333SERBSF10,618

333SERBSF10,618

Site Name (Subject):	SOUTHERN WOOD PIEDMONT COMPANY
Site ID (Document ID):	NCD053488557
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STATE OF NORTH CAROLINA

Department of Environment
and Natural Resources
Division of Waste Management
Superfund Section

EXPANDED SITE INSPECTION / REFERENCES 1 THRU 41
VOLUME II

Southern Wood Piedmont Company
NCD 053 488 557
Gulf, Chatham County, North Carolina
Reference No. 02802

June 1999

G. Doug Rumford
Hydrogeologist
Division of Waste Management
Superfund Section

Ref. 1

Federal Register

Friday
December 14, 1990

Part II

Environmental Protection Agency

40 CFR Part 300
Hazard Ranking System; Final Rule

Ref. 2

SOUTHERN WOOD PIEDMONT
HAZARDOUS WASTE INVESTIGATION
GULF, NORTH CAROLINA
EPA ID NO. NC0053488557
ESD NO. 83-190
MAY 31, 1984

INTRODUCTION

A hazardous waste site investigation was conducted at the Southern Wood Piedmont site in Gulf, North Carolina, on September 21, 1983, by Messrs. Charles Till and Ted Vaughan of the US-EPA, Region IV, Environmental Services Division (ESD). This investigation was requested by the US-EPA, Region IV, Air and Hazardous Materials Division (AHMD). Mr. Ed Gibbs, representing Southern Wood Piedmont and Mr. Tom Karnoski, representing the North Carolina Department of Human Resources (NC-DHR) were present during the investigation.

The site is an abandoned landfill that was once used as a wood preserving facility. The process equipment has been dismantled and removed. After the process equipment was removed, the site and the process waste lagoons were covered with fill. Various wood preservatives were used in the operation, but creosote was the major preservative utilized.

The objective of the investigation was to determine if hazardous wastes were migrating off-site via surface drainage. Soil samples were collected from selected locations on and off-site. Surface water samples were not collected because there was no surface water. Groundwater samples could not be collected because there were no known wells (private or public) in the immediate vicinity of the site. Temporary monitoring wells could not be installed because the water table at the site was approximately 40-50 feet below the ground surface.

SUMMARY

Nine soil and sediment samples were collected from selected locations on and off-site. All of the samples contained organic compounds (except for the sample from the southeast edge of the site, SWP-008) that were positively identified and quantified with concentrations ranging from 1,100 ug/kg to 2,900,000 ug/kg. All of the organic compounds detected during this investigation were associated with wood preserving (i.e., creosote and PCP). The off-site sediment samples collected in Little Cedar Creek and the adjacent floodplain contained many of the same organic compounds that were detected in the on-site sediment and soil samples, but in lower concentrations ranging from 2,200 ug/kg to 19,000 ug/kg.

STUDY AREA

The site is located in the small community of Gulf approximately 10 miles from the town of Sanford, North Carolina (figure 1). The site consists of approximately 80 acres, and is bordered to the north by Little Cedar Creek, to the south by a clay mining operation, to the east by woods and to the west by residential areas. The site is divided into two sections by railroad tracks that run through the site in an east/west direction. The plant's main processing areas were located south of the railroad. All of the waste materials generated from the preserving operations were stored in waste lagoons located in the area north of the railroad track. Almost all of the drainage from the site flows north toward Little Cedar Creek via two on-site interconnecting drainage ditches (figure 2).

Geology

The rocks on site are associated with the Cumnock formation of the Deep River basin geologic belt which lies along the eastern edge of the Piedmont Plateau in Chatham County. This Deep River basin geologic belt is a part of the Newark group of Upper Triassic age. The rocks consist of fine-grained siltstones and sandstones (1). The upper portions (west) of the site along the drainage ditch and railroad cuts revealed outcrops of siltstone and sandstone. The rocks in the middle and lower portions of the site have been decomposed by differential weathering. The soils on-site are silt and clay sandy loams (1). The groundwater table in the area of the site is 40 to 50 feet below the ground surface according to state personnel (Tom Karnoski, NC-DHR). The community of Gulf has it's own water system, so there were no private wells in the vicinity of the site from which to collect groundwater samples. Surface water samples could not be collected because the on-site drainage ditches and Little Cedar Creek (intermittent stream) were dry.

RESULTS AND DISCUSSION

During this investigation nine soil and sediment samples were collected. Five of the nine samples were collected on site. The remaining four samples were collected off-site in Little Cedar Creek and the Little Cedar Creek floodplain (figure 2). Sampling location descriptions are given in table 1. The analytical data summary is given in table 2. The complete analytical data sheets are included in the Appendix.

The surface soils on-site had been hauled in or moved from different locations on the site making it very difficult to interpret the metals data in terms of original soil and fill material. All of the samples collected contained nearly the same metals with approximately the same range of concentrations (table 2).

All of the extractable organic compounds detected in the samples collected during this investigation were polynuclear aromatic hydrocarbons (coal-tar derivatives) except for pentachlorophenol and its related compounds. The purgeable organic compounds detected are commercial solvents and related compounds which were used in the wood preserving process.

On-Site Sampling Locations

Sampling location SWF-003 was located in the large drainage ditch (that received almost all of the site drainage) on the east side of the site. Drainage collected in this ditch flows north into Little Cedar Creek. A composite sediment sample (SWP-003) was collected in the ditch bed where sediment had been deposited. Pentrachlorophenol (110,000 ug/kg) and seven PNA compounds were positively identified and quantified with concentrations ranging from 3,200 ug/kg to 16,000 ug/kg. Four other PNA compounds were positively identified with estimated concentrations. One purgeable organic compound (tetrahydrofuran) was tentatively identified with an estimated concentration.

Sampling location SWP-004 was located on the east side of the site in the area where the buried waste lagoon no. 6 was reportedly located. The sample was collected from a depth of 7 to 7.5 feet (approximate bottom of lagoon). Ten PNA compounds were positively identified and quantified with concentrations ranging from 260,000 ug/kg to 2,900,000 ug/kg. Ten other PNA compounds were either tentatively identified or positively identified, all with estimated concentrations. Four purgeable organic compounds were positively identified and quantified with concentrations ranging from 1,100 ug/kg to 5,600 ug/kg. Five other purgeable organic compounds were tentatively identified or positively identified, all with estimated concentrations.

Sampling location SWP-005 was located on the east side of the site adja-adjacent to and south of sampling location SW-004. This location was in the approximate area of waste lagoon no. 5. A soil sample (SWP-005) was collected from a depth of 5 to 6 feet (approximate bottom of lagoon). Nine PNA compounds were positively identified and quantified with concentrations ranging from 690,000 ug/kg to 2,000,000 ug/kg. Ten other PNA compounds were tentatively identified or positively identified, all with estimated concentrations. Five purgeable organic compounds were positively identified with quantifiable concentrations ranging from 2,000 ug/kg to 10,000 ug/kg. Four other purgeable organic compounds were tentatively identified or positively identified, all with estimated concentrations.

Sampling location SWP-007 was located on the south central portion of the site south of the railroad. This area was the plant's main operations and processing area. A composite soil sample (SWP-007) was collected from this area. Pentrachlorophenol and eleven PNA compounds were positively identified and quantified with concentrations ranging from 53,000 ug/kg to 1,100,000 ug/kg. Eight other PNA compounds were positively identified or tentatively identified, all with estimated concentrations. Six purgeable organic compounds were positively identified or tentatively identified, all with estimated concentrations.

Sampling location SWP-008 was located on the southeastern portion of the site along the site boundary. This area (used mostly for storage) was selected to determine if waste materials were migrating from the operations area. A composite sediment sample (SWP-008) was collected from various depositional points in this area. The sample contained no PNA compounds. Two purgeable organic compounds were tentatively identified with estimated concentrations (table 2).

Off-Site Sampling

Sampling location SWP-001 was located in Little Cedar Creek approximately 200 feet downstream (downgradient) from the confluence of Little Cedar Creek and the on-site drainage ditch. A sediment sample (SWP-001) was collected from a depositional area in the streambed. Four extractable organic compounds (PNA's) were positively identified and quantified with concentrations ranging from 2,200 ug/kg to 3,800 ug/kg. Four other organic compounds (PNA's) were positively identified with estimated concentrations. One purgeable organic compound (tetrahydrofuran) was tentatively identified with an estimated concentration.

Sampling location SWP-002 was located in Little Cedar Creek where the large on-site drainage ditch drains into Little Cedar Creek. A sediment sample (SWP-002) was collected in a depositional area at this confluence point. Four PNA compounds were positively identified and quantified with concentrations ranging from 2,200 ug/kg to 4,300 ug/kg. Four other PNA compounds were positively identified with estimated concentrations. Tetrahydrofuran (purgeable organic compound) was tentatively identified with an estimated concentration.

Sampling location SWP-006 was located in the Little Cedar Creek floodplain adjacent to the landfill on the north side of the site. This area received direct drainage from the northern edge of the landfill. A sediment sample SWP-006 was collected in the floodplain along the toe of the landfill. Three PNA compounds were positively identified and quantified with concentrations ranging from 2,200 ug/kg to 4,300 ug/kg (table 2). Five other PNA compounds were positively identified with estimated concentrations. Two purgeable organic compounds (cyclohexanone and tetrahydrofuran) were tentatively identified with estimated concentrations.

Sampling location SWP-009 was located in Little Cedar Creek upstream (upgradient) from the site at the Pottsboro Road Bridge (figure 2). Ten PNA compounds were positively identified and quantified with concentrations ranging from 2,500 ug/kg to 19,000 ug/kg. Two other PNA compounds were positively identified with estimated concentrations. Tetrahydrofuran was tentatively identified with an estimated concentration.

METHODOLOGY

All of the soil samples were collected in accordance with standard operating procedures of the Engineering Support Branch, ESD (2). All laboratory analyses were conducted by the Analytical Support Branch, ESD, in accordance with standard procedures and protocols of the Branch (3).

REFERENCES

1. Explanatory Text for Geologic Map of North Carolina, Jasper L. Stuckey and Stephen G. Conrad, Bulletin Number 71, North Carolina Department of Conservation and Development, 1958.

2. Water Surveillance Branch Standard Operating Procedures and Quality Assurance Manual (Draft); U. S. Environmental Protection Agency, Region IV, Surveillance and Analysis Division, August 29, 1980.

3. Analytical Support Branch Operations and Quality Control Manual, U.S. Environmental Protection Agency, Region IV, Environmental Services Division, April 1982.

TABLE 1
SAMPLING LOCATION DATA
SOUTHERN WOOD PIEDMONT
GULF, NORTH CAROLINA

Field I.D.	Date	Time	Description	Depth (Feet)	Type of Sample
SWP-001	9/21/83	1200	Little Cedar Creek downstream from site	Surface	Sediment
SWP-002	9/21/83	1210	Confluence of site drainage ditch and Little Cedar Creek	Surface	Sediment
SWP-003	9/21/83	1215	Large drainage ditch	Surface	Sediment
SWP-004	9/21/83	1315	Old waste lagoon No. 6	7 to 7.5	Soil
SWP-005	9/21/83	1330	Old waste lagoon No. 5	5 to 6	Soil
SWP-006	9/21/83	1315	Little Cedar Creek floodplain, north side of site	Surface	Sediment
SWP-007	9/21/83	1445	Old operations area	Surface	Soil
SWP-008	9/21/83	1540	SE edge of site	Surface	Sediment
SWP-009	9/21/83	1600	Little Cedar Creek at Pittboro Road Bridge	Surface	Sediment

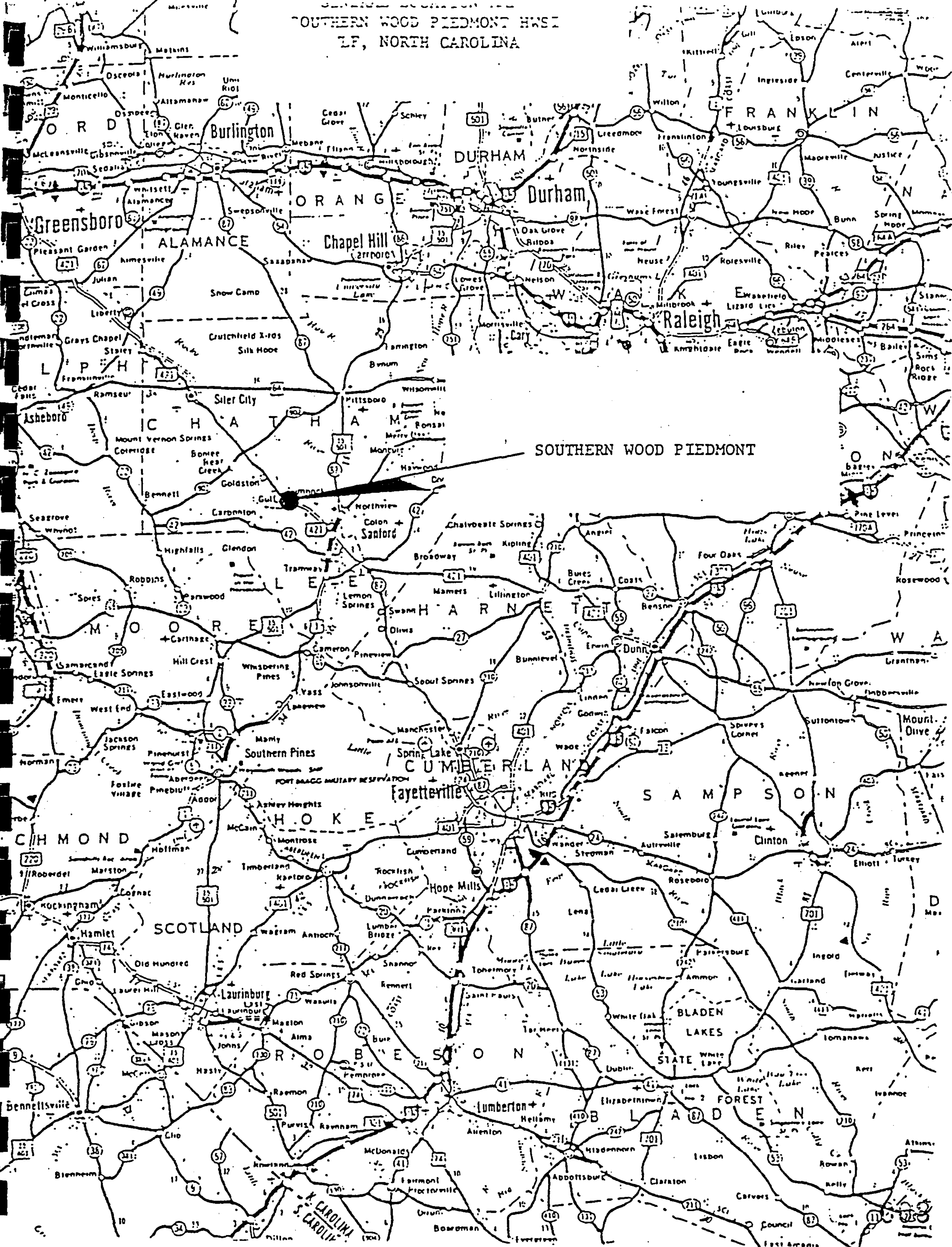
TABLE 2
Analytical Data Summary - Soil Samples
Southern Hood Piedmont RASI
Gulf, North Carolina

	SAD-001	SAD-002	SAD-003	SAD-004	SAD-005	SAD-006	SAD-007	SAD-008	SAD-009
	09/21/83 1200	09/21/83 1210	09/21/83 1215	09/21/83 1315	09/21/83 1330	09/21/83 1315	09/21/83 1445	09/21/83 1540	09/21/83 1600
	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
IC ELEMENT/COMPOUND									
SILVER	2.5	3.2	2.9	1.6	0.99	1.5	2.7	2.1	1.4
RSENIC	7.9	4.8	6.6	5.8	4.4	3.8	5.9	3.5	2.1
RIUM	81	120	93	45	56	14	46	100	29
RYLLIUM	--	--	0.32	0.38	1.1	0.16	0.4	0.3	--
DMIUM	--	--	--	--	--	--	--	0.08	--
COBALT	10	24	12	9.4	15	15	9.2	11	5.4
CHROMIUM	22	29	26	7.4	6.3	7.2	9.7	13	4.6
PPER	17	29	18	12	15	12	20	18	3.9
CKEL	26	43	20	14	20	16	11	14	2.3
EAD	20	23	20	15	13	15	19	21	6.9
TIN	19X	21X	13X	11X	11X	9.1X	7.7X	9.5X	3.3X
ANADIUM	23	34	25	--	--	--	14	19	12
NC	22	24	25	42	50	37	30	36	13
UMINUM	9700	12000	8800	5600	4900	5400	6600	6400	3200
ANGANESE	290	500	270	160	160	220	160	940	260
IRON	16000	22000	20000	11000	7500	10000	18000	14000	9500
TABLE ORGANIC COMPOUNDS									
	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
APHTHALENE	--	--	--	1900000	1300000	--	320000	--	--
CENAPHTHYLENE	--	--	500J	70000J	61000J	360J	37000J	--	1200J
ACENAPHTHENE	--	--	--	1200000	910000	--	490000	--	--
FLUORENE	700J	480J	1100J	1600000	1200000	--	690000	--	340J
PHENANTHRENE	1300J	1400J	2000J	2900000	2000000	450J	1000000	--	2500
NTHRACENE	3800	2200	8300	880000	590000	4300	250000	--	3800
LUORANTHENE	3000	4100	16000	1400000	1100000	1200J	1100000	--	14000
YRENE	2200	3100	12000	1000000	780000	1400J	710000	--	13000
BENZO(A)ANTHRACENE	--	1600J	3900	190000J	150000J	900J	150000	--	5700
CHRYSENE	2600	4300	10000	260000	180000J	2700	260000	--	19000
ENZO(B)FLUORANTHENE	2000J	--	7900	140000J	110000J	2200	150000	--	13000
ENZO-A-PYRENE	--	1600J	3200	77000J	50000J	1300J	53000	--	9100
INDENO (1,2,3-CD) PYRENE	--	--	--	--	--	--	--	--	4400
DIBENZO(A,H)ANTHRACENE	900J	--	--	--	--	--	--	--	--
BENZO(GHI)PERYLENE	--	--	--	--	--	--	--	--	3000
ENTACHLOROPHENOL	--	--	11000	--	--	--	770000	--	--
2 ALKYLNAPHTHALENE (4 ISOMERS)	--	--	--	800000JN	--	--	--	--	--
ARBAZOLE	--	--	--	300000JN	250000JN	--	--	--	--
1-METHYLNAPHTHALENE	--	--	--	600000JN	500000JN	--	200000JN	--	--
IPHENYL	--	--	--	400000JN	300000JN	--	100000JN	--	--
2 ALKYLNAPHTHALENE (2 ISOMERS)	--	--	--	--	500000JN	--	300000JN	--	--
ETHYLDIBENZOFURAN	--	--	--	--	--	--	100000JN	--	--
METHYLBIPHENYL	--	--	--	--	--	--	100000JN	--	--
METHYLPHENANTHRENE	--	--	--	250000JN	--	--	300000JN	--	--
CYCLOPENTA(DEF)PHENANTHRENE	--	--	--	250000JN	250000JN	--	400000JN	--	--
ETROLEUM PRODUCT	--	--	--	N	N	--	N	--	--
IBENZOFURAN	--	--	290J	1000000	700000	--	330000	--	--
2-METHYL NAPHTHALENE	--	--	--	1400000	1100000	--	250000	--	--
ABLE ORGANIC COMPOUNDS									
ENZENE	--	--	--	100J	430J	--	--	--	--
OLUENE	--	--	--	1600	2500	--	100J	--	--
ETHYL BENZENE	--	--	--	1100	2000	--	100J	--	--
1 UNIDENTIFIED TERPENE	--	--	--	10000JN	10000JN	--	--	--	--
RIMETHYLCYCLOHEXANONE	--	--	--	1000JN	1000JN	--	--	--	--
OTAL XYLENES	--	--	--	5600	10000	--	300J	--	--
3 UNIDENTIFIED TERPENES	--	--	--	--	--	--	5000JN	--	--
CYCLOHEXANONE	--	--	--	--	--	20JN	--	10JN	--
ETONE	--	--	--	2700	3800	--	--	--	--
YPENE	--	--	--	900J	2000	--	100J	--	--
ETRAHYDROFURAN	10JN	10JN	10JN	100JN	100JN	20JN	100JN	20JN	20JN

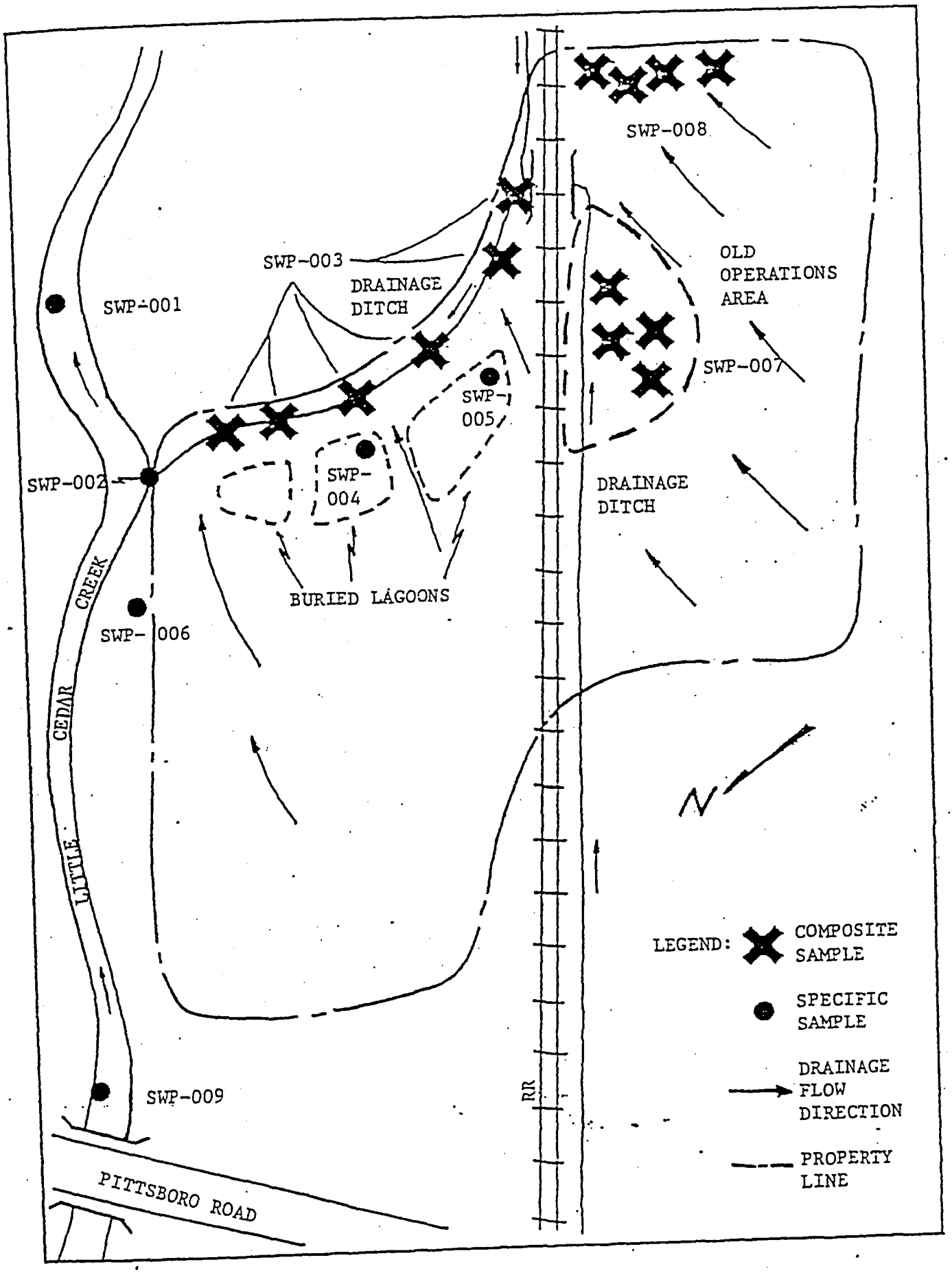
Note:

J - Estimated value
N - Presumptive evidence of presence of material
- Value is suspect

OUTHERN WOOD PIEDMONT HWSI
LF, NORTH CAROLINA



SAMPLING LOCATION MAP
SOUTHERN WOOD PIEDMONT HWST
GULF, NORTH CAROLINA



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

Phone 803/576-7660

Ref. 3

Southern Wood Piedmont Company

11-M-1.10
June 4, 1981

U.S. ENVIRONMENTAL PROTECTION AGENCY
Region IV - Sites Notification
345 Courtland Street, N.E.
Atlanta, Georgia 30308

Gentlemen:

Enclosed are Superfund notification forms for Southern Wood Piedmont Company's eight sites in the Southeastern United States. We have tried to provide you with the most accurate information available on these forms.

The volumes of buried waste are estimates based on what our long-term employees remember about the various sites involved. All the volumes are calculated using a concentration factor of 20% actual waste. Therefore, the figures reported are for 100% concentration.

Our wood-treating plants are engaged in long-term wood preservation. Our products include crossties, switchties, utility poles, lumber, bridge timber, crossarms and industrial floorblock. Preservatives used are coal tar creosote, pentachlorophenol in diesel fuel, and chromated copper arsenate (CCA).

If you have any additional questions, please let us know.

Sincerely,

SOUTHERN WOOD PIEDMONT COMPANY

for C. A. Burdell

C. A. Burdell
Director
Environmental Affairs

CAB:kwm

cc: (w/o Enc.) C. A. Counsil
C. E. Martin
H. I. Warrington
M. A. Roldan
M. T. Breen - Atlanta
R. H. Watts - Stamford
E. F. Button - Stamford

Enclosures

EPA Notification of Hazardous Waste Si

United States
Environmental Protection
Agency
Washington DC 20460

This initial notification information is required by Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and must be mailed by June 9, 1981.

Please type or print in ink. If you need additional space, use separate sheets of paper. Indicate the letter of the item which applies.

Person Required to Notify:

Enter the name and address of the person or organization required to notify.

Name: ITT Rayonier, Inc.

Street: P. O. Box 45165

City: Atlanta State: GA Zip Code: 30320

Site Location:

Enter the common name (if known) and actual location of the site.

Name of Site: Southern Wood Piedmont Company

Street: 2139 State Road

City: Gulf County: Chatham State: NC Zip Code: 27256

Person to Contact:

Enter the name, title (if applicable), and business telephone number of the person to contact regarding information submitted on this form.

Name (Last, First and Title): Burdell, Charles-Dir. Environmental Affairs

Phone: 404/996-1460

Dates of Waste Handling:

Enter the years that you estimate waste treatment, storage, or disposal began and ended at the site.

From (Year): 1946 To (Year): 1980

Waste Type: Choose the option you prefer to complete

Option I: Select general waste types and source categories. If you do not know the general waste types or sources, you are encouraged to describe the site in Item I—*Description of Site*.

General Type of Waste:
Place an X in the appropriate boxes. The categories listed overlap. Check each applicable category.

1. ☒ Organics
2. ☐ Inorganics
3. ☐ Solvents
4. ☒ Pesticides
5. ☐ Heavy metals
6. ☐ Acids
7. ☐ Bases
8. ☐ PCBs
9. ☐ Mixed Municipal Waste
10. ☐ Unknown
11. ☐ Other (Specify)

Source of Waste:
Place an X in the appropriate boxes.

1. ☐ Mining
2. ☐ Construction
3. ☐ Textiles
4. ☐ Fertilizer
5. ☐ Paper/Printing
6. ☐ Leather Tanning
7. ☐ Iron/Steel Foundry
8. ☐ Chemical, General
9. ☐ Plating/Polishing
10. ☐ Military/Ammunition
11. ☐ Electrical Conductors
12. ☐ Transformers
13. ☐ Utility Companies
14. ☐ Sanitary/Refuse
15. ☐ Photofinish
16. ☐ Lab/Hospital
17. ☐ Unknown
18. ☒ Other (Specify)

Wood Preserving

Option 2: This option is available to persons familiar with the Resource Conservation and Recovery Act (RCRA) Section 3001 regulations (40 CFR Part 261).

Specific Type of Waste:
EPA has assigned a four-digit number to each hazardous waste listed in the regulations under Section 3001 of RCRA. Enter the appropriate four-digit number in the boxes provided. A copy of the list of hazardous wastes and codes can be obtained by contacting the EPA Region serving the State in which the site is located.

K001		
U-051		

Form Approved
OMB No. 2000-0138

EPA Form 8900-1

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

SITE NAME: Southern Wood Piedmont Co. CERCLIS #: NCD 053 488 557

AKA: _____ SSID: _____

ADDRESS: SR 2139

CITY: Gulf STATE: NC ZIP CODE: 27256

SITE REFERENCE POINT: Former Wood Treatment Process Area

USGS QUAD MAP NAME: Goldston, NC TOWNSHIP: ___ N/S RANGE: ___ E/W

SCALE: 1:24,000 MAP DATE: 1980 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: 79 ° 15 ' 00 " LATITUDE: 35 ° 30 ' 00 "

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

LONGITUDE: 79 ° 15 ' 00 " LATITUDE: 35 ° 32 ' 30 "

CALCULATIONS: LATITUDE (7.5' QUADRANGLE MAP)

A) NUMBER OF RULER GRADUATIONS FROM LATITUDE GRID LINE TO SITE REF POINT: 200

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

A x 0.3304 = 66.08 "

C) EXPRESS IN MINUTES AND SECONDS (1'= 60"): 1 ' 06.08 "

D) ADD TO STARTING LATITUDE: 35 ° 32 ' 30.0 " + 1 ' 06.08 =

SITE LATITUDE: 35 ° 33 ' 36.0 "

CALCULATIONS: LONGITUDE (7.5' QUADRANGLE MAP)

A) NUMBER OF RULER GRADUATIONS FROM RIGHT LONGITUDE LINE TO SITE REF POINT: 285

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

A x 0.3304 = 94.16 "

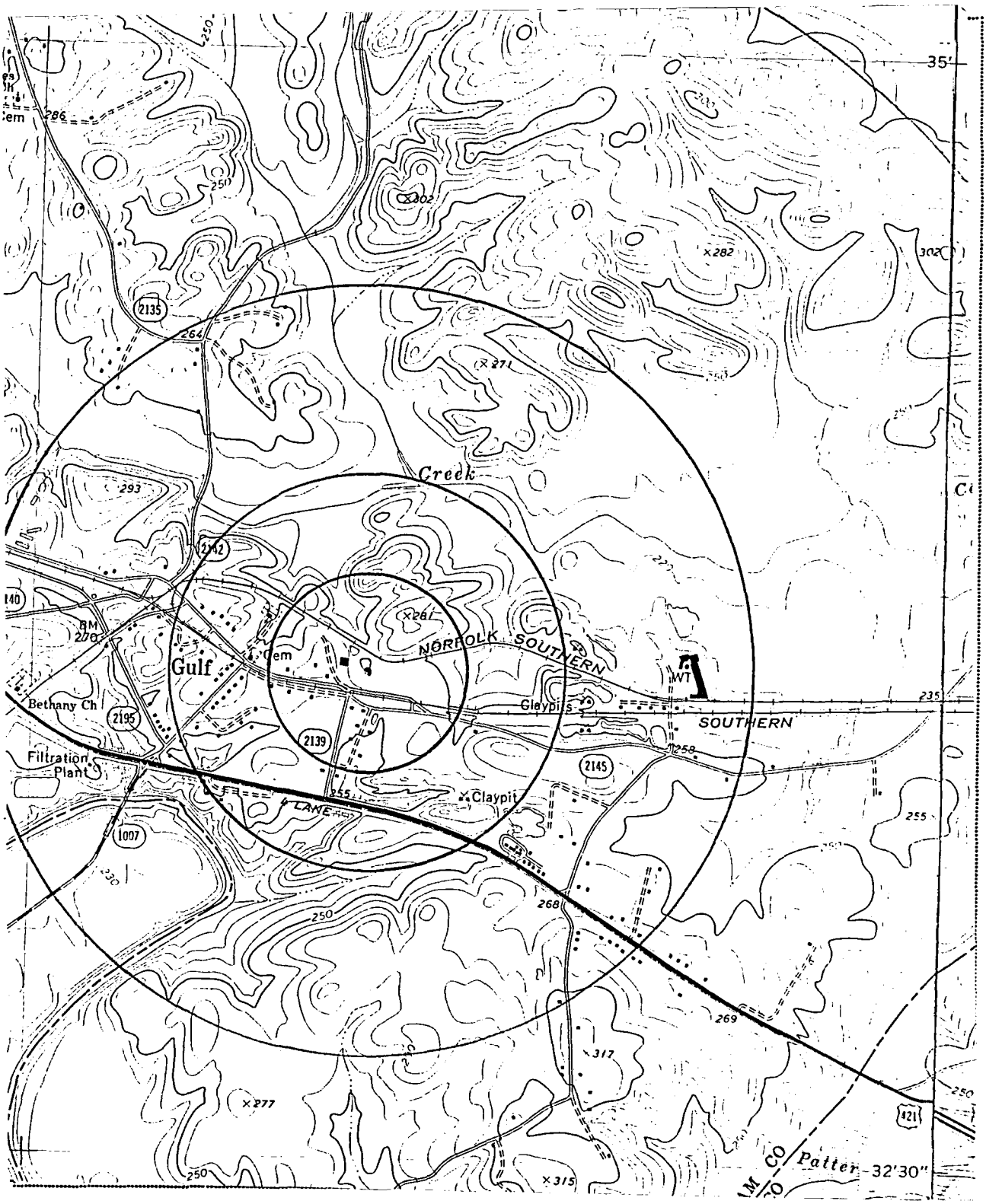
C) EXPRESS IN MINUTES AND SECONDS (1'= 60"): 1 ' 34.16 "

D) ADD TO STARTING LONGITUDE: 79 ° 15 ' 00.0 " + 1 ' 34.16 =

SITE LONGITUDE: 79 ° 16 ' 34.0 "

INVESTIGATOR: C. D. Rumford DATE: 9/23/97

SITE NAME: Southern Wood Piedmont Co. NUMBER: NCD 053 488 557



TOPOGRAPHIC MAP QUADRANGLE NAME: Goldston, NC SCALE: 1:24,000

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

LATITUDE: 79° 15' 00" LONGITUDE: 35° 32' 30"

North Carolina Department of Human Resources
Division of Health Services
P.O. Box 2091 • Raleigh, North Carolina 27602-2091

James G. Martin, Governor
David T. Flaherty, Secretary

Ronald H. Levine, M.D., M.P.H.
State Health Director

24 November 1987

Mr. Bob Holman
NC Dept. of NRCD-DEM
Water Quality Planning
PO Box 27687
Raleigh, NC 27611

Dear Bob:

RE: Southern Wood Piedmont Company
NCD 053 488 557

In response to your questions about the impact of this facility on the proposed downstream water intake, I have reviewed our files and talked with USEPA about past waste handling practices and about closure actions at Southern Wood Piedmont. The facility began operations in 1946 as a wood preserving plant using creosote, pentachlorophenol, and chromated copper arsenate. The wastes were handled by an 8000 GPD non-discharge type waste water treatment facility which included storage-settling ponds, aeration lagoons, and a spray irrigation area (NC DEM Permit No. 3931). In 1980 the facility was closed by dismantling the plant, by evaporating the liquids remaining in the lagoons by increased spray irrigation (NC DEM Permit No. 3931-R), and by regrading and seeding the land. In 1981 the company filed a Notification of Hazardous Waste Site (CERCLA 103(C)) with USEPA.

In September 1983 the site was investigated by a Field Investigation Team (FIT) from USEPA. They sampled soil from the old lagoon areas and from the drainage ditch that carries run-off into Cedar Creek. They also sampled Cedar Creek sediment upstream and downstream of the confluence of the drainage ditch and Cedar Creek, sediment at the confluence, and sediment from the floodplain upstream of the confluence. Their sample analyses show plainly that contamination from wood treating chemicals exists in the soil in the old lagoon areas and along the drainage ditch. However, the data do not clearly show that stream sediment in Cedar Creek is contaminated with chemicals that originated at the wood treating site.

I contacted Ms. Giezelle Bennett of USEPA, Region IV, (404) 347-3402, who told me that the site achieved a Hazard Ranking System (HRS) score of 15.57 based on data gathered by the USEPA FIT. This score is insufficient to warrant the site's inclusion on the National Priorities List (NPL), and

presently, USEPA is taking no remedial action there. In the future some clean-up may be directed by either USEPA or by the state agency responsible for old hazardous waste sites, particularly since the new intake is just under three stream miles downstream of the site.

In summary, the FIT data show contamination by extractable organic compounds in the soil of the site and in the sediment of Cedar Creek. These contaminants are within three miles upstream of the proposed intake. It may be prudent to move the intake upstream of the confluence of Cedar Creek and the Deep River and therefore upstream of any contamination that could come from the Souther Wood Piedmont facility.

I have included copies of appropriate parts of our file. If you have any questions, please call me at 733-2801 or Ms. Giezelle Bennett at (404) 347-3402.

Sincerely,

Grover Nicholson, Geologist
CERCLA Unit
Solid and Hazardous Waste Management Branch
Environmental Health Section

GN/ds/0400b/67-68

Ref. 6

GEOLOGY AND GROUND-WATER
in the
DURHAM AREA, NORTH CAROLINA

By

GEORGE L. BAIN
Geologist, U. S. Geological Survey

Chemical Quality of Water Section

By

J. D. THOMAS, *Chemist*, U. S. Geological Survey

GROUND-WATER BULLETIN NUMBER 7

NORTH CAROLINA
DEPARTMENT OF WATER RESOURCES
GEORGE E. PICKETT, *Director*

Division of Ground Water
HARRY M. PEEK, *Chief*

Prepared Cooperatively By
the Geological Survey
United States Department of the Interior

May
1966

TABLES

Geology and Ground Water in the Durham Area, North Carolina

By

GEORGE L. BAIN

ABSTRACT

The Durham area is in the north-central part of the Piedmont physiographic province and consists of Chatham, Durham, Orange, Person, and Randolph Counties—a total of 2,605 square miles. In 1960 the area had a population of 269,641.

The Durham area is geologically complex. Most of it lies within the so-called Carolina slate belt, which consists of slightly metamorphosed, volcanic, and sedimentary rocks. The volcanic and sedimentary rocks are tightly to openly folded and are faulted and intruded by igneous plutons. The volcanic rocks are felsic to mafic in composition. The plutonic igneous rocks range in composition from granite to gabbro. The area outside the Carolina slate belt is underlain by mica gneiss, mica schist, and hornblende gneiss, and by younger rocks of Triassic age.

Ground water in the area is obtained from drilled, bored, and dug wells and from springs. It is stored in secondary openings such as the planes of schistosity, joints, and cleavage of the unweathered rocks or in the voids of the overlying porous mantle of soil and weathered rock. The relative abundance of secondary openings for the storage and transmission of ground water is not necessarily related to any particular rock type or mapped unit in the area.

At least three factors—rock type, depth of weathering, and topography—govern the potential yield at any one place in the Durham area. A statistical treatment of the well data shows that the two highest average yields, 0.20 and 0.18 gallon per minute per foot of uncased hole, are in granodiorite and granite. Depth of weathering is shown to have a greater influence on yields from the metavolcanic, and argillite-graywacke units than it has on yields from the triassic, and granite and granodiorite units, which appear to reflect topographic control.

Comparison of yields from different topographic situations

GEOGRAPHY

Area and Population

The area covered by this report totals 2,605 square miles. According to the 1960 Bureau of the Census report, the Durham area has a population of 269,741, or about 103 per square mile. There are 15 cities and towns having a population of more than 1,000 each. Of these, Asheboro, Chapel Hill, and Durham have a population in excess of 10,000. The city of Durham is by far the largest with a population of 79,398. With the exception of the Durham-Chapel Hill, and Asheboro-Randleman areas, the report area is almost exclusively rural.

Economic Development

According to the 1960 Census, 62 percent of the Durham area is classed as farmland.

The agricultural products include tobacco, corn, hay, dairy products, livestock, and poultry. Tobacco is the chief cash crop and is the major source of income for many farm families. The broiler industry is an important source of farm income in Chatham County.

Manufacturing is important in the Durham area. Many people who operate small farms are employed on a full or part-time basis by industry. Industries include the manufacture of cigarettes, furniture, textiles, lumber, brick, and tile; the production of crushed stone, and poultry processing.

Mineral resources of economic importance include shale, clay, stone, pyrophyllite, and coal (Broadhurst, 1955). Copper, gold, lead, zinc, quartz, iron ore, and kyanite also are present in the Durham area. Triassic shale and clay used in the manufacture of brick and tile, and stone, which is crushed for road metal and general construction purposes, are the area's most valuable mineral resources. Argillite from the argillite-graywacke unit (pl. 2) meets the rigid requirements for primary highway construction. The argillite, where it is well sheared and jointed, has proved to be an economic source of crushed stone, owing to its ease of excavation and crushing. Where the argillite has a well-developed bedding plane cleavage and is not deformed, it is a potential source of building stone.

Pyrophyllite is mined only at Hillsboro in Orange County.

Coal is interbedded with the Triassic rocks in southern Chatham County in economic quantities (Reinemund, 1955), but it is not being mined at the present time. Copper deposits occur in Person County, and in Chatham County near Harpers Cross Roads, but they are not economically important under present market conditions.

Climate

Comparison of U. S. Weather Bureau records at five stations for the 30-year period 1931-60 reveals that the Durham area has a normal annual temperature of 60.1° F. Records of precipitation for the same period show that the normal annual precipitation at nine stations ranges from a maximum of 45.14 in. at Moncure in Chatham County to a minimum of 42.65 in. at Durham in Durham County. The normal monthly precipitation and temperature at the Chapel Hill station are plotted on figure 2.

Physiography and Drainage

The Durham area is within the Piedmont physiographic province. According to Fenneman (1938), the Piedmont is an uplifted peneplain in various stages of dissection, having a general slope from the mountains toward the Coastal Plain. In the southern part of Durham County and in the eastern part of Chatham County (pl. 2) the Piedmont upland is interrupted by a distinct lowland developed on weak Triassic rocks.

Topographic coverage is available for approximately one-tenth of the report area. Where coverage is not available, relief is estimated to rarely exceed 300 feet and to average about 50 feet per mile. An exception is in the vicinity of the Uwharrie Mountains in Randolph County, where relief commonly is in excess of 400 feet per mile. The Piedmont upland slopes from 850 feet in northwestern Randolph County to 180 feet in southeastern Chatham County, and from 700 feet in northeastern Orange County to 250 feet in eastern Durham County.

Surface water, derived from direct runoff and ground-water discharge, is drained by four major stream systems—the Pee Dee, the Cape Fear, the Neuse, and the Roanoke Rivers (fig. 3). Randolph County is drained by the Uwharrie River, which empties into the Pee Dee River, and by the Deep River, which empties into the Cape Fear River. The Deep River, which

a e 3. Average yield of wells in the argillite-graywacke unit

According to Range in Depth

Range in depth (feet)	Number of wells	Average depth (feet)	Average uncased depth 1/ (feet)	Yield (gallons per minute)		
				Average	Per foot of well	Per foot of uncased hole
0-100	49	73.7	37.9	7.4	0.10	0.20
0-150	64	87.1	51.3	7.2	.08	.14
0-200	72	96.6	60.8	7.5	.08	.12
0-283	74	100.6	64.8	7.4	.07	.11

1/Average casing depth for argillite-graywacke unit is 35.8 feet.

According to Topographic Location

Topographic location	Number of wells	Average depth (feet)	Average casing depth (feet)	Average uncased depth (feet)	Yield (gallons per minute)		
					Average	Per foot of well	Per foot of uncased hole
Hill	16	112.0	42.6	69.4	9.4	0.08	0.14
Knoll	11	100.5	40.1	60.4	4.8	.05	.08
Slope	18	92.4	32.2	60.2	4.1	.04	.07
Flat	15	86.6	36.2	50.4	10.3	.12	.20
Valley and draw	4	101.2	10.5	90.7	5.7	.06	.06

Table 4. Average yield of wells in the Triassic unit

According to Range in Depth

Range in depth (feet)	Number of wells	Average depth (feet)	Average uncased depth 1/ (feet)	Yield (gallons per minute)		
				Average	Per foot of well	Per foot of uncased hole
0-100	50	78.1	51.6	7.4	0.10	0.14
0-150	94	99.0	72.5	7.1	.07	.10
0-200	99	102.4	75.9	7.1	.07	.09
0-300	106	112.0	85.5	7.2	.06	.08

1/Average casing depth for the Triassic unit is 26.5.

According to Topographic Location

Topographic location	Number of wells	Average depth (feet)	Average casing depth (feet)	Average uncased depth (feet)	Yield (gallons per minute)		
					Average	Per foot of well	Per foot of uncased hole
Hill	22	125.2	25.4	99.8	8.3	0.07	0.08
Knoll	25	121.6	34.1	87.5	6.2	.05	.07
Slope	25	101.4	20.6	80.8	9.3	.09	.12
Flat	23	127.5	27.8	99.7	7.0	.06	.07
Valley and draw	10	102.1	27.4	74.7	11.1	.11	.15

Table 5. Average yield of wells in the granite and granodiorite unit

According to Range in Depth

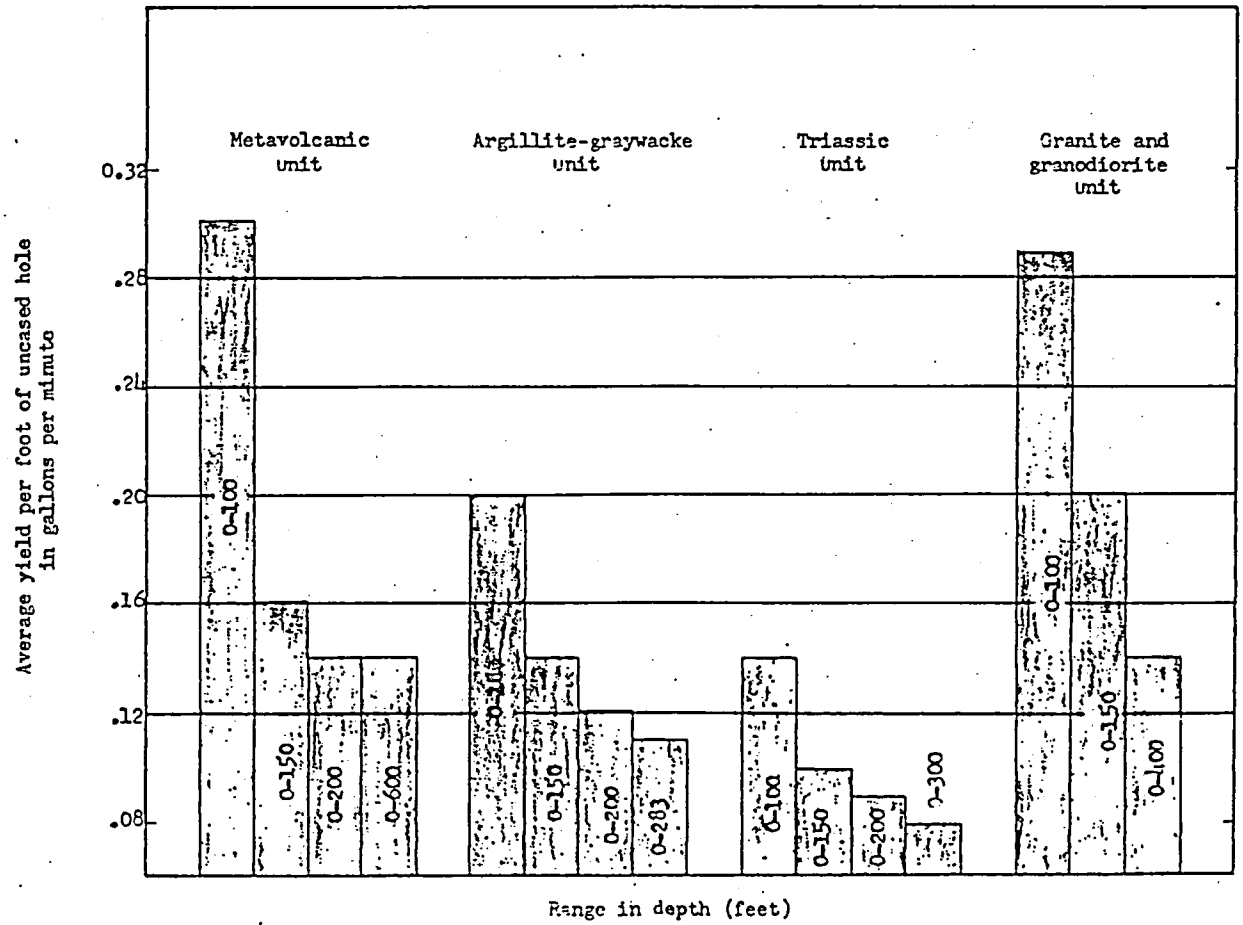
Range in depth (feet)	Number of wells	Average depth (feet)	Average uncased depth 1/ (feet)	Yield (gallons per minute)		
				Average	Per foot of well	Per foot of uncased hole
0-100	59	63.1	27.1	7.9	0.12	0.29
0-150	75	75.8	39.8	8.0	.10	.20
0-400	81	86.8	50.8	8.2	.09	.16

1/Average casing depth for the granite and granodiorite unit is 36.0 feet.

According to Topographic Location

Topographic location	Number of wells	Average depth (feet)	Average casing depth (feet)	Average uncased depth (feet)	Yield (gallons per minute)		
					Average	Per foot of well	Per foot of uncased hole
Hill	37	94.4	34.5	59.9	7.5	0.08	0.12
Knoll	14	103.3	42.3	61.0	10.4	.10	.17
Slope	18	68.4	31.6	36.8	6.9	.10	.19
Flat	12	69.7	34.3	35.4	8.8	.13	.25

Figure 14. Average yield per foot of uncased hole of the lithologic units according to range in depth.



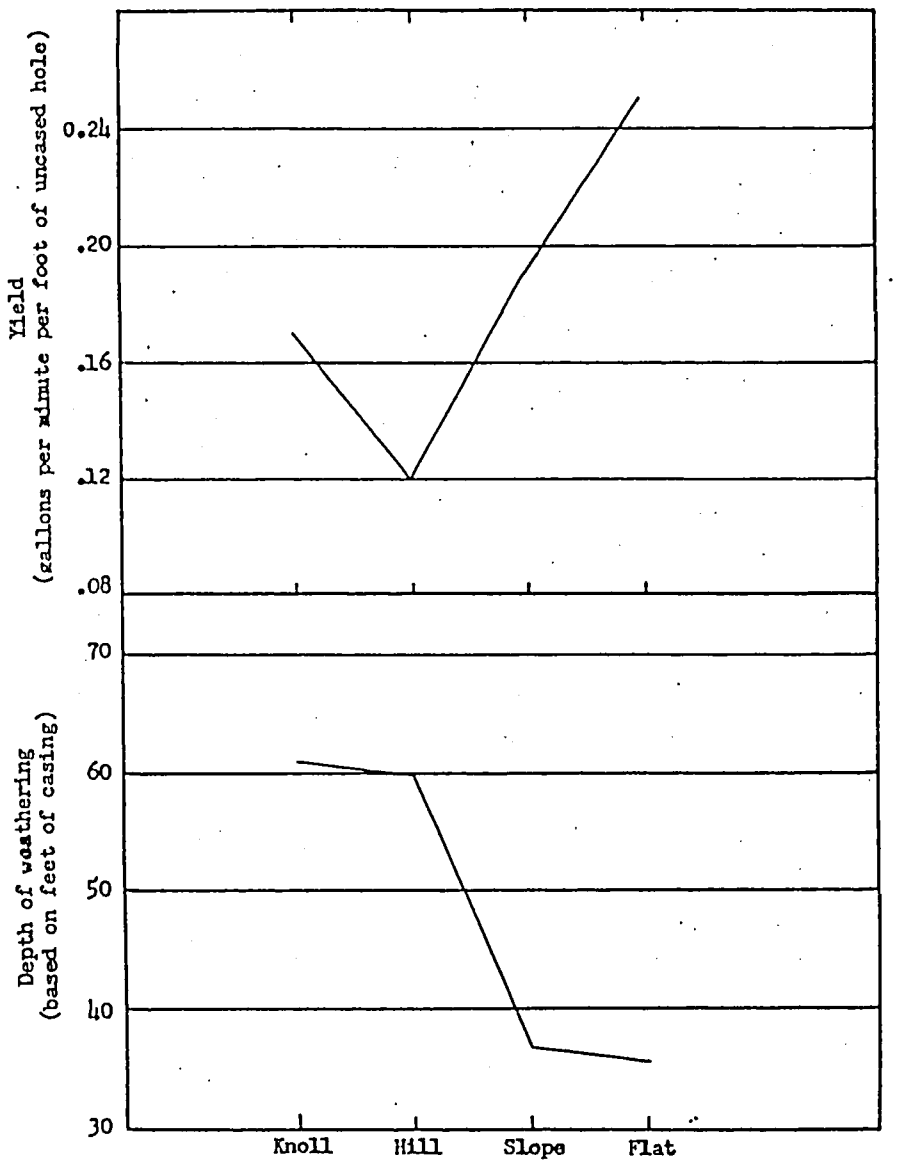


Figure 18. Relation of depth of weathering to average yield of the granite and granodiorite unit in different topographic situations.

brittle, quartz veins are well fractured. Consequently, they store and yield their water freely compared to the surrounding rock. Many of the wells having high yields in the Durham area are in quartz veins. Most large quartz veins were observed to dip steeply to the northwest. Care should be exercised in locating a well on or near a quartz dike so that the well will intersect the dike below the water table. Figure 21 illustrates a drilled well that intersects both fracture systems and quartz dikes. A well drilled at position *B* will penetrate a quartz dike, but the dike will be devoid of water at this point because of its position above the water table.

Where practicable, wells should be spaced far enough apart to avoid mutual interference through pumping. How far apart they should be spaced depends on the pumping rate and permeability of the surrounding rock.

The Triassic rocks in the Durham area are intruded by numerous diabase dikes that are dense and impermeable. Where cut by transverse streams or located downgradient from the direction of groundwater movement, dikes tend to impound ground water behind them. One such dike which is very large is just northwest of the junction of the Eno and Little Rivers in Durham County. Yields in the Triassic rocks north of this point are greater than average.

Relative Water-Yielding Properties of the Map Units

General Conditions

The rocks of the Durham area include igneous, metamorphic, and highly indurated sedimentary rocks in which secondary interstices are the principal storage spaces for ground water.

The factors which have determined the distribution and relative abundance of secondary interstices in the Durham area are complex and interrelated. They include the composition of the rock, the degree of dynamic metamorphism, the relative ability of the rocks to weather, the degree to which the rocks have been intruded by quartz dikes, and the relative position of the rock with respect to drainage systems. Thus, the occurrence of suitable secondary openings for the storage and transmission of ground water in the Durham area is not necessarily related to any particular rock type or lithologic unit. For example, an acid tuff may be a good aquifer in one locality because it is deeply weathered and well jointed, but the same tuff

depth are more tightly pressed together with increasing depth owing to the weight of overburden.

The average depth of all wells inventoried in the Durham area is 99.2 feet. Wells drilled to depths below 200 feet are not usually successful in obtaining large additional quantities of water. There are notable exceptions, but if enough water is not obtained at 200 feet of depth, the prospective well owner is advised to drill three or more wells rather than one well 600 feet deep.

The thickness of weathered material above solid rock apparently has a very significant effect on yield in the Durham area. In some places it may be more important than either topography or rock type. The relation of weathered material to yield in different topographic situations is shown graphically in figures 15-18.

Yields from wells in the argillite-graywacke and metavolcanic units appear to be directly proportional to depth of weathering except on the slopes, where the somewhat anomalous yields are probably due to influent seepage from upslope. A thick section of weathered material serves both as a reservoir for increased infiltration and as an aquifer. Depth of weathering appears to have little relation to yield in the Triassic and granite and granodiorite units. However, at least 50 percent of the wells in granite and granodiorite obtain their water from the weathered upper surface. The effect of depth of weathering on yield in these units is probably masked by the topographic effect.

The effect of rock type on yield has already been shown (tables 2-5). The relative ability of the different rock units to yield water can be directly related to the type, size, and amount of original openings and to the ease with which secondary openings are produced by weathering processes and dynamic metamorphism.

Secondary pore spaces such as joints, planes of schistosity, and cleavage planes are important for storage and transmittal of water in the Durham area. Figure 21 illustrates how water percolates downward through fracture systems to a drilled well. Figures 11, 19, and 20 illustrate several types of secondary pore spaces.

Quartz veins are important sources of ground water in the Durham area. Because quartz (commonly called white flint) is

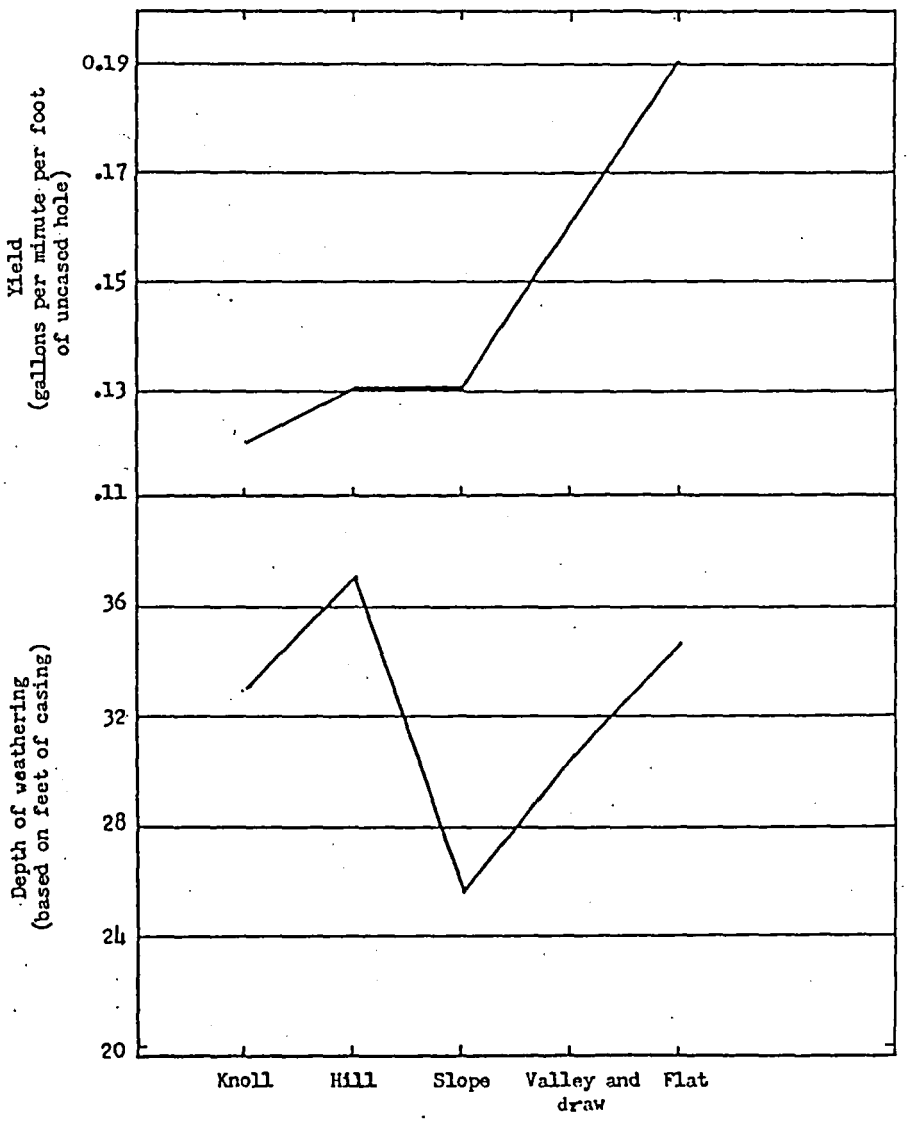


Figure 15. Relation of depth of weathering to average yield of the metavolcanic unit in different topographic situations.

ppm. Total hardness ranged from 11 ppm to 492 ppm and the median was 102 ppm. Chloride ranged from 0.2 ppm to 311 ppm and the median was 12 ppm.

Analyses of water from selected wells in this unit are listed in tables 9, 12, 15, 18, and 21.

Argillite-Graywacke Unit

The argillite-graywacke unit includes interbedded argillite, graywacke sandstone, graywacke conglomerate, and felsic tuff. Analyses of water from selected wells in this unit are listed in tables 9, 15, 18, and 21.

The waters from this unit are principally calcium and magnesium bicarbonate and calcium chloride types. One sodium chloride type water and one sodium bicarbonate water were analyzed. The inherent low sodium content of shales and argillites probably accounts for the low sodium concentrations in the ground water from this unit.

Iron ranged from 0.04 ppm to 1.4 ppm. The median for iron was 0.15 ppm. Total hardness ranged from 33 ppm to 1340 ppm and the median was 63 ppm. Chloride ranged from 3 ppm to 750 ppm and the median was 16 ppm.

Granite and Granodiorite Unit

The granite and granodiorite unit includes plutonic igneous rocks which range in composition from the typical granite through granodiorite. This unit also includes small bodies of diorite and xenoliths of volcanic rock too small to map. Analyses of ground water from selected wells in this unit are listed in tables 9, 12, 15, 18, and 21.

The water from granite and granodiorite is predominantly a calcium bicarbonate type (46%). Sodium and magnesium bicarbonate types constitute 23 and 30 percent, respectively, of the waters analyzed from this unit. The relative proportions of sodium, calcium, and magnesium in this unit are quite similar to those of the metavolcanic unit, indicating that their bulk compositions are approximately the same.

Triassic Unit

The rocks of Triassic age are principally continental and consist of maroon to reddish-gray sandstones, shales, siltstones,

conglomerates, and fanglomerates. Waters from this unit differ from those of the other map units in that there are an equal number of calcium and sodium bicarbonate types and no magnesium bicarbonate types. One each of the sodium and calcium chloride types was present.

Analyses of water from selected wells in the Triassic unit are listed in tables 9 and 12.

Iron ranged from 0.01 ppm to 0.90 ppm, and the median was 0.15 ppm. Total hardness ranged from 46 ppm to 524 ppm, and the median was 158 ppm. Chloride ranged from 12 to 384 ppm, and the median was 75 ppm.

Summary and Conclusions

The chemical character of the ground water in the Durham area shows little relation to the rock units. Water from the Triassic unit usually contained more dissolved solids than water from the other units. Water from the metavolcanic unit is similar to that of the granite and granodiorite unit. Calcium and sodium chloride water was found in a few wells in the metavolcanic, argillite-graywacke, and Triassic units. Bromide occurred in association with excessive chloride in two wells in the metavolcanic unit. Objectionable amounts of iron were reported in some samples from the metavolcanic unit. Ground water in the area is of the sodium, calcium, and magnesium bicarbonate type, and is suitable for most domestic, municipal, and industrial uses.

