND	ND
Tetrachlorophenols, mg/l	ND	ND	ND	ND	ND

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
46553-1	MW-7 (# 11437)	11-17-93
46553-2	MW-8A (# 11438)	11-17-93
46553-3	MW-8 (# 11439)	11-17-93
46553-4	MW-9 (# 11440)	11-17-93
46553-5	MW-10 (# 11441)	11-17-93

PARAMETER	46553-1	46553-2	46553-3	46553-4	46553-5
Volatiles by GC/MS					
Chloromethane, mg/l	ND	ND	ND	ND	ND
Bromomethane, mg/l	ND	ND	ND	ND	ND
Vinyl Chloride, mg/l	ND	ND	ND	ND	ND
Chloroethane, mg/l	ND	ND	ND	ND	ND
Methylene Chloride (Dichloromethane), mg/l	ND	ND	ND	ND	ND
1,1-Dichloroethene, mg/l	ND	ND	ND	ND	ND
1,1-Dichloroethane, mg/l	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethylene, mg/l	ND	ND	ND	ND	ND
1,2-Dichloroethane, mg/l	ND	ND	ND	ND	ND
1,1,1-Trichloroethane, mg/l	ND	ND	ND	ND	ND
Carbon Tetrachloride, mg/l	ND	ND	ND	ND	ND
Bromodichloromethane, mg/l	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane, mg/l	ND	ND	ND	ND	ND
1,2-Dichloropropane, mg/l	ND	ND	ND	ND	ND
Trichloroethene, mg/l	ND	ND	ND	ND	ND
Dibromochloromethane, mg/l	ND	ND	ND	ND	ND
1,1,2-Trichloroethane, mg/l	ND	ND	ND	ND	ND
Benzene, mg/l	ND	ND	ND	ND	ND

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
46553-1	MW-7 (# 11437)	11-17-93
46553-2	MW-8A (# 11438)	11-17-93
46553-3	MW-8 (# 11439)	11-17-93
46553-4	MW-9 (# 11440)	11-17-93
46553-5	MW-10 (# 11441)	11-17-93

PARAMETER	46553-1	46553-2	46553-3	46553-4	46553-5
Cis-1,3-Dichloropropene, mg/l	ND	ND	ND	ND	ND
2-Chloroethylvinyl Ether, mg/l	ND	ND	ND	ND	ND
Toluene, mg/l	ND	ND	ND	ND	ND
Chlorobenzene, mg/l	ND	ND	ND	ND	ND
Ethylbenzene, mg/l	ND	ND	ND	ND	ND
Methyl-Tert-Butyl-Ether (MTBE), mg/l	ND	ND	ND	ND	ND
Dichlorodifluoromethane, mg/l	ND	ND	ND	ND	ND
m&p-Xylene, mg/l	ND	ND	ND	ND	ND
o-Xylene, mg/l	ND	ND	ND	ND	ND
Fluorotrichloromethane, mg/l	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB) , mg/l	ND	ND	ND	ND	ND
Arsenic, mg/l	ND	ND	ND	0.049	0.050
Arsenic (Dissolved), mg/l	ND	ND	ND	ND	ND
Chromium, mg/l	ND	ND	ND	ND	ND
Chromium (Dissolved), mg/l	ND	ND	ND	ND	ND
Copper, mg/l	ND	ND	ND	ND	ND
Copper (Dissolved), mg/l	ND	ND	ND	ND	ND

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
46553-6	MW-20A (# 11442)	11-17-93
46553-7	MW-21 (# 11443)	11-17-93
46553-8	MW-23 (# 11444)	11-17-93
46553-9	MW-24A (# 11445)	11-17-93
46553-10	Trip Blank	11-17-93

PARAMETER	46553-6	46553-7	46553-8	46553-9	46553-10
Semivolatile Organics (8270)					
bis(2-Chloroethyl)ether, mg/l	ND	ND	ND	ND	ND
Naphthalene, mg/l	ND	ND	ND	ND	ND
Acenaphthene, mg/l	ND	ND	ND	ND	ND
Phenanthrene, mg/l	ND	ND	ND	ND	ND
Anthracene, mg/l	ND	ND	ND	ND	ND
Fluoranthene, mg/l	ND	ND	ND	ND	ND
Chrysene, mg/l	ND	ND	ND	ND	ND
Benzo(a)Anthracene, mg/l	ND	ND	ND	ND	ND
Benzo(b)fluoranthene, mg/l	ND	ND	ND	ND	ND
Benzo(k)fluoranthene, mg/l	ND	ND	ND	ND	ND
Benzo(a)pyrene, mg/l	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene, mg/l	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene, mg/l	ND	ND	ND	ND	ND
2-Chlorophenol, mg/l	ND	ND	ND	ND	ND
Phenol, mg/l	ND	ND	ND	ND	ND
2,4-Dimethylphenol, mg/l	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol, mg/l	ND	ND	ND	ND	ND
4-Chloro-3-methylphenol, mg/l	ND	ND	ND	ND	ND
2,4-Dinitrophenol, mg/l	ND	ND	ND	ND	ND
Pentachlorophenol, mg/l	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol, mg/l	ND	ND	ND	ND	ND
Carbazole, mg/l	ND	ND	ND	ND	ND
Tetrachlorophenols, mg/l	ND	ND	ND	ND	ND

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46553-6	MW-20A (# 11442)	11-17-93
46553-7	MW-21 (# 11443)	11-17-93
46553-8	MW-23 (# 11444)	11-17-93
46553-9	MW-24A (# 11445)	11-17-93
46553-10	Trip Blank	11-17-93

PARAMETER	46553-6	46553-7	46553-8	46553-9	46553-10
Volatiles by GC/MS					
Chloromethane, mg/l	ND	ND	ND	ND	ND
Bromomethane, mg/l	ND	ND	ND	ND	ND
Vinyl Chloride, mg/l	ND	ND	ND	ND	ND
Chloroethane, mg/l	ND	ND	ND	ND	ND
Methylene Chloride (Dichloromethane), mg/l	ND	ND	ND	ND	ND
1,1-Dichloroethene, mg/l	ND	ND	ND	ND	ND
1,1-Dichloroethane, mg/l	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethylene, mg/l	ND	ND	ND	ND	ND
1,2-Dichloroethane, mg/l	ND	ND	ND	ND	ND
1,1,1-Trichloroethane, mg/l	ND	ND	ND	ND	ND
Carbon Tetrachloride, mg/l	ND	ND	ND	ND	ND
Bromodichloromethane, mg/l	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane, mg/l	ND	ND	ND	ND	ND
1,2-Dichloropropane, mg/l	ND	ND	ND	ND	ND
Trichloroethene, mg/l	ND	ND	ND	ND	ND
Dibromochloromethane, mg/l	ND	ND	ND	ND	ND
1,1,2-Trichloroethane, mg/l	ND	ND	ND	ND	ND
Benzene, mg/l	ND	ND	ND	ND	ND

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46553-6	MW-20A (# 11442)	11-17-93
46553-7	MW-21 (# 11443)	11-17-93
46553-8	MW-23 (# 11444)	11-17-93
46553-9	MW-24A (# 11445)	11-17-93
46553-10	Trip Blank	11-17-93

PARAMETER	46553-6	46553-7	46553-8	46553-9	46553-10
Cis-1,3-Dichloropropene, mg/l	ND	ND	ND	ND	ND
2-Chloroethylvinyl Ether, mg/l	ND	ND	ND	ND	ND
Toluene, mg/l	ND	ND	ND	ND	ND
Chlorobenzene, mg/l	ND	ND	ND	ND	ND
Ethylbenzene, mg/l	ND	ND	ND	ND	ND
Methyl-Tert-Butyl-Ether (MTBE), mg/l	ND	ND	ND	ND	ND
Dichlorodifluoromethane, mg/l	ND	ND	ND	ND	ND
m&p-Xylene, mg/l	ND	ND	ND	ND	ND
o-Xylene, mg/l	ND	ND	ND	ND	ND
Fluorotrichloromethane, mg/l	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB) , mg/l	ND	ND	ND	ND	ND
Arsenic, mg/l	ND	0.019	ND	ND	ND
Arsenic (Dissolved), mg/l	ND	ND	ND	ND	ND
Chromium, mg/l	ND	0.016	ND	ND	ND
Chromium (Dissolved), mg/l	ND	ND	ND	ND	ND
Copper, mg/l	ND	ND	ND	ND	ND
Copper (Dissolved), mg/l	ND	ND	ND	ND	ND

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Southern Wood Piedmont (WI)
P.O. Box 5477, I-85 and Sigsbee Rd.
Spartanburg, SC 29304

Project: Wilmington, NC
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
46553-11	Field Blank	11-17-93

PARAMETER	46553-11
Semivolatile Organics (8270)	
bis(2-Chloroethyl)ether, mg/l	ND
Naphthalene, mg/l	ND
Acenaphthene, mg/l	ND
Phenanthrene, mg/l	ND
Anthracene, mg/l	ND
Fluoranthene, mg/l	ND
Chrysene, mg/l	ND
Benzo(a)Anthracene, mg/l	ND
Benzo(b)fluoranthene, mg/l	ND
Benzo(k)fluoranthene, mg/l	ND
Benzo(a)pyrene, mg/l	ND
Indeno(1,2,3-cd)pyrene, mg/l	ND
Dibenz(a,h)anthracene, mg/l	ND
2-Chlorophenol, mg/l	ND
Phenol, mg/l	ND
2,4-Dimethylphenol, mg/l	ND
2,4,6-Trichlorophenol, mg/l	ND
4-Chloro-3-methylphenol, mg/l	ND
2,4-Dinitrophenol, mg/l	ND
Pentachlorophenol, mg/l	ND
2,4,5-Trichlorophenol, mg/l	ND
Carbazole, mg/l	ND
Tetrachlorophenols, mg/l	ND

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Spartanburg, SC 29304

Project: Wilmington, NC
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
46553-11	Field Blank	11-17-93

PARAMETER	46553-11
Volatiles by GC/MS	
Chloromethane, mg/l	ND
Bromomethane, mg/l	ND
Vinyl Chloride, mg/l	ND
Chloroethane, mg/l	ND
Methylene Chloride (Dichloromethane), mg/l	ND
1,1-Dichloroethene, mg/l	ND
1,1-Dichloroethane, mg/l	ND
Trans-1,2-Dichloroethylene, mg/l	ND
1,2-Dichloroethane, mg/l	ND
1,1,1-Trichloroethane, mg/l	ND
Carbon Tetrachloride, mg/l	ND
Bromodichloromethane, mg/l	ND
1,1,2,2-Tetrachloroethane, mg/l	ND
1,2-Dichloropropane, mg/l	ND
Trichloroethene, mg/l	ND
Dibromochloromethane, mg/l	ND
1,1,2-Trichloroethane, mg/l	ND
Benzene, mg/l	ND
Cis-1,3-Dichloropropene, mg/l	ND
2-Chloroethylvinyl Ether, mg/l	ND
Toluene, mg/l	ND
Chlorobenzene, mg/l	ND
Ethylbenzene, mg/l	ND

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Spartanburg, SC 29304

Project: Wilmington, NC
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
46553-11	Field Blank	11-17-93

PARAMETER	46553-11
Methyl-Tert-Butyl-Ether (MTBE), mg/l	ND
Dichlorodifluoromethane, mg/l	ND
m&p-Xylene, mg/l	ND
o-Xylene, mg/l	ND
Fluorotrichloromethane, mg/l	ND
1,2-Dibromoethane (EDB) , mg/l	ND
Arsenic, mg/l	ND
Arsenic (Dissolved), mg/l	ND
Chromium, mg/l	ND
Chromium (Dissolved), mg/l	ND
Copper, mg/l	ND
Copper (Dissolved), mg/l	ND

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
46553-12	MW-6 (# 11435)	11-17-93
46553-13	MW-18 (# 11436)	11-17-93

PARAMETER	46553-12	46553-13
Semivolatile Organics (8270)		
bis(2-Chloroethyl)ether, mg/l	ND	ND
Naphthalene, mg/l	ND	ND
Acenaphthene, mg/l	ND	ND
Phenanthrene, mg/l	ND	ND
Anthracene, mg/l	ND	ND
Fluoranthene, mg/l	ND	ND
Chrysene, mg/l	ND	ND
Benzo(a)Anthracene, mg/l	ND	ND
Benzo(b)fluoranthene, mg/l	ND	ND
Benzo(k)fluoranthene, mg/l	ND	ND
Benzo(a)pyrene, mg/l	ND	ND
Indeno(1,2,3-cd)pyrene, mg/l	ND	ND
Dibenz(a,h)anthracene, mg/l	ND	ND
2-Chlorophenol, mg/l	ND	ND
Phenol, mg/l	ND	ND
2,4-Dimethylphenol, mg/l	ND	ND
2,4,6-Trichlorophenol, mg/l	ND	ND
4-Chloro-3-methylphenol, mg/l	ND	ND
2,4-Dinitrophenol, mg/l	ND	ND
Pentachlorophenol, mg/l	ND	ND
2,4,5-Trichlorophenol, mg/l	ND	ND
Carbazole, mg/l	ND	ND
Tetrachlorophenols, mg/l	ND	ND

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ENVIRONMENTAL

LOG NO: S3-46553

Received: 18 NOV 93

Ms. Sandra Watson
Southern Wood Piedmont (WI)
P.O. Box 5477, I-85 and Sigsbee Rd.
Spartanburg, SC 29304

Project: Wilmington, NC
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
46553-12	MW-6 (# 11435)	11-17-93
46553-13	MW-18 (# 11436)	11-17-93

PARAMETER	46553-12	46553-13
Volatiles by GC/MS		
Chloromethane, mg/l	ND	ND
Bromomethane, mg/l	ND	ND
Vinyl Chloride, mg/l	ND	ND
Chloroethane, mg/l	ND	ND
Methylene Chloride (Dichloromethane), mg/l	ND	ND
1,1-Dichloroethene, mg/l	ND	ND
1,1-Dichloroethane, mg/l	ND	ND
Trans-1,2-Dichloroethylene, mg/l	ND	ND
1,2-Dichloroethane, mg/l	ND	ND
1,1,1-Trichloroethane, mg/l	ND	ND
Carbon Tetrachloride, mg/l	ND	ND
Bromodichloromethane, mg/l	ND	ND
1,1,2,2-Tetrachloroethane, mg/l	ND	ND
1,2-Dichloropropane, mg/l	ND	ND
Trichloroethene, mg/l	ND	ND
Dibromochloromethane, mg/l	ND	ND
1,1,2-Trichloroethane, mg/l	ND	ND
Benzene, mg/l	ND	ND
Cis-1,3-Dichloropropene, mg/l	ND	ND
2-Chloroethylvinyl Ether, mg/l	ND	ND
Toluene, mg/l	ND	ND
Chlorobenzene, mg/l	ND	ND

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
46553-12	MW-6 (# 11435)	11-17-93
46553-13	MW-18 (# 11436)	11-17-93

PARAMETER	46553-12	46553-13
Ethylbenzene, mg/l	ND	ND
Methyl-Tert-Butyl-Ether (MTBE), mg/l	ND	ND
Dichlorodifluoromethane, mg/l	ND	ND
m&p-Xylene, mg/l	ND	ND
o-Xylene, mg/l	ND	ND
Fluorotrichloromethane, mg/l	ND	ND
1,2-Dibromoethane (EDB) , mg/l	ND	ND
Arsenic, mg/l	ND	0.016
Arsenic (Dissolved), mg/l	ND	ND
Chromium, mg/l	ND	4.6
Chromium (Dissolved), mg/l	ND	ND
Copper, mg/l	ND	0.050
Copper (Dissolved), mg/l	ND	ND
Hydrocarbons (Modified 8015 - Ext.)		
Hydrocarbons as Kerosene, mg/l	ND	ND
Hydrocarbons as Heavy Oils, mg/l	ND	ND
Hydrocarbons as Mineral Spirits, mg/l	ND	ND
Hydrocarbons as Varsol, mg/l	ND	ND
Hydrocarbons as Fuel Oil/Diesel, mg/l	ND	ND
Hydrocarbons (Modified 8015)		
Hydrocarbons as Gasoline, mg/l	ND	ND

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Spartanburg, SC 29304

Project: Wilmington, NC
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
46553-14	Detection Limits
46553-15	Accuracy (mean % recovery)
46553-16	Precision (% RPD)
46553-17	Analyst Initials)
46553-18	EPA Method Numbers

PARAMETER	46553-14	46553-15	46553-16	46553-17	46553-18
Semivolatile Organics (8270)					
1,4-Dichlorobenzene, mg/l	0.010	85 %	14 %	BK	8270
bis(2-Chloroethyl)ether, mg/l	0.010	---	---	BK	8270
N-Nitrosodi-N-Propylamine, mg/l	0.010	115 %	10 %	BK	8270
1,2,4-Trichlorobenzene, mg/l	0.010	93 %	13 %	BK	8270
Naphthalene, mg/l	0.010	---	---	BK	8270
Acenaphthene, mg/l	0.010	96 %	10 %	BK	8270
2,4-Dinitrotoluene, mg/l	0.010	116 %	12 %	BK	8270
Phenanthrene, mg/l	0.010	---	---	BK	8270
Anthracene, mg/l	0.010	---	---	BK	8270
Fluoranthene, mg/l	0.010	---	---	BK	8270
Pyrene, mg/l	0.010	113 %	11 %	BK	8270
Chrysene, mg/l	0.010	---	---	BK	8270
Benzo(a)Anthracene, mg/l	0.010	---	---	BK	8270
Benzo(b)fluoranthene, mg/l	0.010	---	---	BK	8270
Benzo(k)fluoranthene, mg/l	0.010	---	---	BK	8270
Benzo(a)pyrene, mg/l	0.010	---	---	BK	8270
Indeno(1,2,3-cd)pyrene, mg/l	0.010	---	---	BK	8270
Dibenz(a,h)anthracene, mg/l	0.010	---	---	BK	8270
2-Chlorophenol, mg/l	0.010	85 %	14 %	BK	8270

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LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
46553-14	Detection Limits
46553-15	Accuracy (mean % recovery)
46553-16	Precision (% RPD)
46553-17	Analyst Initials)
46553-18	EPA Method Numbers

PARAMETER	46553-14	46553-15	46553-16	46553-17	46553-18
Phenol, mg/l	0.010	86 %	13 %	BK	8270
2,4-Dimethylphenol, mg/l	0.010	---	---	BK	8270
2,4,6-Trichlorophenol, mg/l	0.010	---	---	BK	8270
4-Chloro-3-methylphenol, mg/l	0.010	89 %	10 %	BK	8270
2,4-Dinitrophenol, mg/l	0.050	---	---	BK	8270
Pentachlorophenol, mg/l	0.050	61 %	16 %	BK	8270
4-Nitrophenol, mg/l	0.050	78 %	13 %	BK	8270
2,4,5-Trichlorophenol, mg/l	0.010	---	---	BK	8270
Carbazole, mg/l	0.010	---	---	BK	8270
Tetrachlorophenols, mg/l	0.010	---	---	BK	8270

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P.O. Box 5477, I-85 and Sigsbee Rd.
Spartanburg, SC 29304

Project: Wilmington, NC
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
46553-14	Detection Limits
46553-15	Accuracy (mean % recovery)
46553-16	Precision (% RPD)
46553-17	Analyst Initials)
46553-18	EPA Method Numbers

PARAMETER	46553-14	46553-15	46553-16	46553-17	46553-18
Volatiles by GC/MS					
Chloromethane, mg/l	0.010	---	---	KA	8240
Bromomethane, mg/l	0.010	---	---	KA	8240
Vinyl Chloride, mg/l	0.010	---	---	KA	8240
Chloroethane, mg/l	0.010	---	---	KA	8240
Methylene Chloride (Dichloromethane), mg/l	0.0050	---	---	KA	8240
1,1-Dichloroethene, mg/l	0.0050	80 %	8.7 %	KA	8240
1,1-Dichloroethane, mg/l	0.0050	---	---	KA	8240
Trans-1,2-Dichloroethylene, mg/l	0.0050	---	---	KA	8240
1,2-Dichloroethane, mg/l	0.0050	---	---	KA	8240
1,1,1-Trichloroethane, mg/l	0.0050	---	---	KA	8240
Carbon Tetrachloride, mg/l	0.0050	---	---	KA	8240
Bromodichloromethane, mg/l	0.0050	---	---	KA	8240
1,1,2,2-Tetrachloroethane, mg/l	0.0050	---	---	KA	8240
1,2-Dichloropropane, mg/l	0.0050	---	---	KA	8240
Trichloroethene, mg/l	0.0050	95 %	11 %	KA	8240
Dibromochloromethane, mg/l	0.0050	---	---	KA	8240
1,1,2-Trichloroethane, mg/l	0.0050	---	---	KA	8240
Benzene, mg/l	0.0050	107 %	15 %	KA	8240

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Project: Wilmington, NC
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
46553-14	Detection Limits
46553-15	Accuracy (mean % recovery)
46553-16	Precision (% RPD)
46553-17	Analyst Initials)
46553-18	EPA Method Numbers

PARAMETER	46553-14	46553-15	46553-16	46553-17	46553-18
Cis-1,3-Dichloropropene, mg/l	0.0050	---	---	KA	8240
2-Chloroethylvinyl Ether, mg/l	0.050	---	---	KA	8240
Toluene, mg/l	0.0050	103 %	9.3 %	KA	8240
Chlorobenzene, mg/l	0.0050	112 %	8.0 %	KA	8240
Ethylbenzene, mg/l	0.0050	---	---	KA	8240
Methyl-Tert-Butyl-Ether (MTBE), mg/l	0.010	---	---	KA	8240
Dichlorodifluoromethane, mg/l	0.0050	---	---	KA	8240
m&p-Xylene, mg/l	0.0050	---	---	KA	8240
o-Xylene, mg/l	0.0050	---	---	KA	8240
Fluorotrichloromethane, mg/l	0.0050	---	---	KA	8240
1,2-Dibromoethane (EDB) , mg/l	0.0050	---	---	KA	8240
Arsenic, mg/l	0.010	103 %	2.3 %	CH	7060
Arsenic (Dissolved), mg/l	0.010	110 %	1.5 %	CH	7060
Chromium, mg/l	0.010	100 %	0.39 %	AL	6010
Chromium (Dissolved), mg/l	0.010	99 %	0.26 %	AL	6010
Copper, mg/l	0.025	100 %	0.60 %	AL	6010
Copper (Dissolved), mg/l	0.025	99 %	0.14 %	AL	6010

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Spartanburg, SC 29304

Project: Wilmington, NC
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
46553-14	Detection Limits
46553-15	Accuracy (mean % recovery)
46553-16	Precision (% RPD)
46553-17	Analyst Initials)
46553-18	EPA Method Numbers

PARAMETER	46553-14	46553-15	46553-16	46553-17	46553-18
Hydrocarbons (Modified 8015 - Ext.)					
Hydrocarbons as Kerosene, mg/l	0.30	---	---	LM	8015
Hydrocarbons as Heavy Oils, mg/l	1.0	---	---	LM	8015
Hydrocarbons as Mineral Spirits, mg/l	0.30	---	---	LM	8015
Hydrocarbons as Varsol, mg/l	0.30	---	---	LM	8015
Hydrocarbons as Fuel Oil/Diesel, mg/l	0.30	78 %	15 %	LM	8015
Hydrocarbons (Modified 8015)					
Hydrocarbons as Gasoline, mg/l	0.050	94 %	2.1 %	SLG	8015

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Spartanburg, SC 29304

Project: Wilmington, NC
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
46553-19	Dates Extracted
46553-20	Dates Analyzed

PARAMETER	46553-19	46553-20
Semivolatile Organics (8270)		
bis(2-Chloroethyl)ether	11.23.93	12.02.93
Naphthalene	11.23.93	12.02.93
Acenaphthene	11.23.93	12.02.93
Phenanthrene	11.23.93	12.02.93
Anthracene	11.23.93	12.02.93
Fluoranthene	11.23.93	12.02.93
Chrysene	11.23.93	12.02.93
Benzo(a)Anthracene	11.23.93	12.02.93
Benzo(b)fluoranthene	11.23.93	12.02.93
Benzo(k)fluoranthene	11.23.93	12.02.93
Benzo(a)pyrene	11.23.93	12.02.93
Indeno(1,2,3-cd)pyrene	11.23.93	12.02.93
Dibenz(a,h)anthracene	11.23.93	12.02.93
2-Chlorophenol	11.23.93	12.02.93
Phenol	11.23.93	12.02.93
2,4-Dimethylphenol	11.23.93	12.02.93
2,4,6-Trichlorophenol	11.23.93	12.02.93
4-Chloro-3-methylphenol	11.23.93	12.02.93
2,4-Dinitrophenol	11.23.93	12.02.93
Pentachlorophenol	11.23.93	12.02.93
2,4,5-Trichlorophenol	11.23.93	12.02.93

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
46553-19	Dates Extracted
46553-20	Dates Analyzed

PARAMETER	46553-19	46553-20
Volatiles by GC/MS		
Chloromethane	---	11.25.93
Bromomethane	---	11.25.93
Vinyl Chloride	---	11.25.93
Chloroethane	---	11.25.93
Methylene Chloride (Dichloromethane)	---	11.25.93
1,1-Dichloroethene	---	11.25.93
1,1-Dichloroethane	---	11.25.93
Trans-1,2-Dichloroethylene	---	11.25.93
1,2-Dichloroethane	---	11.25.93
1,1,1-Trichloroethane	---	11.25.93
Carbon Tetrachloride	---	11.25.93
Bromodichloromethane	---	11.25.93
1,1,2,2-Tetrachloroethane	---	11.25.93
1,2-Dichloropropane	---	11.25.93
Trichloroethene	---	11.25.93
Dibromochloromethane	---	11.25.93
1,1,2-Trichloroethane	---	11.25.93
Benzene	---	11.25.93
Cis-1,3-Dichloropropene	---	11.25.93
2-Chloroethylvinyl Ether	---	11.25.93
Toluene	---	11.25.93
Chlorobenzene	---	11.25.93

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
46553-19	Dates Extracted
46553-20	Dates Analyzed

PARAMETER	46553-19	46553-20
Ethylbenzene	---	11.25.93
Methyl-Tert-Butyl-Ether (MTBE)	---	11.25.93
Dichlorodifluoromethane	---	11.25.93
m&p-Xylene	---	11.25.93
o-Xylene	---	11.25.93
Fluorotrichloromethane	---	11.25.93
1,2-Dibromoethane (EDB)	---	11.25.93
Fluorotrichlorome	---	---
M/P-Xylenes	---	---
O-Xylenes	---	---
Arsenic	---	12.07.93
Arsenic (Dissolved)	---	12.07.93
Chromium	---	12.07.93
Chromium (Dissolved)	---	12.08.93
Copper	---	12.07.93
Copper (Dissolved)	---	12.08.93
Hydrocarbons (Modified 8015 - Ext.)		
Hydrocarbons as Kerosene	11.23.93	12.05.93
Hydrocarbons as Heavy Oils	11.23.93	12.05.93
Hydrocarbons as Mineral Spirits	11.23.93	12.05.93
Hydrocarbons as Varsol	11.23.93	12.05.93
Hydrocarbons as Fuel Oil/Diesel	11.23.93	12.05.93

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
46553-19	Dates Extracted
46553-20	Dates Analyzed

PARAMETER	46553-19	46553-20
Hydrocarbons (Modified 8015)		
Hydrocarbons as Gasoline	---	11.24.93

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Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
46553-21	Report Completion Date

PARAMETER	46553-21
Date Reported	12.30.93

Methods: EPA SW-846
ND = Not Detected

J. W. Andrews, Ph. D.

Final Page Of Report

SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC. U5184

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☐ 2846 Industrial Plaza Drive, Tallahassee, FL 32301 — Phone: (904) 8[illegible]94 — Fax (904) 878-9504
☐ 414 Southwest 12th Avenue, Deerfield Beach, FL 33442 — Phone: (305) 421-7400 — Fax (305) 421-2584
☐ 900 Lakeside Drive, Mobile, AL 36693 — Phone: (205) 666-6633 — Fax (205) 666-6696
☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax (813) 885-7049

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

P.O. NUMBER	PROJECT NUMBER	PROJECT NAME
	12-53015.00	SWP-Wilmington

Wilmington Site Specific

CLIENT NAME	TELEPHONE/FAX NO.
ViroGroup, Inc.	803-957-6270 803-957-3845

CLIENT ADDRESS	CITY, STATE, ZIP CODE
1445 Pisgah Church Rd	Lexington, SC 29072

SAMPLER(S) NAME(S)	CLIENT PROJECT MANAGER
Greg Kuntz James Leaphart	Greg Kuntz

☒ STANDARD TAT
☐ EXPEDITED TAT *
REPORT DUE DATE _____
* SUBJECT TO RUSH FEES

PAGE 1 OF 1

MATRIX TYPE: AQUEOUS MATRIX / NONAQUEOUS MATRIX / OIL MATRIX / AIR MATRIX

REQUIRED ANALYSES: SV, VOC, Total Cr, Cr Dissolved, Cr, Cu, As, TPH Diesel, TPH GAS & MTBE

NUMBER OF CONTAINERS SUBMITTED

SAMPLING DATE	SAMPLING TIME	SAMPLE IDENTIFICATION	AQUEOUS MATRIX	NONAQUEOUS MATRIX	OIL MATRIX	AIR MATRIX	SV	VOC	Total Cr	Cr Dissolved	Cr, Cu, As	TPH Diesel	TPH GAS & MTBE
11-17-93	2:20	MW-6 SWP Log# 11435	X				2	3	1	1	2	3	
	2:50	MW-18 11436											
	3:10	MW-7 11437											
	3:20	MW-8A 11438											
	3:40	MW-8 11439											
	3:50	MW-9 11440											
	4:00	MW-10 11441											
	4:15	MW-20A 11442											
	4:30	MW-21 11443											
	4:40	MW-23 11444											
	4:50	MW-24A 11445											
	5:15	Field Blank Trip Blank											

RECEIVED JAN 03 1994 ENVIRONMENTAL

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	11/11	12:00	Gregory B. Kuntz	11/16/93	7:30			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RELINQUISHED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
			Gregory B. Kuntz	11/17/93	6:20	Catherine Nilson	11-17-93	6:20

FOR SAVANNAH LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	S.L. LOG NO.	LABORATORY REMARKS
J. Baker	11/18/93	10:20	☑ YES ☐ NO		41653	

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

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LOG NO: S3-46595

Received: 19 NOV 93

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JAN 03 1994
ENVIRONMENTAL SERVICES

Ms. Sandra Watson
Southern Wood Piedmont (WI)
P.O. Box 5477, I-85 and Sigsbee Rd
Spartanburg, SC 29304

Project: Wilmington, NC
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
46595-1	MW-29 (# 11484)	11-18-93
46595-2	MW-29A (# 11485)	11-18-93
46595-3	MW-30 (# 11486)	11-18-93
46595-4	MW-25 (# 11487)	11-18-93
46595-5	MW-20 (# 11488)	11-18-93

PARAMETER	46595-1	46595-2	46595-3	46595-4	46595-5
Semivolatile Organics (8270)					
bis(2-Chloroethyl)ether, mg/l	ND	ND	ND	ND	ND
Naphthalene, mg/l	ND	ND	ND	ND	ND
Acenaphthene, mg/l	ND	0.54	0.040	0.043	0.014
Phenanthrene, mg/l	ND	ND	0.058	0.062	ND
Anthracene, mg/l	ND	ND	0.026	0.025	ND
Fluoranthene, mg/l	ND	ND	0.016	0.034	ND
Chrysene, mg/l	ND	ND	ND	ND	ND
Benzo(a)Anthracene, mg/l	ND	ND	ND	ND	ND
Benzo(b)fluoranthene, mg/l	ND	ND	ND	ND	ND
Benzo(k)fluoranthene, mg/l	ND	ND	ND	ND	ND
Benzo(a)pyrene, mg/l	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene, mg/l	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene, mg/l	ND	ND	ND	ND	ND
2-Chlorophenol, mg/l	ND	ND	ND	ND	ND
Phenol, mg/l	ND	ND	ND	ND	ND
2,4-Dimethylphenol, mg/l	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol, mg/l	ND	ND	ND	ND	ND
4-Chloro-3-methylphenol, mg/l	ND	ND	ND	ND	ND
2,4-Dinitrophenol, mg/l	ND	ND	ND	ND	ND
Pentachlorophenol, mg/l	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol, mg/l	ND	ND	ND	ND	ND
Tetrachlorophenols, mg/l	ND	ND	ND	ND	ND
Carbazole, mg/l	ND	0.019	0.013	ND	ND

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46595-2	MW-29A (# 11485)	11-18-93
46595-3	MW-30 (# 11486)	11-18-93
46595-4	MW-25 (# 11487)	11-18-93
46595-5	MW-20 (# 11488)	11-18-93

PARAMETER	46595-1	46595-2	46595-3	46595-4	46595-5
Volatiles by GC/MS					
Chloromethane, mg/l	ND	ND	ND	ND	ND
Bromomethane, mg/l	ND	ND	ND	ND	ND
Vinyl Chloride, mg/l	ND	ND	ND	ND	ND
Chloroethane, mg/l	ND	ND	ND	ND	ND
Methylene Chloride (Dichloromethane), mg/l	ND	ND	ND	ND	ND
1,1-Dichloroethene, mg/l	ND	ND	ND	ND	ND
1,1-Dichloroethane, mg/l	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethylene, mg/l	ND	ND	ND	ND	ND
1,2-Dichloroethane, mg/l	ND	ND	ND	ND	ND
1,1,1-Trichloroethane, mg/l	ND	ND	ND	ND	ND
Carbon Tetrachloride, mg/l	ND	ND	ND	ND	ND
Bromodichloromethane, mg/l	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane, mg/l	ND	ND	ND	ND	ND
1,2-Dichloropropane, mg/l	ND	ND	ND	ND	ND
Trichloroethene, mg/l	ND	ND	ND	ND	ND
Dibromochloromethane, mg/l	ND	ND	ND	ND	ND
1,1,2-Trichloroethane, mg/l	ND	ND	ND	ND	ND
Benzene, mg/l	ND	ND	ND	ND	ND

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46595-2	MW-29A (# 11485)	11-18-93
46595-3	MW-30 (# 11486)	11-18-93
46595-4	MW-25 (# 11487)	11-18-93
46595-5	MW-20 (# 11488)	11-18-93

PARAMETER	46595-1	46595-2	46595-3	46595-4	46595-5
Cis-1,3-Dichloropropene, mg/l	ND	ND	ND	ND	ND
2-Chloroethylvinyl Ether, mg/l	ND	ND	ND	ND	ND
Toluene, mg/l	ND	ND	ND	ND	ND
Chlorobenzene, mg/l	ND	ND	ND	ND	ND
Ethylbenzene, mg/l	ND	ND	ND	ND	ND
Dichlorodifluoromethane, mg/l	ND	ND	ND	ND	ND
Methyl-Tert-Butyl-Ether (MTBE), mg/l	ND	ND	ND	ND	ND
1,2-Dibromomethane, mg/l	ND	ND	ND	ND	ND
o-Xylene, mg/l	ND	ND	ND	ND	ND
m&p-Xylene, mg/l	ND	ND	ND	ND	ND
Fluorotrichloromethane, mg/l	ND	ND	ND	ND	ND
Arsenic, mg/l	ND	ND	ND	ND	ND
Arsenic (Dissolved), mg/l	ND	ND	ND	ND	ND
Chromium, mg/l	ND	ND	0.024	0.011	ND
Chromium (Dissolved), mg/l	ND	ND	ND	ND	ND
Copper, mg/l	ND	ND	ND	ND	ND
Copper (Dissolved), mg/l	ND	ND	ND	ND	ND

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
46595-6	MW-11B (# 11489)	11-18-93
46595-7	MW-19A (# 11490)	11-18-93
46595-8	MW-28A (# 11491)	11-18-93
46595-9	MW-22A (# 11492)	11-18-93
46595-10	MW-15 (# 11493)	11-18-93