COUNTY DESCRIPTIONS

Chatham County

(Area 707 square miles; population 26,785)

Chatham County is the southeasternmost county in the Durham area. It is bounded on the north by Alamance, Orange, and Durham Counties, to the west by Randolph County, to the south by Moore and Lee Counties, and to the east by Harnett and Wake Counties. Pittsboro, the county seat, is the second largest town in Chatham County. Siler City, near the Randolph-Chatham County line, is the largest town, with a population of 4,455 according to the 1960 Bureau of the Census report. Other towns in the county are Bennett, Goldston, and Moncure.

The county is drained by the Deep, Rocky, Haw, and New Hope Rivers. The Haw and Deep Rivers become the Cape Fear River at their confluence south of Moncure.

The topography of Chatham County is similar to that of other counties in the Piedmont province. The upland surface generally slopes toward the southeast and is submaturely dissected by southeastward-flowing antecedent streams. A topographic lowland has developed on the Triassic rocks in the eastern and southeastern parts of the county. Highest elevations occur along a northeastward-trending ridge between Siler City and Pittsboro and on the large granite pluton between Bynum and Chapel Hill. The lowest altitude is along the Cape Fear River on the Chatham-Harnett County line.

The economy of the county depends largely on its agriculture. The production of broilers is quite important and one of the largest poultry-processing plants in the State is at Pittsboro. Other agricultural products include tobacco, corn, small grains, and livestock. Textile plants are at Bynum, Pittsboro, and Siler City.

Geology

Most of Chatham County is underlain by rocks of the metavolcanic unit (pl. 2), which include felsic to mafic pyroclastics, flows, and interbedded sedimentary rocks. The volcanic rocks are deeply weathered and poorly exposed. Where unweathered they are dense, flinty rocks that break with a conchoidal fracture and are green to gray in color. Tuffs ranging in texture from glassy varieties to coarse agglomerates are present. Most

interbedded sedimentary rocks in the metavolcanic unit appear to be silicified argillite. They are aphanitic and glassy and are easily confused with rhyolite flows.

Rocks of the metavolcanic unit grade upward into a predominantly sedimentary unit, which is mapped as the argillite-graywacke unit. The argillite-graywacke unit includes argillite, slate, graywacke, sandstone, graywacke conglomerate, and minor amounts of tuff. The argillite-graywacke unit is exposed in tightly folded, northeastward-trending synclines in the western half of the county. The sedimentary rocks of the argillite-graywacke unit are apparently overlain by andesitic tuffs and flows included in the mafic tuff and flow unit.

The sedimentary and volcanic rocks have been intruded and locally metamorphosed by igneous plutons of granite to granodiorite composition. The largest of these plutons is north of Pittsboro. Smaller plutons are exposed northwest of Terrells, east of Bynum, and south and east of Corinth. One outcrop of biotite schist is exposed in the southeastern tip of the county.

The eastern and south-central parts of Chatham County are underlain by rocks of Triassic age. These rocks include maroon to gray arkosic sandstones, siltstones, shales, and fanglomerates. The Triassic rocks dip to the southeast where they abut against the Jonesboro fault. The Triassic rocks as well as the surrounding volcanic-sedimentary terrane have been intruded by diabase dikes of Triassic age.

Ground Water

All water used for domestic and industrial purposes in Chatham County is obtained from wells or springs except in the towns of Pittsboro and Siler City, which utilize surface water. Most dug wells obtain their water from the saprolite overlying unweathered rock and they frequently go dry during periods of drought. Drilled wells in Chatham County obtain their water from fractures, planes of schistosity, and other secondary openings below the water table, and are more dependable sources of water than the dug wells. (See figs. 22 and 23.)

Data from 228 wells in Chatham County are summarized in table 7. Comparison of yields in table 7 indicates that wells in granite and granodiorite have three times the yield per foot of well that wells in the argillite-graywacke unit have, and nearly

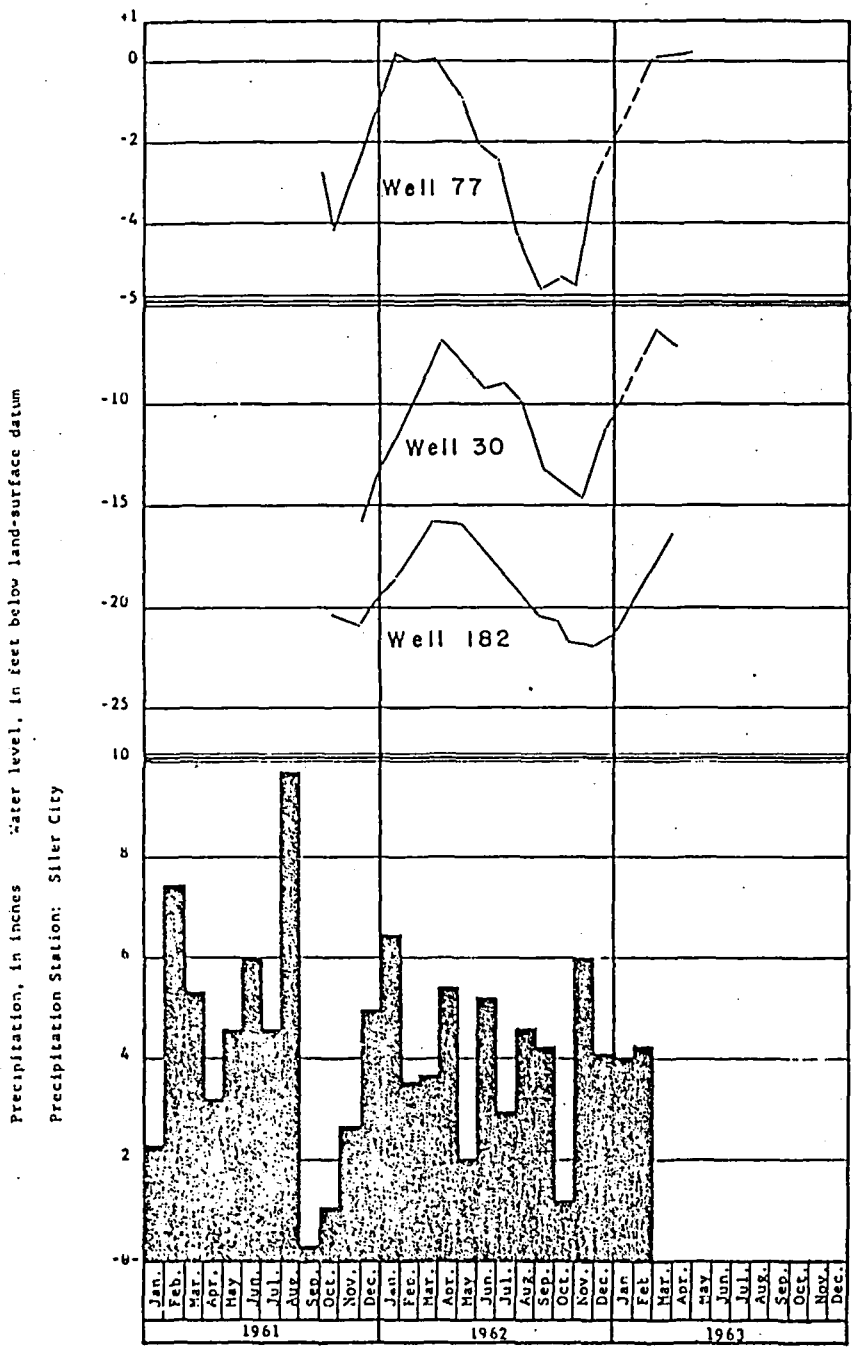
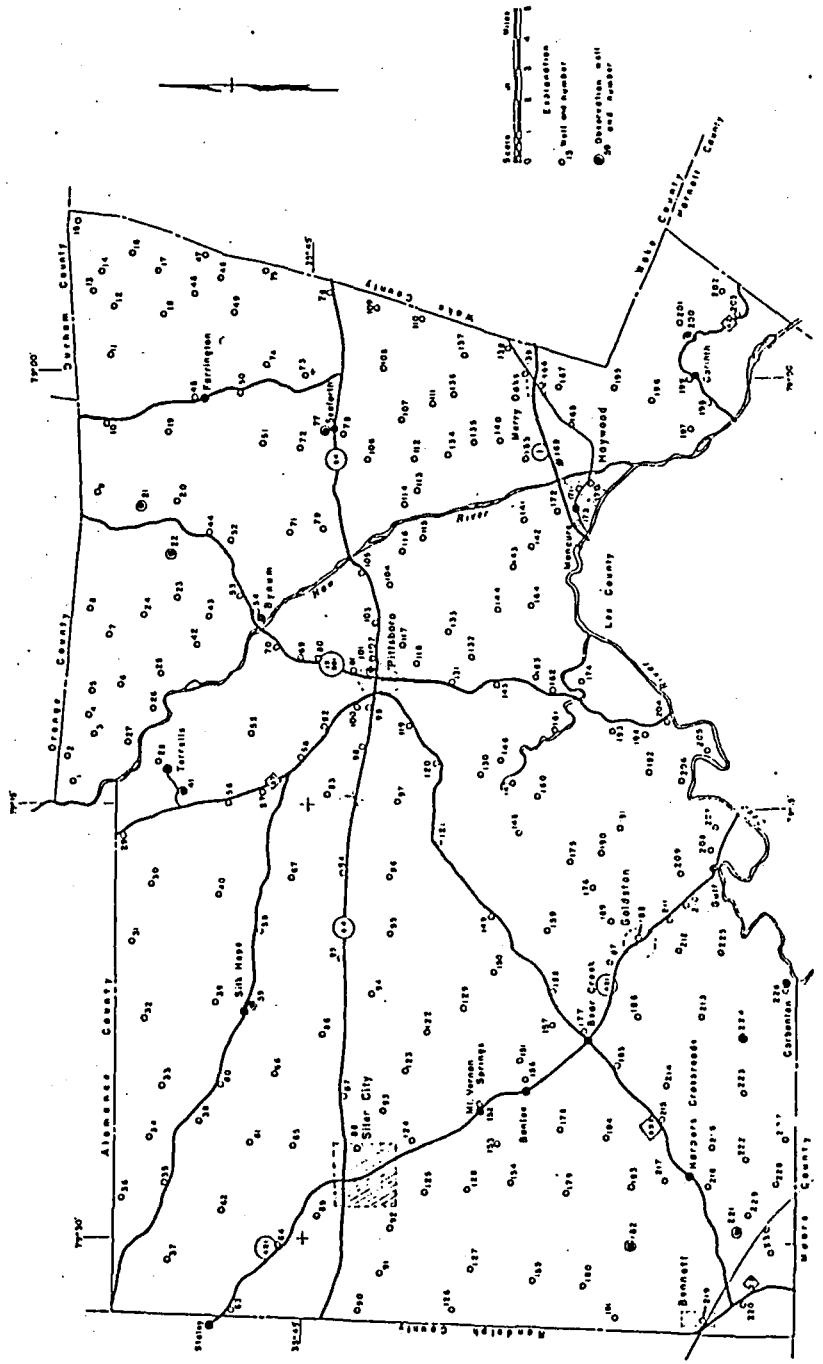


Figure 22. Selected hydrographs showing seasonal fluctuation of the water table in Chatham County.



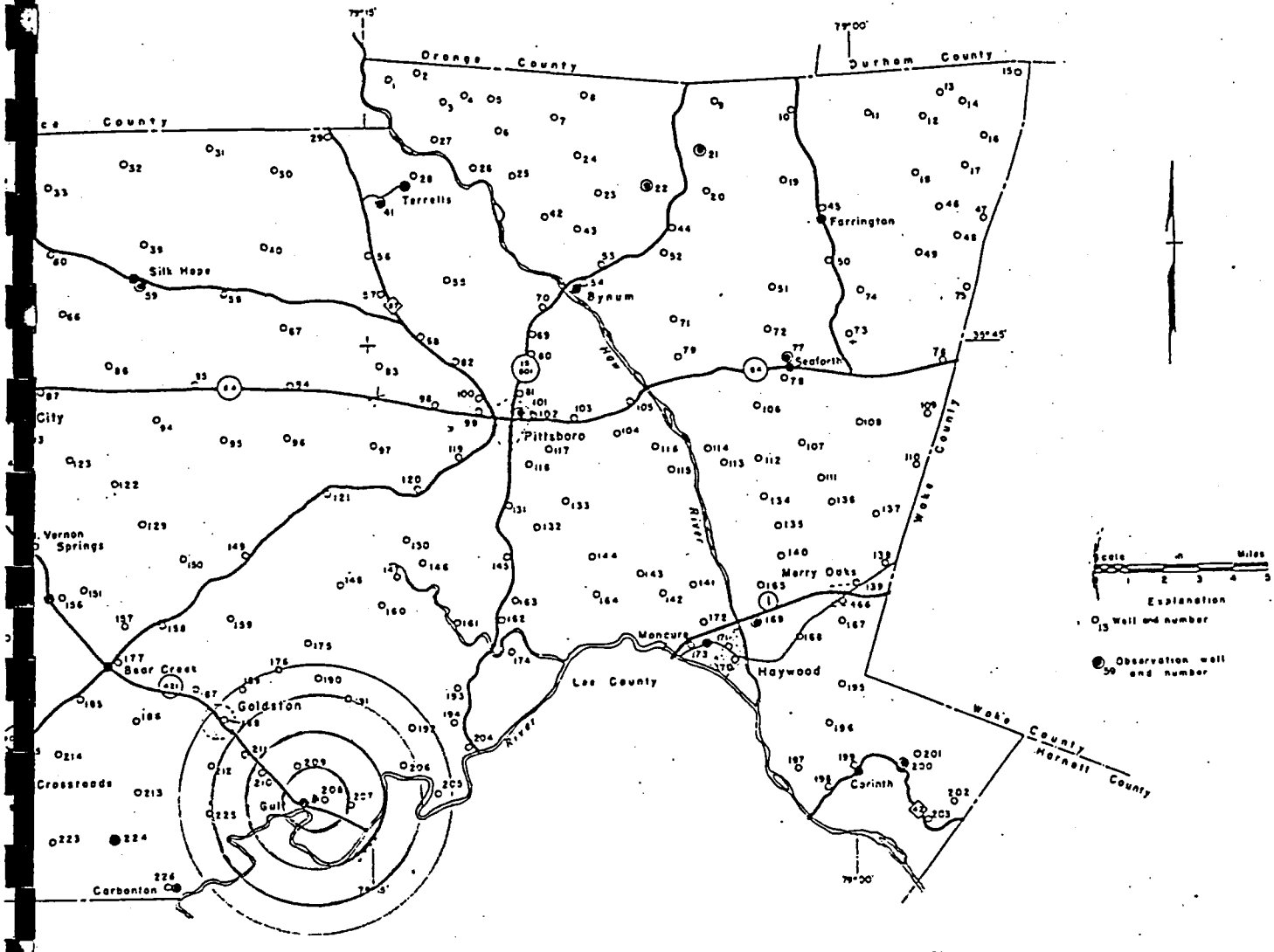


Figure 23. Map of Chatham County showing the location of wells.

Enlargement of p. 69

Table 7. Summary of Well Data in Chatham County according to Rock Type

Map unit	Number of wells	Yield (gallons per minute)		Average depth (feet)
		Average	Per foot of well	
Granite and granodiorite	21	8.0	0.12	68.1
Triassic	64	6.7	.07	97.7
Argillite-graywacke	17	5.0	.04	123.4
Metavolcanic	120	7.3	.07	99.2

Average water level in Chatham County is 24.2 feet below land surface.

twice the yield of wells in the Triassic and volcanic rocks. The higher yield in granite and granodiorite is attributed to deep weathering and to the higher permeability of the weathered material. The poorer yields in the argillite-graywacke unit (table 7) can no doubt be attributed to the thinner veneer of weathered material on this unit in Chatham County.

There is a great difference in yield from place to place in the same rock unit. Figures 15 and 16 show that depth of weathered material has a greater influence on yield in the metavolcanic and argillite-graywacke units than does topography. Plate 1 shows the areal distribution of relative yields for the Durham area. It can be seen from this map that a large area extending northeastward across Chatham County has yields that exceed 0.1 gpm per foot of uncased hole. In this area an 80-foot well cased to a depth of 30 feet should yield 5 gpm or more. The areas having a horizontal-line pattern should yield less than 5 gpm for the same well and casing depths. Areas in which yields would be expected to be less than 1 gpm under the same conditions are shown in a cross-hatched pattern. Records of wells in Chatham County are shown in table 8.

Table 8. Records of Wells in Chatham County

(Type of well: B,bored; D,dug; Dr,drilled. Reported hardness: H,hard; M,medium; S,soft. Relative yield: gallons per minute per foot of uncased hole.)

Well no.	Location	Owner	Topography	Type of well	Depth (ft.)	Diameter (in.)	Water-bearing material	Depth of casing (ft.)	Water level (ft.)	Yield (gpm)	Relative yield (gallons per foot)	Reported hardness	Remarks
1	3.1 mi. N of Terrells	F. J. Ferguson	Hill	Dr	100	6	Mafic tuff	30	20	6	0.09	M	
2	3.2 mi. N of Terrells	Walter Atwater	Slope	do	63	6	do		20	6		S	
3	3.1 mi. NE of Terrells	Ben Mann	Hill	do	84	6	Granite		20	0.5		H	
4	4.4 mi. NE of Terrells	Mrs. K. H. Hackney	do	D	52	36	do	0	46	4		S	
5	3.1 mi. NE of Terrells	E. F. Moses	do	B	33	20	do	33	21	3		S	
6	5.6 mi. NE of Terrells	Mrs. John Kenfield	do	Dr	90	6	do		25	15		S	
7	5.9 mi. NE of Terrells	J. B.-Faircloth	Slope	D	26	24	do	0	21	1		S	
8	4.6 mi. NW of Farrington	Mrs. Pendergraph	do	do	21	30	do	0	15	2		M	Iron taste reported.
9	3.2 mi. N of Farrington	Dennis Boggs	Draw	Dr	107	6	Triassic	35	19	6	0.08	M	
10	3.3 mi. NE of Farrington	N. C. State College	Flat	D	30	48	do	0	14	5		S	
11	4.1 mi. NE of Farrington	R. C. Horton	Hill	Dr	104	6	do	36	19	5	0.07	H	
12	5.0 mi. NE of Farrington	J. E. Burke	do	do	133	6	do	20	20	5	.04	M	Lime taste reported.
13	5.3 mi. NE of Farrington	H. A. Sims	Knoll	do	92	6	Triassic diabase		50	3		M	Do.
14	7.0 mi NE of Farrington	W. W. High	do	do	85	6	Triassic		35	4		M	
15	5.3 mi. NE of Farrington	T. B. Slade	Slope	Dr	96	6	Triassic	20	60	1.5	0.20	M	Lime taste reported.
16	4.5 mi. NE of Farrington	J. C. Riggsbee	Hill	D	49	48	do	0	44	0.5		M	Do.
17	3.0 mi. NE of Farrington	Fallie Council	Upland flat	Dr	105	6	do		21	3		M	

Table 8. Records of Wells in Chatham County (Continued)

(Reported hardness: H,hard; M,medium; S,soft)
(Type of well: B,bored; D,dug; Dr,drilled. Relative yield: gallons per minute per foot of uncased hole.)

Well no.	Location	Owner	Topography	Type of well	Depth (ft.)	Diameter (in.)	Water-bearing material	Depth of casing (ft.)	Water level (ft.)	Yield (gpm)	Relative yield (gallons per foot)	Reported hardness	Remarks
81	2.2 mi. NW of Pittsboro---	Leon Brooks---	Slope--	-Dr--	148	6	Mafic tuff---	28	-----	4	0.03	M	Slight taste reported.
82	4.1 mi. NW of Pittsboro---	J. Horace Mangum------	Flat---	-do--	60	6	Andesitic tuff-------	45	20	8	0.32	S	
83	6.5 mi. W of Pittsboro---	C. p. Clark---	Knoll--	-do--	105	6	-----do------	50	50	20	0.36	[illegible]	Analysis in table.
84	3.7 mi. SE of Silk Hope---	Floyd Bowers--	Flat---	-do--	43	8	-----do------	15	13	6	0.21	S	
85	2.5 mi. S of Silk Hope---	H. C. Owens---	Hill---	-do--	60	6	Argillite and tuff-------	------	20	5	--------	S	
86	2.4 mi. E of Siler City--	J. E. Lemon---	Knoll--	-do--	115	4	Argillite----	60	-----	5	0.09	S	Do.
87	Siler City----	N. C. State Highway-----	Flat---	-do--	190	-----	-----do------	175	-----	8	0.53	M	Do.
88	2.0 mi. NW of Siler City--	L. W. Craig---	Valley-	-do--	120	6	-----do------	7	-----	1	0.01	H	Bad taste reported.
89	4.5 mi. W of Siler City--	C. A. Burke---	Draw---	-do--	33	6	-----do------	15	15	4.5	0.25	S	
90	3.3 mi. W of Siler City--	C. K. Fox-----	Hill---	-do--	138	4	Mafic tuff---	30	40	3	0.03	S	Reported to be corrosive.
91	2.0 mi. SW of Siler City--	Fletcher Brooks	Flat	-do--	72	6	Argillite and felsic tuff	20	20	1.5	.03	--------	
92	2.0 mi. SE of Siler City--	Chatham Poultry	Slope--	-do--	100	6	Andesitic tuff-------	35	3	1	.02	S	
93	5.7 mi. E of Siler City--	Joe Johnson---	Hill---	-do--	60	6	-----do------	------	44	5	.23	S	
94	7.8 mi. E of Siler City--	Walter Powers	--do---	-do--	102	6	-----do------	80	30	20	--------	S	
95	6.0 mi. W of Pittsboro---	Jim Clark-----	--do---	-do--	150	6	-----do------	20	40	1	0.01	--------	
96	4.0 mi. SW of Pittsboro---	Ed Johnson----	Flat---	-do--	42	36	-----do------	2	32	5	--------	S	

Table 8. Records of Wells in Chatham County (Continued)

(Reported hardness: H,hard; M,medium; S,soft)
(Type of well: B,bored; D,dug; Dr,drilled. Relative yield: gallons per minute per foot of uncased hole.)

Well no.	Location	Owner	Topography	Type of well	Depth (ft.)	Diameter (in.)	Water-bearing material	Depth of casing (ft.)	Water level (ft.)	Yield (gpm)	Relative yield (gallons per foot)	Reported hardness	Remarks
97	2.2 mi. W of Pittsboro---	Mrs. J. A. Webster-----	Hill---	-Dr--	60	6	Andesitic tuff-------	34	-----	3	0.12	M	
98	0.8 mi. W of Pittsboro---	F. C. Justice	--do---	-do--	140	6	Mafic tuff---	56	40	5	.06	S	
99	1.0 mi. NW of Pittsboro---	J. B. Reeves--	Knoll--	-do--	135	6	Andesitic tuff-------	125	30	10	1.00	--------	Analysis in table.
100	Pittsboro-----	Town of Pittsboro---	Slope--	-do--	117	6	Mafic tuff---	------	16	10+	--------	--------	Observation well.
101	Pittsboro-----	A. J. Boone---	--do---	-do--	36	6	-----do------	20	5	4	0.25	--------	
102	1.8 mi. E of Pittsboro---	W. L. Mann----	--do---	-do--	70	6	-----do------	24	20	3	.67	S	
103	3.1 mi. E of Pittsboro---	H. D. Amos----	Flat---	-do--	96	6	-----do------	28	30	4.5	.06	S	
104	3.5 mi. E of Pittsboro---	David L. Richards----	Hill---	-do--	47	6	-----do------	21	-----	10	0.28	H	Bad taste reported.
105	1.5 mi. SW of Seaforth----	C. M. and W. W. Ward--------	Knoll--	-do--	107	6	Triassic-----	77	30	9	0.30	S	
106	2.2 mi. S of Seaforth----	Roy B. Farrar-	--do---	-do--	135	6	-----do------	50	50	2.5	.03	M	
107	2.6 mi. SE of Seaforth----	Dewey Poe-----	--do---	-do--	110	6	-----do------	11	22	15	.16	S	
108	4.3 mi. SE of Seaforth----	Earl G. Goodwin---------	Draw---	-do--	80	6	-----do------	40	8	30	.77	S	
109	4.6 mi. SE of Seaforth----	A. L. Barker--	Knoll--	-do--	215	6	-----do------	20	22	3	.02	M	
110	3.2 mi. S of Seaforth----	Mrs. J. L. Mathews-----	Slope--	-do--	109	6	-----do------	18	24	5	.06	M	
111	2.7 mi. SW of Seaforth----	Sam Jones-----	Knoll--	-do--	92	6	-----do------	39	15	5	.09	M	Lizy taste reported.
112	3.3 mi. SW of Seaforth----	Harold Lasater	--do---	-do--	107	6	-----do------	40	40	6	.09	--------	Use water softener.
113	3.3 mi. SW of Seaforth----	Mrs. Eva Thomas	Hill---	-do--	100	6	Andesitic tuff-------	50	45	2.5	.05	S	

(Reported hardness: H,hard; M,medium; S,soft)
(Type of well: B,bored; D,dug; Dr,drilled. Relative yield: gallons per minute per foot of uncased hole.)

Well no.	Location	Owner	Topography	Type of well	Depth (ft.)	Diameter (in.)	Water-bearing material	Depth of casing (ft.)	Water level (ft.)	Yield (gpm)	Relative yield (gallons per foot)	Reported hardness	Remarks
148	5.1 mi. NE of Bear Creek--	Gerald Rives--	Flat--	-Dr--	150	6	Mafic tuff---	20	17	1.5	0.01	M	
149	3.9 mi. NE of Bear Creek--	A. J. McLaurin	Hill--	-do--	57	6	-----do------	21	25	8	.22	M	
150	1.0 mi. E of Bonlee------	McKinlew Marsh	Flat--	-do--	48	6¼	-----do------	-----	10	6	--------	--------	
151	Mt. Vernon Springs-----	J. E. Rice----	Slope-	-do--	40	4	Andesitic tuff-------	24	35	35	2.00	S	
152	1.2 mi. SW of Mt. Vernon Springs-----	Hugh Tillman--	Hill--	-do--	60	4	-----do------	-----	20	5	--------	S	
153	2.5 mi. SW of Mt. Vernon Springs-----	B. E. Webster	--do--	-do--	80	6	-----do------	-----	30	9.5	--------	S	
154	6.1 mi. W of Bonlee------	L. T. Bray----	Flat--	-do--	67	6	Tuff and graywacke--	-----	19	5	--------	S	
155	Bonlee--------	Jullian Williams	Hill--	-do--	125	6	Quartz dike in mafic tuff-------	-----	25	100	--------	S	
156	1.3 mi. NE of Bonlee------	L. T. Jones---	--do--	-do--	114	6	Felsic tuff--	-----	14	4	--------	S	Analysis in table.
157	2.0 mi. NE of Bear Creek--	J. J. Ivey----	--do--	-do--	92	6	Tuffaceous argillite--	70	33	16	0.72	S	
158	3.0 mi. N of Goldston----	Tommy Fields--	Slope-	-do--	72	6	Tuff breccia	28	24	5.5	.13	S	
159	5.9 mi. NE of Goldston----	Beatrice Watson	Flat--	-do--	32	6	Mafic tuff---	-----	11	2	--------	S	
160	6.1 mi. S of Pittsboro---	W. L. Cheek---	Hill--	-do--	225	6	Felsic tuff--	25	35	2.5	0.01	H	
161	5.8 mi. S of Pittsboro---	H. L. Hardwood	Knoll-	-do--	96	6	Mafic tuff---	-----	20	5	--------	S	
162	5.2 mi. S of Pittsboro---	Silas Williams, Jr.----------	Flat--	-do--	56	6	Felsic tuff--	11	15	2.5	0.06	S	
163	3.4 mi. NW of Moncure-----	Mrs. D. L. Burns-------	Hill--	-do--	65	6	Mafic tuff---	41	55	8	.33	H	

Table 8. Records of Wells in Chatham County (Continued)

(Reported hardness: H,hard; M,medium; S,soft)
(Type of well: B,bored; D,dug; Dr,drilled. Relative yield: gallons per minute per foot of uncased hole.)

Well no.	Location	Owner	Topography	Type of well	Depth (ft.)	Diameter (in.)	Water-bearing material	Depth of casing (ft.)	Water level (ft.)	Yield (gpm)	Relative yield (gallons per foot)	Reported hardness	Remarks
164	2.5 mi. NE of Moncure-----	G. F. Carr-----	Hill----	-Dr--	82	6	Triassic------	-----	15	5	--------	S	
165	Merry Oaks----	L. S. Howard--	Knoll---	-do--	115	6	-----do------	12	10	1.5	0.02	H	
166	0.6 mi. S of Merry Oaks-	T. F. Williams	Slope---	-do--	53	6	Triassic shale and diabase-----	20	18	12	.36	S	
167	1.5 mi. SW of Merry Oaks-	Sam Jones------	Flat----	-do--	95	6	Triassic------	20	29	10	0.13	M	
168	1.8 mi. E of Moncure-----	J. T. Moore----	Knoll---	-do--	140	6	-----do------	-------	13	0.5	--------	--------	Observation well; analysis in table.
169	Haywood-------	O. M. Covert--	Slope---	-do--	100	6	-----do------	25	------	20	0.27	S	
170	Haywood-------	C. M. Burke----	--do----	-do--	74	6	-----do------	21	11	2	.04	M	Limy taste reported.
171	0.5 mi. N of Moncure-----	Chatham County Schools------	Flat----	-do--	120	4	-----do------	-----	22	8	--------	--------	Analysis in table.
172	Moncure-------	O. M. Covert--	Slope---	-do--	100	6	-----do------	-----	------	18	--------	S	Bad taste reported.
173	5.4 mi. W of Moncure-----	Sam Williams---	--do----	-do--	63	6	Quartz dike in mafic tuff-------	-----	------	8	--------	M	
174	3.4 mi. NE of Goldston----	Virgil Rives---	Hill----	-do--	95	6	Mafic tuff---	33	40	2	0.03	S	
175	2.3 mi. NE of Goldston----	Mrs. W. C. McMillian------	Knoll---	-do--	155	2½	Felsic tuff--	40	1	4	.04	H	Reported bad taste & corrosive.
176	Bear Creek----	John A. Gilmore	Draw----	-do--	180	6	Argillite-----	10	------	2	.01	S	
177	1.6 mi. SW of Bonlee------	Mrs. E. M. Leonard------	Hill----	-do--	101	6	Mafic tuff---	30	27	8	.11	S	
178	3.6 mi. SW of Bonlee------	A. B. Chilton-	--do----	-do--	167	6	-----do------	30	36	1	.01	H	Limy taste reported.
179	4.1 mi. N of Pennett-----	C. L. Welch----	--do----	-do--	92	6	Quartz dike in felsic tuff or argillite--	80	32	10	.83	S	

Table 8. Records of Wells in Chatham County (Continued)

(Reported hardness: H,hard; M,medium; S,soft)
(Type of well: B,bored; D,dug; Dr,drilled. Relative yield: gallons per minute per foot of uncased hole.)

Well no.	Location	Owner	Topography	Type of well	Depth (ft.)	Diameter (in.)	Water-bearing material	Depth of casing (ft.)	Water level (ft.)	Yield (gpm)	Relative yield (gallons per foot)	Reported hardness	Remarks
180	2.9 mi. N of Bennett	Mrs. B. F. Brown	Knoll	Dr	50	6	Felsic tuff	28	-----	10	0.46	S	
181	3.3 mi. NE of Bennett	E. R. Teague	Hill	do	170	4	Quartz dike in felsic tuff	24	16	5	.03	S	Observation well; analysis in table.
182	2.0 mi. N of Harper's Crossroads	B. P. Phillips	Flat	do	133	6	Felsic tuff	30	56	6	.06	H	Analysis in table.
183	3.2 mi. W of Bear Creek	Paul Fesmire	do	do	187	4	Mafic tuff	18	30	0.5	.00	M	Slight lime taste reported.
184	1.2 mi. SW of Bear Creek	Charles Tillman	Hill	do	220	6	Felsic tuff	23	25	2	.01	M	
185	1.7 mi. S of Bear Creek	Talmadge Elkins	Flat	do	130	1½	Tuffaceous argillite	18	30	4.5	.04	S	
186	1.3 mi. NW of Goldston	W. F. Moses	do	do	81	6	Mafic tuff	40	15	2	.05	M	Some iron reported.
187	Goldston	H. H. Elder Oil Company	do	do	115	6	do	------	10	17	--------	M	
188	1.1 mi. NW of Goldston	Marion Williams	do	do	93	6	do	18	16	2	0.03	M	
189	3.2 mi. NE of Goldston	J. W. Poe	Slope	do	55	6	do	16	12	0.5	.13	M	
190	3.8 mi. E of Goldston	J. B. Oldham	Hill	do	200	6¾	Felsic tuff	28	25	2.5	.02	--------	
191	4.0 mi. NE of Gulf	L. W. Burns	Knoll	do	65	6	Triassic	20	27	12	.27	S	
192	7.0 mi. E of Goldston	Johnson's Grocery	Flat	do	180	6	Argillite and graywacke	------	22	5	--------	H	
193	5.0 mi. NE of Gulf	Margaret Gunter	do	do	90	6	Argillite	20	15	1	0.01	M	
194	2.3 mi. S of Merry Oaks	R. M. Cotten	do	do	95	6	Triassic	------	20	3	--------	H	

Table 8. Records of Wells in Chatham County (Continued)

(Reported hardness: H,hard; M,medium; S,soft)
(Type of well: B,bored; D,dug; Dr,drilled. Relative yield: gallons per minute per foot of uncased hole.)

Well no.	Location	Owner	Topography	Type of well	Depth (ft.)	Diameter (in.)	Water-bearing material	Depth of casing (ft.)	Water level (ft.)	Yield (gpm)	Relative yield (gallons per foot)	Reported hardness	Remarks
195	1.6 mi. NW of Corinth	W. E. Peele	Flat	Dr	72	5	Triassic	32	40	5	0.13	S	
196	1.8 mi. W of Corinth	C. H. Marks	Knoll	do	63	4	do	------	8	0.5	--------	S	
197	0.8 mi. W of Corinth	Fred L. Cross	do	do	81	6	do	19	52	4.5	0.07	S	
198	Corinth	A. A. Marks	do	do	67	6	do	30	23	1.5	.04	S	Some iron reported.
199	1.4 mi. E of Corinth	W. O. Jeffries	Hill	do	118	6	do	28	2	0	.00	H	Observation well; analysis in table.
200	1.8 mi. E of Corinth	James Cross	do	do	75	------	do	------	------	3	--------	H	
201	2.8 mi. SE of Corinth	C. R. Cotten	do	do	101	6	Schist	------	41	5	--------	S	
202	2.5 mi. SE of Corinth	J. L. Ragland	do	do	140	6	do	100	70	13	0.33	S	
203	5.2 mi. E of Gulf	Clyde Williams	Slope	do	150	6	Mafic tuff	20	40	.1	.00	S	
204	4.0 mi. E of Gulf	C. V. Dowdy	Valley	do	45	6	Triassic	20	30	6	.24	S	Some iron reported.
205	3.2 mi. E of Gulf	E. O. Dowdy	Flat	do	100	6	do	------	20	.5	--------	H	
206	1.0 mi. E. of Gulf	Chatham Brick and Tile	Valley	do	90	4	do	------	20	8	--------	--------	
207	Gulf	Gulf Creosot Company	Flat	do	220	6	do	------	25	15	--------	H	Analysis in table.
208	1.1 mi. N of Gulf	Charles E. Frazier	Knoll	do	143	6	do	11	35	2	0.02	M	
209	1.5 mi. NW of Gulf	Murchison Store	do	do	90	6	do	------	20	3	--------	M	

(Reported hardness: H,hard; M,medium; S,soft)
(Type of well: B,bored; D,dug; Dr,drilled. Relative yield: gallons per minute per foot of uncased hole.)

Well no.	Location	Owner	Topography	Type of well	Depth (ft.)	Diameter (in.)	Water-bearing material	Depth of casing (ft.)	Water level (ft.)	Yield (gpm)	Relative yield (gallons per foot)	Reported hardness	Remarks
210	1.2 mi. SE of Goldston----	Gaines Lumber Company-----	Knoll--	-Dr--	110	6	Felsic tuff--	-----	20	3	-------	H	
211	1.3 mi. S of Goldston----	Thomas Martin-	Slope--	-do--	136	6	-----do------	-----	-----	3	-------	S	
212	3.1 mi. SW of Goldston----	G. J. Wilkie--	Hill---	-do--	100	6	Argillite----	27	45	2	0.03	S	
213	3.0 mi. SW of Bear Creek--	Aubrey Fields-	Flat---	-do--	140	6	Argillaceous tuff-------	10	27	3.5	.03	S	
214	2.0 mi. NE of Harper's Crossroads--	James Phillips	--do---	-do--	100	6	Felsic tuff--	20	50	1	.01	H	Limy taste reported.
215	1.2 mi. SE of Harper's Crossroads--	Willie Scott--	Knoll--	-do--	57	6	Mafic tuff and phyllite---	-----	20	4	-------	S	
216	0.9 mi. N of Harper's Crossroads--	Mossie Johnson	--do---	-do--	50	6	Mafic and Felsic tuff	10	20	1	0.02	S	
217	0.6 mi. SW of Harper's Crossroads--	Jack Dark-----	Hill---	-do--	105	6	Bedded mafic tuff-------	30	25	3	.04	M	
218	Bennett-------	Wade Brawer---	Flat---	-do--	149	6	Felsic tuff--	-----	20	6	-------	H	Use water softener; some iron reported.
219	1.5 mi. SE of Bennett-----	M. Z. Manoss--	Knoll--	-do--	155	6	Mafic tuff---	20	19	3	0.02	H	
220	3.0 mi. SE of Bennett-----	Archie Councilman---------	--do---	-do--	120	6	Felsic tuff--	22	16	0.8	.08	-------	Observation well.
221	1.8 mi. S of Harper's Crossroads--	Eugene Gaines-	--do---	-do--	77	6	Mafic tuff---	6	15	2	.03	H	

Table 8. Records of Wells in Chatham County (Continued)

(Reported hardness: H,hard; M,medium; S,soft)
(Type of well: B,bored; D,dug; Dr,drilled. Relative yield: gallons per minute per foot of uncased hole.)

Well no.	Location	Owner	Topography	Type of well	Depth (ft.)	Diameter (in.)	Water-bearing material	Depth of casing (ft.)	Water level (ft.)	Yield (gpm)	Relative yield (gallons per foot)	Reported hardness	Remarks
222	3.5 mi. NW of Carbonton---	Daniel Wilson	Knoll--	-Dr--	56	6	Argillite----	------	15	11	-------	S	
223	4.5 mi. SW of Goldston----	Ronald Gilliland---	--do---	-do--	163	6	-----do------	------	38	11	-------	S	Observation well; analysis in table.
224	2.6 mi. S of Goldston----	Robert Palmer	Hill---	-do--	218	6	Triassic-----	30	50	2.5	0.01	-------	
225	Carbonton-----	Walter Heron--	Valley-	-do--	90	6	-----do------	------	15	5	-------	S	
226	3.3 mi. SE of Harper's Crossroads--	W. D. Wilson--	Hill--	-do--	60	6	Mafic tuff---	------	-----	40	-------	S	
227	2.9 mi. S of Harper's Crossroads--	Paul H. Phillips	--do--	-do--	150	6	Felsic tuff--	20	37	2.5	0.02	S	Some iron reported.
228	3.5 mi. SE of Bennett-----	Archie Councilman---------	Flat--	-do--	135	6	Mafic tuff---	10	40	.8	.00	M	
229	3.0 mi. SE of Bennett-----	Mrs. Burt Brewer	Draw--	-do--	232	6	-----do------	18	-----	2	.01	M	

(Type of well: B, bored; D, dug; Dr, drilled. Relative yield: gallons per minute per foot of unca

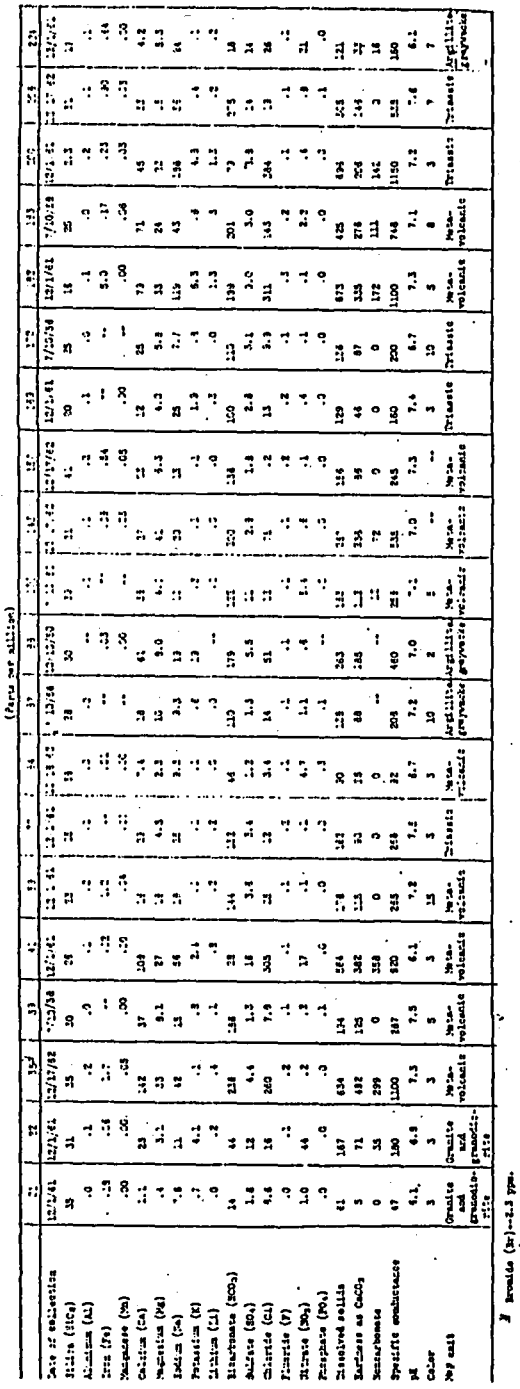
Well no.	Location	Owner	Topography	Type of well	Depth (ft.)	Diameter (in.)	Water-bearing material	Depth of casing (ft.)	Water level (ft.)	Yield (gpm)	Relative yield (gallons per foot)	Reported hardness	Remarks
1A	2.7 mi. NE. of Terrells	Grady Snipes	Draw	Spring			Granite			1.5		S	

Quality of Water

Ground water in Chatham County is principally of the calcium and sodium bicarbonate types and is suitable for most domestic, industrial, and municipal purposes. Calcium and sodium chloride waters are present at some localities in the county.

Iron ranges from 0.00 to 5.0 ppm. Fifty percent of the wells analyzed for iron had iron concentrations below the 0.3 ppm maximum recommended by the U. S. Public Health Service. Chloride ranged from 0.2 ppm to 384 ppm. Eighty percent of the wells sampled had chloride concentrations below the 250 ppm limit recommended by Public Health Service. Hardness ranged from 5 ppm to 492 ppm. Analyses from 20 selected wells in Chatham County are listed in table 9.

Table. 9. Chemical Analyses of Ground Water for Chatham County
(Numbers heading the columns correspond to well numbers in table 8)



Durham County

(Area 299 square miles; population 111,995)

Durham County is the smallest county in the Durham area. It is bounded on the north by Person County, on the west by orange Alamance County, on the south by Chatham and Wake Counties, and on the east by Wake and Granville Counties. Durham, the county seat, is the largest city in the Durham area and has a population of 78,302. Other towns include Bethesda and Rougemont. Most of the people in Durham County are employed by industry and supporting services in the city of Durham. The American Tobacco Co. and the Liggett and Myers Tobacco Co. are located in the city of Durham. The northern and eastern parts of the county are still largely devoted to agriculture. Tobacco, corn, small grains, and livestock are the chief agricultural products.

Durham County is drained by the New Hope, Neuse, Eno, Little, and Flat Rivers. The confluence of the Eno and Flat Rivers east of Fairntosh marks the beginning of the Neuse River.

The topography of Durham County is dominated by a lowland developed on Triassic rocks. The Triassic lowland, which occupies most of the county, is bordered on the northwest and the southeast by a distinct escarpment of the resistant volcanic rocks. The undulating, submaturely dissected upland surface developed on the resistant volcanic rocks is similar to that of adjacent counties in the Piedmont province. This surface generally slopes to the southeast. The highest elevations are in the northern part, north and east of Rougemont. The lowest elevations are in the eastern part of the county along the Neuse River and in the southern part of the county along the tributaries of the New Hope River.

Geology

The northwestern third of the county is underlain by rocks included in the metavolcanic unit (pl. 2). The metavolcanic unit in Durham County includes felsic to mafic tuffs and flows and thin interbeds of sedimentary rock. Acidic volcanic rocks predominate in a belt ranging from 2 to 4 miles in width along the Triassic contact. Intermediate to basic volcanic rocks crop out in the northwest corner, and a narrow belt of volcanic rock

Ref. 7

Ref. 7 Keith

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

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

Date: February 25, 1983

(2)

Mr. Joe Morgan
Southern Wood Piedmont Co.
P.O. Box 5447
Spartanburg, N. C. 29304

Re: Facility ID No. NCD053488557

Dear Mr. Morgan:

Based on information supplied by you we have processed and accepted at the State level your request for the facility identified with the above ID number to receive the indicated change in classification under RCRA:

Add As	Delete As	
☐	☒	generator
☐	☒	transporter
☐	☐	treater
☐	☐	storer
☐	☐	disposer
☐	☐	small generator

We are advising EPA of the change in your status. Please notify us if there is any further change in your operations which would again affect your status. Your EPA ID NO. is ☒ is not ☐ being cancelled.

Cordially,

O. W. Strickland, Head
Solid & Hazardous Waste Management Branch
Environmental Health Section

OWS

cc: Doug McCurry
EPA Region IV
Emil Breckling
Larry Perry

This is to show that this plant is closed.

DHS Form 3048 3/82
Solid & Haz. Waste Mgt. Branch

001

Jon.

(1)

DIVISION OF ENVIRONMENTAL MANAGEMENT

August 20, 1980

Mr. Joe Morgan, Environmental Manager
Southern Wood Piedmont Company
P.O. Box 5447
Spartanburg, South Carolina 29304

SUBJECT: Permit No. 3931-R
Southern Wood Piedmont Company
Gulf, North Carolina
Chatham County

Dear Mr. Morgan:

In accordance with your application received August 8, 1980, we are forwarding herewith Permit No. 3931-R, dated August 20, 1980, to Southern Wood Piedmont Company for the construction and operation of the subject non-discharge type waste treatment facilities.

This permit shall be effective from the date of issuance until rescinded, and shall be subject to the conditions and limitations as specified therein.

If any parts, requirements, or limitations contained in this permit are unacceptable to you, you have the right to an adjudicatory hearing before a hearing officer upon written demand to the Director within thirty (30) days following receipt of this permit, identifying the specific issues to be contended. Unless such demand is made, this permit shall be final and binding.

One (1) set of approved plans and specifications is being forwarded to you.

Yours very truly,

Original Signed by
L. P. BENTON, JR.
for Neil S. Grigg, Director
Division of Environmental Management

Enclosures
cc: Chatham County Health Department
Mr. Stan Taylor Regional Supervisor
Mr. A. C. Turnage, Jr.
Raleigh Regional Office Manager

DST:tcs

002

NORTH CAROLINA

ENVIRONMENTAL MANAGEMENT COMMISSION

DEPARTMENT OF NATURAL RESOURCES & COMMUNITY DEVELOPMENT

RALEIGH

P E R M I T

For the Discharge of Sewage, Industrial Wastes, or Other Wastes

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In accordance with the provisions of Article 21 of Chapter 143, General Statutes of North Carolina as amended, and other applicable Laws, Rules and Regulations

PERMISSION IS HEREBY GRANTED TO

Southern Wood Piedmont Company
Chatham County

FOR THE

construction and operation of 8,000 GPD non-discharge type industrial wastewater treatment facilities consisting of a monitoring system, runoff collection systems for process areas and irrigation areas, gravity oil separator system, storage-setting ponds and appurtenances in series with two (2) aerated lagoons followed by a spray irrigation system with approximately 40 acres of properly terraced irrigation area, so that there shall not be any discharge of wastewater to the surface waters of the State,

pursuant to the application received August 8, 1980, and in conformity with the project plans, specifications, and other supporting data, subsequently filed and approved by the Department of Natural Resources and Community Development and considered a part of this Permit.

This Permit shall be effective from the date of issuance until rescinded, and shall be subject to the following specified conditions and limitations:

1. This permit shall become voidable unless the facilities are constructed in accordance with the approved plans, specifications and other supporting data.

2. This permit is effective only with respect to the nature and volume of wastes described in the application and other supporting data.

3. The facilities shall be properly maintained and operated at all times.

4. This permit is not transferable.

5. This permit shall become voidable in the event of failure of the soil to adequately absorb the wastes, and may be rescinded unless the facilities are installed, maintained and operated in a manner which will protect the assigned water quality standards of the surface waters, and prevent any contamination of the ground waters which will render them unsatisfactory for normal use.

6. In event the facilities fail to perform satisfactorily, the Permittee shall take such immediate corrective action as may be required by this Department.

7. Solids, sludges, or other pollutants removed or resulting from the wastewater treatment process shall be contained and disposed of in such a manner as to prevent any contamination of the surface or ground waters of the State.

8. This is a Class II Wastewater Treatment Plant and the person in responsible charge must hold a valid Grade II Certificate.

9. Diversion or bypassing of the untreated wastewater from the treatment facilities is prohibited.

10. Terracing shall be provided for all wastewater application areas so that all surface runoff will be returned to the treatment system.

11. Appropriate warning signs shall be posted around the wastewater treatment areas.

12. Reports on the operations of the spray irrigation facilities shall be submitted to the North Carolina Division of Environmental Management at regular intervals and in such form and detail as may be required by the Governing Board of the Division of Environmental Management.

13. The application rate shall not exceed one (1) inch/acre/week.

14. The Permittee, at least six (6) months prior to the expiration of this Permit, shall request its extension. Upon receipt of the request, the Commission will review the adequacy of the facilities described therein, and if indicated, will extend the Permit for such period of time and under such conditions and limitations as it may deem.

15. Freeboard in the wastewater treatment facility basins shall not be less than two (2) feet at any time.

16. Monitoring facilities including a groundwater monitoring well located approximately 50 feet north of pond No. 7 shall be constructed, and monitoring reports and data shall be submitted as required by the Division of Environmental Management, Water Quality Section.

Permit issued this the 20th day of August, 1980.

NORTH CAROLINA EVNIRONMENTAL MANAGEMENT COMMISSION
Original Signed by
L. P. BENTON, JR

Neil S. Grigg, Director
Division of Environmental Management
By Authority of the Secretary of the Department
of Natural Resources & Community Development

Permit No. 3931-R

PRELIMINARY EXPLANATORY TEXT FOR THE 1985 GEOLOGIC MAP OF NORTH CAROLINA

Contractual Report 88-1

by

The North Carolina Geological Survey

November 4, 1988

Deep River Basin

The Deep River Basin is a northeast-southwest trending fault trough filled with nonmarine sedimentary rocks of the Late Triassic Chatham Group of the Newark Supergroup which were been intruded by Jurassic age diabase dikes and sheets. Strata in this basin generally strike northeast-southwest and dip to the southeast. The basin ranges between 6 and 16 miles in width and is approximately 150 miles long. The basin lies within the eastern edge of the North Carolina Piedmont physiographic province. The northernmost portion of the basin is near Oxford, North Carolina; the southern terminus is in Chesterfield County, South Carolina, just south of the North Carolina line. The basin is surrounded by pre-Triassic metavolcanic and metasedimentary rocks of the Carolina Slate belt and by intrusive rocks of the Raleigh belt along the northeast edge. Triassic rocks of the Deep River Basin occur in Granville, Durham, Wake, Orange, Lee, Chatham, Moore, Montgomery, Anson, and Richmond counties.

The Deep River Basin is subdivided into three sub-basins which are separated by cross-structures. These sub-basins are, from north to south: the Durham basin, the Sanford basin, and the Wadesboro basin. Prouty (1926) named the Durham and Sanford sub-basins. Traditionally, these three basins have been referred to as the Deep River-Wadesboro Basin. Gore (1986) included the Wadesboro basin in the Deep River Basin and that convention is followed in this report.

The southeastern border of the Deep River Basin is structurally defined by the Jonesboro fault, a northeast-southwest trending high angle normal fault that dips to the northwest. The fault was named by Campbell and Kimball (1923) for the town of Jonesboro which is now within the Sanford city limits. Bain and Brown (1980) and Reinemund (1955) interpreted the Jonesboro fault to actually be a series of en echelon block faults that step down to the basin. Reinemund (1955) estimated the vertical displacement along the Jonesboro fault to be between 6,000 to 10,000 feet. The Wadesboro basin is terminated on the southeastern side by either a subsidiary branch of the Jonesboro fault or by an extension of the Governors Creek fault, an intrabasinal structure of the Sanford basin (Randazzo and Copeland, 1976). Small detached Triassic basins lying southeast of the Wadesboro basin in Richmond County and possibly others to the north beneath Cretaceous Coastal Plain "cover" are thought to be bounded on the southeast by a continuation of the Jonesboro fault (Randazzo and Copeland, 1976).

The Durham and Sanford basins are bounded on the northwest in part by an unconformity between pre-Triassic crystalline rocks and sedimentary rocks and in part by high angle normal faults of low magnitude (Prouty, 1931; Reinemund, 1955; Harrington, 1958). The Wadesboro basin, on the other hand, is bounded on the northwest by a series of closely spaced, parallel, high angle normal faults (Swe, 1963).

The Colon cross-structure which separates the Durham and Sanford basins was first recognized by Emmons (1852). Campbell and Kimball (1923) named the feature and described it as a anticlinal warp that was cross-faulted. The Colon cross-structure is located between the communities of Moncure and Colon and is 8 miles long and 5 miles wide. Reinemund (1955) thought that the Colon cross-structure developed by differential subsidence of the Durham and Sanford basins. He speculated that initial movement started before the end of Triassic sedimentation and that the

structure was principally developed at the same time as the Jonesboro fault. Bain and Brown (1980) thought that the Colon cross-structure was a negative topographic feature during Pekin time and was later elevated.

The Pekin cross-structure which separates the Sanford and Wadesboro basins, was recognized by Mann and Zablocki (1961) on the basis of gravity data. Mann and Zablocki (1961) interpreted the structure as being analogous to the Colon cross-structure except that the Pekin cross-structure developed more by faulting than by folding. The Pekin cross-structure trends N25W and is centered between the towns of Pekin and Harrisville (Randazzo and Copeland, 1976). Randazzo and Copeland (1976) suggested that as much as 5,000 feet of sedimentary rocks have been eroded from this structure.

The Deep River Basin strata are cut by two sets of post-depositional normal faults: a longitudinal set trending northeast-southwest, roughly parallel to the Jonesboro fault, and a second set of cross faults which trend northwest-southeast. This latter set is commonly followed by diabase dikes (Campbell and Kimball, 1923; Reinemund, 1955; Bain and Harvey, 1977). These post-depositional faults, in combination, break the basin up into rectangular, triangular, and diamond shaped blocks that usually are tilted south and southeast (Reinemund, 1955; Bain and Harvey, 1977). Cross faults terminate the Deep River Basin to the south (Randazzo and Copeland, 1976). The northern terminus is also formed by faults.

Reinemund (1955) estimated the thickness of sedimentary rocks overlying the Colon cross-structure to be 4,000-5,000 feet. He estimated the thickness of sedimentary rocks to be 7,000-8,000 feet in the Sanford basin and 10,000 feet in the Durham basin. Mann and Zablocki (1961) estimated the thickness of strata over the Colon cross-structure to be 2,000 feet, thickening to 6,100-7,700 feet in the Sanford basin and 6,100 feet in the Durham basin. They estimated the thickness of strata in the Wadesboro basin to 3,800 feet. Bain and Harvey (1977) estimated the thickness of strata in the Durham basin to be 6,800 feet in the vicinity of Apex in southern Wake County.

DURHAM BASIN

The Durham basin is the largest and northernmost Triassic basin within the greater Deep River Basin. The Durham basin is approximately 52 miles long and attains a maximum width of 16 miles. The eastern margin is defined by the Jonesboro fault, a major northeast trending high angle normal fault which dips to the northwest. The western margin consists of unconformities and minor northwest-trending high angle normal faults which dip to the southeast. The southernmost boundary of the Durham basin is the Colon cross-structure. In the northernmost Durham basin, the eastern boundary fault abruptly changes trend from northeast to north-northwest in the vicinity of Creedmoor. Wright Horton (personal communication, 1988) traced the Jonesboro fault along its northeast trend into the Piedmont from this junction. North of this junction the basin is probably bounded by a north-northwest trending cross fault that intersects the western boundary fault and terminates the basin in the vicinity of Oxford, Granville County.

Very little detailed geologic work is published on the Durham basin. Prouty (1926, 1931) published a general report on the Durham basin and noted the presence of fossil and coalified wood in conglomerates along the western margin of the basin between Chapel Hill and Durham. He also named

October 22, 1993

TO: File

FROM: Irene Williams, Environmental Chemist Irene Williams
N.C. Superfund Section

RE: Southern Wood Piedmont Gulf Site (NCD 053 488 557)
Estimation of flow rates

The annual runoff near the site was estimated to be 14 inches using the "Map of Mean Annual Runoff for the Northeastern, Southeastern, and Mid-Atlantic United States, Water Years 1951-1980, U.S. Geologic Survey, Water-Resources Investigations Report 88-4094," Madison, Wisconsin, 1990 (1).

The drainage area for Cedar Creek near the site was found to be 4.42 square miles using "Drainage Areas of Selected Sites on Streams in North Carolina, Open-File Report 83-211, U.S. Department of the Interior Geological Survey," Raleigh, N.C., 1983, page 64 (2).

Using reference (1), formula given on page 10, the flow rate for Cedar Creek near the site was calculated to be 4.6 cubic feet/second as shown below.

(14 inches/year)(4.42 square miles)/13.58=4.6 cfs

Using data from reference (2), the drainage area for the Deep River near the site was found to be 1112 square miles. Applying the formula mentioned above, the flow for the Deep River was determined to be 1146 cubic feet per second as shown below.

(14 inches/year)(1112 square miles)/13.58=1146 cfs

References (1) and (2) are attached to this memorandum.

MAP OF MEAN ANNUAL RUNOFF FOR THE NORTHEASTERN, SOUTHEASTERN, AND MID-ATLANTIC UNITED STATES, WATER YEARS 1951–80

By
William R. Krug, Warren A. Gebert, David J. Graczyk, U.S. Geological Survey;
Donald L. Stevens, Jr., Eastern Oregon State College;
Barry P. Rochelle, Northrop Services, Inc.;
and M. Robbins Church, U.S. Environmental Protection Agency

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations Report 88–4094

Prepared in cooperation with the
U.S. ENVIRONMENTAL PROTECTION AGENCY

Madison, Wisconsin
1990

sions that the methods that used the area-weighted average of the drainage area or the centroid of the drainage area produced somewhat better correlations—that is, the interecept was closer to zero, the standard errors were small, and the correlation coefficients were larger. These methods have slightly greater power to predict actual runoff

Additional statistical investigation found no significant differences in reliability of the runoff estimates among the areas. No significant differences existed in the errors for stations with drainage areas of differing size.

USE OF MEAN ANNUAL RUNOFF MAP

Mean annual runoff for a site can be estimated from the runoff map by several methods. The simplest method of estimating the runoff is to locate the site on the runoff map and to identify the runoff contour nearest the site. This method, however, is less accurate than other methods. The most accurate method is to draw the drainage basin on the runoff map, and use the runoff contours to divide the basin into bands of differing runoff. The area of each of the bands within the drainage basin is then determined. The areas of the separate bands are then used to compute a weighted average runoff for the basin. For example, if 50 percent of the basin is in an area of 18 in/yr (inches per year) of runoff, 30 percent in an area of 20 in/yr of runoff and 20 percent in an area of 22 in/yr of runoff the mean annual runoff would be calculated as follows:

$$0.5 \times 18 + 0.3 \times 20 + 0.2 \times 22 = 19.4$$

Runoff estimated from the map is in inches per year, averaged over the entire drainage basin. Multiply this value by the drainage area, in square miles, and divide by 13.58 to convert to mean annual discharge, in cubic feet per second. In the above example, assume the drainage area of the site is 100 mi^2. The mean annual discharge, in cubic feet per second, would be:

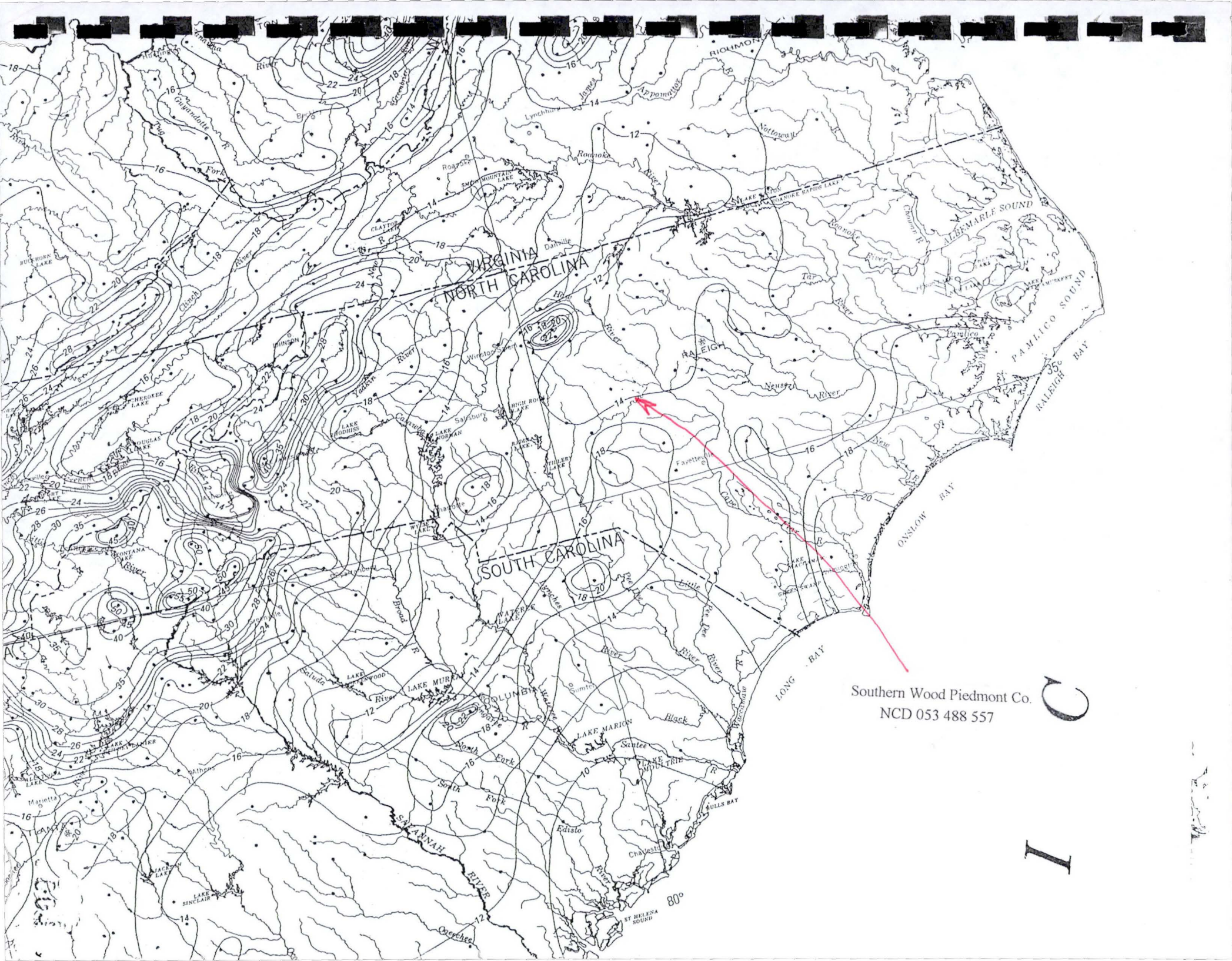
$$19.4 \times 100/13.58 = 143$$

The runoff map was prepared to allow estimation of mean annual runoff at sites where no streamflow data are available. The map represents mean annual runoff for areas with natural land cover. Caution should be used in applying the map to estimate runoff for areas that are not natural land areas. The runoff map should not be used for areas, such as large urban areas, where the land cover has been altered in ways that would change the amount of runoff. The runoff map is not applicable for lakes or bays, for coastal wetlands affected by tides, for streams controlled by reservoirs large enough to influence the total annual streamflow, or for streams with substantial diversions.