PARAMETER	46595-6	46595-7	46595-8	46595-9	46595-10
Semivolatile Organics (8270)					
bis(2-Chloroethyl)ether, mg/l	ND	ND	ND	ND	ND
Naphthalene, mg/l	ND	ND	ND	0.018	0.055
Acenaphthene, mg/l	0.081	ND	ND	0.012	0.074
Phenanthrene, mg/l	0.039	ND	ND	ND	0.015
Anthracene, mg/l	ND	ND	ND	ND	ND
Fluoranthene, mg/l	ND	ND	ND	ND	ND
Chrysene, mg/l	ND	ND	ND	ND	ND
Benzo(a)Anthracene, mg/l	ND	ND	ND	ND	ND
Benzo(b)fluoranthene, mg/l	ND	ND	ND	ND	ND
Benzo(k)fluoranthene, mg/l	ND	ND	ND	ND	ND
Benzo(a)pyrene, mg/l	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene, mg/l	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene, mg/l	ND	ND	ND	ND	ND
2-Chlorophenol, mg/l	ND	ND	ND	ND	ND
Phenol, mg/l	ND	ND	ND	ND	ND
2,4-Dimethylphenol, mg/l	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol, mg/l	ND	ND	ND	ND	ND
4-Chloro-3-methylphenol, mg/l	ND	ND	ND	ND	ND
2,4-Dinitrophenol, mg/l	ND	ND	ND	ND	ND
Pentachlorophenol, mg/l	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol, mg/l	ND	ND	ND	ND	ND
Tetrachlorophenols, mg/l	ND	ND	ND	ND	ND
Carbazole, mg/l	ND	ND	ND	ND	ND

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46595-7	MW-19A (# 11490)	11-18-93
46595-8	MW-28A (# 11491)	11-18-93
46595-9	MW-22A (# 11492)	11-18-93
46595-10	MW-15 (# 11493)	11-18-93

PARAMETER	46595-6	46595-7	46595-8	46595-9	46595-10
Volatiles by GC/MS					
Chloromethane, mg/l	ND	ND	ND	ND	ND
Bromomethane, mg/l	ND	ND	ND	ND	ND
Vinyl Chloride, mg/l	ND	ND	ND	ND	ND
Chloroethane, mg/l	ND	ND	ND	ND	ND
Methylene Chloride (Dichloromethane), mg/l	ND	ND	ND	ND	ND
1,1-Dichloroethene, mg/l	ND	ND	ND	ND	ND
1,1-Dichloroethane, mg/l	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethylene, mg/l	ND	ND	ND	ND	ND
1,2-Dichloroethane, mg/l	ND	ND	ND	ND	ND
1,1,1-Trichloroethane, mg/l	ND	ND	ND	ND	ND
Carbon Tetrachloride, mg/l	ND	ND	ND	ND	ND
Bromodichloromethane, mg/l	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane, mg/l	ND	ND	ND	ND	ND
1,2-Dichloropropane, mg/l	ND	ND	ND	ND	ND
Trichloroethene, mg/l	ND	ND	ND	ND	ND
Dibromochloromethane, mg/l	ND	ND	ND	ND	ND
1,1,2-Trichloroethane, mg/l	ND	ND	ND	ND	ND
Benzene, mg/l	ND	ND	ND	ND	ND

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46595-7	MW-19A (# 11490)	11-18-93
46595-8	MW-28A (# 11491)	11-18-93
46595-9	MW-22A (# 11492)	11-18-93
46595-10	MW-15 (# 11493)	11-18-93

PARAMETER	46595-6	46595-7	46595-8	46595-9	46595-10
Cis-1,3-Dichloropropene, mg/l	ND	ND	ND	ND	ND
2-Chloroethylvinyl Ether, mg/l	ND	ND	ND	ND	ND
Toluene, mg/l	ND	ND	ND	ND	ND
Chlorobenzene, mg/l	ND	ND	ND	ND	ND
Ethylbenzene, mg/l	ND	ND	ND	ND	0.0051
Dichlorodifluoromethane, mg/l	ND	ND	ND	ND	ND
Methyl-Tert-Butyl-Ether (MTBE), mg/l	ND	ND	ND	ND	ND
1,2-Dibromomethane, mg/l	ND	ND	ND	ND	ND
o-Xylene, mg/l	ND	ND	ND	0.0060	ND
m&p-Xylene, mg/l	ND	ND	ND	0.0061	ND
Fluorotrichloromethane, mg/l	ND	ND	ND	ND	ND
Arsenic, mg/l	ND	ND	ND	ND	0.088
Arsenic (Dissolved), mg/l	ND	ND	ND	ND	ND
Chromium, mg/l	ND	ND	ND	ND	ND
Chromium (Dissolved), mg/l	ND	ND	ND	ND	ND
Copper, mg/l	ND	ND	ND	ND	ND
Copper (Dissolved), mg/l	ND	ND	ND	ND	ND

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LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
46595-11	MW-19 (# 11495)	11-18-93
46595-12	MW-24 (# 11496)	11-18-93
46595-13	MW-11A (# 11497)	11-18-93
46595-14	MW-14A (# 11498)	11-18-93
46595-15	MW-28 (# 11499)	11-18-93

PARAMETER	46595-11	46595-12	46595-13	46595-14	46595-15
Semivolatile Organics (8270)					
bis(2-Chloroethyl)ether, mg/l	ND	ND	ND	ND	ND
Naphthalene, mg/l	0.29	0.29	0.31	3.3	ND
Acenaphthene, mg/l	0.27	0.29	0.076	0.41	0.012
Phenanthrene, mg/l	0.077	0.068	0.047	ND	0.021
Anthracene, mg/l	ND	ND	ND	ND	ND
Fluoranthene, mg/l	ND	ND	ND	ND	ND
Chrysene, mg/l	ND	ND	ND	ND	ND
Benzo(a)Anthracene, mg/l	ND	ND	ND	ND	ND
Benzo(b)fluoranthene, mg/l	ND	ND	ND	ND	ND
Benzo(k)fluoranthene, mg/l	ND	ND	ND	ND	ND
Benzo(a)pyrene, mg/l	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene, mg/l	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene, mg/l	ND	ND	ND	ND	ND
2-Chlorophenol, mg/l	ND	ND	ND	ND	ND
Phenol, mg/l	ND	ND	ND	ND	ND
2,4-Dimethylphenol, mg/l	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol, mg/l	ND	ND	ND	ND	ND
4-Chloro-3-methylphenol, mg/l	ND	ND	ND	ND	ND
2,4-Dinitrophenol, mg/l	ND	ND	ND	ND	ND
Pentachlorophenol, mg/l	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol, mg/l	ND	ND	ND	ND	ND
Tetrachlorophenols, mg/l	ND	ND	ND	ND	ND
Carbazole, mg/l	ND	ND	ND	ND	ND

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46595-13	MW-11A (# 11497)	11-18-93
46595-14	MW-14A (# 11498)	11-18-93
46595-15	MW-28 (# 11499)	11-18-93

PARAMETER	46595-11	46595-12	46595-13	46595-14	46595-15
Volatiles by GC/MS					
Chloromethane, mg/l	ND	ND	ND	ND	ND
Bromomethane, mg/l	ND	ND	ND	ND	ND
Vinyl Chloride, mg/l	ND	ND	ND	ND	ND
Chloroethane, mg/l	ND	ND	ND	ND	ND
Methylene Chloride (Dichloromethane), mg/l	ND	ND	ND	ND	ND
1,1-Dichloroethene, mg/l	ND	ND	ND	ND	ND
1,1-Dichloroethane, mg/l	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethylene, mg/l	ND	ND	ND	ND	ND
1,2-Dichloroethane, mg/l	ND	ND	ND	ND	ND
1,1,1-Trichloroethane, mg/l	ND	ND	ND	ND	ND
Carbon Tetrachloride, mg/l	ND	ND	ND	ND	ND
Bromodichloromethane, mg/l	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane, mg/l	ND	ND	ND	ND	ND
1,2-Dichloropropane, mg/l	ND	ND	ND	ND	ND
Trichloroethene, mg/l	ND	ND	ND	ND	ND
Dibromochloromethane, mg/l	ND	ND	ND	ND	ND
1,1,2-Trichloroethane, mg/l	ND	ND	ND	ND	ND
Benzene, mg/l	0.0055	ND	ND	ND	ND

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46595-14	MW-14A (# 11498)	11-18-93
46595-15	MW-28 (# 11499)	11-18-93

PARAMETER	46595-11	46595-12	46595-13	46595-14	46595-15
Cis-1,3-Dichloropropene, mg/l	ND	ND	ND	ND	ND
2-Chloroethylvinyl Ether, mg/l	ND	ND	ND	ND	ND
Toluene, mg/l	ND	ND	ND	ND	ND
Chlorobenzene, mg/l	ND	ND	ND	ND	ND
Ethylbenzene, mg/l	0.0058	0.0089	ND	0.018	ND
Dichlorodifluoromethane, mg/l	ND	ND	ND	ND	ND
Methyl-Tert-Butyl-Ether (MTBE), mg/l	ND	ND	ND	ND	ND
1,2-Dibromomethane, mg/l	ND	ND	ND	ND	ND
o-Xylene, mg/l	ND	ND	ND	0.0087	ND
m&p-Xylene, mg/l	0.0054	ND	ND	0.020	ND
Fluorotrichloromethane, mg/l	ND	ND	ND	ND	ND
Arsenic, mg/l	ND	ND	ND	ND	ND
Arsenic (Dissolved), mg/l	ND	ND	ND	ND	ND
Chromium, mg/l	ND	0.010	ND	ND	ND
Chromium (Dissolved), mg/l	ND	ND	ND	ND	ND
Copper, mg/l	ND	ND	ND	ND	ND
Copper (Dissolved), mg/l	ND	ND	ND	ND	ND

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LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
46595-16	MW-12 (# 11500)	11-18-93
46595-17	MW-13 (# 11501)	11-18-93
46595-18	MW-17 (# 11502)	11-18-93
46595-19	MW-16 (# 11503)	11-18-93
46595-20	Trip Blank	11-18-93

PARAMETER	46595-16	46595-17	46595-18	46595-19	46595-20
Semivolatile Organics (8270)					
bis(2-Chloroethyl)ether, mg/l	ND	ND	ND	ND	ND
Naphthalene, mg/l	3.1	3.1	ND	ND	ND
Acenaphthene, mg/l	0.77	0.80	0.016	ND	ND
Phenanthrene, mg/l	0.74	0.77	0.017	ND	ND
Anthracene, mg/l	ND	ND	ND	ND	ND
Fluoranthene, mg/l	0.31	0.30	0.010	ND	ND
Chrysene, mg/l	ND	ND	ND	ND	ND
Benzo(a)Anthracene, mg/l	ND	ND	ND	ND	ND
Benzo(b)fluoranthene, mg/l	ND	ND	ND	ND	ND
Benzo(k)fluoranthene, mg/l	ND	ND	ND	ND	ND
Benzo(a)pyrene, mg/l	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene, mg/l	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene, mg/l	ND	ND	ND	ND	ND
2-Chlorophenol, mg/l	ND	ND	ND	ND	ND
Phenol, mg/l	ND	ND	ND	ND	ND
2,4-Dimethylphenol, mg/l	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol, mg/l	ND	ND	ND	ND	ND
4-Chloro-3-methylphenol, mg/l	ND	ND	ND	ND	ND
2,4-Dinitrophenol, mg/l	ND	ND	ND	ND	ND
Pentachlorophenol, mg/l	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol, mg/l	ND	ND	ND	ND	ND
Tetrachlorophenols, mg/l	ND	ND	ND	ND	ND
Carbazole, mg/l	0.21	0.22	ND	ND	ND

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Ms. Sandra Watson
Southern Wood Piedmont (WI)
P.O. Box 5477, I-85 and Sigsbee Rd.
Spartanburg, SC 29304

Project: Wilmington, NC
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
46595-16	MW-12 (# 11500)	11-18-93
46595-17	MW-13 (# 11501)	11-18-93
46595-18	MW-17 (# 11502)	11-18-93
46595-19	MW-16 (# 11503)	11-18-93
46595-20	Trip Blank	11-18-93

PARAMETER	46595-16	46595-17	46595-18	46595-19	46595-20
Volatiles by GC/MS					
Chloromethane, mg/l	ND	ND	ND	ND	ND
Bromomethane, mg/l	ND	ND	ND	ND	ND
Vinyl Chloride, mg/l	ND	ND	ND	ND	ND
Chloroethane, mg/l	ND	ND	ND	ND	ND
Methylene Chloride (Dichloromethane), mg/l	ND	ND	ND	ND	ND
1,1-Dichloroethene, mg/l	ND	ND	ND	ND	ND
1,1-Dichloroethane, mg/l	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethylene, mg/l	ND	ND	ND	ND	ND
1,2-Dichloroethane, mg/l	ND	ND	ND	ND	ND
1,1,1-Trichloroethane, mg/l	ND	ND	ND	ND	ND
Carbon Tetrachloride, mg/l	ND	ND	ND	ND	ND
Bromodichloromethane, mg/l	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane, mg/l	ND	ND	ND	ND	ND
1,2-Dichloropropane, mg/l	ND	ND	ND	ND	ND
Trichloroethene, mg/l	ND	ND	ND	ND	ND
Dibromochloromethane, mg/l	ND	ND	ND	ND	ND
1,1,2-Trichloroethane, mg/l	ND	ND	ND	ND	ND
Benzene, mg/l	ND	0.046	ND	ND	ND

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LOG NO: S3-46595

RECEIVED JAN 0 3 1994 ENVIRONMENTAL AFFAIRS

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
46595-16	MW-12 (# 11500)	11-18-93
46595-17	MW-13 (# 11501)	11-18-93
46595-18	MW-17 (# 11502)	11-18-93
46595-19	MW-16 (# 11503)	11-18-93
46595-20	Trip Blank	11-18-93

PARAMETER	46595-16	46595-17	46595-18	46595-19	46595-20
Cis-1,3-Dichloropropene, mg/l	ND	ND	ND	ND	ND
2-Chloroethylvinyl Ether, mg/l	ND	ND	ND	ND	ND
Toluene, mg/l	0.0074	ND	ND	ND	ND
Chlorobenzene, mg/l	ND	ND	ND	ND	ND
Ethylbenzene, mg/l	ND	0.026	ND	ND	ND
Dichlorodifluoromethane, mg/l	ND	ND	ND	ND	ND
Methyl-Tert-Butyl-Ether (MTBE), mg/l	ND	ND	ND	ND	ND
1,2-Dibromomethane, mg/l	ND	ND	ND	ND	ND
o-Xylene, mg/l	0.0066	0.013	ND	ND	ND
m&p-Xylene, mg/l	0.011	0.014	ND	ND	ND
Fluorotrichloromethane, mg/l	ND	ND	ND	ND	ND
Arsenic, mg/l	0.029	0.049	0.023	ND	ND
Arsenic (Dissolved), mg/l	ND	ND	ND	ND	ND
Chromium, mg/l	0.024	0.040	0.012	ND	ND
Chromium (Dissolved), mg/l	ND	ND	ND	ND	ND
Copper, mg/l	0.043	0.058	0.025	ND	ND
Copper (Dissolved), mg/l	ND	ND	ND	ND	ND

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
46595-21	Field Blank	11-18-93

PARAMETER	46595-21
Semivolatile Organics (8270)	
bis(2-Chloroethyl)ether, mg/l	ND
Naphthalene, mg/l	ND
Acenaphthene, mg/l	ND
Phenanthrene, mg/l	ND
Anthracene, mg/l	ND
Fluoranthene, mg/l	ND
Chrysene, mg/l	ND
Benzo(a)Anthracene, mg/l	ND
Benzo(b)fluoranthene, mg/l	ND
Benzo(k)fluoranthene, mg/l	ND
Benzo(a)pyrene, mg/l	ND
Indeno(1,2,3-cd)pyrene, mg/l	ND
Dibenz(a,h)anthracene, mg/l	ND
2-Chlorophenol, mg/l	ND
Phenol, mg/l	ND
2,4-Dimethylphenol, mg/l	ND
2,4,6-Trichlorophenol, mg/l	ND
4-Chloro-3-methylphenol, mg/l	ND
2,4-Dinitrophenol, mg/l	ND
Pentachlorophenol, mg/l	ND
2,4,5-Trichlorophenol, mg/l	ND
Tetrachlorophenols, mg/l	ND
Carbazole, mg/l	ND

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
46595-21	Field Blank	11-18-93

PARAMETER	46595-21
Volatiles by GC/MS	
Chloromethane, mg/l	ND
Bromomethane, mg/l	ND
Vinyl Chloride, mg/l	ND
Chloroethane, mg/l	ND
Methylene Chloride (Dichloromethane), mg/l	ND
1,1-Dichloroethene, mg/l	ND
1,1-Dichloroethane, mg/l	ND
Trans-1,2-Dichloroethylene, mg/l	ND
1,2-Dichloroethane, mg/l	ND
1,1,1-Trichloroethane, mg/l	ND
Carbon Tetrachloride, mg/l	ND
Bromodichloromethane, mg/l	ND
1,1,2,2-Tetrachloroethane, mg/l	ND
1,2-Dichloropropane, mg/l	ND
Trichloroethene, mg/l	ND
Dibromochloromethane, mg/l	ND
1,1,2-Trichloroethane, mg/l	ND
Benzene, mg/l	ND
Cis-1,3-Dichloropropene, mg/l	ND
2-Chloroethylvinyl Ether, mg/l	ND
Toluene, mg/l	ND
Chlorobenzene, mg/l	ND
Ethylbenzene, mg/l	ND

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
46595-21	Field Blank	11-18-93

PARAMETER	46595-21
Dichlorodifluoromethane, mg/l	ND
Methyl-Tert-Butyl-Ether (MTBE), mg/l	ND
1,2-Dibromomethane, mg/l	ND
o-Xylene, mg/l	ND
m&p-Xylene, mg/l	ND
Fluorotrichloromethane, mg/l	ND
Arsenic, mg/l	ND
Arsenic (Dissolved), mg/l	ND
Chromium, mg/l	ND
Chromium (Dissolved), mg/l	ND
Copper, mg/l	ND
Copper (Dissolved), mg/l	ND

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
46595-22	MW-27 (# 11494)	11-18-93

PARAMETER	46595-22
Semivolatile Organics (8270)	
bis(2-Chloroethyl)ether, mg/l	ND
Naphthalene, mg/l	ND
Acenaphthene, mg/l	ND
Phenanthrene, mg/l	ND
Anthracene, mg/l	ND
Fluoranthene, mg/l	ND
Chrysene, mg/l	ND
Benzo(a)Anthracene, mg/l	ND
Benzo(b)fluoranthene, mg/l	ND
Benzo(k)fluoranthene, mg/l	ND
Benzo(a)pyrene, mg/l	ND
Indeno(1,2,3-cd)pyrene, mg/l	ND
Dibenz(a,h)anthracene, mg/l	ND
2-Chlorophenol, mg/l	ND
Phenol, mg/l	ND
2,4-Dimethylphenol, mg/l	ND
2,4,6-Trichlorophenol, mg/l	ND
4-Chloro-3-methylphenol, mg/l	ND
2,4-Dinitrophenol, mg/l	ND
Pentachlorophenol, mg/l	ND
2,4,5-Trichlorophenol, mg/l	ND
Tetrachlorophenols, mg/l	ND
Carbazole, mg/l	ND

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
46595-22	MW-27 (# 11494)	11-18-93

PARAMETER	46595-22
Volatiles by GC/MS	
Chloromethane, mg/l	ND
Bromomethane, mg/l	ND
Vinyl Chloride, mg/l	ND
Chloroethane, mg/l	ND
Methylene Chloride (Dichloromethane), mg/l	ND
1,1-Dichloroethene, mg/l	ND
1,1-Dichloroethane, mg/l	ND
Trans-1,2-Dichloroethylene, mg/l	ND
1,2-Dichloroethane, mg/l	ND
1,1,1-Trichloroethane, mg/l	ND
Carbon Tetrachloride, mg/l	ND
Bromodichloromethane, mg/l	ND
1,1,2,2-Tetrachloroethane, mg/l	ND
1,2-Dichloropropane, mg/l	ND
Trichloroethene, mg/l	ND
Dibromochloromethane, mg/l	ND
1,1,2-Trichloroethane, mg/l	ND
Benzene, mg/l	ND
Cis-1,3-Dichloropropene, mg/l	ND
2-Chloroethylvinyl Ether, mg/l	ND
Toluene, mg/l	ND
Chlorobenzene, mg/l	ND
Ethylbenzene, mg/l	ND

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
46595-22	MW-27 (# 11494)	11-18-93

PARAMETER	46595-22
Dichlorodifluoromethane, mg/l	ND
Methyl-Tert-Butyl-Ether (MTBE), mg/l	ND
1,2-Dibromomethane, mg/l	ND
o-Xylene, mg/l	ND
m&p-Xylene, mg/l	ND
Fluorotrichloromethane, mg/l	ND
Arsenic, mg/l	0.014
Arsenic (Dissolved), mg/l	ND
Chromium, mg/l	ND
Chromium (Dissolved), mg/l	ND
Copper, mg/l	ND
Copper (Dissolved), mg/l	ND
Hydrocarbons (Modified 8015)	
Hydrocarbons as Gasoline, mg/l	ND
Hydrocarbons (Modified 8015 - Ext.)	
Hydrocarbons as Kerosene, mg/l	ND
Hydrocarbons as Heavy Oils, mg/l	ND
Hydrocarbons as Mineral Spirits, mg/l	ND
Hydrocarbons as Varsol, mg/l	ND
Hydrocarbons as Fuel Oil/Diesel, mg/l	ND

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
46595-23	Detection Limits
46595-24	Accuracy (mean % recovery)
46595-25	Precision (% RPD)
46595-26	Analyst Initials
46595-27	EPA Method Numbers

PARAMETER	46595-23	46595-24	46595-25	46595-26	46595-27
Semivolatile Organics (8270)					
Bis(2-chloroisopropyl)ether, mg/l	0.010	---	---	RB	8270
Naphthalene, mg/l	0.010	---	---	RB	8270
Acenaphthene, mg/l	0.010	88 %	8.0 %	RB	8270
Phenanthrene, mg/l	0.010	---	---	RB	8270
Anthracene, mg/l	0.010	---	---	RB	8270
Fluoranthene, mg/l	0.010	---	---	RB	8270
Chrysene, mg/l	0.010	---	---	RB	8270
Benzo(a)Anthracene, mg/l	0.010	---	---	RB	8270
Benzo(b)fluoranthene, mg/l	0.010	---	---	RB	8270
Benzo(k)fluoranthene, mg/l	0.010	---	---	RB	8270
Benzo(a)pyrene, mg/l	0.010	---	---	RB	8270
Indeno(1,2,3-cd)pyrene, mg/l	0.010	---	---	RB	8270
Dibenz(a,h)anthracene, mg/l	0.010	---	---	RB	8270
2-Chlorophenol, mg/l	0.010	98 %	7.1 %	RB	8270
Phenol, mg/l	0.010	82 %	6.1 %	RB	8270
2,4-Dimethylphenol, mg/l	0.010	---	---	RB	8270
2,4,6-Trichlorophenol, mg/l	0.010	---	---	RB	8270
4-Chloro-3-methylphenol, mg/l	0.010	88 %	5.7 %	RB	8270
2,4-Dinitrophenol, mg/l	0.050	---	---	RB	8270
Pentachlorophenol, mg/l	0.050	64 %	1.5 %	RB	8270
2,4,5-Trichlorophenol, mg/l	0.010	---	---	RB	8270
Tetrachlorophenols, mg/l	0.050	---	---	RB	8270
Carbazole, mg/l	0.010	---	---	RB	8270

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LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
46595-23	Detection Limits
46595-24	Accuracy (mean % recovery)
46595-25	Precision (% RPD)
46595-26	Analyst Initials
46595-27	EPA Method Numbers

PARAMETER	46595-23	46595-24	46595-25	46595-26	46595-27
Volatiles by GC/MS					
Chloromethane, mg/l	0.010	---	---	TCS	8240
Bromomethane, mg/l	0.010	---	---	TCS	8240
Vinyl Chloride, mg/l	0.010	---	---	TCS	8240
Chloroethane, mg/l	0.010	---	---	TCS	8240
Methylene Chloride (Dichloromethane), mg/l	0.0050	---	---	TCS	8240
1,1-Dichloroethene, mg/l	0.0050	133 %	3.0 %	TCS	8240
1,1-Dichloroethane, mg/l	0.0050	---	---	TCS	8240
Trans-1,2-Dichloroethylene, mg/l	0.0050	---	---	TCS	8240
1,2-Dichloroethane, mg/l	0.0050	---	---	TCS	8240
1,1,1-Trichloroethane, mg/l	0.0050	---	---	TCS	8240
Carbon Tetrachloride, mg/l	0.0050	---	---	TCS	8240
Bromodichloromethane, mg/l	0.0050	---	---	TCS	8240
1,1,2,2-Tetrachloroethane, mg/l	0.0050	---	---	TCS	8240
1,2-Dichloropropane, mg/l	0.0050	---	---	TCS	8240
Trichloroethene, mg/l	0.0050	129 %	1.6 %	TCS	8240
Dibromochloromethane, mg/l	0.0050	---	---	TCS	8240
1,1,2-Trichloroethane, mg/l	0.0050	---	---	TCS	8240
Benzene, mg/l	0.0050	131 %	1.5 %	TCS	8240

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LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
46595-23	Detection Limits
46595-24	Accuracy (mean % recovery)
46595-25	Precision (% RPD)
46595-26	Analyst Initials
46595-27	EPA Method Numbers

PARAMETER	46595-23	46595-24	46595-25	46595-26	46595-27
Cis-1,3-Dichloropropene, mg/l	0.0050	---	---	TCS	8240
2-Chloroethylvinyl Ether, mg/l	0.0050	---	---	TCS	8240
Toluene, mg/l	0.0050	130 %	0.77 %	TCS	8240
Chlorobenzene, mg/l	0.0050	132 %	0.76 %	TCS	8240
Ethylbenzene, mg/l	0.0050	---	---	TCS	8240
Dichlorodifluoromethane, mg/l	0.0050	---	---	TCS	8240
Methyl-Tert-Butyl-Ether (MTBE), mg/l	0.050	---	---	TCS	8240
1,2-Dibromomethane, mg/l	0.0050	---	---	TCS	8240
o-Xylene, mg/l	0.0050	---	---	TCS	8240
m&p-Xylene, mg/l	0.0050	---	---	TCS	8240
Fluorotrichloromethane, mg/l	0.0050	---	---	TCS	8240
Arsenic, mg/l	0.010	107 %	2.6 %	JS	7060
Arsenic (Dissolved), mg/l	0.010	91 %	2.6 %	JS	7060
Chromium, mg/l	0.010	93 %	0.34 %	AL	6010
Chromium (Dissolved), mg/l	0.010	93 %	0.34 %	AL	6010
Copper, mg/l	0.025	93 %	0.17 %	AL	6010
Copper (Dissolved), mg/l	0.025	93 %	0.17 %	AL	6010
Hydrocarbons (Modified 8015)					
Hydrocarbons as Gasoline, mg/l	0.050	94 %	2.1 %	SLG	8015

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46595-23	Detection Limits
46595-24	Accuracy (mean % recovery)
46595-25	Precision (% RPD)
46595-26	Analyst Initials
46595-27	EPA Method Numbers

PARAMETER	46595-23	46595-24	46595-25	46595-26	46595-27
Hydrocarbons (Modified 8015 - Ext.)					
Hydrocarbons as Kerosene, mg/l	0.30	---	---	LM	8015
Hydrocarbons as Heavy Oils, mg/l	1.0	---	---	LM	8015
Hydrocarbons as Mineral Spirits, mg/l	0.30	---	---	LM	8015
Hydrocarbons as Varsol, mg/l	0.30	---	---	LM	8015
Hydrocarbons as Fuel Oil/Diesel, mg/l	0.30	78 %	15 %	LM	8015

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
46595-28	Date Extracted
46595-29	Date Analyzed

PARAMETER	46595-28	46595-29
Semivolatile Organics (8270)		
Bis(2-chloroisopropyl)ether	11.24.93	12.1/9.93
Naphthalene	11.24.93	12.1/9.93
Acenaphthene	11.24.93	12.1/9.93
Phenanthrene	11.24.93	12.1/9.93
Anthracene	11.24.93	12.1/9.93
Fluoranthene	11.24.93	12.1/9.93
Chrysene	11.24.93	12.1/9.93
Benzo(a)Anthracene	11.24.93	12.1/9.93
Benzo(b)fluoranthene	11.24.93	12.1/9.93
Benzo(k)fluoranthene	11.24.93	12.1/9.93
Benzo(a)pyrene	11.24.93	12.1/9.93
Indeno(1,2,3-cd)pyrene	11.24.93	12.1/9.93
Dibenz(a,h)anthracene	11.24.93	12.1/9.93
2-Chlorophenol	11.24.93	12.1/9.93
Phenol	11.24.93	12.1/9.93
2,4-Dimethylphenol	11.24.93	12.1/9.93
2,4,6-Trichlorophenol	11.24.93	12.1/9.93
4-Chloro-3-methylphenol	11.24.93	12.1/9.93
2,4-Dinitrophenol	11.24.93	12.1/9.93
Pentachlorophenol	11.24.93	12.1/9.93
2,4,5-Trichlorophenol	11.24.93	12.1/9.93
Tetrachlorophenols	11.24.93	12.1/9.93
Carbazole	11.24.93	12.1/9.93

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LOG NO: S3-46595

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Ms. Sandra Watson
Southern Wood Piedmont (WI)
P.O. Box 5477, I-85 and Sigsbee Rd.
Spartanburg, SC 29304

Project: Wilmington, NC
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
46595-28	Date Extracted
46595-29	Date Analyzed

PARAMETER	46595-28	46595-29
Volatiles by GC/MS		
Chloromethane	---	12.01.93
Bromomethane	---	12.01.93
Vinyl Chloride	---	12.01.93
Chloroethane	---	12.01.93
Methylene Chloride (Dichloromethane)	---	12.01.93
1,1-Dichloroethene	---	12.01.93
1,1-Dichloroethane	---	12.01.93
Trans-1,2-Dichloroethylene	---	12.01.93
1,2-Dichloroethane	---	12.01.93
1,1,1-Trichloroethane	---	12.01.93
Carbon Tetrachloride	---	12.01.93
Bromodichloromethane	---	12.01.93
1,1,2,2-Tetrachloroethane	---	12.01.93
1,2-Dichloropropane	---	12.01.93
Trichloroethene	---	12.01.93
Dibromochloromethane	---	12.01.93
1,1,2-Trichloroethane	---	12.01.93
Benzene	---	12.01.93
Cis-1,3-Dichloropropene	---	12.01.93
2-Chloroethylvinyl Ether	---	12.01.93
Toluene	---	12.01.93
Chlorobenzene	---	12.01.93

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LOG NO: S3-46595

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Received: 19 NOV 93

Ms. Sandra Watson
Southern Wood Piedmont (WI)
P.O. Box 5477, I-85 and Sigsbee Rd.
Spartanburg, SC 29304

Project: Wilmington, NC
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
46595-28	Date Extracted
46595-29	Date Analyzed

PARAMETER	46595-28	46595-29
Ethylbenzene	---	12.01.93
Dichlorodifluoromethane	---	12.01.93
Methyl-Tert-Butyl-Ether (MTBE)	---	12.01.93
1,2-Dibromomethane	---	12.01.93
o-Xylene	---	12.01.93
m&p-Xylene	---	12.01.93
Fluorotrichloromethane	---	12.01.93
rsenic	---	12.10.93
Arsenic (Dissolved)	---	12.08.93
Chromium	---	12.09.93
Chromium (Dissolved)	---	12.09.93
Copper	---	12.09.93
Copper (Dissolved)	---	12.09.93
Hydrocarbons (Modified 8015)		
Hydrocarbons as Gasoline	---	11.26.93
Hydrocarbons (Modified 8015 - Ext.)		
Hydrocarbons as Kerosene	11.23.93	12.05.93
Hydrocarbons as Heavy Oils	11.23.93	12.05.93
Hydrocarbons as Mineral Spirits	11.23.93	12.05.93
Hydrocarbons as Varsol	11.23.93	12.05.93
Hydrocarbons as Fuel Oil/Diesel	11.23.93	12.05.93

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LOG NO: S3-46595
Received: 19 NOV 93

Ms. Sandra Watson
Southern Wood Piedmont (WI)
P.O. Box 5477, I-85 and Sigsbee Rd.
Spartanburg, SC 29304

Project: Wilmington, NC
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
46595-30	Report Completion Date

PARAMETER	46595-30
Date Reported	12.22.93

Methods: EPA SW-846
ND = Not Detected

J. W. Andrews, Ph. D.

Final Page Of Report

SAVANNAH LABORATORIES
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05183

- [X] 5102 LaRoche Avenue, Savannah, GA 31404 — Phone: (912) 3[illegible]58 — Fax (912) 352-0165
- [ ] 2846 Industrial Plaza Drive, Tallahassee, FL 32301 — Phone: (904) 8[illegible]94 — Fax (904) 878-9504
- [ ] 414 Southwest 12th Avenue, Deerfield Beach, FL 33442 — Phone: (305) 421-7400 — Fax (305) 421-2584
- [ ] 900 Lakeside Drive, Mobile, AL 36693 — Phone: (205) 666-6633 — Fax (205) 666-6696
- [ ] 6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax (813) 885-7049

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Wilmington Site Specific

P.O. NUMBER	PROJECT NUMBER	PROJECT NAME
	12-53015.00	SWP-Wil

CLIENT NAME	TELEPHONE/FAX NO.
ViroGroup, Inc	803-957-6270 803-957-3845

CLIENT ADDRESS	CITY, STATE, ZIP CODE
1445 Pisgah Church Rd.	Lexington, SC 29073

SAMPLER(S) NAME(S)	CLIENT PROJECT MANAGER
Greg Kuntz James Leaphart	Greg Kuntz

PAGE 1 OF 2

[X] STANDARD TAT
[ ] EXPEDITED TAT *

REPORT DUE DATE _____
* SUBJECT TO RUSH FEES

MATRIX TYPE: AQUEOUS MATRIX / NONAQUEOUS MATRIX / OIL MATRIX / AIR MATRIX

REQUIRED ANALYSES: SV / VOC / Total Metals / CR, Cu, As / Dissolved Metals / Cr, Cu, As / TPH-Diesel / TPH-Gas + MTBE

NUMBER OF CONTAINERS SUBMITTED

SAMPLING DATE	SAMPLING TIME	SAMPLE IDENTIFICATION	AQUEOUS MATRIX	NONAQUEOUS MATRIX	OIL MATRIX	AIR MATRIX	SV	VOC	Total Metals	CR, Cu, As	Dissolved Metals	Cr, Cu, As	TPH-Diesel	TPH-Gas + MTBE				
11-18-93	7:20	MW-29 SWP Log# 11484	X				2	3	1	1	~~2~~	~~3~~						
	7:40	MW-29A 11485																
	8:00	MW-30 11486																
	8:15	MW-25 11487																
	8:30	MW-20 11488																
	8:45	MW-11B 11489																
	9:10	MW-19A 11490																
	1:50	MW-28A 11491																
	2:05	MW-22A 11492																
	2:20	MW-15 11493																
	2:35	MW-27 11494											2	3				
	2:50	MW-19 11495																

RECEIVED JAN 03 1994 Environmental

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	11/11	12:00	[signature]	11.18	1619			

RECEIVED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
Gregory B. Kuntz	11/16/93	7:30	Gregory B. Kuntz	4/18/93	1670			

FOR SAVANNAH LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	S.L. LOG NO.	LABORATORY REMARKS
[signature]	11-19-93	10:12	[X] YES [ ] NO		46595	

SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC. 05182

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☐ 414 Southwest 12th Avenue, Deerfield Beach, FL 33442 — Phone: (305) 421-7400 — Fax (305) 421-2584
☐ 900 Lakeside Drive, Mobile, AL 36693 — Phone: (205) 666-6633 — Fax (205) 666-6696
☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax (813) 885-7049

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

P.O. NUMBER	PROJECT NUMBER	PROJECT NAME	PAGE	OF
	12-53015.00	SWP-Wil	2	2

CLIENT NAME: ViroGroup, Inc.
TELEPHONE/FAX NO.: 803-957-6270 / 803-957-3845
CLIENT ADDRESS: 1415 Pisgah Church Rd.
CITY, STATE, ZIP CODE: Lexington, SC 29072
SAMPLER(S) NAME(S): Greg Kuntz, James Leaphart
CLIENT PROJECT MANAGER: Greg Kuntz

☒ STANDARD TAT
☐ EXPEDITED TAT *
REPORT DUE DATE:
* SUBJECT TO RUSH FEES

MATRIX TYPE: AQUEOUS MATRIX / NONAQUEOUS MATRIX / OIL MATRIX / AIR MATRIX

REQUIRED ANALYSES: Wilmington Site Specific

NUMBER OF CONTAINERS SUBMITTED

SAMPLING DATE	SAMPLING TIME	SAMPLE IDENTIFICATION	AQUEOUS MATRIX	NONAQUEOUS MATRIX	OIL MATRIX	AIR MATRIX	SV	VOC	Total Metal Cr Cu As	Dissolved Metals Cr Cu As
11-18-93	3:05	MW-24 SWP Log# 11496	X				2	3	1	1
	3:15	MW-11A 11497								
	3:25	MW-14A 11498								
	3:40	MW-28 11499								
	3:50	MW-12 ~~11~~ 11500								
	4:00	MW-13 11501								
	4:10	MW-17 11502								
	4:20	MW-16 11503								
	5:00	Field Blank								
		Trip Blank								

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RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	11/17	12:00	[signature]	11/18	1618			
RECEIVED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
Gregory B. Kuntz	11/18/93	7:30	Gregory B. Kuntz	11/18/93	1618			

FOR SAVANNAH LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	S.L. LOG NO.	LABORATORY REMARKS
[signature]	11-19-93	10:13	☑ YES ☐ NO		46595	

Phase III Surface Water Sample Parameter Summary Table - Semi-Volatiles and Metals

PHASE III SURFACE WATER SAMPLE PARAMETER SUMMARY TABLE
SEMI–VOLATILES AND METALS
SOUTHERN WOOD PIEDMONT FACILITY
WILMINGTON, NORTH CAROLINA

	U.S. HIGHWAY #74 BRIDGE		OLD SLIP		GREENFIELD CREEK		STATE PORTS AUTHORITY	
	1/94		1/94		1/94		1/94	
SEMI–VOLATILES	RESULT	DL*	RESULT	DL*	RESULT	DL*	RESULT	DL*
Acenaphthene	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Acenaphthylene	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Anthracene	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Benzo(a)Anthracene	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Benzo(a)Pyrene	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Benzo(b,k)Fluoranthene	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Carbazole	ND	0.010	ND	0.010	ND	0.010	ND	0.010
2–Chlorophenol	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Chrysene	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Dibenzo(a,h)Anthracene	ND	0.010	ND	0.010	ND	0.010	ND	0.010
2,4–Dimethylphenol	ND	0.010	ND	0.010	ND	0.010	ND	0.010
2,4–Dinitrophenol	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Fluoranthene	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Indeno(1,2–cd)pyrene	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Naphthalene	ND	0.010	ND	0.010	ND	0.010	ND	0.010
p–chloro–m–cresol	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Pentachlorophenol	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Phenanthrene	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Phenol	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Tetrachlorophenols	ND	0.050	ND	0.050	ND	0.050	ND	0.050
Trichlorophenols	ND	0.010	ND	0.010	ND	0.010	ND	0.010
METALS								
Arsenic	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Chromium	ND	0.010	ND	0.010	ND	0.010	ND	0.010
Copper	ND	0.025	ND	0.025	ND	0.025	ND	0.025

NOTE: DL = Detection Limit
ND = Below Laboratory Detection Limit
All units in mg/l

Phase III Surface Water Sample Laboratory Analytical Data and QA/QC

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ENVIRONMENTAL AFFAIRS

LOG NO: S4-40324

Received: 20 JAN 94

Ms. Sandra Watson
Southern Wood Piedmont (WI)
P.O. Box 5477, I-85 and Sigsbee Rd.
Spartanburg, SC 29304

CC: Greg Kuntz-ETE

Project: Wilmington, NC
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
40324-1	States Port Authority C/F River Sample # 60 (# 11743)	01-18-94
40324-2	Greenfield Creek # 61 (# 11744)	01-18-94
40324-3	SWP Old Slip # 62 (# 11745)	01-18-94
40324-4	US #74 New Bridge #63 (# 11746)	01-18-94

PARAMETER	40324-1	40324-2	40324-3	40324-4
K001 (Method 8270)				
Chlorophenol, mg/l	ND	ND	ND	ND
Phenol, mg/l	ND	ND	ND	ND
2,4-Dimethylphenol, mg/l	ND	ND	ND	ND
Trichlorophenols, mg/l	ND	ND	ND	ND
p-Chloro-m-cresol, mg/l	ND	ND	ND	ND
Tetrachlorophenols, mg/l	ND	ND	ND	ND
2,4-Dinitrophenol, mg/l	ND	ND	ND	ND
Pentachlorophenol, mg/l	ND	ND	ND	ND
Naphthalene, mg/l	ND	ND	ND	ND
Acenaphthene, mg/l	ND	ND	ND	ND
Acenaphthylene, mg/l	ND	ND	ND	ND
Phenanthrene, mg/l	ND	ND	ND	ND
Anthracene, mg/l	ND	ND	ND	ND
Fluoranthene, mg/l	ND	ND	ND	ND
Chrysene, mg/l	ND	ND	ND	ND
Benzo(a)Anthracene, mg/l	ND	ND	ND	ND
Benzo(b,k)fluoranthene, mg/l	ND	ND	ND	ND
Benzo(a)pyrene, mg/l	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene, mg/l	ND	ND	ND	ND
Dibenzo(a,h)anthracene, mg/l	ND	ND	ND	ND
Carbazole, mg/l	ND	ND	ND	ND
Dilution factor	1	1	1	1

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ENVIRONMENTAL

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Spartanburg, SC 29304

CC: Greg Kuntz-ETE

Project: Wilmington, NC
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
40324-1	States Port Authority C/F River Sample # 60 (# 11743)	01-18-94
40324-2	Greenfield Creek # 61 (# 11744)	01-18-94
40324-3	SWP Old Slip # 62 (# 11745)	01-18-94
40324-4	US #74 New Bridge #63 (# 11746)	01-18-94

PARAMETER	40324-1	40324-2	40324-3	40324-4
Arsenic (7060), mg/l	ND	ND	ND	ND
Chromium (6010), mg/l	ND	ND	ND	ND
Copper (6010), mg/l	ND	ND	ND	ND

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RECEIVED
FEB 28 '94

LOG NO: S4-40324

Received: 20 JAN 94

Ms. Sandra Watson
Southern Wood Piedmont (WI)
P.O. Box 5477, I-85 and Sigsbee Rd.
Spartanburg, SC 29304

CC: Greg Kuntz-ETE

Project: Wilmington, NC
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
40324-5	Detection Limits
40324-6	Accuracy (mean % recovery)
40324-7	Precision (% RPD)
40324-8	Analyst Initials
40324-9	EPA Method Numbers

PARAMETER	40324-5	40324-6	40324-7	40324-8	40324-9
KO01 (Method 8270)					
2-Chlorophenol, mg/l	0.010	108 %	4.6 %	ML	8270
Phenol, mg/l	0.010	110 %	0 %	ML	8270
2,4-Dimethylphenol, mg/l	0.010	120 %	0.83 %	ML	8270
Trichlorophenols, mg/l	0.010	72 %	4.2 %	ML	8270
p-Chloro-m-cresol, mg/l	0.010	116 %	0 %	ML	8270
Tetrachlorophenols, mg/l	0.050	73 %	5.5 %	ML	8270
2,4-Dinitrophenol, mg/l	0.050	102 %	2.9 %	ML	8270
Pentachlorophenol, mg/l	0.050	66 %	29 %	ML	8270
Naphthalene, mg/l	0.010	90 %	2.2 %	ML	8270
Acenaphthene, mg/l	0.010	77 %	7.8 %	ML	8270
Acenaphthylene, mg/l	0.010	88 %	3.4 %	ML	8270
Phenanthrene, mg/l	0.010	86 %	4.6 %	ML	8270
Anthracene, mg/l	0.010	94 %	5.3 %	ML	8270
Fluoranthene, mg/l	0.010	88 %	1.1 %	ML	8270
Chrysene, mg/l	0.010	94 %	3.2 %	ML	8270
Benzo(a)Anthracene, mg/l	0.010	106 %	2.8 %	ML	8270
Benzo(b,k)fluoranthene, mg/l	0.010	99 %	11 %	ML	8270
Benzo(a)pyrene, mg/l	0.010	98 %	10 %	ML	8270
Indeno(1,2,3-cd)pyrene, mg/l	0.010	106 %	4.7 %	ML	8270
Dibenzo(a,h)anthracene, mg/l	0.010	110 %	0.91 %	ML	8270
Carbazole, mg/l	0.010	60 %	12 %	ML	8270

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ENVIRONMENTAL AFFAIRS

LOG NO: S4-40324

Received: 20 JAN 94

Ms. Sandra Watson
Southern Wood Piedmont (WI)
P.O. Box 5477, I-85 and Sigsbee Rd.
Spartanburg, SC 29304

CC: Greg Kuntz-ETE

Project: Wilmington, NC
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
40324-5	Detection Limits
40324-6	Accuracy (mean % recovery)
40324-7	Precision (% RPD)
40324-8	Analyst Initials
40324-9	EPA Method Numbers

PARAMETER	40324-5	40324-6	40324-7	40324-8	40324-9
Arsenic (7060), mg/l	0.010	99 %	6.1 %	PG	7060
Chromium (6010), mg/l	0.010	100 %	3.0 %	JM	6010
Copper (6010), mg/l	0.025	100 %	3.0 %	JM	6010

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ENVIRONMENTAL AFFAIRS

LOG NO: S4-40324

Received: 20 JAN 94

Ms. Sandra Watson
Southern Wood Piedmont (WI)
P.O. Box 5477, I-85 and Sigsbee Rd
Spartanburg, SC 29304

CC: Greg Kuntz-ETE

Project: Wilmington, NC
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
40324-10	Dates Extracted
40324-11	Dates Analyzed

PARAMETER	40324-10	40324-11
K001 (Method 8270)		
2-Chlorophenol	01.24.94	02.17.94
Phenol	01.24.94	02.17.94
2,4-Dimethylphenol	01.24.94	02.17.94
Trichlorophenols	01.24.94	02.17.94
-Chloro-m-cresol	01.24.94	02.17.94
Tetrachlorophenols	01.24.94	02.17.94
2,4-Dinitrophenol	01.24.94	02.17.94
Pentachlorophenol	01.24.94	02.17.94
Naphthalene	01.24.94	02.17.94
Acenaphthene	01.24.94	02.17.94
Acenaphthylene	01.24.94	02.17.94
Phenanthrene	01.24.94	02.17.94
Anthracene	01.24.94	02.17.94
Fluoranthene	01.24.94	02.17.94
Chrysene	01.24.94	02.17.94
Benzo(a)Anthracene	01.24.94	02.17.94
Benzo(b,k)fluoranthene	01.24.94	02.17.94
Benzo(a)pyrene	01.24.94	02.17.94
Indeno(1,2,3-cd)pyrene	01.24.94	02.17.94
Dibenzo(a,h)anthracene	01.24.94	02.17.94
Carbazole	01.24.94	02.17.94
Arsenic (7060)	---	01.21.94
Chromium (6010)	---	01.24.94
Copper (6010)	---	01.24.94

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RECEIVED
FEB 28 1994
ENVIRONMENTAL AFFAIRS

LOG NO: S4-40324

Received: 20 JAN 94

Ms. Sandra Watson
Southern Wood Piedmont (WI)
P.O. Box 5477, I-85 and Sigsbee
Spartanburg, SC 29304

CC: Greg Kuntz-ETE

Project: Wilmington, NC
Sampled By: Client

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES
40324-12	Report Completion Date

PARAMETER	40324-12
Date Reported	02.23.94

Methods: EPA SW-846
ND = Not Detected

J. W. Andrews

J. W. Andrews, Ph. D.

Final Page Of Report

MEMORANDUM

To: File
From: Stuart F. Parker, Jr., Hydrogeologist
Date: October 6, 1994
Re: Southern Wood Piedmont Co.,Wilmington
NCD 058 517 467
Surface Water Pathway Definition

Surface water pathway definition is complicated by the convergence of the Cape Fear and Northeast Cape Fear Rivers, along with tributaries, near the site, as well as the tidal nature of the system.

SFP telephoned Edward Beck, Engineer, NCDEHNR Water Quality Section in Wilmington (910-395-3900) on 7/20/94 to inquire as to the upstream extent of tidal flow reversal. Beck explained that the best definition is made by tracing the 5-foot USGS topographic contour; Rivers are considered to undergo tidal reversal downstream of where the contour crosses them. Based on this definition, the Cape Fear and Northeast Cape Fear Rivers are both tidal for a distance more than 15 miles upstream of the site.

Other sources indicate that 1) Flow reversal occurs on the Cape Fear River as far upstream as Phoenix NC, and 2) Maximum salt water intrusion in the Northeast Cape Fear River reaches north of Castle Hayne, beyond the 15-mile target distance limit (Ref. 37, Figs. 2-3, 2-4, Plate 1).

The upstream 15-mile limit for the Cape Fear River is located in Bulldog Cut, a bend approximately 1 mile upstream of the Brunswick/Pender/New Hanover County junction. The 15-mile upstream limit for the Northeast Cape Fear River is located 1.6 miles below the mouth of Prince George Creek near Castle Hayne, NC. The 2 rivers join 1.7 miles upstream of the site, however, the Brunswick River section bypasses both the junction and the site, forming Eagle Island. The downstream 15-mile limit of the Cape Fear River crosses the river at Reeves point, upstream of the open Atlantic Ocean.

(next page)

15-mile surface water pathway: Using USGS data (Ref.38), SFP estimated flow conditions for the various segments of the surface water pathway, as defined above. For each segment, a representative USGS drainage area (in square miles) was multiplied by the local mean annual runoff (MAR)(Ref. 39) and divided by a conversion factor (13.58) to produce a mean annual discharge (cfs).

A representative average drainage area of the Cape Fear River (CFR), upstream of Eagle Island to the 15-mile limit, is 7616 sq mi. The total drainage area at the lower end of this segment is 8760 sq mi. The representative (average) drainage area of the Northeast Cape Fear River (NE CFR) within the 15-mile limit is 1670 cfs. The total drainage area of this segment is 1637 sq mi.

The CFR segment immediately upstream of the site combines the drainage areas of the NE CFR and the upper CFR, equalling 10,397 sq mi. Sturgeon Creek, Jackey's Creek and Mallory Creek add 34.8 sq mi. to the system below Eagle Island. The SWP site and Greenfield Lake add drainage areas of 0.08 and 3.7 sq mi. Dilution effects of tributary streams further downstream were not factored into this segment's total drainage area. The total drainage area calculated for the lower CFR is therefore 10,436 sq mi. Mean annual discharges in cfs, calculated by the above method, are summarized below. Wetland frontage was tabulated from National Wetland Inventory Maps (see Ref. 40):

(next page)

Segment *	Distance (mi)	Drainage Area (sq. mi.)	Flow (cfs)	Wetland Frontage (mi)
Site/ Drainage Ditch	0-0.19	0.08	1 **	0.45
Greenfield Creek	0.19-0.36	3.81	5.89	0.05
Tidal Reversal:				
CFR (GC to NE CFR)	0.36-1.7	10,397	16,078	1.0
NE CFR	1.7-15	1,637	2,531	42.8
Upper CFR	1.7-15	8,760	13,546	34.4
Normal Flow:				
Lower CFR	0.36-15	10,436	16,138	91.9 ***

* Includes main channel and tidal segments of tributaries.
** Rounded upwards (for PREScore) from 0.12 cfs.
*** Includes Brunswick River.

P. O. Box 5447
Spartanburg, S. C. 29304

Phone 803/576-7660

Ref. 9

Southern Wood Piedmont Company

RECEIVED
JUN 18 1984
SOLID & HAZARDOUS WASTE MANAGEMENT BRANCH

11-M-1.10.7
June 8, 1984

Mr. William Paige
Solid and Hazardous Waste Management Branch
N. C. Department of Human Resources
Box 2091
Raleigh, N. C. 27602

Dear Mr. Paige:

Enclosed please find the detailed procedure we plan to follow in cleaning up our former Wilmington, N. C. plant site. As you know, aerobic breakdown of the wood preservatives is accelerated as temperature increases. In order to take advantage of the summer temperatures and the remainder of our lease term we plan to implement the enclosed procedure at once.

The wood preservative wastes we are subjecting to bacterial degradation are not classified as a hazardous waste under the Resource Conservation Recovery Act or North Carolina's solid waste management regulations. Therefore, we are not asking your office to approve this practice or to issue any form of permit. What we do ask, is that you inform us at once if you believe this procedure will violate any laws or regulations. In the absence of such notice we plan to proceed, as we believe this is the best way to clean the site of residual wood preservatives.

You asked Mr. Ned Button about the stage of the tide corresponding to the November 1982 groundwater samples. We did not record the time these samples were taken so we cannot tie them into the tide stage. We did not observe a significant change of water level in the wells as tide level changed. We do not believe that the groundwater is affected by tide change in this area.

In answer to your question regarding the direction of groundwater flow, our groundwater consultant, Law Engineering and Testing Company, believes that it is flowing somewhat parallel but towards the shoreline. This would mean it is flowing from the city parcel towards the port parcel towards the mouth of the creek south of the plant site.

I did meet again with Mr. Farris of the City and explained in more detail our plans.

We have changed the scope of the procedures to be used and modified the methodology to accommodate the suggestions you made with respect to our initial suggestion submitted on February 13, 1984. If you have further suggestions with respect to monitoring of methodology we would be pleased to discuss them with you, but again we need to know about them in the immediate future.

Very truly yours,

SOUTHERN WOOD PIEDMONT COMPANY

Charles A. Burdell

Charles A. Burdell
Director, Technical Services

CAB:bsb

attachments

cc: E. F. Button - Stamford
E. L. Gibbs

0832T

The following is a list of attachments referenced in the attached proposal. Attachments 1 thru 7 were included in the package mailed to you February 13. Please refer to them.

Attachment 1	-	Map with Locations of Various Deposits
Attachment 2	-	Summary of Groundwater Data
Attachment 3	-	Copy of Law Engineering Testing Company's Findings
Attachment 4	-	Map showing Cape Fear Water Locations
Attachment 5	-	Summary Memo Regarding the Monitoring of the NPDES Discharge
Attachment 6	-	University of Florida Study
Attachment 7	-	EPA Submittal by MSU Illustrating the Breakdown of PCP in the Soil

The below listed Attachments 8 thru 10 are included in this package:

Attachment 8	-	Landfarming Areas Diagram
Attachment 9	-	Landfarming Lysimeter Locations
Attachment 10	-	Extraction and Analytical Procedure/Methods

PROPOSED CLEANUP PROGRAM FOR SOUTHERN WOOD PIEDMONT
WILMINGTON, N. C. PLANT SITE

I. Site Description

The plant is located in Wilmington, New Hanover County, N. C. at the end of Greenfield Street on the Cape Fear River (map attached). There are approximately 39 acres leased from the city and about 7 acres leased from the State Port Authority (SPA). The soil is classified as gray clay and sand to a 3.5' depth by Froehling and Robertson, Inc. There was a 24-hour water table of 19" in the treatment room area when sampled in May of 1971.

II. Site History

The site was originally developed during World War I as a plant to construct concrete barges and ships. Northstate Creosote Company constructed a wood treating plant on the site about 1932. This plant was purchased by the Taylor-Colquitt Company in 1935. In 1964, Southern Wood Preserving Company (now SWP) purchased the Taylor-Colquitt Company and has operated it since then. Through 1971, creosote coal tar was the only preservative used. In 1972, a separate treating system was installed to use the water salt preservatives: copper, chromium, and arsenic (known as CCA). In 1980, penta-petroleum preservative treatment was added using an existing creosote treating cylinder.

In 1975, a large area of cull and broken poles along the city/Port District property line was cleaned up. At this time, a permit was obtained to close a surface drainage ditch on the Port District property which contained settled creosote sludge. This buried material was reported under Superfund (see Section A).

There has never been any aeration water treatment at the Wilmington plant. Original waste water treatment was simple settling and discharge. In recent years, process waste water was given thorough settling and discharged to the Wilmington sewage treatment plant (POTW). More recently, since 1980, the settled effluent was further clarified using a Wemco flotation clarification system prior to discharge to the POTW. Oil and float separated in the settling tanks and in WEMCO have been recycled to the process or burned for fuel value in the plant waste wood boiler. No K001 sludge was ever generated by this treatment approach.

III. Current Status of Site

The plant ceased production in May of 1983. Removal of physical inventory and plant equipment started at that time. At present, all material except three rail tracks have been removed from the State Port Authority property. The ditch area covered in 1975 has grass growing on it. SPA personnel have inspected the site and stated it was acceptable for their use. About one-half of the area nearest the river was used for storage of treated poles and piling.

All the wood inventory has been removed from the city's acreage and raked reasonably clean. The CCA treating tanks and cylinder have been removed. The oil preservative tanks have been removed. The pole machine and maintenance equipment have been removed. All of the tanks and equipment used in handling the process waste water have been removed. The tracks in front of the oil preservative cylinder have been removed back to the road crossing (about 200 feet). We are in the process of having the creosote sludge removed from the large storage tanks.

IV. Description of Treating Chemical Deposits

Please see attached map showing location of various deposits (Attachment 1).

A. Deposits Reported Under Superfund

A Superfund report was filed in June of 1982. A copy of this report is attached, listing four deposits. When this report was filed, we were not clear as to what K001 sludge was. We have since learned that it is sludge resulting from the aerobic stabilization of wood preservative waste waters. As mentioned in section II, no such sludge was ever created at the Wilmington plant.

1. Superfund Area I, Covered Sludge Ditch

This area was described in section II above. Creosote sludges from early plant operations were buried when this ditch was filled.

2. Superfund Area II, Trash Dump Area

This area is a general waste landfill used by the plant for many years. It consists almost exclusively of wood waste, dirt, and metal waste. Small amounts of creosote cleanup material were deposited here from time to time. It was listed under Superfund because of the suspected presence of creosote material.

3. Superfund Area III, Dike Area

Old, hard and solid creosote residuals similar to road tar were used to seal some of the earthfilled dike near the south slip.

4. Superfund Area IV, Trash Fill Area

Part of the north slip was filled with trash a number of years ago. This mill waste consisted of mainly wood waste and metal bands. Some creosote sludge was deposited on the top of part of this area.

B. Operating Area Deposits

1. Track Area

The track area in front of the cylinder was inspected in 1982 by your office and Mr. Ray Church. Two soil samplings were made which showed residuals to a depth of 18" about 10 feet in front of the cylinder and to 6" deep about 200 feet out in front of the cylinder.

2. Treating Areas

The soil areas around both oil treating room buildings have treating chemical residuals. Soil around the working tanks is noticeably contaminated with oil to about two feet deep. The soil area around the waste water-oil recovered tank system is noticeably discolored to about a one-foot depth.

3. Large Storage Tank Containment Area

The soil in this area contains creosote residuals to about a foot in depth.

4. Treated Product Storage Areas

Relatively large areas on both Port District and city property have a small degree of creosote residuals in the soil as evidenced by some discoloration. These are areas where the treated poles were stored prior to shipment.

5. CCA Storage Tank Area

Soil around the CCA storage tanks is discolored and has some CCA chemical content.

6. Storage Tank Sludges

Varying amounts of sludge is present in the bottom of the various treating tanks.

V. Proposed General Approach to Cleanup of Chemical Residuals

A. Landfarming of Contaminated Soils

We propose to utilize the landfarming method to reduce the oil preservative residuals in non-hazardous contaminated soils. This landfarming approach has already been recognized by the North Carolina Solid and Hazardous Waste Management Branch for other wood preserving plant locations. We propose to conduct the landfarming on treated pole storage areas at the Wilmington plant where there are already low levels of preservative residuals in the soil.

Monitoring wells have been in place at the Wilmington site since 1981. The effect on groundwater from years of plant operation is therefore known. Preservative chemicals have been detected at low levels in some of the groundwater samples. A summary of groundwater data is attached (Attachment 2). Our groundwater consultant, Law Engineering, is convinced that this groundwater discharges to the Cape Fear River. Further, there are no groundwater uses that would be impacted. A copy of Law Engineering's findings is also attached (Attachment 3). The Cape Fear River has been tested upstream and downstream at the plant. Treating chemicals were not detected indicating no impact by the site (Attachment 4). The surface drainage at the NPDES discharge to ditch drainage to Greenfield Creek has been monitored and reported for several years. This data is on file at your department, a summary memo is attached (Attachment 5).

We realize that some of our contaminated soils contain traces of pentachlorophenol (PCP). For this reason, an acceptable residual concentration for PCP needs to be established. The University of Florida, Gainesville has established 0.475 ppm as such a concentration. We have attached their study used to develop this proposed standard (Attachment 6). We propose to use 0.475 ppm PCP as an acceptable residual level for soil requiring landfarming, and to consider landfarmed soil having less than this concentration to be acceptable (with respect to PCP). We have also attached information submitted to EPA by Mississippi State University illustrating the breakdown of PCP in the soil (Attachment 7).

We propose to landfarm the contaminated soilds from the following areas:

1. Track area.
2. Treating areas.
3. Treated product storage areas.

These areas have been contaminated with treating chemical residues from working solutions and/or treated product drippage. These deposits occurred slowly over many, many years and tended to "weather" as they were deposited. We are convinced that these contaminated soils are not classified as hazardous waste under RCRA definitions. We are, therefore, not proposing to landfarm RCRA hazardous material.

It is our understanding that standards for creosote residuals in landfarmed soil have not been established as yet. As this is somewhat a site specific question, we propose to discuss this with the Agency after the six-month testing program is completed. We have been in contact with Dr. Gary McGinnis of Mississippi State University regarding possible standards. We will be submitting information that he has developed separately.

B. Disposition of Other Contaminated Material

Following is an outline of our planned disposition of other contaminated material present on the site.

1. Superfund Area I, Filled Ditch

We are currently doing further sampling of this area. We will discuss proposed disposition with the owner, the State Port District, prior to finalizing our disposition plans.

2. Superfund Area II, Trash Dump Area

We propose to leave this area as it is since there is very little creosote material here and it is dispersed in large amounts of wood waste.

3. Superfund Area III, Dike Area

We propose to remove the large chunks of creosote contaminated soil; and landfarm in a treated pole storage area.

4. Superfund Area IV, Trashfill Area

We propose to remove the creosote sludge piled on top of the area and send to a permitted hazardous waste landfill.

Plant Operating Areas

1. Track Area

We propose to remove the visually contaminated soil and to landfarm in a treated pole storage area. After removal of the contaminated soil, we would till the underlying soil in place, soil moisture conditions permitting, to obtain the maximum breakdown of any remaining chemicals. We would not follow the full landfarm procedure, but would fertilize, till and retill one to three times.

2. Oil Treating Areas

We propose to handle as described in Section 1 above.

3. Large Storage Tank Containment Area

The visually contaminated soil will be removed and sent to a hazardous waste landfill. If dry enough, we will till the underlying soil as outlined in section 1 above.

4. Treated Product Storage Area

Those treated pole storage areas not used for landfarming of heavily contaminated soil would be tilled in place as outlined in section 1 for the underlying soil.

5. CCA Storage Tank Area

We propose to remove soil containing CCA salts, as determined by the EPA EP toxicity tests. Some soil has been removed and will be sent to a permitted hazardous waste landfill. Further tests will be made to determine if more soil needs to be removed. If we elect to encapsulate some contaminated soil, we will submit a separate proposal.

6. Storage Tank Sludges

The CCA sludge has already been removed and sent to a hazardous waste landfill.

soil ?

We are in the process of removing the sludges from the bottom of the various oil tanks. These sludges are being burned in one of our pulp mill waste wood boilers (the State of Georgia has approved) to recover heat value. Any sludge that cannot be burned will be sent to a permitted hazardous waste landfill.

VI. Proposed Landfarming Procedure

1. The landfarming will be done in either the Area LF1 or Area LF2, or both, if needed, outlined on the plant layout diagram (Attachment 8). These areas are already lightly contaminated with treating chemical residues from many years use as treated pole storage.

2. The designated landfarm areas will be bermed and ditched to prevent rain runoff or runon.

3. Three to six suction vacuum lysimeters will be installed at one, two, and three foot depths to monitor soil water quality. The proposed lysimeter cluster locations are indicated on the landfarm layout diagram (Attachment 9). These lysimeter clusters will be protected by barricades to prevent damage by tilling equipment. We will install two monitoring wells immediately downgradient of the landfarm areas. We propose to utilize the existing upgradient well. A proposal showing well design and location will be submitted shortly. We are convinced that these samples will demonstrate that the wood treating chemicals are breaking down, not leaching into the groundwater.

4. Contaminated soil from the areas outlined in Section V A above; the treating cylinder track area and treating area; will be spread in a maximum two inch layer over the landfarm area. This will be at a maximum additional rate of 20% of the underlying soil when tilled to a depth of ten to twelve inches. From previous analysis these soils contain less than 5% creosote.

5. Nutrients will be added at an application rate of 200 lbs. per acre as commercial fertilizer (10/10/10 or 10/5/5). 3/- Ratio

6. The initial application of contaminated soil and fertilizer will be thoroughly tilled into the underlying soil to a depth of ten to twelve inches.

7. The soil will be tilled weekly, weather permitting, to promote biological and photochemical breakdown of treating chemical residuals.

8. Sampling and Testing Schedules

   Extraction and analytical procedures are outlined in Attachment 10.

   a. Lysimeters will be sampled for soil water just prior to application of contaminated soil to the landfarm areas, and every two months thereafter. Soil water will be analyzed for total phenol content using the Standard Methods Test 222 Method and for PCP and the creosote compounds using the gas chromatograph method (G/C), EPA SW8040 through 8100.

   b. Soil will be sampled immediately after the initial tilling is completed. It will be resampled after one, two, four, and six months. Soil samples will be sampled at the points indicated on the landfarm diagram (Attachment 8). Samples will be obtained at 0-3", 9-12", and 21-24" depths. The soil samples from each of the two landfarm areas will be composited for equal depths

c. All samples will be analyzed for total extractable phenol. The initial samples and the four and six-month samples will be analyzed by G/C for other organics.

9. After the six month sample analyses results are available, all results will be reviewed with the North Carolina agency.

VII. Outline of Tilling Procedure

All lightly contaminated treated product storage areas and the soil underlying areas not utilized for landfarming where heavily contaminated soil is removed will be tilled to encourage breakdown of any residual treating chemicals that might be present. Some of the areas where soil is removed may be too wet to till due to soil moisture conditions.

1. The overlying soil will be removed for landfarming; or for offsite disposal in the case of the soil around the creosote storage tanks. No soil will be removed from the treated pole storage areas.

2. Immediately after soil removal, fertilizer will be added at the rate of 200 lbs. per acre and the underlying soil will be tilled, soil moisture content permitting.

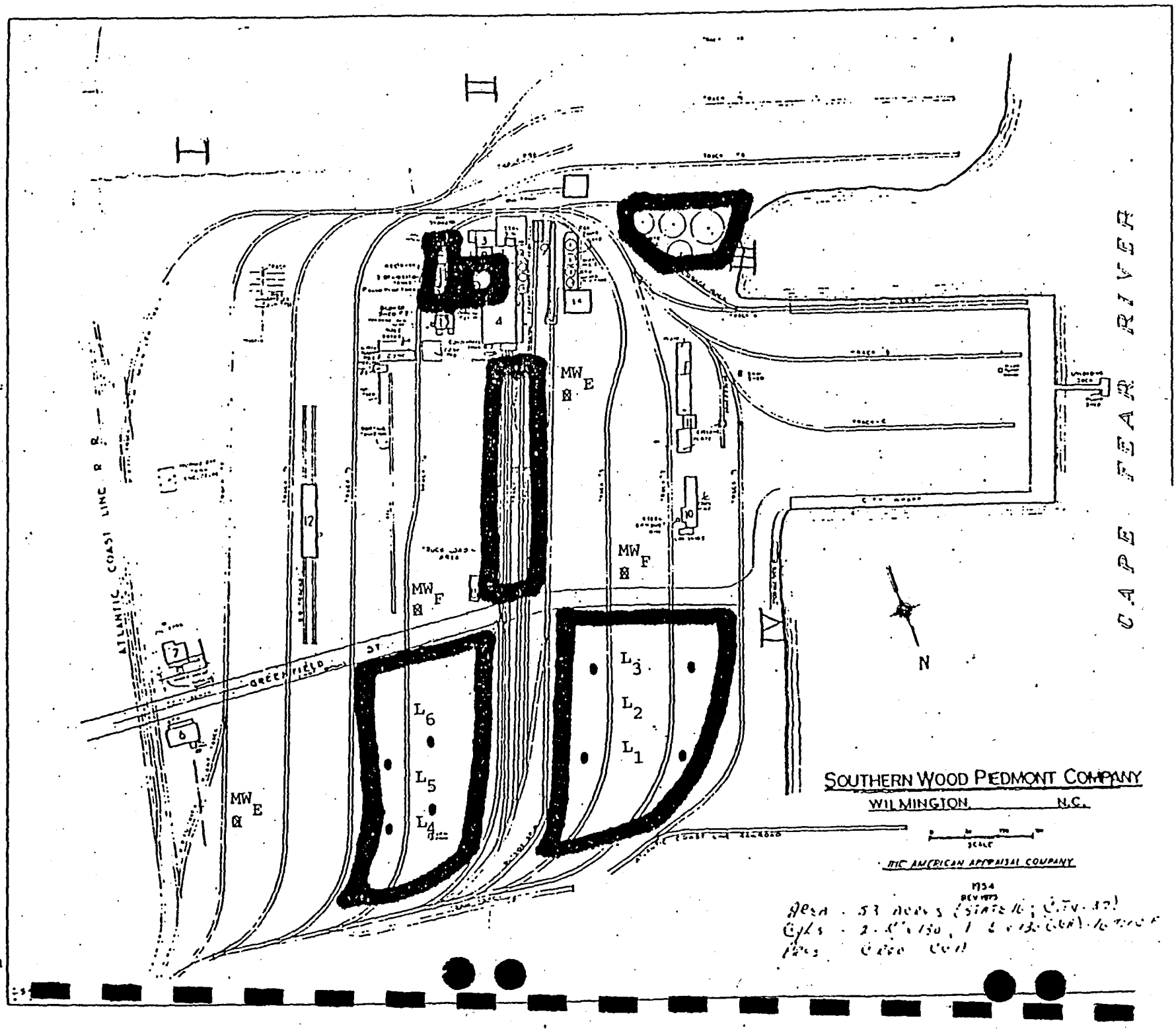
3. Tilling will be repeated weekly for the first 12 to 16 weeks, weather permitting, and will be done once per month until the six months.