Local features could cause the runoff at a particular site to differ substantially from the runoff indicated by the runoff map. The geology of the drainage basin might cause substantial amounts of water to enter or leave the basin as ground water. This could substantially increase or decrease the runoff. For example, a stream with a small drainage area that includes a large spring probably would have higher average streamflow than indicated by the runoff map.

Table 5.—Descriptive statistics of errors in estimated runoff at 93 test stations

Method	Mean absolute value	Mean	Standard error of mean	Standard deviation
		Error, in inches		
Area-weighted	2.0	–0.35	0.30	2.9
Centroid	2.2	–.71	.33	3.1
GIS	2.7	–1.74	.37	3.6
Nearest-inch	2.8	–1.77	.38	3.7
Nearest contour	2.8	–1.79	.39	3.8
		Percent error		
Area-weighted	9.0	–0.54	1.3	12.9
Centroid	9.8	–.71	1.4	13.5
GIS	12.0	–6.42	1.6	15.9
Nearest-inch	12.1	–6.20	1.6	15.6
Nearest-contour	12.2	–6.26	1.6	15.8


VIRGINIA
NORTH CAROLINA
SOUTH CAROLINA
RALEIGH
ALBEMARLE SOUND
PAMLICO SOUND
RALEIGH BAY
ONSLOW BAY
LONG BAY
LAKE MURRAY
LAKE MARION
SAVANNAH RIVER
Southern Wood Piedmont Co.
NCD 053 488 557

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DRAINAGE AREAS OF SELECTED SITES ON STREAMS IN NORTH CAROLINA

By Robert L. Meikle

Open-File Report 83-211

Prepared in cooperation with the
NORTH CAROLINA DEPARTMENT OF NATURAL
RESOURCES AND COMMUNITY DEVELOPMENT

Raleigh, North Carolina
1983

STATION NUMBER	STATION NAME	DRAINAGE AREA (SQ MI)	SITE TYPE	LAT	LONG	QUAD NAME	COUNTY CODE
0210146300	DEEP R AT SR 1007 AT GULF	1063.	20	353418	791714	GOLDSTON	037
0210146329	INDIAN C AT MTH NR GULF	26.0	20	353238	791928	GOLDSTON	037
0210147850	POCKET C AT SR 1303 NR WHITE HILL	5.23	20	352500	791539	WHITE HILL	105
0210148350	POCKET C AT SR 1305 NR WHITE HILL	10.4	20	352616	791546	WHITE HILL	105
0210148365	POCKET C AT SR 1318 NR CUMNOCK	15.0	20	352732	791552	WHITE HILL	105
0210148375	RACCOON C AT SR 1318 NR COOL SPRINGS	2.68	20	352750	791509	WHITE HILL	053
0210148385	RACCOON C AT MTH NR CUMNOCK	4.08	20	352900	791607	WHITE HILL	105
0210148400	POCKET C NR CUMNOCK	23.2	02	352925	791624	WHITE HILL	105
0210148479	L POCKET C AT SR 1314 NR WHITE HILL	1.14	20	352546	791825	WHITE HILL	105
0210148493	L POCKET C AT SR 1318 NR HAW BRANCH	4.21	20	352732	791830	WHITE HILL	105
0210148699	L POCKET C AT SR 1326 NR HAW BRANCH	5.84	20	352828	791821	WHITE HILL	105
0210148800	L POCKET NR CUMNOCK	9.52	20	353017	791732	GOLDSTON	105
0210148829	L POCKET C AT MTH NR GULF	11.3	20	353119	791641	GOLDSTON	105
0210148889	POCKET C AT MTH NR GULF	37.7	20	353202	791651	GOLDSTON	105
0210149579	PATTERSON C AT MTH NR GULF	7.24	20	353233	791522	GOLDSTON	105
0210149600	DEEP R AT US 421 NR GULF	1112.	20	353244	791512	GOLDSTON	037
0210150000	DEEP R AT CUMNOCK	1112.	01	353331	791436	COLON	037
0210150190	CEDAR C HEADWATERS AT GOLDSTON	2.23	20	353504	791841	GOLDSTON	037
0210150400	CEDAR C AT SR 2142 AT GULF	4.42	11	353400	791705	GOLDSTON	037
0210150459	CEDAR C TRIB HEADWATERS NR GOLDSTON	1.82	20	353609	791730	GOLDSTON	037
0210150509	CEDAR C TRIB AT MTH AT GULF	5.49	20	353401	791628	GOLDSTON	037
0210150600	CEDAR C AT SR 2145 NR GULF	13.0	11	353405	791445	COLON	037
0210150739	ROCKY B AT SR 2153 NR FARMVILLE	2.48	20	353547	791442	COLON	037
0210150769	ROCKY B AT MTH NR FARMVILLE	4.07	20	353459	791431	COLON	037
0210150779	GEORGES C AT SR 2153 NR FARMVILLE	8.67	20	353458	791430	COLON	037
0210151082	PERSIMMON C TRIB AT MTH AT SANFORD	1.58	20	352755	791208	SANFORD	105
0210151095	PERSIMMON C AT MTH AT SANFORD	4.37	20	352832	791151	SANFORD	105
0210151100	SKUNK C AT MTH AT SANFORD	2.68	20	352832	791150	SANFORD	105
0210152400	BIG BUFFALO C AT SR 1100 NR SANFORD	8.64	11	352919	791208	SANFORD	105
0210152494	BIG BUFFALO C TRIB AT MTH AT SANFORD	1.10	20	352917	791210	SANFORD	105
0210152600	BIG BUFFALO C AT US 421 NR SANFORD	10.9	20	353002	791211	COLON	105
0210153900	BIG BUFFALO C NR COLON	12.5	11	353040	791212	COLON	105
0210154200	PURGATORY R AT US 421 NR CUMNOCK	1.27	11	353144	791403	COLON	105
0210155200	BIG BUFFALO C NR CUMNOCK	19.7	20	353230	791347	COLON	105
0210155333	BIG BUFFALO C AT MTH NR FARMVILLE	20.4	20	353307	791336	COLON	105
0210155469	DEEP R TRIB AT MTH AT FARMVILLE	2.56	20	353323	791234	COLON	105
0210156400	DEEP R NR CUMNOCK	1151.	20	353328	791208	COLON	105
0210157100	GEORGES C AT FARMVILLE	11.8	02	353423	791255	COLON	037
0210157125	GEORGES C AT MTH AT FARMVILLE	12.8	20	353401	791203	COLON	037
0210157700	DEEP R NR COALGLEN	1165.	20	353441	791140	COLON	105
0210160400	L BUFFALO C AT SCLRR AT SANFORD	2.75	20	353008	791027	COLON	105
0210161200	L BUFFALO C NR COLON	4.79	02	353154	791027	COLON	105
0210161695	L BUFFALO C AT US 1 NR NORTHVIEW	6.62	20	353317	791122	COLON	105
0210161800	L BUFFALO C AT MTH NR FARMVILLE	8.08	20	353443	791123	COLON	105
0210163100	ROCKY R AT LIBERTY	2.18	02	354930	793424	LIBERTY	151
0210166000	ROCKY R NR LIBERTY	4.52	02	354909	793324	LIBERTY	151
0210166019	ROCKY R TRIB AT MTH NR LIBERTY	1.29	20	354917	793305	LIBERTY	151
0210166029	ROCKY R AT SR 1300 NR CRUTCHFIELD X RDS	7.42	20	354825	793141	LIBERTY	037
0210167212	ROCKY R AB LAKE NR CRUTCHFIELD X RDS	12.2	20	354755	793029	LIBERTY	037
0210167225	ROCKY R TRIB NR CRUTCHFIELD X RDS	1.93	20	354803	792941	CRUTCHFIELD CROSSROA	037
0210168600	N P ROCKY R NR LIBERTY	2.70	11	355151	793234	LIBERTY	151
0210168709	N P ROCKY R TRIB AT MTH NR SNOW CAMP	1.10	20	355127	793141	LIBERTY	001
0210168809	N P ROCKY R AT SR 1301 NR SILER CITY	7.37	20	355029	793148	LIBERTY	037
0210169900	N P ROCKY R NR STALEY	10.1	11	354921	793047	LIBERTY	037
0210171200	N P ROCKY R NR SILER CITY	11.7	11	354852	793013	LIBERTY	037
0210171300	N P ROCKY R NR CRUTCHFIELD X RDS	12.7	20	354829	792929	CRUTCHFIELD CROSSROA	037
0210171409	GREENBRIER C NR PLEASANT HILL	3.64	20	355031	792928	CRUTCHFIELD CROSSROA	037
0210171459	GREENBRIER C AT MTH NR PLEASANT HILL	8.55	20	354832	792849	CRUTCHFIELD CROSSROA	037
0210171555	ROCKY R AT DAM NR CRUTCHFIELD X RDS	37.1	20	354742	792839	CRUTCHFIELD CROSSROA	037
0210171659	LICK C AT SR 1004 CRUTCHFIELD X RDS	1.58	20	354916	792556	CRUTCHFIELD CROSSROA	037
0210171699	LICK C NR CRUTCHFIELD X RDS	4.79	20	354830	792722	CRUTCHFIELD CROSSROA	037
0210171739	JOHNSON C NR CRUTCHFIELD X RDS	2.72	20	354830	792723	CRUTCHFIELD CROSSROA	037
0210171900	MUD C NR SILER CITY	7.99	02	354753	792747	CRUTCHFIELD CROSSROA	037
0210171929	MUD C AT MTH NR SILER CITY	8.58	20	354730	792755	CRUTCHFIELD CROSSROA	037
0210172059	LACYS C NR SILER CITY	3.67	20	354629	792820	CRUTCHFIELD CROSSROA	037
0210172200	ROCKY R AT SILER CITY	54.0	20	354547	792727	CRUTCHFIELD CROSSROA	037
0210172209	ROCKY R TRIB BL WTP NR SILER CITY	0.72	20	354541	792719	CRUTCHFIELD CROSSROA	037
0210172220	ROCKY R AT SR 1004 NR SILER CITY	56.2	20	354542	792638	CRUTCHFIELD CROSSROA	037
0210172250	NICK C TRIB NR CRUTCHFIELD X RDS	1.87	20	354651	792544	CRUTCHFIELD CROSSROA	037
0210172300	NICK C NR SILER CITY	5.01	02	354558	792613	CRUTCHFIELD CROSSROA	037
0210172399	NICK C AT MTH NR SILER CITY	7.27	20	354539	792603	CRUTCHFIELD CROSSROA	037
0210172580	ROCKY R TRIB AT MTH NR SILER CITY	2.28	20	354418	792535	SILER CITY	037
0210172600	ROCKY R AT US 64 NR SILER CITY	69.1	20	354406	792524	SILER CITY	037
0210172650	LOVES C AT SR 1006 NR SILER CITY	1.06	20	354134	792826	SILER CITY	037
0210172810	LOVES C TRIB AT MTH AT SILER CITY	2.05	20	354301	792725	SILER CITY	037
0210173002	LOVES C AT SR 2208 AT SILER CITY	5.32	20	354305	792722	SILER CITY	037
0210173900	LOVES C AB SEO NR SILER CITY	7.51	02	354343	792619	SILER CITY	037
0210175555	LOVES C AT MTH NR SILER CITY	7.99	11	354357	792523	SILER CITY	037
0210176700	VARNELL C AT SR 1003 NR SILK HOPE	2.02	20	354618	792304	CRUTCHFIELD CROSSROA	037
0210176819	VARNELL C TRIB NR SILK HOPE	1.07	20	354529	792232	CRUTCHFIELD CROSSROA	037
0210177219	VARNELL C TRIB AT SR 1500 NR SILK HOPE	1.90	20	354510	792232	CRUTCHFIELD CROSSROA	037
0210177819	VARNELL C TRIB AT MTH NR SILER CITY	1.06	20	354421	792347	SILER CITY	037
0210177900	VARNELL C NR SILER CITY	9.74	02	354404	792408	SILER CITY	037
0210177950	VARNELL C AT MTH NR SILER CITY	10.2	20	354334	792414	SILER CITY	037
0210178027	ROCKY R NR SILER CITY	90.4	20	354313	792351	SILER CITY	037

006

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

CHATHAM COUNTY, NORTH CAROLINA
(UNINCORPORATED AREAS)

PANEL 200 OF 225

COMMUNITY–PANEL NUMBER:
370299 0200 B

EFFECTIVE DATE:
JULY 16, 1991

Federal Emergency Management Agency

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100–YEAR FLOOD

- ZONE A — No base flood elevations determined.
- ZONE AE — Base flood elevations determined.
- ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE A99 — To be protected from 100–year flood by Federal flood protection system under construction; no base elevations determined.
- ZONE V — Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- ZONE VE — Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

- ZONE X — Areas of 500–year flood; areas of 100–year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100–year flood.

OTHER AREAS

- ZONE X — Areas determined to be outside 500–year flood plain.
- ZONE D — Areas in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS

- Flood Boundary
- Floodway Boundary
- Zone D Boundary
- Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zone.
- 567 — Base Flood Elevation Line; Elevation in Feet*
- A — A — Cross Section Line
- (EL 19) — Base Flood Elevation in Feet Where Uniform Within Zone*
- RM5 × — Elevation Reference Mark
- M3.0 • — Mile Mark

*Referenced to the National Geodetic Vertical Datum of 1929

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all planimetric features outside Special Flood Hazard Area or all areas subject to flooding, particularly from local drainage sources of small size.

Areas of Special Flood Hazard (100–year flood) include zones, A, AE, A1–A30, AH, AO, A99, V, VE and V1–V30.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Refer to Floodway Data Table where floodway width is shown at 1/20 inch.

Coastal base flood elevations apply only landward of the shoreline.

This map incorporates approximate boundaries of coastal barriers established under the Coastal Barrier Resources Act (PL 97–348).

Corporate limits shown are current as of the date of this map. The user should contact appropriate community officials to determine if corporate limits have changed subsequent to the issuance of this map.

For adjoining panels, see separately printed Map Index.

MAP REPOSITORY
Planning Office, County Health Building, 112 East Street, Pittsboro, North Carolina (Maps available for reference only, not for distribution.)

INITIAL IDENTIFICATION:
MAY 19, 1978

FLOOD HAZARD BOUNDARY MAP REVISION:

FLOOD INSURANCE RATE MAP EFFECTIVE:
JULY 16, 1991

FLOOD INSURANCE RATE MAP REVISIONS:

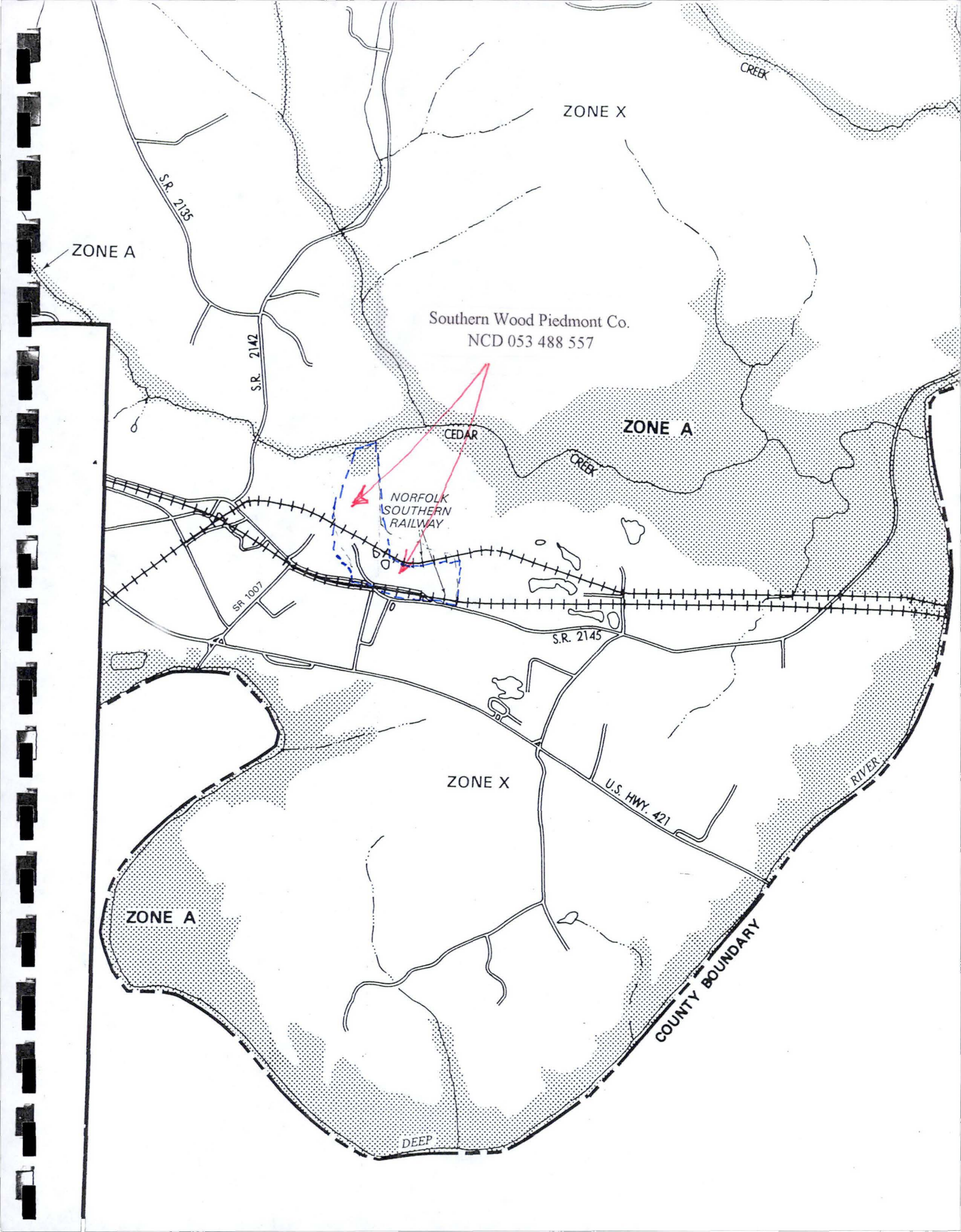
To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638–6620.

N

APPROXIMATE SCALE IN FEET

2000 0 2000

Ref. 10


ZONE X
CREEK
S.R. 2135
ZONE A
Southern Wood Piedmont Co.
NCD 053 488 557
S.R. 2142
CEDAR
CREEK
ZONE A
NORFOLK
SOUTHERN
RAILWAY
SR 1007
S.R. 2145
ZONE X
U.S. HWY. 421
RIVER
ZONE A
COUNTY BOUNDARY
DEEP

Ref. 11

October 22, 1993

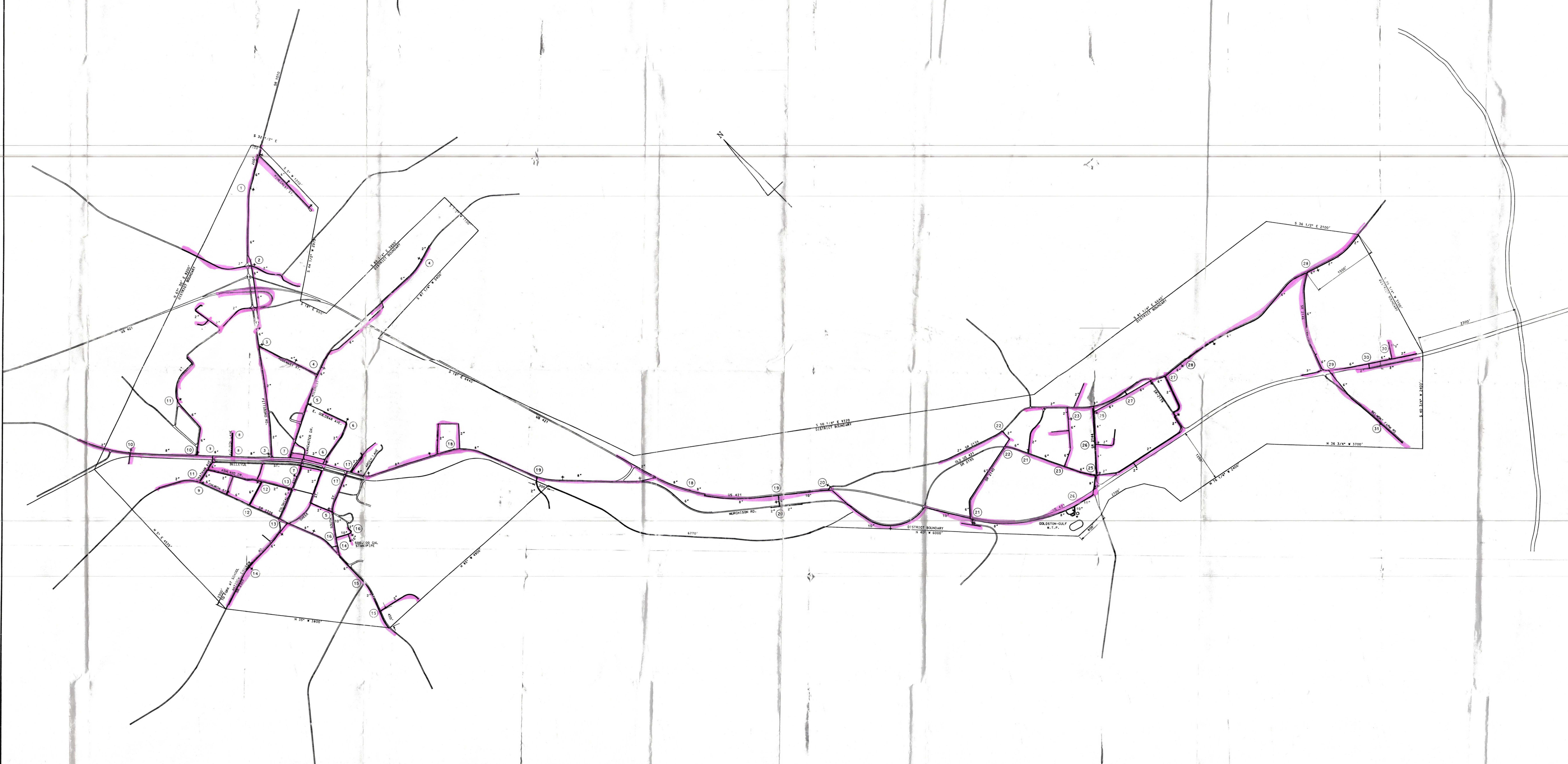
TO: File

FROM: Irene Williams, Environmental Chemist
N.C. Superfund Section

RE: Southern Wood Piedmont (NCD 053 488 557)
Teleconference concerning Goldston-Gulf Sanitary District

On the above date I spoke with Mr. Travis Cade, Water Plant Operator at the Goldston-Gulf Water Sanitary District (919/898-2239) concerning water lines. He said that he would mail me a map, that the intake is located at Highway 421, and that they do serve Cumnock.

Ref. 12



GOLDSTON-GULF SANITARY DISTRICT

DISTRICT BOUNDARY

WATER MAP

800 400 0 800 1600 2400

CENTRAL CAROLINA ENGINEERING, P.A.

CONSULTING ENGINEERS-PLANNERS

P.O. BOX 1706
SANFORD, N.C. 27330

November 5, 1993

TO: File

FROM: Irene Williams, Environmental Chemist Irene Williams
N.C. Superfund Section

RE: Southern Wood Piedmont (NCD 053 488 557)
Teleconference with Mr. Bob Joyce, Lee County

On the above date I spoke with Mr. Bob Joyce, 919/774-8424, Lee County Planning, concerning municipal water supplies in Lee County. Earlier, Mr Randy Clark, Water Plant Operator, had indicated to me that there is a surface water intake on the Deep River that primarily serves a poultry processing plant. He referred me to Mr. Joyce for full information on well water and surface water municipal systems in Lee County.

In our conversation, Mr. Joyce indicated that the small water system Mr. Clark had mentioned was opened in order to attract a poultry processing plant to the county. He reported that the system serves approximately 8 residences in addition to the poultry processing plant. This system is interconnected, but valved off from, a well water system which serves an area of about a 5 mile radius of the town of Lemon Springs. The two systems would be blended only on an emergency basis. This has reportedly never yet been done. The intake is located on the Deep River about 3000 feet downstream (north) of the Highway 421 bridge, between the highway bridge and the Southern Railroad bridge.

Mr. Joyce mentioned that the city of Sanford is served by a surface water intake on the Cape Fear River located about 1 mile downstream of McKay Island. He also indicated that the Lee County well system near Lemon Springs is interconnected with the city of Sanford water lines. He stated that the village of Cumnock has reportedly had problems with elevated trihalomethane levels in the drinking water and that the Lee County system may begin serving Cumnock soon. Cumnock is now served by the Goldston-Gulf Sanitary District.

Mr. Joyce will mail us a map showing the waterlines and intakes we discussed.

Lee County

Fax Transmission Cover Page

Date: 11-8-93 Time: 3:00

To: Ms. Irene Williams SF Location: Raleigh, NC 27605

From: Bob Joyce Location: Lee County 774-8424
Lee County Economic + Development

Of Pages (Inc. Cover Page) 3

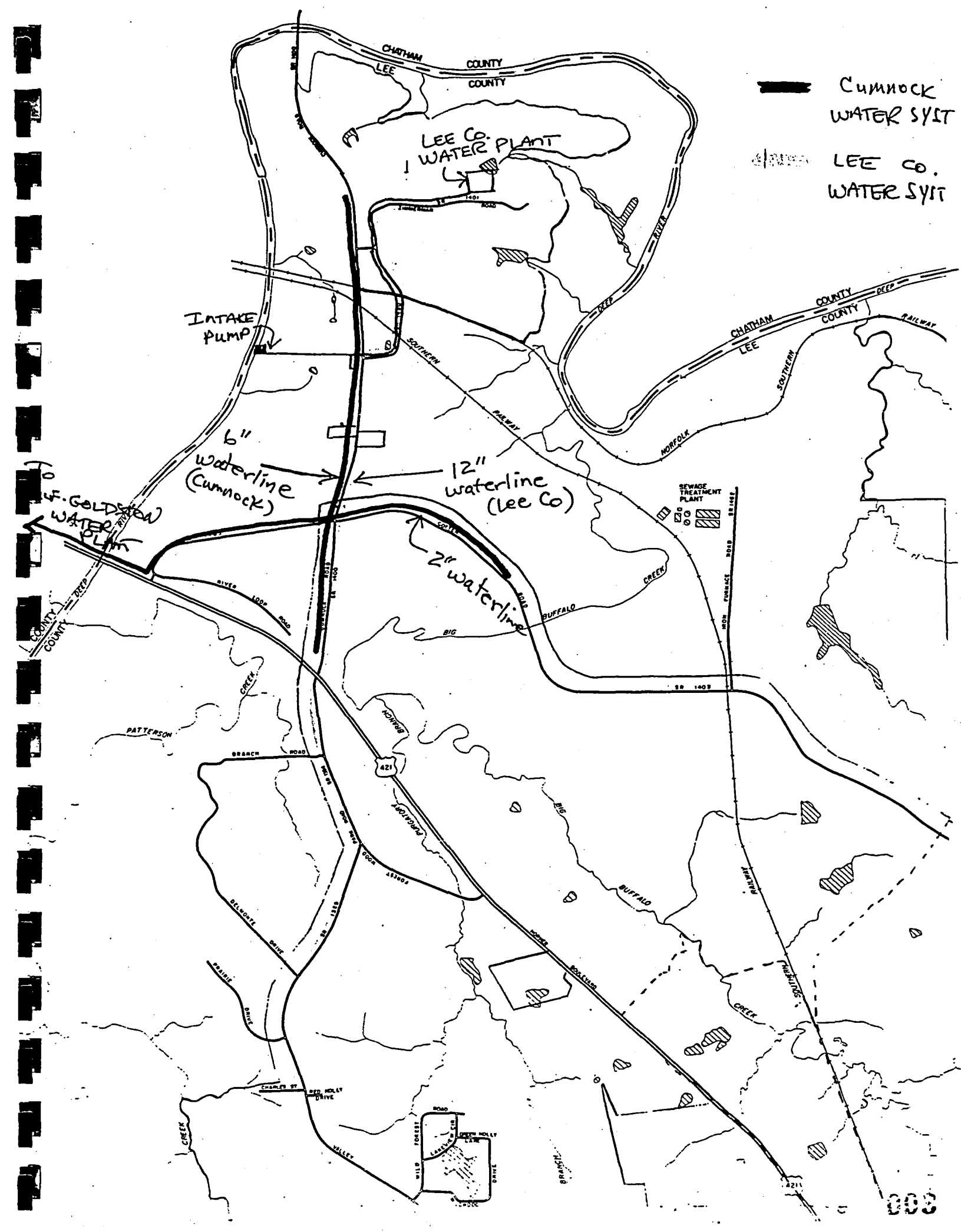
Message

If you did not receive all pages, please call (919) 774-8430

Fax Number (919) 774-8407

Fax 1-919-733-4811
Could not fax, no answer

002


Cumnock Water Syst
Lee Co. Water Syst
Lee Co. Water Plant
Intake Pump
6" waterline (Cumnock)
12" waterline (Lee Co)
2" waterline
Ft. Goldston Water Plant
Chatham County
Lee County
Deep River
Southern Railway
Norfolk Southern Railway
Sewage Treatment Plant
Big Buffalo Creek
Patterson Branch Road
Bellmont Drive
Prairie Drive
Charles St
Red Holly Drive
Green Holly Lane
Wild Forest Drive
Valley Creek
Southern Railway
421


GULF-GOLDSTON
INTAKE
CO. OF LEE
INTAKE
CITY OF SANFORD
INTAKE

Ref. 13

November 9, 1993

TO: File

FROM: Irene Williams, Environmental Chemist Irene Williams
N.C. Superfund Section

RE: Southern Wood Piedmont Gulf Site (NCD 053 488 557)
Identification of sensitive environments

On the above date I reviewed appropriate USGS quad maps at the Natural Heritage Program office to identify critical habitats and sensitive environments within a 4-mile radius of the site and along the 15-mile downstream surface water pathway.

One animal species identified:

Notropis mekistocholas, or Cape Fear Shiner, Endangered at both the U.S. and N.C. levels.

Plant species identified:

(1) Collinsonia tuberosa, or Piedmont Horsebalm, Candidate for Endangered at the N.C. level

(2) Enemion biternatum, or Eastern Isopyrum, Significantly Rare at the N.C. level

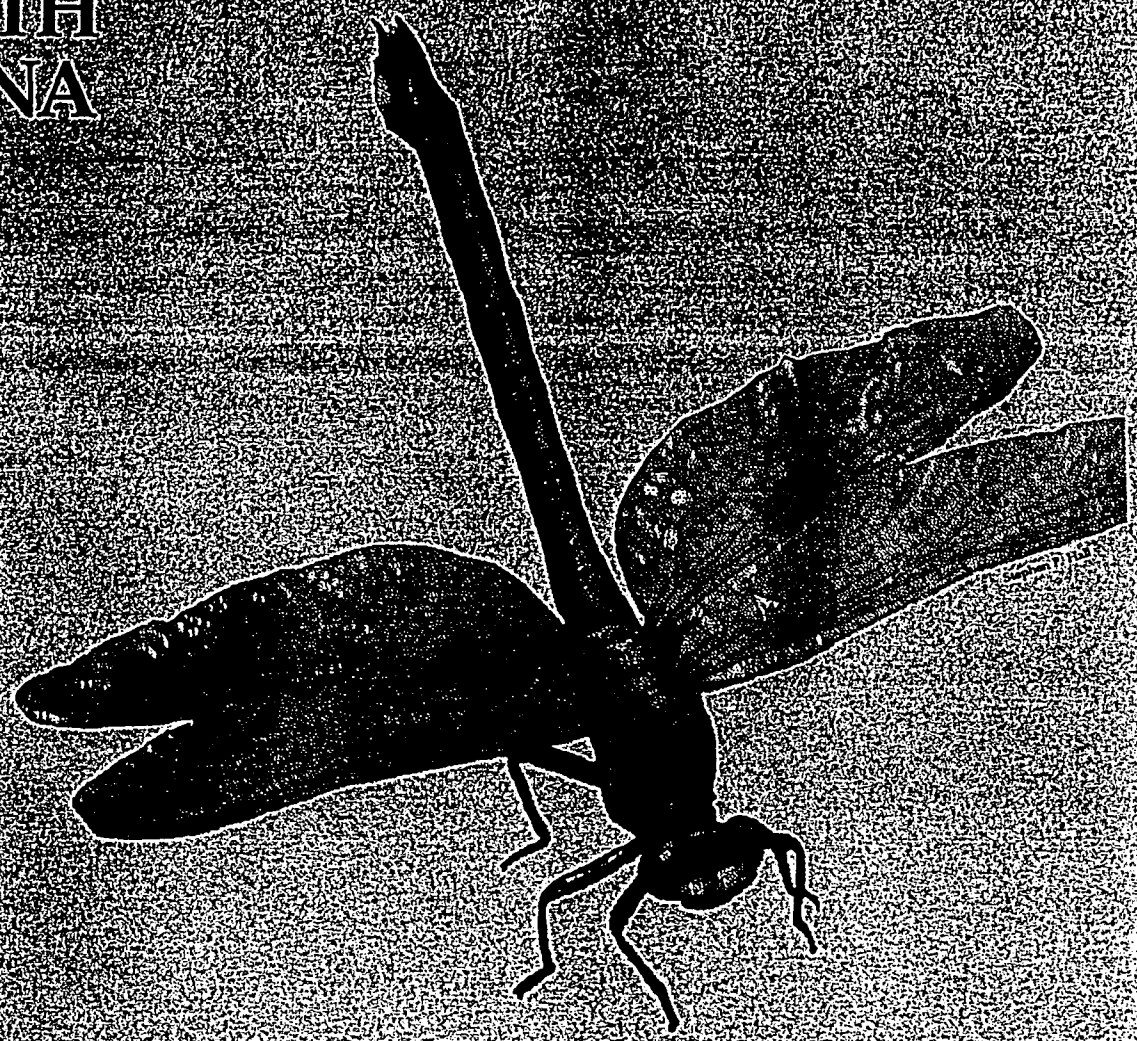
(3) Porteranthus stipulatus, or Indian Physic, Significantly Rare at the N.C. level

(4) Ptilimnium nodosum, or Harperella, Endangered at both the U.S. and N.C. levels

References: (a) LeGrand, Harry E., Jr., Natural Heritage Program List of the Rare Animal Species of North Carolina, 1993

(b) Weakley, Alan S., Natural Heritage Program List of the Rare Plant Species of North Carolina, 1993.

NATURAL HERITAGE PROGRAM LIST OF THE RARE ANIMAL SPECIES OF NORTH CAROLINA



Compiled By
Harry E. LeGrand, Jr., Zoologist
With Contributions by Stephen P. Hall

North Carolina Natural Heritage Program
Division of Parks and Recreation
N. C. Department of Environment, Health, and Natural Resources 1993

Physiographic Province. The provinces in which the animal is known to occur are indicated. This should not be regarded as the only province(s) of the state in which the species could occur; our knowledge of the fauna of North Carolina, especially the invertebrates, is still very imperfect. The provinces are abbreviated as follows:

M	Mountains	All parts of North Carolina west of the foot of the Blue Ridge Escarpment.
P	Piedmont	All parts of North Carolina east of the foot of the Blue Ridge Escarpment and west of the Fall Line, including outlying "foothill" ranges, such as the Brushy, Uwharrie, and Sauratown mountains.
C	Coastal Plain	All parts of North Carolina east of the Fall Line (including the Sandhills), but excluding the portions associated with tidal water (ocean, sounds, barrier islands, and mainland brackish or salt marshes).
T	Tidewater	That part of the state associated with tidal water, such as the ocean and barrier islands, sounds, estuaries, and mainland brackish or salt marshes.

Habitat. The known, or the most typical, habitats are described briefly; as with provinces, these should not be regarded as the only possible habitats of the species in the state.

Scientific Name Province: Habitat	Common Name	Status N.C.	Status U.S.	Rank N.C.	Rank Global
Etheostoma mariae C: streams of Lumber drainage, mainly in the sandhills; perhaps in adjacent Pee Dee drainage	Pinewoods Darter	SC	3C	S3	G3
Etheostoma perlongum C: Lake Waccamaw (endemic to North Carolina)	Waccamaw Darter	T	3B	S1	G1Q
Etheostoma podostemone P: large streams in Dan River system	Riverweed Darter	SC		S2	G3
Etheostoma simoterum M: streams of French Broad drainage (formerly)	Tennessee Snubnose Darter	SC		SH	G5
Etheostoma vulneratum M: streams of Little Tennessee system; perhaps extirpated from French Broad system	Wounded Darter	SC		S2	G2
Exoglossum laurae M: New drainage	Tonguetied Minnow	SR		S2	G4
Exoglossum maxillingua P: streams of Dan River system	Cutlips Minnow	E		S1	G5
Fundulus waccamensis C: large natural lakes (Lakes Waccamaw and Phelps) (endemic to North Carolina)	Waccamaw Killifish	SC	C2	S1	G1
Heterandria formosa C: streams and lakes near Wilmington	Least Killifish	SC		S1	G5
Hiodon tergisus M: French Broad River	Mooneye	SC		S1	G5
Hybopsis monacha (see Cyprinella monacha)					
Hybopsis rubrifrons (see Notropis rubescens)					
Hybopsis zanema (see Cyprinella zanema)					
Hybopsis, new species [Cape Fear Chub] (merged with Cyprinella zanema)					
Hypentelium roanokense P: Dan drainage	Roanoke Hog Sucker	SR		S3	G3?
Ictiobus bubalus MP: French Broad River; Piedmont reservoirs	Smallmouth Buffalo	SR		S2	G5
Lampetra aepyptera CP: Tar and Neuse drainages	Least Brook Lamprey	SC		S2	G5
Lampetra appendix M: French Broad drainage	American Brook Lamprey	T		S1	G5
Lepomis megalotis M: French Broad drainage	Longear Sunfish	SR*		SH	G5
Lucania goodei C: stream in Wilmington area	Bluefin Killifish	SC		S1	G5
Luxilus chrysocephalus M: Cane River system	Striped Shiner	T		S1	G5
Menidia extensa C: Lake Waccamaw (endemic to North Carolina)	Waccamaw Silverside	T	T	S1	G1
Micropterus coosae M: Savannah drainage	Redeye Bass	SR		S1	G5
Moxostoma ariommum P: Dan drainage	Bigeye Jumprock	SC		S2	G2
Moxostoma carinatum (undescribed form) P: Pee Dee River	River Redhorse	SC		S1	G4T1
Moxostoma hamiltoni P: Dan drainage	Rustyside Sucker	E	3C	S1	G2
Notropis bifrenatus C: stream near lower Neuse River	Bridle Shiner	SC		SH	G5
Notropis chrysocephalus (see Luxilus)					
Notropis lutipinnis MP: Savannah, Little Tennessee, and Broad drainages [only the Savannah and Little Tennessee drainages are listed as SC]	Yellowfin Shiner	SC		S3	G4
Notropis mekistocholas P: Cape Fear drainage (endemic to North Carolina)	Cape Fear Shiner	E	E	S1	G1

LIST FORMAT

Species are grouped by major taxa. The vertebrates are arranged by class, beginning with the most advanced phylogenetically (mammals). Within a given taxa, species are listed alphabetically by scientific name. The following information is presented for each species on the list. "Status" is a word or phrase that indicates the degree of protection (if any), based on rarity, of a species; "rank" is a numerical scale of the rarity of a species, regardless of legal protection.

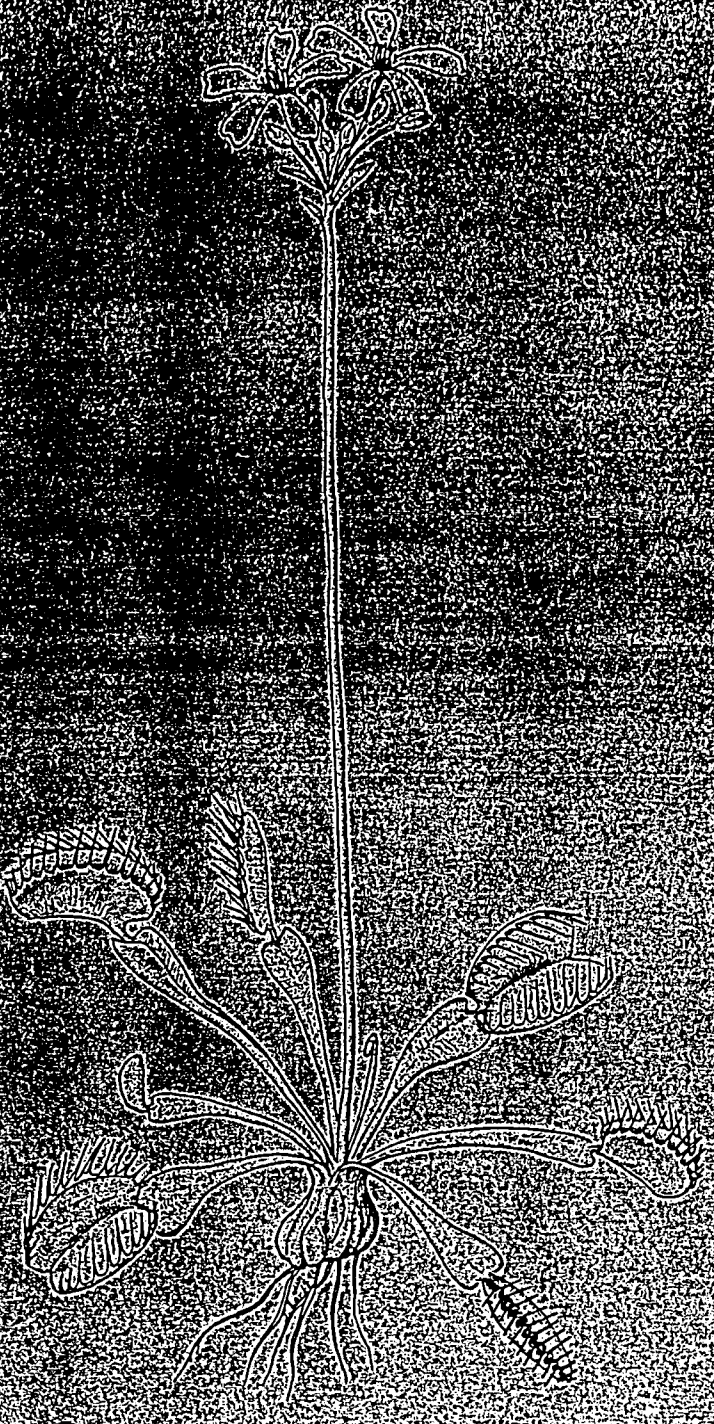
Scientific Name.

Common Name. For most groups, these names are not standardized.

North Carolina Status. Endangered, Threatened, and Special Concern species of Mammals, Birds, Reptiles, Amphibians, Freshwater Fishes, and Freshwater and Terrestrial Mollusks have legal protection status in North Carolina (Wildlife Resources Commission). In addition to the above categories, the Natural Heritage Program maintains computer and map files on Significantly Rare, Vulnerable, and Undetermined status species, as well as species considered Extirpated. Paper files only are maintained for some of the above species; these species are indicated by the phrase "not tracking."

STATUS CODE	STATUS	DEFINITION
E	Endangered	"Any native or once-native species of wild animal whose continued existence as a viable component of the State's fauna is determined by the Wildlife Resources Commission to be in jeopardy or any species of wild animal determined to be an 'endangered species' pursuant to the Endangered Species Act." (Article 25 of Chapter 113 of the General Statutes; 1987)...
T	Threatened	"Any native or once-native species of wild animal which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range, or one that is designated as a threatened species pursuant to the Endangered Species Act." (Article 25 of Chapter 113 of the General Statutes; 1987).
SC	Special Concern	"Any species of wild animal native or once-native to North Carolina which is determined by the Wildlife Resources Commission to require monitoring but which may be taken under regulations adopted under the provisions of this Article." (Article 25 of Chapter 113 of the General Statutes; 1987).

NATURAL HERITAGE PROGRAM LIST OF THE RARE PLANT SPECIES OF NORTH CAROLINA



Compiled By
Alan S. Weakley
Botanist

North Carolina Natural Heritage Program
Division of Parks and Recreation
N.C. Department of Environment, Health, and Natural Resources, 1993

North Carolina Status. Endangered, Threatened, and Special Concern species have legally protected status in North Carolina through the Plant Conservation Program. The Natural Heritage Program maintains computer and map files on Endangered, Threatened, Candidate, and Significantly Rare species; paper files are maintained on Watch List species.

STATUS CODE	STATUS	DEFINITION
E	Endangered	"Any species or higher taxon of plant whose continued existence as a viable component of the State's flora is determined to be in jeopardy" (GS 19B 106: 202.12). (Endangered species may not be removed from the wild except when a permit is obtained for research, propagation, or rescue which will enhance the survival of the species.)
T	Threatened	"Any resident species of plant which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range" (GS 19B 106:202.12). (Regulations are the same as for Endangered species.)
SC	Special Concern	"Any species of plant in North Carolina which requires monitoring but which may be collected and sold under regulations adopted under the provisions of [the Plant Protection and Conservation Act]" (GS 19B 106:202.12). (Special Concern species which are not also listed as Endangered or Threatened may be collected from the wild and sold under specific regulations. Propagated material only of Special Concern species which are also listed as Endangered or Threatened may be traded or sold under specific regulations.)
C	Candidate	Species which are very rare in North Carolina, generally with 1-20 populations in the state, generally substantially reduced in numbers by habitat destruction (and sometimes also by direct exploitation or disease). These species are also either rare throughout their ranges (fewer than 100 populations total) or disjunct in North Carolina from a main range in a different part of the country or world. Also included are species which may have 20-50 populations in North Carolina, but fewer than 50 populations rangewide. These are species which have the preponderance of their distribution in North Carolina and whose fate depends largely on their conservation here. Also included are many species known to have once occurred in North Carolina but with no known extant occurrences in the state (historical or extirpated species); if these species are relocated in the state, they are likely to be listed as Endangered or Threatened. If present land use trends continue, candidate species are likely to merit listing as Endangered or Threatened.

SR	Significantly Rare	Species which are very rare in North Carolina, generally with 1-20 populations in the state, generally substantially reduced in numbers by habitat destruction (and sometimes also by direct exploitation or disease). These species are generally more common somewhere else in their ranges, occurring in North Carolina peripherally to their main ranges, mostly in habitats which are unusual in North Carolina. Also included are some species with 20-100 populations in North Carolina, if they also have only 50-100 populations rangewide and are declining.
W	Watch List	Any other species believed to be rare and of conservation concern in the state but not warranting active monitoring at this time (see the Watch List section in the Supplement for a more complete discussion).
P_	Proposed	A species which has been formally proposed for listing as Endangered, Threatened, or Special Concern, but has not yet completed the legally mandated listing process.

United States Status is designated by the U.S. Fish and Wildlife Service. Federally listed Endangered and Threatened species are protected under the provisions of the Endangered Species Act of 1973, as amended. Unless otherwise noted, definitions are taken from the *Federal Register*, Vol. 55, No. 35, February 21, 1990 (50 CFR Part 17).

STATUS CODE	STATUS	DEFINITION
E	Endangered	A taxon "which is in danger of extinction throughout all or a significant portion of its range" (Endangered Species Act, Section 3).
T	Threatened	A taxon "which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range (Endangered Species Act, Section 3).
C1	Candidate 1	"Taxa for which the [Fish and Wildlife] Service has on file enough substantial information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened. Development and publication of proposed rules on these taxa are anticipated; however, because of the large number of category 1 taxa, it will take several years to clear the backlog."
C2	Candidate 2	"Taxa for which there is some evidence of vulnerability, but for which there are not enough data to support listing proposals at this time....Further biological research and field study usually will be necessary to ascertain the status of [these taxa]....It is likely that some category 2 candidates will not warrent listing, while others will be found to be in greater danger of extinction than some taxa in category 1."

Scientific Name Province: Habitat (Counties of Occurrence)	Common Name	Status NC	Status US	Rank NC	Rank Global
Carex woodii MPC: forested slopes, cove forests, and northern hardwoods (Alleghany, Ashe, Avery*, Clay, Henderson*, Jackson*, Jones, Macon*, Mitchell, Orange, Transylvania, Watauga)	Wood's Sedge	SR	-	S2	G4Q
Carya laciniosa C: brownwater river levees (Halifax*, Northampton?; non-native occurrences in other counties)	Big Shellbark Hickory	C	-	S1	G5
Carya myristiciformis (not in NC in RAB; = *C. myristicaef.*) C: wet marl forests (Pender*)	Nutmeg Hickory	T	-	S1	G5
Caulophyllum giganteum (not in RAB) M: cove forests (Alleghany)	Northern Blue Cohosh	SR	-	S1	G3G5Q
Chamaesyce cordifolia (= *Euphorbia cordifolia*) C: sandhills (Richmond, Wayne)	Heartleaf Sandmat	C	-	SH	G5
Chasmanthium nitidum (= *Uniola nitida*) C: blackwater bottomlands (Pender)	A Spanglegrass	C	-	S1	G3?
Cheilanthes alabamensis M: calcareous outcrops (Madison*)	Alabama Lip-fern	C	-	S1	G5
Chelone cuthbertii MPC: bogs (Alexander, Alleghany*, Ashe*, Avery*, Burke*, Forsyth, Henderson*, Jackson*, Macon, McDowell*, Stokes, Transylvania, Wilkes, Yancey*)	Cuthbert's Turtlehead	SR	-	S3?	G3
Chenopodium simplex (not in RAB) M: shaded soil at bases of cliffs (Ashe*, Jackson)	Giant-seed Goosefoot	SR	-	S1	G5
Chloris (see *Eustachys*)					
Chrysoma pauciflosculosa (= *Solidago pauciflosculosa*) C: sandhills (Columbus*, Robeson*)	Woody Goldenrod	E	-	S1	G4G5
Cirsium carolinianum (= *Carduus carolinianus*) P: forests and disturbed areas, mostly on basic soils (Burke*, Cabarrus, Granville*, Montgomery*, Rowan, Wake, Wilkes)	Carolina Thistle	C	-	S1	G5
Cladium mariscoides CSM: bogs, fens, brackish marshes, sandhill seepage bogs (Alleghany, Ashe*, Camden*, Carteret*, Craven, Cumberland*, Currituck*, Dare, Harnett*, Hoke*, Moore*, Onslow*, Watauga*, Yancey*)	Twig-Rush	SR	-	S2	G5
Clematis glaucophylla MP: habitat not known (Buncombe, Burke?, Stokes, Surry)	White-leaved Leatherflower	C	-	SH	G3?
Clematis occidentalis (= *C. verticillaris*) M: rocky forests (Ashe*, Buncombe?)	Mountain Clematis	SR	-	S1	G5
Coeloglossum viride var. *virescens* (= *Habenaria viridis*) MP: seeps in cove forests (Avery, Buncombe, Forsyth, Haywood, Jackson)	Long-bracted Frog Orchid	C	-	SH	G5T5
Coelorachis cylindrica (= *Manisuris cylindrica*) P: open woodlands and roadsides (Anson, Montgomery, Union)	Carolina Jointgrass	C	-	SH	G4G5
Collinsonia tuberosa PM: rich hardwood forests (Alamance, Chatham*, Guilford, Henderson, Richmond)	Piedmont Horsebalm	C	-	S1	G3G4?
Collinsonia verticillata PM: cove forests (Polk*)	Stoneroot	C	-	S1	G2G3
Conioselinum chinense M: high elevation seepage slopes (Avery*)	Hemlock-parsley	E	-	S1	G5
Coreopsis latifolia M: cove forests and other rich woods (Avery*, Buncombe*, Henderson*, McDowell*, Polk*, Rutherford*, Yancey*)	Broadleaf Coreopsis	C	3C	S3	G3
Cornus asperifolia C: wet marl forests (Brunswick*, New Hanover, Onslow*, Pender*)	Roughleaf Dogwood	C	-	S1	G3G4

Scientific Name / Province: Habitat (Counties of Occurrence)	Common Name	Status NC	Status US	Rank NC	Rank Global
Enemion biternatum (= *Isopyrum biternatum*)	Eastern Isopyrum	SR	-	S2	G5
PC: rich bottomlands, levees, and lower slopes (Cumberland*, Durham*, Franklin*, Granville*, Halifax*, Harnett*, Lee*, Northampton*, Orange, Person, Vance*)					
Epidendrum conopseum	Green Fly Orchid	SR	-	S2	G3G4
C: epiphytic on trees in blackwater river swamps (Brunswick*, Columbus*, Pender*)					
Epilobium angustifolium	Purple Willowherb	SR	-	S1	G5
M: meadows and disturbed sites at high elevations (Avery, Watauga, Yancey)					
Epilobium ciliatum	Purpleleaf Willowherb	SR	-	S2	G5
M: seeps and bogs (Alleghany*, Avery*, Buncombe*, Henderson*, Jackson, Macon, Mitchell, Watauga*, Yancey)					
Epilobium leptophyllum (see Watch List)					
Eriocaulon aquaticum (= *E. pellucidum, E. septangulare*)	Seven-angled Pipewort	SR	-	S2	G5
CS: blackwater creeks, natural lakes, tidal freshwater marshes (Bladen, Brunswick, Columbus, Craven, Cumberland*, Hoke*, Moore*, Perquimans, Tyrrell, Washington)					
Eriocaulon lineare	Narrow Pipewort	E	-	SX	G4
M: bogs (Henderson)					
Eriocaulon parkeri (not in RAB)	Estuary Pipewort	C	3C	S1	G3
C: natural lakes (Hyde*, Tyrrell)					
Eriocaulon texense (not in RAB)	Texas Hatpins	C	-	S1	G3G4
S: sphagnous bog (Cumberland*)					
Eriogonum tomentosum (not in NC in RAB)	Southern Wild-buckwheat	C	-	SH	G4G5
C: sandhills (Bladen)					
Erythrina herbacea	Coralbean	SR	-	S1	G5
C: maritime forests (Brunswick*, Carteret, New Hanover*)					
Eulophia (see *Pteroglossaspis*)					
Eupatorium godfreyanum (not in RAB)	Godfrey's Thoroughwort	SR	-	S1	G4
PM: woodlands, especially over mafic rocks (Caswell, Durham*, Granville, McDowell, Orange, Swain, Vance)					
Eupatorium incarnatum	Pink Thoroughwort	SR	-	S1	G5
PMC: rich woods and thin woodlands over diabase, calcareous rocks, other basic rocks, or rich alluvium (Alexander*, Durham, Madison*, Martin, Polk, Warren, Wilkes*)					
Eupatorium leptophyllum (= *E. capillifolium* var. *l.*)	Limesink Dog-fennel	C	-	S1	G4G5
C: limesink ponds and clay-based Carolina bays (Brunswick*, New Hanover*, Scotland*)					
Eupatorium resinosum	Resinous Boneset	C	C2/P3C	S3	G3
SC: seepage bogs, beaver ponds, pondshores, shrub swamps (Bladen*, Cumberland*, Harnett*, Hoke*, Moore*, Scotland*)					
Euphorbia commutata (not in NC in RAB)	Cliff Spurge	SR	-	S1	G5
MP: thin soil around mafic or calcareous outcrops (Buncombe*, Caswell, Haywood*)					
Euphorbia mercurialina (not in RAB)	Cumberland Spurge	C	-	S1	G4
P: rich slopes over gabbro (Richmond*)					
Euphorbia purpurea	Glade Spurge	C	C2	S2	G3
M: forests, especially over mafic rock (Ashe, Buncombe*, Clay*, Graham*, Haywood*, Jackson*, Macon, Madison*, Mitchell*, Swain*, Watauga, Yancey*)					
Euphorbia (also see *Chamaesyce*)					
Eustachys glauca (= *Chloris glauca*)	Saltmarsh Fingergrass	SR	-	SH	G4
C: salt marshes (New Hanover)					
Filipendula rubra	Queen-of-the-Prairie	E	-	S1	G4G5
M: bogs, wet meadows (Buncombe, Haywood*, Macon, Watauga, Yancey*)					

Scientific Name Province: Habitat (Counties of Occurrence)	Common Name	Status NC	Status US	Rank NC	Rank Global
Plantago cordata P: beds of small, slate-bottomed, perennial streams (Davidson*)	Heart-leaf Plantain	E	3C	S1	G3
Plantago sparsiflora C: wet savannas (Bladen, Brunswick*, Columbus*, Pender*)	Pineland Plantain	E	C2	S1	G2
Platanthera flava var. *herbiola* (not in RAB) M: bogs and moist forests (Buncombe, Clay, Forsyth?, Graham, Haywood*, Jackson, Macon, Yancey)	Northern Green Orchid	SR	3C	S2?	G4T4
Platanthera grandiflora (= *Habenaria psycodes* var. *g.*) M: bogs, seeps, grassy balds, high elevation moist forests and banks (Avery*, Buncombe, Clay, Haywood*, McDowell, Watauga, Yancey)	Large Purple-fringed Orchid	SR	-	S2	G5
Platanthera integra (= *Habenaria integra*) CMP: savannas (Brunswick*, Carteret*, Cherokee?, Columbus*, Craven, Forsyth?, Henderson?, Onslow, Pamlico, Pender, Robeson, Rowan?)	Yellow Fringeless Orchid	T	3C	S1	G5
Platanthera integrilabia (= *Habenaria bleph.* var. *i.*) M: bogs (Cherokee, Henderson)	White Fringeless Orchid	E	C2	SX	G2
Platanthera nivea (= *Habenaria nivea*) C: wet savannas (Beaufort, Bladen, Brunswick*, Columbus, Craven*, Dare, Hoke, New Hanover*, Pender*, Robeson)	Snowy Orchid	T	-	S1	G5
Platanthera peramoena (= *Habenaria peramoena*) MP: bogs, forests (Buncombe, Burke, Caldwell, Clay, Durham*, Forsyth, Guilford*, Haywood, Henderson, Jackson*, Macon, Mitchell, Orange*, Swain, Transylvania*, Warren, Watauga, Yancey)	Purple Fringeless Orchid	C	3C	S1	G5
Poa paludigena (not in RAB) M: bogs (Avery*)	Bog Bluegrass	E	C2	S1	G2
Poa palustris M: spruce-fir forests, grassy balds (Avery, Haywood, Henderson, Macon, Mitchell, Polk, Swain, Watauga, Yancey)	Swamp Bluegrass	SR	-	S1	G5
Poa saltuensis (= *Poa languida*) M: olivine barrens (Clay*)	A Bluegrass	C	-	S1	G5?
Polygala grandiflora SC: sandhills (Richmond*, Robeson, Scotland*)	Showy Milkwort	SR	-	S1	G5?
Polygala hookeri C: savannas (Bladen, Brunswick*, Carteret*, Columbus, Craven, New Hanover, Onslow, Pender*, Sampson)	Hooker's Milkwort	C	-	S2	G3
Polygonella articulata C: sandhills (Gates)	Coast Jointweed	C	-	SH	G5
Polygonum glaucum C: ocean and sound beaches (Beaufort, Brunswick*, Carteret*, Dare, Hyde, New Hanover, Onslow)	Seabeach Buckwheat	C	-	S1	G3
Polygonum hirsutum CS: limesink ponds, clay-based Carolina bays, drawdown zones of blackwater riverbanks (Brunswick*, Carteret, Onslow, Richmond*, Scotland*)	Hairy Smartweed	SR	-	S1	G4G5
Ponthieva racemosa C: blackwater forests and swamps, especially over marl (Beaufort, Brunswick, Craven, Jones*, Onslow*, Pender*)	Shadow-witch	SR	-	S2	G4G5
Porteranthus stipulatus (= *Gillenia stipulata*) P: forests and open woods, mainly over mafic rocks (Cabarrus, Chatham, Davidson, Durham, Granville*, Lee, Montgomery, Moore, Orange, Person*, Union, Wake*)	Indian Physic	SR	-	S2	G5
Portulaca smallii P: granite flatrocks and diabase glades (Cabarrus*, Forsyth, Franklin*, Granville*, Rowan*, Wake*)	Small's Portulaca	T	3C	S2	G3
Potamogeton confervoides SC: beaverponds and old millponds on blackwater creeks (Cumberland*, Gates, Moore, Richmond, Scotland)	Conferva Pondweed	C	C2	S1	G5

Scientific Name Province: Habitat (Counties of Occurrence)	Common Name	Status NC	Status US	Rank NC	Rank Global
Prenanthes roanensis M: grassy balds, high elevation forests and outcrops (Alleghany*, Ashe*, Avery*, Buncombe*, Graham*, Haywood*, Jackson*, McDowell, Mitchell*, Surry, Swain, Transylvania*, Yancey*)	Roan Rattlesnakeroot	SR	3C	S3	G3
Prunus pumila var. *susquehanae* MP: rocky forests (Durham, Henderson)	Susquehanna Cherry	C	-	SH	G5T4
Psilocarya (see *Rhynchospora*)					
Psilotum nudum (not in NC in RAB) C: acid swamp (Chowan*)	Whiskfern	C	-	S1	G5
Psoralea (see *Orbexilum, Pediomelum*)					
Pteroglossaspis ecristata (= *Eulophia ecristata*) C: pinelands (Bladen, Cumberland, Hoke*, New Hanover)	Spiked Medusa	E	C2	S1	G3G4
Ptilimnium costatum C: tidal swamps or marshes (New Hanover*)	Ribbed Bishopweed	C	-	S1	G3G4
Ptilimnium nodosum (including *Ptilimnium fluviatile*) P: rocky riverbeds (Chatham*, Granville*, Lee)	Harperella	E	E	S1	G2
Ptilimnium sp. 1 (not in RAB) C: tidal freshwater marshes (Brunswick*, New Hanover*, Pender)	Carolina Bishopweed	C	-	S1	G2
Pycnanthemum torreyi (not in RAB) PM: dry upland forests and woodlands, over mafic rocks (Alexander, Ashe, Granville, Orange, Wilkes)	Torrey's Mountain-mint	C	-	S1	G2
Pyrola elliptica (not in RAB) M: moist forests (Ashe)	A Shinleaf	C	-	SH	G5
Pyxidanthera barbulata var. *brevifolia* S: sandhills (Cumberland*, Harnett*, Hoke*, Moore*)	Sandhills Pyxie-moss	E	3B/PC2	S2	G4T2
Quercus austrina CP: bluff and bottomland forests (Bladen, Harnett, Johnston, Montgomery*, Sampson, Union, Wayne)	Bluff Oak	SR	-	S1	G5
Quercus ilicifolia P: dry summits and rocky woods on Piedmont monadnocks (Burke*, Gaston*, Stokes*, Surry*)	Bear Oak	SR	-	S1	G5
Quercus prinoides PM: dry, rocky slopes (Buncombe, Caldwell, Cleveland, Gaston, Guilford, Iredell, Jackson, Person, Polk, Rutherford, Stanly)	Dwarf Chinquapin Oak	C	-	SH	G5
Ranunculus ambigens CP: open wet areas (Bertie, Orange, Perquimans)	Water-plantain Spearwort	C	-	SH	G4G5
Ranunculus flabellaris C: pools in blackwater swamps (Edgecombe, Gates*)	Yellow Water-crowfoot	C	-	S1	G5
Ranunculus hederaceus C: marshes (Currituck)	Ivy Buttercup	C	-	SH	G5
Ranunculus micranthus P: rich woods (Durham, Forsyth)	Rock Buttercup	SR	-	SH	G5?
Rhexia aristosa C: clay-based Carolina bays and limesink ponds (Bladen, Brunswick, Cumberland, Hoke*, Onslow*, Robeson*, Scotland*)	Awned Meadow-beauty	T	C2	S3	G3
Rhexia cubensis C: limesink ponds (Brunswick*, Carteret*, New Hanover*, Onslow*)	West Indies Meadow-beauty	SR	-	S1	G5
Rhododendron cumberlandense (not in RAB) M: grassy or shrub balds (Graham, Macon*, Transylvania)	Cumberland Azalea	SR	3C	S1	G2Q
Rhododendron prinophyllum (= *Rhododendron roseum*) M: high elevation forests (Ashe*)	Early Azalea, Election Pink	SR	-	S1	G5
Rhododendron vaseyi M: wet swampy places, high elevation rocky areas, openings, or forests (Avery*, Caldwell*, Haywood*, Jackson*, Macon*, McDowell, Mitchell, Transylvania*, Watauga*, Yancey)	Pink-shell Azalea	SR	3C	S3	G3

Ref. 14

January 24, 1994

TO: File

FROM: Irene Williams, Environmental Chemist Irene Williams
N.C. Superfund Section

RE: Southern Wood Piedmont Gulf Site (NCD 053 488 557)
Wetlands identification

Wetlands occur at the probable point of entry to surface water (PPE) and continue for approximately 0.3 mile downstream. More wetlands occur intermittently for the remainder of the 15 mile surface water pathway. Total wetland frontage within the 15 mile surface water target distance limit is approximately 7 miles.

These figures were determined by measuring the wetland frontages on the following quadrangle maps prepared by the National Wetlands Inventory, U.S. Department of the Interior, Fish and Wildlife Service.

1. Goldston, NC 2/16/93
2. Colon, NC 2/17/93
3. Merry Oaks, NC 2/12/93
4. Moncure, NC 2/16/93

Acreage of wetlands within a 0.5 mile radius of the site were estimated to be approximately 0.4 acre. (Note that when only a linear marking occurred on the wetland map, a minimum of 5 feet of wetland on each side of the stream was assumed in estimating the acreage of a wetland. When an area was shown, a digital planimeter was used).

Small areas of wetlands are scattered throughout a 4-mile radius of the site, including approximately 30 acres in the 0.5-mile to 1-mile radius, 170 acres in the 1-mile to 2-mile radius, and 75 acres in the 3-mile to 4-mile radius. The total area of wetlands in a 4-mile radius of the site is approximately 275 acres.

VETLANDS INVENTORY
S DEPARTMENT OF THE INTERIOR

NATIONAL WETLANDS INVENTORY
UNITED STATES DEPARTMENT OF THE INTERIOR

Southern Wood Piedmont Co.
NCD 053 488 557

January 24, 1994

TO: File

FROM: Irene Williams, Environmental Chemist
N.C. Superfund Section

RE: Southern Wood Piedmont Gulf Site (NCD 053 488 557)
Fishing conditions in surface water pathway

On the above date I spoke with Mr. Raebon King, owner of the J.R. Moore and Sons Store in Gulf, NC, 919/898-9901. Mr. King had volunteered to make some contacts on my behalf regarding whether local people had knowledge of any fishing at Cedar Creek from the 1980's forward. He reported that all he had been able to learn from his enquiries was that eels were all that had been caught in Cedar Creek and that occurred a "few years back."

Note that I had spoken to others about the fishing conditions in the entire surface water pathway earlier. See attached memoranda dated December 22, 1993, and January 19, 1994.

Attachments

January 19, 1994

TO: File

FROM: Irene Williams, Environmental Chemist Irene Williams
N.C. Superfund Section

RE: Southern Wood Piedmont Gulf Site (NCD 053 488 557)
Fishing conditions in surface water pathway

On the above date I spoke with Julian Alman (Siler City, 919/663-3048) and he referred to Bryan Scruggs (Sanford, 919/776-1028), Wildlife Resources enforcement personnel, concerning fishing conditions in Cedar Creek. I had left messages for each of them and Mr. Alman called back while in Bryan Scruggs' presence. Mr. Alman indicated that it was quite likely that Cedar Creek is fished by local residents of the area. He suggested that I contact the J.R. Moore and Sons Store in Gulf for more information.

Regarding other industries in the area, he mentioned Boren Clay Products, Sanford Grading, Carolina Power and Light, and the poultry plant (at Cumnock upstream of the probable point of entry of surface runoff to surface water).

Note that I had spoken to others about the fishing conditions in the entire surface water pathway at and earlier date. See attached memorandum dated December 22, 1993.

December 22, 1993

TO: File

FROM: Irene Williams, Environmental Chemist Irene Williams
N.C. Superfund Section

RE: Southern Wood Piedmont Gulf Site (NCD 053 488 557)
Fishing conditions in surface water pathway

On 12/20/93 I spoke with Franklin McBride, Wildlife Resources Commission, Boating and Inland Fisheries, 733-3633, concerning fishing conditions in Cedar Creek and the Deep River. He indicated that the Deep River is fished but provided no harvest data. He could find no record of Cedar Creek as a fishery, but referred me to Ms. Sherry Bryant, District Biologist (910/449-7625).

Ms. Bryant and I talked on 12/21/93. She suggested I contact an enforcement person and gave me the following names and numbers:

Julian Alman, Siler City, 919/663-3048
Bryan Scruggs, Sanford, 919/776-1028.

Since I was unable to reach either of these persons, I contacted Frederick Harris of Wildlife Resources on 12/22/93, 733-3633. Mr. Harris and I discussed the location, flow rate, length and classification ("C, aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture", Classifications and Water Quality Standards Assigned to the Waters of the Cape Fear River Basin, N.C. Department of Environment, Health, and Natural Resources, February 1, 1993) of Cedar Creek.

According to Mr. Harris, any stream in the Piedmont that is capable of supporting fishing and is accessible, especially from bridges, such as those over State Roads 2142 and 2145 in the case of Cedar Creek, will be fished. From this discussion, I decided it is valid to consider Cedar Creek a fishery, with light fishing pressure, for purposes of evaluating the 15-mile surface water pathway for the site.

We also discussed the fact that the Deep River is heavily fished. No harvest data is available for either stream.

Ref. 16

December 20, 1993

TO: File

FROM: Irene Williams, Environmental Chemist
N.C. Superfund Section

RE: Southern Wood Piedmont Gulf Site (NCD 053 488 557)
Estimation of ground water users

The number of persons using ground water within a 4-mile radius of the site was determined by counting the houses on the topographic map (Fig. 1) that were outside the service areas of either the Goldston-Gulf (Ref. 11) or Lee County (Ref. 12) municipal water systems. The number of houses were then multiplied by the appropriate number of persons per household factor from 1990 Census Data (Ref. 18) for Chatham County (2.51) and Lee County (2.59) as shown in the table below.

From the N.C. Public Water Supply Database information (Ref.17), it was determined that there were no community wells located within a 4-mile radius of the site.

(MILE) RADIUS	LEE HOUSES	LEE PERSONS	CHATHAM HOUSES	CHATHAM PERSONS	TOTAL PERSONS
0-0.25	0	0	0	0	0
0.25-0.5	0	0	3	8	8
0.5-1.0	0	0	20	50	50
1.0-2.0	5	13	21	53	66
2.0-3.0	32	83	16	40	123
3.0-4.0	89	231	149	374	605
				TOTAL:	844

Ref. 17

PAGE 1

PMMGRID STATE N.C. PUBLIC WATER SUPPLY SYSTEM 10/12/93
ACTIVE SYSTEMS
GRID LATITUDE: 353000 / 353730, LONGITUDE: 0791200 / 0792130

PWS ID	SYSTEM NAME	TYPE	POPULATION	RES.PERSON WORK PHONE	SOURCE NAME	SOURCE TYPE	SOURCE AVAIL.	LATITUDE	LONGITUDE
319025	GOLDSTON-GULF SANITARY DIST	C	1334	9198982239	DEEP RIVER	S	P	353331	791722
319040	ST LUKES WATER CORPORATION	C	200	9198984663	GOLDSTON-GULF SAN DIST	P	P	353331	791722
319407	BREWERS RESTAURANT	N	950	9198375511	WELL	G	P	353400	792000
353025	CUMNOCK COMMUNITY WATER SYSTEM	C	158	9197761424	GOLDSTON-GULF SAN DIST	P	P	353331	791722
353130	LEE COUNTY WTR TRTMT PLT	C	2418	9197751839	DEEP RIVER	S	P	353319	791436

Ref. 17

U.S. Department of Commerce
Economics and Statistics Administration
BUREAU OF THE CENSUS

1990 CPH-1-35

CENSUS '90

1990 Census of Population and Housing

Summary Population and Housing Characteristics

North Carolina

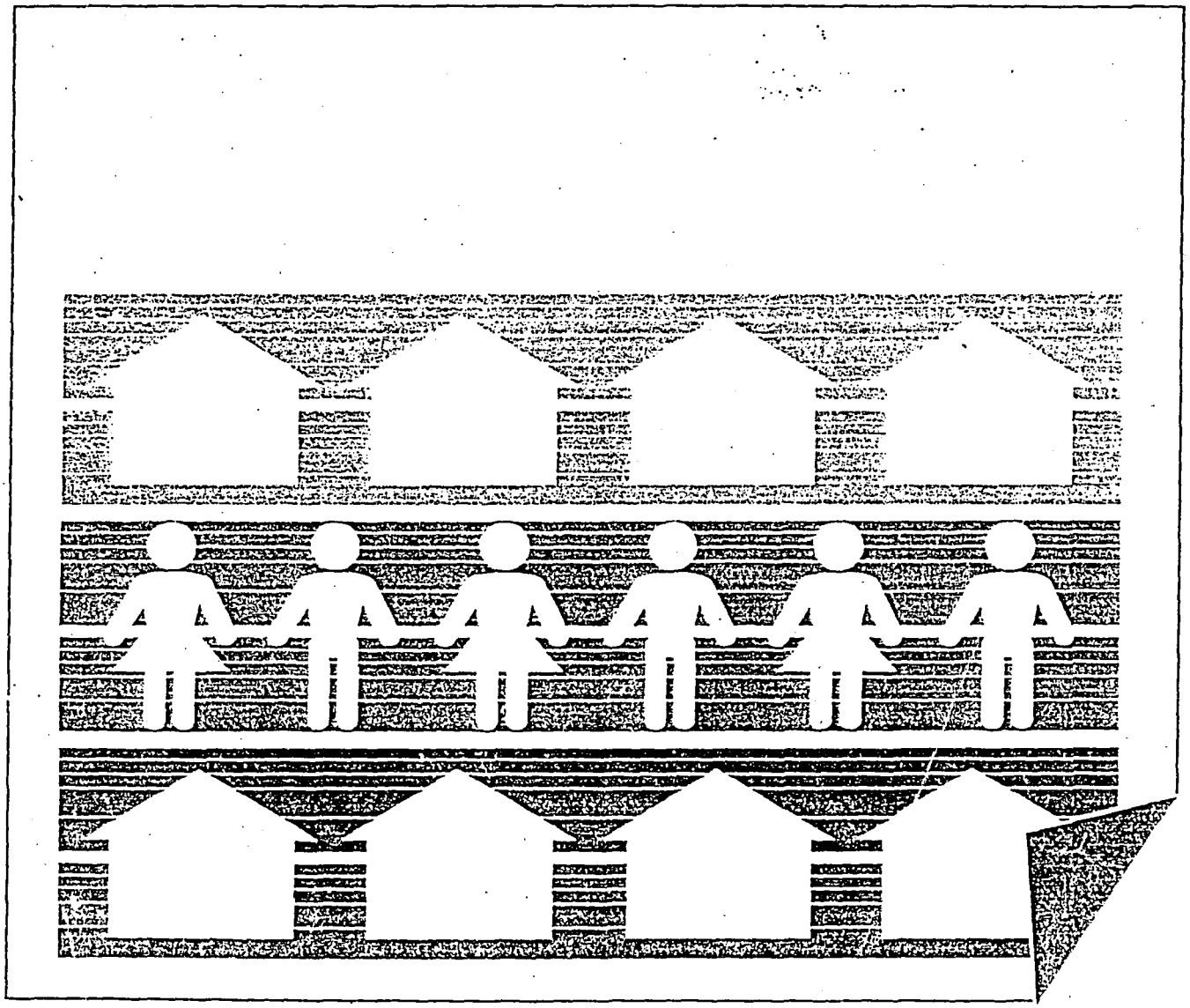


Table 5. Household, Family, and Group Quarters Characteristics: 1990—Con.

[For definitions of terms and meanings of symbols, see text]

State County County Subdivision Place	Persons in households	All households	Family households			Nonfamily households				Persons per—		Persons in group quarters		
			Total	Married-couple family	Female householder, no husband present	Total	Householder living alone			Household	Family	Total	Institutionalized persons	Other persons in group quarters
							Total	65 years and over						
								Total	Female					
Catawba County—Con.														
Newton township	25 301	9 949	7 402	5 916	1 161	2 547	2 271	1 020	830	2.54	2.99	518	499	19
Claremont city (pt.)	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Conover city (pt.)	4 281	1 749	1 266	1 035	181	483	438	177	147	2.45	2.92	50	47	3
Hickory city (pt.)	49	17	15	14	1	2	–	–	–	2.88	2.87	–	–	–
Maiden town (pt.)	2 017	786	590	447	114	196	181	100	77	2.57	3.03	–	–	–
Newton city	9 065	3 783	2 580	1 873	575	1 203	1 076	518	433	2.40	2.94	239	223	16
Chatham County	38 315	15 293	11 227	9 115	1 605	4 066	3 445	1 412	1 141	2.51	2.95	444	377	67
Albright township	2 124	794	637	558	52	157	140	56	50	2.68	3.02	25	25	–
Baldwin township	4 498	1 946	1 259	1 058	155	687	487	92	65	2.31	2.82	20	20	–
Bear Creek township	3 221	1 230	971	826	95	259	239	117	92	2.62	3.00	–	–	–
Cape Fear township	1 048	396	302	241	43	94	75	39	35	2.65	3.03	–	–	–
Center township	4 716	1 885	1 373	1 021	293	512	450	200	163	2.50	2.96	138	138	–
Pittsboro town	1 352	594	394	284	93	200	180	95	82	2.28	2.82	84	84	–
Gulf township	3 043	1 154	904	735	122	250	232	130	103	2.64	3.04	40	–	40
Goldston town	299	125	92	76	14	33	31	20	18	2.39	2.87	–	–	–
Hadley township	1 046	407	304	270	21	103	89	39	29	2.57	2.99	13	13	–
Haw River township	1 016	382	281	219	42	101	92	40	29	2.66	3.15	2	–	2
Hickory Mountain township	1 474	554	431	347	80	123	115	47	35	2.66	3.07	–	–	–
Matthews township	9 225	3 564	2 669	2 023	504	895	800	360	303	2.59	3.01	181	181	–
Siler City town	4 627	1 896	1 329	943	319	567	506	230	191	2.44	2.92	181	181	–
New Hope township	1 707	695	516	452	44	179	147	59	47	2.46	2.88	25	–	25
Oakland township	948	352	278	233	36	74	69	24	18	2.69	3.09	–	–	–
Williams township	4 249	1 934	1 302	1 132	138	632	510	209	172	2.20	2.65	–	–	–
Fearrington CDP	1 101	544	420	404	13	124	103	45	37	2.02	2.27	–	–	–
Cherokee County	19 899	7 966	6 069	5 065	765	1 897	1 764	975	759	2.50	2.91	271	196	75
Beaverdam township	635	251	192	155	25	59	57	32	21	2.53	2.96	–	–	–
Hot House township	908	363	294	250	31	69	69	35	27	2.50	2.83	–	–	–
Murphy township	7 997	3 218	2 437	2 009	343	781	728	375	304	2.49	2.91	218	143	75
Murphy town	1 547	711	441	304	118	270	259	145	127	2.18	2.84	28	24	4
Notla township	2 649	1 051	828	708	87	223	195	112	81	2.52	2.85	–	–	–
Shoal Creek township	1 571	599	475	416	44	124	122	70	50	2.62	3.03	–	–	–
Valley Town township	6 139	2 484	1 843	1 527	235	641	593	351	276	2.47	2.91	53	53	–
Andrews town	2 520	1 065	738	566	139	327	302	191	153	2.37	2.88	31	31	–
Chowan County	13 233	5 113	3 775	2 842	767	1 338	1 238	641	499	2.59	3.07	273	273	–
Township 1, Edenton	7 174	2 779	1 984	1 357	540	795	734	396	309	2.58	3.13	273	273	–
Edenton town (pt.)	4 928	2 006	1 350	846	450	656	608	345	268	2.46	3.07	273	273	–
Township 2, Middle	3 017	1 176	903	748	117	273	259	136	107	2.57	2.97	–	–	–
Township 3, Upper	1 336	502	394	320	51	108	102	57	47	2.66	3.04	–	–	–
Township 4, Yeopim	1 706	656	494	417	59	162	143	52	36	2.60	3.04	–	–	–
Edenton town (pt.)	67	25	22	17	3	3	2	–	–	2.68	2.73	–	–	–
Clay County	7 150	2 928	2 177	1 894	203	751	699	418	314	2.44	2.90	5	4	1
Brasstown township	1 296	493	382	332	40	111	103	63	46	2.63	3.05	–	–	–
Hayesville township	2 727	1 164	821	694	95	343	319	183	146	2.34	2.86	5	4	1
Hayesville town	275	158	74	58	11	84	80	51	44	1.74	2.49	4	4	–
Hiwassee township	954	418	313	275	27	105	97	65	50	2.28	2.66	–	–	–
Shooting Creek township	1 078	444	334	300	20	110	105	60	44	2.43	2.87	–	–	–
Sweetwater township	646	229	184	159	15	45	42	23	17	2.82	3.22	–	–	–
Tusquittee township	449	180	143	134	6	37	33	24	11	2.49	2.85	–	–	–
Cleveland County	83 012	32 037	24 282	19 011	4 168	7 755	7 011	3 202	2 624	2.59	3.02	1 702	915	787
Township 1, River	680	255	206	173	20	49	48	24	18	2.67	2.99	11	11	–
Township 2, Boiling Springs	5 264	2 012	1 572	1 337	180	440	384	178	155	2.62	2.99	796	70	726
Boiling Springs town	1 675	668	493	380	89	175	148	59	55	2.51	2.94	770	44	726
Shelby city (pt.)	7	2	1	1	–	1	1	–	–	3.50	6.00	–	–	–
Township 3, Rippys	7 686	2 837	2 235	1 755	365	602	528	189	144	2.71	3.09	24	–	24
Earl town	230	91	68	51	12	23	21	14	13	2.53	3.00	–	–	–
Patterson Springs town	690	266	204	165	29	62	51	24	21	2.59	2.96	–	–	–
Shelby city (pt.)	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Township 4, Kings Mountain	17 475	6 727	5 094	3 994	857	1 633	1 468	721	573	2.60	3.03	136	136	–
Grover town	516	215	157	120	28	58	53	33	29	2.40	2.84	–	–	–
Kings Mountain city (pt.)	7 883	3 234	2 310	1 679	518	924	852	475	381	2.44	2.94	124	124	–
Township 5, Warlick	6 546	2 342	1 907	1 596	228	435	381	110	85	2.80	3.11	22	22	–
Waco town	320	118	96	83	8	22	21	9	6	2.71	3.04	–	–	–
Township 6, Shelby	29 132	11 730	8 457	6 171	1 920	3 273	3 001	1 374	1 149	2.48	2.98	570	539	31
Light Oak CDP	1 213	384	315	190	102	69	65	31	25	3.16	3.58	126	126	–
Shelby city (pt.)	14 259	6 079	3 994	2 487	1 315	2 085	1 936	949	811	2.35	2.96	403	372	31
Township 7, Sandy Run	5 013	1 854	1 447	1 187	194	407	356	167	141	2.70	3.12	–	–	–
Kingstown town (pt.)	868	244	212	140	57	32	27	14	8	3.56	3.89	–	–	–
Lattimore town	183	72	53	40	9	19	17	12	11	2.54	2.96	–	–	–
Mooresboro city	294	126	81	58	21	45	40	26	19	2.33	3.01	–	–	–
Township 8, Polkville	2 838	1 098	840	717	90	258	246	139	118	2.58	3.02	7	6	1
Kingstown town (pt.)	88	26	23	15	7	3	2	–	–	3.38	3.61	–	–	–
Polkville city	1 514	596	449	392	41	147	140	76	66	2.54	3.00	–	–	–
Township 9, Double Shoals	4 825	1 840	1 429	1 172	196	411	375	196	157	2.62	3.02	131	131	–
Belwood town (pt.)	307	121	94	83	7	27	24	13	11	2.54	2.94	–	–	–
Fallston town	498	203	149	128	16	54	50	27	22	2.45	2.95	–	–	–
Lawndale town	573	239	172	140	26	67	63	45	41	2.40	2.87	–	–	–
Township 10, Knob Creek	1 908	731	590	469	78	141	126	59	44	2.61	2.93	5	–	5
Belwood town (pt.)	324	138	99	81	12	39	35	16	10	2.35	2.80	–	–	–
Township 11, Casar	1 645	611	505	440	40	106	98	45	40	2.69	3.00	–	–	–
Casar town	328	127	101	83	11	26	25	10	9	2.58	2.93	–	–	–
Columbus County	48 953	18 459	13 754	10 381	2 757	4 705	4 351	2 152	1 695	2.65	3.15	634	624	10
Bogue township	2 974	1 117	848	685	135	269	245	124	87	2.66	3.13	1	–	1
Lake Waccamaw town (pt.)	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Bolton township	1 599	562	447	328	89	115	107	51	36	2.85	3.28	–	–	–
Bolton town	531	206	148	96	43	58	56	34	22	2.58	3.16	–	–	–
Bug Hill township	2 357	839	656	532	96	183	173	85	65	2.81	3.24	–	–	–
Cerro Gordo township	1 918	696	554	452	86	142	140	69	59	2.76	3.17	–	–	–
Cerro Gordo town	227	88	68	56	11	20	20	7	6	2.58	3.04	–	–	–
Chadbourn township	5 693	2 171	1 576	1 123	371	595	554	265	205	2.62	3.16	–	–	–
Chadbourn town	2 005	796	541	351	168	255	241	123	98	2.52	3.16	–	–	–
Fair Bluff township	1 925	746	508	362	128	238	221	128	94	2.58	3.25	6	6	–
Fair Bluff town	1 062	429	277	180	87	152	143	86	62	2.48	3.20	6	6	–
Lees township	2 784	1 062	813	682	91	249	222	109	86	2.62	3.05	–	–	–
Ransom township	3 739	1 307	1 047	832	161	260	241	121	102	2.86	3.26	–	–	–
South Williams township	4 909	1 854	1 356	982	309	498	469	251	200	2.65	3.19	63	54	9
Tabor City town	2 267	938	635	449	156	303	286	169	132	2.42	3.03	63	54	9

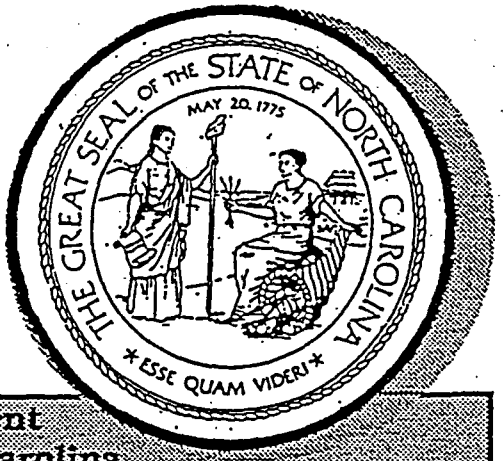
Table 5. Household, Family, and Group Quarters Characteristics: 1990—Con.

[For definitions of terms and meanings of symbols, see text]

State County County Subdivision Place	Persons in households	All households	Family households			Nonfamily households				Persons per—		Persons in group quarters	
			Total	Married-couple family	Female householder, no husband present	Total	Householder living alone			Household	Family	Total	Of institutionalized persons
							Total	65 years and over					
								Total	Female				
Jones County—Con.													
Township 4, Cypress Creek	895	348	262	211	35	86	80	43	33	2.57	3.03	–	–
Township 5, Tuckahoe	861	321	245	194	43	76	63	28	18	2.68	3.13	–	–
Township 6, Chinquapin	664	259	191	157	23	68	61	37	30	2.56	3.04	2	2
Township 7, Beaver Creek	739	267	207	165	34	60	48	22	16	2.77	3.16	–	–
Lee County	40 651	15 689	11 739	9 087	2 135	3 950	3 482	1 369	1 107	2.59	3.03	723	672
Township 1, Greenwood	5 097	1 895	1 502	1 240	186	393	332	112	92	2.69	3.03	18	–
Township 2, Jonesboro	9 944	3 926	2 924	2 244	559	1 002	871	312	247	2.53	2.94	28	23
Sanford city (pt.)	2 638	1 077	733	507	191	344	301	126	107	2.45	3.00	9	4
Township 3, Cape Fear	2 913	1 100	853	710	108	247	222	112	90	2.65	3.04	9	–
Broadway town (pt.)	973	362	286	247	32	76	71	37	28	2.69	3.08	–	–
Township 4, Deep River	1 756	640	500	399	75	140	125	45	33	2.74	3.14	127	127
Township 5, East Sanford	5 786	2 175	1 592	940	559	583	523	220	174	2.66	3.15	245	244
Sanford city (pt.)	4 080	1 527	1 073	554	452	454	412	186	149	2.67	3.24	245	244
Township 6, West Sanford	11 665	4 666	3 378	2 732	521	1 288	1 143	457	377	2.50	2.98	288	278
Sanford city (pt.)	7 371	3 131	2 104	1 613	411	1 027	922	370	306	2.35	2.92	132	122
Township 7, Pocket	3 490	1 287	990	822	127	297	266	111	94	2.71	3.15	8	–
Lenoir County	55 652	21 938	15 611	11 131	3 798	6 327	5 706	2 580	2 073	2.54	3.06	1 622	1 559
Contentnea Neck township	2 841	1 049	812	619	160	237	213	100	81	2.71	3.12	16	16
Grifton town (pt.)	253	97	67	35	29	30	28	17	14	2.61	3.28	–	–
Falling Creek township	5 209	1 957	1 520	1 306	168	437	380	111	86	2.66	3.06	56	56
Kinston city (pt.)	738	286	226	196	26	60	57	20	18	2.58	2.97	–	–
Institute township	1 350	493	371	312	43	122	101	44	37	2.74	3.19	–	–
Kinston township	24 371	10 082	6 630	4 000	2 330	3 452	3 182	1 538	1 264	2.42	3.05	1 248	1 199
Kinston city (pt.)	22 926	9 544	6 220	3 712	2 230	3 324	3 072	1 503	1 235	2.40	3.05	1 140	1 091
Moseley Hall township	4 803	1 843	1 351	930	337	492	451	226	178	2.61	3.11	125	125
La Grange town	2 805	1 123	796	495	259	327	308	159	129	2.50	3.06	–	–
Neuse township	5 552	2 162	1 598	1 218	319	564	486	170	131	2.57	3.01	–	–
Kinston city (pt.)	54	22	13	8	5	9	7	2	1	2.45	3.15	–	–
Pink Hill township	2 182	819	605	504	73	214	188	93	70	2.66	3.11	19	5
Pink Hill town	547	214	147	109	33	67	58	24	19	2.56	3.13	–	–
Sand Hill township	941	367	273	229	26	94	85	39	29	2.56	3.03	–	–
Southwest township	1 527	580	442	346	73	138	118	35	21	2.63	3.03	7	7
Kinston city (pt.)	18	7	7	4	3	–	–	–	–	2.57	2.57	–	–
Trent township	2 029	816	608	524	64	208	186	100	83	2.49	2.93	–	–
Vance township	3 376	1 227	959	754	166	268	226	84	63	2.75	3.14	151	151
Kinston city (pt.)	419	128	110	78	29	18	17	5	4	3.27	3.58	–	–
Woodington township	1 471	543	442	389	39	101	90	40	30	2.71	3.04	–	–
Lincoln County	49 802	18 764	14 661	12 207	1 827	4 103	3 580	1 467	1 173	2.65	3.03	517	517
Catawba Springs township	10 059	3 742	2 984	2 592	272	758	617	187	140	2.69	3.01	35	35
Lowesville CDP	1 092	385	312	271	33	73	61	26	21	2.84	3.20	–	–
Westport CDP	1 280	500	430	405	16	70	59	18	15	2.56	2.77	–	–
Howards Creek township	5 429	2 020	1 602	1 334	176	418	364	141	113	2.69	3.03	–	–
Ironton township	13 979	5 111	4 151	3 528	463	960	843	325	260	2.74	3.07	28	28
Boger City CDP (pt.)	1 278	530	385	317	56	145	135	52	39	2.41	2.90	–	–
Maiden town (pt.)	–	–	–	–	–	–	–	–	–	–	–	–	–
Lincolnton township	16 166	6 346	4 674	3 673	802	1 672	1 487	697	571	2.55	3.01	434	434
Boger City CDP (pt.)	95	39	29	24	4	10	8	4	3	2.44	2.72	–	–
Lincolnton city	6 582	2 713	1 861	1 344	434	852	778	415	353	2.43	2.99	265	265
Maiden town (pt.)	–	–	–	–	–	–	–	–	–	–	–	–	–
North Brook township	4 169	1 545	1 250	1 080	114	295	269	117	89	2.70	3.04	20	20
McDowell County	35 064	13 680	10 366	8 576	1 363	3 314	2 996	1 399	1 135	2.56	2.99	617	416
Brackett township	290	111	91	75	11	20	18	8	6	2.61	2.92	–	–
Crooked Creek township	2 301	840	696	594	72	144	122	56	42	2.74	3.05	–	–
Dysartsville township	2 146	773	628	536	63	145	121	51	39	2.78	3.10	254	149
Glenwood township	1 406	510	414	364	35	96	91	46	37	2.76	3.11	–	–
Higgins township	1 545	576	467	389	64	109	94	33	29	2.68	2.98	144	92
Marion township	13 525	5 643	3 960	3 157	636	1 683	1 555	769	641	2.40	2.92	202	175
Marion city	4 718	2 091	1 334	982	287	757	712	408	355	2.26	2.90	47	22
West Marion CDP (pt.)	1 234	520	381	299	63	139	123	54	42	2.37	2.78	–	–
Montford Cove township	3 064	1 113	934	782	115	179	158	61	46	2.75	3.02	5	–
West Marion CDP (pt.)	57	20	16	6	7	4	3	–	–	2.85	2.69	–	–
Nebo township	4 008	1 473	1 170	987	129	303	274	117	95	2.72	3.11	12	–
North Cove township	1 843	726	557	479	55	169	151	74	59	2.54	2.94	–	–
Old Fort township	4 936	1 915	1 449	1 213	183	466	412	184	141	2.58	3.01	–	–
Old Fort town	720	305	204	139	51	101	92	46	34	2.36	2.97	–	–
Macon County	22 992	9 834	7 235	6 236	773	2 599	2 388	1 307	1 021	2.34	2.76	507	233
Burningtown township	606	243	193	173	14	50	44	32	22	2.49	2.84	–	–
Cartoogechaye township	1 666	679	529	471	42	150	134	58	41	2.45	2.83	234	–
Cowee township	1 241	522	394	342	38	128	119	67	47	2.38	2.77	–	–
Ellijay township	1 707	729	566	497	53	163	156	100	75	2.34	2.70	6	–
Flats township	376	151	123	112	9	28	24	5	5	2.49	2.77	29	–
Franklin township	9 580	4 201	2 977	2 518	368	1 224	1 118	609	503	2.28	2.74	219	219
Franklin town	2 808	1 357	830	659	145	527	483	269	237	2.07	2.66	65	65
Highlands township	2 079	910	638	559	58	272	258	146	120	2.28	2.78	14	14
Highlands town (pt.)	930	430	278	241	27	152	148	85	72	2.16	2.74	14	14
Millshoal township	2 082	857	652	555	78	205	187	93	70	2.43	2.81	–	–
Nantahala township	766	319	244	211	25	75	72	38	30	2.40	2.82	5	–
Smiths Bridge township	2 297	960	738	641	70	222	202	111	76	2.39	2.77	–	–
Sugar Fork township	592	263	181	157	18	82	74	48	32	2.25	2.76	–	–
Madison County	16 104	6 488	4 806	4 058	516	1 682	1 510	789	581	2.48	2.92	849	104
Township 1, Marshall	3 705	1 430	1 094	899	129	336	309	177	129	2.59	2.99	7	7
Marshall town	802	343	232	168	53	111	108	71	55	2.34	2.87	7	7
Township 2, Laurel	1 271	506	385	332	35	121	106	45	32	2.51	2.90	–	–
Township 3, Mars Hill	2 894	1 213	848	692	123	365	321	158	131	2.39	2.90	825	97
Mars Hill town	911	416	253	203	43	163	138	74	67	2.19	2.83	700	2
Township 4, Beech Glenn	2 222	886	675	581	59	211	176	88	63	2.51	2.87	–	–
Township 5, Walnut	1 198	478	351	307	29	127	119	64	39	2.51	3.01	–	–
Township 6, Hot Springs	992	418	282	234	41	136	125	74	58	2.37	2.96	–	–
Hot Springs town	478	199	137	114	21	62	57	33	28	2.40	2.96	–	–
Township 7, Ebbs Chapel	1 091	448	344	304	26	104	96	44	31	2.44	2.82	–	–
Township 8, Spring Creek	788	328	237	207	18	91	84	48	37	2.40	2.87	17	–
Township 9, Sandy Mush	439	176	132	111	11	44	39	23	16	2.49	2.89	–	–
Township 10, Grapevine	1 043	421	319	274	32	102	91	44	31	2.48	2.90	–	–
Township 11, Revere Rice Cove	461	184	139	117	13	45	44	24	14	2.51	2.98	–	–

STATE OF
NORTH CAROLINA
DEPARTMENT OF
ENVIRONMENT, HEALTH,
AND NATURAL RESOURCES

Classifications and Water Quality Standards Assigned to The Waters of the Cape Fear River Basin



Division of Environmental Management
Raleigh, North Carolina

Reprint from North Carolina Administrative Code: 15A NCAC 2B .0311
Current through: February 1, 1993

SECTION .0300 - ASSIGNMENT OF STREAM CLASSIFICATIONS

.0301 CLASSIFICATIONS: GENERAL

(a) Schedule of Classifications. The classifications assigned to the waters of the State of North Carolina are set forth in the schedules of classifications and water quality standards assigned to the waters of the river basins of North Carolina, 15A NCAC 2B .0302 to .0317. These classifications are based upon the existing or contemplated best usage of the various streams and segments of streams in the basin, as determined through studies and evaluations and the holding of public hearings for consideration of the classifications proposed.

(b) Stream Names. The names of the streams listed in the schedules of assigned classifications were taken as far as possible from United States Geological Survey topographic maps. Where topographic maps were unavailable, U.S. Corps of Engineers maps, U.S. Department of Agriculture soil maps, and North Carolina highway maps were used for the selection of stream names.

(c) Classifications. The classifications assigned to the waters of North Carolina are denoted by the letters WS-I, WS-II, WS-III, WS-IV, WS-V, B, C, SA, SB, and SC in the column headed "class." A brief explanation of the "best usage" for which the waters in each class must be protected is given as follows:

Fresh Waters

Class WS-I:	waters protected as water supplies which are in natural and undeveloped watersheds; point source discharges of treated wastewater are permitted pursuant to Rules .0104 and .0211 of this Subchapter; local programs to control nonpoint source and stormwater discharge of pollution are required; suitable for all Class C uses;
Class WS-II:	waters protected as water supplies which are generally in predominantly undeveloped watersheds; point source discharges of treated wastewater are permitted pursuant to Rules .0104 and .0211 of this Subchapter; local programs to control nonpoint source and stormwater discharge of pollution are required; suitable for all Class C uses;
Class WS-III:	waters protected as water supplies which are generally in low to moderately developed watersheds; point source discharges of treated wastewater are permitted pursuant to Rules .0104 and .0211 of this Subchapter; local programs to control nonpoint source and stormwater discharge of pollution are required; suitable for all Class C uses;
Class WS-IV:	waters protected as water supplies which are generally in moderately to highly developed watersheds; point source discharges of treated wastewater are permitted pursuant to Rules .0104 and .0211 of this Subchapter; local programs to control nonpoint source and stormwater discharge of pollution are required; suitable for all Class C uses;
Class WS-V:	waters protected as water supplies which are generally upstream and draining to Class WS-IV waters; no categorical restrictions on watershed development or treated wastewater discharges are required, however, the Commission or its designee may apply appropriate management requirements as deemed necessary for the protection of downstream receiving waters (15A NCAC 2B .0203); suitable for all Class C uses;
Class B:	primary recreation and any other usage specified by the "C" classification;
Class C:	aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture.

Tidal Salt Waters

Class SA:	shellfishing for market purposes and any other usage specified by the "SB" and "SC" classification;
Class SB:	primary recreation and any other usage specified by the "SC" classification;
Class SC:	aquatic life propagation and survival, fishing, wildlife, and secondary recreation.

Supplemental Classifications

Trout Waters:	Suitable for natural trout propagation and maintenance of stocked trout;
Swamp Waters:	Waters which have low velocities and other natural characteristics which are different from adjacent streams;
NSW:	Nutrient Sensitive Waters which require limitations on nutrient inputs;
HQW:	High Quality Waters which are waters that are rated as excellent based on biological and physical/chemical characteristics through division monitoring or special studies, native and special native trout waters (and their tributaries) designated by the Wildlife Resources Commission, primary nursery areas (PNA) designated by the Marine Fisheries Commission and other functional nursery areas designated by the Wildlife Resources Commission, critical habitat areas designated by the Wildlife Resources Commission or the Department of Agriculture, all water supply watersheds which are either classified as WS-I or WS-II or those for which a formal petition for reclassification as WS-I or WS-II has been received from the appropriate local government and accepted by the Division of Environmental Management and all Class SA waters.
ORW:	Outstanding Resource Waters which are unique and special waters of exceptional state or national recreational or ecological significance which require special protection to maintain existing uses.

(d) Water Quality Standards. The water quality standards applicable to each classification assigned are those established in 15A NCAC 2B .0200, Classifications and Water Quality Standards Applicable to the Surface Waters of North Carolina, as adopted by the North Carolina Environmental Management Commission.

(e) Index Number.

(1) Reading the Index Number. The index number appearing in the column so designated is an identification number assigned to each stream or segment of a stream, indicating the specific tributary progression between the main stem stream and the tributary stream.

(2) Cross-Referencing the Index Number. The inclusion of the index number in the schedule is to provide an adequate cross reference between the classification schedules and an alphabetic list of streams.

(f) Classification Date. The classification date indicates the date on which enforcement of the provisions of Section 143-215.1 of the General Statutes of North Carolina became effective with reference to the classification assigned to the various streams in North Carolina.

(g) Reference. Copies of the schedules of classifications adopted and assigned to the waters of the various river basins may be obtained at no charge by writing to:

Director
Division of Environmental Management
Department of Environment, Health, and Natural Resources
Post Office Box 29535
Raleigh, North Carolina 27626-0535

(h) Places where the schedules may be inspected:

Division of State Library
Archives -- State Library Building
109 E. Jones Street
Raleigh, North Carolina.

(i) Unnamed Streams.

(1) Any stream which is not named in the schedule of stream classifications carries the same classification as that assigned to the stream segment to which it is tributary except:

(A) unnamed streams specifically described in the schedule of classifications; or

(B) unnamed freshwaters tributary to tidal saltwaters will be classified "C"; or

(C) after November 1, 1986, any newly created areas of tidal saltwater which are connected to Class SA waters by approved dredging projects will be classified "SC" unless case-by-case reclassification proceedings are conducted.

(2) The following river basins have different policies for unnamed streams entering other states or for specific areas of the basin:

Hiwassee River Basin (Rule .0302); Little Tennessee River Basin and Savannah River Drainage Area (Rule .0303); French Broad River Basin (Rule .0304); Watauga River Basin (Rule .0305); Broad River Basin (Rule .0306); New River Basin (Rule .0307); Catawba River Basin (Rule .0308); Yadkin-Pee Dee River Basin (Rule .0309); Lumber River Basin (Rule .0310); Roanoke River Basin (Rule .0313); Tar-Pamlico River Basin (Rule .0316); Pasquotank River Basin (Rule .0317).

History Note: *Statutory Authority G.S. 143-214.1; 143-215.1; 143-215.3(a)(1);*
Eff. February 1, 1976;
Amended Eff. August 3, 1992; August 1, 1990; October 1, 1989; November 1, 1986.

.0311 CAPE FEAR RIVER BASIN

(a) Places where the schedules may be inspected:

(1) Clerk of Court:
Alamance County
Bladen County
Brunswick County
Caswell County
Chatham County
Columbus County
Cumberland County
Duplin County
Durham County
Forsyth County
Guilford County
Harnett County
Hoke County
Lee County
Montgomery County
Moore County
New Hanover County
Onslow County
Orange County
Pender County
Randolph County
Rockingham County
Sampson County
Wake County
Wayne County

(2) North Carolina Department of Environment, Health, and Natural Resources:

(A) Winston-Salem Regional Office
8025 North Point Boulevard, Suite 100
Winston-Salem, North Carolina

(B) Fayetteville Regional Office
Wachovia Building
Suite 714
Fayetteville, North Carolina

(C) Raleigh Regional Office
3800 Barrett Drive
Raleigh, North Carolina

(D) Washington Regional Office
1424 Carolina Avenue
Washington, North Carolina

(E) Wilmington Regional Office
127 Cardinal Drive Extension
Wilmington, North Carolina

.0311 CAPE FEAR RIVER BASIN

Name of Stream	Description	Class	Classification Date	Classification Index No.
Little Creek	From source to McLendons Creek	C	9/1/74	17-30-4
Richland Creek	From source to Moore County SR 1264	B	3/1/66	17-30-5-(1)
Richland Creek	From Moore County SR 1264 to McLendons Creek	C	9/1/74	17-30-5-(2)
Unnamed Tributary northwest of Mount Carmel Church	From source to Moore County SR 1264	B	3/1/66	17-30-5-3-(1)
Unnamed Tributary northwest of Mount Carmel Church	From Moore County Road SR 1264 to Richland Creek	C	9/1/74	17-30-5-3-(2)
McLendons Creek	From a point 0.4 mile downstream of Moore County SR 1628 to Deep River	WS-IV	8/3/92	17-30-(6)
Big Governors Creek	From source to Moore County SR 1651	C	7/1/73	17-32-(0.3)
Big Governors Creek	From Moore County SR 1651 to Deep River	WS-IV	8/3/92	17-32-(0.7)
McIntosh Creek	From source to Big Governors Creek	C	9/1/74	17-32-1
Crawley Creek	From source to a point 3.4 miles upstream of mouth	C	9/1/74	17-32-2-(1)
Crawley Creek	From a point 3.4 miles upstream of mouth to Big Governors Creek	WS-IV	8/3/92	17-32-2-(2)
Little Governors Creek	From source to Big Governors Creek	WS-IV	8/3/92	17-32-3
Line Creek	From source to Deep River	WS-IV	8/3/92	17-33
DEEP RIVER	From N. C. Hwy. 42 to a point 0.8 mile upstream of Lee County SR 1007	WS-IV	8/3/92	17-(33.5)
Smiths Creek	From source to Deep River	WS-IV	8/3/92	17-34
Indian Creek	From source to Deep River	WS-IV	8/3/92	17-35
Little Indian Creek	From source to Indian Creek	WS-IV	8/3/92	17-35-1
DEEP RIVER	From a point 0.8 mile upstream of Lee County SR 1007 to Town of Gulf-Goldston water supply intake (located 0.3 mile upstream of Lee County SR 1007)	WS-IV CA	8/3/92	17-(36)
DEEP RIVER	From Town of Gulf-Goldston water supply intake to Georges Creek	C	8/3/92	17-(36.5)
Pocket Creek	From source to Deep River	C	7/1/73	17-37
Sugar Creek	From source to Pocket Creek	C	9/1/74	17-37-1
Dry Fork Creek	From source to Pocket Creek	C	9/1/74	17-37-2
Raccoon Creek	From source to Pocket Creek	C	9/1/74	17-37-3
Little Pocket Creek	From source to Pocket Creek	C	9/1/74	17-37-4
Patterson Creek	From source to Deep River	C	9/1/74	17-38
Cedar Creek	From source to Deep River	C	3/1/77	17-39
Big Buffalo Creek	From source to Deep River	C	9/1/74	17-40
Skunk Creek	From source to Big Buffalo Creek	C	3/1/77	17-40-1
Persimmon Creek	From source to Big Buffalo Creek	C	9/1/74	17-40-2
Purgatory Branch	From source to Big Buffalo Creek	C	9/1/74	17-40-3
Georges Creek	From source to Deep River	C	3/1/77	17-41
Rocky Branch	From source to Georges Creek	C	3/1/77	17-41-1
DEEP RIVER	From Georges Creek to Cape Fear River (junction with Haw River)	WS-IV	8/3/92	17-(41.5)
Little Buffalo Creek	From source to Deep River	WS-IV	8/3/92	17-42

NORTH CAROLINA HAZARDOUS WASTE MANAGEMENT RULES

and

SOLID WASTE MANAGEMENT LAW

DIVISION OF SOLID WASTE MANAGEMENT
HAZARDOUS WASTE SECTION
P. O. BOX 27687
RALEIGH, NC 27611-7687
(919) 733-2178

October 1, 1993

State of North Carolina
James B. Hunt, Governor

Department of Environment, Health, and Natural Resources
Jonathan B. Howes, Secretary

261.32 Hazardous waste from specific sources.

The following solid wastes are listed hazardous wastes from specific sources unless they are excluded under Sections 260.20 and 260.22 and listed in Appendix IX.

Industry and EPA hazardous waste No.	Hazardous waste	Hazard Code
Wood Preservation:		
K001.....	Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol.	(T)
Inorganic Pigments:		
K002.....	Wastewater treatment sludge from the production of chrome yellow and orange pigments	(T)
K003.....	Wastewater treatment sludge from the production of molybdate orange pigments	(T)
K004.....	Wastewater treatment sludge from the production of zinc yellow pigments	(T)
K005.....	Wastewater treatment sludge from the production of chrome green pigments	(T)
K006.....	Wastewater treatment sludge from the production of chrome oxide green pigments (anhydrous and hydrated)	(T)
K007.....	Wastewater treatment sludge from the production of iron blue pigments	(T)
K008.....	Oven residue from the production of chrome oxide green pigments	(T)
Organic Chemicals:		
K009.....	Distillation bottoms from the production of acetaldehyde from ethylene	(T)
K010.....	Distillation side cuts from the production of acetaldehyde from ethylene	(T)
K011.....	Bottom stream from the wastewater stripper in the production of acrylonitrile	(R,T)
K013.....	Bottom stream from the acetonitrile column in the production of acrylonitrile	(R,T)
K014.....	Bottoms from the acetonitrile purification column in the production of acrylonitrile	(T)
K015.....	Still bottoms from the distillation of benzyl chloride	(T)
K016.....	Heavy ends or distillation residues from the production of carbon tetrachloride	(T)
K017.....	Heavy ends (still bottoms) from the purification column in the production of epichlorohydrin	(T)
K018.....	Heavy ends from the fractionation column in ethyl chloride production	(T)
K019.....	Heavy ends from the distillation of ethylene dichloride in ethylene dichloride production	(T)
K020.....	Heavy ends from the distillation of vinyl chloride in vinyl chloride monomer production	(T)
K021.....	Aqueous spent antimony catalyst waste from fluoromethanes production	(T)
K022.....	Distillation bottom tars from the production of phenol/acetone from cumene	(T)
K023.....	Distillation light ends from the production of phthalic anhydride from naphthalene	(T)
K024.....	Distillation bottoms from the production of phthalic anhydride from naphthalene	(T)
K025.....	Distillation bottoms from the production of nitrobenzene by the nitration of benzene	(T)

Hazardous waste no.	Chemical abstracts No.	Substance
	6533-73-9	Carbonic acid, dithallium (I+) salt
U215	353-50-4	Carbonic difluoride
U033	79-22-1	Carbonochloridic acid, methyl ester (I,T)
U156	353-50-4	Carbo oxyfluoride (R,T)
U033	56-23-5	Carbon tetrachloride
U211	75-87-6	Chloral
U034	305-03-3	Chlorambucil
U035	57-74-9	Chlordane, alpha & gamma isomers
U036	494-03-1	Chlornaphazin
U026	108-90-7	Chlorobenzene
U037	510-15-6	Chlorobenzilate
U038	59-50-7	p-Chloro-m-cresol
U039	110-75-8	2-Chloroethyl vinyl ether
U042	67-66-3	Chloroform
U044	107-30-2	Chloromethyl methyl ether
U046	91-58-7	beta-Chloronaphthalene
U047	95-57-8	o-Chlorophenol
U048	3165-93-3	4-Chloro-o-toluidine, hydrochloride
U049	13765-19-0	Chromic acid H_2CrO_4, calcium salt
U032	218-01-9	Chrysene
U050	.....	Creosote
U051	1319-77-3	Cresols (Cresylic acid)
U052	4170-30-3	Crotonaldehyde
U053	98-82-8	Cumene (I)
U055	506-68-3	Cyanogen bromide (CN)Br
U246	106-51-4	2,5-Cyclohexadiene-1,4-dione
U197	110-82-7	Cyclohexane (I)
U056	58-89-9	Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1alpha,2alpha,3beta,4alpha,5alpha,6beta)-
U129	108-94-1	Cyclohexanone (I)
U057	77-47-4	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-
U130	50-18-0[1]	Cyclophosphamide
U058	94-75-7	2,4-D, salts and esters
U240	20830-81-3	Daunomycin
U059	72-54-8	DDD
U060	50-29-3	DDT
U061	2303-16-4	Diallate
U062	53-70-3	Dibenz[a,h]anthracene
U063	189-55-9	Dibenzo[a,i]pyrene
U064	96-12-8	1,2-Dibromo-3-chloropropane
U066	84-74-2	Dibutyl phthalate
U069	95-50-1	o-Dichlorobenzene
U070	541-73-1	m-Dichlorobenzene
U071	106-46-7	p-Dichlorobenzene
U072	91-94-1	3,3'-Dichlorobenzidine
U073	764-41-0	1,4-Dichloro-2-butene (I,T)
U074	75-71-8	Dichlorodifluoromethane
U075	75-35-4	1,1-Dichloroethylene
U078	156-60-5	1,2-Dichloroethylene
U079	111-44-4	Dichloroethyl ether
U025	108-60-1	Dichloroisopropyl ether
U027	111-91-1	Dichloromethoxy ethane
U024	120-83-2	2,4-Dichlorophenol
U081	87-65-0	2,6-Dichlorophenol
U082	542-75-6	1,3-Dichloropropene
U084	1464-53-5	1,2:3,4-Diepoxybutane (I,T)
U085	123-91-1	1,4-Diethyleneoxide
U108	117-81-7	Diethylhexyl phthalate
U028	1615--80-1	N,N-Diethylhydrazine
U086		

[1]CAS Number given for parent compound only.

Ref. 21

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

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

January 19, 1982

MEMORANDUM

TO: O. W. Strickland, Head
Solid & Hazardous Waste Management Branch

FROM: Larry D. Perry, District Representative
Solid & Hazardous Waste Management Branch

SUBJECT: Interim Status Inspection - Generator, TSD, and Transporter
Southern Wood Peidmont Co.
2139 State Road
Gulf, NC 27256
EPA I.D. #NCD053488557
Contact: Mr. C.A. Burdell - Director, Technical Services
Southern Wood Peidmont Co.
P.O. Box 5447
Spartanburg, SC 29304

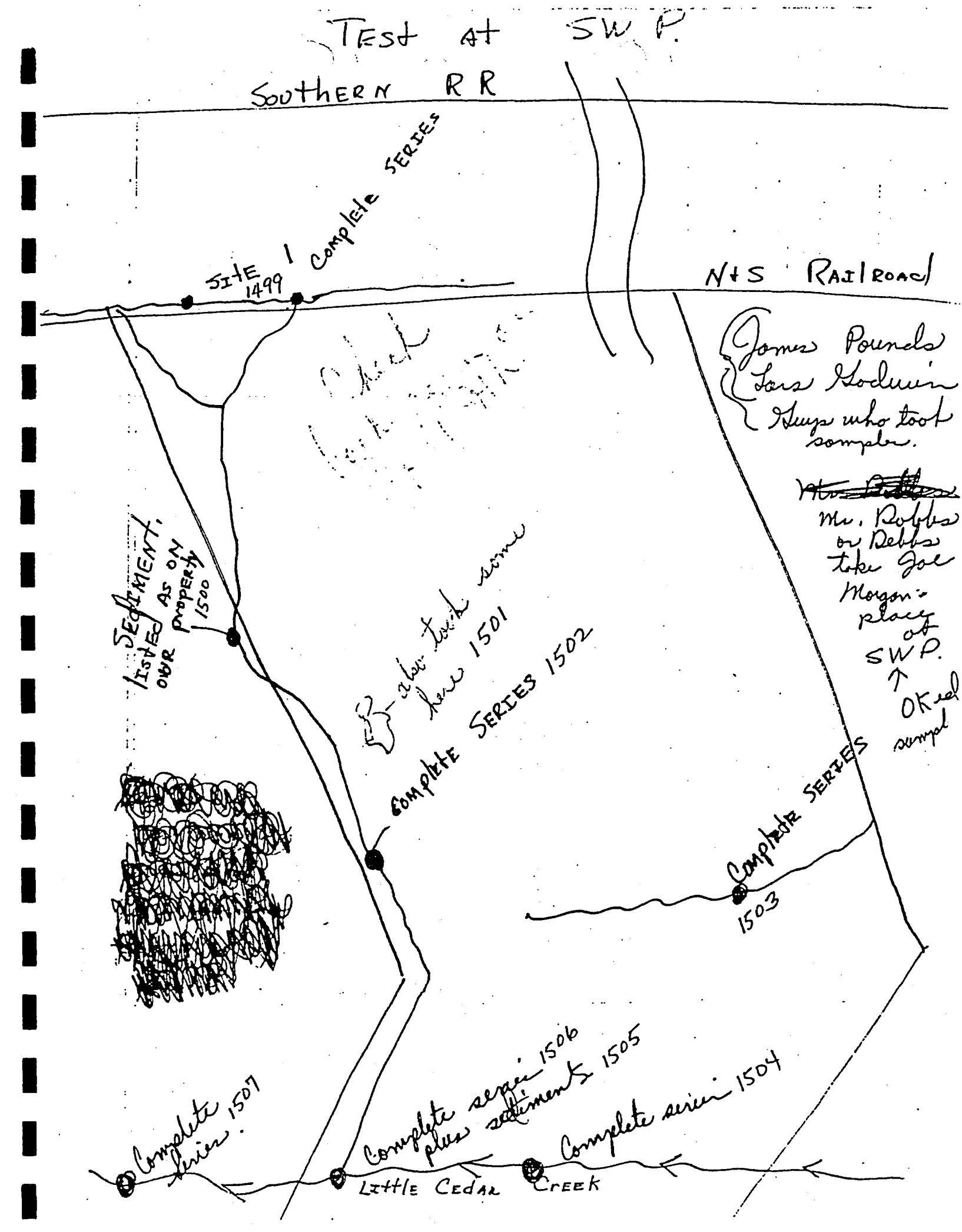
On September 16, 1981 an inspection was to be made on this site. Upon arrival at the site, there was nothing there. The facility had been closed down, completely disassembled and moved to a new location (explained in attached information). Upon walking over the facility site I found a sign stating that the area was posted due to a chemical dump or burial area located at the site. I talked with a man at a garage across the street from the site and he stated that there had once been a wastewater chemical holding pond on the site. From my observation the site had been completely re-landscaped and there was no evidence of any holding pond - everything was level and smooth.

I phoned several people with other Southern Wood locations and finally was able to get some information from this Mr. Burdell. He informed me that he thought that he had properly closed out the site with his meeting and correspondence with Stan Taylor in the summer and fall of 1980 - see attached letters. He also listed the site on Superfund.

The reason for the delay in this report is due to the difficulty in obtaining the enclosed paper work from Mr. Burdell. He finally sent the material after several requests - each time he promised faithfully to send the information but I had to keep reminding him.

Since obtaining the information, no further contact has been made with Mr. Burdell by this inspector concerning proper close-out, etc.