4. After six months of tilling, soil samples will be obtained at 0-3", 9-12", and 21-24" depths.

5. Soil samples will be composited by depth for each major area and analyzed for organics by G/C.

6. Analytical results will be reviewed with the agency.

ATTACHMENT 9



NOTES:

L_{1-6} =Lysimeters

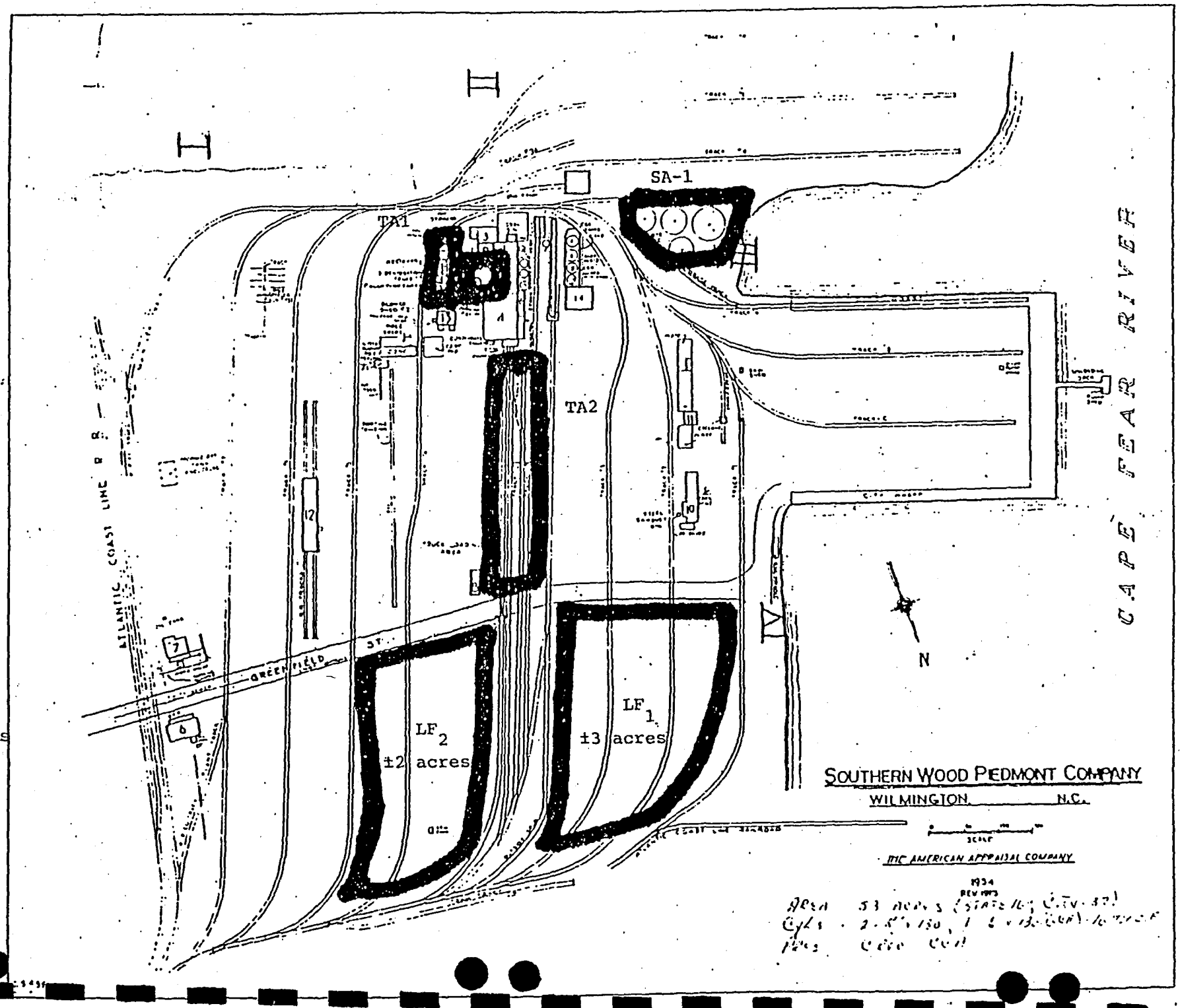
● =Soil Sampling Points

MW⊠ =Monitoring Wells

E =Existing

F =To be added by Law Eng. Recommendation

ATTACHMENT 8



TES
A=Stg. Tank Area
A=Treating Areas
F=Landfarming Areas
F_1=±3 acres
F_2=±2 acres

ATTACHMENT 10

METHODS OF ANALYSIS

Phenol - EPA SW846, 261 or Standard Method for Water and Wastes, Method 222

O & G - Standard Method for Water and Wastes, 209A

Organic - Test Methods for Evaluating Solid Waste, SW846, 8040-8100

CCA - Standard Methods for Water and Wastes, 307B (Cu)
104A (As)
308C (Cu)

Ronald H. Levine, M.D., M.P.H.
STATE HEALTH DIRECTOR

DIVISION OF HEALTH SERVICES
P.O. Box 2091
Raleigh, N.C. 27602-2091

Ref. 10

PA File

August 10, 1984

Mr. Walton Jones
EPA 3012 Regional Project Officer
Air and Hazardous Materials Division
345 Courtland Street, N.E.
Atlanta, Georgia 30365

RE: Preliminary Assessment Reports/
Transmittal Letter

Dear Mr. Jones:

Submitted under this cover are the Preliminary Assessment Reports for the following ERRIS List Sites in North Carolina:

North State Chemicals, Inc. — NCD991278839
3301 Spring Garden Street — Guilford County
Greensboro, N. C. 27407

The location noted here is where the facility began operations sometime in 1978 as a processor and reclaimer of industrial chemical wastes. The company had problems with the property owner and moved to another location. The State forced a cleanup of the second location when the company went out of business in 1983. Both sites are "clean" and are not CERCLA hazardous waste disposal sites.

Based on the review of available information we recommend that no further action is required at this site. It is therefore requested that North State Chemicals be placed on the inactive ERRIS List.

Rohm & Haas, Inc. — NCD039047485
Cedar Creek Road — Cumberland County
Fayetteville, N. C. 28302

This listing is an ERRIS List Duplication and therefore request that it be removed from ERRIS. The correct site identification is: Rohm & Haas Co. - Corodel Plant NCD990714479, Cedar Creek Rd, Fayetteville. The correct listing is already on the ERRIS List and a PA is being completed for the site. The RCRA ID number is also NCD990714479.

Note, past disposal activities of Westinghouse may lead to other disposal locations, off-site.

Southern Wood Piedmont Company — NCD058517467
Greenfield Street — New Hanover County
Wilmington, N. C. 28401

This site was the location of a wood treating facility from 1933 to 1983. They used, spilled and disposed on-site creosote residues, pentachlorophenol residues as well as CCA mixtures. The company is trying to address some of the areas of concern under their closure with RCRA. The other areas will not be cleaned-up. The major CERCLA area reported is where creosote sludges and residues were disposed in a lagoon and later buried. The site is on the edge of the Cape Fear River and G-W is reported to be only 18" below the surface. Significant creosote contamination was visible during a site visit on 7-23-84. (Soil & Water)

Based on the review of available information, we recommend a medium priority for site inspection at this site. Therefore it is requested that Southern Wood Piedmont remain on the active ERRIS List as a hazardous waste disposal site.
Note: Site referred to EPA for FIT evaluation and SI.

Southern Wood Piedmont Company — NCD053488557
SR #2139 — Chatham County
Gulf, N. C. 27256

This site was reported by the company under a CERCLA 103(c) notification for disposal of creosote, PCP and CCA wood treating residues and sludges on site. The site was recommended for a medium priority for site inspection and referred to EPA for FIT evaluation. It was later learned that a FIT SI had been done in 1983. (Attached)

Based on the review of available information and the FIT SI a low priority for follow-up is recommended. This is based primarily on the conclusion that the FIT SI detected no off-site impact from past disposals. However, it is requested that this site remain on the active ERRIS List.

Note: The company is reportedly planning to do additional site clean-up in the future.

Please find attached the site summary sheet for the above sites.

If you have any questions or comments regarding the contents of this report, please call me.

Sincerely,

Frank E. Moore

Frank E. Moore, Geologist

Solid & Hazardous Waste Management Branch
Environmental Health Section

FEM:jj

PRELIMINARY ASSESSMENTS SUBMITTED TO EPA

Date August 13, 1984

EPA ID NUMBER	SITE NAME	DISPOSITION			
		PRIORITY-INSPECTION			NO FURTHER ACTION
		HIGH	MEDIUM	LOW	
NCD991278839	N. State Chemicals, Inc.				X
NCD039047485	Rohm & Haas, Inc.		(Duplication)		X
NCD990715625	Hoover Universal, Inc.				X
NCD980839757	Indian Grave Gap Drum Disposal		X		
NCD000831065	Photo Chem Systems, Inc.				X
NCD991277807	Woolfolk Chemical Wks.				X
NCD980557920	DuPont/Brevard		(Duplication)		X
NCD003152329	DuPont		X to	X	
NCD080894645	Chloride Automotive Batt.				X
NCD003195963	Westinghouse		X		
NCD058517467	Southern Wood Piedmont		X		
NCD053488557	Southern Wood Piedmont		X to	X	

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
SITE INFORMATION AND ASSESSMENT

NCD058517467 NEW HANOVER
SOUTHERN WOOD PIEDMONT CO#
PO BOX 450 GREENFIELD ST
WILMINGTON NC 28401

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NC	D058517467

02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER

04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
		New Hanover	065	07

09 COORDINATES LATITUDE	LONGITUDE
34 12 45.0	077 57 15.0

10 DIRECTIONS TO SITE (Starting from nearest public road)

Map attached -

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)
City of Wilmington - N.C. Ports Authority	

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
Wilmington	NC	28401	( )

07 OPERATOR (If known and different from owner)	08 STREET (Business, mailing, residential)
Southern Wood Piedmont Company	P. O. Box 5447

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
Spartanburg	SC	29304	(803) 576-7660

13 TYPE OF OWNERSHIP (Check one)

☒ A. PRIVATE ☐ B. FEDERAL: _____ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)

☒ A. RCRA 3001 DATE RECEIVED: / / (MONTH DAY YEAR) ☒ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: / / (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES DATE 7 / 23 / 84 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☒ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)
CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)
☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
1933 (BEGINNING YEAR) | 1983 (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

Creosote, pentachlorophenol (PCP), and CCA wood preserving residues. Several disposal areas on site, with spills, leaks and drippings in production areas. (52 ac. tract)

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

Surface and G-W contamination known as well as several acres of soil contamination. Part of the area is being addressed under RCRA - Most will not be. This site is adjacent to Cape Fear River. Referred to FIT Team for SI.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)

☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
William Paige	Engr. S& HW Mgt. Br., N. C.	919) 733-217

PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
O. W. Strickland	DHR	S&HW Mgt. Br.	(919) 733-2178	7 / 24 / 84 (MONTH DAY YEAR)

FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NC	D058517467

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☒ A. SOLID
- ☐ B. POWDER, FINES
- ☐ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☒ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____

CUBIC YARDS Unknown

NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- ☒ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☒ D. PERSISTENT
- ☒ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☒ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	Yes		Several on-site disposal areas
OLW	OILY WASTE	500,000	gallons	estimate of ditch 500' x 25'x5
SOL	SOLVENTS			
PSD	PESTICIDES			
CCC	OTHER ORGANIC CHEMICALS	yes		
ICC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS	Yes		Chromium from CCA

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently used CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
SLU	Creosote		Landfill & OD		
OLW	Creosote		Landfill		
	Pentachlorophenol	87-86-5			
CCC	PCP (penta)	87-86-5	OD LF		
MES	CCA Chromated,		OD LF		
	Copper Arsenate				

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

CRA Files
Site Visit 7-23-84

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NC	D058517467

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [X] A. GROUNDWATER CONTAMINATION — 02 [ ] OBSERVED (DATE: 7-23-84) — [X] POTENTIAL — [X] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ---
04 NARRATIVE DESCRIPTION

G-W is contaminated - oil sheen visable on water. Water table reported 18" below surface - discharge to Cape Fear River and Greenfield Creek.

01 [X] B. SURFACE WATER CONTAMINATION — 02 [ ] OBSERVED (DATE: 7-23-84) — [X] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ---
04 NARRATIVE DESCRIPTION

Observed oily sheen on water in several areas on site.

01 [X] C. CONTAMINATION OF AIR — 02 [ ] OBSERVED (DATE: 7-23-84) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED:
04 NARRATIVE DESCRIPTION

Votatiles coming off "tars" in large storage tanks

01 [X] D. FIRE/EXPLOSIVE CONDITIONS — 02 [ ] OBSERVED (DATE:) — [X] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED:
04 NARRATIVE DESCRIPTION

In tank storage area - large tanks were cut open to clean out the bottoms. Very high BTU & votatile.

01 [ ] E. DIRECT CONTACT — 02 [ ] OBSERVED (DATE:) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED:
04 NARRATIVE DESCRIPTION

N/A

01 [X] F. CONTAMINATION OF SOIL — 02 [ ] OBSERVED (DATE: 7-23-84) — [ ] POTENTIAL — [ ] ALLEGED
03 AREA POTENTIALLY AFFECTED: 50 ac. (Acres)
04 NARRATIVE DESCRIPTION

Contamination is greater in tank storage and production areas - less in finished product storage areas - plus disposal sites. (see maps)

01 [ ] G. DRINKING WATER CONTAMINATION — 02 [ ] OBSERVED (DATE:) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED:
04 NARRATIVE DESCRIPTION

None reported

01 [ ] H. WORKER EXPOSURE/INJURY — 02 [ ] OBSERVED (DATE:) — [ ] POTENTIAL — [ ] ALLEGED
03 WORKERS POTENTIALLY AFFECTED:
04 NARRATIVE DESCRIPTION

None reported

01 [ ] I. POPULATION EXPOSURE/INJURY — 02 [ ] OBSERVED (DATE:) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED:
04 NARRATIVE DESCRIPTION

N/A

EPA

TENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: NC
02 SITE NUMBER: D058517467

ARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☒ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: 7-23-84) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Some stressed vegatation in disposal areas.

01 ☒ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) X☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

Unknown

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) X☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Unknown

01 XX M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids/leaking drums) — 02 ☐ OBSERVED (DATE: 7-23-84) X☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

Disposal in land filled areas and a ditch area as well as in production areas

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Unknown

XO. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL X☒ ALLEGED
NARRATIVE DESCRIPTION

Unknown - materials were discharged to sewer WWTP

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Unknown

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

Although RCRA is trying to address this site many areas of concern will remain untouched.

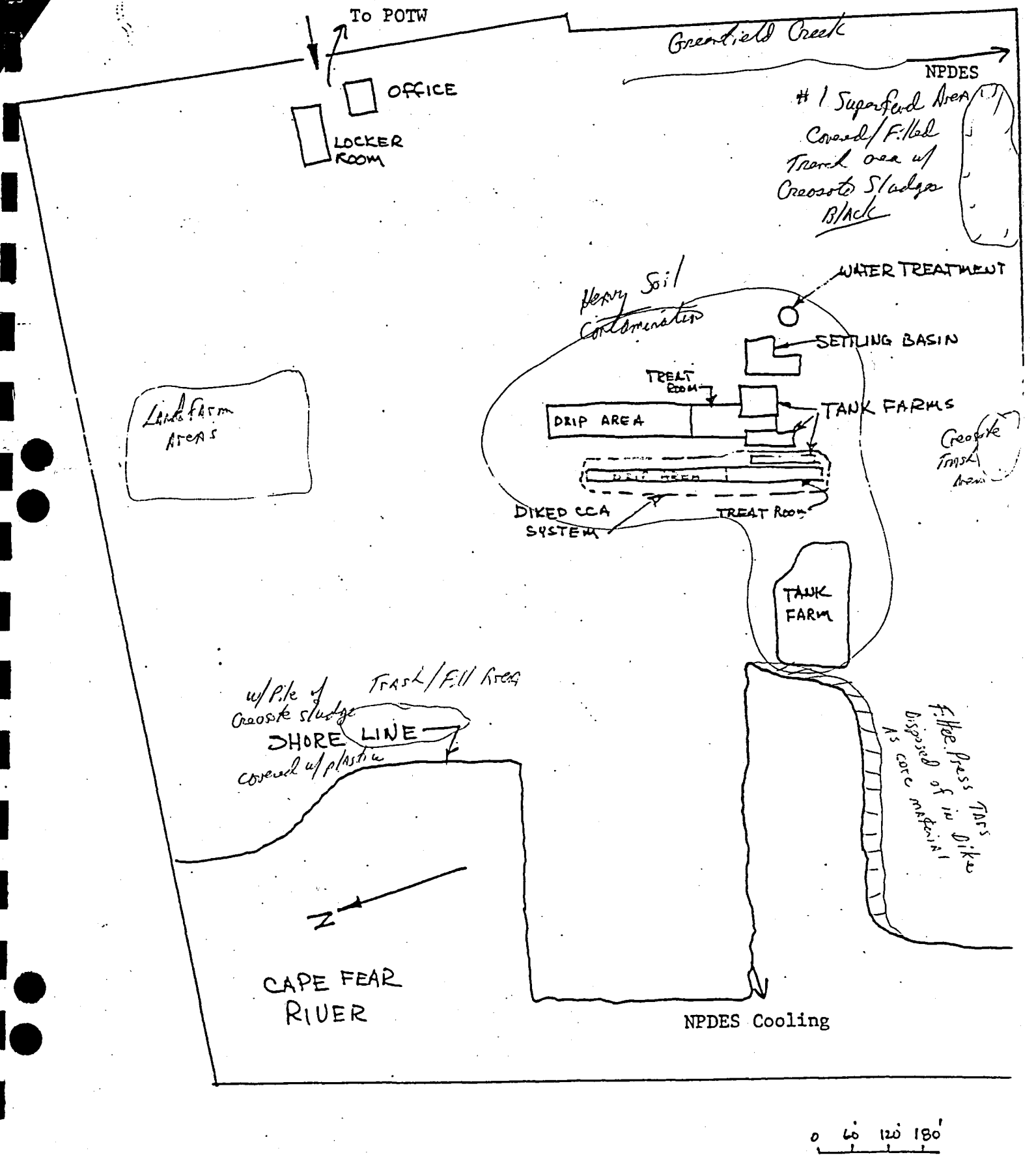
V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Site visit 7-23-84
RCRA Files

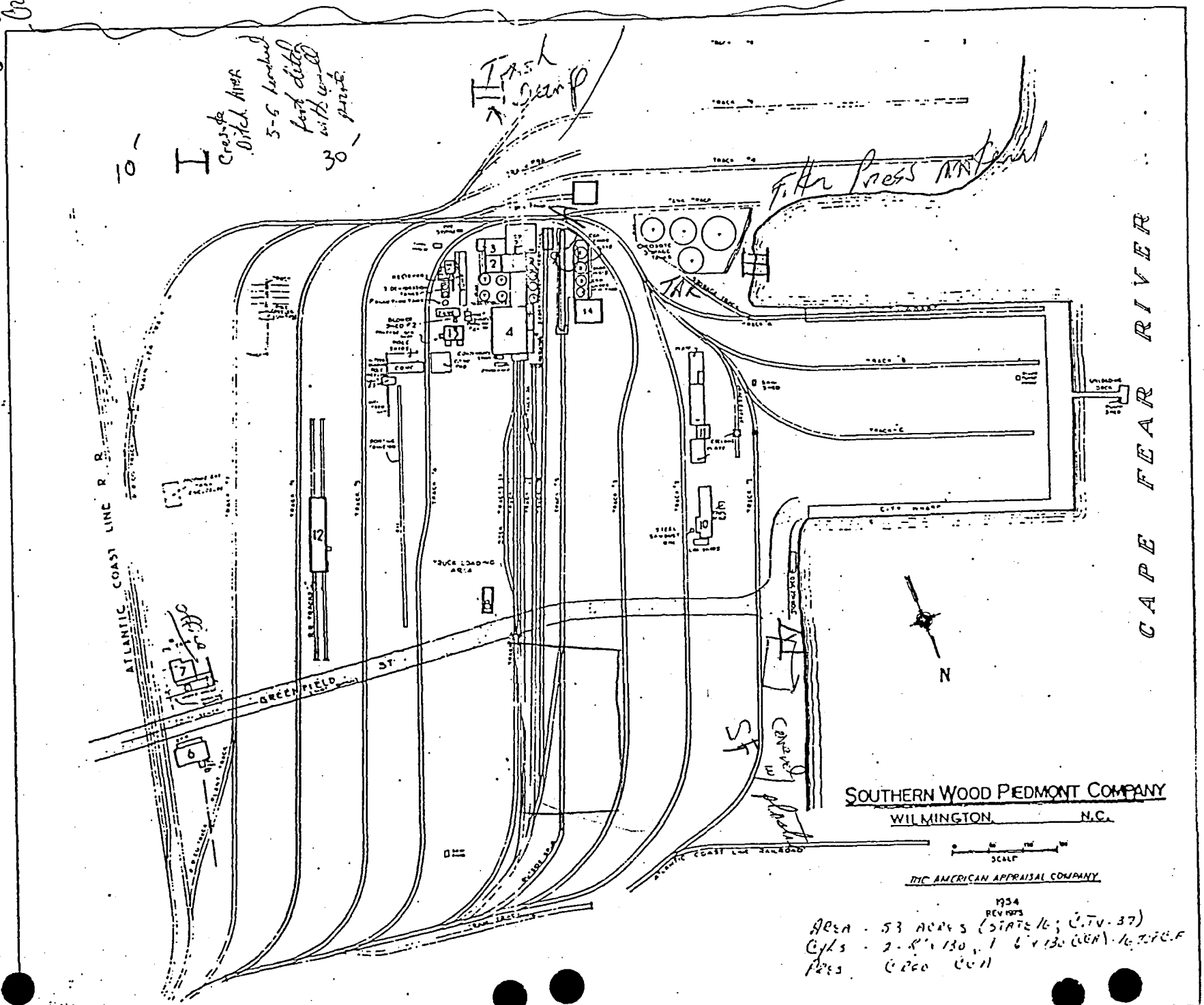
NG (see page 4)

WILMINGTON

Sketch & Notes
Site Visit 7-23-84
F.M.



ATTACHMENT 1



STATE OF NORTH CAROLINA DEPARTMENT OF HUMAN RESOURCES

DEPARTMENT OF HEALTH SERVICES

In Re: SOUTHERN WOOD PIEDMONT COMPANY NCD058517467	)))	ADMINISTRATIVE ORDER ON CONSENT

BACKGROUND

From about 1964 to 1983, Southern Wood Piedmont Company (Southern Wood), a subsidiary of ITT Rayonier, Inc., a Delaware corporation, owned and operated a plant in Wilmington, North Carolina, which engaged in the business of wood preserving. The preservatives used were creosote coal tar, pentachlorophenol (PCP) in diesel oil and copper, chromate and arsenate (known as CCA). As part of that operation, residues were deposited in several locations on the plant site. The areas, identified in Southern Wood's February 13, 1983, correspondence to Mr. William Paige, Environmental Engineer, are summarized in Attachment I and shown in the map in Attachment II.

AGREEMENT

In order to resolve a dispute regarding the applicability of the Resource Conservation and Recovery Act (RCRA) and the Solid Waste Management Act and rules (N.C.G.S. 130-A, Article 9 and 10 NCAC 10 F), and to avoid costly protracted litigation, Southern Wood and the State do hereby enter into this Administrative Order on Consent (Consent Order).

The purpose of this Order is to address soil and ground water contamination and to provide clean-up/remedial actions which will minimize the site's impact on the environment and public health in a manner which is consistent with the State and Federal hazardous waste laws and rules.

Therefore, in order to further the public interest and to protect the public health and environment, Southern Wood Piedmont and the State, by and through their authorized representatives, do enter into the following Consent Order and agree:

1. That Southern Wood is a Delaware corporation, which rents a plant site in North Carolina at Wilmington owned by the city of Wilmington and the Port Authority of the State.
2. That, to protect the public health and environment, the Solid and Hazardous Waste Management Branch, Environmental Health Section, Department of Human Resources of the State of North Carolina (State) is empowered to implement and seek compliance with the standards for generation, transportation, treatment, storage and disposal of waste pursuant to the Solid Waste Management Act, N.C.G.S. Chapter 130-A (Act), and the rules promulgated thereunder at 40 CFR 260-271, codified at 10 NCAC 10 F (rules). The State has been authorized to implement the State program in lieu of the Federal hazardous waste program under the Resource Conservation and Recovery Act (RCRA). William L. Meyer, Head of the Branch, has been delegated those responsibilities.
3. This Consent Order shall apply and be binding upon Southern Wood, its successors and assigns and upon all persons or firms acting under or for them. Southern Wood shall provide a copy of this Consent Order to each contractor or other person performing any work under this Order and shall condition each contract or agreement for such work upon these Consent Order terms.
4. That nothing in this Consent Order shall be construed as limiting the State from performing its duty to protect the public health and the environment of the State as required by law.

5. That nothing herein shall be construed to affect any rights, claims or defenses as may exist between Southern Wood and any other person or entity.

6. That the State shall suspend the Compliance Order and Notice of Penalty, dated September 7, 1984, if compliance with this Consent Order is achieved as set forth herein. If compliance with this Order is not achieved, the September 7, 1984, Order and penalty shall become effective immediately upon written notice.

7. That Southern Wood shall continue with the ongoing remedial action being implemented in the operating areas as set forth in the remedial action plan submitted to the State on July 31, 1984, as modified by the terms of this Order. This action currently consists of land treatment to reduce the oil preservative residuals in contaminated soil to an acceptable residual level. The land treatment shall be conducted on treated pole storage areas where there are presently low levels of preservative residuals in the soil.

The contaminated areas described below shall be addressed in the following manner:

a. Superfund Area I

Excavate this area and landfarm the discolored soil in one of the treated pole storage areas.

b. Track Area

Remove the visually, heavily contaminated soil and landfarm in a treated pole storage area.

c. Oil Treating Areas

Remove the visually, heavily contaminated soil and landfarm in a treated pole storage area.

d. Large Storage Tank Containment Area

Remove the visually, heavily contaminated soil and landfarm in a treated pole storage area.

e. Treated Product Storage Area

The treated pole storage areas not used for landfarming of heavily contaminated soil shall be tilled in place.

f. CCA Storage Tank Area

Soil testing 0.5PPM arsenic or greater on the basis of the EP toxicity test for arsenic will be excavated from the site, but not from a depth in excess of five feet. Soil testing greater than 5.0 PPM arsenic will be sent offsite to a permitted land disposal facility, while soil which contains between 5.00 PPM and 0.5PPM arsenic will be mixed with Portland cement in a ratio which does not allow arsenic to extract above 0.5PPM as determined by the EP toxicity test. The treated material will then be buried on site.

g. Storage Tank Sludges

Remove the CCA sludge for disposal in a hazardous waste landfill. Remove the sludges from the bottom of the various oil tanks for disposal or energy recovery in a State approved landfill, incinerator, or boiler that has no outstanding Class I RCRA violations, or a landfill or combustion process out of the State which is approved by the environmental agency of the state concerned.

h. The landfarming will be done in an area identified as LF1 or LF2, or both, if needed, as outlined on the plant layout diagram (Attachment II).

i. The designated landfarm areas will be bermed and ditched to prevent rain runoff or runon.

j. Lysimeters will be installed at depths sufficient to monitor soil water quality. These lysimeters shall be protected to prevent damage by tilling equipment. Three down gradient monitoring wells and one upgradient monitoring well shall be installed to monitor groundwater quality. Groundwater monitoring devices shall be in accordance with the standards established by the Division of Environmental Management, Department of Natural Resources.

k. Contaminated soil from the areas identified earlier shall be spread not to exceed a maximum two-inch layer over the landfarm area. Land treatment shall be limited to the upper six inches.

l. The application of a commercial fertilizer shall be determined based upon soil analysis.

m. The soil will be tilled weekly, weather permitting, to promote biological and photochemical breakdown of treating chemical residuals.

n. Tillage and aeration of the land treatment areas shall continue until residual concentrations are determined not to have a significant impact on the public health and the environment as determined by the State.

8. That Southern Wood shall adhere to the following sampling and testing schedule:

   a. Lysimeters will be sampled prior to application of contaminated soil to the landfarm areas, and every two months thereafter.

   b. Soil will be sampled immediately after the initial tilling is completed. Samples will be obtained at 0-3", 9-12", and 21-24" depths. The soil sampling will be in accordance with SW 846.

   c. All samples (soil, water) will be analyzed for PCP and the major constituents of creosote.

   d. The sample results shall be submitted to this agency within 7 days after analysis.

9. All sampling and analysis shall be in accordance with EPA Publication, SW-846, "Test Methods for Evaluating Solid Waste" as revised.

10. That the landfarming operation will continue until a concentration of residual PCP and major constituents of creosote is reached which will protect public health and the environment. At this time it is not known what these concentrations are or how long it will take to reach them, but it is possible that up to two years may be required to stabilize the waste taken from Superfund Area I. Nothing in this order shall be interpreted to preclude Southern Wood from exercising its right to challenge any State determination as to safe residual concentrations if the company does not agree with such determination.

11. It is recognized that groundwater flow under the site is towards the Cape Fear River and that any contaminants reaching the groundwater from the site should eventually reach the river. Accordingly, Southern Wood will monitor the Cape Fear River upstream and downstream from the site to see if any water quality standard which could be affected by residues at the site is causing a violation of state water quality standards. Such monitoring shall be done at least twice per year during the time the land treatment operation to which this Order is in process. Further action to protect surface water quality standards or groundwater may be required by the Department of Human Resources or the Department of Natural Resources and Community Devlopment pursuant to Chapter 143, Articles 21, 21A, and Chapter 87, Article 7 of the North Carolina General Statutes and 15 NCAC 2C, 2E, and 2L depending on the results of such monitoring, and the parties expressly reserve their respective rights with respect to such further action.

12. That Southern Wood shall arrange with the owners of the property, City of Wilmington and the State Port Authority, to provide the notice in the deed that the land has been used for hazardous waste as required by 40 CFR 265.120 codified at 10 NCAC 10 F .0033.

13. That Southern Wood shall complete the clean-up remedial steps authorized in the Consent Order and the Plan in paragraph 7(f) & (g) by November 1, 1985, and shall also commence land treatment of contaminated soil from areas a, b, c, d, and e as described in paragraph 7 by November 1, 1985.

14. The scope of the State's overview shall consist of the following:

    a. The option to inspect the work performed and to collect and perform analysis of waste and soil samples upon any phase completion.

    b. A comprehensive site inspection and record review after June 1, 1985 to determine compliance with the approved plan and other terms of the order.

15. The Branch shall designate Mr. William Paige, Environmental Engineer, as the primary contact for technical matters concerning the implementation of the plan. Mr. Jerry Rhodes, Environmental Chemist, will be available upon Mr. Paige's absence. Other Branch resources may be used for review and inspection as determined by Mr. Paige or Mr. Rhodes.

16. Southern Wood will designate one person as the primary contact for technical matters concerning implementation of the plan.

Attachment I

DEPOSITS REPORTED UNDER SUPERFUND

1. Superfund Area I, Covered Sludge Ditch
An area described as a covered ditch containing creosote sludges from early plant operations. The location is on property leased fron the State's Port Authority.

2. Superfund Area II. Trash Dump Area
An area described as a general waste landfill used by the plant for many years. It is believed to consist almost exclusively of wood waste, dirt, and metal waste. Small amounts of creosote cleanup material may also have been deposited here.

3. Superfund Area III, Dike Area
An area containing old, hard and solid creosote residuals similar to road tar were disposed of in an area near the south slip.

4. Superfund Area IV, Trash Fill Area
Located in the north slip, this area was filled with mill waste consisting of mainly wood waste and metal bands. Some creosote sludge was deposited on the top of part of this area.

OPERATING AREA DEPOSITS

1. Track Area
An area located in front of a treatment cylinder. Residual samples collected by Southern Wood suggest contamination to a depth of approximately six (6) inches.

2. Oil Treating Areas
The soil areas around both oil treating room buildings contain treating chemical residuals. Soil around the working tanks is noticeably contaminated with oil to a depth of approximately two feet. The soil area around the waste water-oil recovered tank system is noticeably discolored to about a one foot depth.

3. Large Storage Tank Containment Area
The soil in this area contains creosote residuals to a depth of approximately one foot.

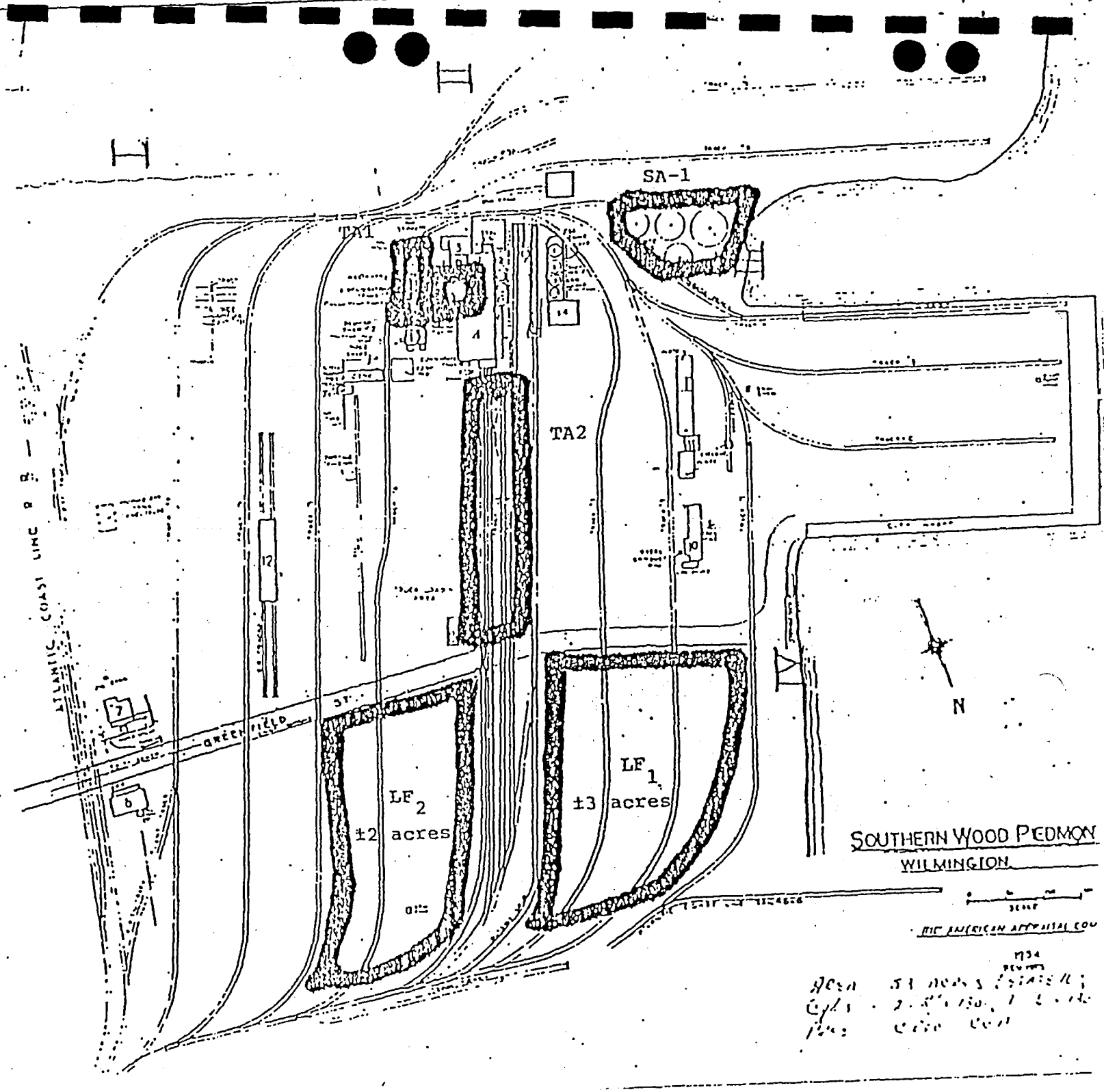
4. Treated Product Storage Areas
Relatively large areas on both State Port Authority property and City of Wilmington property contain creosote residuals in the soil as evidenced by some discoloration. These are areas where the treated poles were stored prior to shipment.

5. CCA Storage Tank Area
Soil around the CCA storage tanks is discolored due to CCA residuals.

6. Storage Tank Sludges
Varying amounts of sludge is present in the bottom of the various treating tanks.

2044A

ATTACHMENT 7



NOTES:
SA=Stg. Tank Area
TA=Treating Areas
LF=Landfarming Areas
LF_1=±3 acres
LF_2=±2 acres

IN WITNESS WHEREOF, the parties have executed this Agreement, on this the 20th day of May, 1985, by their duly authorized representatives.

Solid and Hazardous Waste Management
Branch, Environmental Health Section
Division of Health Services
Department of Human Resources of the
State of North Carolina

By: William L Meyer
William L. Meyer, Head

Southern Wood Piedmont Company

By: Timothy H Brannon
Vice President and Chief Operator

Ref. 12

DATA SUMMARY REPORT FOR THE 1990 LANDFARM AREA SAMPLING, SOUTHERN WOOD PIEDMONT COMPANY, WILMINGTON, NORTH CAROLINA

September 1993

NC09006

Prepared for:

SOUTHERN WOOD PIEDMONT COMPANY
Spartanburg, South Carolina

Prepared by:

GERAGHTY & MILLER, INC.
Environmental Services
2840 Plaza Place - Suite 350
Raleigh, North Carolina 27612
(919) 571-1662

1387swp

1.0 INTRODUCTION

Geraghty & Miller, Inc., (G&M) was retained by the Southern Wood Piedmont (SWP) company to sample the soils in the Wilmington landfarm areas. Ground-water samples were also collected from four ground-water monitor wells, one upgradient and three downgradient from the land farm areas. The purpose of the sampling was to provide baseline data with which to conduct a risk assessment. This risk assessment was to evaluate whether a "concentration of residual pentachlorophenol (PCP) and major constituents of creosote is reached which will protect public-health and the environment," according to the terms of the Administrative Order of Consent Agreement (North Carolina Department of Human Resources, 1985), paragraph 10.

This report presents a brief history of the landfarming operations at the site, a discussion of the site environmental setting, the sampling and analysis methodologies used, and a discussion of the results.

2.3 LANDFARM HISTORICAL DATA REVIEW

The MSUFPRD analytical data of PAHs in soil taken from two landfarm areas (LF1 and LF2) between 1985 and 1990 were reviewed to determine the efficiency of the landfarm bioremediation activities. Total PAH concentrations substantially declined following applications of discolored spoil pile soil material to the two landfarm areas. As expected, the degradation rates varied between the different PAHs. PAHs with two aromatic rings were found to degrade more rapidly than PAHs with four or more aromatic rings. These findings are in agreement with the literature which showed the degradation rates to be dependent upon the molecular size and structure of the PAHs. According to MSUFPRD, PAHs detected in the landfarms can be divided into three groups based on the observed half-lives: (a) PAHs with half-lives of 10 days or less, (b) PAHs with half-lives of 10 to 100 days, and (c) PAHS with half-lives of more than 100 days (Table 2-1). PAHs with half-lives ranging from 10 to 100 days comprised the majority of the PAHs that were detected in the soil samples obtained from LF1 and LF2.

Generally the PAH concentrations measured in the surficial soil samples (i.e., 0 to 3 inches) exceeded the concentrations measured in the 9- to 12-inch and 21- to 24-inch layers within the two landfarm areas. The comparatively lower levels that were detected in the deeper layers may be explained in two ways: First during the initial period of landfarm operation the deeper soil samples were collected from the indigenous substrate soil, not soil from the spoil pile. It is also conceivable that the deepest soil sampling interval (i.e., 21- to 24-inches) consisted predominantly of indigenous substrate soil even during the final stages of the landfarm operation. The depth of the landfarm material on October 10, 1990 ranged from 12- to 30-inches. Secondly as a result of frequent spoil applications soil below 0 to 3 inch contained spoil pile material which was applied at an earlier date. These earlier applications would be subject to a longer period of bioremediation and enhanced removal of PAHs. For the above reasons, evaluation of the data for short-term degradation rates was limited to the 0- to 3-inch soil layer.

Three 4- to 6-months periods each consisting of 3 to 4 sampling events not interrupted by the addition of soil pile material were used to assess the short-term degradation of PAHs in LF1 and LF2. The first period began with the addition of affected (discolored) soil to LF1 and LF2 on June 5, 1986. The addition resulted in increased total PAH concentrations in samples collected eleven days latter on June 16, 1986. Figures A1 and A2 in Appendix A show total concentrations of PAHs grouped by their half-life spans at different sampling periods. Subsequent samples taken on August 4, October 1 and December 1, 1986, in LF1 and on August 4 and October 1, 1986, in LF2 exhibited a gradual decrease in total PAH concentrations. Total concentrations of PAHs with half-lives of less than 10 days and of PAHs with half-lives of 10 to 100 days were reduced after 2 to 4 months following June 16, 1986. Degradation of total PAHs with half-lives greater than 100 days was also observed but to a much lesser extent. Higher total PAH concentrations were detected in LF2 as compared to LF1 (Figures A1 and A2, Appendix A).

On August 25, 1986, and on August 25 and November 11, 1986, chicken and turkey manure was added to LF1 and LF2, respectively. These manure additions appeared to have enhanced the biodegradation of PAHs. An evaluation of degradation rates of individual PAHs in LF1 indicated that acenaphthene, acenapthylene and 1-methylnaphthalene were completely degraded within 2 months after June 16, 1986, (Figures A3-A5, Appendix A). Fluorene, dibenzofuran, biphenyl, 2-methylnaphthalene, naphthalene, carbazole, benzo(a)pyrene, and benzo(g,h,i)perylene were degraded within 4 months after June 16, 1986, (Figures A6-A13, Appendix A). Anthracene, phenanthrene, fluoranthene, pyrene, benzo(a)anthracene and chrysene, however, were found to persist at low concentrations after 6 months starting June 16, 1986, (Figures A14-A19, Appendix A). Although the degradation of individual PAHs in LF2 are not shown here, the trends were similar to individual PAHs in LF1.

Results for phenol and PCP in LF1 are shown in Figure A20 and A21, respectively. Figures A22 and A23 represent soil concentrations of phenol and PCP in LF2. The results in

Figures A20-A23 show persistence at low soil concentrations after 6 months starting June 16, 1986.

The second sampling period that was evaluated extended from November 9, 1987, to April 20, 1988, in LF1 and November 10, 1987, to April 28, 1988, in LF2. Soil samples were collected for laboratory analyses on November 16 (1987), January 19 (1988), March 1 (1988), and April 11 (1989) from LF1 and LF2. The soil samples that were collected on November 16, 1987 exhibited increased concentrations of total PAHs following spoil pile soil application on November 9 (1987) in LF1 and November 10 (1987) in LF2 (Figures A24 and A25, respectively, Appendix A). Total PAH concentration detected during the second sampling period were comparatively higher than those measured during the first sampling period (compare Figure A1-A2 of first sampling period and Figure A24-A25 of second sampling period). Samples collected from LF1 on November 16, 1987 and January 19, March 1 and April 11, 1988 exhibited a gradual decrease in total PAH concentrations (Figure A24, Appendix A) whereas the total PAH concentrations measured in LF2 decreased drastically (Figure A25 , Appendix A). After 6-month of landfarm treatment following spoil pile soil application, PAHs with half-lives of less than 10 days were almost completely degraded. Lower concentrations of PAHs with half-lives of 10 days or greater were detected on March 1 and April 11, 1988, in LF1 and LF2 and on January 19, 1988, in LF1 compared to the levels initially measured on November 16, 1987 in both LF1 and LF2.

Results of PCP from the second sampling period in LF1 and LF2 are presented in Figures A26 and A27, respectively. PCP was not detected in soils collected from LF1 in January and April 1988 (Figure A26, Appendix A). PCP was detected at a relatively constant concentration in every sample collected form LF2 (Figure A27, Appendix A).

The third period extended from June 15 to October 4, 1988 for LF1 and June 20 to October 4, 1988, for LF2. Soil samples were collected on June 21, August 15 and September 27, 1988. The results are shown in Figures A28 and A29, Appendix A. Total PAH

concentrations in LF1 and LF2 decreased with time, a similar trend observed in previous sampling periods. PAHs with half-lives less than 10 days were completely degraded after 3 months whereas PAHs with intermediate and long half-lives persisted throughout this period (Figures A28 and A29, Appendix A). Greater reduction in PAH concentration, however, was observed on September 27, 1988.

PCP concentrations in the third sampling period in LF1 and LF2 are depicted in Figures A30 and A31(Appendix A), respectively. PCP was not detected in soil samples collected from LF1 after 2 months but was found in soil samples taken from LF2 (Figures A30 and A31, Appendix A).

2.4 SURROUNDING LAND USE

The SWP facility, which measures approximately 1,000 feet east to west by 1,600 feet north to south, lies within an industrialized area of Wilmington, North Carolina. Industry in the vicinity includes the Hess Fuel Tank Farms separated from the SWP property by a ditch on the north side and the Poctank, Inc., plant separated by an undeveloped lot on the south side of the SWP property. The major roads in the vicinity of the plant are Greenfield and Surrey Street. Greenfield Street runs in an east-west direction and dead ends into the center of the facility. Surrey Street runs in a north-south direction and is situated east of the property. The Cape Fear River borders the property on the west.

2.5 REGIONAL AND SITE GEOLOGY AND HYDROLOGY

The Wilmington site is located in the Coastal Plain Physiographic Province of North Carolina, a region underlain by Cretaceous and Cenozoic marine and non-marine sedimentary sequences. Approximately 1500 feet of Coastal Plain sediments overlie pre-Mesozoic crystalline basement rock in the Wilmington area (NCGS, 1985). The site is directly underlain by the Cretaceous-age Pee Dee Formation (NCGS, 1985), which consists predominantly of

3.0 INVESTIGATIVE METHODS

A soil and ground-water sampling program, separate from the routine sampling described in Chapter 2.0, was designed to provide a baseline of current conditions within the two landfarmed areas (LF1 and LF2). The soil sampling locations and depths were selected to assess the presence of wood-preserving constituents (the list previously monitored by the MSUFPRD) and nutrients. The soil samples were collected in the landfarmed material and underlying substrate in accordance with standard operating procedures presented in the Work Plan (Geraghty & Miller, 1990). Ground water samples were collected from the four monitor wells bordering LF1 and LF2. All samples were analyzed by U.S. Environmental Protection Agency (USEPA) methodologies for the nutrients and selected semi-volatile organic compounds (SVOCs). In addition, two composite surficial soil samples were collected and analyzed to assess the presence of polychlorinated dibenzodioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) and their respective chlorinated homologues and 2,3,7,8-congeners. The analytical procedures for PCDDs and PCDFs were conducted in accordance with USEPA methodologies. All field records and analytical data were reviewed and validated by a Geraghty & Miller Quality Assurance Officer.

3.1 SOIL SAMPLING

Soil samples were collected at five locations from the two landfarmed areas on October 10, 1990, as illustrated in Figure 3-1. At each location, three samples were collected within the landfarmed material and one sample was taken from the underlying substrate. Soil samples were analyzed for pH and the expanded list of wood-preserving constituents and nutrients (Table 3-1), including those previously monitored by the MSUFPRD and additional constituents (see Section 3.3, Expanded List of Constituents). Table 3-2 lists the analytical methods.

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A small-diameter (<4-inch), stainless steel, hand-held bucket auger was used to determine the depth of the substrate layer at each sampling location prior to collecting soil samples. Following this preliminary activity, the auger was decontaminated with a laboratory-grade soap solution and rinsed three times with distilled water. The depth of the landfarmed material in LF1 and LF2 ranged from 12 to 30 inches and 12 to 27 inches, respectively. Three soil samples within the landfarmed material were collected at each sampling location by means of a hand-held bucket auger. Each borehole consisted of a sample taken at the surface, in the center of the landfarmed material and above the substrate layer.

The upper and lower sections of the individual soil cores were removed and discarded to prevent potential contamination between subsequent samples. The landfarmed soil was black, friable and had a moist consistency. Bricks and glass were encountered at the landfarmed material-substrate interface at several borehole locations. A faint creosote odor was also noticed at a few sample locations. The samples were placed in stainless steel bowls and thoroughly mixed prior to being stored in sample containers on ice at 4°C. Following the collection of the samples and the removal of the intermediate soil layers, the bucket auger was decontaminated with a laboratory-grade soap solution and rinsed three times with distilled water. A 3-foot length of polyvinyl chloride (PVC) pipe was inserted into the boreholes prior to the collection of the substrate samples. The upper 6 inches of the substrate were first removed using a 2-inch-diameter probe and discarded. The sampling equipment was decontaminated prior to collecting the substrate samples. The samples were thoroughly mixed in a stainless steel bowl and stored in a sample container on ice at 4°C.

Additional surficial soil samples (0- to 6-inch) were collected on October 9, 1990, for PCDD and PCDF analyses (Table 3-3). The soil cores were taken with a hand-held bucket auger at each of the five borehole locations in LF1 and LF2 and composited into two samples. The samples were thoroughly mixed and stored in containers on ice at 4°C. The bucket auger was decontaminated using the procedures previously described prior to and following the collection of each set of subsamples.

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Four surficial (0- to 6-inch) soil samples were collected with a sampling scoop on October 19, 1990, for grain- and particle-size determination and organic matter analysis. The individual soil samples were thoroughly mixed and placed in sample containers. The results of these analyses are included in Appendix B.

3.2 GROUND-WATER SAMPLING

The three downgradient (MW-7, MW-8, and MW-9) and upgradient (MW-6) monitor wells on the perimeter of LF1 and LF2 were sampled on October 9, 1990. These samples were analyzed for pH and the expanded list of wood-preserving constituents and nutrients (Table 3-1), including those previously monitored by the MSUFPRD and additional constituents (see Section 3.3, Expanded List of Constituents).

Plastic sheeting was placed around the wells to protect the sampling equipment from potential contamination prior to determining the well depth and water elevations using an electronic water-level meter. The wells were evacuated and sampled with disposable polyethylene bailers in accordance with standard operation procedures outlined in the Work Plan (Geraghty & Miller, 1990). The pH and conductance of the ground water were monitored and recorded. The ground-water samples were placed in sample containers and stored on ice at 4°C. The sampling logs completed during the ground-water sampling activities are presented in Appendix C.

3.3 EXPANDED LIST OF CONSTITUENTS

During an investigation of soil quality in the former treated and untreated wood storage area in 1991, several inorganic and semi-volatile organic constituents that were not included in the MSUFPRD list of wood preserving constituents were detected in site soils. Some of these additional constituents, included in Table 3-1 (without asterisks), were included in the analytical method used to analyze the 1990 landfarm soil and ground-water samples (EPA Method 8270),

but had not been reported by the laboratory because they had not been requested. To determine whether these additional organic constituents were also present in the landfarm soil and ground-water samples collected by Geraghty & Miller in 1990, Geraghty & Miller requested that these additional constituents be reported by Savannah Laboratories in 1991. The laboratory complied with the request.

3.4 LABORATORY ANALYSES AND QUALITY ASSURANCE/QUALITY CONTROL PRACTICES

All soil and ground-water samples collected during the 1990 sampling event were analyzed by Savannah Laboratories Environmental Services, Inc., located in Savannah, Georgia, for nutrient (total nitrogen, total phosphorus, total organic carbon, and chloride) and wood-preserving constituents in accordance with USEPA-approved methodologies (Table 3-2). Several field quality control samples were collected during the soil sampling program to assess field techniques and laboratory performance. These samples included a rinsate blank (RB-1) and a field (FB-1). Sample RB-1 was collected using the decontaminated bucket auger and stainless steel bowl following the collection of sample LF1BU. Concurrently, sample FB-1 was taken. The quality control samples were prepared in accordance with procedures described in the Work Plan and analyzed for the list of constituents presented in Table 3-1.

The two composite surficial soil samples collected for PCDD and PCDF determination and their respective tetra-, penta-, hexa-, hepta- and octa-chlorinated homologues and 2,3,7,8-congeners, including 2,3,7,8-TCDD and 2,3,7,8-tetrachlorodibenzo-p-furan (TCDF) (Table 3-3), were analyzed by Triangle Laboratories, Inc., located in Research Triangle Park, North Carolina, in accordance with the USEPA-approved methodology 8290.

The four surficial soil samples (LF1-B, LF1-D, LF2-B, and LF2-D) collected for grain- and (sieve) particle-size and organic mater (loss on ignition, American Society Testing and Materials [ASTM] method) determination were analyzed by Law Environmental, Inc., located

in Kennesaw, Georgia. The silt and clay fractions for sample LF1-D were determined using the hydrometer method.

3.4 CHAIN OF CUSTODY

Samples collected in the field remained in the presence of a project representative at all times until they were shipped to the analytical laboratory. The transfer of the samples to the laboratory was accomplished by means of chain-of-custody forms. Activity documentation logs completed during this investigation are presented in Appendix B, and chain-of-custody forns are included in Appendix D. The placement of the custody seals ensured the integrity of the samples and prevented potential tampering.

3.5 DATA VALIDATION

The purpose of this section is to evaluate the field data for its adherence to the approved sampling Work Plan and to ensure the completion of required documentation. Additionally, the analytical laboratory data were reviewed for the completeness of the data package deliverables and the achievement of project-specific data quality objectives.

All field activities were appropriately documented as illustrated by the sampling logs presented in Appendix B. Field (FB) and rinsate blanks (RB) for nutrient and wood-preserving constituent analysis were taken at a frequency of 1 for every 40 samples collected using procedures described in the Work Plan. Field and rinsate blank sample results are shown in Table 3-4 Total organic carbon was detected at a concentration of 2.4 mg/L in FB-1. This constituent was not found in RB-1.

The requested detection limits for the wood-preserving constituents analyzed in the soil samples were not achieved for 31 out of the 40 samples collected. Samples LF1DM and LF2AL were diluted due to matrix interferences whereas the dilution of the remaining samples was

attributed to PAH concentrations above the calibration range of the gas chromatography/mass spectroscopy (GC/MS) detection system. The matrix spike analyses were conducted on sample LF1AS. These dilutions accounted for the absence of surrogate recoveries. Estimated constituent concentrations were reported for levels below the detection limits where applicable. The remaining quality control (QC) data, however, were within established control limits.

The two surficial soil samples LF1 and LF2 were analyzed for PCDD and PCDF by high resolution GC/MS in accordance with the USEPA Method 8290. The samples were diluted and reanalyzed due to hexa-, hepta- and octa-chlorinated dibenzodioxin and furan isomer concentrations above the calibration range of the mass spectrometer detection system. The data reported herein represent a combination of the two analyses. The isomers 2,3,4,6,7,8-hexachlorodibenzofuran and octa-chlorodibenzodioxin were detected in the laboratory method blank. The concentrations found, however, were acceptable under TLI guidelines. Quantitative interferences were reported for a number isomers in the method blank, and samples LF1 and LF2. The concentration of the affected analytes may be considered qualitative.

All soil, ground-water, and quality control samples collected were analyzed within the required holding times. With the exception of the deviations reported herein, all quality control samples were found to be within established control limits. The enclosed data (Appendix D) are valid and met the data quality objectives stated in the Work Plan.

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4.0 SAMPLING RESULTS

4.1 SOIL SAMPLE RESULTS

The wood-preserving constituent, pH, and nutrient results for soil samples collected from LF1 and LF2 are presented in Tables 4-1 and 4-2, respectively. These data tables present the expanded constituent list which includes additional semi-volatile data reported by the laboratory in 1991. Table 4-3 summarizes the PCDD and PCDF data for the two composite samples. Sample results are identified with a unique sample ID consisting of the landfarm (LF1 or LF2), the location (A through E), and the sampling depth (U [upper], M [middle], L [lower], or S [substrate]). For example, sample LF2BU was the upper sample collected from location B in LF2. Laboratory data reports and the 1991 supplemental data are included in Appendix D.

A total of 15 semi-volatile organic compounds (semi-VOCs) were detected above their respective practical quantitation limits (PQLs) in the landfarm samples. Thirteen are PAHs: naphthalene; 1-methylnaphthalene; 2-methylnaphthalene; acenaphthene; fluorene; phenanthrene; anthracene; pyrene; benzo(a)anthracene; chrysene; benzo(a)pyrene; benzo(g,h,i)perylene; and fluoranthene. Two of the constituents are heterocyclic organics: carbazole and dibenzofuran. An additional 5 constituents were detected in the landfarm samples, but the concentrations were below the PQLs: benzo(b,k)fluoranthene (the laboratory could not resolve the two isomers and reported them together); indeno(1,2,3-cd)pyrene; dibenzo(a,h)anthracene; pentachlorophenol, and tetrachlorophenols (the laboratory did not resolve the tetrachlorophenol isomers and reported them together). The first 3 constituents are PAHs. Compounds detected below PQLs are "J"-qualified on the data tables.

Anthracene, a 3-ring PAH, had the highest concentration of the semi-VOCs: 900 milligrams per kilogram on a dry weight basis (mg/kg dw) in the upper sample from location C in LF2. Fluoranthene and pyrene occurred in the second-highest concentrations: up to 500

mg/kg dw each in the lower sample from location D in LF2. Generally, there was no observable trending in constituent concentrations between the upper, middle and lower samples from the landfarm area. For example, pyrene occurred in concentrations of 51, 66, and 500 mg/kg dw for the upper, middle, and lower samples, respectively, from location D in LF2. The same constituent occurred in concentrations of 130, 36, and 41 mg/kg dw for the upper, middle, and lower samples, respectively, from location C in LF2. Analyses of variance (ANOVA) performed on the data indicate no significant difference in constituent concentrations between the upper, middle, and lower samples. Concentrations of constituents in the substrate samples, however, were significantly lower than those occurring in the overlying landfarm material samples, indicating minimal vertical migration of constituents. Five of the ten substrate samples had no detectable semi-VOCs.

Both composite samples had detectable concentrations of PCDDs and PCDFs. The concentrations for each class of PCDFs ranged from 0.09/0.10 (LF1/LF2) micrograms per kilogram (μg/kg dw) total tetrachlodibenzofurans to 147/164 (LF1/LF2) μg/kg dw total heptachlorodibenzofurans. The concentrations for each class of PCDDs ranged from 0.14/0.17 (LF1/LF2) μg/kg dw total tetrachlodibenzodioxins to 621/932 (LF1/LF2) μg/kg dw total octachlorodibenzodioxins.

4.2 GROUND-WATER SAMPLE RESULTS

The wood-preserving constituent, pH, suspended solids, and nutrient results for ground-water samples collected from monitor wells MW-6, MW-7, MW-8, and MW-9 are presented in Tables 4-4. None of the wood-preserving constituents were detected in any of the ground-water samples.

5.0 REFERENCES

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TABLES

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Table 2-1. Half-Life Categories for Polycyclic Aromatic Hydrocarbons (PAHs) Monitored by the Mississippi State University Forest Product Division, Southern Wood Piedmont Landfarm Area, Wilmington, North Carolina.

Less Than 10 Days	10 to 100 Days	Greater Than 100 Days
Acenaphthylene	Anthracene	Benzo(a)anthracene
Acenaphthene	Carbazole	Benzo(a)pyrene
Biphenyl	Fluoranthene	Benzo(g,h,i)perylene
Dibenzofuran	Phenanthrene	Chrysene
Fluorene		Pyrene
1-Methylnaphthalene		
2-Methylnaphthalene		
Naphthalene		

Reference: USEPA, 1989.

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Table 2-2. List of Wood-Preserving Constituents and Nutrients Monitored by the Mississippi State University Forest Product Research Division, Southern Wood Piedmont Landfarm Area, Wilmington, North Carolina.

Wood Preserving Constituents
Acenapthylene
Acenaphthene
Anthracene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(g,h,i)perylene
Biphenyl
Carbazole
Chrysene
Dibenzofuran
Fluoranthene
Fluorene
2-Methylnaphthalene
1-Methylnaphthalene
Naphthalene
Oil
Pentachlorophenol
Phenanthrene
Phenol
Pyrene
Nutrients/Other
Chloride
Total nitrogen
Total organic carbon
Total phosphorous

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Table 3-1. Expanded List of Constituents Analyzed for in Landfarm Soil and Ground-Water Samples Collected in 1990 at the Southern Wood Piedmont Facility, Wilmington, North Carolina.

- Base Neutral Acid Extractable Constituents

Naphthalene*
2-Methylnaphthalene*
1-Methylnaphthalene*
1,1-Biphenyl*
Acenaphthylene*
Acenaphthene*
Dibenzofuran*
Fluorene*
Phenanthrene*
Anthracene*
Carbazole*
Pyrene*
Benzo(a)anthracene*
Chrysene*
Benzo(a)pyrene*
Benzo(g,h,i)perylene*
Pentachlorophenol*
Fluoranthene*
2-Chlorophenol
Phenol
2,4-Dimethylphenol
Trichlorophenols
o-Cresol
m- & p-Creosol
p-Chloro-m-cresol
Tetrachlorophenols
2,4-Dinitrophenol
Benzo(k)fluoranthene
Indeno(1,2,3-c,d)pyrene
Dibenzo(a,h)anthracene

- Nitrogen Series

Total Kjeldahl Nitrogen-N*
Nitrate + Nitrite-N*
Total Nitrogen*

- Total Phosphorus*
Total Organic Carbon*
Chloride*

- pH*

* 1990 Mississippi State University Forest Product Research Division (MSUFPRD) Constituent List (also included polychlorinated dibenzodioxins and polychlorinated dibenzofurans). Data for other constituents (1990 sampling program) were requested in 1991.

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Table 3-2. U.S. Environmental Protection Agency Methods of Analysis for Soil and Ground Water, Southern Wood Piedmont Landfarm Area, Wilmington, North Carolina.

Constituents	Method
Polycyclic aromatic hydrocarbons	SW-846 8270
Other Semi-VOCs (phenols, furans, carbazole)	SW-846 8270
Total kjeldahl nitrogen	351.2
Nitrate and nitrite	353.1
Total phosphorus	365.1
Total suspended solids	160.2
Total organic carbon	415.1
Chloride	325.2

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Table 3-3. Polychlorinated Dibenzofurans and Polychlorinated Dibenzodioxins Analyzed at the Southern Wood Piedmont Landfarm Area, Wilmington, North Carolina.

Constituents	Abbreviations
Furans	
Tetrachlorodibenzofurans (total)	TCDFs (total)
2,3,7,8-Tetrachlorodibenzofuran	2,3,7,8-TCDF
Pentachlorodibenzofurans (total)	PeCDFs (total)
1,2,3,7,8-Pentachlorodibenzofuran	1,2,3,7,8-PeCDF
2,3,4,7,8-Pentachlorodibenzofuran	2,3,4,7,8-PeCDF
Hexachlorodibenzofurans (total)	HxCDFs (total)
1,2,3,4,7,8-Hexachlorodibenzofuran	1,2,3,4,7,8-HxCDF
1,2,3,6,7,8-Hexachlorodibenzofuran	1,2,3,6,7,8-HxCDF
2,3,4,6,7,8-Hexachlorodibenzofuran	2,3,4,6,7,8-HxCDF
1,2,3,7,8,9-Hexachlorodibenzofuran	1,2,3,7,8,9-HxCDF
Heptachlorodibenzofurans (total)	HpCDFs (total)
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1,2,3,4,6,7,8-HpCDF
1,2,3,4,7,8,9-Heptachlorodibenzufuran	1,2,3,4,7,8,9-HpCDF
Octachlorodibenzofurans (total)	OCDF
Dioxins	
Tetrachlorodibenzodioxins (total)	TCDDs total
2,3,7,8-Tetrachlorodibenzodioxin	2,3,7,8-TCDD
Pentachlorodibenzodioxins (total)	PeCDDs (total)
1,2,3,7,8-Pentachlorodibenzodioxin	1,2,3,7,8-PeCDD
Hexachlorodibenzodioxins (total)	HxCDDs (total)
1,2,3,4,7,8-Hexachlorodibenzodioxin	1,2,3,4,7,8-HxCDD
1,2,3,6,7,8-Hexachlorodibenzodioxin	1,2,3,6,7,8-HxCDD
1,2,3,7,8,9-Hexachlorodibenzodioxin	1,2,3,7,8,9-HxCDD
Heptachlorodibenzodioxins (total)	HpCDDs (total)
1,2,3,4,6,7,8-Heptachlorodibenzodioxin	1,2,3,4,6,7,8-HpCDD
Octachlorodibenzodioxins (total)	OCDD

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Table 3-4. Analytical Results for Quality Control Samples Associated with Ground-Water Samples Collected in 1990, Southern Wood Piedmont Site, Wilmington, North Carolina.

Sample Identification #:	RB-1	FB-1
Constituents (mg/L)		
Semi-Volatile Organic Constituents (8270)		
Naphthalene	ND	ND
1-Methylnaphthalene	ND	ND
2-Methylnaphthalene	ND	ND
1,1-Biphenyl	ND	ND
Acenaphthylene	ND	ND
Acenaphthene	ND	ND
Dibenzofuran	ND	ND
Fluorene	ND	ND
Phenanthrene	ND	ND
Anthracene	ND	ND
Carbazole	ND	ND
Pyrene	ND	ND
Benzo(a)Anthracene	ND	ND
Chrysene	ND	ND
Benzo(a)pyrene	ND	ND
Benzo(g,h,i)perylene	ND	ND
Pentachlorophenol	ND	ND
Fluoranthene	ND	ND
2-Chlorophenol	ND	ND
Phenol	ND	ND
2,4-Dimethylphenol	ND	ND
Trichlorophenols	ND	ND
Creosol (ortho)	ND	ND
Creosol m&p	ND	ND
P-chloro-m-cresol	ND	ND
Tetrachlorophenols	ND	ND
2,4-Dinitrophenol	ND	ND
Benzo(b,k)fluoranthene	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND
Dibenzo(a,h)anthrancene	ND	ND
Total Organic Carbon	ND	ND
Chloride	ND	2.4

RB Rinsate blank.
FB Field blank.
ND Compound was not detected.
NA pH was not analyzed.

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Table 4-1. Analytical Results for Soil Samples Collected in 1990 Within the River Landfarm 1 and Underlying Substrate at the Southern Wood Piedmont Site, Wilmington, North Carolina.

Sample Identification # /1	LF1AU 9100A	LF1AM 9100B	LF1AL 9100C	LF1AS 9100D	LF1BU 9101A	LF1BM 9101B	LF1BL 9101C	LF1BS 9101D	LF1CU 9102A	LF1CM 9102B
Constituents (mg/kg dw)										
Semi-Volatile Organic Compounds (8270)										
Naphthalene	3.8J	ND	ND	ND	4.4J	12	ND	ND	4.8J	ND
2-Methylnaphthalene	4.0J	ND	ND	ND	5.9J	15	ND	ND	ND	ND
1-Methylnaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Biphenyl	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	5.0J	ND	ND	ND	6.7J	11	ND	ND	6.6J	ND
Fluorene	14	ND	ND	ND	4.9J	27	ND	ND	20	ND
Phenanthrene	25	3.9J	6.2J	ND	36	41	ND	ND	130	8.1
Anthracene	88	3.4J	3.7J	ND	230	200	4.6J	ND	29	58
Carbazole	26	ND	ND	ND	46	90	ND	ND	43	9.6
Pyrene	44	13	80	ND	50	27	20	ND	150	11
Benzo(a)Anthracene	20	5.8J	39	ND	19	8.6	10	ND	32	ND
Chrysene	22	9.5	59	ND	27	15	18	ND	42	8.9
Benzo(a)pyrene	19	7.3	32	ND	20	9.4	10	ND	24	ND
Benzo(g,h,i)perylene	8.8	5.0J	16	ND	7.4	ND	3.9J	ND	10	ND
Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	58	13	80	ND	19	34	20	ND	140	8.9
2-Chlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorophenols	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Creosol (ortho)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Creosol m&p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
P-chloro-m-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachlorophenols	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b,k)fluoranthene	35J	19J	100J	ND	43J	19J	27J	ND	49J	14J
Ideno(1,2,3-cd)pyrene	10J	5.2J	17J	ND	10J	4.9J	5.2J	ND	11J	3.3J
Dibenzo(a,h)anthracene	4.2J	2.2J	7.5J	ND	4.3J	2.7J	2.3J	ND	5.0J	1.6J
Nitrogen Series										
Total Kjeldahl Nitrogen-N	1600	500	1200	58	1600	1600	7500	88	1900	1100
Nitrate + Nitrite-N	ND	6.7	ND	ND	ND	16	8.2	ND	8.1	ND
Total Nitrogen	1600	507	1200	58	1600	1616	7508	88	1908	1100
Total Phosphorous	830	560	900	40	1100	840	450	42	1000	620
Total Organic Carbon	35000	18000	25000	ND	32000	26000	15000	120	39000	23000
Chloride	ND	ND	ND	ND	29	28	26	ND	35	ND
pH	6	6.6	6.8	7.3	6.5	6.5	7.7	8	6.6	6.7
Percent Solids %	82	90	90	94	82	84	90	95	70	88

1 Represents Landfarm 1 location (A, B, C, D, or E) depth sampled (U, M, L, or S).
J Estimated concentration below the practical quantitation limit.
ND Compound was not detected.

Table 4-1. Analytical Results for Soil Samples Collected in 1990 Within the River Landfarm 1 and Underlying Substrate at the Southern Wood Piedmont Site, Wilmington, North Carolina.

Sample Identification # /1	LF1CL 9102C	LF1CS 9102D	LF1DU 9103A	LF1DM 9103B	LF1DL 9103C	LF1DS 9103D	LF1EU 9104A	LF1EM 9104B	LF1EL 9104C	LF1ES 9104D
Constituents (mg/kg dw)										
Semi-Volatile Organic Compounds (8270)										
Naphthalene	ND	ND	ND	ND	ND	ND	3.6J	ND	ND	ND
2-Methylnaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1-Methylnaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Biphenyl	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	ND	ND	5.0J	ND	ND	ND	6.0J	ND	ND	ND
Phenanthrene	13	ND	11	ND	14	6.5J	20	4.6J	ND	ND
Anthracene	6.8J	ND	35	4.7J	3.6J	3.0J	70	5.0J	ND	ND
Carbazole	ND	ND	ND	ND	ND	ND	23	ND	ND	ND
Pyrene	110	ND	28	9.5	68	23	41	6.0J	6.5J	ND
Benzo(a)Anthracene	42	ND	11	3.4J	18	13	21	7.4	ND	ND
Chrysene	59	ND	17	7.3	40	19	22	8.1	3.7J	ND
Benzo(a)pyrene	22	ND	16	7.3	16	5.9J	18	8.1	3.5J	ND
Benzo(g,h,i)perylene	6.5J	ND	6.3J	4.8J	7.4J	ND	ND	ND	ND	ND
Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	120	ND	29	9.5	71	24	51	4.4J	6.8J	ND
2-Chlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorophenols	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Creosol (ortho)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Creosol m&p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
P-chloro-m-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachlorophenols	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b,k)fluoranthene	68J	ND	31J	14J	52J	18J	29J	120J	9.1J	1.1J
Ideno(1,2,3-cd)pyrene	9.3J	ND	8.0J	4.9J	8.7J	4.1J	8.1J	14J	2.0J	ND
Dibenzo(a,h)anthracene	4.7J	ND	4.3J	1.6J	3.9J	1.8J	3.2J	4.2J	0.76J	ND
Nitrogen Series										
Total Kjeldahl Nitrogen-N	1300	67	1600	1000	330	1500	1400	ND	470	ND
Nitrate + Nitrite-N	ND	ND	7	6.9	ND	ND	ND	ND	ND	ND
Total Nitrogen	1300	67	1607	1007	330	1500	1400	ND	470	ND
Total Phosphorous	250	66	630	530	240	340	980	640	320	88
Total Organic Carbon	21000	ND	34000	17000	26000	25000	30000	21000	8000	ND
Chloride	77	ND	ND	ND	ND	ND	40	27	ND	21
pH	6.5	6.8	6.3	6.3	6.6	6.9	6.4	6.7	7.1	7.3
Percent Solids %	88	90	86	90	86	87	88	88	91	97

1 Represents Landfarm 1 location (A, B, C, D, or E) depth sampled (U, M, L, or S).
J Estimated concentration below the practical quantitation limit.
ND Compound was not detected.

1387wp

Table 4-2. Analytical Results for Soil Samples Collected in 1990 Within the Office Landfarm 2 and Underlying Substrate at the Southern Wood Piedmont Site, Wilmington, North Carolina.

Sample Identification # /1	LF2AU 9105A	LF2AM 9105B	LF2AL 9105C	LF2AS 9105D	LF2BU 9106A	LF2BM 9106B	LF2BL 9106C	LF2BS 9106D	LF2CU 9107A	LF2CM 9107B
Constituents (mg/kg dw)										
Semi-Volatile Organic Compounds (8270)										
Naphthalene	ND	ND	ND	0.33J	ND	30	ND	ND	ND	5.1J
2-Methylnaphthalene	ND	10	ND	ND	ND	41	ND	ND	ND	ND
1-Methylnaphthalene	ND	ND	ND	ND	ND	20	ND	ND	ND	ND
1,1-Biphenyl	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	ND	28	ND	ND	49	ND	ND	ND	ND	ND
Dibenzofuran	ND	26	ND	ND	19	20	5.6J	ND	ND	3.8J
Fluorene	22	91	ND	ND	42	57	12	ND	12	ND
Phenanthrene	34	200	ND	0.49	82	86	24	ND	99	17
Anthracene	100	280	ND	0.36J	350	400	66	ND	900	72
Carbazole	45	200	ND	ND	100	160	30	ND	270	23
Pyrene	26	200	4.7J	2.0	55	23	78	0.60	130	36
Benzo(a)Anthracene	20	110	ND	1.2	33	13	21	0.21J	43	19
Chrysene	21	120	3.6J	1.9	35	18	31	0.35J	58	22
Benzo(a)pyrene	16	46	ND	1.3	24	30	41	0.30J	41	16
Benzo(g,h,i)perylene	7.8	17	ND	0.71	12	ND	16	ND	17	13
Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	35	300	5.0J	2.3	92	27	82	0.63	110	38
2-Chlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorophenols	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Creosol (ortho)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Creosol m&p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
P-chloro-m-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachlorophenols	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b,k)fluoranthene	33J	89J	6.2J	2.6J	43J	24J	17J	0.78J	43J	5.7J
Ideno(1,2,3-cd)pyrene	8.6J	18J	1.1J	ND	11J	ND	ND	0.18J	11J	14J
Dibenzo(a,h)anthracene	3.9J	ND	ND	ND	ND	ND	ND	ND	5.3J	6.2J
Nitrogen Series										
Total Kjeldahl Nitrogen-N	1400	1400	170	1100	1700	1400	900	920	2200	340
Nitrate + Nitrite-N	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Nitrogen	1400	1400	170	1100	1700	1400	900	920	2200	340
Total Phosphorous	1100	290	120	800	920	970	390	61	740	90
Total Organic Carbon	37000	51000	3700	26000	36000	34000	31000	230	36000	24000
Chloride	26	51	ND	ND	ND	ND	ND	ND	ND	ND
pH	6.3	6.3	6.6	5.1	6.2	5.8	6.7	7.2	6.2	7.0
Percent Solids %	84	79	92	73	85	84	86	88	86	91

1 Represents Landfarm 2 location (A, B, C, D, or E) depth sampled (U, M, L, or S).
J Estimated concentration below the practical quantitation limit.
ND Compound was not detected.