LDP:ns


TEST at SW P.
Southern RR
Site 1499 Complete Series
N+S Railroad
James Pounds
Lars Godwin
Guys who took samples.
Mr. Robbs or Bobbs take Joe Morgan place at SW P.
OK'ed sampl
Segment listed as on our property 1500
Complete Series 1501
Complete Series 1502
Complete Series 1503
Complete series 1504
Complete series 1505
Complete series 1506
Complete Series 1507
Little Cedar Creek

N.C. DEPT. OF NATURAL RESOURCES & COMMUNITY DEVELOPMENT

DIVISION OF ENVIRONMENTAL MANAGEMENT

WATER QUALITY FIELD-LAB FORM (DM1)

COUNTY: Chatham

RIVER BASIN: Cape Fear

REPORT TO: (Circle One)

ARO, FRO, MRO, (RRO), WaRO, WIRO, WSRO, BM, TS,

OTHER:

COLLECTOR(S): Powell & Godwin

BOD RANGE: SEED:

CHLORINATED:

LAB NUMBER 00008: 1499

DATE RECIEVED: 82/03/26

RECIEVED BY:

DATA ENTRY BY: CK: eg

DATE REPORTED:

SAMPLE TYPE: (1)

☐ AMBIENT ☐ CORE ☐ COMPLIANCE

☑ INTENSIVE S. ☐ SPLIT ☐ EMERGENCY

STATION LOCATION: So the... [illegible] Dist. on R. [illegible]

REMARKS: Lab [illegible]

Station Number	Date Begin (yy/mm/dd)	Time Begin	Date End	Time End	Depth DM DB DBM	Value Type A H L	Sample Type C G GNXX	Composite T S P
Sample 1	82/03/26	10:30						

1	BOD5 310	mg/l	Chloride 940	mg/l	NH3 as N 610	mg/l	Mo – Molybdenum 1062	
2	COD High 340	mg/l	Arsenic: Inorganic 1002	24 ug/l	TKN as N 625	mg/l	Na – Sodium 929	mg/l
3	COD: Low 335	mg/l	Chl a: Tri 32217	ug/l	NO2+NO3 as N 630	mg/l	Ni – Nickel 1087	<100 ug/l
4	Coliform: MF Fecal 31616	/100ml	Chl a: Corr 32209	ug/l	PO4 as P 70507	mg/l	Pb – Lead 1051	100 ug/l
5	Coliform: MF Total 31504	/100ml	Phosphytin a 32213	ug/l	P: Total as P 665	mg/l	Sb – Antimony 1097	ug/l
6	Coliform: Tube Fecal 31615	/100ml	Color: True, 80	Pt-Co	P: Dissolved as P 666	mg/l	Sn – Tin 1102	ug/l
7	Coliform: Tube Total 31505	/100ml	Chromium: Hex, 1032	ug/l	Ag – Silver 1077	ug/l	V – Vanadium 1087	ug/l
8	Residue: Total 500	mg/l	Cyanide 720	mg/l	Al – Aluminum 1105	ug/l	Zn – Zinc 1092	70 ug/l
9	Volatile 505	mg/l	Fluoride 951	mg/l	Ba – Barium 1007	ug/l	Pesticides (Specify)	
10	Fixed 510	mg/l	Formaldehyde 71880	mg/l	Be – Beryllium 1012	ug/l		
11	Residue: Suspended 530	mg/l	Grease and Oils 556	mg/l	Ca – Calcium 916	mg/l		
12	Volatile 535	mg/l	Hardness: Total 900	mg/l	Cd – Cadmium 1027	<50 ug/l		
13	Fixed 540	mg/l	MBAS 38260	mg/l	Co – Cobalt 1037	<100 ug/l	Organics (Specify)	SC
14	pH 403	units	Phenols 32730	ug/l	Chromium: Total 1034	<80 ug/l	[illegible]	
15	Acidity to pH 4.5 436	mg/l	Sulfate 945	mg/l	Cu – Copper 1042	80 ug/l	[illegible]	
16	Acidity to pH 8.3 435	mg/l	Sulfide 745	mg/l	Fe – Iron 1045	10,000 ug/l	[illegible]	
17	Alkalinity to pH 8.3 415	mg/l	Specific Cond. 95	uMhos/cm	Hg – Mercury 71900	Omit ug/l		
18	Alkalinity to pH 4.5 410	mg/l	Biomass: Dry Wt. 573	g/M^2	Li – Lithium 1132	ug/l		
19	TOC 680	mg/l	Biomass: Perl Ash Free 572	g/M^2	Mg – Magnesium 927	18 mg/l		
20	Turbidity 76	NTU	Chl a: Peri Fluro 82547	mg/M^2	Mn – Manganese 1055	2200 ug/l		

A	Sampling Point PT / # 63 / 2	Water Temperature (°C) 10	D.O. 300	pH 400	Conductance at 25°C 94	Alkalinity pH 8.3 82244	Alkalinity pH 4.5 431	Acidity pH 4.5 82243	Acidity pH 8.3 82242
B	Secchi (Meters) 78	Air Temperature (°C) 20	D.O. % Saturation 301	Salinity ‰ 480	Algae-Floating Mats Severity 1325	Precipitation (In/Day) 45	Cloud Cover. % 32	Wind Direction (Deg.) 36	Wind Force Beaufort 37
C	1 Hr Settleable Matter (ml/l/Hr) 50086	Dead Fish Severity 1340	Turbidity Severity 1350	Odor: Atmosphere Severity 1330	Stream Flow Severity 1351	Detergent Suds Severity 1305	Oil-Grease Severity 1300	Floating Debris Severity 1345	Sludge Severity 1315

DM1/Revised 1/81LA

.ec by [illegible]

.cked by FTC

ıpervisor RCK

ORGANIC ANALYSIS

Entered by

Checked by

Lab No.	Water Analytical Results
1499	The following compounds were identified by matching to library mass spectra. They were not matched to standards:
	Dibenzo anthracene
	Fluorene HW
	Phenanthrene
	Fluoranthene
	Phenol
	Methyl phenol
	Dimethyl phenol
	Ethyl, Methyl phenol
	Propenyl phenol
	Methyl Benzofuranone
	Methyl Benzoic acid
	Tetrachloro phenol
	Pentachloro phenol
	Naphthalenecarboxylic Acid
	Quinoline
	Benzene Carcinogen HS HW PTP on shot.
	Toluene HS HW PTP
	3 unidentified peaks detected by GC/MS

✓ GC/MS/DS used

COUNTY: [redacted]

RIVER BASIN: [redacted]

REPORT TO: (Circle One)

ARO, WSRO, MRO, FRO, WaRO, WiRO, RRO, TS, BM,

AM, OTHER:

COLLECTOR: [redacted]

N.C. DEPT. OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT

DIVISION OF ENVIRONMENTAL MANAGEMENT

FIELD/LAB FORM

SEDIMENT/TISSUE

(2)

- [x] SEDIMENT
- [ ] TISSUE
- [ ] AMBIENT
- [ ] COMPLIANCE
- [x] INTENSIVE S.
- [ ] CORE
- [ ] SPLIT
- [ ] EMERGENCY

LAB NUMBER #: [redacted]

DATE RECIEVED: [redacted]

RECIEVED BY: [redacted]

DATA ENTRY BY: [redacted] CK: [redacted]

DATE REPORTED: [redacted]

STATION LOCATION: [redacted]

REMARKS: [redacted]

Station Number	Date Begin	Time Begin	Date End	Time End	Depth DM DB DMB	Value Type	T, S, or B	Sample Type
[redacted]	82-03-26	1100				A H L		C G GNXX

	Tissue	Units	Sediment	Units	Tissue	Units	Sediment	Units	Tissue	Units	Sediment	Uni
1	01004 As	mg/Kg	01003 As 5.6	mg/Kg			00611 NH3	mg/Kg	39482 Methoxychlr	ug/Kg	39481 Methoxychlr	ug/K
2	01666 Al	mg/Kg	01108 Al 68	mg/Kg			00627 TKN as N	mg/Kg	34688 Hxchlbenzene	mg/Kg	39701 Hxchlbenzene	ug/Kg
3	71940 Cd	mg/Kg	01028 Cd <.50	mg/Kg			00633 NO2 & NO3	mg/Kg	39060 PCP	ug/g	39061 PCP	ug/Kg
4	71938 Cr, tot.	mg/Kg	01029 Cr, tot. 18	mg/Kg			00668 P, tot, as P	mg/Kg	39074 alpha-BHC	ug/g	39076 alpha-BHC	ug/Kg
5	71937 Cu	mg/Kg	01043 Cu 25	mg/Kg			70511 PO4 as P	mg/Kg	39075 gamma-BHC	ug/g	3981 gamma-BHC	ug/Kg
6	01660 Fe	mg/Kg	01170 Fe 18000	mg/Kg	34690 Aldrin	mg/Kg	39333 Aldrin	mg/Kg	34685 Endrin	mg/Kg	39393 Endrin	ug/Kg
7	71930 Hg	mg/Kg	71921 Hg .09	mg/Kg	34684 Dieldrin	mg/Kg	39383 Dieldrin	mg/Kg	39515 PCB	mg/Kg	39519 PCB	ug/Kg
8	01656 Mg	mg/Kg	00924 Mg 6.8	mg/Kg	39325 o,p DDD	ug/g	39316 o,p DDD	ug/Kg	✓ Others:		Others:	
9	01069 Ni	mg/Kg	01068 Ni 15	mg/Kg	39312 p,p DDD	ug/g	39311 P,P DDD	ug/Kg	Organic			
10	71936 Pb	mg/Kg	01052 Pb 22	mg/Kg	38328 o,p DDE	ug/g	39328 o,p DDE	ug/Kg	Scan			
11	71938 Zn	mg/Kg	01093 Zn 43	mg/Kg	39322 p,p DDE	ug/g	39321 P,P DDE	ug/Kg	Creosote			
12	Other Metals:	mg/Kg	Other Metals:	mg/Kg	39290 Total DDT	ug/g	39373 Total DDT	ug/Kg				
13		mg/Kg		mg/Kg	39316 o,p DDT	ug/g	39306 o,p DDT	ug/Kg				
14		mg/Kg		mg/Kg	39302 P,P DDT	ug/g	39301 P,P DDT	ug/Kg				
15		mg/Kg		mg/Kg	39063 cis-Chlordane	ug/g	39064 cis-Chlordane	ug/Kg				
16		mg/Kg		mg/Kg	39066 trans-Chlordane	ug/g	39067 trans-Chlordane	ug/Kg				
17		mg/Kg		mg/Kg	39069 cis-Nchlor	ug/g	39070 cis-Nchlor	ug/Kg				
18		mg/Kg		mg/Kg	39072 trans-Nchlor	ug/g	39073 trans-Nchlor	ug/Kg				
19		mg/Kg		mg/Kg								

	Sampling Point	Temperature °C	Dissolved Oxygen	pH Units	Conductivity	Salinity ‰	Turbidity FTU	Stream Color	Secchi (M)
A	PI 63 / % 2	10	300	400	95	70305	78		78
	R P	Stream Stage ft:	Flow MGD	Flooting Debris Sever.	Sludge Severity	Detergent Suds Sever.	Atmos. Odor Severity	Cloud Cover %	Wind Dir from North
B	8 647	65	50051	1345	1315	1305	1330	32	36

Supervisor [illegible]

Entered by

Checked by

Lab No.	Sediment Analytical Results
1500	The following compounds were identified by matching to library mass spectra. They were not matched to standards:
	Chlorophenol
	Trichlorophenol
	Dichlorophenol
	Trichlorophenol
	Naphthalene HS HW PTP
	Methyl naphthalene
	Dibenzofuran
	Fluorene
	Phenanthrene
	Fluoranthene
	Pyrene

✓ GC/MS/DS used

COUNTY: [redacted]

RIVER BASIN: [redacted]

REPORT TO: (Circle One)

ARO, FRO, MRO, RRO, WaRO, WIRO, WSRO, BM, TS,

OTHER:

COLLECTOR(S): [redacted]

BOD RANGE: SEED:

CHLORINATED:

DEVELOPMENT

DIVISION OF ENVIRONMENTAL MANAGEMENT

WATER QUALITY FIELD-LAB FORM (DM1)

(3)

SAMPLE TYPE

☐ AMBIENT ☐ CORE ☐ COMPLIANCE

☑ INTENSIVE S. ☐ SPLIT ☐ EMERGENCY

LAB NUMBER 00008: [redacted]

DATE RECIEVED: [redacted]

RECIEVED BY: [redacted]

DATA ENTRY BY: CK:

DATE REPORTED: [redacted]

STATION LOCATION: [redacted]

REMARKS: [redacted]

Station Number	Date Begin (yy/mm/dd)	Time Begin	Date End	Time End	Depth DM DB DBM	Value Type A H L	Sample Type C G GNXX	Composite T S B
SAMPLE 3		1010						

1		BOD5 310	mg/l		Chloride 940	mg/l		NH3 as N 610	mg/l		Mo – Molybdenum 1062	ug/l
2		COD: High 340	mg/l		Arsenic: Inorganic 997	ug/l		TKN as N 625	mg/l		Na – Sodium 929	mg/l
3		COD: Low 335	mg/l		Chl a: Tri 32210	ug/l		NO2+NO3 as N 630	mg/l		Ni – Nickel 1067	ug/l
4		Coliform: MF Fecal 31616	/100ml		Chl a: Corr 32211	ug/l		PO4 as P 70507	mg/l		Pb – Lead 1051	ug/l
5		Coliform: MF Total 31504	/100ml		Phaophytin a 32218	ug/l		P: Total as P 665	mg/l		Sb – Antimony 1097	ug/l
6		Coliform: Tube Fecal 31615	/100ml		Color: True 80	Pt-Co		P: Dissolved as P 666	mg/l		Sn – Tin 1102	ug/l
7		Coliform: Tube Total 31505	/100ml		Chromium: Hex. 1032	ug/l		Ag – Silver 1077	ug/l		V – Vanadium 1087	ug/l
8		Residue: Total 500	mg/l		Cyanide 720	mg/l		Al – Aluminum 1105	ug/l		Zn – Zinc 1092	ug/l
9		Volatile 505	mg/l		Flyoride 951	mg/l		Ba – Barium 1007	ug/l		Pesticides (Specify)	
10		Fixed 510	mg/l		Formaldehyde 71880	mg/l		Be – Beryllium 1012	ug/l			
11		Residue: Suspended 530	mg/l		Grease and Oils 556	mg/l		Ca – Calcium 916	mg/l			
12		Volatile 535	mg/l		Hardness: Total 900	mg/l		Cd – Cadmium 1027	ug/l			
13		Fixed 540	mg/l		MBAS 38260	mg/l		Co – Cobalt 1037	ug/l	✓	Organics (Specify)	
14		pH 403	units		Phenols 32730	ug/l		Chromium: Total 1034	ug/l			
15		Acidity to pH 4.5 436	mg/l		Sulfate 945	mg/l		Cu – Copper 1042	ug/l			
16		Acidity to pH 8.3 435	mg/l		Sulfide 745	mg/l		Fe – Iron 1045	ug/l	✓		
17		Alkalinity to pH 8.3 415	mg/l		Specific Cond. 95	uMhos/cm		Hg – Mercury 71900	ug/l			
18		Alkalinity to pH 4.5 410	mg/l		Biomass: Dry Wt. 573	g/M^2		Li – Lithium 1132	ug/l			
19		TOC 680	mg/l		Biomass: Perl Ash Free 572	g/M^2		Mg – Magnesium 927	mg/l			
20		Turbidity 76	NTU		Chl a: Peri Spectro 32228	mg/M^2		Mn – Manganese 1055	ug/l			

A	Sampling Point: PT 63 / % 2	Water Temperature (°C): 10	D.O.: 300	pH: 400	Conductance at 25°C: 94	Alkalinity pH 8.3: 82244	Alkalinity pH 4.5: 431	Acidity pH 4.5: 82243	Acidity pH 8.3: 82242
B	Secchi (Meters): 78	Air Temperature (°C): 20	D.O. % Saturation: 301	Salinity ‰: 480	Algae: Floating Mats Severity: 1325	Precipitation (In/Day): 45	Cloud Cover: %: 37	Wind Direction (Deg.): 36	Wind Force Beaufort: 37
C	1 Hr. Settleable Matter (ml/l/Hr.): 50086	Dead Fish Severity: 1340	Turbidity Severity: 1350	Odor: Atmosphere Severity: 1330	Stream Flow Severity: 1351	Detergent Suds Severity: 1305	Oil-Grease Severity: 1300	Floating Debris Severity: 1345	Sludge Severity: 1315

DM1/Revised 1/81 LA

by PTD

.rvisor R&K

ORGANIC ANALYSIS

Entered by [illegible]

Checked by _____

ab No.	(W)ATER Analytical Results
501	The following Cpds were identified by matching to library mass spectra. They were not matched to standards: [redacted] Phenol, methyl phenol, Benzoic acid, Hydroxy-methoxy-Benzaldehyde, Benzene propanoic acid, Dichloro phenol, Pentachlorophenol, Fluoranthene, Pyrene. 2 unidentified peaks detected by GC/MS. No volatiles detected by GC/MS

✓ GC/MS/DS used

N.C. DEPT. OF NATURAL RESOURCES & COMMUNITY DEVELOPMENT

DIVISION OF ENVIRONMENTAL MANAGEMENT

WATER QUALITY FIELD-LAB FORM (DM1)

(4)

COUNTY: Chatham

RIVER BASIN: Cape Fear

REPORT TO: (Circle One)

ARO, FRO, MRO, (RRO) WaRO WiRO, WSRO, BM, IS,

OTHER:

COLLECTOR(S): Ford & Galvin

BOD RANGE _____ SEED: _____

CHLORINATED: _____

LAB NUMBER 00008: 1502

DATE RECIEVED: 82/03/26

RECIEVED BY: [illegible]

DATA ENTRY BY: CK

DATE REPORTED: 1-25-82

SAMPLE TYPE

☐ AMBIENT ☐ CORE ☐ COMPLIANCE

☑ INTENSIVE S. ☐ SPLIT ☐ EMERGENCY

STATION LOCATION: Drainage Ditch

REMARKS: Southern Industrial Landfill

Station Number	Date Begin(yy/mm/dd)	Time Begin	Date End	Time End	Depth DM DB DBM	Value Type A H L	Sample Type C G GNXX	Composite T S B
Sample 4	82/03/26	11:30						

1	BOD5 310	mg/l	Chloride 940	mg/l	NH3 as N 610	mg/l	Mo – Molybdenum 1062	ug
2	COD-High 340	mg/l	✓ Arsenic: Inorganic 1002	(1) ug/l	TKN as N 625	mg/l	Na – Sodium 929	mg/l
3	COD: Low 335	mg/l	Chl a: Tri 32217	ug/l	NO2+NO3 as N 630	mg/l	✓ Ni – Nickel 1067	<100 ug/l
4	Coliform: MF Fecal 31616	/100ml	Chl a: Corr 32209	ug/l	PO4 as P 70507	mg/l	✓ Pb – Lead 1051	100 ug/l
5	Coliform: MF Total 31504	/100ml	Phaephytin a 32213	ug/l	P: Total as P 665	mg/l	Sb – Antimony 1097	ug/l
6	Coliform: Tube Fecal 31615	/100ml	Color: True 80	Pt-Co	P: Dissolved as P 666	mg/l	Sn – Tin 1102	ug/l
7	Coliform: Tube Total 31505	/100ml	Chromium: Hex. 1032	ug/l	Ag – Silver 1077	ug/l	V – Vanadium 1087	ug/l
8	Residue Total 500	mg/l	Cyanide 720	mg/l	Al – Aluminum 1105	ug/l	✓ Zn – Zinc 1092	50 ug/l
9	Volatile 505	mg/l	Fluoride 951	mg/l	Ba – Barium 1007	ug/l	Pesticides (Specify)	
10	Fixed 510	mg/l	Formaldehyde 71880	mg/l	Be – Beryllium 1012	ug/l		
11	Residue: Suspended 530	mg/l	Grease and Oils 556	mg/l	Ca – Calcium 916	mg/l		
12	Volatile 535	mg/l	Hardness: Total 900	mg/l	✓ Cd – Cadmium 1027	<50 ug/l		
13	Fixed 540	mg/l	MBAS 38260	mg/l	✓ Co – Cobalt 1037	<100 ug/l	✓ Organics (Specify)	Scan
14	pH 403	units	Phenols 32730	ug/l	✓ Chromium: Total 1034	<50 ug/l		Phenols
15	Acidity to pH 4.5 436	mg/l	Sulfate 945	mg/l	✓ Cu – Copper 1042	40 ug/l		[illegible]
16	Acidity to pH 8.3 435	mg/l	Sulfide 745	mg/l	✓ Fe – Iron 1045	14000 ug/l		Volatiles
17	Alkalinity to pH 8.3 415	mg/l	Specific Cond. 95	uMhos/cm	✓ Hg – Mercury 71900	Omit ug/l		Cresols
18	Alkalinity to pH 4.5 410	mg/l	Biomass: Dry Wt. 573	g/M²	Li – Lithium 1132	ug/l		
19	TOC 680	mg/l	Biomass. Peri Ash Free 572	g/M²	✓ Mg – Magnesium 927	21 mg/l		
20	Turbidity 76	NTU	Chl a: Peri Fluro 82547	mg/M²	✓ Mn – Manganese 1055	1600 ug/l		

A	Sampling Point PT / #	Water Temperature(°C)	D.O.	pH	Conductance at 25°C	Alkalinity pH 8.3	Alkalinity pH 4.5	Acidity pH 4.5	Acidity pH 8.3
	61 / 2	10	300	400	94	82244	431	82243	82242
B	Secchi (Meters)	Air Temperature (°C)	D.O. % Saturation	Salinity ‰	Algae: Floating Mats Severity	Precipitation(In/Day)	Cloud Cover: %	Wind Direction(Deg.)	Wind Force Beaufort
	76	20	301	480	1325	45	32	36	37
C	1 Hr. Settleable Matter(ml/l/Hr.)	Dead Fish Severity	Turbidity Severity	Odor: Atmosphere Severity	Stream Flow Severity	Detergent Suds Severity	Oil-Grease Severity	Floating Debris Severity	Sludge Severity
	50086	1340	1350	1330	1351	1305	1300	1345	1315

DM1/Revised 1/81A

-y PD

rvisor R.E.K.

ORGANIC ANALYSIS

Entered by [illegible]

Checked by _____

ab No.	Water Analytical Results
1502	The following compounds were identified by matching to library mass spectra - They were not matched to standards
	Napthalene
	Methyl napthalene
	Dimethyl napthalene + undecane
	dihydro acenapthylene
	dibenzofuran
	Trimethyl napthalene
	octa decane
	fluorene
	phenanthrene
	Methyl phenanthrene
	fluoranthene
	pyrene
	benzofluorene
	Chrysene
	benz \A\ anthracene
	tetra chloro phenol
	penta chloro phenol
	4H - Cyclopenta \DEF\ Phenanthrene
	Napthalene carboxylic acid
	Acetic Acid ethyl ester
	Methyl pentane
	Dimethyl Butane
	Methyl Benzene (Toluene)
	Trimethyl Bicyclo Heptane
	Dihydro Indene

1 GC/MS/DS used

RIVER BASIN: Neu

REPORT TO: (Circle One)

ARO, FRO, MRO, RRO, WaRO WIRO, WSRO, BM, TS,

OTHER:

COLLECTOR(S): [illegible]

BOD RANGE: SEED:

CHLORINATED

DIVISION OF ENVIRONMENTAL MANAGEMENT
WATER QUALITY FIELD-LAB FORM (DM1)

SAMPLE TYPE

☐ AMBIENT ☐ CORE ☐ COMPLIANCE

☑ INTENSIVE S. ☐ SPLIT ☐ EMERGENCY

LAB NUMBER 00000:

DATE RECIEVED:

RECIEVED BY:

DATA ENTRY BY: CK:

DATE REPORTED:

STATION LOCATION: [illegible]

REMARKS: [illegible]

Station Number	Date Begin (yy/mm/dd)	Time Begin	Date End	Time End	Depth DM DB DBM	Value Type A H L	Sample Type C G GNXX	Composite I S B
Sample A	[illegible]	1145						

1		BOD5 310	mg/l		Chloride 940	mg/l		NH3 as N 610	mg/l		Mo – Molybdenum 1062	ug/l
2		COD High 340	mg/l		Arsenic Inorganic 997	<10 ug/l		TKN as N 625	mg/l		Na – Sodium 929	mg/l
3		COD Low 335	mg/l		Chl a: Tri 32210	ug/l		NO2+NO3 as N 630	mg/l		Ni – Nickel 1067	<100 ug/l
4		Coliform: MF Fecal 31616	/100ml		Chl a: Corr 32211	ug/l		PO4 as P 70507	mg/l		Pb – Lead 1051	100 ug/l
5		Coliform: MF Total 31504	/100ml		Phaophytin a 32218	ug/l		P: Total as P 665	mg/l		Sb – Antimony 1077	ug/l
6		Coliform: Tube Fecal 31615	/100ml		Color: True 80	Pt-Co		P: Dissolved as P 666	mg/l		Sn – Tin 1102	ug/l
7		Coliform: Tube Total 31505	/100ml		Chromium: Hex. 1032	ug/l		Ag – Silver 1077	ug/l		V – Vanadium 1087	ug/l
8		Residue: Total 500	mg/l		Cyanide 720	mg/l		Al – Aluminum 1105	ug/l		Zn – Zinc 1092	ug/l
9		Volatile 505	mg/l		Fluoride 951	mg/l		Ba – Barium 1007	ug/l		Pesticides (Specify)	
10		Fixed 510	mg/l		Formaldehyde 71880	mg/l		Be – Beryllium 1012	ug/l			
11		Residue: Suspended 530	mg/l		Grease and Oils 556	mg/l		Ca – Calcium 916	mg/l			
12		Volatile 535	mg/l		Hardness: Total 900	mg/l		Cd – Cadmium 1027	<50 ug/l			
13		Fixed 540	mg/l		MBAS 38260	mg/l		Co – Cobalt 1037	<100 ug/l		Organics (Specify)	
14		pH 403	units		Phenols 32730	ug/l		Chromium: Total 1034	<50 ug/l			
15		Acidity to pH 4.5 436	mg/l		Sulfate 945	mg/l		Cu – Copper 1042	<40 ug/l			
16		Acidity to pH 8.3 435	mg/l		Sulfide 745	mg/l		Fe – Iron 1045	18000 ug/l			
17		Alkalinity to pH 8.3 415	mg/l		Specific Cond. 95	uMhos/cm		Hg – Mercury 71900	ug/l			
18		Alkalinity to pH 4.5 410	mg/l		Biomass: Dry Wt. 573	g/M2		Li – Lithium 1132	ug/l			
19		TOC 680	mg/l		Biomass: Peri Ash Free 572	g/M2		Mg – Magnesium 927	11 mg/l			
20		Turbidity 76	NTU		Chl a: Peri Spectro 32228	mg/M2		Mn – Manganese 1055	[illegible] ug/l			

Sampling Point PT / #	Water Temperature (°C)	D.O.	pH	Conductance at 25°C	Alkalinity pH 8.3	Alkalinity pH 4.5	Acidity pH 4.5	Acidity pH 8.3
63 / 2	10	300	400	94	82244	431	82243	82242
Secchi (Meters)	Air Temperature (°C)	D.O. % Saturation	Salinity ‰	Algae: Floating Mats Severity	Precipitation (In/Day)	Cloud Cover: %	Wind Direction (Deg.)	Wind Force Beaufort
78	20	301	480	1325	45	32	36	37
1 Hr. Settleable Matter (ml/l/1hr)	Dead Fish Severity	Turbidity Severity	Odor, Atmosphere Severity	Stream Flow Severity	Detergent Suds Severity	Oil-Grease Severity	Floating Debris Severity	Sludge Severity
50086	1340	1350	1330	1351	1305	1300	1345	1315

DM1/Revised 1/81 LA

Supervisor R.K

Entered by

Checked by

Lab Nr.	Water Analytical Results
1503	The following compounds were identified by matching to library mass spectra. They were not matched to stds
	tetrachlorophenol
	pentachlorophenol
	anthracene
	3 unidentified peaks detected by GC/MS
1504	The following compound was identified by matching to library mass spectra. It was not matched to stds
	Trichloro, Trifluoro, ethane
	one unidentified peak detected by GC/MS.
	Sediment
1505	The following compounds were identified by matching to library mass spectra. They were not matched to standards
	Phenanthrene
	Fluoranthene
	Pyrene
	Benz [A] anthracene
	Chrysene
	Benzo [K] Fluoranthene
	Pentachlorophenol

✓ GC/MS/DS used

N.C. DEPT. OF NATURAL RESOURCES & COMMUNITY DEVELOPMENT

DIVISION OF ENVIRONMENTAL MANAGEMENT

WATER QUALITY FIELD-LAB FORM (DM1)

COUNTY: Chatham

RIVER BASIN: Cape Fear

REPORT TO: (Circle One)

ARO, FRO, MRO, RRO, WaRO, WIRO, WSRO, BM, TS,

OTHER:

COLLECTOR(S): Cook & Colvin

BOD RANGE: SEED:

CHLORINATED:

SAMPLE TYPE

☐ AMBIENT ☐ CORE ☐ COMPLIANCE

☑ INTENSIVE S. ☐ SPLIT ☐ EMERGENCY

LAB NUMBER 00008: 1504

DATE RECIEVED: 82/03/26

RECIEVED BY: [illegible]

DATA ENTRY BY: CK:

DATE REPORTED:

STATION LOCATION: Little Cedar Creek

REMARKS: 100 yds upstream of confluence with Lick

Station Number	Date Begin (yy/mm/dd)	Time Begin	Date End	Time End	Depth DM DB DBM	Value Type A H L	Sample Type C G GNXX	Composite T S
Sample 1	82 03 26	12:45						

1	BOD5 310	mg/l	Chloride 940	mg/l	NH3 as N 610	mg/l	Mo – Molybdenum 1062			
2	COD: High 340	mg/l	Arsenic: Inorganic 1002	<10 ug/l	TKN as N 625	mg/l	Na – Sodium 929	mg/l		
3	COD: Low 335	mg/l	Chl a: Trl 32217	ug/l	NO2+NO3 as N 630	mg/l	Ni – Nickel 1067	<100	ug/l	
4	Coliform: MF Fecal 31616	/100ml	Chl a: Corr 32209	ug/l	PO4 as P 70507	mg/l	Pb – Lead 1051	100	ug/l	
5	Coliform: MF Total 31504	/100ml	Pheophytin a 32213	ug/l	P: Total as P 665	mg/l	Sb – Antimony 1097		ug/l	
6	Coliform: Tube Fecal 31615	/100ml	Color: True 80	Pt-Co	P: Dissolved as P 666	mg/l	Sn – Tin 1102		ug/l	
7	Coliform Tube Total 31505	/100ml	Chromium: Hex. 1032	ug/l	Ag – Silver 1077	ug/l	V – Vanadium 1087		ug/l	
8	Residue: Total 500	mg/l	Cyanide 720	mg/l	Al – Aluminum 1105	ug/l	Zn – Zinc 1092	<50	ug/l	
9	Volatile 505	mg/l	Fluoride 951	mg/l	Ba – Barium 1007	ug/l	Pesticides (Specify)			
10	Fixed 510	mg/l	Formaldehyde 71880	0.1 mg/l	Be – Beryllium 1012	ug/l				
11	Residue: Suspended 530	mg/l	Grease and Oils 556	mg/l	Ca – Calcium 916	mg/l				
12	Volatile 535	mg/l	Hardness: Total 900	mg/l	Cd – Cadmium 1027	<50	ug/l			
13	Fixed 540	mg/l	MBAS 38260	mg/l	Co – Cobalt 1037	<100	ug/l	Organics (Specify)	Sa	
14	pH 403	units	Phenols 32730	ug/l	Chromium: Total 1034	<50	ug/l			
15	Acidity to pH 4.5 436	mg/l	Sulfate 945	mg/l	Cu – Copper 1042	<40	ug/l			
16	Acidity to pH 8.3 435	mg/l	Sulfide 745	mg/l	Fe – Iron 1045	700	ug/l			
17	Alkalinity to pH 8.3 415	mg/l	Specific Cond. 95	uMhos/cm	Hg – Mercury 71900	<.2	ug/l			
18	Alkalinity to pH 4.5 410	mg/l	Biomass: Dry Wt. 573	g/M²	Li – Lithium 1132		ug/l			
19	TOC 680	mg/l	Biomass: Peri Ash Free 572	g/M²	Mg – Magnesium 927	5.6	mg/l			
20	Turbidity 76	NTU	Chl a: Peri Fluro 82547	mg/M²	Mn – Manganese 1055	900	ug/l			

A	Sampling Point PT / T: 63 / 2	Water Temperature (°C) 10	D.O. 300	pH 400	Conductance at 25°C 94	Alkalinity pH 8.3 82244	Alkalinity pH 4.5 431	Acidity pH 4.5 82243	Acidity pH 8.3 82242
B	Secchi (Meters) 78	Air Temperature (°C) 20	D.O. % Saturation 301	Salinity ‰ 480	Algae: Floating Mats Severity 1325	Precipitation (In/Day) 45	Cloud Cover: % 32-	Wind Direction (Deg.) 36	Wind Force Beaufort 37
C	1 Hr. Settleable Matter (ml/l/Hr) 50086	Dead Fish Severity 1340	Turbidity Severity 1350	Odor: Atmosphere Severity 1330	Stream Flow Severity 1351	Detergent Suds Severity 1305	Oil-Grease Severity 1300	Floating Debris Severity 1345	Sludge Severity 1315

DM1/Revised 1/81 LA

Supervisor [illegible] Entered by [illegible]

Checked by _____

Lab No.	Water Analytical Results
1503	The following compounds were identified by matching to library mass spectra. They were not matched to stds.
	tetrachlorophenol
	pentachlorophenol
	anthracene
	3 unidentified peaks detected by GC/MS
1504	The following compound was identified by matching to library mass spectra. It was not matched to stds
	Trichloro, Trifluoro, ethane
	one unidentified peak detected by GC/MS.
	Sediment
1505	The following compounds were identified by matching to library mass spectra. They were not matched to standards
	Phenanthrene
	Fluoranthene
	Pyrene
	Benz [A] anthracene
	Chrysene
	Benzo [K] Fluoranthene
	Pentachlorophenol

✓ GC/MS/DS used

N.C. DEPT. OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT
FIELD/LAB FORM
SEDIMENT/TISSUE

LAB NUMBER #: 1905
DATE RECIEVED: 4-13-2005 @ 2
RECIEVED BY: [illegible]
DATA ENTRY BY: CK:
DATE REPORTED:

BASIN: Cape Fear
REPORT TO: (Circle One)
ARO, WSRO, MRO, FRO, WaRO, WIRO, RRO, FS, BM,
AM, OTHER:
COLLECTOR: Lewis Gaskins & Stevens

[x] SEDIMENT [ ] AMBIENT [ ] CORE
[ ] TISSUE [ ] COMPLIANCE [ ] SPLIT
[ ] INTENSIVE S. [ ] EMERGENCY

STATION LOCATION:
REMARKS:

Station Number	Date Begin	Time Begin	Date End	Time End	Depth DM DB DMB	Value Type	T, S, or B	Sample Type
SAMPLE	3-APR-05	1215				A H L		C G GNXX

	Tissue	Units	Sediment	Units	Tissue	Units	Sediment	Units	Tissue	Units	Sediment	Units
1	01004 As	mg/Kg	01003 As 3.2	mg/Kg			00611 NH3	mg/Kg	39482 Methoxychlr	ug/Kg	39481 Methoxychlr	ug/Kg
2	01686 Al	mg/Kg	01106 Al 130	mg/Kg			00627 TKN as N	mg/Kg	34688 Hxchlbenzene	mg/Kg	39701 Hxchlbenzene	ug/Kg
3	71940 Cd	mg/Kg	01028 Cd <.50	mg/Kg			00633 NO2 & NO3	mg/Kg	39080 PCP	ug/g	39081 PCP	ug/Kg
4	71939 Cr;tot.	mg/Kg	01029 Cr;tot. 47	mg/Kg			00668 P,tot as P	mg/Kg	39074 alpha-BHC	ug/g	39076 alpha-BHC	ug/Kg
5	71937 Cu	mg/Kg	01043 Cu 4.5	mg/Kg			70511 PO4 as P	mg/Kg	39075 gamma-BHC	ug/g	3981 gamma-BHC	ug/Kg
6	01660 Fe	mg/Kg	01170 Fe 33000	mg/Kg	34680 Aldrin	mg/Kg	39333 Aldrin	mg/Kg	34685 Endrin	mg/Kg	39393 Endrin	ug/Kg
7	71930 Hg	mg/Kg	71921 Hg .01	mg/Kg	34684 Dieldrin	mg/Kg	39383 Dieldrin	mg/Kg	39515 PCB	mg/Kg	39519 PCB	ug/Kg
8	01656 Mg	mg/Kg	00924 Mg 6800	mg/Kg	39325 o,P DDD	ug/g	39318 o,P DDD	ug/Kg	Others:		Others:	
9	01089 Ni	mg/Kg	01068 Ni 78	mg/Kg	39312 P,P DDD	ug/g	39311 P,P DDD	ug/Kg				
10	71936 Pb	mg/Kg	01052 Pb 16	mg/Kg	39329 o,P DDE	ug/g	39328 o,P DDE	ug/Kg				
11	71938 Zn	mg/Kg	01093 Zn 48	mg/Kg	39322 P,P DDE	ug/g	39321 P,P DDE	ug/Kg				
12	Other Metals:	mg/Kg	Other Metals:	mg/Kg	39290 Total DDT	ug/g	39373 Total DDT	ug/Kg				
13		mg/Kg		mg/Kg	39318 o,P DDT	ug/g	39306 o,P DDT	ug/Kg				
14		mg/Kg		mg/Kg	39302 P,P DDT	ug/g	39301 P,P DDT	ug/Kg				
15		mg/Kg		mg/Kg	39063 cis-Chlordane	ug/g	39064 cis-Chlordane	ug/Kg				
16		mg/Kg		mg/Kg	39066 trans-Chlordane	ug/g	39067 trans-Chlordane	ug/Kg				
17		mg/Kg		mg/Kg	39069 cis-N'chlor	ug/g	39070 cis-N'chlor	ug/Kg				
18		mg/Kg		mg/Kg	39072 trans-N'chlor	ug/g	39073 trans-N'chlor	ug/Kg				
19		mg/Kg		mg/Kg								

	Sampling Point	Temperature °C	Dissolved Oxygen	pH Units	Conductivity	Salinity ‰	Turbidity FTU	Stream Color	Secchi (M)
A	pt 93 / % 2	10	300	400	95	70305	78		78
	R P	Stream Stage ft	Flow MGD	Floating Debris Sever.	Sludge Severity	Detergent Suds Sever.	Atmos. Odor Severity	Cloud Cover %	Wind Dir from North
B	B 847	65	50051	1345	1315	1305	1330	32	36

Supervisor R.K Entered by _____

Checked by _____

Lab No.	Water Analytical Results
1503	The following compounds were identified by matching to library mass spectra. They were not matched to stds tetrachlorophenol pentachlorophenol anthracene 3 unidentified peaks detected by GC/MS
1504	The following compound was identified by matching to library mass spectra. It was not matched to stds Trichloro, Trifluoro, ethane one unidentified peak detected by GC/MS.
1505	Sediment The following compounds were identified by matching to library mass spectra. They were not matched to standards Phenanthrene Fluoranthene Pyrene Benz [A] anthracene Chrysene Benzo [K] Fluoranthene Pentachlorophenol

✓ GC/MS/DS used

N.C. DEPT. OF NATURAL RESOURCES & COMMUNITY DEVELOPMENT

DIVISION OF ENVIRONMENTAL MANAGEMENT
WATER QUALITY FIELD-LAB FORM (DM1)

COUNTY:

RIVER BASIN:

REPORT TO: (Circle One)

ARO, FRO, MRO, RRO, WaRO WIRO, WSRO, BM, TS,

OTHER:

COLLECTOR(S):

BOD RANGE: SEED:

CHLORINATED:

LAB NUMBER 00008: 1506

DATE RECIEVED:

RECIEVED BY:

DATA ENTRY BY: CK:

DATE REPORTED:

SAMPLE TYPE

☐ AMBIENT ☐ CORE ☐ COMPLIANCE

☑ INTENSIVE S. ☐ SPLIT ☐ EMERGENCY

STATION LOCATION:

REMARKS:

Station Number	Date Begin(yy/mm/dd)	Time Begin	Date End	Time End	Depth DM DB DBM	Value Type A H L	Sample Type C G GNXX	Composite T
		1015						

1	BOD5 310	mg/l		Chloride 940	mg/l		NH3 as N 610	mg/l		Mo – Molybdenum 1062	ug/l
2	COD: High 340	mg/l	V	Arsenic: Inorganic 997	<10 ug/l		TKN as N 625	mg/l		Na – Sodium 929	mg/l
3	COD: Low 335	mg/l		Chl a: Tri 32210	ug/l		NO2+NO3 as N 630	mg/l		Ni – Nickel 1067	<100 ug/l
4	Coliform: MF Fecal 31616	/100ml		Chl a: Corr 32211	ug/l		PO4 as P 70507	mg/l		Pb – Lead 1051	100 ug/l
5	Coliform: MF Total 31504	/100ml		Pheophytin a 32218	ug/l		P: Total as P 665	mg/l		Sb – Antimony 1097	ug/l
6	Coliform: Tube Fecal 31615	/100ml		Color: True 80	Pt-Co		P: Dissolved as P 666	mg/l		Sn – Tin 1102	ug/l
7	Coliform: Tube Total 31505	/100ml		Chromium: Hex. 1032	ug/l		Ag – Silver 1077	ug/l		V – Vanadium 1087	ug/l
8	Residue: Total 500	mg/l		Cyanide 720	mg/l		Al – Aluminum 1105	ug/l		Zn – Zinc 1092	<50 ug/l
9	Volatile 505	mg/l		Fluoride 951	mg/l		Ba – Barium 1007	ug/l		Pesticides (Specify)	
10	Fixed 510	mg/l		Formaldehyde 71880	<0.1 mg/l		Be – Beryllium 1012	ug/l			
11	Residue: Suspended 530	mg/l		Grease and Oils 556	mg/l		Ca – Calcium 916	mg/l			
12	Volatile 535	mg/l		Hardness: Total 900	mg/l		Cd – Cadmium 1027	<50 ug/l			
13	Fixed 540	mg/l		MBAS 38260	mg/l		Co – Cobalt 1037	<100 ug/l	V	Organics (Specify)	
14	pH 403	units		Phenols 32730	ug/l		Chromium: Total 1034	<50 ug/l			
15	Acidity to pH 4.5 436	mg/l		Sulfate 945	mg/l		Cu – Copper 1042	<40 ug/l			
16	Acidity to pH 8.3 435	mg/l		Sulfide 745	mg/l		Fe – Iron 1045	6000 ug/l			
17	Alkalinity to pH 8.3 415	mg/l		Specific Cond. 95	uMhos/cm		Hg – Mercury 71900	0.4 ug/l			
18	Alkalinity to pH 4.5 410	mg/l		Biomass: Dry Wt. 573	g/M2		Li – Lithium 1132	ug/l			
19	TOC 680	mg/l		Biomass: Peri Ash Free 572	g/M2		Mg – Magnesium 927	66 mg/l			
20	Turbidity 76	NTU		Chl a: Peri Spectro 32228	mg/M2		Mn – Manganese 1055	700 ug/l			

A	Sampling Point PT / % 63 / 2	Water Temperature(°C) 10	D.O. 300	pH 400	Conductance at 25°C 94	Alkalinity pH 8.3 82244	Alkalinity pH 4.5 431	Acidity pH 4.5 82243	Acidity pH 8.3 82242
B	Secchi (Meters) 78	Air Temperature(°C) 20	D.O. % Saturation 301	Salinity ‰ 480	Algae: Floating Mats Severity 1325	Precipitation(In/Day) 45	Cloud Cover: % 32	Wind Direction(Deg.) 36	Wind Force Beaufort 37
C	1 Hr. Settleable Matter(ml/l/Hr) 50086	Dead Fish Severity 1340	Turbidity Severity 1350	Odor: Atmosphere Severity 1330	Stream Flow Severity 1351	Detergent Suds Severity 1305	Oil-Grease Severity 1300	Floating Debris Severity 1345	Sludge Severity 1315

DM1/Revised 1/81LA

ed by PTD

upervisor REK

ORGANIC ANALYSIS

Entered by [illegible]

Checked by _____

Lab No.	Water Analytical Results
1506	The following compounds were identified by matching to library mass spectra. They were not matched to standards.
	Fluoranthrene HW + PTP PAHs not exceeding 2 ug/l
	Pyrene
	Chrysene
	Hydroxy, Methyl, Pentanone
	Tetrachlorophenol
	Pentachlorophenol
	three unidentified peaks detected by GC/MS
1507	[redacted]
	No Acid or Base Neutral organics detected by GC/FID

_____ GC/MS/DS used

N.C. DEPT. OF NATURAL RESOURCES & COMMUNITY DEVELOPMENT

DIVISION OF ENVIRONMENTAL MANAGEMENT

WATER QUALITY FIELD-LAB FORM (DM1)

COUNTY: [illegible]

RIVER BASIN: [illegible]

REPORT TO: (Circle One)

ARO, FRO, MRO, (RRO) WaRO, WiRO, WSRO, BM, TS

OTHER:

COLLECTOR(S): [illegible]

BOD RANGE: SEED:

CHLORINATED

LAB NUMBER 00008: [illegible]

DATE RECIEVED: 87.03.2[illegible]

RECIEVED BY: [illegible]

DATA ENTRY BY: CK

DATE REPORTED:

SAMPLE TYPE

- [ ] AMBIENT
- [ ] CORE
- [ ] COMPLIANCE
- [x] INTENSIVE S
- [ ] SPLIT
- [ ] EMERGENCY

STATION LOCATION: [illegible]

REMARKS: [illegible]

Station Number	Date Begin yy/mm/dd	Time Begin	Date End	Time End	Depth DM D8 D8M	Value Type A H L	Sample Type C G GNXX	Composite T S
[illegible]	87 | 03 | 20	12:30						

1		BOD5 310	mg/l		Chloride 940	mg/l		NH3 as N 610	mg/l		Mo – Molybdenum 1062	ug/l
2		COD High 340	mg/l	✓	Arsenic: Inorganic 1002	<10 ug/l		TKN as N 625	mg/l		Na – Sodium 929	mg/l
3		COD Low 335	mg/l		Chl a: Tri 32217	ug/l		NO2+NO3 as N 630	mg/l	✓	Ni – Nickel 1067	<100 ug/l
4		Coliform: MF Fecal 31616	/100ml		Chl a: Corr 32209	ug/l		PO4 as P 70507	mg/l	✓	Pb – Lead 1051	<100 ug/l
5		Coliform: MF Total 31504	/100ml		Pheophytin a 32213	ug/l		P: Total as P 665	mg/l		Sb – Antimony 1097	ug/l
6		Coliform: Tube Fecal 31615	/100ml		Color: True 80	Pt-Co		P: Dissolved as P 666	mg/l		Sn – Tin 1102	ug/l
7		Coliform: Tube Total 31505	/100ml		Chromium: Hex. 1032	ug/l		Ag – Silver 1077	ug/l		V – Vanadium 1087	ug/l
8		Residue: Total 500	mg/l		Cyanide 720	mg/l		Al – Aluminum 1105	ug/l	✓	Zn – Zinc 1092	<50 ug/l
9		Volatile 505	mg/l		Fluoride 951	mg/l		Ba – Barium 1007	ug/l		Pesticides (Specify)	
10		Fixed 510	mg/l	X	Formaldehyde 71880	<1 mg/l		Be – Beryllium 1012	ug/l			
11		Residue: Suspended 530	mg/l		Grease and Oils 556	mg/l		Ca – Calcium 916	mg/l			
12		Volatile 535	mg/l		Hardness: Total 900	mg/l	✓	Cd – Cadmium 1027	<50 ug/l			
13		Fixed 540	mg/l		MBAS 38260	mg/l	✓	Co – Cobalt 1037	<100 ug/l	✓	Organics (Specify)	Gas
14		pH 403	units		Phenols 32730	ug/l	✓	Chromium: Total 1034	<50 ug/l		[illegible]	
15		Acidity to pH 4.5 436	mg/l		Sulfate 945	mg/l	✓	Cu – Copper 1042	<40 ug/l		[illegible]	
16		Acidity to pH 8.3 435	mg/l		Sulfide 745	mg/l	✓	Fe – Iron 1045	800 ug/l		[illegible]	
17		Alkalinity to pH 8.3 415	mg/l		Specific Cond. 95	uMhos/cm	✓	Hg – Mercury 71900	<0.2 ug/l		Creosote	
18		Alkalinity to pH 4.5 410	mg/l		Biomass: Dry Wt. 573	g/M2		Li – Lithium 1132	ug/l		[illegible]	
19		TOC 680	mg/l		Biomass: Peri Ash Free 572	g/M2	✓	Mg – Magnesium 927	4.9 mg/l		[illegible]	
20		Turbidity 76	NTU		Chl a: Peri Fluro 82547	mg/M2	✓	Mn – Manganese 1055	90 ug/l	✓	[illegible]	

A	Sampling Point PT / % 63 / 2	Water Temperature (°C) 10	D.O. 300	pH 400	Conductance at 25°C 94	Alkalinity pH 8.3 d2244	Alkalinity pH 4.5 431	Acidity pH 4.5 82243	Acidity pH 8.3 82242
B	Secchi (Meters) 78	Air Temperature (°C) 20	D.O. % Saturation 301	Salinity ‰ 480	Algae: Floating Mats Severity 1325	Precipitation (In/Day) 45	Cloud Cover: % 32	Wind Direction (Deg.) 36	Wind Force Beaufort 37
C	1 Hr. Settleable Matter (ml/l/Hr) 50086	Dead Fish Severity 1340	Turbidity Severity 1350	Odor: Atmosphere Severity 1330	Stream Flow Severity 1351	Detergent Suds Severity 1305	Oil-Grease Severity 1300	Floating Debris Severity 1345	Sludge Severity 1315

DM1/Revised 1/81LA

ed by PTD

pervisor REK

ORGANIC ANALYSIS

Entered by [illegible]

Checked by _____

Lab No.	Water Analytical Results
1506	The following compounds were identified by matching to library mass spectra. They were not matched to standards.
	Fluoranthene Hw + PTP PAHs not exceeding .2 ug/l
	Pyrene
	Chrysene
	Hydroxy Methyl Pentanone
	Tetrachlorophenol
	Penta Chloro phenol
	three unidentified peaks detected by GC/MS
1507	[redacted]
	No Acid or Base Neutral compounds detected by GC/FID

✓ GC/MS/DS used

NCD 053488557

Date: January 26, 1982

County: Chatham

Notifier's name and address: C. A. Counsil

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

Contact's name: Mr. Charles Burdell *803) 576-7660

Site name and address: Southern Wood Piedmont

State Road 2139, Gulf, N.C. 27256

Site location:

Type of waste: Possible creosote, pentachlorophenol, copper chromic arsenic sludges

What process generated the waste? Wood Preservation Treatment

Volume of waste:

Method of storage or disposal: on-site burial

Dates of waste activity: 1946 - 1980

Site history: C. A. Counsil notified that Southern Wood Piedmont Company buried creosote, pentachlorophenol, and copper chromic arsenic sludges on plant property between 1946 and 1980. The plant, located in Gulf, N.C., ceased operations in 1980.

*The preceding information is based on preliminary data supplied by the Environmental Protection Agency, and not on detailed site investigations.

Ref. 22

10 January 1991

MEMORANDUM

TO: File

FROM: Charlotte Jesneck
Superfund Section

RE: Southern Wood Piedmont
Gulf, Chatham County
Site Cleanup

I telephoned Chuck Davis (803/599-1075) with Southern Wood Piedmont today to find out if the company was involved in a cleanup. Mr. Davis said that they recently excavated three dry ponds at the site and sent the waste to Marine Shale in Louisiana to be incinerated. Approximately 35,000 tons of waste was sent off-site for incineration. Mr. Davis said that, as he previously indicated in the meeting with our Division on 20 April 1990, his company was not interested in signing an Administrative Order on Consent. Mr. Davis added that he will submit the information on the cleanup and on the ongoing site assessment being conducted by Geraghty and Miller after all the data is compiled.

CJ/acr

Ref. 23

MEMO

TO: Superfund Section Staff

FROM: Jeanette Stanley
Environmental Chemist
NC Superfund Section

DATE: August 15, 1996

SUBJECT: Update on Status of Wellhead Protection Programs in N.C.

I spoke with Mr. Randy Prillaman, Hydrogeologist, NC DEM (919) 715-6187. He said that the Wellhead Protection Area implementation plan written by him and submitted to US EPA in late December 1994 has been approved. This plan calls for protection of a whole area based on a calculation using recharge rate and pumping rate as variables.

North Carolina now has primacy in approval of wellhead protection areas. None have yet been implemented. Several requests for approval have been received but no areas have yet been approved. Mr. Prillaman said that he could not project a date when a plan would be approved.

Site Name: Southern Wood Piedmont
Site Number: NCD 053 488 557

Site Location: Gulf, N.C.
Chatham County
Latitude: 35 33 37.5
Longitude: 79 16 38.0

Date: July 06, 1992

Calculation Results

Distance from Site Location	Population Per Ring	Population Cumulative	Number of Households Per Ring	Number of Households Cumulative
0 to 1/4 mile	27	27	9	9
>1/4 to 1/2 mile	60	87	24	33
>1/2 to 1 mile	103	190	39	72
>1 to 2 miles	227	417	93	165
>2 to 3 miles	464	881	184	349
>3 to 4 miles	1,052	1,933	399	748

Note: The populations and number of households within specified target distance rings were calculated for the NC Superfund Section by the NC State Center for Geographic Information and Analysis using the 1990 US Census data. These values were calculated by summing the population and the number of households data for each census block located within each target ring. For census blocks lying only partially within the ring, the per cent area of the block within the ring was multiplied by the population and household densities of the block.

P. O. Box 5447
Spartanburg, S. C. 29304
Phone 803/576-7660

Ref. [illegible]25

P.40

Southern Wood Piedmont Company

11-M-1.4.8
November 19, 1980

Mr. Stan Taylor
Regional Engineer
Water Quality Section
N.C. DEPARTMENT OF NATURAL
RESOURCES & COMMUNITY DEVELOPMENT
P. O. Box 27687
Raleigh, North Carolina 27611

Dear Mr. Taylor:

I would like to inform you that Southern Wood Piedmont Company has successfully concluded the evaporation of all water in the water pollution control project at our plant in Gulf, North Carolina. After this evaporation, the water pollution system has been closed and landscaped.

Most of the other plant facilities have been removed. Our demolition contractor expects to be finished by the end of December. By that time, the rest of the plant site will be landscaped. We plan to plant grass and trees over this whole area.

We would like to thank you and your department for the cooperation we received on the addendum to our Permit No. 3931, allowing us to use additional evaporation measures. Now that this water pollution project is no longer needed, we will be allowing this permit to lapse.

Thank you again for your cooperation. If you have any questions, please do not hesitate to give us a call.

Sincerely yours,

SOUTHERN WOOD PIEDMONT COMPANY

Joe Morgan III

Joe Morgan III
Environmental Manager

JMIII:kwf

cc: Mr. L. G. Hope
Mr. C. A. Burdell - Atlanta
Mr. M. T. Breen - Atlanta
Mr. D. G. Wright

Ref. 26

DEPARTMENT OF COMMERCE
[illegible] Hodges, Secretary

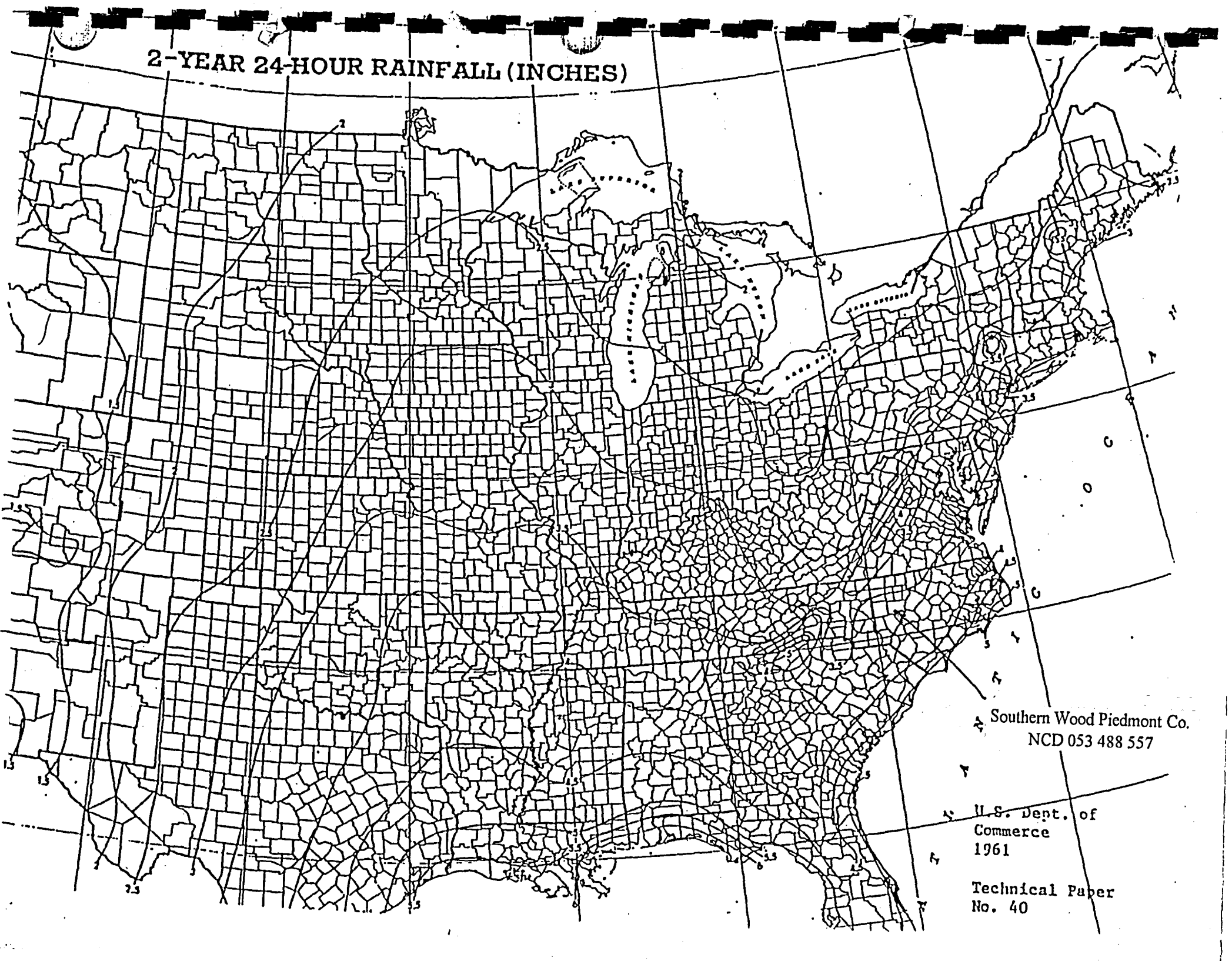
WEATHER BUREAU
F. W. Reichelderfer, Chief

TECHNICAL PAPER NO. 40

RAINFALL FREQUENCY ATLAS OF THE UNITED STATES

for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years

Prepared by
DAVID M. HERSHFIELD
Cooperative Studies Section, Hydrologic Services Division
for
Engineering Division, Soil Conservation Service
U.S. Department of Agriculture


2-YEAR 24-HOUR RAINFALL (INCHES)
Southern Wood Piedmont Co.
NCD 053 488 557
U.S. Dept. of Commerce
1961
Technical Paper
No. 40

Ref. 27

January 26, 1994

TO: File

FROM: Irene Williams, Environmental Chemist Irene Williams
N.C. Superfund Section

RE: Southern Wood Piedmont Gulf Site (NCD 053 488 557)
Day care centers in vicinity of site

Review of the September, 1992, monthly alphabetic listing of facilities from the Division of Facility Services, Child Day Care Section, revealed that the closest day care centers are located in the town of Goldston. Goldston is located between 3 and 4 miles from the site and is served by the Goldston-Gulf municipal water system.

Ref. 28

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT, HEALTH AND NATURAL RESOURCES Ref. 28
DIVISION OF SOLID WASTE MANAGEMENT

ORIGINAL

4

1990 HAZARDOUS WASTE ANNUAL REPORT
(Generators & On-Site TSD Facilities)

I. FACILITY INFORMATION

Facility Name: Southern Wood Piedmont Co. Facility EPA ID Number: NCD053488557

Location of Facility: State Road 2139
(Street or Route Number)

Gulf	Chatham	NC	27256
(City or Town)	(County)	(State)	(Zip Code)

Facility Contact: William P. Arrants 803-599-1078
(Name) (Area Code) (Phone Number)

List EPA ID Number of each Transporter used during 1990: ALD981023492

II. QUANTITY VERIFICATION

The weights reported for each waste stream were determined from:

- X Actual weight
- ___ Gallons times the weight of water (8.34 lbs per gallon)
- ___ Gallons times the density of the waste
- ___ Other, specify ___

Estimated percentage of error in method used to determine weight: ±3 %

Waste identification was determined from:

- X Knowledge of product/raw materials
- ___ Sampling results
- ___ Other, specify ___

III. CERTIFICATION

I certify a program is in place to reduce the volume and toxicity of hazardous waste generated to the degree to be economically practicable, and the proposed method of treatment, storage or disposal is that practicable method currently available which minimized the present and future threat to human health and the environment.

-AND-

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

(Signature)	William P.Arrants (Print of Type Name)	2-22-91 (Date Signed)

000001

DEHNR 3036/3037 (Revised 1-90)
Hazardous Waste Section
Doc. No. 36-27

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT, HEALTH AND NATURAL RESOURCES
DIVISION OF SOLID WASTE MANAGEMENT

000002

1990 HAZARDOUS WASTE ANNUAL REPORT
(Generators & On-Site TSD Facilities)

RECEIVED
FEB 26 1991
HAZARDOUS WASTE SECTION

ORIGINAL

Facility EPA ID Number: NCD053488557

Waste Identification					On-Site Waste Management		Off-Site Waste Management			Waste Minimization	
Line No.	Waste No.	Waste Form Code	Waste Source Code	Quantity Generated On-Site (lbs)	On-Site Handling Code	Quantity Stored** Treated/Recovered or Disposed On-Site (lbs)	Off-Site Handling Code	Quantity Shipped Off-Site (lbs)	Receiving Facility EPA ID Number	Production Index	Activity Code
1	K001	B603	A60	72,963,379	N/A	0	T03	72,963,379	LAD981057706	NA	NA
2											
3											
4											
5											
6											
7											
8											
9											
10											

For additional waste streams complete the "Continuation Sheet"

**As of December 31, 1990

NOTE: Read Instructions before completing form

DEHNR 3036/3037 (Revised 1-90)
Hazardous Waste Section
Doc. No. 36-37

Ref. 29

Ref. 29
P. O. Box 5447
Spartanburg, S. C. 29304

Phone 803/576-7660

COPY

Southern Wood Piedmont Company

April 6, 1988

Mr. Jack Butler
Superfund Unit
Division of Health Services
P. O. Box 2091
Raleigh, NC 27602

Dear Mr. Butler:

As per our phone conversation of 3/30/88, attached please find Southern Wood Piedmont's completed questionaire. I appreciate your understanding and approval of these few days delay in submitting the questionaire. It allowed me to find and question two employees that had worked at the site before closure.

If you need any additional information, please call me at 803-576-7660.

Sincerely,

Edward L. Gibbs
Manager Regulatory Affairs

CC: M. D. Pruett

554bw

N.C. Department of Human Resources
Division of Health Services

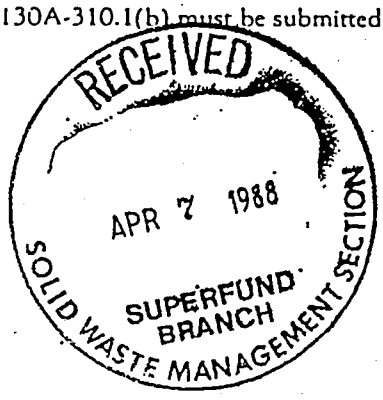
For Agency Use Only
SITE # _____

SECTION A

NOTIFICATION OF AN INACTIVE HAZARDOUS SUBSTANCE OR WASTE DISPOSAL SITE

North Carolina General Statutes Section 130A-310 provides for protection of the public from inactive hazardous substance or waste disposal sites. Notification information, required by North Carolina General Statutes Section 130A-310.1(b) must be submitted to:

Superfund Unit
Division of Health Services
P.O. Box 2091
Raleigh, NC 27602-2091



Please read instructions before completing.

Please type or print in black ink.

A. SITE NAME AND PERSON REQUIRED TO NOTIFY:

1. Site Name Southern Wood Piedmont - Gulf
(One site per form)

2. Person Completing Form:
Name Edward L. Gibbs
Mailing Address P. O. Box 5447
City Spartanburg State S.C. Zip Code 29304
Telephone (803) 576-7660

- [ ] Present Owner
- [ ] Past Owner
- [ ] Present Operator
- [ ] Past Operator
- [X] Other (specify) Environmental Mgr.

3. Present Owner:
Name Southern Wood Piedmont
Mailing Address P. O. Box 5447
City Spartanburg State S.C. Zip Code 29304
Telephone (803) 576-7660

- [X] Corporation
- [ ] Partnership
- [ ] Individual
- [ ] Other Responsible Party (specify) _____

4. Other General Creosoting
Mailing Address _____
City _____ State _____ Zip Code _____
Telephone ( )

- [X] Past Owner
- [ ] Present Operator
- [ ] Past Operator
- [ ] Other Responsible Party (specify) _____

5. Other _____
Mailing Address _____
City _____ State _____ Zip Code _____
Telephone ( )

- [ ] Past Owner
- [ ] Present Operator
- [ ] Past Operator
- [ ] Other Responsible Party (specify) _____

Site Name Southern Wood Piedmont - Gulf

B. SITE LOCATION:

1. Street or Route Address 2139 State Rd.
   City or Town Gulf
   County Chatham

2. Directions to the Site *(Use state road numbers where possible.)*

   From Sanford go north on 241 to Gulf township
   Turn right, go 1/2 mile to State Rd. 2139
   SWP - Gulf is vacant property across intersection.

3. Attach a Department of Transportation map or a USGS map showing the location of the site or facility. Label the map with the site name.

4. Check the appropriate description of the area surrounding the site. *(More than one may apply.)*

   [X] Residential [X] Industrial [X] Forest Land
   [ ] Business [ ] Pasture Land [ ] Farm Land
   [ ] Other *(specify)* _____

C. TYPE AND YEARS OF OPERATION:

1. Type of Operation Wood Treating [ ] Present
   Standard Industrial Classification Code (SIC) 2491 [X] Past
   Years of Operation (Dates) from 1 9/4 6 to 1 9/8 0

2. Type of Operation _____ [ ] Present
   Standard Industrial Classification Code (SIC) _____ [ ] Past
   Years of Operation (Dates) from __/__ to __/__

3. Type of Operation _____ [ ] Present
   Standard Industrial Classification Code (SIC) _____ [ ] Past
   Years of Operation (Dates) from __/__ to __/__

D. ENVIRONMENTAL PERMIT HISTORY:

If no environmental permit has been issued, check "None" for each type of permit. Complete for each of the following.

Type of Permit	None	Permit Number	Date Issued	Expiration Date	Comments
1. NPDES	[ ]	NC0000787	08/75	03/76	
2. Air	[ ]	?	?/__	?/__	Site had boiler permit
3. RCRA	[X]		__/__	__/__	
4. RCRA interim status	[X]		__/__	__/__	
5. State	[X]		__/__	__/__	
a. Non-discharge	[ ]	3931-R	08/76	06/81	System ceased operation
b. High productivity well	[X]		__/__	__/__	10 - 1980
c. Other *(specify)* _____	[ ]	8132	04/75	06/76	Waste water discharge
6. Local *(specify)* _____	[X]		__/__	__/__	
7. Other *(specify)* _____	[X]		__/__	__/__	

000003

Site Name Southern Wood Piedmont - Gulf

E. CURRENT ENVIRONMENTAL PERMITS:

If no environmental permit has been issued, check "None" for each type of permit. Complete for each of the following.