1387wp

Table 4-2. Analytical Results for Soil Samples Collected in 1990 Within the Office Landfarm 2 and Underlying Substrate at the Southern Wood Piedmont Site, Wilmington, North Carolina.

Sample Identification # /1	LF2CL 9107C	LF2CS 9107D	LF2DU 9108A	LF2DM 9108B	LF2DL 9108C	LF2DS 9108D	LF2EU 9109A	LF2EM 9109B	LF2EL 9109C	LF2ES 9109D
Constituents (mg/kg dw)										
Semi-Volatile Organic Compounds (8270)										
Naphthalene	ND	ND	ND	3.7J	11	ND	3.5J	ND	2.1J	ND
2-Methylnaphthalene	ND	ND	9.5	ND	11	ND	ND	ND	ND	ND
1-Methylnaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Biphenyl	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	ND	24	ND	ND	ND	ND	ND
Dibenzofuran	ND	ND	ND	ND	20	ND	3.7J	ND	ND	ND
Fluorene	ND	ND	37	ND	54	ND	ND	6.1J	ND	ND
Phenanthrene	6.0J	ND	70	12	130	0.40J	19	14	5.7	ND
Anthracene	ND	ND	170	15	290	0.97	70	50	14	ND
Carbazole	ND	ND	67	4.6J	75	ND	24	17	1.9J	ND
Pyrene	41	ND	51	66	500	2.2	34	34	30	ND
Benzo(a)Anthracene	18	ND	18	27	100	1.0	13	13	11	ND
Chrysene	32	ND	22	40	150	1.4	18	19	16	ND
Benzo(a)pyrene	11	ND	19	33	65	0.97	18	15	12	ND
Benzo(g,h,i)perylene	4.2J	ND	7.9	34	14	0.47	8.1	7.1J	8.6	ND
Pentachlorophenol	ND	ND	ND	ND	20J	0.80J	ND	ND	ND	ND
Fluoranthene	47	ND	74	65	500	2.3	36	36	32	ND
2-Chlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorophenols	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Creosol (ortho)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Creosol m&p	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
P-chloro-m-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachlorophenols	ND	ND	ND	ND	1.2J	ND	ND	ND	ND	ND
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b,k)fluoranthene	38J	ND	1.4J	82J	99J	2.3J	35J	32J	31J	ND
Ideno(1,2,3-cd)pyrene	23J	ND	ND	19J	19J	0.53J	9.6J	8.3J	9.4J	ND
Dibenzo(a,h)anthracene	15J	ND	ND	8.0J	9.4J	0.23J	4.4J	3.2J	3.9J	ND
Nitrogen Series										
Total Kjeldahl Nitrogen-N	520	67	1300	1400	290	190	190	1400	520	90
Nitrate + Nitrite-N	ND	ND	ND	ND	ND	ND	ND	12	ND	ND
Total Nitrogen	520	67	1300	1400	290	190	190	1400	520	90
Total Phosphorous	200	49	910	250	130	580	1200	940	370	53
Total Organic Carbon	13000	580	36000	49000	44000	4700	35000	31000	20000	490
Chloride	ND	ND	63	99	85	64	27	ND	ND	ND
pH	7.5	7.7	6.5	5.9	5.8	5.6	6.0	6.1	6.7	7.5
Percent Solids %	87	86	83	85	78	77	88	87	80	91

1 Represents Landfarm 2 location (A, B, C, D, or E) depth sampled (U, M, L, or S).
J Estimated concentration below the practical quantitation limit.
ND Compound was not detected.

1387mwp

Table 4-3. Dioxin and Furan Concentrations for Composite Soil Samples Collected in Landfarms 1 and 2 at the Southern Wood Piedmont Site, Wilmington, North Carolina.

Parameters	Land Farm 1	Land Farm 2
Furans (µg/kg*)		
Tetrachlorodibenzofurans (total)	0.09	0.10
2,3,7,8-Tetrachlorodibenzofuran	0.02	0.02
Pentachlorodibenzofurans (total)	0.92	0.87
1,2,3,7,8-Pentachlorodibenzofuran	0.06	0.06
2,3,4,7,8-Pentachlorodibenzofuran	0.06	0.06
Hexachlorodibenzofurans (total)	31.4	34.4
1,2,3,4,7,8-Hexachlorodibenzofuran	0.71	0.76
1,2,3,6,7,8-Hexachlorodibenzofuran	0.24	0.21
2,3,4,6,7,8-Hexachlorodibenzofuran	0.16	0.14
1,2,3,7,8,9-Hexachlorodibenzofuran	0.04	0.05**
Heptachlorodibenzofurans (total)	147.0	164.0
1,2,3,4,6,7,8-Heptachlorodibenzofuran	59.5	66.0
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.77	0.96
Octachlorodibenzofurans (total)	63.2	83.3
Dioxins (µg/kg*)		
Tetrachlorodibenzodioxins (total)	0.14	0.17
2,3,7,8-Tetrachlorodibenzodioxin	0.004**	0.008
Pentachlorodibenzodioxins (total)	0.48	0.65
1,2,3,7,8-Pentachlorodibenzodioxin	0.03	0.05
Hexachlorodibenzodioxins (total)	16.4	22.5
1,2,3,4,7,8-Hexachlorodibenzodioxin	0.10	0.18
1,2,3,6,7,8-Hexachlorodibenzodioxin	1.3	1.8
1,2,3,7,8,9-Hexachlorodibenzodioxin	0.22	0.89
Heptachlorodibenzodioxins (total)	461	573
1,2,3,4,6,7,8-Heptachlorodibenzodioxin	65.5	98.7
Octachlorodibenzodioxins (total)	621	932

* µg/kg = micrograms per kilogram.
** Estimated Maximum Possible Concentration

1387swp

Table 4-4. Analytical Results for Ground-Water Samples Collected in 1990 From the Upgradient Monitor Well (W-6) and Three Downgradient Monitor Wells (W-7, W-8, and W-9) Located on the Perimeter of Landfarms 1 and 2 at the Southern Wood Piedmont Site, Wilmington, North Carolina.

Sample Identification #	MW-6	MW-7	MW-8	MW-9
Constituents (mg/L)				
Semi-Volatile Organic Compounds (8270)				
Naphthalene	ND	ND	ND	ND
2-Methylnaphthalene	ND	ND	ND	ND
1-Methylnaphthalene	ND	ND	ND	ND
1,1-Biphenyl	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	ND
Dibenzofuran	ND	ND	ND	ND
Fluorene	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND
Carbazole	ND	ND	ND	ND
Pyrene	ND	ND	ND	ND
Benzo(a)Anthracene	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND
Pentachlorophenol	ND	ND	ND	ND
Fluoranthene	ND	ND	ND	ND
Nitrogen Series				
Total Kjeldahl Nitrogen-N	11	7.2	10	6.7
Nitrate + Nitrite-N	ND	ND	ND	ND
Total Nitrogen	11	7.2	10	6.7
Total Phosphorous	1.0	0.47	0.51	0.35
Suspended Solids	68	130	220	30
Total Organic Carbon	13	22	26	20
Chloride	530	210	110	120

ND Compound was not detected.

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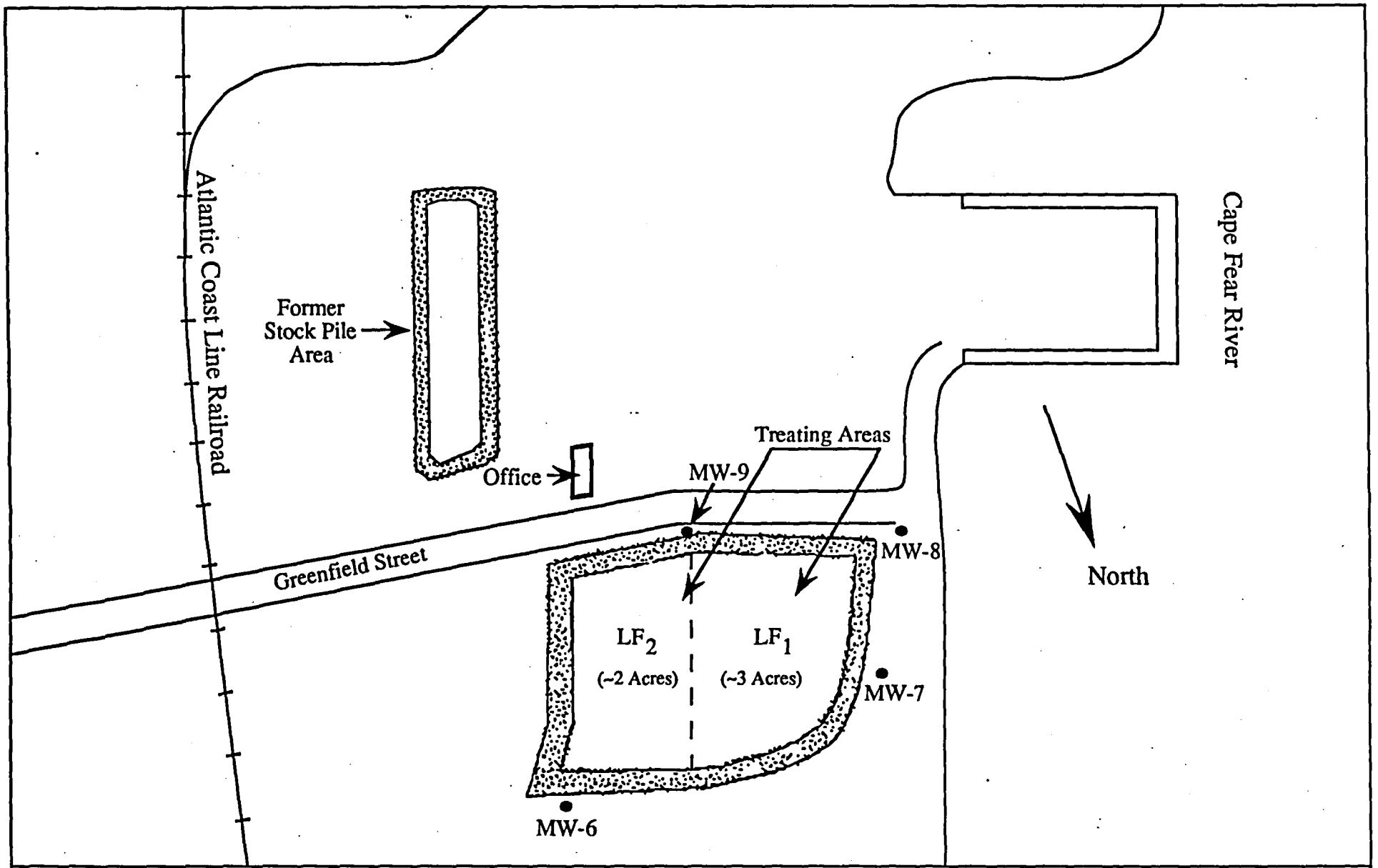
FIGURES

1395swp

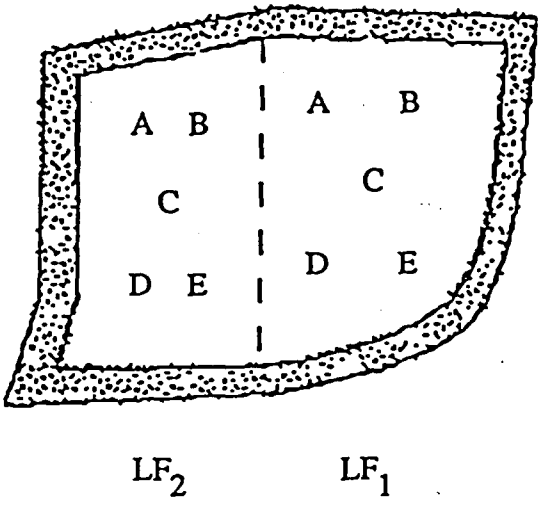


GERAGHTY & MILLER, INC.
Environmental Services

GENERALIZED SITE MAP
Southern Wood Piedmont, Wilmington, North Carolina
(Not to Scale)

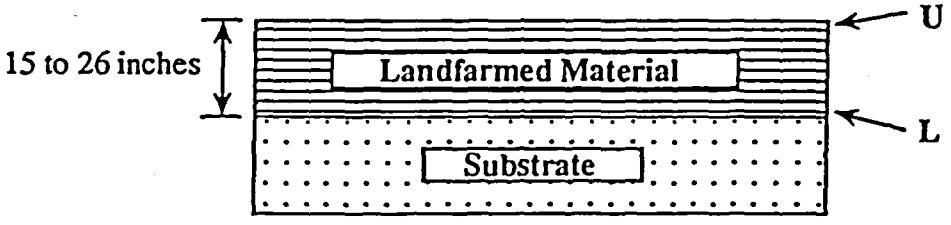
Figure 2-1

Plan View



Soil Sampling Locations in Landfarm Areas 1 and 2 Southern Wood Piedmont, Wilmington

Cross-Sectional View



U Upper soil sample taken approximately 3" below landfarm surface.

L Lower soil sample taken within the bottom 6" of the landfarmed material.

GERAGHTY & MILLER, INC. *Environmental Services*	Soil Sampling Locations within the Landfarm Areas at Southern Wood Piedmont's Former Wood-Treatment Facility - Wilmington, North Carolina (Not to Scale)	Figure 3-1

APPENDIX D

Analytical Laboratory Reports and Chain-of-Custody Forms

1387swp

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S0-12806

Received: 10 OCT 90

Ms. Sandra Watson
Southern Wood Piedmont (SP)
P. O. Box 5447
Spartanburg, SC 29304

CC: Mark Radecke

Project: Wilmington, NC

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	SAMPLED BY
12806-1	MW-9 (# 9112) 10-9-90	Client
12806-2	MW-8 (# 9113) 10-9-90	
12806-3	MW-7 (# 9114) 10-9-90	
12806-4	MW-6 (# 9115) 10-9-90	
12806-5	TB-1 10-9-90	

PARAMETER	12806-1	12806-2	12806-3	12806-4	12806-5
Semi Volatiles					
Naphthalene, mg/l	<0.010	<0.010	<0.010	<0.010	<0.010
2-Methylnaphthalene, mg/l	<0.010	<0.010	<0.010	<0.010	<0.010
1-Methylnaphthalene, mg/l	<0.010	<0.010	<0.010	<0.010	<0.010
1,1-Biphenyl, mg/l	<0.010	<0.010	<0.010	<0.010	<0.010
Acenaphthylene, mg/l	<0.010	<0.010	<0.010	<0.010	<0.010
Acenaphthene, mg/l	<0.010	<0.010	<0.010	<0.010	<0.010
Dibenzofuran, mg/l	<0.010	<0.010	<0.010	<0.010	<0.010
Fluorene, mg/l	<0.010	<0.010	<0.010	<0.010	<0.010
Phenanthrene, mg/l	<0.010	<0.010	<0.010	<0.010	<0.010
Anthracene, mg/l	<0.010	<0.010	<0.010	<0.010	<0.010
Carbazole, mg/l	<0.010	<0.010	<0.010	<0.010	<0.010
Pyrene, mg/l	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo(a)Anthracene, mg/l	<0.010	<0.010	<0.010	<0.010	<0.010
Chrysene, mg/l	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo(a)pyrene, mg/l	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo(g,h,i)perylene, mg/l	<0.010	<0.010	<0.010	<0.010	<0.010
Pentachlorophenol, mg/l	<0.050	<0.050	<0.050	<0.050	<0.050
Fluoranthene, mg/l	<0.010	<0.010	<0.010	<0.010	<0.010
% R Surrogate-2FP (CL 21-100)	46 %	36 %	42 %	25 %	30 %

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S0-12806

Received: 10 OCT 90

Ms. Sandra Watson
Southern Wood Piedmont (SP)
P. O. Box 5447
Spartanburg, SC 29304

CC: Mark Radecke

Project: Wilmington, NC

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	SAMPLED BY
12806-1	MW-9 (# 9112) 10-9-90	Client
12806-2	MW-8 (# 9113) 10-9-90	
12806-3	MW-7 (# 9114) 10-9-90	
12806-4	MW-10 (# 9115) 10-9-90	
12806-5	TB-1 10-9-90	

PARAMETER	12806-1	12806-2	12806-3	12806-4	12806-5
% R Surrogate-PHL (CL 10-94)	26 %	22 %	64 %	38 %	34 %
% R Surrogate-NBZ (CL 35-114)	46 %	50 %	65 %	56 %	54 %
% R Surrogate-2FBP (CL 43-116)	46 %	45 %	64 %	59 %	50 %
% R Surrogate-TBP (CL 10-123)	58 %	55 %	50 %	72 %	67 %
% R Surrogate-TPH (CL 33-141)	60 %	46 %	66 %	65 %	69 %
Date Extracted	10.16.90	10.16.90	10.16.90	10.16.90	10.16.90
Date Analyzed	10.18.90	10.18.90	10.18.90	10.18.90	10.18.90
Nitrogen Series					
Total Kjeldahl Nitrogen-N, mg/l	6.7	10	7.2	11	<0.10
Nitrate + Nitrite-N, mg/l	<0.050	<0.050	<0.050	<0.050	<0.050
Total Nitrogen, mg/l	6.7	10	7.2	11	<0.10
Total Phosphorus, mg/l	0.35	0.51	0.47	1.0	<0.050
Suspended Solids, mg/l	30	220	130	68	<5.0
Total Organic Carbon, mg/l	20	26	22	13	<1.0
Chloride, mg/l	120	110	210	530	<1.0

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S0-12806

Received: 10 OCT 90

Ms. Sandra Watson
Southern Wood Piedmont (SP)
P. O. Box 5447
Spartanburg, SC 29304

CC: Mark Radecke

Project: Wilmington, NC

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , REPORT FOR LIQUID SAMPLES	SAMPLED BY
12806-6	Method Blank (MB) Result	Client
12806-7	Lab Control Standard (LCS) Result	
12806-8	LCS Expected Value	
12806-9	LCS % Recovery	
12806-10	LCS % Recovery Limits	

PARAMETER	12806-6	12806-7	12806-8	12806-9	12806-10
Semi Volatiles					
Naphthalene, mg/l	<0.010	71	100	71 %	39-140 %
2-Methylnaphthalene, mg/l	<0.010	---	---	---	---
1-Methylnaphthalene, mg/l	<0.010	---	---	---	---
1,1-Biphenyl, mg/l	<0.010	---	---	---	---
Acenaphthylene, mg/l	<0.010	103	100	103 %	36-140 %
Acenaphthene, mg/l	<0.010	101	100	101 %	46-118 %
Dibenzofuran, mg/l	<0.010	---	---	---	---
Fluorene, mg/l	<0.010	---	---	---	---
Phenanthrene, mg/l	<0.010	114	100	114 %	54-140 %
Anthracene, mg/l	<0.010	105	100	105 %	40-140 %
Carbazole, mg/l	<0.010	---	---	---	---
Pyrene, mg/l	<0.010	---	---	---	---
Benzo(a)Anthracene, mg/l	<0.010	118	100	118 %	29-140 %
Chrysene, mg/l	<0.010	105	100	105 %	17-168 %
Benzo(a)pyrene, mg/l	<0.010	119	100	119 %	25-160 %
Benzo(g,h,i)perylene, mg/l	<0.010	---	---	---	---
Pentachlorophenol, mg/l	<0.050	77	100	77 %	9-103 %
Fluoranthene, mg/l	<0.010	96	100	96 %	26-140 %

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S0-12806

Received: 10 OCT 90

Ms. Sandra Watson
Southern Wood Piedmont (SP)
P. O. Box 5447
Spartanburg, SC 29304

CC: Mark Radecke

Project: Wilmington, NC

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , REPORT FOR LIQUID SAMPLES	SAMPLED BY
12806-6	Method Blank (MB) Result	Client
12806-7	Lab Control Standard (LCS) Result	
12806-8	LCS Expected Value	
12806-9	LCS % Recovery	
12806-10	LCS % Recovery Limits	

PARAMETER	12806-6	12806-7	12806-8	12806-9	12806-10
Nitrogen Series					
Total Kjeldahl Nitrogen-N, mg/l	<0.10	5.0	5.0	100 %	90-110 %
Nitrate + Nitrite-N, mg/l	<0.050	0.89	0.93	96 %	90-110 %
Total Nitrogen, mg/l	<0.10	---	---	---	---
Total Phosphorus, mg/l	<0.050	10.4	10	104 %	75-125 %
Suspended Solids, mg/l	<5.0	360	399	90 %	60-140 %
Total Organic Carbon, mg/l	<1.0	6.3	6.1	104 %	60-140 %
Chloride, mg/l	<1.0	211	222	95 %	90-110 %

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , REPORT FOR LIQUID SAMPLES	SAMPLED BY
12806-11	Matrix Spike (MS) Result/Dup	Client
12806-12	MS Expected Value	
12806-13	MS % Recovery/Duplicate	
12806-14	MS % Recovery Limit	
12806-15	MS % RPD (Limit)	

PARAMETER	12806-11	12806-12	12806-13	12806-14	12806-15
Semi Volatiles					
Naphthalene, mg/l	103/98	100	103/98 %	39-140 %	5.0(<40)%
Acenaphthylene, mg/l	118/120	100	118/120 %	36-140 %	1.7(<40)%
Acenaphthene, mg/l	105/109	100	105/109 %	46-118 %	3.7(<31)%
Phenanthrene, mg/l	115/116	100	115/116 %	54-140 %	0.87(<40)%
Anthracene, mg/l	113/111	100	113/111 %	40-140 %	1.8(<40)%
Carbazole, mg/l	157/175	100	157/175 %	---	---
Benzo(a)Anthracene, mg/l	121/120	100	121/120 %	29-140 %	0.83(<40)%
Chrysene, mg/l	112/111	100	112/111 %	17-168 %	0.90(<48)%
Benzo(a)pyrene, mg/l	119/122	100	119/122 %	25-160 %	2.5(<40)%
Pentachlorophenol, mg/l	127/125	100	127/125 %	9-103 %	1.6(<50)%
Fluoranthene, mg/l	100/112	100	100/112 %	26-140 %	11(<40)%
Nitrogen Series					
Total Kjeldahl Nitrogen-N, mg/l	4.18/4.18	4.0	105/105 %	75-125 %	0(<40)%
Nitrate + Nitrite-N, mg/l	.183/.184	0.20	91/92 %	75-125 %	1.1(<30)%
Total Nitrogen, mg/l	---	---	---	---	---
Total Phosphorus, mg/l	.514/.509	0.50	103/102 %	75/125 %	0.98(<30)%
Suspended Solids, mg/l	---	---	---	---	---
Total Organic Carbon, mg/l	124/126	100	124/126 %	60-140 %	1.6(<40)%
Chloride, mg/l	4.65/4.93	5.0	93/99 %	75-125 %	6.3(<30)%

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CC: Mark Radecke

Project: Wilmington, NC

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , REPORT FOR LIQUID SAMPLES	SAMPLED BY
12806-16	Methods	Client

PARAMETER	12806-16
Semi Volatiles	
Naphthalene	8270
2-Methylnaphthalene	8270
1-Methylnaphthalene	8270
1,1-Biphenyl	8270
Acenaphthylene	8270
Acenaphthene	8270
Dibenzofuran	8270
Fluorene	8270
Phenanthrene	8270
Anthracene	8270
Carbazole	8270
Pyrene	8270
Benzo(a)Anthracene	8270
Chrysene	8270
Benzo(a)pyrene	8270
Benzo(g,h,i)perylene	8270
Pentachlorophenol	8270
Fluoranthene	8270
Nitrogen Series	
Total Kjeldahl Nitrogen-N	351.2
Nitrate + Nitrite-N	353.1
Total Phosphorus	365.1
Suspended Solids	160.2
Total Organic Carbon	415.1
Chloride	325.2

Methods: EPA SW-846 & 40 CFR Part 136

J. W. Andrews

J. W. Andrews, Ph. D.

GERAGHTY & MILLER, INC.
Environmental Services

Laboratory Task Order No. N/A

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number NC09001

Project Location WILMINGTON, NC

Laboratory SAVANNAH LABORATORIES

Sampler(s)/Affiliation M. RADECKE G&M
D. RUMFORD, III G&M

SAMPLE BOTTLE / CONTAINER DESCRIPTION

SAMPLE IDENTITY	Code	Date/Time Sampled	Lab ID	1 Liter amber glass *KOOT PAH's	250ml plastic 4°C Total N	100ml plastic TOTAL P 4°C H_2SO_4 TSS	250ml amber glass 4°C TOC	250ml plastic 4°C H_2SO_4 Cl⁻					TOTAL
TB-1	L	10/9/90		1	1	1	1	1					5
MW9 / 9112	L	10/9/90 14:20		1	1	1	1	1					5
MW8 / 9113	L	10/9/90 15:30		1	1	1	1	1					5
MW7 / 9114	L	10/9/90 16:30		1	1	1	1	1					5
/ 9115	L	10/9/90		1	1	1	1	1					5
12806													

Sample Code: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers 25

Relinquished by: Mark E. Radecke Organization: Geraghty & Miller, Inc. 10/9/90 19:00
Received by: R. Bonds Organization: Sav. Labs Date 10/10/90 Time 10:30 am
Seal Intact? Yes No N/A

Relinquished by: Organization:
Received by: Organization: Date / / Time
Seal Intact? Yes No N/A

Special Instructions/Remarks: *~~KOOT~~ PAH's Site Specific list + PCP

KOOT changed to PAH's per Mark Radecke 10/24/90. GF

Delivery Method: ☐ In Person ☒ Common Carrier Federal Express (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

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LOG NO: SO-12822

Received: 11 OCT 90

Ms. Sandra Watson
Southern Wood Piedmont (SP)
P. O. Box 5447
Spartanburg, SC 29304

CC: Mark Radecke

Project: NC09001 Wilmington, NC

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
12822-1	LF1BL (# 9101C) 10-10-90	Client
12822-2	LF1BU (# 9101A) 10-10-90	
12822-3	LF1BM (# 9101B) 10-10-90	
12822-4	LF1BS (# 9101D) 10-10-90	
12822-5	LF1ES (# 9104D) 10-10-90	

PARAMETER	12822-1	12822-2	12822-3	12822-4	12822-5
Semi Volatiles					
Naphthalene, mg/kg dw	<7.3	4.4J	12	<0.35	<0.34
2-Methylnaphthalene, mg/kg dw	<7.3	5.9J	15	<0.35	<0.34
1-Methylnaphthalene, mg/kg dw	<7.3	<7.4	<7.8	<0.35	<0.34
1,1-Biphenyl, mg/kg dw	<7.3	<7.4	<7.8	<0.35	<0.34
Acenaphthylene, mg/kg dw	<7.3	<7.4	<7.8	<0.35	<0.34
Acenaphthene, mg/kg dw	<7.3	<7.4	<7.8	<0.35	<0.34
Dibenzofuran, mg/kg dw	<7.3	6.7J	11	<0.35	<0.34
Fluorene, mg/kg dw	<7.3	4.9J	27	<0.35	<0.34
Phenanthrene, mg/kg dw	<7.3	36	41	<0.35	<0.34
Anthracene, mg/kg dw	4.6J	230	200	<0.35	<0.34
Carbazole, mg/kg dw	<7.3	46	90	<0.35	<0.34
Pyrene, mg/kg dw	20	50	27	<0.35	<0.34
Benzo(a)Anthracene, mg/kg dw	10	19	8.6	<0.35	<0.34
Chrysene, mg/kg dw	18	27	15	<0.35	<0.34
Benzo(a)pyrene, mg/kg dw	10	20	9.4	<0.35	<0.34
Benzo(g,h,i)perylene, mg/kg dw	3.9J	7.4	<7.8	<0.35	<0.34
Pentachlorophenol, mg/kg dw	<37	<37	<39	<1.8	<1.7
Fluoranthene, mg/kg dw	20	19	34	<0.35	<0.34
% R Surrogate-2FP (CL 21-100)	*	*	*	97 %	88 %

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Received: 11 OCT 90

Ms. Sandra Watson
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Spartanburg, SC 29304

CC: Mark Radecke

Project: NC09001 Wilmington, NC

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
12822-1	LF1BL (# 9101C) 10-10-90	Client
12822-2	LF1BU (# 9101A) 10-10-90	
12822-3	LF1BM (# 9101B) 10-10-90	
12822-4	LF1BS (# 9101D) 10-10-90	
12822-5	LF1ES (# 9104D) 10-10-90	

PARAMETER	12822-1	12822-2	12822-3	12822-4	12822-5
% R Surrogate-PHL (CL 10-94)	*	*	*	87 %	80 %
% R Surrogate-NBZ (CL 35-114)	*	*	*	94 %	91 %
% R Surrogate-2FBP (CL 43-116)	*	*	*	104 %	101 %
% R Surrogate-TBP (CL 10-123)	*	*	*	81 %	90 %
% R Surrogate-TPH (CL 33-141)	*	*	*	103 %	89 %
Date Extracted	10.23.90	10.23.90	10.23.90	10.23.90	10.23.90
Date Analyzed	11.01.90	11.01.90	11.01.90	11.01.90	11.01.90
pH, units	7.7	6.5	6.5	8.0	7.3
Nitrogen Series					
Total Kjeldahl Nitrogen-N, mg/kg dw	7500	1600	1600	88	<15
Nitrate + Nitrite-N, mg/kg dw	8.2	<2.0	16	<2.0	<2.0
Total Nitrogen, mg/kg dw	7500	1600	1600	88	<15
Total Phosphorus, mg/kg dw	450	1100	840	42	88
Total Organic Carbon, mg/kg dw	15000	32000	26000	120	<0.50
Chloride, mg/kg dw	26	29	28	<20	21
Percent Solids, %	90 %	82 %	84 %	95 %	97 %

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Spartanburg, SC 29304

CC: Mark Radecke

Project: NC09001 Wilmington, NC

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
12822-6	LF1EM (# 9104B) 10-10-90	Client
12822-7	LF1EL (# 9104C) 10-10-90	
12822-8	LF1EU (# 9104A) 10-10-90	
12822-9	LF1CU (# 9102A) 10-10-90	
12822-10	LF1CM (# 9102B) 10-10-90	

PARAMETER	12822-6	12822-7	12822-8	12822-9	12822-10
Semi Volatiles					
Naphthalene, mg/kg dw	<7.4	<7.2	3.6J	4.8J	<7.4
2-Methylnaphthalene, mg/kg dw	<7.4	<7.2	<7.5	<9.4	<7.4
1-Methylnaphthalene, mg/kg dw	<7.4	<7.2	<7.5	<9.4	<7.4
1,1-Biphenyl, mg/kg dw	<7.4	<7.2	<7.5	<9.4	<7.4
Acenaphthylene, mg/kg dw	<7.4	<7.2	<7.5	<9.4	<7.4
Acenaphthene, mg/kg dw	<7.4	<7.2	<7.5	<9.4	<7.4
Dibenzofuran, mg/kg dw	<7.4	<7.2	<7.5	6.6J	<7.4
Fluorene, mg/kg dw	<7.4	<7.2	6.0J	20	5.8J
Phenanthrene, mg/kg dw	4.6J	<7.2	20	130	8.1
Anthracene, mg/kg dw	5.0J	<7.2	70	29	58
Carbazole, mg/kg dw	<7.4	<7.2	23	43	9.6
Pyrene, mg/kg dw	6.0J	6.5J	41	150	11
Benzo(a)Anthracene, mg/kg dw	7.4	<7.2	21	32	3.7J
Chrysene, mg/kg dw	8.1	3.7J	22	42	8.9
Benzo(a)pyrene, mg/kg dw	8.1	3.5J	18	24	6.5J
Benzo(g,h,i)perylene, mg/kg dw	<7.4	<7.2	<7.5	10	<7.4
Pentachlorophenol, mg/kg dw	<37	<36	<38	<47	<37
Fluoranthene, mg/kg dw	4.4J	6.8J	51	140	8.9
% R Surrogate-2FP (CL 21-100)	*	*	*	*	*

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CC: Mark Radecke

Project: NC09001 Wilmington, NC

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
12822-6	LF1EM (# 9104B) 10-10-90	Client
12822-7	LF1EL (# 9104C) 10-10-90	
12822-8	LF1EU (# 9104A) 10-10-90	
12822-9	LF1CU (# 9102A) 10-10-90	
12822-10	LF1CM (# 9102B) 10-10-90	

PARAMETER	12822-6	12822-7	12822-8	12822-9	12822-10
% R Surrogate-PHL (CL 10-94)	*	*	*	*	*
% R Surrogate-NBZ (CL 35-114)	*	*	*	*	*
% R Surrogate-2FBP (CL 43-116)	*	*	*	*	*
% R Surrogate-TBP (CL 10-123)	*	*	*	*	*
% R Surrogate-TPH (CL 33-141)	*	*	*	*	*
Date Extracted	10.23.90	10.23.90	---	---	---
Date Analyzed	11.01.90	11.01.90	---	---	---
pH, units	6.7	7.1	6.4	6.6	6.7
Nitrogen Series					
Total Kjeldahl Nitrogen-N, mg/kg dw	<15	470	1400	1900	1100
Nitrate + Nitrite-N, mg/kg dw	<2.0	<2.0	<2.0	8.1	<2.0
Total Nitrogen, mg/kg dw	<15	470	1400	1900	1100
Total Phosphorus, mg/kg dw	640	320	980	1000	620
Total Organic Carbon, mg/kg dw	21000	8000	30000	39000	23000
Chloride, mg/kg dw	27	<20	40	35	<20
Percent Solids, mg/kg dw	88 %	91 %	88 %	70 %	88 %

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
12822-11	LF1CL (# 9102C) 10-10-90	Client
12822-12	LF1CS (# 9102D) 10-10-90	
12822-13	LF1AU (# 9100A) 10-10-90	
12822-14	LF1AM (# 9100B) 10-10-90	
12822-15	LF1AL (# 9100C) 10-10-90	

PARAMETER	12822-11	12822-12	12822-13	12822-14	12822-15
mi Volatiles					
aphthalene, mg/kg dw	<7.5	<0.36	3.8J	<7.3	<7.3
2-Methylnaphthalene, mg/kg dw	<7.5	<0.36	4.0J	<7.3	<7.3
1-Methylnaphthalene, mg/kg dw	<7.5	<0.36	<8.0	<7.3	<7.3
1,1-Biphenyl, mg/kg dw	<7.5	<0.36	<8.0	<7.3	<7.3
Acenaphthylene, mg/kg dw	<7.5	<0.36	<8.0	<7.3	<7.3
Acenaphthene, mg/kg dw	<7.5	<0.36	<8.0	<7.3	<7.3
Dibenzofuran, mg/kg dw	<7.5	<0.36	5.0J	<7.3	<7.3
Fluorene, mg/kg dw	<7.5	<0.36	14	<7.3	<7.3
Phenanthrene, mg/kg dw	13	<0.36	25	3.9J	6.2J
Anthracene, mg/kg dw	6.8J	<0.36	88	3.4J	3.7J
Carbazole, mg/kg dw	<7.5	<0.36	26	<7.3	<7.3
Pyrene, mg/kg dw	110	<0.36	44	13	80
Benzo(a)Anthracene, mg/kg dw	42	<0.36	20	5.8J	39
Chrysene, mg/kg dw	59	<0.36	22	9.5	59
Benzo(a)pyrene, mg/kg dw	22	<0.36	19	7.3	32
Benzo(g,h,i)perylene, mg/kg dw	6.5J	<0.36	8.8	5.0J	16
Pentachlorophenol, mg/kg dw	<38	<1.8	<40	<37	<37
Fluoranthene, mg/kg dw	120	<0.36	58	13	80
% R Surrogate-2FP (CL 21-100)	*	92 %	*	*	*

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Project: NC09001 Wilmington, NC