Type of Permit	None	Permit Number	Date Issued	Expiration Date	Comments
1. NPDES	[X]		__/__/__	__/__/__	
2. Air	[X]		__/__/__	__/__/__	
3. RCRA	[X]		__/__/__	__/__/__	
4. RCRA interim status	[X]		__/__/__	__/__/__	
5. State	[X]		__/__/__	__/__/__	
a. Non-discharge	[X]		__/__/__	__/__/__	
b. High productivity well	[X]		__/__/__	__/__/__	
c. Other (*specify*) _____	[X]		__/__/__	__/__/__	
6. Local (*specify*) _____	[X]		__/__/__	__/__/__	
7. Other (*specify*) _____	[X]		__/__/__	__/__/__	

F. KNOWN OR SUSPECTED RELEASE OF HAZARDOUS SUBSTANCE OR WASTE TO THE ENVIRONMENT:

(More than one may apply.)

Environmental Media	Known	Suspected	Date of Known or Suspected Release	Likely	Unlikely	None	Comments
1. Groundwater	[ ]	[ ]	__/__/__	[ ]	[ ]	[ ]	No information
2. Surface water	[ ]	[ ]	__/__/__	[ ]	[ ]	[ ]	" "
3. Surface soil	[ ]	[ ]	__/__/__	[X]	[ ]	[ ]	
4. Subsurface soil	[X]	[ ]	4 6/8 0	[ ]	[ ]	[ ]	Material buried on site
5. Air	[ ]	[ ]	__/__/__	[ ]	[X]	[ ]	@ closure - 1980

G. PHYSICAL STATE OF HAZARDOUS SUBSTANCE OR WASTE AS DEPOSITED: *(More than one may apply.)*

1. [X] Solid
2. [ ] Powder
3. [ ] Liquid
4. [X] Sludge
5. [ ] Non-Containerized Gas
6. [ ] Containerized Gas
7. [ ] Other *(describe)* _____

H. HAZARDOUS SUBSTANCE OR WASTE DISPOSAL AND STORAGE METHOD: *(More than one may apply.)*

1. [ ] Piles
2. [ ] Land treatment
3. [X] Landfill
4. [ ] Tanks, underground
5. [ ] Tanks, above ground
6. [ ] Septic tanks
7. [ ] Impoundment
8. [ ] Underground injection
9. [ ] Drums, above ground
10. [ ] Drums, above ground, in open
11. [ ] Drums, below ground
12. [ ] Other (*specify*) _____

I. HAZARDOUS SUBSTANCE OR WASTE TYPE USED OR DISPOSED ON SITE: *(More than one may apply.)*

1. [X] Organics
2. [ ] Inorganics
3. [ ] Solvents
4. [ ] Pesticides
5. [ ] Heavy metals
6. [ ] Acids
7. [ ] Bases
8. [ ] PCBs
9. [ ] Mixed municipal waste
10. [ ] Unknown
11. [ ] Other (*specify*) _____

Site Name Southern Wood Piedmont - Gulf

J. HAZARDOUS SUBSTANCE OR WASTE QUANTITY: *(More than one may apply.)*

1. Pounds:
   - ☐ less than 10 pounds
   - ☐ 10 pounds or more, but less than 100 pounds
   - ☐ 100 pounds or more, but less than 1000 pounds
   - ☐ 1000 pounds or more
   - ☒ Unknown

2. Drums:
   - ☒ less than 10 drums
   - ☐ 10 drums or more, but less than 100 drums
   - ☐ 100 drums or more, but less than 1000 drums
   - ☐ 1000 drums or more
   - ☐ Unknown

3. Cubic Feet:
   - ☐ less than 10 cubic feet
   - ☐ 10 cubic feet or more, but less than 100 cubic feet
   - ☐ 100 cubic feet or more, but less than 1000 cubic feet
   - ☒ 1000 cubic feet or more
   - ☐ Unknown

4. Gallons:
   - ☐ less than 10 gallons
   - ☐ 10 gallons or more, but less than 100 gallons
   - ☐ 100 gallons or more, but less than 1000 gallons
   - ☐ 1000 gallons or more
   - ☒ Unknown

5. Total area of site:
   - ☐ less than 1 acre
   - ☐ 1 acre or more, but less than 5 acres
   - ☐ 5 acres or more, but less than 10 acres
   - ☒ 10 acres or more
   - ☐ Unknown

K. SOURCE OF HAZARDOUS SUBSTANCE OR WASTE USED OR DISPOSED ON SITE:

(More than one may apply)

	Used On Site	On-Site Disposal	Off-Site Disposal
1. Mining	☐	☐	☐
2. Construction	☐	☐	☐
3. Textiles	☐	☐	☐
4. Fertilizer	☐	☐	☐
5. Paper/printing	☐	☐	☐
6. Leather tanning	☐	☐	☐
7. Iron/steel foundry	☐	☐	☐
8. Chemical, general	☐	☐	☐
9. Plating/polishing	☐	☐	☐
10. Military/ammunition	☐	☐	☐
11. Electrical conductors	☐	☐	☐
12. Transformers	☐	☐	☐
13. Utility companies	☐	☐	☐
14. Sanitary/refuse	☐	☐	☐
15. Photo finish	☐	☐	☐
16. Lab/hospital	☐	☐	☐
17. Wood treating	☒	☒	☐
18. Battery reclamation	☐	☐	☐
19. Pesticides formulation, packaging and/or distribution	☐	☐	☐
20. Herbicide formulation, packaging and/or distribution	☐	☐	☐
21. Other Agrichemical formulation, packaging and/or distribution	☐	☐	☐
22. Dry cleaning	☐	☐	☐
23. Petrochemical processing or refining	☐	☐	☐
24. Unknown	☐	☐	☐
25. Other (*specify*) _____	☐	☐	☐

000005

Site Name Southern Wood Piedmont - Gulf

L. SPECIFIC HAZARDOUS SUBSTANCE OR WASTE COMPOUNDS ASSOCIATED WITH THE SITE, IF KNOWN: *(More than one may apply.)*

	Waste Compounds/ Substances	Generated On Site	Off-Site Disposal	On-Site Disposal
1.	Wood treating wastewater treatment sludges	[X]	[ ]	[X]
2.	(creosote and pentachlorophenol) & Tank Sludges	[ ]	[ ]	[ ]
3.		[ ]	[ ]	[ ]
4.		[ ]	[ ]	[ ]
5.		[ ]	[ ]	[ ]
6.		[ ]	[ ]	[ ]

M. ACCESSIBILITY OF SITE: *(More than one may apply.)*

1. [ ] Security guard
2. [X] Physical barrier (steep bank, creek, walls, etc.)
   Describe physical barriers ditch restricts access by vehicles onto site
3. [ ] Site completely surrounded by fence
4. [ ] Site partially surrounded by fence
5. [ ] Locked gate
6. [ ] Unlocked gate
7. [X] No control of access to site
8. [ ] Other *(specify)* Warning signs are posted

N. REMEDIAL ACTION: *(More than one may apply.)*

1. [ ] No environmental action
2. [X] Environmental study
3. [ ] Remedial action

O. AVAILABILITY OF ANALYTICAL MONITORING DATA:

Is analytical monitoring data for the site available?

[X] YES [ ] NO

IF YES: check the appropriate box to indicate the purpose for which the data was collected. *(More than one may apply.)*

- [ ] CERCLA
- [ ] RCRA
- [ ] Remedial Action
- [X] Environmental Audit
- [ ] Other *(specify)* _____

IF DATA WAS COLLECTED: FIRST COMPLETE SECTION P. CERTIFICATION AND SIGNATURE ON THE NEXT PAGE AND THEN COMPLETE DHS 3525, SECTION B SITE DATA ADDENDUM NOTIFICATION OF AN INACTIVE HAZARDOUS SUBSTANCE OR WASTE DISPOSAL SITE.

Site Name Southern Wood Piedmont - Gulf

P. CERTIFICATION AND SIGNATURE:

I certify that to the best of my knowledge and belief, the information supplied on this form is complete and accurate.

Signature Edward L Gibbs Date 3/3/88

Name and Title (*Type or print*) Edward L. Gibbs - Environmental Mgr.

Mailing Address P. O. Box 5447

Spartanburg, S. C. 29304

South
~~NORTH~~ CAROLINA

Spartanburg County

I, Mary Anne Stephens, a Notary Public for said County and State, do hereby certify that Edward L. Gibbs personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and official seal, this the 5th day of April 19 88

(Official Seal)

Mary Anne Stephens
Notary Public

My commission expires My Commission Expires October 9, 1996 19

000007

DHS 3524 (11/87)
Superfund Unit (Review 11/89)

N.C. Department of Human Resources
Division of Health Services

For Agency Use Only
SITE # _____

SECTION B

SITE DATA ADDENDUM FOR AN INACTIVE HAZARDOUS SUBSTANCE OR WASTE DISPOSAL SITE

North Carolina General Statutes Section 130A-310 provides for protection of the public from inactive hazardous substance or waste disposal sites. Notification information and site data, required by North Carolina General Statutes Section 130A-310.1(b) must be submitted to:

Superfund Unit
Division of Health Services
P.O. Box 2091
Raleigh, NC 27602-2091

Please read instructions before completing.

Please type or print in black ink.

A. SITE NAME AND PERSON REQUIRED TO NOTIFY:

1. Site Name Southern Wood Piedmont - Gulf
(One site per form)

2. Person Completing Form:
Name Edward L. Gibbs
Mailing Address P. O. Box 5447
City Spartanburg State S.C. Zip Code 29304
Telephone (803) 576-7660

- [ ] Present Owner
- [ ] Past Owner
- [ ] Present Operator
- [ ] Past Operator
- [X] Other
(specify) Environmental Mgr.

3. Present Owner:
Name Southern Wood Piedmont
Mailing Address P. O. Box 5447
City Spartanburg State S.C. Zip Code 29304
Telephone (803) 576-7660

- [X] Corporation
- [ ] Partnership
- [ ] Individual
- [ ] Other
(specify) _____

B. SITE LOCATION:

Street or Route Address 2139 State Rd.
City or Town Gulf
County Chatham

000008

Site Name Southern Wood Piedmont - Gulf

C. ON-SITE WATER AND SEWER:

1. Wastewater Management

Does the site currently have an on-site wastewater management system? ☐ YES ☒ NO

Has the site previously had an on-site wastewater management system? ☒ YES ☐ NO ☐ UNKNOWN

If there is a past or present on-site wastewater treatment system, check all appropriate boxes below to describe the wastewater treatment system used at the facility. Indicate the dates of operation for each wastewater treatment system. More than one system may apply. Complete for all on-site systems, both past and present.

	Process Wastewater		Sanitary Wastewater		Dates of Operation	
	Yes	No	Yes	No	Beginning	Ending
Municipal	☐	☒	☐	☒	__/__	__/__
Pretreatment						
a. With sludge generation	☐	☒	☐	☒	__/__	__/__
b. Without sludge generation	☐	☐	☐	☐	__/__	__/__
On-site wastewater disposal						
a. Drainfield	☐	☒	☒	☐	__/__	__/__
b. Septic tank	☐	☒	☐	☐	__/__	__/__
c. Land Application	☒	☐	☐	☐	aprox 19/75	19/80
Biological treatment	☒	☐	☐	☐	aprox 19/75	19/80
Discharge to surface water	☒	☐	☐	☐	aprox 19/46	19/75

Name of surface water _____

NPDES # _____

2. Water Supply Source

Does the site now have or has it in the past had a water system? ☒ YES ☐ NO

If yes, complete the following:

	Groundwater		Surface Water		Dates of Operation	
	Yes	No	Yes	No	Beginning	Ending
Municipal or County _____	☐	☒	☐	☒	__/__	__/__
Community _____	☐	☒	☐	☒	__/__	__/__
Non-Community _____	☒	☐	☐	☐	__/__	19/80

If surface water source is used, name of the body of water _____

Provide the use of the surface water:
☐ Potable ☐ Production
☐ Cooling ☐ Fire protection
☐ Irrigation ☐ Other (*specify*) _____

Attach a facility or local map with intake point marked for private or on-site surface water sources. Label the map with the site name.

000009

Site Name: Southern Wood Piedmont - Gulf

D. ON-SITE WELLS:

Does the site now have or has it in the past had any on-site wells? [X] YES [ ] NO
If yes, complete the following:

1. Attach a facility or site map showing the location of all on-site wells. Label the attachment: "D. 1. On-Site Wells".

2. Total number of on-site wells: 3

3. For each on-site well, provide the following information:

   a. Label the corresponding well on the map required in D. 1.: _____
   b. Presently used? [ ] YES [X] NO
   c. If not presently in use, give year abandoned: 1980(Approx.)
   d. Type of well: [X] Monitoring [ ] Injection
      [ ] Production [ ] Fire Protection
      [ ] Cooling [ ] Irrigation
      [ ] Potable [ ] Other (*specify*) _____
   e. Permitted well? [ ] YES [X] NO
      Permit Number _____
   f. Type of construction: PVC
   g. Date installed: Approx. 1978
   h. Depth of well: _____ ft.
   i. Size (diameter): _____ inches
   j. Depth to static water level: _____ ft.
   k. Has laboratory analysis ever indicated ground water contamination? [ ] YES [ ] NO
      Not Known

   Additional Section B, Part D. 3. forms are available.

E. CLOSEST OFF-SITE WELL

Provide the following information for the closest currently used off-site well within a one-mile radius of the site, where such information is known to you:

1. Owner Mr. Jr. Poe
2. Location Address Gulf, N.C.
3. City _____
4. Show the location of the well on a map of the area. Label the attachment: "E. 4. Off-Site Well".

F. ANALYTICAL MONITORING DATA

Complete for any monitoring which has been done at the site.

1. Groundwater — Has groundwater monitoring been conducted at the site? [X] YES [ ] NO
   If yes, complete the following:

	Date	Method	Method Number	Compounds Detected	Level
a. Organics					
(1) Purgeables					
(2) Base Neutrals/Acid					
(3) PCB					
(4) Pesticides/Herbicides					
(5) Other	1978	(See attached)			
b. Inorganics					

Laboratory performing analyses: SWP - Environmental Lab
Does the laboratory have EPA contract laboratory status? [ ] YES [X] NO

Site Name: Southern Wood Piedmont - Gulf

2. Surface Water — Has surface water monitoring been conducted at the site? [X] YES | | NO
If yes, complete the following:

	Date	Method	Method Number	Compounds Detected	Level
a. Organics					
(1) Purgeables	9/83	EPA - 846		EPA conducted on site sampling	(1
(2) Base Neutrals/Acid	"			"	
(3) PCB	"			"	
(4) Pesticides/Herbicides	"			"	
(5) Other	"			"	
b. Inorganics	"			"	

Laboratory performing analyses: State & EPA Region IV 1986 Project # 83-190
Does the laboratory have EPA contract laboratory status? [X] YES [ ] NO

3. Soil — Has soil testing been conducted at the site? [X] YES [ ] NO
If yes, complete the following:

	Date	Method	Method Number	Compounds Detected	Level
a. Organics					
(1) Purgeables	9/83	EPA-846		EPA conducted on site sampling	(19
(2) Base Neutrals/Acid	"			"	
(3) PCB	"			"	
(4) Pesticides/Herbicides	"			"	
(5) Other	"			"	
b. Inorganics	"			"	

Laboratory performing analyses: State & EPA Region IV - Project #83-190
Does the laboratory have EPA contract laboratory status? [X] YES [ ] NO

4. Air — Has air monitoring been conducted at the site? [ ] YES [X] NO
If yes, complete the following:

	Date	Method	Method Number	Compounds Detected	Level
a. Organics					
b. Inorganics					
c. Particulates					
d. Visible Emissions					
e. Ambient Air Monitoring					
f. Other					

Laboratory performing analyses:
Does the laboratory have EPA contract laboratory status? [ ] YES [ ] NO

G. CLEANUP ACTIONS

Describe briefly any cleanup activities at the site and attach a map showing cleanup activities. Label the map with the site name.

Site was closed in 1980. All structures were demolished. All surface impoundments were closed by absorbing sludges and backfilling with clay.

.c Name Southern Wood Piedmont Gulf

List documents related to cleanup actions including, but not limited to, work plans, cleanup action plans, and remedial action plans.

Document Date	Document Name	Purpose of Document

H. RECORDATION

Is the location/existence of the disposal site recorded in the register of deeds' office in the county or counties in which the land is located? ☐ YES ☒ NO

If yes, date of recordation: _____

I. CERTIFICATION AND SIGNATURE:

I certify that to the best of my knowledge and belief, the information supplied on this form is complete and accurate.

Signature Edward L. Gibbs Date 3/28/88

Name and Title (*Type or print*) Edward L. Gibbs, Environmental Mgr.

Mailing Address P. O. Box 5447

Spartanburg, S. C. 29304

South
~~NORTH~~ CAROLINA

Spartanburg County

I, Mary Anne Stephens, a Notary Public for said County and State, do hereby certify that Edward L. Gibbs personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and official seal, this the 5th day of April, 19 88

(*Official Seal*)

Mary Anne Stephens
Notary Public

My commission expires My Commission Expires October 9, 1996 19

000912

DHS 3525 (11/87)
Superfund Unit (Review 11/89)

Site Name Southern Wood Piedmc. . - Gulf

SECTION B: SUPPLEMENTAL FORM

SITE DATA ADDENDUM FOR AN INACTIVE HAZARDOUS SUBSTANCE OR WASTE DISPOSAL SITE

D. ON-SITE WELLS:

3. For each on-site well, provide the following information:

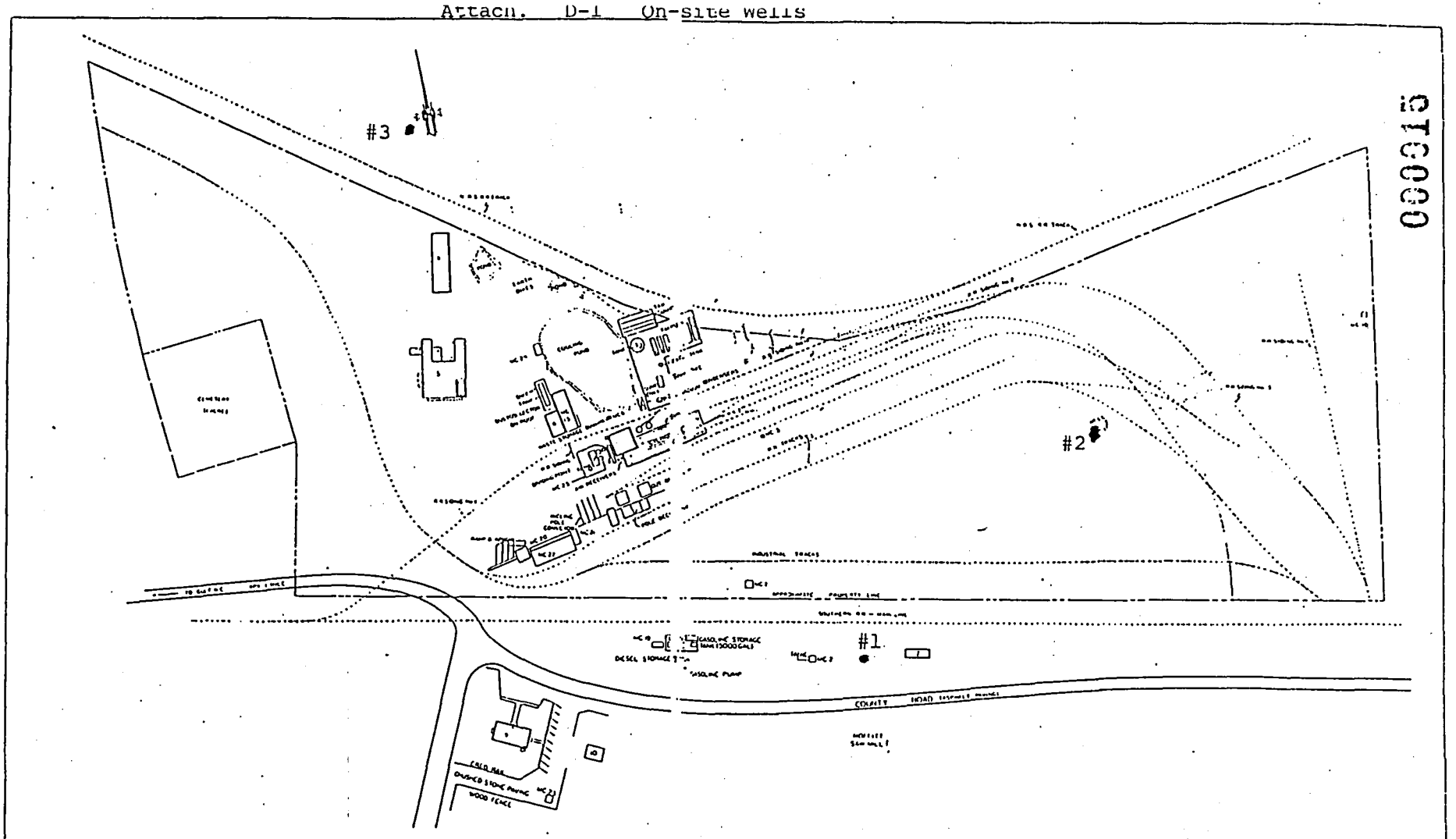
a. Label the corresponding well on the map required in D. 1.: #1
b. Presently used? ☐ YES ☒ NO
c. If not presently in use, give year abandoned: 1980
d. Type of well:
☐ Monitoring ☐ Injection
☒ Production ☐ Fire Protection
☐ Cooling ☐ Irrigation
☒ Potable ☐ Other (*specify*) _____
e. Permitted well? ☐ YES ☒ NO
Permit Number _____
f. Type of construction: ?
g. Date installed: ?
h. Depth of well: ? ft.
i. Size (diameter): ? inches
j. Depth to static water level: _____ ft.
k. Has laboratory analysis ever indicated ground water contamination? ☐ YES ☐ NO

D. ON-SITE WELLS:

3. For each on-site well, provide the following information:

a. Label the corresponding well on the map required in D. 1.: #2
b. Presently used? ☐ YES ☒ NO
c. If not presently in use, give year abandoned: 1980
d. Type of well:
☐ Monitoring ☐ Injection
☒ Production ☐ Fire Protection
☐ Cooling ☐ Irrigation
☒ Potable ☐ Other (*specify*) _____
e. Permitted well? ☐ YES ☒ NO
Permit Number _____
f. Type of construction: ?
g. Date installed: ?
h. Depth of well: ? ft.
i. Size (diameter): ? inches
j. Depth to static water level: _____ ft.
k. Has laboratory analysis ever indicated ground water contamination? ☐ YES ☐ NO

Attach. D-1 On-site wells



000315

SOUTHERN WOOD PIEDMONT COMPANY

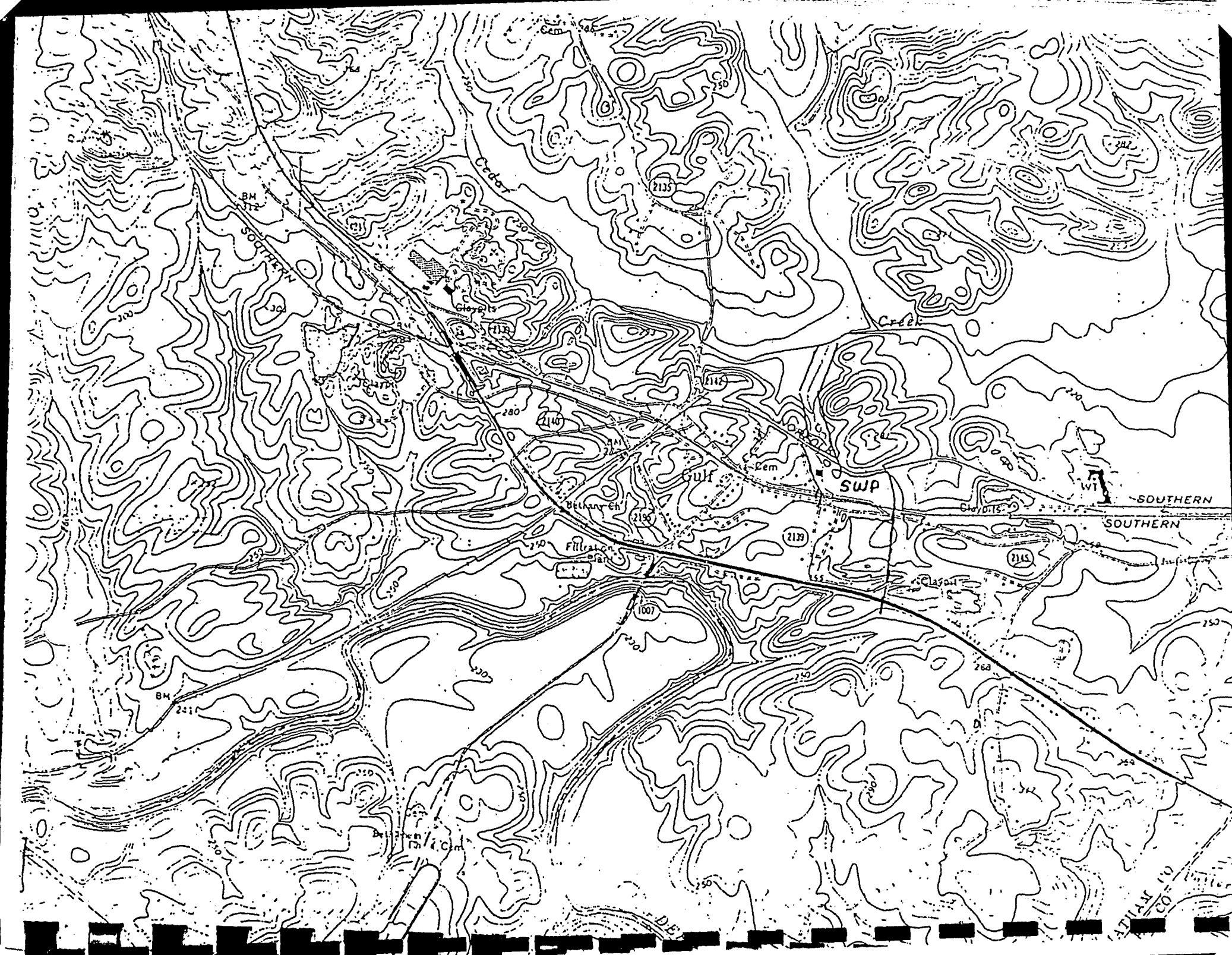
GENERAL CREOSOTING DIVISION

GULF, NORTH CAROLINA

CONTRACT		APPRAISAL DATE		SCALE
59012	CS 6159	CS 1958	REV 1975	0 60 120 180

Area - 81.55 acres
Cyls - 1-6.5ft ; 1-6 ft 137, 1-6 ft 12; 1-6 ft 150
Crnes - 2 Nine D.E.
Pres - Creo ; Penta

AMERICAN APPRAISAL
THE AMERICAN APPRAISAL COMPANY


Cem
Cem
Cedar
Creek
BM
SOUTHERN
Glorias
Creek
Gulf
Cem
SWP
SOUTHERN
SOUTHERN
Fillmore Cem
Clapout
BM
Cem
Cem
DE
ATLANTIC CO

WAT ANALYSIS REPORT

PLANT Nucla, CO DATE SAMPLE TAKEN 1978

LOCATION Well DATE ANALYSIS RUN

Date Sample Taken	X	1/26	2/17	3/15	4/26	5/25	6/22	7/11	8/19	9/13	10/4	11/10	12/14
pH	7.93	8.47	8.25	8.2	7.92	8.08	WELL	8.16	8.13	7.25	7.15	7.67	7.99
C.O.D.	54	24.7	67	86	11	43	LOST	23	42	103	45	86	63
Phenols	.011	.023	.017	.013	.019	.004		.008	.009	.007	.005	.005	.007
Oil and Grease	6.69	2.4	4	3.2	3.4	17.8	SAMPLE	11	12.	3.2	10.7	2.9	3
Total Solids	405	355	456	422	530	358	FROM	325	414	408	390	378	422
Dissolved Solids	366	321	438	388	368	318	PLUG	301	390	394	358	360	386
Suspended Solids	40	34	18	34	162	40	ED	24	24	14	32	18	36
Volatile Solids	136	116	161	171	159	89	BY	180	—	148	147	90	96
Non-volatile Solids	268	239	291	251	371	269	LOW	145	—	260	243	288	326
Total Cr.							IN						
As.							SUN						
Cu.								-					

Analyst _____

Results in mg/l where applicable.

SOUTHERN WOOD PIEDMONT COMPANY

WATER ANALYSIS REPORT

1-75

11-M-1.4.8

PLANT Gulf, N.C. DATE SAMPLE TAKEN 1979

LOCATION Sampling Well DATE ANALYSIS RUN

Date	1/18	2/21	3/14	4/12	5/2	6/5	7/9	8/2		10/29	11/23	12/27
pH	7.79	7.88	8.12	7.74	7.92	7.85	7.99	8.02		8.14	8.04	8.13
C.O.D.	68	25	54	92	23	26	135	106		48.7	167.2	92.6
Phenols	.010	.006	.009	.007	.018	.002	.001	.004		.003	.003	.001
Oil and Grease	11	2.4	1.6	5	1.9	.3	2.9	2.1		1.5	24.5	10.2
Total Solids	449	413	431	584	434	425	415	438		402	269	376
Dissolved Solids	357	345	371	510	330	401	281	434		356	221	939
Suspended Solids	92	68	60	74	84	24	134	4		46	48	80
Volatile Solids	96	87	147	323	154	158	181	204		181	107	205
Non-volatile Solids	353	326	284	261	270	267	234	234		221	162	234
Total Cr.												
As.												
Cu.												

Analyst Janet Davis

Michael A. Rollins

Results in mg/l where applicable.

pH = 7.97
C.O.D = 71.59
Cr = .0058
TOG = 5.75

T.S. 421.4
D.S. 413.1
S.S. 64.9
V.S. 167.5
N.V.S. 253.9

000021

21

WATER ANALYSIS REPORT

PLANT Wall, NC — DATE SAMPLE TAKEN 1980

LOCATION Simplicia Well — DATE ANALYSIS RUN

Date Sample Taken	1/18	2/25	3/17	4/	5/16	6/9	7/8	8/4		X		
pH	8.3	7.53	7.89	7.74	7.54	7.64	8.24	7.76		7.83		
C.O.D.	70.6	31.4	24	-	47	22.7	114	56.8		52.4		
Phenols	.004	.001	.003	-	0	?.001	.005	.004		.003		
Oil and Grease	1.5	3	28	—	0	0	1.1	.4		1.26		
Total Solids	404	448	419	437	412	412	444	411		423.4		
Dissolved Solids	352	372	327	397	376	348	404	407		372.9		
Suspended Solids	52	76	92	40	36	64	40	4		50.5		
Volatile Solids	157	183	146	156	165	159	170	176		164		
Non-volatile Solids	247	265	273	284	247	253	274	235		259.4		
Total Cr.												
As.												
Cu.												

Analyst _____

Results in mg/l where applicable.

STATE OF NORTH CAROLINA

Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
Superfund Section

SITE INSPECTION PRIORITIZATION

Southern Wood Piedmont (Gulf) Site
Gulf, Chatham County, North Carolina
NCD 053 488 557
Reference No. 02802

March 1994

Irene Williams, Environmental Chemist
Division of Solid Waste Management
Superfund Section

State of North Carolina
Department of Environment,
Health and Natural Resources
Division of Solid Waste Management

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
William L. Meyer, Director

March 31, 1994

Ms. Cathy Amoroso:
EPA NC CERCLA Project Officer
U. S. EPA Region IV Waste Division
345 Courtland Street, NE
Atlanta, GA 30365

Subject: Site Inspection Prioritization
Southern Wood Piedmont Gulf Site (NCD 053 488 557)
Gulf, Chatham County, N.C.

Dear Ms. Amoroso:

The enclosed report contains the findings of the Site Inspection Prioritization of the Southern Wood Piedmont Gulf Site (NCD 053 488 557) located in Gulf, Chatham County, North Carolina.

The Southern Wood Piedmont company operated a wood treating plant from 1946 until 1980 using creosote, chromated copper arsenate, and pentachlorophenol at the site. Wastewater from the wood preserving process were treated using storage-settling ponds, aeration lagoons, and a spray irrigation system for land application of effluent. In 1980, the facility was closed by dismantling the plant, by evaporating the liquids remaining in the lagoons by increased spray irrigation, and by regrading and seeding the land. Prior to the construction of the treatment system described above, the facility had discharged effluent into Cedar Creek from an on-site wastewater treatment facility consisting of oil separators and holding ponds.

In January of 1982 sediment and surface water samples were collected by representatives of the North Carolina Department of Natural Resources and Community Development (NRCD) on and near the site. Analytical results for these samples revealed levels of the metals arsenic, chromium, copper, lead, and mercury in surface water and sediments. A number of organic compounds were detected but not quantified. These included several polynuclear aromatic hydrocarbons (PAH's) such as anthracene, chrysene, napthalene, phenanthrene, and fluoranthene. Phenols were also detected, including pentachlorophenol, tetrachlorophenol, methylphenol and phenol.

In September of 1983, a site investigation was performed by the United States Environmental Protection Agency (EPA) Region IV. Sampling was performed to identify sources and determine migration of hazardous substances. The EPA sampled soil from the old lagoon areas, the old operations area, and the drainage ditch that carries runoff into Cedar Creek. They also sampled Cedar Creek sediment upstream and downstream of the confluence of the drainage ditch and Cedar Creek, sediment at the confluence, and soil from the creek floodplain adjacent to the site.

Analytical results of this EPA investigation indicate that, with the exception of the sample from the southeast edge of the site, all of the samples contained organic compounds that were positively identified and quantified. All of the organic compounds detected were associated with wood preserving. The off-site sediment samples collected in Cedar Creek and soil from the adjacent floodplain contained many of the same organic compounds that were detected in the on-site sediment and soil samples. Levels of chromium significantly above background were found in soil from the drainage ditch.

In April of 1988, the Southern Wood Piedmont Company filed a Notification of an Inactive Hazardous Substance or Waste Disposal Site which included data from analyses performed on three wells on the site from 1978 to 1980. Analytical results for these ground water samples indicate levels of phenols that were considerably higher than the current N.C. standard.

An extensive environmental assessment of the site has reportedly been performed for the Southern Wood Piedmont Company. Sampling information and analytical data from that assessment have not yet been made available to the N.C. Superfund Section. No analytical data related to the reported removal of contaminated soil and backfilling at the site by the Southern Wood Piedmont Company have been provided to the N.C. Superfund Section.

In summary, elevated levels of wood preserving chemicals, including arsenic, chromium, copper, and PAH's, were recorded in the surface water pathway in the 1984 EPA site investigation report. Contamination of the surface water pathway with chromium levels significantly above background was documented in this report. Contamination of ground water with phenols has been documented in data received from the Southern Wood Piedmont Company. Ground water contamination has also been acknowledged by a representative of the company. Risk of direct dermal exposure of the public to contaminated soil is likely since the site is not securely fenced. There is no available evidence of a release of contaminants to air, but this may have occurred during removal activities.

Based on the above factors, it is recommended that a status of high priority for an Expanded Site Inspection be assigned to the Southern Wood Piedmont (Gulf) site.

Sincerely,

Irene Williams

Irene Williams
Environmental Chemist
Superfund Section

Ref. 31

0845 Arrive at site - meet Greg Koontz (Yard Group) + Mike of NC utilities locator service. Mike checks for utilities along 2 roads Tracks & Tells me that there are None. — Cloudy Cool —

0940 At Sampling Point
SW-003-SL
Collect sample SW-003-SL from 0-2" interval.
HNU unit 970164 calibrated on 11-2-95 + span setting 3.76
Background = 0
Picture #1 Facing NW showing SW-003-SL with background
VOA Sample SW-003-SL is collected 9:55 — soil is brown clay with high clay moisture
The rest of SW-003-SL composited at 10:10
0-6" clay 6-9" Gravel layer
9-23" clay 23-24" brown clay layer
No HNU Reading above background

11-12-95

SW-GULF

SW-004-SL at sample Location
SW-005-SL Taken in 24 hr.
Changed auger bucks allowed the
VOA sample Location depth of 2'6" to
2'10". Composite 2'to 4' depth
for remainder of sample
SS:1 is a light Brown silty clay material
No HNU Reading above Background
Tight silty clay Low consistent
Grey 2'6" to 3'4" no sampling was
discontinued at 3'4"
Simple SW-004-SL was collected at 10:50
The location of SW-003-SL is ~~North~~ of MW-6A
South 1193 11-13-85

Top soil at SW-005-SL to gravel
with sandy silt Plastic fines
at approximately 16" to 18" VOA collected from
18" to 20" Root of sample collected
to 24" depth Soil is Dark Brown
Sandy soil with 2 to 3 inch
pieces of clay Time 11:40
Simple SW-006-SL is a grey brown
sandy silt SW-006-SL VOA sample
collected from 2'6" to 2'11" depth.

11-13-85

MW 6A

SW-5

33'

SW-004-SL

10'

S 10° W

SW-003-SL

SWP - Gulf

sample SW006SL was continued
to a depth of 9'-3" where refusal
was encountered. Pieces of wood were
brought up. The Refusal may be because
of some kind of buried debris in this
area. Wood was like Lumber not
like roots. Time 1200
Set up SW007SL reading above background
were detected

Set up at Location SW007SL
This is located due South of SW006SL
and the runway
Soil for SW007SL is Brown Gray
Sandy Soil with pieces of gravel
intermixed.
Sample SW007SL was collected
from 1'0" to 1'6" in the area
where stained soil is encountered
No H2S reading above background
encountered. At Depth of 1'6"
encountered oily sheen and
slight odor of H2S was noted
Duplicate Sample SW012SL

Harry Ellis 11-10-05

Slop - Gulf

Subsoil St → collected at Lab.

HB3 — 11-13-95

Set up at Location & sketch
sub-soil St → SW ESC → L
No HNG Readings at this area
A Brick → once-fired at 12" depth
No sample → collected - Bedrock
Fine sand channel - - - like
started approximately 6' east of the
previous attempt.
Tried twice more Auger to refusal
each hole deeper than 1 foot but
encountered alternating each location
Collect subsoil ~ EAST of Shack
@ 1325
Moved to Sample Location subsoil
Augered to 2' depth
Collected subsoil sample
1'-6" to 2'-0" depth Mottled, Light
Brown Clay to approximately 1' depth
Then 1' to 2' material is - dark
brown Sand
No HNG Readings above background
Time for subsoil is 1410

J. Hall 11-13-95

SWP Quip

Proceeded to a depth of 4'-
Material Changed to a Blue green
Clay at approximately 2' depth.
No HNU Reading
Clay Material to a depth of 5'-0"
Vial Sample collected at 1640
The remainder of Sample was then
collected at 1645.
Photo Taken of Site

1635 Begin Hand Augering at SW-17-SL
Location Marty and Augering
1640 Collect Vial Soil Sample From 0'-2'
Interval of Organic Silty Clay Material.
Scrafino makes the remaining Soil
To collect the Metals, Dioxins, Metals.
1650 Marty collects VOC Sample From
2'-4' Interval From same Hole
for Sample SL-017-SL. Zero
Reading a Slight Chemical odor.
Was Collect Soil for Dioxin, metals Samples
From This Hole. Dioxin Samples are labeled
"Dio"

1710 Begin Augering at SW-019-SL
Location - Scrafino is Augering -
This location is in amongst Some
Small Pine Trees.

SWP-GULF

1713 PID reading from Hole of 3 meter units

1715 Harry collects VOC Sample from 1.5 Ft bls of 0-2' Interval for- SW-019-SL

1720 Harry collects Soil Sample SW-019-SL for SVOC's, Dioxins, metals, from 0-2' Soil is same Texture and composition as SW-017-SL location

1735 Harry collects VOC Sample from 3 Feet bls for SW-020-SL

1740 Harry collects SVOC, Dioxin, Metals PID reading & meter units from this Sample, Creosote odor & Saturated w/ water.

1800 Finished Packing Equipment & Leave Site. Site is Not fenced. Access restricted by a Gate only

1930 Drop off Sample Coolers & Dirty Equipment at Herrington St Building All coolers have Chain of Custody Labels attached.

— A. R Rudd

SWP - Gulf

Note: on split sample for SW-009-SL-
We collected a VOA BNA and inorganics sample from the second hole we tried to auger. It was located 6' east of the stake. After conferring with Doug Rumford, we collected a 0-1' composite sample from another hole beside the first hole we attempted to auger located right at the stake. This is the sample given the SWP's contractor. This sample was collected with the same auger and the same pan as the first sample

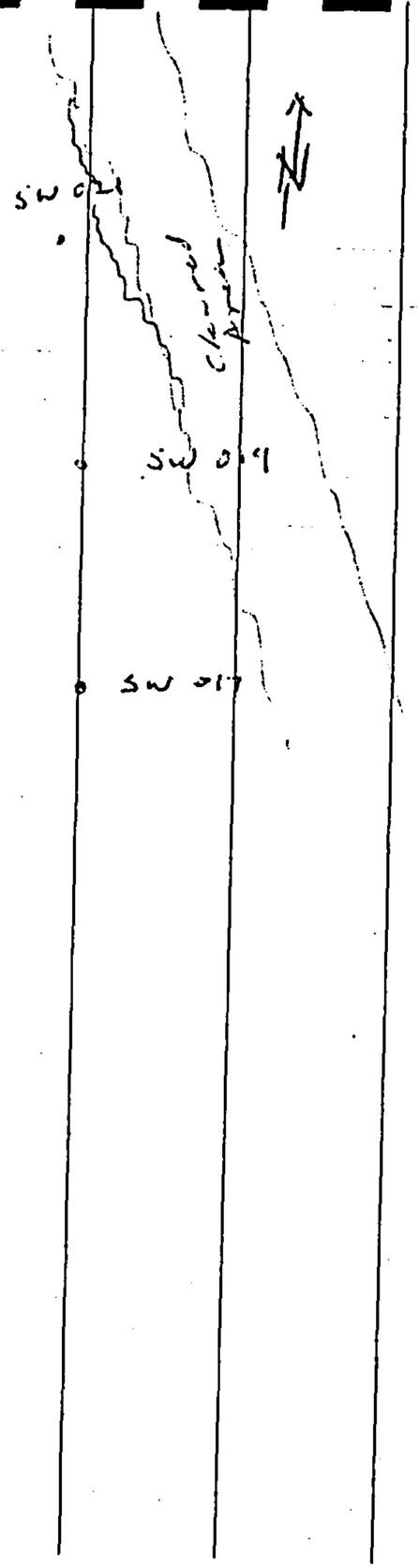
Harry A. Jones
11-14-95

SWP Gulf

11-14-95 Cld 40° Cloudy

Located Background Soil and
Subsoil Location SW-001-SL
Clearing and grading has recently
been done upgradient from the
location approximately 40 feet away.
HNu SN # 970163 is used
Calibrated on 11-8-95 Span = 1.56
Ppb HC
Sample SW 001-SL
Collected at 9.50
Soil Con 0 to 2' is light tan
silty clay material
Changed Auger Buckets and proceeded
to collect SW 002 SL
Material Change to a Red Clay
at depth 2'6"
Same material to a depth of 3'6"
Von Collected at depth of 3'3"
Single cw 002 SL Collected at 1015

11-14-95



Staked at Location of SW 021-SL
Using a measuring wheel walked
100 ft due North. This is in an area
that was recently cleared with significant
ground disturbance. We relocated to
a spot 15 feet West of the original.
This is in a pristine area.

Red clay was encountered to a
depth of approximately 1'-9"
from 1'-9" to 2'-0" Pine bark mixed
with clay was encountered.
Sampled SW 021 at 12:15-SL
were collected at 11:15
Changed Auger Buckets - A
proceeded to a depth of 3'-3"
Collected VOA from 3'-0" to 3'-3"
depth No HNU readings
Still collecting mixed clay and
pine bark. Sampled to 4'-0"
depth Clay & Pine Bark mixed.
Collected SW 022 at 12:25-SL
at HT 11:45

11-14-95

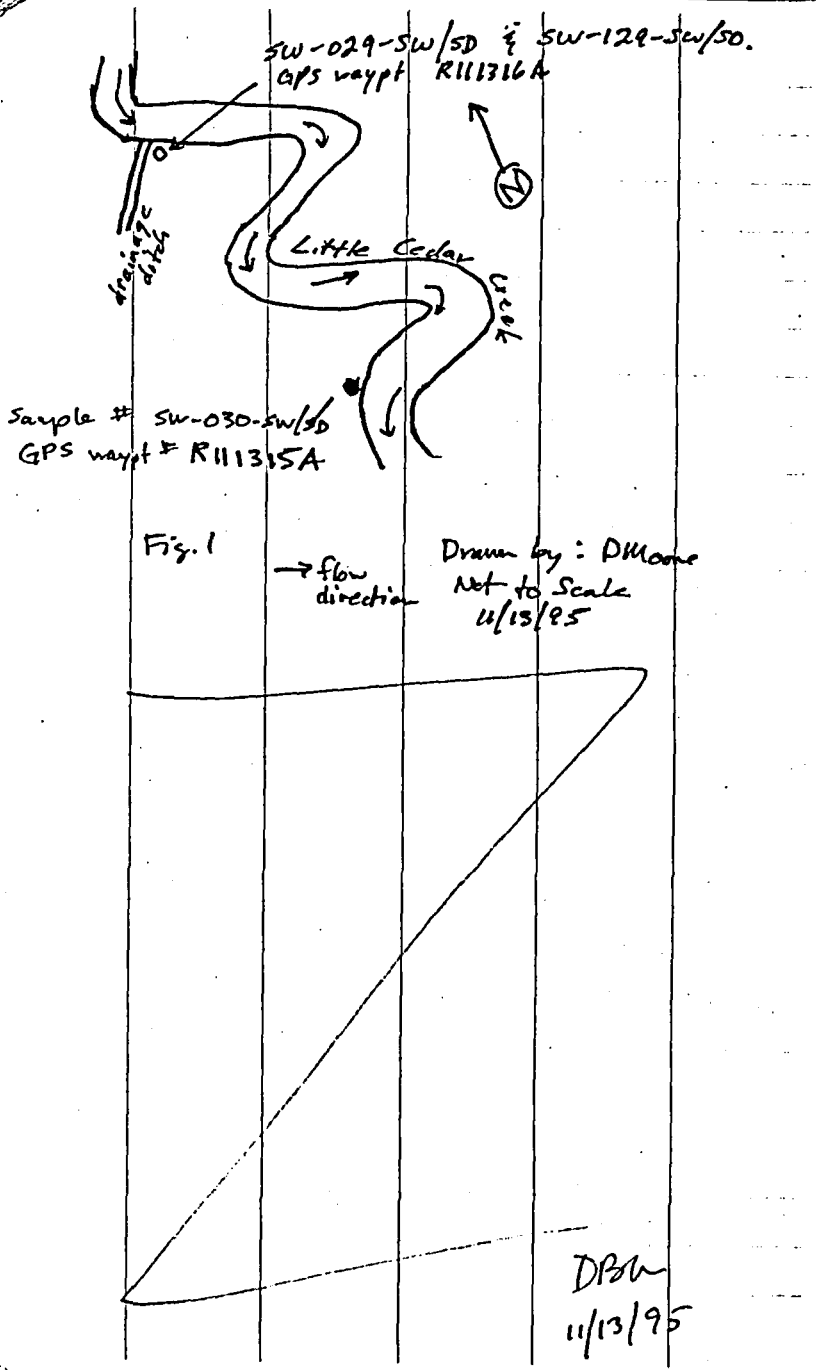
Walked into Location for SW 023 SL
Located Sample approximately 75 feet
downstream from SW-023 SL
Collected Sample from approximately
1 foot from east stream bank
Material is a Light tan Clay no
odors or discolorations.
Sample SW 023 SL collected at
~~@~~ 14:55 and split
2 Aliquots of this split
Material collected from 0 to 1'-0"

Location of SL 024-SL is
~~50~~ S 30°E 100 feet from MW 14A.
Sample Location 6" from edge of
east bank of stream in the stream
Material is a Light tan Clay
Sample collected at 15:35 Sample
was collected from 3 separate holes approx.
1 ft apart from 0 to 12 inches deep
and composited. VOA's were collected
before compositing. Sample was
split.

Jeff Miller

SWP - GULF 11/14/95

The site is Not Fenced, However a Gate Restricts Vehicle Access at the main entrance. There are No Buildings or Structures on site - The former waste Ponds are all Backfilled & Graded. There are No Residences with 200 Ft of The on-site Source Areas. The Norfolk Southern Railroad Tracks That bisect the site are still Active - The Tracks along the Southern Property Boundary Are Not.



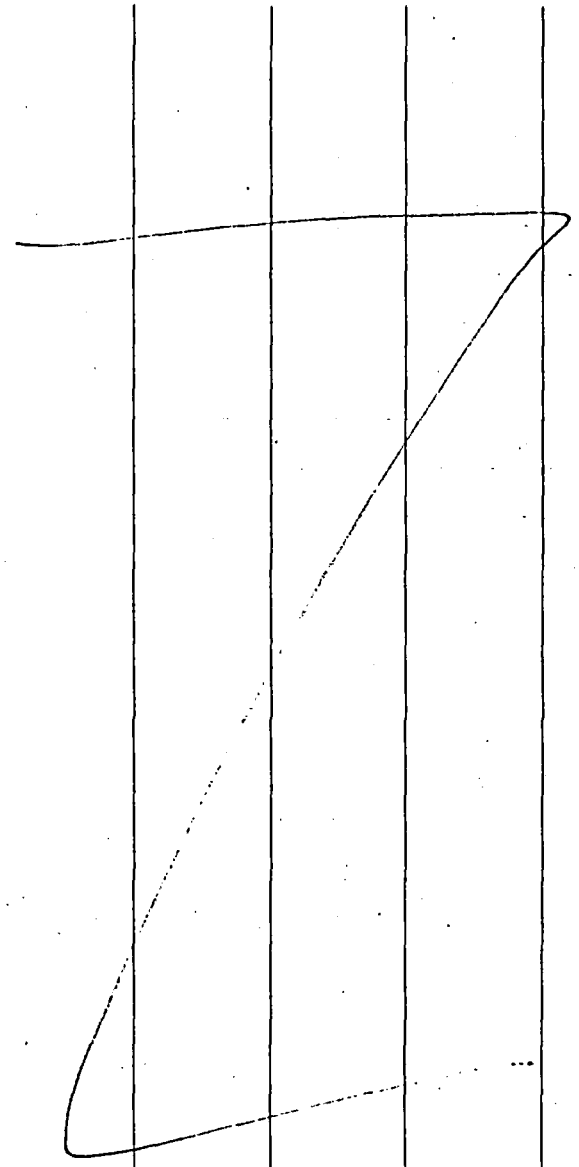
Southern Wood Piedmont - Gulf
Expanded Site Investigation
Sampling Trip -
NCD 053 488 557.
Monday, November 13, 1995
Sampling Team: Doug Moore, Stuart Parker.
Arrived at site @ 0915.
met with Gregory Kuntz - Viro Group, Consultant with SWP. discussed sampling plan

0930 - drove to onsite drainage ditch near MW-16 well cluster.

0945 - walked to downstream sample point SW-030-SW/SD. sample point located along inside edge of west bank. DM collected GPS waypoint R111315A at sample pt.

1025 - COLLECTED SAMPLE SW 030 SW for VOA, SVOA, & Metals. DM photographed SFP collecting sample SW-030-SW. VOA and BNA samples splits were provided to Greg Kuntz.

1035 - SFP collected sediment sample from 0-12 inch profile using closed bucket auger. No odors or sheens apparent in sediment. Coarse to fine-grained, black to medium brown, sand with organic material. Sediment sampled for VOC's, SVOC's & metals. Labeled "SW-030-SD". Split samples were provided for VOC's, SVOC's to Greg Kuntz. DBM 11/13/95.



DBM
11/13/95

1105 – DM and Greg Kuntz located next sample pt at onsite drainage ditch PPE. DM collected GPS waypoint R1113168 at PPE. Drainage ditch observed to be flowing 2' wide with approximately 14 inches depth at PPE. Little Cedar Creek at PPE is approximately 8-10 feet wide with 1-2 feet deep. Greg Kuntz claims flow in both Little Cedar Creek and onsite drainage ditch are above normal. SFP collected (acidified trip blank SW-037-TB at 1100 hrs.

1125 – SFP collected SVOC for SW-029-SW and SW-129-SW. DM photographed SFP collecting split sample for Greg Kuntz. SFP collected VOC for SW-029-SW & SW-129-SW. SFP collected metals for SW-029-SW & SW-129-SW. Split samples for VOC's & SVOC's were provided to Greg Kuntz.

1135 – SFP collected sediment sample at drainage ditch PPE into Little Cedar Creek. SFP observed faint odor in sediment of either petroleum or organic decay. Sediment is a grayish brown, clayey, medium to fine sand. SFP indicates the sediment has a definite creosote odor and obvious sheen on water in pan. SFP collected VOC, SVOC Metals and Dioxin sediment sample. VOC & SVOC samples were split with Greg Kuntz. VOC SVOC & metals labeled "SW-029-SD" and "SW-129-SD". Dioxin samples labeled "DW-029 DBM 11/13

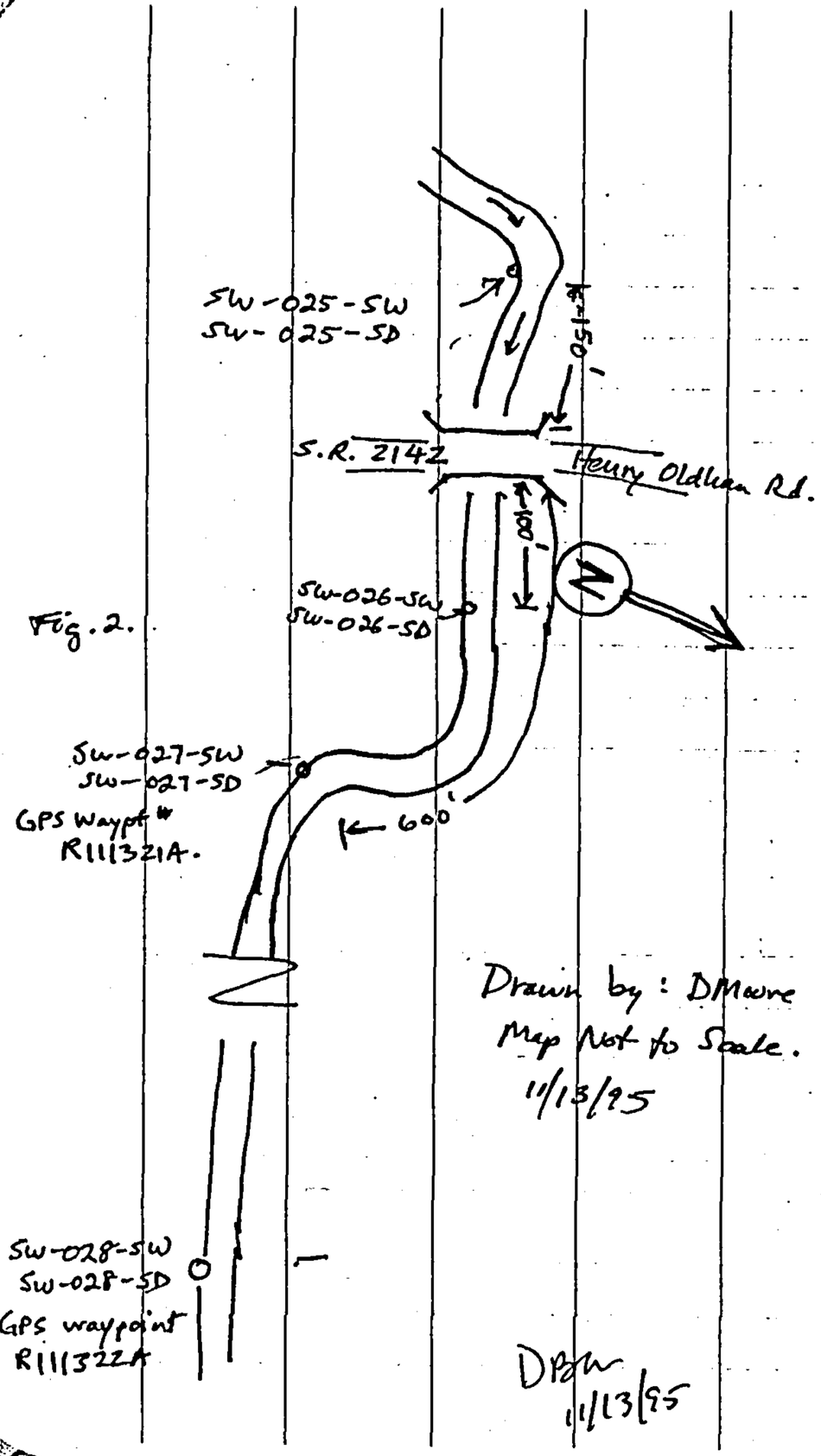


Fig. 2.

Drawn by: DMoore
Map Not to Scale.
11/13/95

DBM
11/13/95

"DW-029-SD" and "DW-129-SD".

1330 - 1430 - Broke for Lunch.

1440 - Doug Rumford, Stuart Parker & Doug Moore located sample pt for upstream bkgd. sample SW-025-SW/SD. Approx 150' upstream of Henry Oldham Road bridge.

1450 - SFP collected VOC, SVOC & Metals for bkgd. sample SW-025-SW and matrix spike duplicate SW-025-SW. No odors or sheen observed @ upstream bkgd. sample. DM photographed SFP & DR collecting upstream bkgd. sample.

1455 - DR collected upstream sediment from 0-12 inch profile from south bank of Little Cedar Creek. Sediment is a poorly sorted, fine to coarse-grained, chocolate-brown sand. DR sampled sediment for VOC, SVOC, Metals & Dioxins. VOC, SVOC and Metal labeled "SW-025-SD". Dioxin sample labeled "DW-025-SD".

1525 - DR collected upstream bkgd. surface water sample SW-026-SW, approx. 100 feet downstream of Henry Oldham Rd. bridge. Samples collected for VOC, SVOC's & Metals. No odors or sheen observed at sample point.

DBM
11/13/95.

1530 - DR collected sediment sample from 0-12 inch profile from south bank of Little Cedar Creek, approx. 100' feet downstream of P. Henry Oldham Rd. bridge. No odors or sheen observed in upstream bkgd. sediment at this sample point. DR collected sediment samples for VOC's, SVOC's and Metals samples labeled "SW-026-SD". Soil is sediment is a yellow-gray, silty-sandy clay.

1535 - Greg Kuntz arrived at bkgd. sample point SW-026-SW/SD. A split sample of both SW-026-SW and SW-026-SD for VOC, and SVOC analyses were provided to Mr. Kuntz. Mr. Kuntz also wanted a split of the SW-025-SW and SW-025-SD sample points. We will reuse the previous extension for SW-026-SW, except we are using a clean bucket to collect the upstream sample point at SW-025-SD.

1600 - Doug Rumford, Doug Moore & Greg Kuntz walked back upstream to bkgd. sample point SW-025-SW and SW-025-SD. to collect split of VOC, SVOC's for Greg Kuntz. At 1605, DR collected upstream surface

DBM 11/13/95.

DBM
11/13/95

water sample SW-025-SW. Mr. Kuntz indicated he would use the same sample times as original sample collected earlier.

At 1600, Doug Rumford collected upstream sediment sample at same location previously sampled as SW-025-SD. A split sample was provided for VOC and SVOC analyses to Greg Kuntz.

1640 - SFP collected surface water sample from tip of sand bar on south bank of Little Cedar Creek, approx. 600 feet downstream from Henry Oldham bridge. Sample collected for VOC, SVOC and metals. No odor or sheen observed at sample point. Sampled labeled "SW-027-SW".

1650 - SFP collected sediment sample from 0-12" profile at pt. 2' feet from toe of sand bar. sediment is a medium to fine silty sand with small amounts of clay and gravel. soil is a light-brown with some organic material. No noticeable odors or sheens observed. Sampled for VOC, SVOC and metals. sample labeled "SW-027-SD". DM collected GPS waypoint R111321A at this location.

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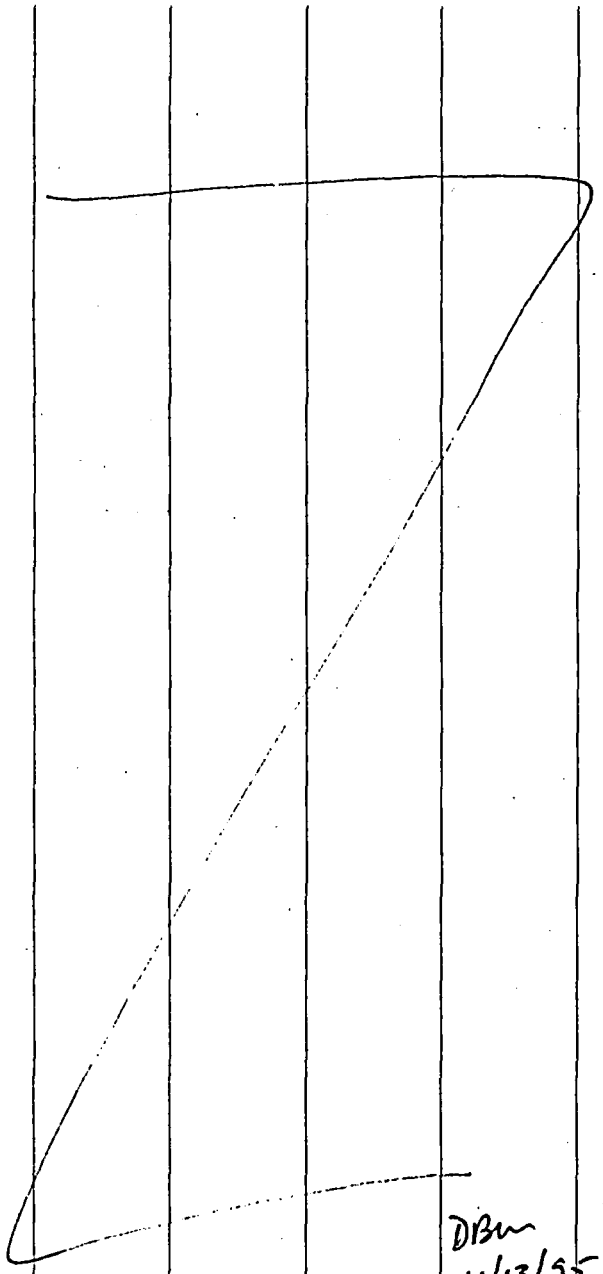
11/13/95

DBM
11/13/95



DBW
11/13/95

1715 - SFP collected upstream sediment sample from south bank of Little Cedar Creek, approx. 300 feet upstream of western boundary of Southern Wood Piedmont property line. Sample point delineated by a yellow marker on north bank of Little Cedar Creek. DM marked south bank sample position as requested by Greg Rantz with red marker on tree and small stake. DM collected GPS waypoint R11322A at this location. Sediment is a brown to gray, coarse-grained sand with gravel. No odors or sheen observed. Some organic decay in sediment. SFP collected samples for VOC, SVOC, metals and dioxin analyses. Sample VOC, SVOC and metals samples labeled "SW-028-SD". Dioxin labeled "DW-028-SD". Sample taken from 0-12 inch profile.

1725 - SFP collected upstream surface water sample from south bank of Little Cedar Creek at same point as "SW-028-SD". Samples collected for VOC, SVOC and metals. Sample labeled "SW-028-SW". No odors or sheen observed.

DBW 11/13/95

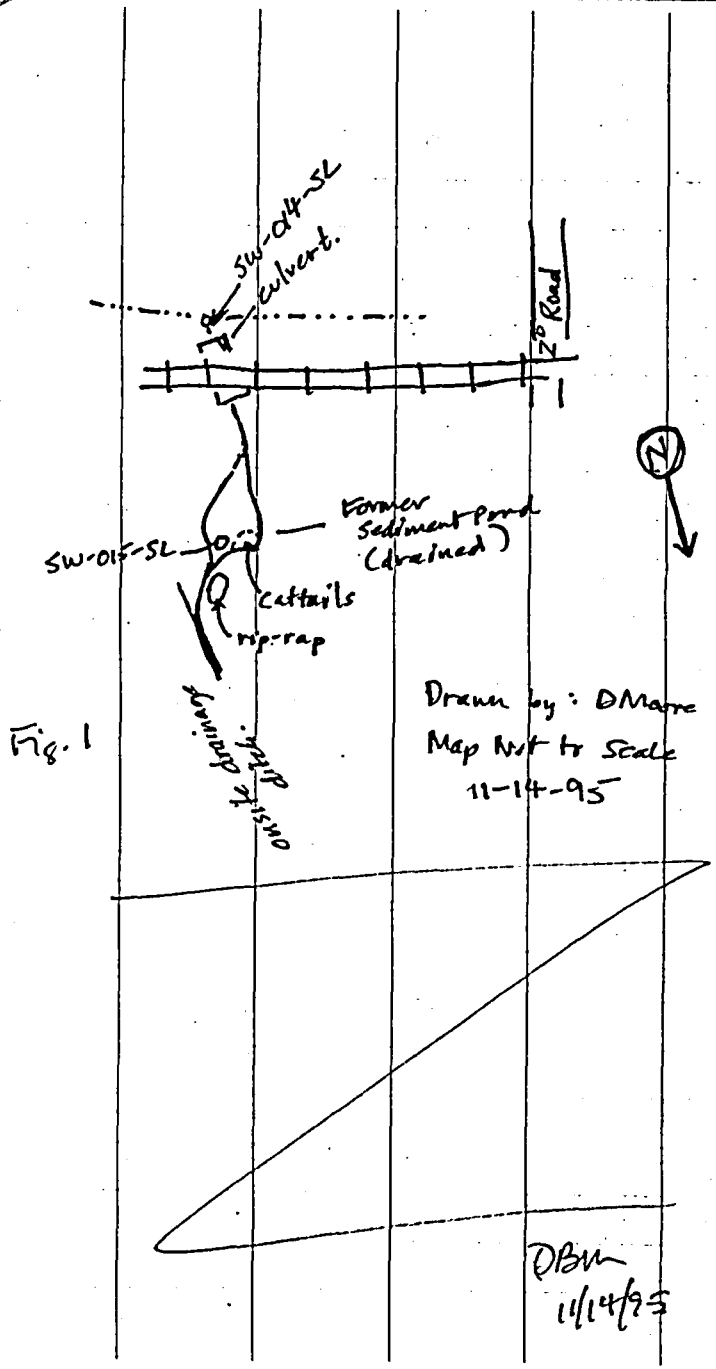


Fig. 1

Southern Wood Piedmont - GULG
Expanded Site Investigation Sampling trip.
Tuesday, November 14, 1995
NCD 053 488 557.
Sampling Team: Doug Moore, Stuart Parker.

0905 - arrived at site. met with Greg Kuntz - Virogroup.

0915 - walked to soil sample points SW-014-SL, SW-015-SL & SW-016-SL. DR decided not to collect SW-018-SL, and moved sample pt SW-014-SL to onsite drainage ditch between cattails and rip-rap, north of railroad line & downgradient of former sediment pond.

0950 - SEP collected sediment sample from 0-12" inch profile. next to cattails in sediment pond north of Railroad tracks near MW-15 well cluster. Obvious sheen apparent on water surface downstream of sample point and sheening visible at sample hole. Sediment has a strong organic creosote-like odor. Sediment is a brown, clayey-silt with visible chemical stain (i.e. iridescent grayish color). DM photographed SEP collecting sediment sample & obvious sheen on water's surface.

DBM 11/14/95

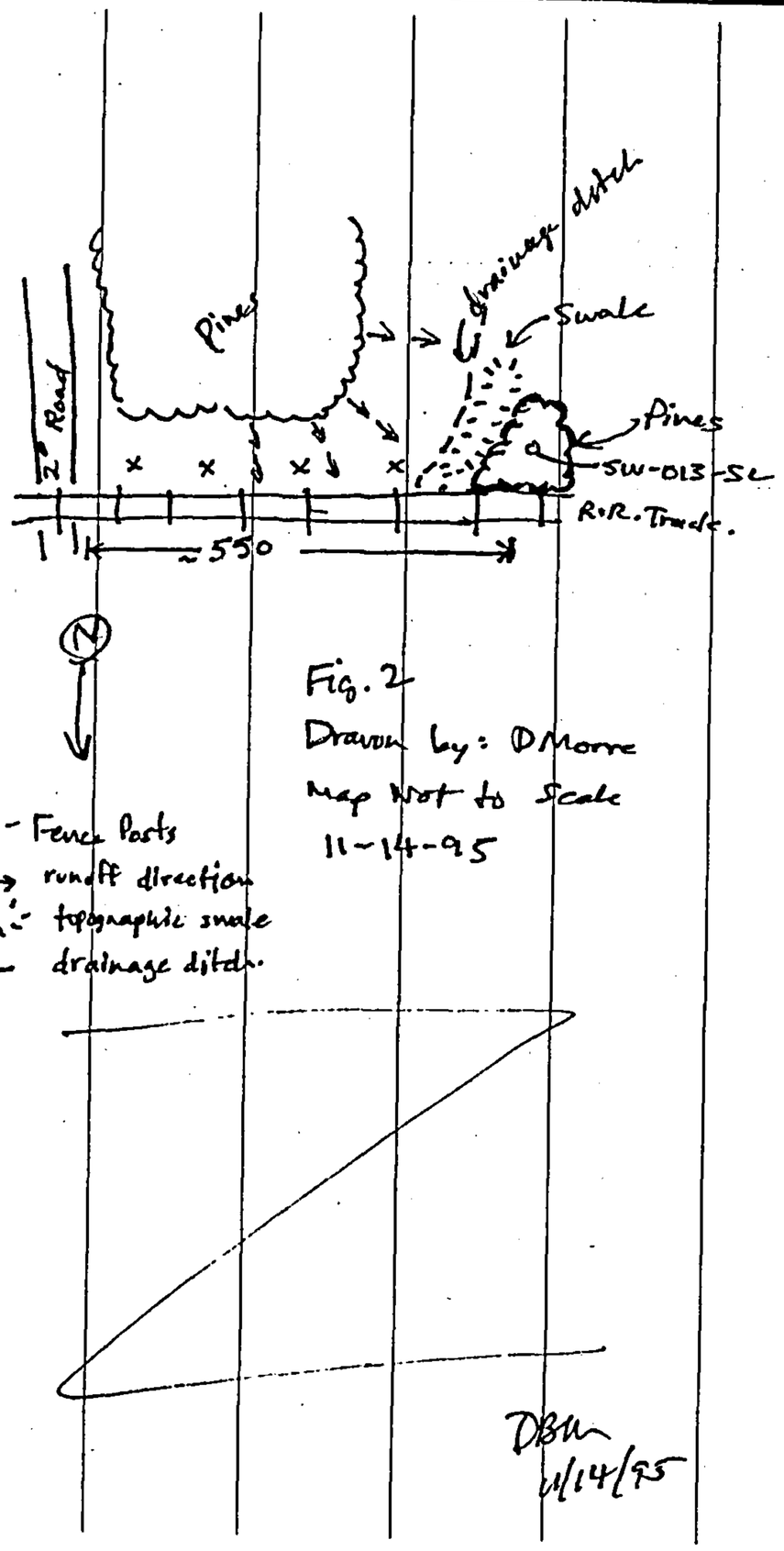


Fig. 2
Drawn by: DMorris
Map Not to Scale
11-14-95

Fig.

DBM
11/14/95

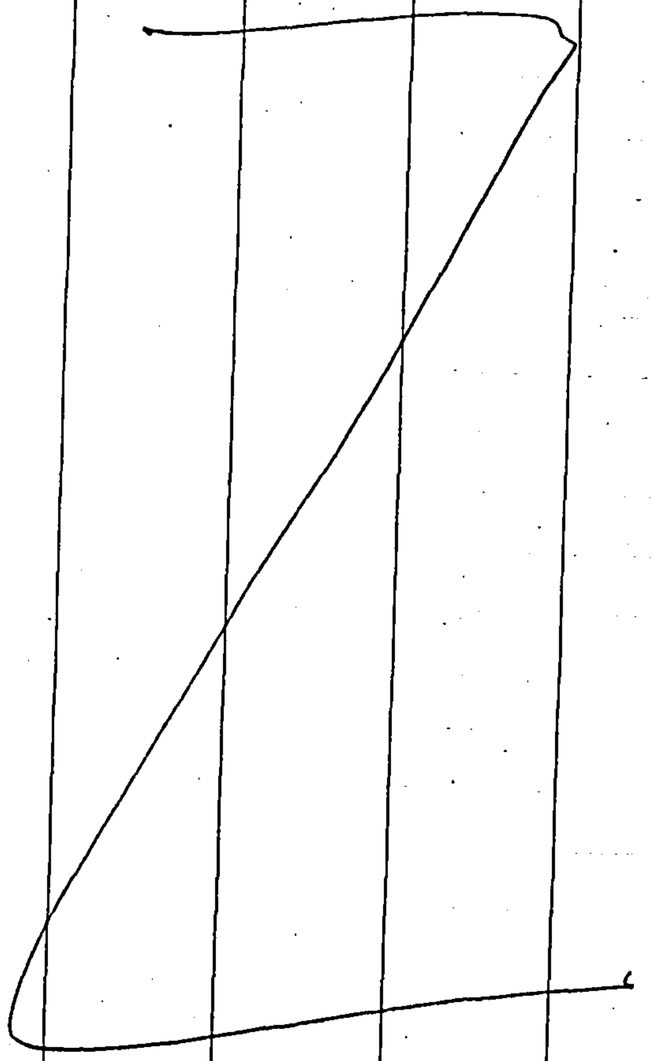
1006 - SFP collected VOC, SVOC & metals & dioxin samples at this location. Split samples of VOC, SVOC" provided to Greg Kuntz. Samples labeled "SW-015-SL". Dioxin samples labeled "DW-015-SL".

1045 - DM collected sediment sample from drainage ditch located at head of culvert on south side of railroad tracks. Soil has obvious organic creosote-like odor. During augering, oily sheen bubbled to surface from sample bore hole. Soil is a brown, hard silty clay with gravel intermixed and obvious chemical stain (i.e. iridescent, greasy sheen). Sample taken from 0-12 inch profile. Soil also has yellow-green silty-clay at roughly 20% of sample volume. SFP collected VOC, SVOC & metals sample for analyses. Sample labeled "SW-014-SL". Greg Kuntz had earlier indicated he did not want a split sample. SFP photographed sample location & obvious sheen on water surface.

DBM
11/14/95

su

Fig.



DBM
11/14/95

1140 - DM collected soil sample from 0-12" profile to serve as a background soil sample. Sample was taken from a flat hilltop overlooking the railroad line along the south bank. Hilltop covered with small ~10 yr. old pine stand. *. Hilltop located near the western corner of On-site fence. Soil is a stiff, clayey, med. to fine sand, predominantly brown w/ yellow and red mottling. No odors or sheen on soils apparent in soil. SFP collected SVOC, VOC, metals & dioxin soil samples. VOC, SVOC & metals labeled "SW-013-SL". Dioxin labeled "DW-013-SL". Sample point estimated to be approx 550 feet from secondary road.

1140-1250 - waited for rest of other sampling teams to arrive back at railroad tracks.

1300 - Broke for lunch

1350 - Departed site for Raleigh

DBM
11/14/95

su

Fig.

Wednesday, November 15, 1995

0900 - Began labeling & preparing samples for shipment.

At 1050 - Doug Rumford prepared preservative blank SW-038-PB on Wednesday, November 15, 1995.

1130 - Broke for lunch. Harry Zinn & Irene Williams remained at Harrington Street to maintain chain-of-custody for samples. Arrived back from lunch at 1230.

1235 - resumed labeling & preparation of samples for shipment.

1500 - Doug Moore & Doug Rumford sealed the organic & inorganic samples in three coolers using strapping tape and chain of custody seals and transferred the coolers to the large cooler at the Bath Bldg for overnight storage.

Thursday, November 16, 1995

0945 - Doug Moore & Doug Rumford & Harry Zinn picked up the sample coolers from the Bath Bldg. Cooler. The coolers were in good shape, the custody seals were intact and indicated that there had not been any tampering with the sample coolers while stored overnight. The coolers were transferred back to the Harrington Street lab. The samples were double checked to ensure they were properly labeled.

1206 - Doug Moore & Doug Rumford transported the organic samples to CompuChem Environmental Labs. The chain-of-custody was relinquished to Terry Evans at CompuChem.

1210 - Doug Moore & Doug Rumford transported the inorganic samples in a sealed cooler to RDU Airport - Federal Express.

Ref 3.1

11-13-95 SOUTHERN WOOD PIEDMONT

DOWNSTREAM SAMPLING TEAM
Bruce Nicholson
Keith Snavely

Arrive on Site @ 9:10 AM
Confer with Doug Rumford
on Sampling plan.

Drive to downstream Bridge
on SR 2145 across Cedar
Creek. Arrive 9:25. Cedar
Creek in High (Flooded)
Condition. Slow, if any,
movement, will attempt
ponar dredge Sample.

Lot Numbers for Containers:

VOA	Water	5013010
Metals	Water	1150022
BNA	Water	4-265-011
Soil	VOA	105 7013
Soil	Other	G-3096-02

Photo 1 - SR 2145 Bridge looking S
Photo 2 - SR 2145 Bridge looking N
Photo 3 - SR 2145 Bridge looking W at Cedar Creek

2nd ... 11:11 11/13/95

Determined water is too deep to sample with butterfly auger and extensions.

Attempted Ponar dredge sample but swift current and hard muddy bottom, so no sample was obtainable.
Returned to site at 11:00 AM
Discussed situation with Doug Rumford.

Next objective is to obtain SW-031-SW & SD in unnamed tributary to Cedar Creek.
Crossed Cedar Creek at PPE and hacked East along Cedar Creek to unnamed tributary.

Sample SW-031-SW collected at small sandbar. Time: 12:55
Collected VOA, BNA, Metals by

Bruce Nicholas 11/13/95

Sample SW-031-SD collected by auguring in location on upstream side of bar
Augered to approx 12 inches deep, therefore sediment sample is a vertical composite from 0 - 12 inches.
Time of sample: 13:05
For VOA, BNA, METALS, AND DIOXIN
Unnamed tributary in question is 15-18 feet wide and about 3 feet deep (estimate) at center. Swift flow

Sediment sample consisted of 9 inches of tan sandy sediment and three inches of gray clayey sediment.

Metals acidified at Van at 15:15 to pH 1

Bruce Nicholas 11/13/95

Next object is SW-033-SW/SD but brush too thick near Cedar Creek Bridge to walk through. Proceeded to (Norfolk + Southern) railroad tracks crossing SR 2145 and walk westward toward Cherokee Brick. Trestle crosses Unnamed trib to Cedar Creek about ½ way to Cherokee Brick Plant. Hack unknown distance North along small tributary towards Cedar Creek. Slow going, too thick to go much farther.

Brian Nichols 11/13/95

estimated 0.25 mile from road we stop to sample stream. Stream is 10' across and 1-2 feet deep in center. Collect SW-033-SW at 16:10 for VOA, BNA and Metals by Keith Snavely

Collect SW-033-SD at 16:20 by Keith Snavely for VOA, BNA, Metals, and DIOXIN Sediment a 0-12 inch Vertical Composite. Gray Clayey type

GPS
Filename: R11321A
Metals
Acidified at Van at 17:15 to pH 1

Photo 4 - Sampling Location SW-033-SW/SD
Photo 5 -
Photo 6 - Keith with GPS
Photo 7 - Sampling VOA

Brian Nichols 11/13/95

Southern Wood Piedmont, cont.
11-14-95
Bruce Nicholson } Sampling Team
Doug Rumford }

Objective - SW-032-SW/SD
on tributary (unnamed)
on north side of Cedar
Creek.

Found Confluence of trib and
cedar Creek at 11:25

Photo 8 - Doug Rumford taking
SW-032-SD approx
30 feet upstream of
confluence of trib and
Cedar Creek

Photo 9 - Confluence showing trib
and Cedar Creek
(Looking S or SE)

Photo 10 - Sample SW-032-SD in
Pyrex. Pan.

Bruce Nicholson 11-14-95

Sample SW-032-SD taken
at 11:30 0-12 inch vertical
Composite of brown clayey
sediment full of organic material.
Sampled for VOA, BNA, Metals
and Dioxin by Doug
Rumford

Sample SW-032-SW
taken at 11:35 just ~~up~~ 5
feet upstream of SW-032-SD
at 11:35 by Bruce Nicholson
for VOA, BNA, Metals.

The unnamed trib here is
2-4 feet wide and
1-1.5 feet deep.

Sample location flagged with
flagging tape on tree
above confluence.

Bruce Nicholson 11-14-95

After Lunch the next object is SW-034-SD/SW in Cedar Creek on upstream side of SR145 Bridge. Not having success yesterday with the Ponar Dredge, we use auger extensions and a butterfly bucket. Water level is way down from yesterday. Use 22' of extensions to reach sediment from bridge. We are able to collect enough sediment with 2 attempts. Therefore this sediment sample consists of 2 locations and is approximately 0-4 inches deep. Sediment in first hole is a tan clay and sediment from second hole is a gray clay.
Sample SW-034-SD taken from 15:05-15:15 for VOA, BNA, Metals and Dioxin

Brian Nickel 11-14-95

The Water Samples in this location were difficult to get because of steep slick banks. Therefore, the only available means to obtain this sample was to lower a 2 liter BNA jug into the water using 1/4" nylon boater cord. This was then poured into the VOA containers and the metals container. The jug was lowered a second time to obtain the BNA water sample.

Sample SW-034-SW taken at 15:20 for VOA, BNA and Metals. Slightly turbid from sediment.

Photo 11 - Day Rumford facing
Photo 12 - SW-034-SD using auger apparatus.

Brian Nickel 11-14-95

Ref. 32

SUPERFUND CHEMICAL DATA MATRIX

APPENDIX B TABLES

AUGUST 1996

Appendix B-1

Tables for Non-Radioactive Hazardous Substances

Ref. 33

Ref. 33

8132

April 30, 1975

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. C. A. Burdall, Director
Research and Environmental
Southern Wood Piedmont Company
P. O. Box 5447
Spartanburg, South Carolina 29301

SUBJECT: Permit No. 8132
Southern Wood Piedmont Company
Gulf Plant
Chatham County, North Carolina

Dear Mr. Burdall:

In accordance with the application received April 5, 1974, we are forwarding herewith Permit No. 8132, issued April 30, 1975, to the Southern Wood Piedmont Company, Gulf Plant, Chatham County, North Carolina, for the continued operation of their wastewater treatment facility, consisting of gravity type oil separators, holding ponds, and the discharge of the effluent into a tributary of Deep River (Little Cedar Creek) in the Cape Fear River Basin, for an interim period of time necessary to provide a terminal land application system with no discharge to the surface waters of the state.

This Permit shall be effective from the date of issuance until June 30, 1976, and shall be subject to the terms and conditions specified therein.

Sincerely,
Original Signed by
LEWIS R. MARTIN
Lewis R. Martin

Enclosure

cc: Chatham County Health Department
Mr. L. P. Denton, Jr.
Mr. T. P. Armstrong
Mr. W. E. Long
Mr. R. Van Tilburg

What did they operate under from June 30, 1976 To August 20, 1980

NORTH CAROLINA

ENVIRONMENTAL MANAGEMENT COMMISSION

DEPARTMENT OF NATURAL AND ECONOMIC RESOURCES

Raleigh

PERMIT

For the Discharge of Sewage, Industrial Wastes, or Other Wastes

---

In accordance with the provisions of Article 21 of Chapter 143, General Statutes of North Carolina as amended, and other applicable Laws, Rules and Regulations

PERMISSION IS HEREBY GRANTED TO

Southern Wood Piedmont Company
Gulf Plant
Chatham County

FOR THE

continued operation of their wastewater treatment facility, consisting of gravity type oil separators, holding ponds, and the discharge of the effluent into a tributary of Deep River (Little Cedar Creek) in the Cape Fear River Basin, for an interim period of time necessary to provide a terminal land application system with no discharge to the surface waters of the state,

pursuant to the application received April 5, 1974, and in conformity with the project plans, specifications, and other supporting data, subsequently filed and approved by the Department of Natural and Economic Resources and considered a part of this Permit.

This Permit shall be effective from the date of issuance until June 30, 1978, and shall be subject to the following specified conditions and limitations:

1. This Permit shall become void unless the facilities to provide terminal land application of the wastewater are constructed in accordance with the following time schedule:

   a. Plans and specifications submitted on or before October 15, 1974.
   b. Begin construction on or before May 15, 1975.
   c. Complete construction on or before December 15, 1975.
   d. Begin operation on or before January 15, 1976.

2. This Permit is effective with respect to the limitations pertaining to the nature and volume of effluent set forth as follows:

Interim Effluent Limitations
In mg/l (lbs/day)

During the period beginning with the effective date of this Permit and lasting until June 30, 1978, discharges from the Southern Wood Piedmont Company Wastewater Treatment Plant shall be limited as specified below:

Effluent Characteristics	Daily Average	Daily Maximum	Other Units Average	Other Units Maximum
Flow			0.004 MGD	0.006 MGD
BOD, 5-Day, 20°C	1300 (39)	2000 (60)		
Total Suspended Solids	300 (9)	450 (14)		
Phenol	250 (8)	380 (12)		

Final Effluent Limitations

Beginning with Jan. 16, 1976, there shall be no discharge to the waters of the State.

The following definitions apply to this condition:

a. The daily average flow is defined as the average of the daily effluent flows in million gallons per day (MGD) during the calendar month.
b. The daily average effluent by concentration is defined as the average of the daily effluent concentrations in milligrams per liter (mg/l) during the calendar month.
c. The daily average effluent by weight is defined as the daily average effluent by concentration multiplied by the daily average flow multiplied by 8.34.
d. The daily maximum flow is defined as the maximum flow for one day during the calendar month.
e. The daily effluent by weight is defined as the flow in MGD multiplied by the daily concentration for the same day multiplied by 8.34.
f. The daily maximum effluent by weight is defined as the maximum daily effluent by weight for one day during the calendar month.

3. This Permit shall become void unless the Permittee conducts monitoring and reporting in accordance with "Regulation Relating to Monitoring and Reporting Wastewater Discharges and Their Effect Upon Receiving Waters," adopted on May 17, 1973, by the North Carolina Board of Water and Air Resources.

4. Pursuant to Chapter 90A of the General Statutes, this is a Class II wastewater treatment plant which requires that the operator in responsible charge hold a valid Grade II Certification.

5. Construction of any facilities associated with this Permit shall not be initiated until plans and specifications have been submitted to the Permitting Authority and written approval of the Plan Documents has been issued.

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

Phone 803/576-7660

Ref. 34

Southern Wood Piedmont Company

11-M-1.4.8
August 6, 1980

Mr. Stan Taylor, Regional Engineer
Water Quality Section
N.C. DEPT. OF NATURAL RESOURCES
AND COMMUNITY DEVELOPMENT
P. O. Box 27687
Raleigh, North Carolina 27611

Dear Mr. Taylor:

Southern Wood Piedmont Company would like to thank you and Mr. Lars Godwin for the very cordial meeting on August 5, 1980. Confirming our conversation of that date, Southern Wood Piedmont Company will be closing our plant in Gulf, North Carolina, for economic reasons in 1980. This plant is located in Chatham County, and is west of Sanford, North Carolina, on Highway 421.

Pursuant to our conversation, we would like to completely dismantle the plant, evaporate all of the remaining water in the water pollution control project, level the plant site, and plant trees and grass on the area by the end of this year. In order to accomplish this, we must greatly increase the evaporation of the water currently held in the water pollution control project.

As we discussed, we are therefore asking your department to issue us an addendum to our Permit No. 3931, to allow us to evaporate this water by dispersing it over the approximately forty acres of land currently used as storage sites on the plant. The water in question is water that has been through our biological treatment system, consisting of two aerated lagoons, followed by a spray irrigation system on approximately six acres of grassed land. The runoff from this grassed field is then collected in No. 4 pond, where it is chemically flocculated to reduce the amount of suspended solids, etc. Compiled analytical results for the first seven months of this year for the No. 4 pond are enclosed.

We would harrow or scarify this acreage in question to prevent runoff from leaving the plant site. In addition, we would also put small berms around the area to be irrigated to also prevent any runoff from leaving the plant. We will make every effort to insure that there is no runoff from these irrigation efforts. We would propose to use a combination of irrigation-type equipment and tank trucks to put this water out.

Also enclosed is the information you requested on the soil types in the Chatham County area where our plant is located. If we can provide any additional information on this subject, please let us know.

Due to the limited amount of hot, dry weather remaining in the year, we would appreciate your prompt action on this matter. Thank you for your cooperation.

Sincerely,

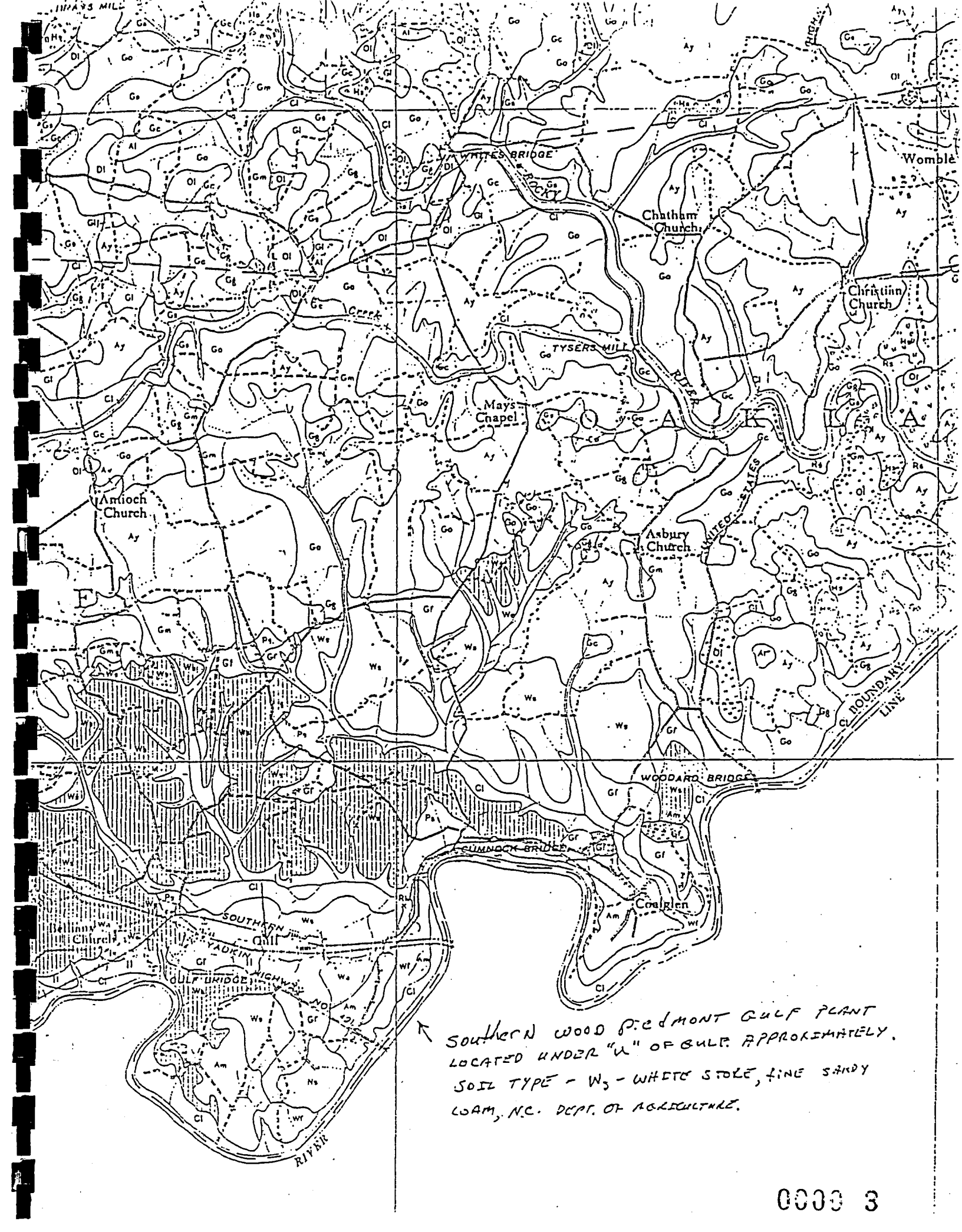
SOUTHERN WOOD PIEDMONT COMPANY

Joe Morgan III
Environmental Manager

JMIII:kwf

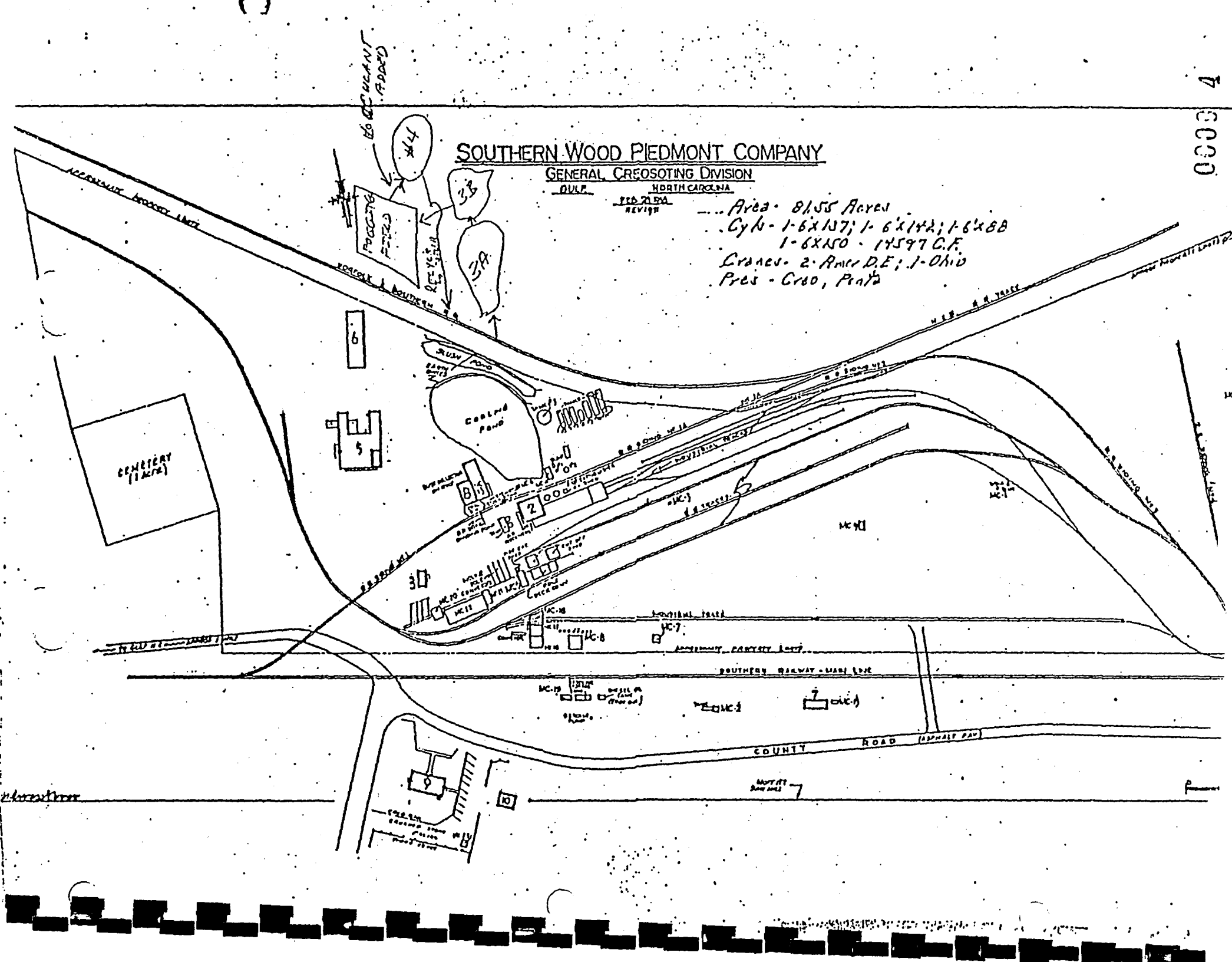
cc: [redacted]
Mr. C. A. Burdell - Atlanta
Mr. M. T. Breen - Atlanta
Mr. C. E. Martin
Mr. M. E. Fix - Gulf
Mr. H. I. Warrington

Enclosures



↖ SOUTHERN WOOD PIEDMONT GULF PLANT LOCATED UNDER "U" OF GULF. APPROXIMATELY. SOIL TYPE - W_3 - WHITE STOLE, FINE SANDY LOAM, N.C. DEPT. OF AGRICULTURE.

0000 3


SOUTHERN WOOD PIEDMONT COMPANY
GENERAL CREOSOTING DIVISION
GULF
NORTH CAROLINA
REVISED
Area - 81.55 Acres
Cyl - 1-6'x137'; 1-6'x142'; 1-6'x88'
1-6'x150' - 14597 C.F.
Cranes - 2 Amer. D.E.; 1 Ohio
Pres - Creo, Penta
TO MT. HOLLY
ACCESS ROAD
ACCESS TO
PRODUCTS
AREA
ACCESS TO
3A
3B
3C
SOUTHERN RAILWAY
COOLING POND
CEMETERY
(1 ACRE)
COUNTY ROAD
(ASPHALT PAVED)
SOUTHERN RAILWAY - MAIN LINE

SOUTHERN WOOD PIEDMONT COMPANY

WATER ANALYSIS REPORT

11-M-1.4.8

PLANT Gulf, N.C. DATE SAMPLE TAKEN 1980

LOCATION #4 DATE ANALYSIS RUN

	1/22	2/25	3/26	4/15	5/28	6/16	7/20					
pH	7.3	6.3	5.17	—	6.66	6.96	6.93					
C.O.D.	—*	547	487	685	935	637	485					
Phenols	—	.184	.32	.064	.075	.008	.04					
Oil and Grease	—	18	14.6	29.8	39.2	28.0	14					
Total Solids	960	1050	1179	—	1734	1699	1378					
Dissolved Solids	924	974	1071	—	1590	1587	1292					
Suspended Solids	36	76	108	—	144	112	96					
Volatile Solids	283	282	305	—	456	380	243					
Non-volatile Solids	677	768	874	—	1278	1319	1135					
Total Cr.												
As.												
Cu.												

Analyst Michael A. Rocco

Results in mg/l where applicable.

* Bottle Broken

Series 1933, No. 7 Issued August 1937

UNITED STATES DEPARTMENT OF AGRICULTURE

Soil Survey

of

Chatham County, North Carolina

By

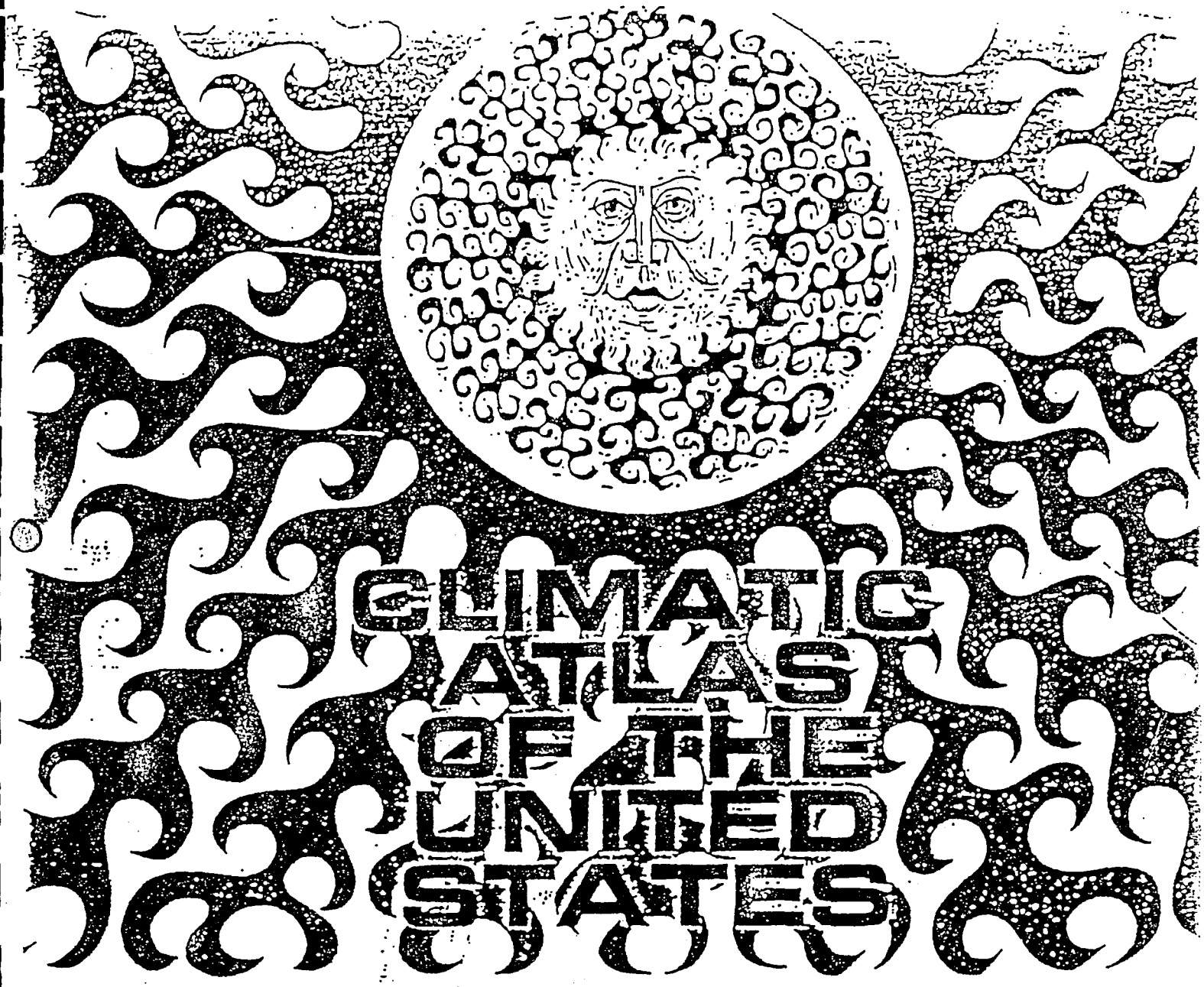
R. C. JURNEY, in Charge, J. T. MILLER, and
S. RANKIN BACON

Gulf p. 23 Congaree Sand Loam
p. 30 Ws White Sand Loam

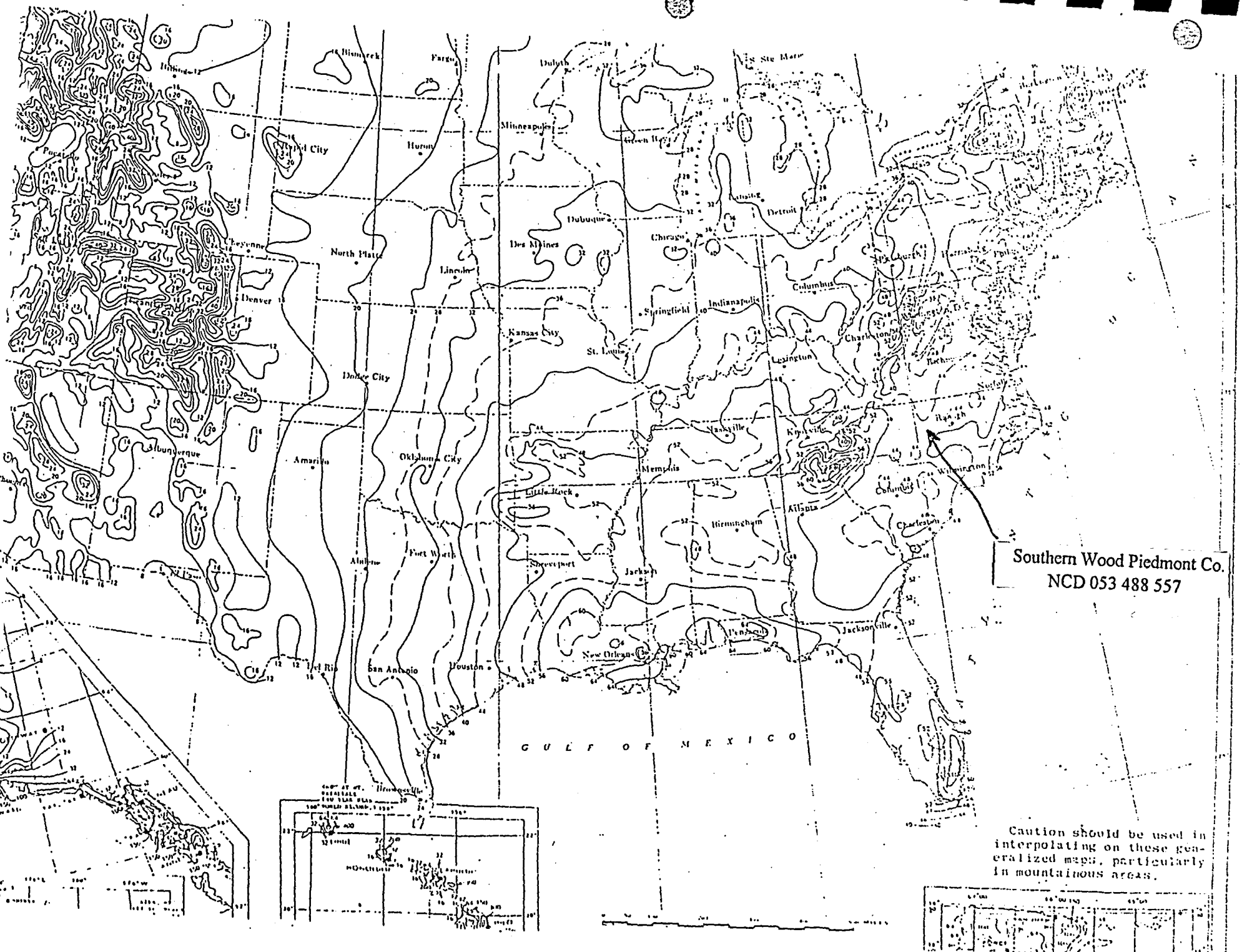
Bureau of Chemistry and Soils

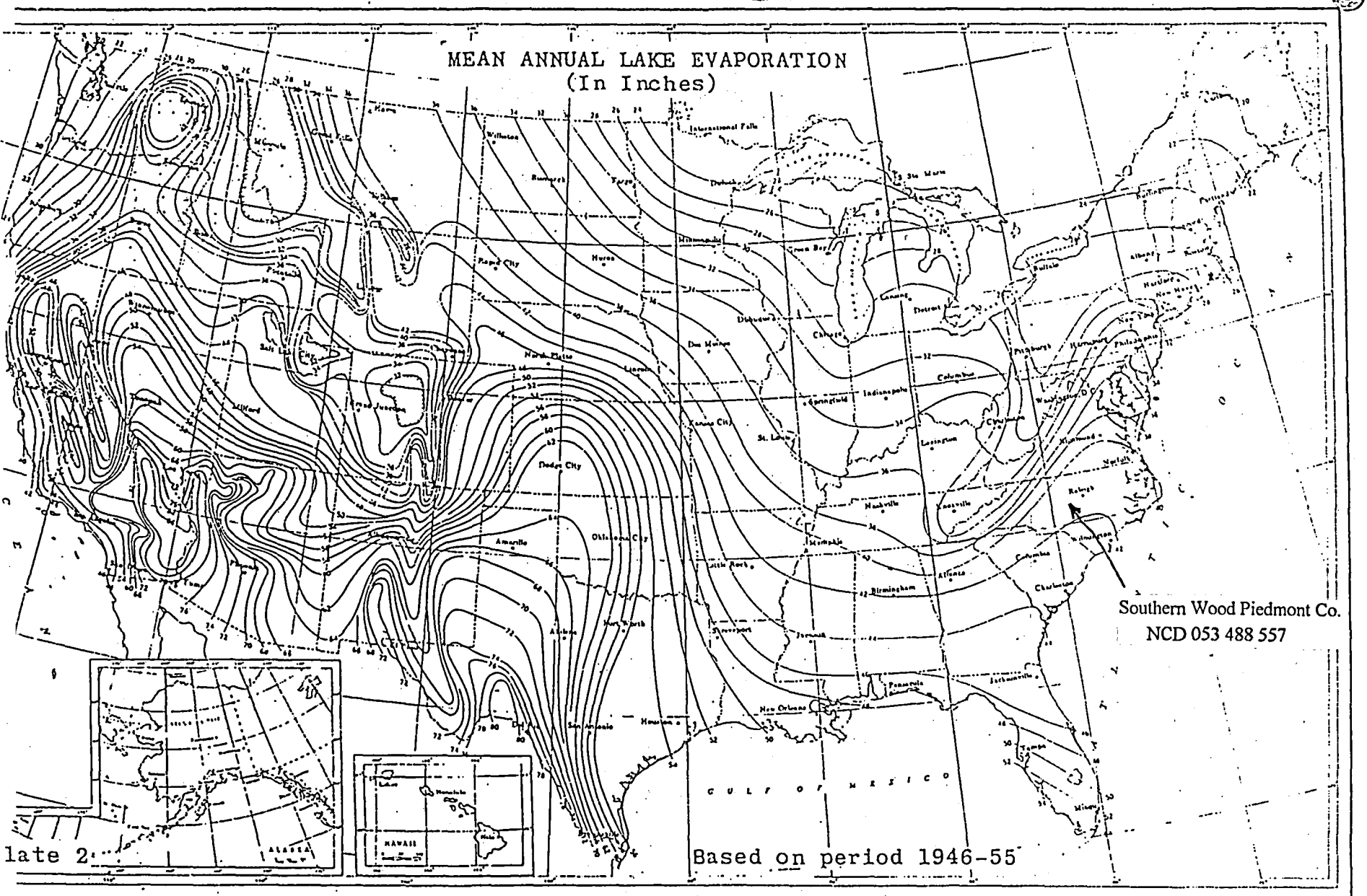
In cooperation with the
North Carolina Department of Agriculture
and the
North Carolina Agricultural Experiment Station

For sale by the Superintendent of Documents, Washington, D. C. - - - - - - - - Price 30 cents

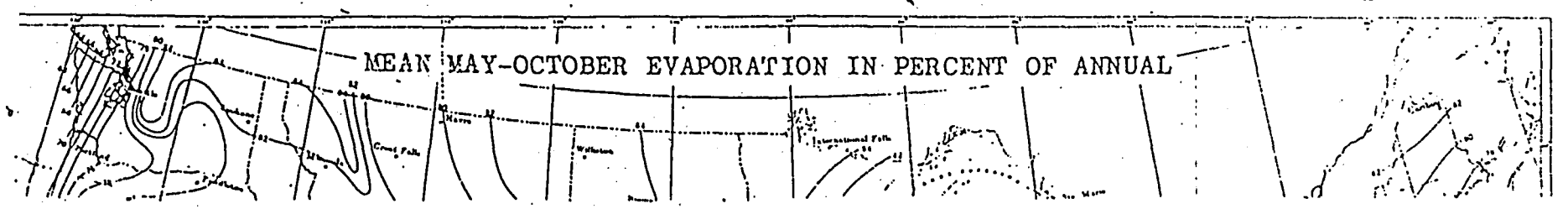


RCE . Environmental Science Services Administration . Environmental Data Service

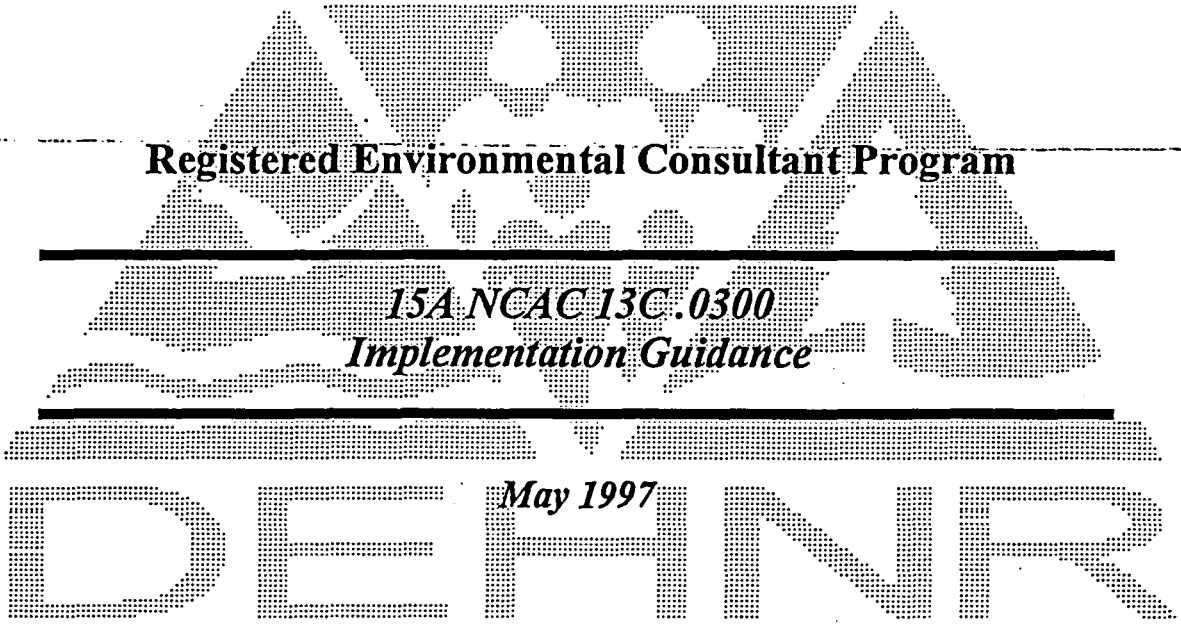

Bismarck
Fargo
Duluth
Sault Ste Marie
Minneapolis
Rapid City
Huron
Detroit
Dubuque
Chicago
Cheyenne
North Platte
Des Moines
Lincoln
Columbus
Denver
Springfield
Indianapolis
Kansas City
St. Louis
Charleston
Lexington
Dodge City
Albuquerque
Amarillo
Oklahoma City
Memphis
Little Rock
Atlanta
Birmingham
Abilene
Fort Worth
Shreveport
Jackson
Jacksonville
New Orleans
Del Rio
San Antonio
Houston
GULF OF MEXICO
Southern Wood Piedmont Co.
NCD 053 488 557
Caution should be used in interpolating on these generalized maps, particularly in mountainous areas.


MEAN ANNUAL LAKE EVAPORATION
(In Inches)
Southern Wood Piedmont Co.
NCD 053 488 557
GULF OF MEXICO
ALASKA
HAWAII
Based on period 1946-55

late 2


MEAN MAY-OCTOBER EVAPORATION IN PERCENT OF ANNUAL

Ref. 36



Registered Environmental Consultant Program

15A NCAC 13C .0300
Implementation Guidance

May 1997

Department of Environment, Health, and Natural Resources
Division of Waste Management
Superfund Section
Inactive Hazardous Sites Branch

401 Oberlin Road - Suite 150
Raleigh, North Carolina 27605
(919) 733-2801

Table D-1: Soil Remediation Goals (RG's)[1]

**Carcinogens identified with an asterisk also exhibit non-carcinogenic effects. See Appendix E for the procedure to calculate remediation goals for chemicals not listed on the table. Cleanup below method detection limits, using analytical methods prescribed in the guidelines, is not required.*

Chemical	CASRN	RG (ppm)	
Acetone	67641	1560	N
Acetone cyanohydrin	75865	1100	N
Acetonitrile	75078	94	N
Acetophenone	98862	1560	N
Acrolein	107028	320	N
Acrylamide *	79061	0.14	C
Acrylic acid	79107	7800	N
Acrylonitrile *	107131	1.2	C
Aldicarb	116063	15.6	N
Aldrin *	309002	0.038	C
Allyl alcohol	107186	78	N
Allyl chloride	107051	780	N
4-Aminopyridine	504245	0.32	N
Ammonium sulfamate	7773060	3200	N
Aniline	62533	110	C
Antimony and compounds	7440360	6.2	N
Antimony pentoxide	1314609	7.8	N
Antimony potassium tartrate	304610	14	N
Antimony tetroxide	1332316	6.2	N
Antimony trioxide	1309644	6.2	N
Arsenic	7440382	4.6	N
Benzene	71432	22	C
Benzenethiol	108985	0.156	N
Benzidine *	92875	0.0028	C
Benzoic acid	65850	62000	N
Benzotrichloride	98077	0.049	C
Benzyl chloride	100447	3.8	C
Beryllium and compounds *	7440417	0.15	C
alpha BHC	319846	0.1	C
beta BHC	319857	0.35	C
gamma BHC (Lindane)*	58899	0.49	C

1 - Adapted from USEPA Region III Risk Based Concentration Table, except as noted.
C - The RG is based on the carcinogenic endpoint and corresponds to an excess lifetime cancer risk of 1 in 1,000,000.
L - The RG is based on USEPA guidance on lead cleanup levels.
N - The RG is based on the non-carcinogenic endpoint and corresponds to a hazard quotient of 0.2.
NA - Not Available.
P - The RG is based on USEPA PCB spill policy.

Table D-1: Soil Remediation Goals (RG's)[1] - (Cont.)

Chemical	CASRN	RG (ppm)	
technical BHC (hexachlorocyclohexane, all isomers)	608731	0.35	C
Bis(2-chloroethyl)ether	111444	0.58	C
Bis(2-ethylhexyl)phthalate (DEHP)*	117817	46	C
Bis(chloromethyl)ether	542881	0.0029	C
Bromodichloromethane *	75274	10	C
Bromoform (tribromomethane)*	75252	81	C
Bromomethane	74839	22	N
4-Bromophenyl phenyl ether	101553	900	N
1-Butanol	71363	1560	N
Butyl benzyl phthalate	85687	3200	N
Cacodylic acid	75605	46	N
Cadmium and compounds	7440439	7.8	N
Captan*	133062	180	C
Carbaryl	63252	1560	N
Carbon disulfide	75150	1560	N
Carbon tetrachloride *	56235	4.9	C
Chloral	75876	32	N
Chlordane *	57749	0.49	C
Chlorine	7782505	1560	N
2-Chloro-1,3-butadiene	126998	320	N
4-Chloro-2,2-methylaniline hydrochloride	3165933	1.4	C
4-Chloro-2-methylaniline	95692	1.1	C
Chloroacetaldehyde	107200	108	N
4-Chloroaniline	106478	62	N
Chlorobenzene	108907	320	N
Chlorobenzilate *	510156	2.4	C
4-Chlorobenzotrifluoride	98566	320	N
1-Chlorobutane	109693	6200	N
Chlorodibromomethane *	124481	7.6	C
Chloroethane	75003	6200	N
2-Chloroethyl vinyl ether	110758	400	N
Chloroform *	67663	100	C
Chloromethane	74873	49	C
beta-Chloronaphthalene	91587	1260	N
o-Chloronitrobenzene	88733	26	C
p-Chloronitrobenzene	100005	35	C

1 - Adapted from USEPA Region III Risk Based Concentration Table, except as noted.
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N - The RG is based on the non-carcinogenic endpoint and corresponds to a hazard quotient of 0.2.
NA - Not Available.
P - The RG is based on USEPA PCB spill policy.

Table D-1: Soil Remediation Goals (RG's)[1] - (Cont.)

Chemical	CASRN	RG (ppm)	
2-Chlorophenol	95578	78	N
o-Chlorotoluene	95498	320	N
Chlorpyrifos	2921882	46	N
Chromium III and compounds	16065831	15600	N
Chromium VI and compounds	18540299	78	N
Copper and compounds	7440508	620	N
Crotonaldehyde *	123739	0.34	C
Cumene	98828	620	N
Cyanide	57125	320	N
Cyclohexanone	108941	78000	N
2-Cyclohexyl-4,6-dinitrophenol (4,6-Dinitro-o-cyclohexyl phenol)	131895	32	N
Dalapon	75990	460	N
DDD	72548	2.7	C
DDE	72559	1.9	C
DDT*	50293	1.9	C
Diallate	2303164	10	C
Diazinon	333415	14	N
Dibenzofuran	132649	62	N
1,2-Dibromo-3-chloropropane	96128	0.46	C
1,2-Dibromoethane	106934	0.0075	C
Di-n-butyl phthalate	84742	1560	N
Dicamba	1918009	460	N
1,2-Dichlorobenzene	95501	1400	N
1,3-Dichlorobenzene	541731	1400	N
1,4-Dichlorobenzene	106467	27	C
3,3'-Dichlorobenzidine	91941	1.4	C
Dichlorodifluoromethane	75718	3200	N
1,1-Dichloroethane	75343	1560	N
1,2-Dichloroethane (EDC)	107062	7	C
1,1-Dichloroethylene*	75354	1.1	C
1,2-Dichloroethylene (cis)	156592	156	N
1,2-Dichloroethylene (mixture)	540590	140	N
1,2-Dichloroethylene (trans)	156605	320	N
2,4-Dichlorophenol	120832	46	N
2,4-Dichlorophenoxyacetic acid (2,4-D)	94757	156	N
1,2-Dichloropropane	78875	9.4	C

1 - Adapted from USEPA Region III Risk Based Concentration Table, except as noted.
C - The RG is based on the carcinogenic endpoint and corresponds to an excess lifetime cancer risk of 1 in 1,000,000.
L - The RG is based on USEPA guidance on lead cleanup levels.
N - The RG is based on the non-carcinogenic endpoint and corresponds to a hazard quotient of 0.2.
NA - Not Available.
P - The RG is based on USEPA PCB spill policy.

Table D-1: Soil Remediation Goals (RG's)[1] - (Cont.)

Chemical	*CASRN*	*RG (ppm)*	
2,3-Dichloropropanol	616239	46	N
1,3-Dichloropropene *	542756	3.7	C
Dichlorvos *	62737	2.2	C
Dicofol	115322	1.5	C
Dieldrin *	60571	0.04	C
Diethyl phthalate	84662	12600	N
Diethylstilbestrol	56531	0.00014	C
Dimethoate	60515	3.2	N
3,3'-Dimethoxybenzidine	119904	46	C
3,3'-Dimethylbenzidine	119937	0.069	C
1,1-Dimethylhydrazine	57147	0.25	C
1,2-Dimethylhydrazine	540738	0.017	C
2,4-Dimethylphenol	105679	320	N
Dimethyl phthalate	131113	156000	N
1,2-Dinitrobenzene (o-Dinitrobenzene)	528290	6.2	N
1,3-Dinitrobenzene (m-Dinitrobenzene)	99650	1.56	N
1,4-Dinitrobenzene (p-Dinitrobenzene)	100254	6.2	N
2,4-Dinitrophenol	51285	32	N
2,4-Dinitrotoluene	121142	32	N
2,6-Dinitrotoluene	606202	15.6	N
Dinitrotoluene mixture	NA	0.94	C
Dinoseb	88857	15.6	N
1,4-Dioxane (p-Dioxane)	123911	58	C
Dioxins and Furans			
2,3,7,8-Heptachlorodibenzo-p-dioxin (2,3,7,8-HPeCDD)	NA	0.0004	C
2,3,7,8-Hexachlorodibenzo-p-dioxin (2,3,7,8-HxCDD)	NA	0.00004	C
Octachlorodibenzo-p-dioxin (OCDD)	NA	0.004	C
2,3,7,8-Pentachlorodibenzo-p-dioxin (2,3,7,8-PeCDD)	NA	0.000008	C
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	1746016	0.000004	C
2,3,7,8-Heptachlorodibenzofuran (2,3,7,8-HPCDF)	NA	0.0004	C
2,3,7,8-Hexachlorodibenzofuran (2,3,7,8-HxCDF)	NA	0.00004	C
Octochlorodibenzofuran (OCDF)	NA	0.004	C
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	NA	0.00008	C
2,3,7,8-Pentachlorodibenzofuran (2,3,7,8-PeCDF)	NA	0.000008	C
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	NA	0.00004	C
Diphenylamine	122394	400	N

1 - Adapted from USEPA Region III Risk Based Concentration Table, except as noted.
C - The RG is based on the carcinogenic endpoint and corresponds to an excess lifetime cancer risk of 1 in 1,000,000.
L - The RG is based on USEPA guidance on lead cleanup levels.
N - The RG is based on the non-carcinogenic endpoint and corresponds to a hazard quotient of 0.2.
NA - Not Available.
P - The RG is based on USEPA PCB spill policy.

Table D-1: Soil Remediation Goals (RG's)[1] - (Cont.)

Chemical	CASRN	RG (ppm)	
1,2-Diphenylhydrazine	122667	0.8	C
Diquat	85007	34	N
Disulfoton	298044	0.62	N
Diuron	330541	32	N
Endosulfan	115297	94	N
Endothall	145733	320	N
Endrin	72208	4.6	N
Epichlorohydrin *	106898	65	C
Ethion	563122	7.8	N
2-Ethoxyethanol	110805	6200	N
Ethyl acetate	141786	14000	N
Ethyl acrylate	140885	13	C
Ethylbenzene	100414	1560	N
Ethylene diamine	107153	320	N
Ethylene oxide	75218	0.63	C
Ethylenethiourea (ETU)*	96457	5.4	C
Ethyl ether	60297	3200	N
Ethyl methacrylate	97632	1400	N
Formaldehyde	50000	3200	N
Formic acid	64186	32000	N
Furfural	98011	46	N
Glycidaldehyde	765344	6.2	N
Heptachlor *	76448	0.14	C
Heptachlor epoxide *	1024573	0.07	C
Hexachlorobenzene	*118741	0.4	C
Hexachlorobutadiene *	87683	8.2	C
Hexachlorocyclopentadiene	77474	110	N
Hexachloroethane *	67721	46	C
Hexachlorophene	70304	4.6	N
Hydrazine	302012	0.21	C
Hydrogen sulfide	7783064	46	N
Isophorone *	78591	670	C
Kepone	143500	0.035	C
Lead	7439921	400	L
Malathion	121755	320	N
Maleic anhydride	108316	1560	N

1 - Adapted from USEPA Region III Risk Based Concentration Table, except as noted.
C - The RG is based on the carcinogenic endpoint and corresponds to an excess lifetime cancer risk of 1 in 1,000,000.
L - The RG is based on USEPA guidance on lead cleanup levels.
N - The RG is based on the non-carcinogenic endpoint and corresponds to a hazard quotient of 0.2.
NA - Not Available.
P - The RG is based on USEPA PCB spill policy.