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
12822-16	LF1AS (# 9100D) 10-10-90	Client
12822-17	LF2BU (# 9106A) 10-10-90	
12822-18	LF2BM (# 9106B) 10-10-90	
12822-19	LF2BL (# 9106C) 10-10-90	
12822-20	LF2BS (# 9106D) 10-10-90	

PARAMETER	12822-16	12822-17	12822-18	12822-19	12822-20
Semi Volatiles					
Naphthalene, mg/kg dw	<0.35	<7.7	30	<7.6	<0.37
2-Methylnaphthalene, mg/kg dw	<0.35	<7.7	41	<7.6	<0.37
1-Methylnaphthalene, mg/kg dw	<0.35	<7.7	20	<7.6	<0.37
1,1-Biphenyl, mg/kg dw	<0.35	<7.7	<7.8	<7.6	<0.37
Acenaphthylene, mg/kg dw	<0.35	<7.7	<7.8	<7.6	<0.37
Acenaphthene, mg/kg dw	<0.35	49	<7.8	<7.6	<0.37
Dibenzofuran, mg/kg dw	<0.35	19	20	5.6J	<0.37
Fluorene, mg/kg dw	<0.35	42	57	12	<0.37
Phenanthrene, mg/kg dw	<0.35	82	86	24	<0.37
Anthracene, mg/kg dw	<0.35	350	400	66	<0.37
Carbazole, mg/kg dw	<0.35	100	160	30	<0.37
Pyrene, mg/kg dw	<0.35	55	23	78	0.60
Benzo(a)Anthracene, mg/kg dw	<0.35	33	13	21	0.21J
Chrysene, mg/kg dw	<0.35	35	18	31	0.35J
Benzo(a)pyrene, mg/kg dw	<0.35	24	30	41	0.30J
Benzo(g,h,i)perylene, mg/kg dw	<0.35	12	<7.8	16	<0.37
Pentachlorophenol, mg/kg dw	<1.8	<39	<39	<38	<1.9
Fluoranthene, mg/kg dw	<0.35	92	27	82	0.63
% R Surrogate-2FP (CL 21-100)	97 %	*	*	*	96 %

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
12822-21	LF2EU (# 9109A) 10-10-90	Client
12822-22	LF2EM (# 9109B) 10-10-90	
12822-23	LF2EL (# 9109C) 10-10-90	
12822-24	LF2ES (# 9109D) 10-10-90	
12822-25	LF2AU (# 9105A) 10-10-90	

PARAMETER	12822-21	12822-22	12822-23	12822-24	12822-25
Semi Volatiles					
Naphthalene, mg/kg dw	3.5J	<7.5	2.1J	<0.36	<7.8
2-Methylnaphthalene, mg/kg dw	<7.4	<7.5	<4.1	<0.36	<7.8
1-Methylnaphthalene, mg/kg dw	<7.4	<7.5	<4.1	<0.36	<7.8
1,1-Biphenyl, mg/kg dw	<7.4	<7.5	<4.1	<0.36	<7.8
Acenaphthylene, mg/kg dw	<7.4	<7.5	<4.1	<0.36	<7.8
Acenaphthene, mg/kg dw	<7.4	<7.5	<4.1	<0.36	<7.8
Dibenzofuran, mg/kg dw	3.7J	<7.5	<4.1	<0.36	<7.8
Fluorene, mg/kg dw	<7.4	6.1J	<4.1	<0.36	22
Phenanthrene, mg/kg dw	19	14	5.7	<0.36	34
Anthracene, mg/kg dw	70	50	14	<0.36	100
Carbazole, mg/kg dw	24	17	1.9J	<0.36	45
Pyrene, mg/kg dw	34	34	30	<0.36	26
Benzo(a)Anthracene, mg/kg dw	13	13	11	<0.36	20
Chrysene, mg/kg dw	18	19	16	<0.36	21
Benzo(a)pyrene, mg/kg dw	18	15	12	<0.36	16
Benzo(g,h,i)perylene, mg/kg dw	8.1	7.1J	8.6	<0.36	7.8
Pentachlorophenol, mg/kg dw	<37	<38	<21	<1.8	<39
Fluoranthene, mg/kg dw	36	36	32	<0.36	35
% R Surrogate-2FP (CL 21-100)	*	*	*	106 %	*

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LOG NO: S0-12822

Received: 11 OCT 90

Ms. Sandra Watson
Southern Wood Piedmont (SP)
P. O. Box 5447
Spartanburg, SC 29304

CC: Mark Radecke

Project: NC09001 Wilmington, NC

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
12822-21	LF2EU (# 9109A) 10-10-90	Client
12822-22	LF2EM (# 9109B) 10-10-90	
12822-23	LF2EL (# 9109C) 10-10-90	
12822-24	LF2ES (# 9109D) 10-10-90	
12822-25	LF2AU (# 9105A) 10-10-90	

PARAMETER	12822-21	12822-22	12822-23	12822-24	12822-25
% R Surrogate-PHL (CL 10-94)	*	*	*	87 %	*
% R Surrogate-NBZ (CL 35-114)	*	*	*	99 %	*
% R Surrogate-2FBP (CL 43-116)	*	*	*	97 %	*
% R Surrogate-TBP (CL 10-123)	*	*	*	103 %	*
% R Surrogate-TPH (CL 33-141)	*	*	*	101 %	*
Date Extracted	10.23.90	10.23.90	10.23.90	10.23.90	10.23.90
Date Analyzed	11.01.90	11.01.90	11.01.90	11.01.90	11.01.90
pH, units	6.0	6.1	6.7	7.5	6.3
Nitrogen Series					
Total Kjeldahl Nitrogen-N, mg/kg dw	190	1400	520	90	1400
Nitrate + Nitrite-N, mg/kg dw	<2.0	12	<2.0	<2.0	<2.0
Total Nitrogen, mg/kg dw	190	1400	520	90	1400
Total Phosphorus, mg/kg dw	1200	940	370	53	1100
Total Organic Carbon, mg/kg dw	35000	31000	20000	490	37000
Chloride, mg/kg dw	27	<20	<20	<20	26
Percent Solids, %	88 %	87 %	80 %	91 %	84 %

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
12822-26	LF2AM (# 9105B) 10-10-90	Client
12822-27	LF2AL (# 9105C) 10-10-90	
12822-28	LF2AS (# 9105D) 10-10-90	
12822-29	LF2CM (# 9107B) 10-10-90	
12822-30	LF2CU (# 9107A) 10-10-90	

PARAMETER	12822-26	12822-27	12822-28	12822-29	12822-30
Semi Volatiles					
Naphthalene, mg/kg dw	<8.3	<7.1	0.33J	5.1J	<7.6
2-Methylnaphthalene, mg/kg dw	10	<7.1	<0.44	<7.3	<7.6
1-Methylnaphthalene, mg/kg dw	<8.3	<7.1	<0.44	<7.3	<7.6
1,1-Biphenyl, mg/kg dw	<8.3	<7.1	<0.44	<7.3	<7.6
Acenaphthylene, mg/kg dw	<8.3	<7.1	<0.44	<7.3	<7.6
Acenaphthene, mg/kg dw	28	<7.1	<0.44	<7.3	<7.6
Dibenzofuran, mg/kg dw	26	<7.1	<0.44	3.8J	<7.6
Fluorene, mg/kg dw	91	<7.1	<0.44	<7.3	12
Phenanthrene, mg/kg dw	200	<7.1	0.49	17	99
Anthracene, mg/kg dw	280	<7.1	0.36J	72	900
Carbazole, mg/kg dw	200	<7.1	<0.44	23	270
Pyrene, mg/kg dw	200	4.7J	2.0	36	130
Benzo(a)Anthracene, mg/kg dw	110	<7.1	1.2	19	43
Chrysene, mg/kg dw	120	3.6J	1.9	22	58
Benzo(a)pyrene, mg/kg dw	46	<7.1	1.3	16	41
Benzo(g,h,i)perylene, mg/kg dw	17	<7.1	0.71	13	17
Pentachlorophenol, mg/kg dw	<42	<36	<2.2	<37	<38
Fluoranthene, mg/kg dw	300	5.0J	2.3	38	110
% R Surrogate-2FP (CL 21-100)	*	*	84 %	*	*

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
12822-26	LF2AM (# 9105B) 10-10-90	Client
12822-27	LF2AL (# 9105C) 10-10-90	
12822-28	LF2AS (# 9105D) 10-10-90	
12822-29	LF2CM (# 9107B) 10-10-90	
12822-30	LF2CU (# 9107A) 10-10-90	

PARAMETER	12822-26	12822-27	12822-28	12822-29	12822-30
% R Surrogate-PHL (CL 10-94)	*	*	74 %	*	*
% R Surrogate-NBZ (CL 35-114)	*	*	76 %	*	*
% R Surrogate-2FBP (CL 43-116)	*	*	92 %	*	*
% R Surrogate-TBP (CL 10-123)	*	*	83 %	*	*
% R Surrogate-TPH (CL 33-141)	*	*	72 %	*	*
Date Extracted	10.23.90	10.23.90	10.23.90	10.23.90	10.23.90
Date Analyzed	11.01.90	11.01.90	11.01.90	11.01.90	11.01.90
pH, units	6.3	6.6	5.1	7.0	6.2
Nitrogen Series					
Total Kjeldahl Nitrogen-N, mg/kg dw	1400	170	1100	340	2200
Nitrate + Nitrite-N, mg/kg dw	<2.0	<2.0	<2.0	<2.0	<2.0
Total Nitrogen, mg/kg dw	1400	170	1100	340	2200
Total Phosphorus, mg/kg dw	290	120	800	90	740
Total Organic Carbon, mg/kg dw	51000	3700	26000	24000	36000
Chloride, mg/kg dw	51	<20	<20	<20	<20
Percent Solids, %	79 %	92 %	73 %	91 %	86 %

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
12822-31	LF2CL (# 9107C) 10-10-90	Client
12822-32	LF2CS (# 9107D) 10-10-90	
12822-33	LF2DS (# 9108D) 10-10-90	
12822-34	LF2DU (# 9108A) 10-10-90	
12822-35	LF2DL (# 9108C) 10-10-90	

PARAMETER	12822-31	12822-32	12822-33	12822-34	12822-35
Semi Volatiles					
Naphthalene, mg/kg dw	<7.5	<0.39	<0.42	<7.9	11
2-Methylnaphthalene, mg/kg dw	<7.5	<0.39	<0.42	9.5	11
1-Methylnaphthalene, mg/kg dw	<7.5	<0.39	<0.42	<7.9	<8.5
1,1-Biphenyl, mg/kg dw	<7.5	<0.39	<0.42	<7.9	<8.5
Acenaphthylene, mg/kg dw	<7.5	<0.39	<0.42	<7.9	<8.5
Acenaphthene, mg/kg dw	<7.5	<0.39	<0.42	<7.9	24
Dibenzofuran, mg/kg dw	<7.5	<0.39	<0.42	<7.9	20
Fluorene, mg/kg dw	<7.5	<0.39	<0.42	37	54
Phenanthrene, mg/kg dw	6.0J	<0.39	0.40J	70	130
Anthracene, mg/kg dw	<7.5	<0.39	0.97	170	290
Carbazole, mg/kg dw	<7.5	<0.39	<0.42	67	75
Pyrene, mg/kg dw	41	<0.39	2.2	51	500
Benzo(a)Anthracene, mg/kg dw	18	<0.39	1.0	18	100
Chrysene, mg/kg dw	32	<0.39	1.4	22	150
Benzo(a)pyrene, mg/kg dw	11	<0.39	0.97	19	65
Benzo(g,h,i)perylene, mg/kg dw	4.2J	<0.39	0.47	7.9	14
Pentachlorophenol, mg/kg dw	<38	<2.0	0.80J	<40	20J
Fluoranthene, mg/kg dw	47	<0.39	2.3	74	500
% R Surrogate-2FP (CL 21-100)	*	97 %	94 %	*	*

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
12822-36	LF2DM (# 9108B) 10-10-90	Client
12822-37	LF1DL (# 9103C) 10-10-90	
12822-38	LF1DU (# 9103A) 10-10-90	
12822-39	LF1DM (# 9103B) 10-10-90	
12822-40	LF1DS (# 9103D) 10-10-90	

PARAMETER	12822-36	12822-37	12822-38	12822-39	12822-40
% R Surrogate-PHL (CL 10-94)	*	*	*	*	*
% R Surrogate-NBZ (CL 35-114)	*	*	*	*	*
% R Surrogate-2FBP (CL 43-116)	*	*	*	*	*
% R Surrogate-TBP (CL 10-123)	*	*	*	*	*
% R Surrogate-TPH (CL 33-141)	*	*	*	*	*
Date Extracted	10.23.90	10.23.90	10.23.90	10.23.90	10.23.90
Date Analyzed	11.01.90	11.01.90	11.01.90	11.01.90	11.01.90
pH, units	5.9	6.6	6.3	6.3	6.9
Nitrogen Series					
Total Kjeldahl Nitrogen-N, mg/kg dw	1400	330	1600	1000	1500
Nitrate + Nitrite-N, mg/kg dw	<2.0	<2.0	7.0	6.9	<2.0
Total Nitrogen, mg/kg dw	1400	330	1600	1000	1500
Total Phosphorus, mg/kg dw	250	240	630	530	340
Total Organic Carbon, mg/kg dw	49000	26000	34000	17000	25000
Chloride, mg/kg dw	99	<20	<20	<20	<20
Percent Solids, %	85 %	86 %	86 %	90 %	87 %

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	SAMPLED BY
12822-41	RB-1	Client
12822-42	FB-1	

PARAMETER	12822-41	12822-42
Semi Volatiles		
Naphthalene, mg/l	<0.010	<0.010
2-Methylnaphthalene, mg/l	<0.010	<0.010
1-Methylnaphthalene, mg/l	<0.010	<0.010
1,1-Biphenyl, mg/l	<0.010	<0.010
Acenaphthylene, mg/l	<0.010	<0.010
Acenaphthene, mg/l	<0.010	<0.010
Dibenzofuran, mg/l	<0.010	<0.010
Fluorene, mg/l	<0.010	<0.010
Phenanthrene, mg/l	<0.010	<0.010
Anthracene, mg/l	<0.010	<0.010
Carbazole, mg/l	<0.010	<0.010
Pyrene, mg/l	<0.010	<0.010
Benzo(a)Anthracene, mg/l	<0.010	<0.010
Chrysene, mg/l	<0.010	<0.010
Benzo(a)pyrene, mg/l	<0.010	<0.010
Benzo(g,h,i)perylene, mg/l	<0.010	<0.010
Pentachlorophenol, mg/l	<0.050	<0.050
Fluoranthene, mg/l	<0.010	<0.010
% R Surrogate-2FP (CL 21-100)	45 %	40 %
% R Surrogate-PHL (CL 10-94)	53 %	51 %
% R Surrogate-NBZ (CL 35-114)	87 %	91 %
% R Surrogate-2FBP (CL 43-116)	92 %	83 %
% R Surrogate-TBP (CL 10-123)	62 %	71 %
% R Surrogate-TPH (CL 33-141)	83 %	81 %
Date Extracted	10.23.90	10.23.90
Date Analyzed	11.01.90	11.01.90

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Project: NC09001 Wilmington, NC

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	SAMPLED BY
12822-41	RB-1	Client
12822-42	FB-1	

PARAMETER	12822-41	12822-42
Suspended Solids, mg/l	<5.0	<5.0
Total Organic Carbon, mg/l	<1.0	2.4
Chloride, mg/l	<1.0	<1.0

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	SAMPLED BY
12822-43	TB-2 10-10-90	Client

PARAMETER	12822-43
Semi Volatiles	
Naphthalene, mg/l	<0.010
2-Methylnaphthalene, mg/l	<0.010
1-Methylnaphthalene, mg/l	<0.010
1,1-Biphenyl, mg/l	<0.010
Acenaphthylene, mg/l	<0.010
Acenaphthene, mg/l	<0.010
Dibenzofuran, mg/l	<0.010
Fluorene, mg/l	<0.010
Phenanthrene, mg/l	<0.010
Anthracene, mg/l	<0.010
Carbazole, mg/l	<0.010
Pyrene, mg/l	<0.010
Benzo(a)Anthracene, mg/l	<0.010
Chrysene, mg/l	<0.010
Benzo(a)pyrene, mg/l	<0.010
Benzo(g,h,i)perylene, mg/l	<0.010
Pentachlorophenol, mg/l	<0.050
Fluoranthene, mg/l	<0.010
% R Surrogate-2FP (CL 21-100)	52 %
% R Surrogate-PHL (CL 10-94)	61 %
% R Surrogate-NBZ (CL 35-114)	92 %
% R Surrogate-2FBP (CL 43-116)	87 %
% R Surrogate-TBP (CL 10-123)	41 %
% R Surrogate-TPH (CL 33-141)	87 %
Date Extracted	10.23.90
Date Analyzed	11.01.90

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	SAMPLED BY
12822-43	TB-2 10-10-90	Client

PARAMETER	12822-43
Nitrogen Series	
Total Kjeldahl Nitrogen-N, mg/l	<0.10
Nitrate + Nitrite-N, mg/l	<0.050
Total Nitrogen, mg/l	<0.10
Total Phosphorus, mg/l	<0.10
Suspended Solids, mg/l	<5.0
Total Organic Carbon, mg/l	<1.0
Chloride, mg/l	<1.0

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	SAMPLED BY
12822-44	Method Blank (MB) Result (Soil)	Client
12822-45	Lab Control Standard (LCS) Result (Soil)	
12822-46	LCS Expected Value (Soil)	
12822-47	LCS % Recovery (Soil)	
12822-48	LCS % Recovery Limits (Soil)	

PARAMETER	12822-44	12822-45	12822-46	12822-47	12822-48
Semi Volatiles					
Naphthalene, mg/kg dw	<0.33	2.6	3.3	79 %	39-127 %
2-Methylnaphthalene, mg/kg dw	<0.33	---	---	---	---
1-Methylnaphthalene, mg/kg dw	<0.33	---	---	---	---
1,1-Biphenyl, mg/kg dw	<0.33	---	---	---	---
Acenaphthylene, mg/kg dw	<0.33	---	---	---	---
Acenaphthene, mg/kg dw	<0.33	3.0	3.3	91 %	31-137 %
Dibenzofuran, mg/kg dw	<0.33	---	---	---	---
Fluorene, mg/kg dw	<0.33	3.3	3.3	100 %	25-150 %
Phenanthrene, mg/kg dw	<0.33	2.7	3.3	82 %	54-120 %
Anthracene, mg/kg dw	<0.33	2.6	3.3	79 %	40-125 %
Carbazole, mg/kg dw	<0.33	---	---	---	---
Pyrene, mg/kg dw	<0.33	2.6	3.3	79 %	20-150 %
Benzo(a)Anthracene, mg/kg dw	<0.33	3.5	3.3	106 %	29-112 %
Chrysene, mg/kg dw	<0.33	3.5	3.3	106 %	17-168 %
Benzo(a)pyrene, mg/kg dw	<0.33	3.8	3.3	115 %	25-160 %
Benzo(g,h,i)perylene, mg/kg dw	<0.33	4.1	3.3	124 %	10-130 %
Pentachlorophenol, mg/kg dw	<1.7	12.6	17	74 %	17-109 %
Fluoranthene, mg/kg dw	<0.33	2.6	3.3	79 %	26-137 %
% R Surrogate-2FP (CL 21-100)	93 %	---	---	96 %	25-121 %

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	SAMPLED BY
12822-44	Method Blank (MB) Result (Soil)	Client
12822-45	Lab Control Standard (LCS) Result (Soil)	
12822-46	LCS Expected Value (Soil)	
12822-47	LCS % Recovery (Soil)	
12822-48	LCS % Recovery Limits (Soil)	

PARAMETER	12822-44	12822-45	12822-46	12822-47	12822-48
% R Surrogate-PHL (CL 10-94)	91 %	---	---	90 %	24-113 %
% R Surrogate-NBZ (CL 35-114)	101 %	---	---	101 %	23-120 %
% R Surrogate-2FBP (CL 43-116)	104 %	---	---	120 %	30-115 %
% R Surrogate-TBP (CL 10-123)	99 %	---	---	106 %	19-122 %
% R Surrogate-TPH (CL 33-141)	97 %	---	---	71 %	18-137 %
Date Extracted	10.23.90	---	---	---	---
Date Analyzed	11.01.90	---	---	---	---
pH, units	---	6.1	6.1	100 %	90-110 %
Chloride, mg/kg dw	<20	4600	4440	105 %	90-110 %
Nitrogen Series					
Total Kjeldahl Nitrogen-N, mg/kg dw	<15	4.79	5.0	96 %	90-110 %
Nitrate + Nitrite-N, mg/kg dw	<2.0	18.7	20	94 %	75-125 %
Total Nitrogen, mg/kg dw	<15	---	---	---	---
Total Phosphorus, mg/kg dw	<25	389	375	104 %	90-110 %
Total Organic Carbon, mg/kg dw	<0.50	270000	230000	117 %	52-134 %

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	SAMPLED BY
12822-49	Matrix Spike (MS) Result/Dup (Soil)	Client
12822-50	MS Expected Value (Soil)	
12822-51	MS % Recovery/Duplicate (Soil)	
12822-52	MS % Recovery Limit (Soil)	
12822-53	MS % RPD (Soil)	

PARAMETER	12822-49	12822-50	12822-51	12822-52	12822-53
Semi Volatiles					
Naphthalene, mg/kg dw	2.8/2.7	3.3	85/82 %	39-127 %	3.6(<32)%
Acenaphthene, mg/kg dw	2.9/3.0	3.3	88/91 %	31-137 %	3.4(<19)%
Fluorene, mg/kg dw	3.1/2.9	3.3	94/88 %	25-150 %	6.6(<33)%
Phenanthrene, mg/kg dw	3.1/2.9	3.3	94/88 %	54-120 %	6.6(<21)%
Anthracene, mg/kg dw	2.7/2.8	3.3	82/85 %	40-125 %	3.6(<25)%
Pyrene, mg/kg dw	3.4/3.2	3.3	103/97 %	20-150 %	6.0(<36)%
Benzo(a)Anthracene, mg/kg dw	3.3/3.1	3.3	100/94 %	29-112 %	6.2(<32)%
Chrysene, mg/kg dw	3.1/2.9	3.3	94/88 %	17-168 %	6.6(<48)%
Benzo(a)pyrene, mg/kg dw	3.1/3.2	3.3	94/97 %	25-160 %	3.1(<38)%
Benzo(g,h,i)perylene, mg/kg dw	3.1/3.1	3.3	94/94 %	10-130 %	0(<56)%
Pentachlorophenol, mg/kg dw	18/18	17	105/105 %	17-109 %	0(<47)%
Fluoranthene, mg/kg dw	3.4/3.2	3.3	103/97 %	26-137 %	6.0(<33)%
% R Surrogate-2FP (CL 21-100)	---	---	95/93 %	25-121 %	---
% R Surrogate-PHL (CL 10-94)	---	---	85/86 %	24-113 %	---
% R Surrogate-NBZ (CL 35-114)	---	---	98/99 %	23-120 %	---
% R Surrogate-2FBP (CL 43-116)	---	---	97/103 %	30-115 %	---
% R Surrogate-TBP (CL 10-123)	---	---	103/103 %	19-122 %	---
% R Surrogate-TPH (CL 33-141)	---	---	106/105 %	18-137 %	---
pH, units	---	---	---	---	---
Chloride, mg/kg dw	108/109	100	108/109 %	75-125 %	0.92(<30)%

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S0-12822

Received: 11 OCT 90

Ms. Sandra Watson
Southern Wood Piedmont (SP)
P. O. Box 5447
Spartanburg, SC 29304

CC: Mark Radecke

Project: NC09001 Wilmington, NC

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	SAMPLED BY
12822-49	Matrix Spike (MS) Result/Dup (Soil)	Client
12822-50	MS Expected Value (Soil)	
12822-51	MS % Recovery/Duplicate (Soil)	
12822-52	MS % Recovery Limit (Soil)	
12822-53	MS % RPD (Soil)	

PARAMETER	12822-49	12822-50	12822-51	12822-52	12822-53
Nitrogen Series					
Total Kjeldahl Nitrogen-N, mg/kg dw	5.04/4.9	5.0	101/98 %	99 %	3.0(<30)%
Nitrate + Nitrite-N, mg/kg dw	22.7/22.7	20	114/114 %	75-125 %	0(<30)%
Total Phosphorus, mg/kg dw	103/108	125	82/86 %	75-125 %	4.8(<40)%
Total Organic Carbon, mg/kg dw	---	---	---	---	---

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CC: Mark Radecke

Project: NC09001 Wilmington, NC

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , REPORT FOR LIQUID SAMPLES	SAMPLED BY
12822-54	Method Blank (MB) Result (Liquid)	Client
12822-55	Lab Control Standard (LCS) Result	
12822-56	LCS Expected Value (Liquid)	
12822-57	LCS % Recovery (Liquid)	
12822-58	LCS % Recovery Limits (Liquid)	

PARAMETER	12822-54	12822-55	12822-56	12822-57	12822-58
Semi Volatiles					
Naphthalene, mg/l	<0.010	---	---	---	---
2-Methylnaphthalene, mg/l	<0.010	---	---	---	---
1-Methylnaphthalene, mg/l	<0.010	---	---	---	---
1,1-Biphenyl, mg/l	<0.010	---	---	---	---
Acenaphthylene, mg/l	<0.010	---	---	---	---
Acenaphthene, mg/l	<0.010	0.050	0.050	100 %	46-118 %
Dibenzofuran, mg/l	<0.010	---	---	---	---
Fluorene, mg/l	<0.010	---	---	---	---
Phenanthrene, mg/l	<0.010	---	---	---	---
Anthracene, mg/l	<0.010	---	---	---	---
Carbazole, mg/l	<0.010	---	---	---	---
Pyrene, mg/l	<0.010	0.060	0.050	120 %	26-127 %
Benzo(a)Anthracene, mg/l	<0.010	---	---	---	---
Chrysene, mg/l	<0.010	---	---	---	---
Benzo(a)pyrene, mg/l	<0.010	---	---	---	---
Benzo(g,h,i)perylene, mg/l	<0.010	---	---	---	---
Pentachlorophenol, mg/l	<0.050	0.090	0.10	90 %	9-103 %
Fluoranthene, mg/l	<0.010	---	---	---	---
% R Surrogate-2FP (CL 21-100)	56 %	---	---	42 %	25-121 %
% R Surrogate-PHL (CL 10-94)	47 %	---	---	27 %	24-113 %
% R Surrogate-NBZ (CL 35-114)	82 %	---	---	103 %	23-120 %
% R Surrogate-2FBP (CL 43-116)	83 %	---	---	101 %	30-115 %
% R Surrogate-TBP (CL 10-123)	59 %	---	---	105 %	19-122 %
% R Surrogate-TPH (CL 33-141)	83 %	---	---	118 %	18-137 %

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LOG NO: S0-12822

Received: 11 OCT 90

Ms. Sandra Watson
Southern Wood Piedmont (SP)
P. O. Box 5447
Spartanburg, SC 29304

CC: Mark Radecke

Project: NC09001 Wilmington, NC

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , REPORT FOR LIQUID SAMPLES	SAMPLED BY
12822-54	Method Blank (MB) Result (Liquid)	Client
12822-55	Lab Control Standard (LCS) Result	
12822-56	LCS Expected Value (Liquid)	
12822-57	LCS % Recovery (Liquid)	
12822-58	LCS % Recovery Limits (Liquid)	

PARAMETER	12822-54	12822-55	12822-56	12822-57	12822-58
Nitrogen Series					
Total Kjeldahl Nitrogen-N, mg/l	<0.10	5.45	5.00	109 %	90-110 %
Nitrate + Nitrite-N, mg/l	<0.050	0.191	0.20	96 %	75-125 %
Total Nitrogen, mg/l	<0.10	---	---	---	---
Total Phosphorus, mg/l	<0.10	1.58	1.50	105 %	90-110 %
Suspended Solids, mg/l	<5.0	380	399	95 %	60-140 %
Total Organic Carbon, mg/l	<1.0	6.5	6.12	106 %	60-140 %
Chloride, mg/l	<1.0	230	222	104 %	90-110 %

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Spartanburg, SC 29304

CC: Mark Radecke

Project: NC09001 Wilmington, NC

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , REPORT FOR LIQUID SAMPLES	SAMPLED BY
12822-59	Matrix Spike (MS) Result/Dup (Liquid)	Client
12822-60	MS Expected Value (Liquid)	
12822-61	MS % Recovery/Duplicate (Liquid)	
12822-62	MS % Recovery Limit (Liquid)	
12822-63	MS % RPD (Limit) (Liquid)	

PARAMETER	12822-59	12822-60	12822-61	12822-62	12822-63
Semi Volatiles					
Acenaphthene, mg/l	0.05/0.05	0.050	100/100 %	46-118 %	0(<31)%
Pyrene, mg/l	0.06/0.06	0.050	120/120 %	26-127 %	0(<31)%
Pentachlorophenol, mg/l	0.09/0.10	0.10	90/100 %	9-103 %	11(<50)%
% R Surrogate-2FP (CL 21-100)	---	---	42/47 %	25-121 %	---
% R Surrogate-PHL (CL 10-94)	---	---	27/30 %	24-113 %	---
% R Surrogate-NBZ (CL 35-114)	---	---	103/112 %	103/112 %	---
% R Surrogate-2FBP (CL 43-116)	---	---	101/99 %	30-115 %	---
% R Surrogate-TBP (CL 10-123)	---	---	105/108 %	19-122 %	---
% R Surrogate-TPH (CL 33-141)	---	---	118/134 %	18-137 %	---
Nitrogen Series					
Total Kjeldahl Nitrogen-N, mg/l	3.95/4.34	4.00	99/109 %	75-125 %	9.6(<30)%
Nitrate + Nitrite-N, mg/l	0.19/0.19	0.20	95/95 %	75-125 %	0(<25)%
Total Phosphorus, mg/l	0.43/0.42	0.50	86/84 %	75-125 %	2.4(<25) %
Suspended Solids, mg/l	---	---	---	---	---
Total Organic Carbon, mg/l	100/99	102.5	98/97 %	60-140 %	1.0(<40) %
Chloride, mg/l	4.74/4.63	5.0	95/93 %	75-125 %	2.3(<25) %

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LOG NO: S0-12822

Received: 11 OCT 90

Ms. Sandra Watson
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P. O. Box 5447
Spartanburg, SC 29304

CC: Mark Radecke

Project: NC09001 Wilmington, NC

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , REPORT FOR LIQUID SAMPLES	SAMPLED BY
12822-64	Report Completion Date	Client

PARAMETER	12822-64
Date Reported	11.13.90

Methods: EPA SW-846
* Because of high levels of components, these samples had to be diluted. Thus, surrogates were not recovered.

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LOG NO: S0-12822

Received: 11 OCT 90

Ms. Sandra Watson
Southern Wood Piedmont (SP)
P. O. Box 5447
Spartanburg, SC 29304

CC: Mark Radecke

Project: NC09001 Wilmington, NC

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	SAMPLED BY
12822-65	Methods	Client

PARAMETER	12822-65
Semi Volatiles	
Naphthalene	8270
2-Methylnaphthalene	8270
1-Methylnaphthalene	8270
1,1-Biphenyl	8270
Acenaphthylene	8270
Acenaphthene	8270
Dibenzofuran	8270
Fluorene	8270
Phenanthrene	8270
Anthracene	8270
Carbazole	8270
Pyrene	8270
Benzo(a)Anthracene	8270
Chrysene	8270
Benzo(a)pyrene	8270
Benzo(g,h,i)perylene	8270
Pentachlorophenol	8270
Fluoranthene	8270
pH	150.1
Nitrogen Series	
Total Kjeldahl Nitrogen-N	351.2
Nitrate + Nitrite-N	353.1
Total Phosphorus	365.1
Total Organic Carbon	415.1
Chloride	325.2

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P. O. Box 5447
Spartanburg, SC 29304

CC: Mark Radecke

Project: NC09001 Wilmington, NC

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	SAMPLED BY
12822-65	Methods	Client

PARAMETER	12822-65
Suspended Solids	160.2

Methods: EPA SW-846
ND = Not Detected

J. W. Andrews

J. W. Andrews, Ph. D.

GERAGHTY & MILLER, INC.
Environmental Services

Laboratory Task Order No. N/A

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number NC09001

Project Location ~~NC09001~~ Wilmington, NC

Laboratory Savannah Laboratories

Sampler(s)/Affiliation M. RADECKE G&M
D. BUMFORD III G&M

SAMPLE BOTTLE / CONTAINER DESCRIPTION

SAMPLE IDENTITY	Code	Date/Time Sampled	Lab ID	1 liter amber glass 4°C ~~TCCP~~ + PAH's	250 ml plastic 4°C Total N	150 ml plastic 4°C H_2SO_4 TSS	250 ml amber glass 4°C TOC	250 ml plastic 4°C H_2SO_4 Cl^-	500 ml glass 4°C KOOI + pH Cl^- TN TP TOC				TOTAL
RB-1	L	10/10/90 16:20	12822	1		1	1	1					4
FB-1	L	10/10/90 16:25		1		1	1	1					4
TB-2	L	10/10/90		1	1	1	1	1					5
LF1BL/9101C	S	10/10/90 16:45							1				1
LF1BU/9101A	S	10/10/90 16:15							1				1
LF1BM/9101B	S	10/10/90 16:40							1				1
LF1BS/9101D	S	10/10/90 17:00							1				1
LF1ES/9104D	S	10/10/90 14:00							1				1
LF1EM/9104B	S	10/10/90 13:45							1				1
LF1EL/9104C	S	10/10/90 13:50							1				1
LF1EU/9104A	S	10/10/90 13:40							1				1

Sample Code: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers 23

Relinquished by: Mark E. Radecke Organization: Geraghty & Miller, Inc 10/10/90 19:00
Received by: Carla Longworth Organization: Savannah LAB Date 10/11/90 Time 10:00
Seal Intact? Yes No N/A

Relinquished by: Organization:
Received by: Organization: Date / / Time
Seal Intact? Yes No N/A

Special Instructions/Remarks: * ~~TCCP~~ PAH's site specific constituents
* Analyze for GS per Mark Radecke 10/15/90 - GF
KOOI changed to PAH's per Mark Radecke 10/24/90. GF

Delivery Method: ☐ In Person ☒ Common Carrier Federal Express (SPECIFY) ☐ Lab Courier ☐ Other (SPECIFY)

GERAGHTY & MILLER, INC.
Environmental Services

Laboratory Task Order No. N/A

CHAIN-OF-CUSTODY RECORD

Project Number NC09001

Project Location Wilmington, NC

Laboratory Savannah laboratories,

Sampler(s)/Affiliation M. RADECKE G&M
D. RUMFORD III G&M

SAMPLE BOTTLE / CONTAINER DESCRIPTION

SAMPLE IDENTITY	Code	Date/Time Sampled	Lab ID	500 ml glass PAH's ~~K001~~ pH TN TP TOC Cl-40									TOTAL
LF2CM/9107B	S	10/10/90 1130	12822	1									1
LF2CU/9107A	S	10/10/90 1115		1									1
LF2CL/9107C	S	10/10/90 1125		1									1
LF2CS/9107D	S	10/10/90 1141		1									1
LF2DS/9108D	S	10/10/90 1235		1									1
* LF2DU/9108A	S	10/10/90 1216	12822	1									1
LF2DL/9108C	S	10/10/90 1230		1									1
LF2DM/9108B	S	10/10/90 1220		1									1
LF1DL/9103C	S	10/10/90 1315		1									1
* LF1DU/9103A	S	10/10/90 1305		1									1
LF1DM/9103B	S	10/10/90 1310		1									1
LF1DS/9103D	S	10/10/90 1320		1									1

Sample Code: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers 12

Relinquished by: Mark E Radecke Organization: Geraghty & Miller, Inc. 10/10/90 19:00
Received by: Carla Longworth Organization: Savannah LAB Date 10/11/90 Time 10:00
Seal Intact? Yes No N/A

Relinquished by: Organization:
Received by: Organization: Date / / Time
Seal Intact? Yes No N/A

Special Instructions/Remarks: * ~~K001~~ PAH's Site specific list K001 changed to PAH's per Mark Radecke 10/24/90. GF
& Analyze for Grain Size per Mark Radecke 10/15/90. GF

Delivery Method: ☐ In Person ☒ Common Carrier Federal Express (SPECIFY) ☐ Lab Courier ☐ Other (SPECIFY)

Southdot 90.0138

GERAGHTY & MILLER, INC.
Environmental Services

Laboratory Task Order No. N/A

CHAIN-OF-CUSTODY RECORD

Project Number NC09001

Project Location Wilmington, NC

Laboratory Savannah Laboratories

Sampler(s)/Affiliation M. RADECKE G&M
D. RUMFORD III G&M

SAMPLE BOTTLE / CONTAINER DESCRIPTION

SAMPLE IDENTITY	Code	Date/Time Sampled	Lab ID	500 ml Glass PAH's TN TP TOC pH Cl- 4°C									TOTAL
* LF2BU/9106A	S	10/10/90	12822	1									1
LF2BM/9106B	S	10/10/90		1									1
LF2BL/9106C	S	10/10/90		1									1
LF2BS/9106D	S	10/10/90		1									1
LF2EU/9109A	S	10/10/90		1									1
LF2EM/9109B	S	10/10/90		1									1
LF2EL/9109C	S	10/10/90		1									1
LF2ES/9109D	S	10/10/90		1									1
LF2AU/9105A	S	10/10/90		1									1
LF2AM/9105B	S	10/10/90		1									1
LF2AL/9105C	S	10/10/90		1									1
LF2AS/9105D	S	10/10/90		1									1

Sample Code: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers: 12

Relinquished by: [signature] Organization: Geraghty & Miller Inc 10/10/90 19:00 Received by: Carla Longworth Organization: Savannah Lab Date 10/11/90 Time 10:00	Seal Intact? (Yes) No N/A
Relinquished by: Organization: Received by: Organization: Date / / Time	Seal Intact? Yes No N/A

Special Instructions/Remarks: PAH's ~~KOOI~~ Site Specific list
* Analyze for Grain Size per Mark Radecke 10/15/90. GF
KOOI changed to PAH's per Mark Radecke 10/24/90. GF

Delivery Method: ☐ In Person ☒ Common Carrier Federal Express (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

GERAGHTY & MILLER, INC.
Environmental Services

Laboratory Task Order No. N/A

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number NC09001

Project Location Wilmington, NC

Laboratory Savannah Laboratories

Sampler(s)/Affiliation D. RUMFORD III G&M
M. RADECKE G&M

SAMPLE IDENTITY	Code	Date/Time Sampled	Lab ID	SOW PAH + Cl- TP TP TOC pH									TOTAL
LFICU/9102A	S	10/10/90 14:20	12822	1									1
LFICM/9102B	S	10/10/90 14:30		1									1
LFICL/9102C	S	10/10/90 14:35		1									1
LFICS/9102D	S	10/10/90 14:50		1									1
LFIAU/9100A	S	10/10/90 15:20		1									1
LFIAM/9100B	S	10/10/90 15:28		1									1
LFIAL/9100C	S	10/10/90 15:34		1									1
LFIAS/9100D	S	10/10/90 15:42		1									1

Sample Code: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers 8

Relinquished by: Mark E Radecke Organization: Geraghty & Miller, Inc 10/10/90 19:00
Received by: Carla Longworth Organization: Savannah Lab Date 10/11/90 Time 10:00
Seal Intact? Yes No N/A

Relinquished by: Organization:
Received by: Organization: Date / / Time
Seal Intact? Yes No N/A

Special Instructions/Remarks: ~~TCLP~~ Site specific list
Kool changed PAH's per Mark Radecke 10/24/90. GF

Delivery Method: ☐ In Person ☒ Common Carrier Federal Express (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

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12822	-1	-2	-3	-4	-5
	9101C	9101A	9101B	9101D	9104D
2-Chlorophenol	<7.3	<7.4	<7.8	<0.35	
Phenol	↓	↓	↓	↓	
2,4-Dimethylphenol					
Trichlorophenols					
p-chloro-m-cresol					
Tetrachlorophenols	↓	↓	↓	↓	
2,4-Dinitrophenol	<37	<7	<39	<1.8	
Benzo(b,k)Fluoranthene	27J	43J	19J	<0.35	
Indeno(1,2,3-cd)pyrene	5.2J	10J	4.9J	↓	
Dibenzo(a,h)anthracene	2.3J	4.3J	2.7J		
o-cresol	<7.3	<7.4	<7.8		
m+p cresol	↓	↓	↓	↓	

12822	-6	-7	-8	-9	-10
	9104B	9104C	9104A	9102A	9102B
2-Chlorophenol	<7.4	<7.2	<7.5	<9.4	<7.4
Phenol	↓	↓	↓	↓	↓
2,4-Dimethylphenol					
Trichlorophenols					
p-Chloro-m-cresol					
Tetrachlorophenols	↓	↓	↓	↓	↓
2,4-Dinitrophenol	<37	<36	<38	<47	<37
Benzo(b,k)Fluoranthene	120J	9.1J	29J	49J	14J
Indeno(1,2,3-cd)pyrene	14J	2.0J	8.1J	11J	3.3J
Dibenzo(a,h)anthracene	4.2J	0.76J	3.0J	5.0J	1.6J
o-cresol	<7.4	<7.4	<7.5	<9.4	<7.4
m+p cresol	↓	↓	↓	↓	↓

12822	-11	-12	-13	-14	-15
	9102C	9102D	9100A	9100B	9100C
2-Chlorophenol	<7.5	<0.36	<8.0	<7.3	<7.3
Phenol	↓	↓	↓	↓	↓
2,4-Dimethylphenol	↓	↓	↓	↓	↓
Trichlorophenols	↓	↓	↓	↓	↓
p-chloro-m-cresol	↓	↓	↓	↓	↓
Tetrachlorophenols	↓	↓	↓	↓	↓
2,4-Dinitrophenol	<38	<1.8	<40	<37	<37
Benzo(b,k)Fluoranthene	68 J	<0.36	35 J	19 J	100 J
Indeno(1,2,3-cd)pyrene	9.3 J	↓	10 J	5.2 J	17 J
Dibenzo(a,h)anthracene	4.7 J	↓	4.2 J	2.2 J	7.5 J
o-cresol	<7.5	↓	<8.0	<7.3	<7.3
m+p-cresol	↓	↓	↓	↓	↓

12822	-16	-17	-18	-19	-20
	9100D	9106A	9106B	9106C	9106D
2-Chlorophenol	<0.35	<7.7	<7.8	<7.6	<0.37
Phenol	↓	↓	↓	↓	↓
2,4-Dimethylphenol	↓	↓	↓	↓	↓
Trichlorophenols	↓	↓	↓	↓	↓
p-chloro-m-cresol	↓	↓	↓	↓	↓
Tetrachlorophenols	↓	↓	↓	↓	↓
2,4-Dinitrophenol	<1.8	<39	<39	<38	<1.9
Benzo(b,k)Fluoranthene	<0.35	43 J	24 J	17 J	0.78 J
Indeno(1,2,3-cd)pyrene	↓	11 J	<7.8	<7.6	0.18 J
Dibenzo(a,h)anthracene	↓	<7.7	↓	↓	<0.37
o-cresol	↓	↓	↓	↓	↓
m+p-cresol	↓	↓	↓	↓	↓

12822	-21	-22	-23	-24	-25
	9109A	9109B	9109C	9109D	9105A
2-Chlorophenol	<7.4	<7.5	<4.1	<0.36	<7.8
Phenol	↓	↓	↓	↓	↓
2,4-Dimethylphenol					
Trichlorophenols					
p-Chloro-m-cresol					
Tetrachlorophenols	↓	↓	↓	↓	↓
2,4-Dinitrophenol	<37	<38	<21	<1.8	<39
Benzo(b,k)Fluoranthene	35J	32J	31J	<0.36	33J
Indeno(1,2,3-cd)pyrene	9.6J	8.3J	9.4J	↓	8.6J
Dibenzo(a,h)anthracene	4.4J	3.2J	3.9J		3.9J
o-cresol	<7.4	<7.5	<4.1	↓	<7.8
m+p cresol	↓	↓	↓		↓

12822	-26	-27	-28	-29	-30
	9105B	9105C	9105D	9107B	9107A
2-Chlorophenol	<8.3	<7.1		<7.3	<7.6
Phenol	↓	↓		↓	↓
2,4-Dimethylphenol					
Trichlorophenols					
p-Chloro-m-cresol					
Tetrachlorophenols	↓	↓		↓	↓
2,4-Dinitrophenol	<42	<36		<37	<38
Benzo(b,k)Fluoranthene	89J	6.2J		5.7J	43J
Indeno(1,2,3-cd)pyrene	18J	1.1J		14J	11J
Dibenzo(a,h)anthracene	<8.3	<7.1		6.2J	5.3J
o-cresol	↓	↓		<7.3	<7.6
m+p cresol	↓	↓		↓	↓

	-31	-32	-33	-34 *	-35
	9107C	9107D	9108D		9108C
2-Chlorophenol	<7.5	<0.39	<0.42		<8.5
Phenol	↓	↓	↓		↓
2,4-Dimethylphenol					
Trichlorophenols					
p-chloro-m-cresol					↓
Tetrachlorophenols	↓	↓	↓		1.2 J
2,4-Dinitrophenol	<38	<2.0	<2.1		<43
Benzo(b,k)Fluoranthene	38 J	<0.39	2.3 J		99 J
Indeno(1,2,3-cd)pyrene	23 J	↓	0.53 J		19 J
Dibenzo(a,h)anthracene	15 J		0.23 J		9.4 J
o-cresol	<7.5		<0.42		<8.5
m+p cresol	↓	↓	↓		↓

12822	-36	-37	-38	-39	-40
	9108B	9108C	9103A	9103B	9103D
2-Chlorophenol	<7.8	<7.6	<7.6	<7.3	<7.6
Phenol	↓	↓	↓	↓	↓
2,4-Dimethylphenol	↓	↓	↓	↓	↓
Trichlorophenols	↓	↓	↓	↓	↓
p-chloro-m-cresol	↓	↓	↓	↓	↓
Tetrachlorophenols	↓	↓	↓	↓	↓
2,4-Dinitrophenol	<39	<38	<38	<37	<38
Benzo(b,k)fluoranthene	82J	52J	31J	14J	18J
Indeno(1,2,3-cd)pyrene	19J	8.7J	8.0J	4.9J	4.1J
Dibenzo(a,h)anthracene	8.0J	3.9J	4.3J	1.6J	1.8J
o-cresol	<7.8	<7.6	<7.6	<7.3	<7.6
m+p-cresol	↓	↓	↓	↓	↓

	-41	-42	-43
	RB1	FB1	TB2
2-Chlorophenol	<0.010	<0.010	<0.010
Phenol	↓	↓	↓
2,4-Dimethylphenol	↓	↓	↓
Trichlorophenols	↓	↓	↓
p-chloro-m-cresol	↓	↓	↓
Tetrachlorophenols	↓	↓	↓
2,4-Dinitrophenol	<0.050	<0.050	<0.050
Benzo(b,k)Fluoranthene	<0.010	<0.010	<0.010
Indeno(1,2,3-cd)pyrene	↓	↓	↓
Dibenzo(a,h)anthracene	↓	↓	↓
o-cresol	↓	↓	↓
m+p cresol	↓	↓	↓

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

Mark,

Additional compound results for

12822 # 5 # 28 # 34.

Thanks,

Gloria

THE ENCLOSURE IS BEING SENT TO YOU WITHOUT A PERSONAL LETTER SO THAT IT MAY REACH YOU EXPEDITIOUSLY.

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DEC 16 1991

12822	-1	-2	-3	-4	-5
	9101C	9101A	9101B	9101D	9104D
2-Chlorophenol	<7.3	<7.4	<7.8	<0.35	<0.34
Phenol	↓	↓	↓	↓	↓
2,4-Dimethylphenol	↓	↓	↓	↓	↓
Trichlorophenols	↓	↓	↓	↓	↓
p-Chloro-m-cresol	↓	↓	↓	↓	↓
Tetrachlorophenols	↓	↓	↓	↓	↓
2,4-Dinitrophenol	<37	<7	<39	<1.8	<1.7
Benzo(b,k)Fluoranthene	27J	43J	19J	<0.35	1.1J
Indeno(1,2,3-cd)pyrene	5.2J	10J	4.9J	↓	<0.34
Dibenzo(a,h)anthracene	2.3J	4.3J	2.7J	↓	↓
o-cresol	<7.3	<7.4	<7.8	↓	↓
m+p cresol	↓	↓	↓	↓	↓

12822	-26	-27	-28 *	-29	-30
	9105B	9105C	9105D	9107B	9107A
2-Chlorophenol	<8.3	<7.1	<0.45	<7.3	<7.6
Phenol	↓	↓	↓	↓	↓
2,4-Dimethylphenol	↓	↓	↓	↓	↓
Trichlorophenols	↓	↓	↓	↓	↓
p-Chloro-m-cresol	↓	↓	↓	↓	↓
Tetrachlorophenols	↓	↓	↓	↓	↓
2,4-Dinitrophenol	<42	<36	<2.3	<37	<38
Benzo(b,k)Fluoranthene	89J	6.2J	2.6J	5.7J	43J
Indeno(1,2,3-cd)pyrene	18J	1.1J	<0.45	14J	11J
Dibenzo(a,h)anthracene	<8.3	<7.1	↓	6.2J	5.3J
o-cresol	↓	↓	↓	<7.3	<7.6
m+p cresol	↓	↓	↓	↓	↓

	-31	-32	-33	-34	-35
	9107C	9107D	9108D	9108A	9108C
2-Chlorophenol (128)	<7.5	<0.39	<0.42	<0.39	<8.5
Phenol	↓	↓	↓	↓	↓
2,4-Dimethylphenol	↓	↓	↓	↓	↓
Trichlorophenols	↓	↓	↓	↓	↓
p-chloro-m-cresol	↓	↓	↓	↓	↓
Tetrachlorophenols	↓	↓	↓	↓	1.2J
2,4-Dinitrophenol	<38	<2.0	<2.1	<2.0	<43
Benzo(b,k)Fluoranthene	38J	<0.39	2.3J	1.4J	99J
Indeno(1,2,3-cd)pyrene	23J	↓	0.53J	<0.39	19J
Dibenzo(a,h)anthracene	15J	↓	0.23J	↓	9.4J
o-cresol	<7.5	↓	<0.42	↓	<8.5
m+p-cresol	↓	↓	↓	↓	↓

SL *SAVANNAH LABORATORIES*
& ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

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G & M RALEIGH

March 12, 1992

Mr. Mark Radecke
GERAGHTY & MILLER, INC.
3724 National Drive
Suite 228
Raleigh, NC 27612

Dear Mark:

Benzo(b,k)fluoranthene cannot be separated for orders SO-12822 and SO-12806.

Sincerely,

Gloria Fulwood

Gloria Fulwood

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TRIANGLE LABORATORIES, INC.
801-10 CAPITOLA DRIVE
RESEARCH TRIANGLE PARK, NC 27713

Phone: (919) 544-5729
Fax: (919) 544-5491

NOV 20 1990

DATE :	* 16 NOVEMBER 1990
CLIENT ID :	* SOUTHERN WOOD PIEDMONT
P.O. NUMBER :	* 5145
TLI PROJECT No. :	* 16661

CASE NARRATIVE
MODEL 8290X

ANALYSIS OF SAMPLES FOR THE PRESENCE OF POLYCHLORINATED DIBENZO-p-DIOXINS AND DIBENZOFURANS BY HIGH-RESOLUTION GAS CHROMATOGRAPHY / HIGH-RESOLUTION MASS SPECTROMETRY

Two soil samples were received from SOUTHERN WOOD PIEDMONT in good condition October 10, 1990 and stored in a refrigerator at 4°C. The samples were extracted and analyzed according to procedures described in the Triangle Labs User Manual provided with this data package. Any particular difficulties encountered during the sample handling by Triangle Labs will be discussed in the QA/QC remark section below.

Quality Assurance/Quality Control Samples

A laboratory method blank -- identified as the TLI Blank -- is prepared along with the batch of samples.

QA/QC Remarks

The release of this particular set of SOUTHERN WOOD PIEDMONT analytical data by Triangle Labs was authorized by the Quality Assurance Officer who has reviewed each sample data package individually following a series of inspections/reviews conducted at two other levels of the data production line. When applicable, general deviations from acceptable QA/QC requirements are identified below. Comments on the effect of these deviations upon the validity and reliability of the results can be obtained from the User Manual (Data Quality Objectives; Section 5). Specific QA/QC Problems Associated with this Particular Project are:

Sample Preparation Laboratory: None

Mass Spectrometry: None

Data Review:

The 234678-HxCDF and OCDD isomers were found in the TLI Blank at levels less than one-third the calculated theoretical method quantitation limit (TMQL) for the associated samples. Blank contamination levels of one-third TMQL or less are acceptable under TLI guidelines, as discussed in section 5.1.3.2 of the Data User's Manual.

TLI Blank, Samples LF1/9110 (TLI # 37-26-1) and LF2/9111 (TLI # 37-26-2) present QC ion instabilities as a result of quantitative interferences (on DB-5 and DB-225 analyses). The affected isomers are flagged "Q" on the report. Affected analytes may be overestimated or underestimated due to this interference. Quantitative interference is described in section 5.1.2.4.1 of the Data User's Manual.

These samples have been diluted and reanalyzed on DB-5 column due to saturation in the original analysis.

Sample LF2/9111 (DIL) (TLI # 37-26-2) has been reanalyzed on DB-5 column due to arcing, present in the HpCDF mass channel.

NOV 19 1990

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Addendum to Section 4.6 of the Data User's Manual

Effective December 15, 1989, Triangle Laboratories has adopted a new procedure for calculating the analyte specific detection limits. Under this new policy two representative noise height determinations are summed and multiplied by an empirically determined factor before the detection limit equation given in Section 4.6 of the Data User's Manual is applied. The effect of this procedure is to increase DB-225 analyses detection limits by a factor of 3.5, and DB-5 analyses detection limits by a factor of 5. This procedure will result in a more accurate estimate of detection limits.

The revised formula for DB-225 analyses is:

$$DL_{ai}^{DB-225} = \frac{2.5 * (3.5 * H_{ai}) * Q_{Bj}}{A_{Bj} * \overline{RRF} * W}$$

$$3.5 * H_{ai} = A_{noise}$$

The revised formula for DB-5 analyses is:

$$DL_{ai}^{DB-5} = \frac{2.5 * (5 * H_{ai}) * Q_{Bj}}{A_{Bj} * \overline{RRF} * W}$$

$$5 * H_{ai} = A_{noise}$$

The symbols are defined in Section 4.6 of the Data User's Manual.

As an example, consider a DB-225 confirmation analysis of a 10 g sample. The internal standard spike is 2000 pg, the 13C12-2,3,7,8-TCDF internal standard area is 12000 area units, the RRF is 1.215 and the noise height is 11 units. The 2,3,7,8-TCDF detection limit is:

$$DL_{TCDF}^{DB-225} = \frac{2.5 * (3.5 * 11) * 2000}{12000 * 1.215 * 10.0} = 1.3 \text{ ppt}$$

Should SOUTHERN WOOD PIEDMONT have any questions or comments to formulate regarding this data package please feel free to contact us.

For Triangle Laboratories,

Analyst | QA Project Officer | Laboratory Manager

SWP

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TRIANGLE LABORATORIES, INC.

[PSTMF 1]

PCDD/PCDF/PBDD/PBDF SAMPLE TRACKING & MANAGEMENT FORM

GENERAL INFORMATION

TLI PROJECT NUMBER: 1 66661

OTHER TLI PROJECTS: 1_____, 1_____ Client Code: DX-H

Detection limits req. 1-10ppt

CUSTOMER Name: Southern Wood Piedmont P.O. No.: 5145

RECEIVING DATE: 10 / 10 / 90 Client's Project No: NC09001

Collection Date: 10-9-90

TURN-AROUND TIME: Hardcopy 30 Days Sample Orgin: Wilmington, NC

Circle one: TSCA/FIFRA/FDA/other GLP/non GLP

DUE DATE: 11 / 09 / 90

10/10/90

SAMPLE PREPARATION LABORATORY INSTRUCTIONS

2 soil

NUMBER/TYPE of SAMPLES: ___ A ___ AA 2 B ___ C

MATRIX TYPE [No Samples]:

Soil	[2]	Water	[ ]	Ash	[ ]
Sludge	[ ]	Pulp	[ ]	Paper	[ ]
Wipes	[ ]	Oil	[ ]	Chemical	[ ]
Fish	[ ]	Blood	[ ]	Adipose	[ ]
Milk	[ ]	MMS	[ ]	Other:	____

NA% of original extract sent to GC/MS

Portion (unspiked) given to Organics (amount/initial/date) NA

ORGANICS TLI PROJECT NUMBER: 1 NA

SAMPLE FORTIFICATION

Solution ID:	USB-I	USB-S	USB-C	USB-A
Before Extraction:	[✓]	[ ]	[ ]	[ ]
Before Cleanup:	[ ]	[✓]	[✓]	[✓]

13C-DBF BS-I Other: _____

Concentration: 0.1 ng/µL Volume: 100 µL

The XAD-2 resins or the PUF cartridges were prespiked with ___ ng/g of the surrogate carbon-labeled standards (USB-S & USB-C; TLI 1 NA).

ISOLATION PULP LOW (HIGH) (DB-5) DB-225 Others _____

(Tetra-Octa) Mono-Octa Tetra only Unchlorinated Others _____

INFORMATION ENTERED BY: PROJECT COORDINATOR INITIALS/DATE: KKC 10-10-90

REV 104 8/27/90

NOV 19 1990

[PSTMF 10]

TRIANGLE LABORATORIES, INC.

166061

PROJECT COMMUNICATION TRACKING SHEET

Use this form to record all exchanges of information between production units as well as personnel handling this project. Decisions, corrective actions and recommendations must also appear on this tracking document.

Date	Name	Comment / Decision / Resolution / Action / Observation
10/23/90	Gm	Run dilutions on 2 samples
		Extra charge @ $575 per sample
		FAX original analysis to Sandra Watson
		803-599-1087. Ship whole
		package when dilutions complete.
15Nov90	B	Data Review:
		① 123478 HxCDF should have been
		detected (S9037911)
		② 123789 HxCDD - AC or flag
		PR (S9042112)
		- Remarks Fine. -
16Nov	B	Data to SWP per Ed Marti.

REV 102 4/15/90

NOV 19 1990

TRIANGLE LABORATORIES, INC. [PSTMF 3]

PCDD/PCDF/PBDD/PBDF SAMPLE TRACKING & MANAGEMENT FORM

SAMPLE PREPARATION LABORATORY INSTRUCTIONS

(continued)

TLI PROJECT NUMBER: 16661

Sample Size(To be extracted): 10 g ___ L Other: ___

Sample Extraction: Soxhlet: Toluene EtOH Tol/EtOH
Sep. Fun. Jar SDS Lyoph/Soxhlet Fish

ASME Front/Back Halves Combined yes no

Filter Sample after Fortification yes no

Extract Solid and Filtrate Separately yes no

Combine both Extracts before Cleanup yes no

Other: _____ (see Special Instructions)

JS 10/15/90

Sample Fractionation: Acid/Base Large Acid
BioSil A Impregnated: yes no
Piggy Back
A540: 12g 50g A950
AX-21 Celite Silica Gel
Other: _____

Percent Moisture: yes no Percent Lipids: yes no

Quality Assurance / Quality Control Samples

Laboratory Method Blank (TLI Blank): yes no L

Duplicate (DUP): ID _____ yes no ___
ID _____

Matrix Spike (MS): ID _____ yes no ___

Matrix Spike Duplicate (MSD): ID _____ yes no ___

MS Solution ID: USB-MX BS-MX Other: ___

MS Solution Conc.: ___ ng/uL

MS Solution Vol.: ___ uL

INFORMATION ENTERED BY: PROJECT COORDINATOR INITIALS/DATE KKC 10-10-90

NOV 1 9 1990

[PSTMF 4]

TRIANGLE LABORATORIES, INC.

PCDD/PCDF/PBDD/PBDF SAMPLE TRACKING & MANAGEMENT FORM

HIGH-RESOLUTION MASS SPECTROMETRY LABORATORY INSTRUCTIONS

TLI PROJECT NUMBER: 16661

Recovery Standards

Solution ID: (USB-RS) 13C-DBD Others: _____

Concentration: 100 pg/uL Volume: 100 uL

Volume of Pure Solvent : NA uL

HRGC/HRMS Method

(2378X) 551 1613 BROMO DD/DF Other: _____

System Definition

Mono-Octa Tri-Octa (Tetra-Octa) Tetra Other: _____

Confirmation Analyses Required (yes) no

Duplicate Injection required on : NA

INFORMATION ENTERED BY: PROJECT COORDINATOR INITIALS/DATE: KKC 10-10-90

RUN TYPE	FULL-SCREEN ANALYSES	CONFIRMATION ANALYSES
I-CAL date	10 / 13 / 90	___ / ___ / ___
CON-CAL File	8903783	_____
RETCHECK File	8903784	_____
For GC/MS Files	8903789 to 8903791	_____ to _____
CON-CAL File	_____	_____
RETCHECK File	_____	_____
For GC/MS Files	_____ to _____	_____ to _____
CON-CAL File	_____	_____
RETCHECK File	_____	_____
For GC/MS Files	_____ to _____	_____ to _____

INFORMATION ENTERED BY: GC/MS CLERK INITIALS / DATE: M. Smith 10/19/90

REV 105 8/27/90

NOV 9 1990

TRIANGLE LABORATORIES, INC. ENVIRONMENTAL [illegible] (PSTMF 51)

PCDD/PCDF/PBDD/PBDF SAMPLE TRACKING & MANAGEMENT FORM

REPORT GENERATION AND DATA REVIEW INSTRUCTIONS

TLI PROJECT NUMBER: 16661

Report Results on Dry-Weight Basis: (yes) no Type: A AA (B) C

Analyte Concentration Units: ppt pg (ppb) ng ppq

Toxic Equivalent Factors: yes (no)

NCASI Report Format: yes (no)

QUALITY ASSURANCE / QUALITY CONTROL REQUIREMENTS

INFORMATION ENTERED BY: PROJECT COORDINATOR INITIALS / DATE: KKC 10-10-96

REV 104 8/27/90

NOV 1 9 1990

TRIANGLE LABORATORIES, INC.

[PSTMF 7]

PCDD/PCDF/PBDD/PBDF SAMPLE PREPARATION TRACKING & MANAGEMENT FORM

SWP

- 16666 1

EXTRACTION DATE: 10/10/90 Spiking Dates: 10/10/90 _/_/_ _/_/_ CB 10/15/90 _/_/_

SAMPLE INFORMATION

WET LAB No:	TLI Sample ID	Gross Weight	Sample Size g / mL	USB-I Vol. µL	USB-I Ex/Cl Init.	USB-S Vol. µL	USB-S Ex/Cl Init.	USB-C Vol. µL	USB-C Ex/Cl Init.	USB-ACS Vol. µL	USB-ACS Ex/Cl Init.	USB-MX Volume µL	USB-MX Extr. Init.	Sple left y/n	Dry Wght g	Msr Lipd (%)
0	TLI Blank			QS 100µl	WK					100µl	MH					
1	37-26-1	531.0	11.02	QS 100µl	WK					100µl	MH			Y	9.46	14.19
2	37-26-2	450.1	11.10g	QS 100µl	WK					100µl	MH			Y	9.40	15.28

*Gross weight of sample container plus sample before a liquot removal.

LABORATORY ID: High Level Lab

(B) - Blank Thimble

(1) - Dark brown Sandy Soil, some rocks

(2) " " " " "

INITIALS OF BOTH THE SPIKER AND OBSERVER MUST BE ENTERED.

Indicate Below the TLI Identification Number of the Sample Fortification Solutions:

USB-I : $11-7-1A WK 0.1ng/µl Exp 3/11/91

USB-ACS : $11-13-18 0.1ng/µl Exp 11 Mar 91 MH

USB-S : _____

USB-MX : _____

USB-C : _____

Other : _____

LOT # (solvents): Toluene Lot # 904956

for extraction _____

fractionation: _____

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[PSTMF 8]

PCDD/PCDF/PBDD/PBDF SAMPLE TRACKING & MANAGEMENT FORM

16661

SWP ENVIRONMENTAL AFFAIRS

SAMPLE INFORMATION

WET LAB No:	TLI Sample ID	Client Sample ID	GC/MS File Name Column: DB5	S	Confirm yes/no	Confirm File Name Column: DB225	S	USB-RS volume soln ID	USB-RS Initial date	ANALYSIS COMMENTS
0	TLI Blank		$903789	✓	NO			100 ml $12-14-3C	C.P. 10/18/90	
1	37-26-1	LF1/9110	* S904212 $903790	✓	YES	U902306		↓	↓	
2	37-26-2	LF1/9111	* T904958 $903791	✓	YES	U902307		↓	↓	
		ec NOV 15 '90 TB								

S = DATA ARCHIVED/SHIPPED *Reshoot, saturation, process these, DC 10/23/90.

Reason for Reextraction:

REV 104 8/27/90

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ENVIRONMENTAL [illegible]

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[PSTMF 9]

PCDD/PCDF/PBDD/PBDF SAMPLE TRACKING & MANAGEMENT FORM

SWP

1 Cololol

SAMPLE EXTRACT INFORMATION

WET LAB No:	TLI Sample ID	EXTRACT CHAIN OF CUSTODY						
		FROM WET LAB		TO MASS SPEC LAB		TO ARCHIVE		
		DATE AND TIME SAMPLE RELEASED	INITIAL	DATE AND TIME SAMPLE ACCEPTED	INITIAL	DATE AND TIME SAMPLE ARCHIVED	INITIAL	COMMENTS
0	TLI Blank	10/17/90 22:00	JS	10/17/90 2330	SB			
1	37-26-1	↓	↓	↓	↓			
2	↓ 2	↓	↓	↓	↓			

REV 104 8/27/90

MASS SPECTROMETER RUN SHEET

FULL SCREEN ANALYSES

CASE ID: Southern Wood Piedmont			TLI PROJECT ID: 16661		
DATE :			SPECTROSCOPIST:		MS # 707
SAMPLE ID:	FILE NAME:	OPERATOR:	DATE	TIME	COMMENTS
RTCHK	$903784	CP	10/18/90	712	
C.Cal	$903783	VC		430	
TLIBlank	$903789	CP		1224	
LF1/9110	90			1328	
LF1/9111	91	HSK		1434	

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REV 2 12/1/88

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MASS SPECTROMETER RUN SHEET

CONFIRMATION ANALYSES

CASE ID:	JWP	TLI PROJECT ID:	16661
DATE :	10/21/90	SPECTROSCOPIST:	MS # 70u

SAMPLE ID:	FILE NAME:	OPERATOR:	DATE	TIME	COMMENTS
RTCHK	U902297	JA	10/21/90	921	
C-Cal	98	↓	↓	1013	
LF1/9110	U902306	JA	10-21-90	1642	
LF1 19111	07	JA	↓	1732	

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REV 2 12/1/88

NOV 19 1990
ENVIRONMENTAL

% Moisture Calculation
Project Number: 6661

Sample Number	Client ID	Vial + Moisture Sample Weight	Empty Vial Weight	Dry Vial + Moisture Sample Weight	% Moisture	Actual Sample Weight	Dry Actual Sample Weight
1	LF1/9110	27.4108	13.2100	25.3972	14.18	11.0200	9.46
2	LF1/9111	27.2169	13.6488	25.1431	15.28	11.1000	9.40

SWP

PERCENT MOISTURE FORM

NOV 19 1990

PROJECT ENVIRONMENTAL AFFAIRS

66661

SAMPLE I.D.	A VIAL+SAMPLE	B MT VIAL	C WET WT.	<-- D --> FIRST DRY	SECOND	THIRD	(A-D) H2O LOST	(A-D)/CX100 %H2O
	10/10/90 gs	10/10/90 gs		10/4/90 wk	10/12/90 wk	10/13/90 wk		
1	27.4108	13.2100		25.4200	25.4021	25.3972		
2	27.2169	13.6488		25.1633	25.1484	25.1431		

GERAGHTY & MILLER, INC.
Environmental Services

Laboratory Task Order No. N/A

CHAIN-OF-CUSTODY RECORD

Project Number NC09001

Project Location WILMINGTON, NC

Laboratory TRIANGLE LABORATORIES INC

Sampler(s)/Affiliation M. RADECKE G&M
D. RUMFORD III G&M

SAMPLE IDENTITY	Code	Date/Time Sampled	Lab ID	SAMPLE BOTTLE / CONTAINER DESCRIPTION: 250ml amber glass PCDD/PCDF with Cl-Cl & with 2,3,7,8 confirmation									TOTAL
LF1/9110	S	10/9/90		1									1
LF2/9111	S	10/9/90		1									1

Sample Code: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers: 2

Relinquished by: Mark E. Radecke	Organization: Geraghty & Miller, Inc	10/9/90 19:00	Seal Intact? Yes No N/A
Received by:	Organization:	Date / / Time	
Relinquished by:	Organization:		Seal Intact?
Received by: Brian Hunt	Organization: TRIANGLE LABS INC	Date 10/10/90 Time 12:45PM	Yes No N/A

Special Instructions/Remarks:

Delivery Method: ☐ In Person ☒ Common Carrier Federal Express (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

OCT 1 0 1990

Custody Seal	Present / Absent // Intact / Not Intact	TLI Project Number	16661
Chain of Custody	Present / Absent	Client	Geraghty & Miller Inc
Sample Tags	Present / Absent	Date Received at TLI	10/10/90 By Bill Hunt
Sample Tag Numbers	Listed / Not listed on Chain of Custody	Carrier and Number	Fed X 806181516
SMO Forms	Present / Absent		
Packaging	Styro foam Cooler	Ice Present	Yes / No

Book: 37

Page: 26

TLI	Sample ID Client	Matrix	Storage Location	To Lab Date/ Initial	To Storage Date/ Initial	To Lab Date/ Initial	To Storage Date/ Initial	To Lab Date/ Initial	To Storage Date/ Initial	To Archive Date/ Initial
37.26.1	LF1/9110	Soil	Cooler #1							
37.26.2	LF2/9111	↓	↓							

Receiving Remarks: (2) Samples Received In good Condition.

Archive Remarks:

SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

14754

2846 Industrial Plaza Drive, Tallahassee, FL 32301 — Phone: (904) 878-3994 — Fax (904) 878-9504
414 Southwest 12th Avenue, Deerfield Beach, FL 33442 — Phone: (305) 421-7[illegible] — Fax (305) 421-2584
900 Lakeside Drive, Mobile, AL 36693 — Phone: (205) 666-6633 — Fax (205) 666-6896
6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax (813) 885-7049

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

1-910-791-2706

O. NUMBER	PROJECT NUMBER	PROJECT NAME	MATRIX TYPE	REQUIRED ANALYSES	PAGE	OF
		Southern Wood Piedmont				

CLIENT NAME: Southern Wood Piedmont
TELEPHONE/FAX NO.: 1-910-791-2706
CLIENT ADDRESS: P.O. Box 450
CITY, STATE, ZIP CODE: Wilmington NC. 28402
SAMPLER(S) NAME(S): H.O. Phillips
CLIENT PROJECT MANAGER: H.O. Phillips

☐ STANDARD TAT
☐ EXPEDITED TAT *
REPORT DUE DATE _____
* SUBJECT TO RUSH FEES

K-001 CCA

SAMPLING DATE	SAMPLING TIME	SAMPLE IDENTIFICATION	AQUEOUS MATRIX	NONAQUEOUS MATRIX	OIL MATRIX	AIR MATRIX	NUMBER OF CONTAINERS SUBMITTED	
1/18/94	9[illegible] Am	State Ports Authy c/Drive #3				2	1	
		Sample # 60						
		Log No 11743						
1/18/94	9[illegible] Am	Green Field Creek #61	3			2	1	
		Log No-11744						
		SWP. old Slip #62	3			2	1	
1/18/94	930 Am	Log No - 1174[illegible]						
1/18/94	10[illegible] Am	US #74 New Bridge #63	3			2	1	
		Log No - 11746						
		All Samples Cape Fear River				LM/M Glass 250ml Plastic		

RECEIVED FEB 28 1994 ENVIRONMENTAL AFFAIRS

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
S Samuel	1/6/94	9:00						
RECEIVED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
[illegible]	1/7/94	8:00 Am	[illegible]	1/18/94	Am			

FOR SAVANNAH LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	S.L. LOG NO.	LABORATORY REMARKS
[illegible]	1/20/94	1:10	☑ YES ☐ NO		40324	