Table D-1: Soil Remediation Goals (RG's)[1] - (Cont.)

Chemical	*CASRN*	*RG (ppm)*	
Maleic hydrazide	123331	7800	N
Malononitrile	109773	0.32	N
Mercury (inorganic)	7439976	4.6	N
Methacrylonitrile	126987	1.56	N
Methanol	67561	7800	N
Methomyl	16752775	400	N
Methoxychlor	72435	78	N
2-Methyl benzenamine (2-methylaniline)	95534	2.7	C
2-Methyl benzenamine hydrochloride (2-methylaniline hydrochloride)	636215	3.5	C
Methyl chlorocarbonate	79221	15600	N
4,4'-Methylene bis(2 chloroaniline)*	101144	4.9	C
Methylene bromide	74953	156	N
Methylene chloride *	75092	85	C
Methyl ethyl ketone (MEK)	78933	9400	N
Methyl hydrazine	60344	0.58	C
Methyl isobutyl ketone (4-methyl-2-pentanone)	108101	1260	N
Methyl methacrylate	80626	1260	N
Methyl parathion	298000	4	N
3-Methylphenol (m-cresol)	108394	780	N
2-Methylphenol (o-cresol)	95487	780	N
4-Methylphenol (p-cresol)	106445	78	N
2-Methly -1-propanol (isobutanol, isobutyl alcohol)	78831	4600	N
Naled	300765	32	N
2-Naphthylamine	91598	0.0049	C
Nickel and compounds	7440020	320	N
Nitric oxide	10102439	1560	N
4-Nitroaniline	100016	46	N
Nitrobenzene	98953	7.8	N
Nitrogen dioxide	10102440	15600	N
4-Nitrophenol	100027	960	N
2-Nitropropane	79469	0	N
N-Nitrosodiethanolamine	1116547	0.23	C
N-Nitrosodiethylamine	55185	0.0043	C
N-Nitrosodimethylamine	62759	0.013	C
N-Nitrosodi-n-butylamine	924163	0.12	C
N-Nitroso di-n-propylamine	621647	0.091	C

1 - *Adapted from USEPA Region III Risk Based Concentration Table, except as noted.*
C - The RG is based on the carcinogenic endpoint and corresponds to an excess lifetime cancer risk of 1 in 1,000,000.
L - The RG is based on USEPA guidance on lead cleanup levels.
N - The RG is based on the non-carcinogenic endpoint and corresponds to a hazard quotient of 0.2.
NA - Not Available.
P - The RG is based on USEPA PCB spill policy.

Table D-1: Soil Remediation Goals (RG's)[1] - (Cont.)

Chemical	*CASRN*	*RG (ppm)*	
N-Nitrosodiphenylamine	86306	130	C
N-Nitroso-N-ethylurea (ethylnitrosourea)	759739	0.0046	C
N-Nitrosopyrrolidine	930552	0.3	C
Nitrotoluene (mixed)		156	N
Octamethylpyrophosphoramide	152169	32	N
di-n-Octyl phthalate	117840	320	N
Paraquat	1910425	70	N
Parathion	56382	94	N
Pentachlorobenzene	608935	12.6	N
Pentachloronitrobenzene *	82688	2.5	C
Pentachlorophenol *	87865	5.3	C
Phenol	108952	9400	N
p-Phenylenediamine	106503	3000	N
Phenylmercuric acetate	62384	1.26	N
Phorate	298022	3.2	N
Phosphine	7803512	4.6	N
Phosphorus (white)	7723140	0.32	N
Phthalic anhydride	85449	32000	N
Polychlorinated biphenyls (PCBs)	1336363	1	P
Polynuclear aromatic hydrocarbons			
Acenaphthene	83329	940	N
Anthracene	120127	4600	N
Benzo[a]pyrene	50328	0.088	C
Benzo[b]fluoranthene	205992	0.88	C
Benzo[k]fluoranthene	207089	8.8	C
Benz[a]anthracene	56553	0.88	C
Carbofuran	1563662	78	N
Chrysene	218019	88	C
Dibenz[ah]anthracene	53703	0.088	C
Fluoranthene	206440	620	N
Fluorene	86737	620	N
Indeno(1,2,3-cd)pyrene	193395	0.88	C
Naphthalene	91203	620	N
Pyrene	129000	460	N
Pronamide	23950585	1180	N
Propargite	2312358	320	N

1 - Adapted from USEPA Region III Risk Based Concentration Table, except as noted.
C - The RG is based on the carcinogenic endpoint and corresponds to an excess lifetime cancer risk of 1 in 1,000,000.
L - The RG is based on USEPA guidance on lead cleanup levels.
N - The RG is based on the non-carcinogenic endpoint and corresponds to a hazard quotient of 0.2.
NA - Not Available.
P - The RG is based on USEPA PCB spill policy.

Table D-1: Soil Remediation Goals (RG's)[1] - (Cont.)

Chemical	CASRN	RG (ppm)	
Propargyl alcohol	107197	32	N
Propazine	139402	320	N
Propylene oxide	75569	2.7	C
Pyridine	110861	15.6	N
Quinoline	91225	0.053	C
Selenious acid	7783008	78	N
Selenium	7782492	78	N
Selenourea	630104	78	N
Silver and compounds	7440224	78	N
Sodium azide	26628228	62	N
Sodium fluoroacetate	62748	0.32	N
Strychnine	57249	4.6	N
Styrene	100425	3200	N
1,2,4,5-Tetrachlorobenzene	95943	4.6	N
1,1,2,2-Tetrachloroethane	79345	3.2	C
1,1,1,2-Tetrachloroethane *	630206	25	C
Tetrachloroethylene (PCE)*	127184	12	C
2,3,4,6-Tetrachlorophenol	58902	460	N
p,a,a,a-Tetrachlorotoluene	5216251	0.032	C
Tetraethyldithiopyrophosphate	3689245	7.8	N
Tetraethyl lead	78002	0.00156	N
Thallic oxide	1314325	1.1	N
Thallium	NA	1.26	N
Thallium acetate	563688	1.4	N
Thallium carbonate	6533739	1.26	N
Thallium chloride	7791120	1.26	N
Thallium nitrate	10102451	1.4	N
Thallium selenite	12039520	1.4	N
Thallium sulfate	7446186	1.26	N
Thiofanox	39196184	4.6	N
Thiram	137268	78	N
Toluene	108883	3200	N
Toluene-2,4-diamine	95807	0.2	C
Toluene-2,6-diamine	823405	3200	N
p-Toluidine	106490	3.4	C
Toxaphene	8001352	0.58	C

1 - Adapted from USEPA Region III Risk Based Concentration Table, except as noted.
C - The RG is based on the carcinogenic endpoint and corresponds to an excess lifetime cancer risk of 1 in 1,000,000.
L - The RG is based on USEPA guidance on lead cleanup levels.
N - The RG is based on the non-carcinogenic endpoint and corresponds to a hazard quotient of 0.2.
NA - Not Available.
P - The RG is based on USEPA PCB spill policy.

Table D-1: Soil Remediation Goals (RG's)[1] - (Cont.)

Chemical	CASRN	RG (ppm)	
1,1,2-Trichloro-1,2,2-trifluoroethane	76131	200000	N
1,2,4-Trichlorobenzene	120821	156	N
1,1,1-Trichloroethane	71556	540	N
1,1,2-Trichloroethane *	79005	11	C
Trichloroethylene (TCE)*	79016	58	C
Trichlorofluoromethane	75694	4600	N
2,4,6-Trichlorophenol	88062	58	C
2,4,5-Trichlorophenol	95954	1560	N
2-(2,4,5-Trichlorophenoxy)propionic acid	93721	126	N
2,4,5-Trichlorophenoxyacetic acid	93765	156	N
1,1,2-Trichloropropane	598776	78	N
1,2,3-Trichloropropane *	96184	0.091	C
1,3,5-Trinitrobenzene	99354	0.78	N
Vanadium pentoxide	1314621	140	N
Vinyl acetate	108054	15600	N
Vinyl chloride	75014	0.34	C
Xylene (mixed)	1330207	32000	N
Zinc	7440666	4600	N
Zinc phosphide	1314847	4.6	N

1 - Adapted from USEPA Region III Risk Based Concentration Table, except as noted.
C - The RG is based on the carcinogenic endpoint and corresponds to an excess lifetime cancer risk of 1 in 1,000,000.
L - The RG is based on USEPA guidance on lead cleanup levels.
N - The RG is based on the non-carcinogenic endpoint and corresponds to a hazard quotient of 0.2.
NA - Not Available.
P - The RG is based on USEPA PCB spill policy.

Table D-2: Groundwater Remediation Goals (RG's)

For each contaminant the lower of the 15A NCAC 2L (2L) standard, interim standard, the USEPA non -zero MCLG, or the USEPA MCL was retained as the remediation goal. All RG's unless otherwise specified by footnotes are the 15 NCAC 2L standard or interim standard. Cleanup below method detection limits, using analytical methods prescribed in these guidelines, is not required. See Appendix E.3 for the procedure to calculate remediation goals for chemicals not listed on the table.

Chemical	*CASRN*	*RG (ppb)*
Acenaphthene	83329	80
Acenaphthylene	208968	210
Acetone	67641	700
Acrylamide	79061	0.01
Aldicarb[2]	116063	7
Anthracene	120127	2100
Antimony[2]	7440360	6
Arsenic	7440382	50
Barium	7440393	2000
Benzene	71432	1
Benzo(a)anthracene	56553	0.0479
Beryllium[1]	7440417	4
Bis(2-ethylhexyl)phthalate	117817	3
Bromodichloromethane	75274	0.56
Bromoform	75252	0.19
Butyl benzyl phthalate	85687	100
Cadmium	7440439	5
Caprolactam	105602	3500
Carbon disulfide	75150	700
Carbofuran	1563662	36
Carbon tetrachloride	56235	0.3
Chlordane	57749	0.027
Chlorobenzene	108907	50
Chlorodibromomethane[2]	124481	80
Chloroform	67663	0.19
2-Chlorophenol	95578	0.1
Chromium	744073	50
Chrysene	218019	4.79
Copper	7440508	1000

1 USEPA MCL.
2 USEPA MCLG.

Table D-2: Groundwater Remediation Goals (Cont.)

Chemical	*CASRN*	*RG (ppb)*
Cyanide	57125	154
1,2-Dibromo-3-chloropropane	96128	0.025
ortho-Dichloroebenzene (1,2-Dichlorobenzene)	95501	620
meta-Dichloroebenzene (1,3-Dichlorobenzene)	541731	620
para-Dichloroebenzen (1,4-Dichlorobenzene)	106467	75
Dichlorodifluoromethane (Freon-12)	75718	1400
1,1-Dichloroethane	75343	700
1,2-Dichloroethane	107062	0.38
1,1-Dichloroethylene	75354	7
cis-1,2-Dichloroethylene	156902	70
trans-1,2-Dichloroethylene	156605	70
2,4-Dichlorophenoxy-acetic-acid (2,4-D)	94757	70
1,2-Dichloropropane	78875	0.56
1,3-Dichloropropene	542756	0.19
Diethyl phthalate	84662	5000
Di-n-butyl phthalate	84742	700
Diquat[2]	85007	20
para-Dioxane	123911	7
2,3,7,8-tetrachlorodibenzo-p-Dioxin (2,3,7,8-TCDD)	1746016	2.2×10^{-7}
Endrin	72208	2
Ethlylbenzene	100414	29
Ethylene dibromide	106934	0.0004
Fluoranthene	206440	280
Heptachlor	76448	0.008
Heptachlor epoxide	1024573	0.004
Hexachlorobenzene	118741	0.02
Hexachlorobutadiene[2]	87683	1
Hexachlorocyclopentadiene[2]	608731	50
Lead	7439921	15
Lindane	58899	0.2
Mercury	7439976	1.1
Methanol	67561	3500
Methoxychlor	72435	35
Methyl ethyl ketone	78933	170

1 USEPA MCL.
2 USEPA MCLG.

Table D-2: Groundwater Remediation Goals (Cont.)

Chemical	*CASRN*	*RG (ppb)*
Methylene chloride	75092	5
Napthalene	91203	21
Nickel	7440020	100
Pentachlorophenol	87865	0.3
Phenol	108952	300
PCB's[1]	1336363	0.5
Pyrene	129000	210
Selenium	7782492	50
Silver	7440224	18
Styrene	100425	100
2,4,5-TP[2]	93765	50
Tetrachloroethylene	127184	0.7
Thallium[2]	7440280	0.5
Toluene	108883	1000
Toxaphene	8001352	0.031
1,2,4-Trichlorobenzene[1]	120821	70
1,1,1-Trichloroethane	71556	200
1,1,2-Trichloroethane[2]	79005	3
Trichloroethylene	79016	2.8
Trichlorofluoromethane	75694	2100
Vinyl chloride	75014	0.015
Xylenes	1320000	530
Zinc	1310000	2100

1 USEPA MCL.
2 USEPA MCLG.

Ref. 37

Ref. 37

Ground-Water Regions of the United States

United States Geological Survey Water-Supply Paper 2242

UNITED STATES DEPARTMENT OF THE INTERIOR
WILLIAM P. CLARK, Secretary

GEOLOGICAL SURVEY
Dallas L. Peck, Director

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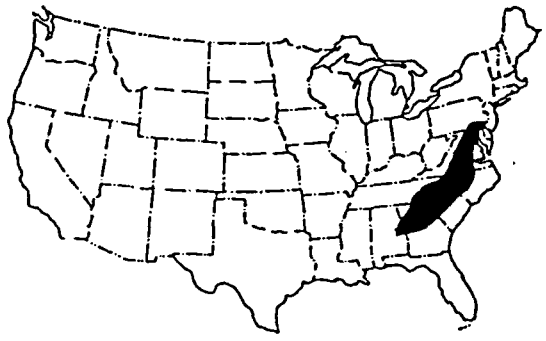
reservoir for the bedrock.

The Glaciated Central region and the Northeast and Superior Uplands region are similar in that the unconsolidated material in both consists of glacial deposits. However, the bedrock in the two regions is different. The bedrock in the Glaciated Central region, as we have already seen, consists of consolidated sedimentary rocks that contain both steeply dipping fractures and fractures along bedding planes. In the Northeast and Superior Uplands, on the other hand, the bedrock is composed of intrusive igneous and metamorphic rocks (nonbedded) in which most water-bearing openings are steeply-dipping fractures. As a result of the differences in fractures, the bedrock in the Glaciated Central region is, in general, a more productive and more important source of ground water than the bedrock in the Northeast and Superior Uplands region.

8. PIEDMONT BLUE RIDGE REGION

(Thick regolith over fractured crystalline and metamorphosed sedimentary rocks)



The Piedmont and Blue Ridge region is an area of about 247,000 km^2 extending from Alabama on the south to Pennsylvania on the north. The Piedmont part of the region consists of low, rounded hills and long, rolling, northeast-southwest tranding ridges whose summits range from about a hundred meters above sea level along its eastern boundary with the Coastal Plain to 500 to 600 m along its boundary with the Blue Ridge area to the west. The Blue Ridge is mountainous and includes the highest peaks east of the Mississippi. The mountains, some of which reach altitudes of more than 2,000 m, have smooth-rounded outlines and are bordered by well-graded streams flowing in relatively narrow valleys.

The Piedmont and Blue Ridge region is underlain by bedrock of Precambrian and Paleozoic age consisting of igneous and metamorphosed igneous and sedimentary rocks. These include granite, gneiss, schist, quartzite, slate, marble, and phyllite. The land surface in the Piedmont and Blue Ridge is underlain by clay-rich, unconsolidated material derived from in situ weathering of the underlying bedrock. This material, which averages about 10 to 20 m in thickness and may be as much as 100 m thick on some ridges, is referred to as saprolite. In many valleys, especially those of larger streams, flood plains are underlain by thin, moderately well-sorted alluvium deposited by the streams. When the distinction between saprolite and alluvium is not important, the term regolith is used to refer to the layer of unconsolidated deposits.

The regolith contains water in pore spaces between rock particles. The bedrock, on the other hand, does not have any significant intergranular porosity. It contains water, instead, in sheetlike openings formed along fractures (that is, breaks in the otherwise "solid" rock) (fig. 36). The hydraulic conductivities of the regolith and the bedrock are similar and range from about 0.001 to 1 m day^{-1}. The major difference in their water-bearing characteristics is their porosities, that of regolith being about 20 to 30 percent and that of the bedrock about 0.01 to 2 percent (fig. 37). Small supplies of water adequate for domestic needs can be obtained from the regolith through large-diameter bored or dug wells. However, most wells, especially those where moderate supplies of water are needed, are relatively small in diameter and are cased through the regolith and finished with open holes in the bedrock. Although, as noted, the hydraulic conductivity of the bedrock is similar to that of the regolith, bedrock wells generally have much larger yields than regolith wells because, being deeper, they have a much larger available drawdown.

All ground-water systems function both as reservoirs that store water and as pipelines (or conduits) that transmit water from recharge areas to discharge areas. The yield of bedrock wells in the Piedmont and Blue Ridge region depends on the number and size of fractures penetrated by the open hole and on the replenishment of the fractures by seepage into them from the overlying regolith. Thus, the ground-water system in this region can be viewed, from the standpoint of ground-water development, as a terrane in which the reservoir and pipeline functions are effectively separated. Because of its larger porosity, the regolith functions as a reservoir which slowly feeds water downward into the fractures in

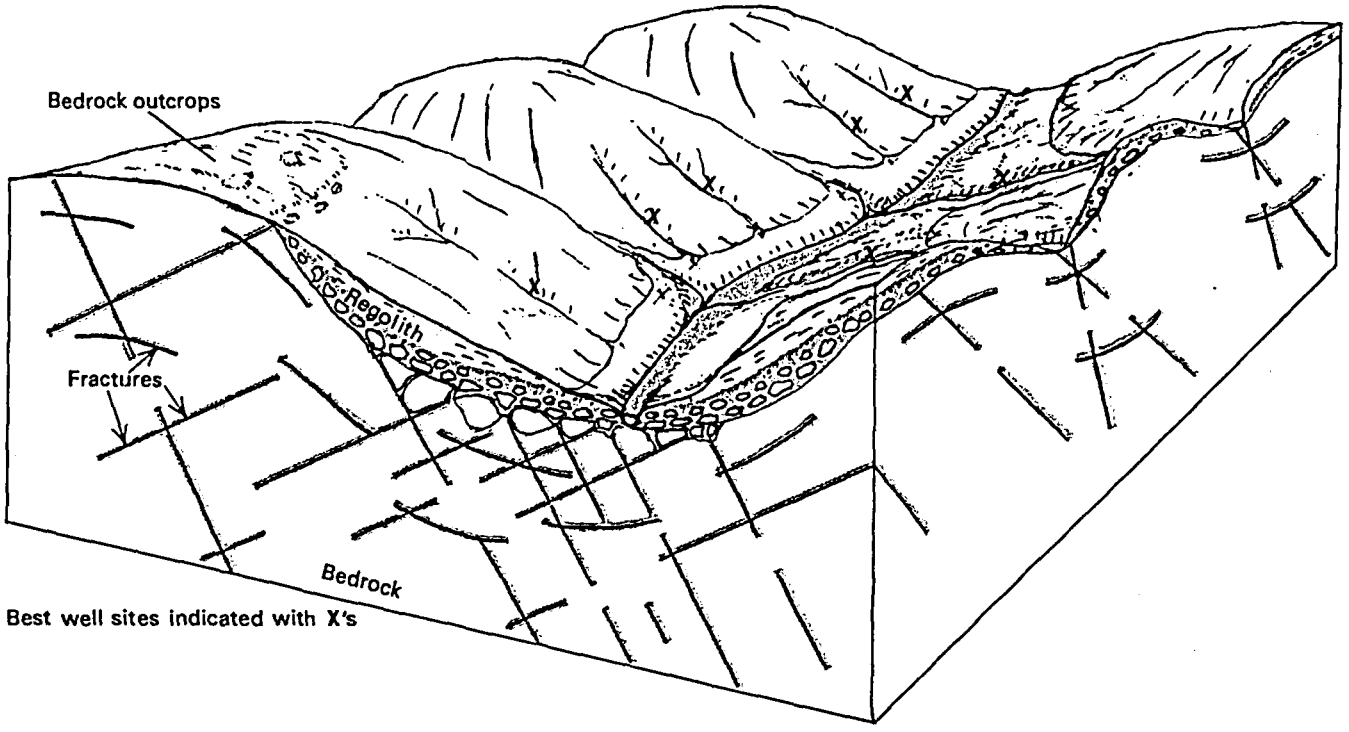


Figure 36. Topographic and geologic features of the Piedmont and Blue Ridge region.

the bedrock. The fractures serve as an intricate interconnected network of pipelines that transmit water either to springs or streams or to wells (fig. 38).

Recharge of the ground-water system occurs on the areas above the flood plains of streams, and natural discharge occurs as seepage springs that are common near the bases of slopes and as seepage into streams. With respect to recharge conditions, it is important to note that forested areas, which include most of the Blue Ridge and much of the Piedmont, have thick and very permeable soils overlain by a thick layer of forest litter. In these areas, even on steep slopes, most of the precipitation seeps into the soil zone, and most of this moves laterally through the soil in a thin, temporary, saturated zone to surface depressions or streams to discharge. The remainder seeps into the regolith below the soil zone, and much of this ultimately seeps into the underlying bedrock.

Because the yield of bedrock wells depends on the number of fractures penetrated by the wells, the key element in selecting well sites is recognizing the relation between the present surface topography and the location of fractures in the bedrock. Most of the valleys, draws, and other surface depressions indicate the presence of more intensely fractured zones in the bedrock which are more susceptible to weathering and erosion than are the intervening areas. Because fractures in the bedrock are the principal avenues along which ground water moves, the best well sites appear to be in draws on the sides of the valleys of perennial streams where the bordering ridges are underlain by substantial thicknesses of regolith (fig. 36). Wells located at such sites seem to be most effective in penetrating open water-bearing fractures and in intercepting ground water draining from the regolith. Chan-

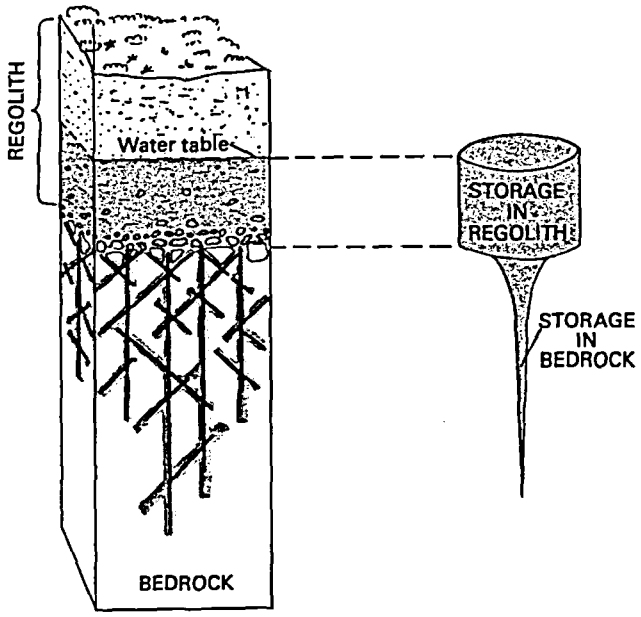


Figure 37. Differences in storage capacity of regolith and bedrock.

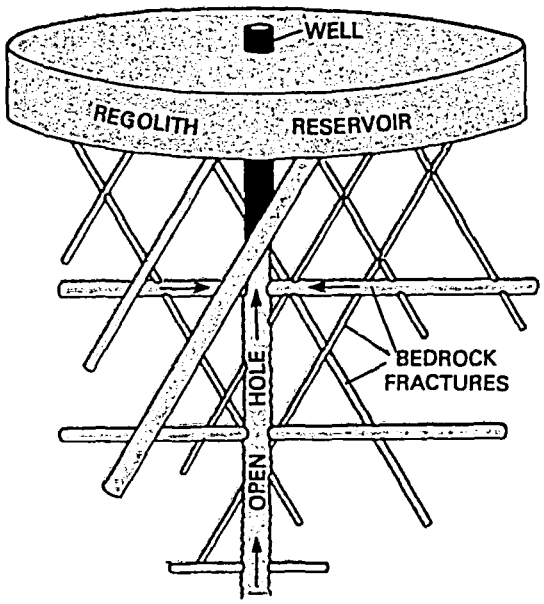


Figure 38. Separation of the storage and pipeline functions in the Piedmont and Blue Ridge region.

ces of success seem to be somewhat less for wells on the flood plains of perennial streams, possibly because the alluvium obscures the topographic expression of bedrock fractures. The poorest sites for wells are on the tops of ridges and mountains where the regolith cover is thin or absent and the bedrock is sparsely fractured.

As a general rule, fractures near the bedrock surface are most numerous and have the largest openings, so that the yield of most wells is not increased by drilling to depths greater than about 100 m. Exceptions to this occur in Georgia and some other areas where water-bearing, low-angle faults or fractured zones are present at depths as great as 200 to 300 m.

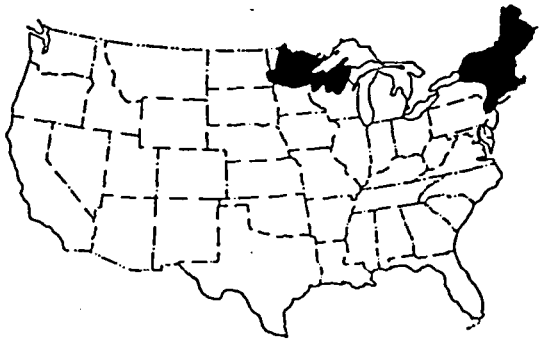
The Piedmont and Blue Ridge region has long been known as an area generally unfavorable for groundwater development. This reputation seems to have resulted both from the small reported yields of the numerous domestic wells in use in the region that were, generally, sited as a matter of convenience and from a failure to apply existing technology to the careful selection of well sites where moderate yields are needed. As water needs in the region increase and as reservoir sites on streams become increasingly more difficult to obtain, it will be necessary to make more intensive use of ground water.

9. NORTHEAST AND SUPERIOR UPLANDS

(Glacial deposits over fractured crystalline rocks)

The Northeast and Superior Uplands region is made up of two separate areas totaling about 415,000 km². The Northeast Upland encompasses the Adirondack Mountains, the Lake Champlain valley, and nearly all of New England. The parts of New England not included are the Cape Cod area and nearby islands, which are included in the Atlantic and Gulf Coastal Plain region, and the Triassic lowland along the Connecticut River in Connecticut and Massachusetts, which is included in the Glaciated Central region. The Superior Upland encompasses most of the northern parts of Minnesota and Wisconsin adjacent to the western end of Lake Superior. The Northeast and Superior Uplands are characterized by rolling hills and low mountains. Landsurface altitudes in the Northeast Upland range from sea level to more than 1,500 m on some of the peaks in the Adirondacks and White Mountains. In contrast to the mountainous areas in the Northeast, the Superior Upland is in an area of rolling hills whose summits reach altitudes of only 300 to 600 m.

Bedrock in the region ranges in age from Precambrian to Paleozoic and consists mostly of granite, syenite,



anorthosite, and other intrusive igneous rocks and metamorphosed sedimentary rocks consisting of gneiss, schist, quartzite, slate, and marble (fig. 39). Most of the igneous and metamorphosed sedimentary rocks have been intensely folded and cut by numerous faults.

The bedrock is overlain by unconsolidated deposits laid down by ice sheets that covered the areas one or more times during the Pleistocene (fig. 40) and by gravel, sand, silt, and clay laid down by meltwater streams and in lakes that formed during the melting of the ice (fig. 39). The thickness of the glacial deposits ranges from a few meters on the higher mountains, which also have large expanses of barren rock, to more than 100 m in some valleys. The most extensive glacial deposit is till, which was laid down

Ref. 38

Memorandum

To: MEMORANDUM FOR THE RECORD

CC:

From: Jean B. Manuele

Date: March 11, 1996

Subject: Action ID. 199602037, Jurisdictional Determination for Mr. Charles Oldham, in Chatham County, North Carolina.

On May 11, 1995, I met with Mr. Charles Oldham on his 600+ acre tract of land located on the north side of S.R. 2139, on the north and south sides of Cedar Creek, approximately 1/2-1 mile west of S.R. 2142, in Gulf, in Chatham County, North Carolina. The property is located adjacent to, and above the headwaters of, Cedar Creek. Also, present at the site inspection were: Mr. Doug Rumford Environmental Chemist with the N.C. Superfund Section and Mr. W.P. "Bill" Arrants, Environmental Compliance and Safety Manager with Southern Wood Piedmont Company. The purpose of the site inspection was to determine the presence of wetlands subject to our regulatory authority pursuant to Section 404 of the Clean Water Act for purposes of evaluating areas downstream of a site identified as a potential Superfund site owned by Southern Wood Piedmont Company.

The presence or absence of wetlands needed to be determined for a distance of less than 1 mile downstream of the site. The presence/absence of wetlands is utilized by the state under the US EPA Hazard Ranking System to determine the eligibility of a site for inclusion on the Superfund Site List.

The site is located on the Goldston Quad. The site consists primarily of wooded uplands divided by Cedar Creek. During the site inspection, the property was examined on the south side of the creek for approximately 1,500-2,000 linear feet. No wetlands were noted as being present within the area examined during the site inspection.

I was later contacted by Mr. Rumford who stated that we needed to revisit the site to examine areas downstream of where we had previously stopped our investigation, as well, we needed to examine the opposite side of the creek. Subsequently, on June 27, 1995, Mr. Rumford, Mr. Arrants and I conducted another site inspection. During this site inspection, it was determined that no

wetlands were found within the areas examined (immediately adjacent to the creek). Therefore, the only jurisdictional areas noted within the examined areas was the stream channel only. See attached wetland data form.

A Jurisdictional Tearsheet was sent to Mr. Oldham in the mail in March 1996.

Jean B. Manuele

Jean B. Manuele

Regulatory Specialist
Raleigh Field Office

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Action ID. 199602037 Date: May 11, 1995
Applicant/Owner: Charles Oldham Project/Site: Possible Superfund
Address: 2205 Southern Road, Sanford, N.C. 27330
Location: 600+ acres on the N side of S.R. 2139, in Gulf, N.C.
Waterway: Cedar Creek County: Chatham
Investigator: Jean B. Manuele State: North Carolina

Do Normal Circumstances exist on the site? Yes X No ___
Is the site significantly disturbed (Atypical Situation)? Yes X No ___
Is the area a potential Problem Area? (Explain on reverse) Yes ___ No X
Community ID: Uplands Along Stream Bank Plot ID: ___

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.Liriodendron tulipifera	Tre/Sap	40%-FAC	2.Ulmus rubra	Tre/Sap	25%-FAC
3.Alnus serrulata	Shrub	25%-FACW	4.Arundinaria gigantea	Herb	35%-FACW
5.Carpinus caroliniana	Tre/Sap	15%-FAC	6.Lonicera japonica	Herb	15%-FAC
7.			8.		
9.			10.		
11.			12.		
13.			14.		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%
Remarks: Wetland Vegetation Present Based Upon Greater than 50% of the Plant Species are Classified as FAC-OBL in the National List of Plant Species that Occur in Wetlands-North Carolina.

SOILS
Map Unit Name Drainage Class: ___
Series and Phase): ___ Field Observations Confirm
Taxonomy (Subgroup): ___ Map Type? ___

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Conc. Structure
11		10 YR 5/3	10 YR 5/6		

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Sulfidic Odor		Organic Streaking in Sandy Soils
	Aquic Moisture Regime		Listed on Local Hydric Soils List
	Reducing Conditions		Listed on National Hydric Soils List
	Gleyed or Low-Chroma Colors		Other (Explain in Remarks)

Remarks: Hydric Soils Absent Based Upon the Lack of Low Chroma Soils.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
_X_ No Recorded Data Available

Field Observations:
Depth of Surface Water: N/A (in.)
Depth to Water in Pit: 20+ (in.)
Depth to Saturated Soil: 20+ (in.)

Wetland Hydrology Indicators:

	Primary Indicators:		Secondary Indicators (2 or more required):
	Inundated		Oxidized Root Channels in Upper 12 Inches
	Saturated in Upper 12 Inches		Water-Stained Leaves
	Water Marks		Local Soil Survey Data
	Drift Lines		FAC-Neutral Test
	Sediment Deposits		Other (Explain in Remarks)
	Drainage Patterns in Wetlands		

Remarks: Wetland Hydrology Absent Due to the Lack of Primary and/or Secondary Hydrology Indicators.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes _X_ No ___
Hydric Soils Present? Yes ___ No _X_
Wetland Hydrology Present? Yes ___ No _X_

Is this Sampling Point Within a Wetland? Yes ___ No _X_

Remarks: Floodplain area bordering Cedar Creek is not classified as jurisdictional wetlands as set forth by the criteria in the 1987 Army Corps of Engineers Wetlands Delineation Manual.

There is no Ref. 39
Included

Ref. 40

North Carolina Administrative Code

Title 15A
Department of Environment, Health, and Natural Resources
Division of Environmental Management

Subchapter 2L

Sections .0100, .0200, and .0300

Classifications and Water Quality Standards Applicable To The Groundwaters of North Carolina

Current Through November 8, 1993
Environmental Management Commission
Raleigh, North Carolina

SECTION .0200 - CLASSIFICATIONS AND GROUNDWATER QUALITY STANDARDS

.0201 GROUNDWATER CLASSIFICATIONS

The classifications which may be assigned to the groundwaters will be those specified in the following series of classifications:

(1) Class GA groundwaters; usage and occurrence:
  (a) Best Usage. Existing or potential source of drinking water supply for humans.
  (b) Conditions Related to Best Usage. This class is intended for those groundwaters in which chloride concentrations are equal to or less than 250 mg/l, and which are considered suitable for drinking in their natural state, but which may require treatment to improve quality related to natural conditions.
  (c) Occurrence. In the saturated zone.
(2) Class GSA groundwaters; usage and occurrence:
  (a) Best Usage. Existing or potential source of water supply for potable mineral water and conversion to fresh waters.
  (b) Conditions Related to Best Usage. This class is intended for those groundwaters in which the chloride concentrations due to natural conditions is in excess of 250 mg/l, but which otherwise may be considered suitable for use as potable water after treatment to reduce concentrations of naturally occurring substances.
  (c) Occurrence. In the saturated zone.
(3) Class GC groundwaters: usage and occurrence:
  (a) Best Usage. The best usage of GC groundwaters is as a source of water supply for purposes other than drinking, including other domestic uses by humans.
  (b) Conditions Related to Best Usage. This class includes those groundwaters that do not meet the quality criteria for GA or GSA groundwaters and for which efforts to improve groundwater quality would not be technologically feasible, or not in the best interest of the public. Continued consumption of waters of this class by humans could result in adverse health affects.
  (c) Occurrence. Groundwaters of this class may be defined by the Commission pursuant to Section .0300 of this Subchapter on a case by case basis.

History Note: *Statutory Authority G.S. 143-214.1; 143B-282(2);*
Eff. June 10, 1979;
Amended Eff. October 1, 1993; August 1, 1989; September 1, 1984; December 30, 1983.

.0202 GROUNDWATER QUALITY STANDARDS

(a) The groundwater quality standards for the protection of the groundwaters of the state are those specified in this Rule. They are the maximum allowable concentrations resulting from any discharge of contaminants to the land or waters of the state, which may be tolerated without creating a threat to human health or which would otherwise render the groundwater unsuitable for its intended best usage.

(b) The groundwater quality standards for contaminants specified in Paragraphs (g) and (h) of this Rule shall be as listed, except that:

(1) Where the standard for a substance is less than the practical quantitation limit,

the detection of that substance at or above the practical quantitation limit shall constitute a violation of the standard.

(2) Where two or more substances exist in combination, the Director shall consider the effects of chemical interactions as determined by the Division of Epidemiology and may establish maximum concentrations at values less than those established in accordance with Paragraphs (c) and (g) of this Rule. In the absence of information to the contrary, the carcinogenic risks associated with carcinogens present shall be considered additive and the toxic effects associated with non-carcinogens present shall also be considered additive.

(3) Where naturally occurring substances exceed the established standard, the standard will be the naturally occurring concentration as determined by the Director.

(c) Except for tracers used in concentrations which have been determined by the Division of Epidemiology to be protective of human health, and the use of which has been permitted by the Division, substances which are not naturally occurring and for which no standard is specified shall not be permitted in detectable concentrations in Class GA or Class GSA groundwaters. Any person may petition the Director to establish an interim maximum allowable concentration for an unspecified substance, however, the burden of demonstrating those concentrations of the substance which correspond to the levels described in Paragraph (d) of this Rule rests with the petitioner. The petitioner shall submit relevant toxicological and epidemiological data, study results, and calculations necessary to establish a standard in accordance with the procedure prescribed in Paragraph (d) of this Rule. Within three months after the establishment of an interim maximum allowable concentration for a substance by the Director, the Director shall initiate action to consider adoption of a standard for that substance.

(d) Groundwater quality standards for substances in Class GA and Class GSA groundwaters are established as the lesser of:

(1) Systemic threshold concentration calculated as follows: [Reference Dose (mg/kg/day) x 70 kg (adult body weight) x Relative Source Contribution (.10 for inorganics; .20 for organics)] / [2 liters/day (avg. water consumption)];

(2) Concentration which corresponds to an incremental lifetime cancer risk of $1x10^{-6}$;

(3) Taste threshold limit value;

(4) Odor threshold limit value;

(5) Maximum contaminant level; or

(6) National secondary drinking water standard.

(e) The following references, in order of preference, shall be used in establishing concentrations of substances which correspond to levels described in Paragraph (d) of this Rule.

(1) Integrated Risk Information System (U.S. EPA).

(2) Health Advisories (U.S. EPA Office of Drinking Water).

(3) Other health risk assessment data published by U.S. EPA.

(4) Other appropriate, published health risk assessment data, and scientifically valid peer-reviewed published toxicological data.

(f) Groundwater quality standards specified in Paragraphs (g) and (h) of this Rule and interim maximum allowable concentrations established pursuant to Paragraph (c) of this Rule shall be reviewed on a biennial basis. Appropriate modifications to established standards will be made in accordance with the procedure prescribed in Paragraph (d) of this Rule where modifications are considered appropriate based on data published subsequent

to the previous review.

(g) Class GA Standards. Where not otherwise indicated, the standard refers to the total concentration in milligrams per liter of any constituent in a dissolved, colloidal or particulate form which is mobile in groundwater. This does not apply to sediment or other particulate matter which is preserved in a groundwater sample as a result of well construction or sampling procedures.

(1) acetone: 0.7
(2) acrylamide (propenamide): 0.00001
(3) arsenic: 0.05
(4) barium: 2.0
(5) benzene: 0.001
(6) bromoform (tribromomethane): 0.00019
(7) cadmium: 0.005
(8) carbofuran: 0.036
(9) carbon tetrachloride: 0.0003
(10) chlordane: 2.7×10^{-5}
(11) chloride: 250.0
(12) chlorobenzene: 0.05
(13) chloroform (trichloromethane): 0.00019
(14) 2-chlorophenol: 0.0001
(15) chromium: 0.05
(16) cis-1,2-dichloroethene: 0.07
(17) coliform organisms (total): 1 per 100 milliliters
(18) color: 15 color units
(19) copper: 1.0
(20) cyanide: 0.154
(21) 2, 4-D (2,4-dichlorophenoxy acetic acid): 0.07
(22) 1,2-dibromo-3-chloropropane: 2.5×10^{-5})
(23) dichlorodifluoromethane (Freon-12; Halon): 1.4
(24) 1,1 dichloroethane: 0.7
(25) 1,2-dichloroethane (ethylene dichloride): 0.00038
(26) 1,1-dichloroethylene (vinylidene chloride): 0.007
(27) 1,2-dichloropropane: 0.00056
(28) di-n-butyl (or dibutyl) phthalate (DBP): 0.7
(29) diethylphthalate (DEP): 5.0
(30) di(2-ethylhexyl) phthalate (DEHP): 0.003
(31) p-dioxane (1,4-diethylene dioxide): 0.007
(32) dioxin: 2.2×10^{-10}
(33) dissolved solids (total): 500
(34) endrin: 0.002
(35) epichlorohydrin (1-chloro-2,3-epoxypropane): 0.00354
(36) ethylbenzene: 0.029
(37) ethylene dibromide (EDB; 1,2-dibromoethane): 4.0×10^{-7}
(38) ethylene glycol: 7.0
(39) fluoride: 2.0
(40) foaming agents: 0.5
(41) gross alpha (adjusted)particle activity (excluding radium-226 and uranium): 15 pCi/l

(42) heptachlor: 8.0×10^{-6}
(43) heptachlor epoxide: 4.0×10^{-6}
(44) heptane: 2.1
(45) hexachlorobenzene (perchlorobenzene): 0.00002
(46) n-hexane: 0.42
(47) iron: 0.3
(48) lead: 0.015
(49) lindane: 2.0×10^{-4}
(50) manganese: 0.05
(51) mercury: 0.0011
(52) metadichlorobenzene (1,3-dichlorobenzene): 0.62
(53) methoxychlor: 0.035
(54) methylene chloride (dichloromethane): 0.005
(55) methyl ethyl ketone (MEK; 2-butanone): 0.17
(56) methyl tert-butyl ether (MTBE): 0.2
(57) nickel: 0.1
(58) nitrate: (as N) 10.0
(59) nitrite: (as N) 1.0
(60) orthodichlorobenzene (1,2-dichlorobenzene): 0.62
(61) oxamyl: 0.175
(62) paradichlorobenzene (1,4-dichlorobenzene): 0.075
(63) pentachlorophenol: 0.0003
(64) pH: 6.5 - 8.5
(65) radium-226 and radium-228 (combined): 5 pCi/l
(66) selenium: 0.05
(67) silver: 0.018
(68) styrene (ethenylbenzene): 0.1
(69) sulfate: 250.0
(70) tetrachloroethylene (perchloroethylene; PCE): 0.0007
(71) toluene (methylbenzene): 1.0
(72) toxaphene: 3.1×10^{-5}
(73) 2, 4, 5,-TP (Silvex): 0.05
(74) trans-1,2-dichloroethene: 0.07
(75) 1,1,1-trichloroethane (methyl chloroform): 0.2
(76) trichloroethylene (TCE): 0.0028
(77) trichlorofluoromethane: 2.1
(78) vinyl chloride (chloroethylene): 1.5×10^{-5}
(79) xylenes (o-, m-, and p-): 0.53
(80) zinc: 2.1

(h) Class GSA Standards. The standards for this class shall be the same as those for Class GA except as follows:

(1) chloride: allowable increase not to exceed 100 percent of the natural quality concentration.
(2) total dissolved solids: 1000 mg/l.

(i) Class GC Waters.

(1) The concentrations of substances which, at the time of classification exceed the standards applicable to Class GA or GSA groundwaters shall not be caused to increase, nor shall the concentrations of other substances be caused to exceed the

GA or GSA standards as a result of further disposal of contaminants to or beneath the surface of the land within the boundary of the area classified GC.

(2) The concentrations of substances which, at the time of classification, exceed the standards applicable to GA or GSA groundwaters shall not be caused to migrate as a result of activities within the boundary of the GC classification, so as to violate the groundwater or surface water quality standards in adjoining waters of a different class.

(3) Concentrations of specific substances, which exceed the established standard at the time of classification, shall be listed in Section .0300 of this Subchapter.

History Note: *Statutory Authority G.S. 143-214.1; 143B-282(2);*
Eff. June 10, 1979;
Amended Eff. October 1, 1993; September 1, 1992; August 1, 1989;
September 1, 1984.

PUBLIC NOTICE

DEPARTMENT OF ENVIRONMENT, HEALTH, AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL MANAGEMENT

The Division has received a petition to establish interim maximum allowable concentrations in groundwater for chloroethane and diphenyl (1,1-diphenyl). In accordance with 15A NCAC 2L .0202 (c), the data supporting the request has been reviewed as have staff recommendations from the Division of Environmental Management and the Division of Epidemiology. Therefore, the following interim maximum allowable concentrations are hereby established for Class GA and GSA groundwaters effective August 17, 1994:

Chloroethane..... 2.80 mg/L

Diphenyl..... 0.35 mg/L

As required by 15A NCAC 2L .0202(c), action to adopt permanent standards for these substances will be initiated within three months of August 17, 1994.

A. Preston Howard, Jr., P.E.,
Director, Division of Environmental Management

NOTICE OF HEARING
DEPARTMENT OF ENVIRONMENT, HEALTH, AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL MANAGEMENT

Notice is hereby given of a public hearing to be held by the Department of Environment, Health, and Natural Resources on behalf of the Environmental Management Commission. The Hearing concerns the proposed amendment of Title 15A NCAC 2L .0202 (Groundwater Classification and Standards-Groundwater Quality Standards). The amendment to 15A NCAC 2L .0202 will provide groundwater quality standards for eight (8) chemicals in the groundwaters of the State. Action to consider adoption of groundwater standards for these eight substances is necessary to satisfy the requirements of 15A NCAC 2L .0202 (c). These requirements specify that after interim maximum allowable concentrations have been established, the Director of the Division of Environmental Management must act to consider permanent groundwater standards.

The following concentrations in units of milligrams/Liter are proposed as groundwater quality standards for these substances:

Substance	milligrams/Liter (ppm)	
BORON	0.32	320 ppb
BUTYLBENZYL PHTHALATE	0.10	100 ppb
DI-N-OCTYL PHTHALATE	0.14	140 ppb
DIUNDECYL PHTHALATE (Santicizer 711)	0.14	140 ppb
FLUORENE	0.28	280 ppb
NAPHTHALENE	0.021	21 ppb
PHENANTHRENE	0.21	210 ppb
PHENOL	0.30	300 ppb

will be brought up by commission Sept. 8

have not been approved yet. would be approved before, date sometime in NOV. these are interim only. can use.

The hearing will be held as follows:

RALEIGH
May 12, 1994
7:00 PM
Ground Floor Hearing Room
Archdale Building
512 N. Salisbury Street

PUBLIC NOTICE

DEPARTMENT OF ENVIRONMENT, HEALTH, AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL MANAGEMENT

The Division has received a petition to establish interim maximum allowable concentrations in groundwater for Acenaphthene, Acenaphthylene, Anthracene, Atrazine, Benzo(a)anthracene, Bromodichloromethane, Caprolactam, Carbon Disulfide, Chrysene, cis and trans-1,3-Dichloropropene, Fluoranthene, Methanol, Pyrene, and Simazine. In accordance with 15A NCAC 2L .0202 (c), the data supporting the request has been reviewed as have staff recommendations from the Division of Environmental Management and the Division of Epidemiology. Therefore, the following interim maximum allowable concentrations are hereby established for Class GA and GSA groundwaters effective May 16, 1995:

Acenaphthene	0.08 mg/L
Acenaphthylene	0.21 mg/L
Anthracene	2.10 mg/L
Atrazine	0.003 mg/L
Benzo(a)anthracene	0.00005 mg/L
Bromodichloromethane	0.0006 mg/L
Caprolactam	3.5 mg/L
Carbon Disulfide	0.7 mg/L
Chrysene	0.005 mg/L
1,3-Dichloropropene (cis and trans isomers)	0.0002 mg/L
Fluoranthene	0.28 mg/L
Methanol	3.5 mg/L
Pyrene	0.21 mg/L
Simazine	0.0035 mg/L

As required by 15A NCAC 2L .0202(c), action to adopt permanent standards for these substances will be initiated within three months of May 16, 1995.

A. Preston Howard, Jr., P.E.,
Director, Division of Environmental Management

GROUNDWATER RULES MAIL LIST NOTICE - 5/25/95

PUBLIC NOTICE

DEPARTMENT OF ENVIRONMENT, HEALTH, AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL MANAGEMENT

The Division has received a petition to establish an interim maximum allowable concentration in groundwater for Benzo(g,h,i)perylene. In accordance with 15A NCAC 2L .0202 (c), the data supporting the request has been reviewed as have staff recommendations from the Division of Environmental Management and the Division of Epidemiology. Therefore, the following interim maximum allowable concentration is hereby established for Class GA and GSA groundwaters effective May 16, 1995:

Benzo(g,h,i)perylene..... 0.21 milligrams/Liter

As required by 15A NCAC 2L .0202(c), action to adopt permanent standards for this substance will be initiated within three months of May 16, 1995.

A. Preston Howard, Jr., P.E.
Director, Division of Environmental Management

Aerial Rep 50's

Lot
615012

Bottles
125ml Solid Caps

Southern Wood Piedmont-Gulf
Follow-up stream sampling trip
Monday, November 9, 1998
NCD 053488557

Sampling Team: Doug Rumford
Doug Moore

0910 - arrived at site. met with Greg Kuntz and Raymond Knox of Schnabel Engineering Associates. discussed sampling plan

0945 - arrived @ SR2145 bridge and scoped sample location about 30-40' feet upstream of bridge. Sample taken from bottom of channel along north bank of Cedar Creek. Cedar Creek is shallow w/ little flow and pools of stagnant water.

0952 - Doug Rumford collected sediment sample and duplicated sediment sample SW-52-SD and SW-152-SD above bridge. Samples collected for semi-volatile organics (SVOC) and dioxin analyses. Sediment was light brown, mottled, silty clay with no odors. Sediment contains decayed leaves & organic matter. Splits recieved by Greg Kuntz. (See Fig. 1)

DBR 11/9/98

DBR 11/9/98

REF 41

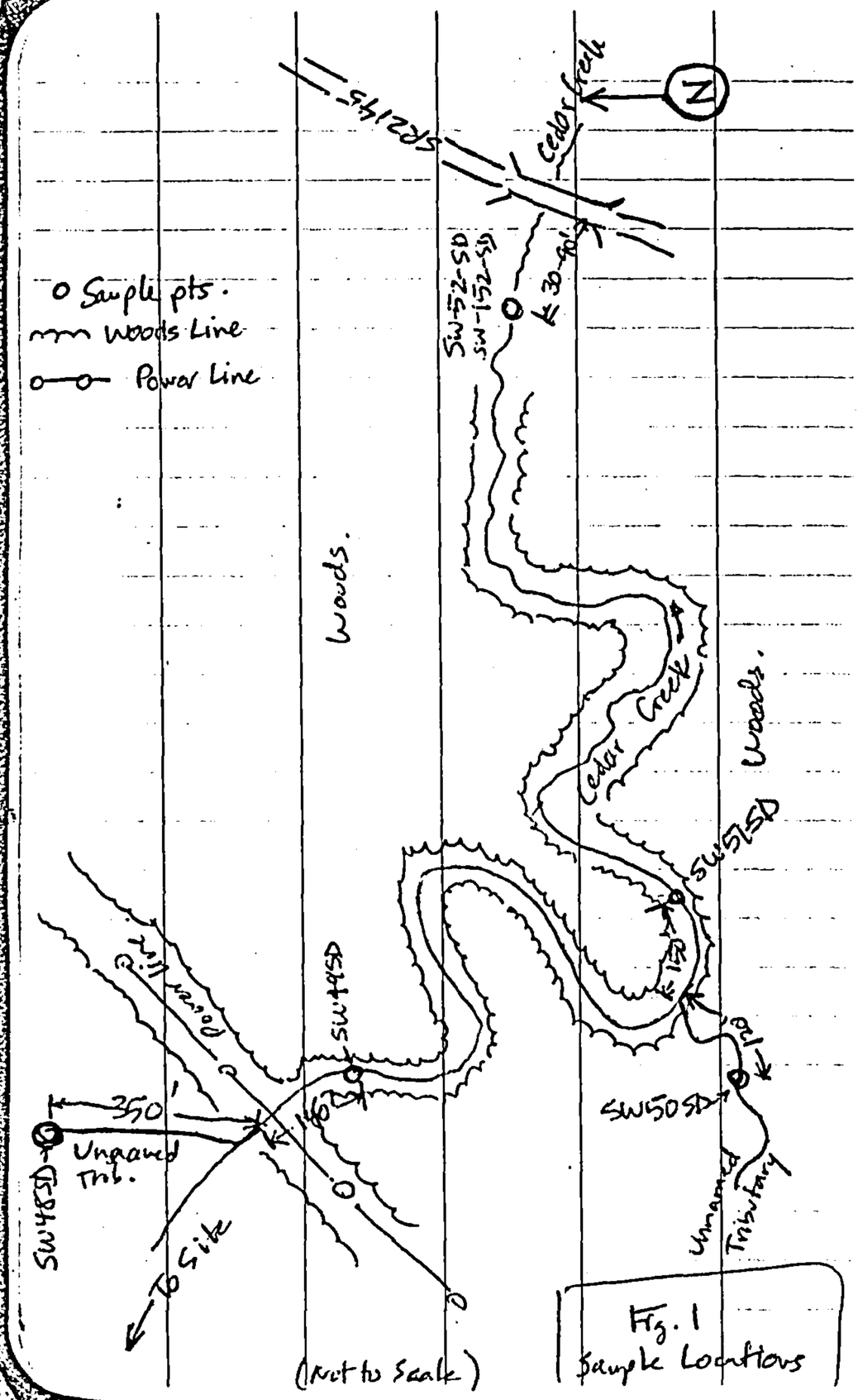


Fig. 1
Sample Locations

1125 - Doug Rumford collected sediment sample SW-48-SD on an unnamed tributary that drains to Cedar Creek, about 1.5 miles downstream of the site. Sediment was dark brown, silty-clay, no mottling, no odors. w/ small amount of organic matter. The sediment sample point was located approx 350' upgradient of the confluence w/ Cedar Creek, near a power line crossing. Samples collected for SVOC and dioxin analyses. Split samples recieved by Greg Kuntz. Unnamed tributary was not flowing and streambed was dry. (See Fig. 1)

1148 - Doug Rumford collected sediment sample SW-49-SD from the bed of Cedar Creek, approximately 140' downstream of confluence with the unnamed tributary and about 1.5 miles downstream of the site. Cedar Creek is dry at this location with no flow and pools of stagnant water. Sediment was collected from the top inch of the streambed.

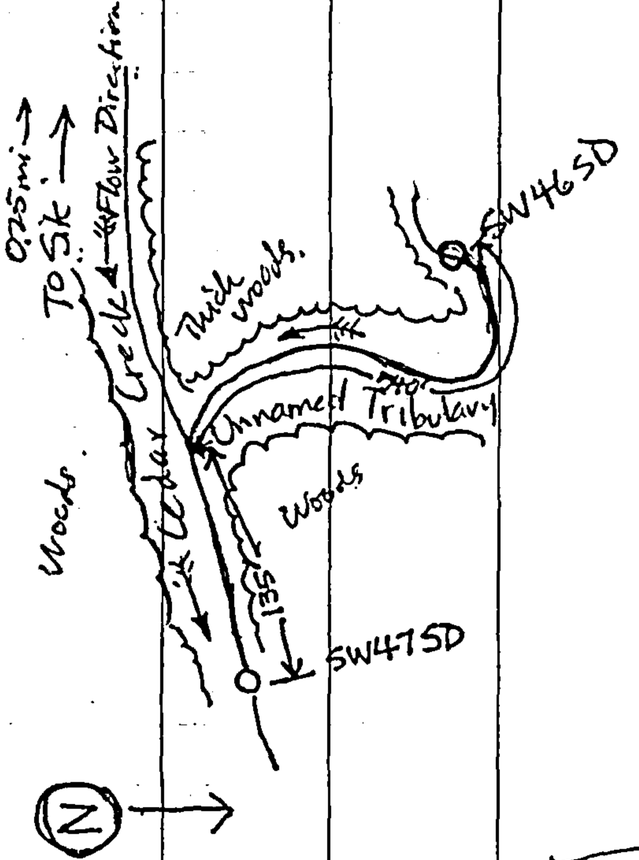
DBR
11/2/98

Sediment is a light-brown, fine gravel and silica coarse-grained sand with some silt, no mottling, no odors, w/ a few leaves. Samples collected for SVOC and dioxin analyses. Split samples recieved by Greg Kuntz. (See Fig. 1)

1220 - Doug Rumford collected sediment sample SW-50-SD on an unnamed tributary that drains to Cedar Creek, about 120 feet upstream of the confluence, and about 1.75 miles downstream of the site. The unnamed tributary was about 6-8 feet wide by 5-6 foot banks with about 1 foot of standing water, and very little flow. The stream is located at the head of an oxbow in Cedar Creek. Sediment was sampled from various points within a 3 foot radius due to difficulty grabbing a single sediment for all sample jars. The sediment is light-brown, silty-clay with streaks of light gray clay interbedded in silts, no odors, lots of leaves and decayed organic matter. Sediment samples collected for SVOC and dioxin analyses. Sample splits recieved by Greg Kuntz. (See Fig. 1)

DBr 11/9/98

DBr 11/9/98



(Not to Scale).

Fig. 2
Sample Location
near Site PPE.
11/9/98

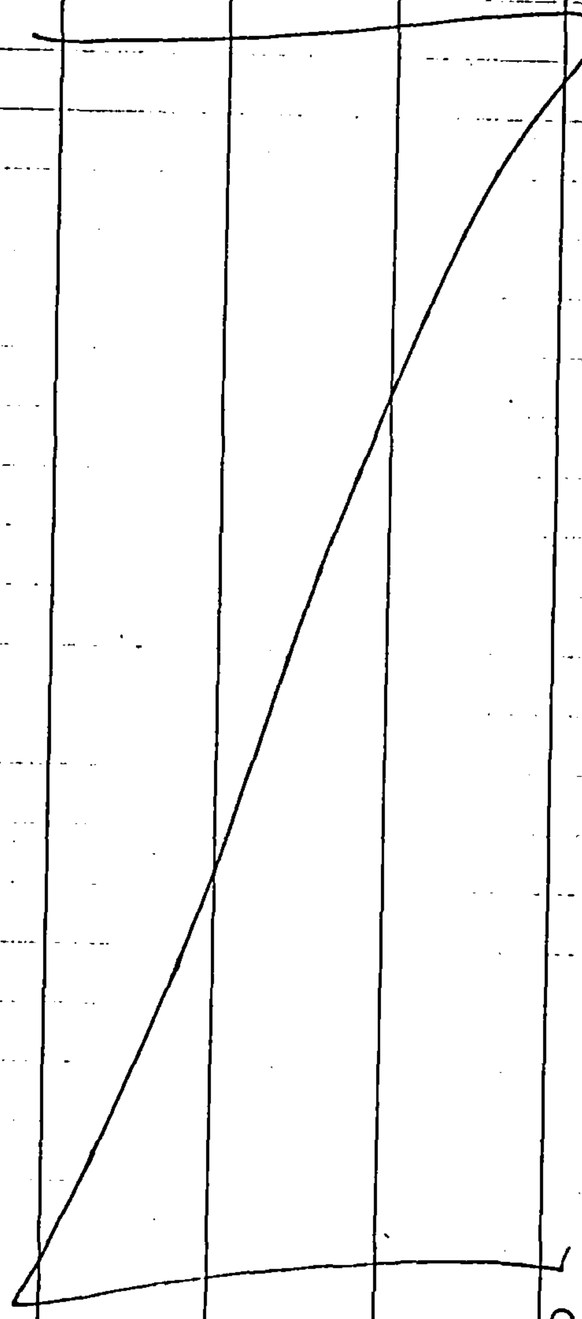
1245 - Doug Rumford collected sediment sample SW-51-SD from the bed of Cedar Creek, approximately 150' downstream of the unnamed tributary confluence, and about 1.75 miles downstream of the site. Cedar Creek is about 20-30 feet wide, with 8-10 foot deep banks and about 1-2 feet of standing water with little flow. Sediment is a light brown, silty clay, no odors and little decayed organic matter, with some sand mixed. Sediment samples collected for SVOC and dioxin analyses. Split samples received by Greg Kuntz. (See Fig. 1)

1345 - 1500 - broke for lunch

1510-1540 - located sample pt. on unnamed tributary that drains to Cedar Creek, about 0.25 mile downstream of site.

1540 - Doug Rumford collected sediment sample SW-46-SD from silty bar on north bank of unnamed tributary that drains to Cedar Creek, about 0.25 mile downstream of site. The sample pt. is located 540 feet upstream of confluence.

DBR 11/9/98



DBW
11/9/98

The unnamed trib. is about 15-20 feet wide with 6-8' tall banks, and about 2 foot of standing water in the channel. The sediment is a brown, silty-clay, a decay odor, lots of leaves and decayed organic matter. Sediment samples collected for SVOC and dioxin analysis. Split samples received by Greg Kuntz. (See Fig. 2)

1605 - Doug Rumford collected sediment sample SW475D on Cedar Creek, approximately 135' feet downstream of confluence with unnamed tributary, and about 0.25 miles downstream of site. The sample was collected from depositional sediments on the north bank of Cedar Creek. Cedar Creek is about 20-25 feet wide with 6-8' tall banks and several feet of standing water (mostly due to Beaver Dams on Cedar creek). The sediment is a brown, fine-grained sandy silt, no odors, no sheen w/ fair amounts of organic matter. The sediments samples were collected for SVOC and dioxin analyses. Split samples were received by Greg Kuntz. (See Fig 2).

1700 - Departed site for Raleigh.

DBW
11/9/98

SWP GULF NCD 053 488 557

ESI FOLLOW-UP SAMPLING 11/9/98

CLOUDY 50-60°

ARRIVED ONSITE 09:15

SF. PARKER / D. LAMONTAGNE SAMPLING TEAM:

940 PROCEED TO CEDAR CREEK DOWNSTREAM OF SITE W/ RAYMOND KNOX (OF SCHNABEL ENGINEERING) TO COLLECT SEDIMENT SAMPLES

0950 REACHED FLAGGING WHERE PREVIOUS BACKGROUND SAMPLE COLLECTED, 150' UST OF ROAD

0952 DL COLLECTED SW-039-SD FROM MID-CHANNEL. STREAM NOT FLOWING VISIBLY AT TIME OF SAMPLING. SEDIMENT IS GRAVELLY COARSE TO FINE SAND SOME SILT. DL FURNISHED SPLIT SAMPLE TO R. KNOX

1010 DL COLLECTED SW 040 SD APPROXIMATELY 10 FT DOWNSTREAM OF SR 242 CROSSING. WATER SHALLOW DUE TO LOW FLOW CONDITION. BOTTOM COVERED W/ FALLEN LEAVES, BUT SAMPLE CONSISTED OF COARSE TO FINE SAND SOME SILT. FURNISHED SPLIT SAMPLE TO R.K.

1015-1030 WALKED DOWN CREEK FROM SR 242, USING 100' MEASURING TAPE TO DELINEATE 700' MIN DISTANCE ALONG CREEK CHANNEL.

1040 DL COLLECTED SW 041 SD 770' DOWNSTREAM OF ROAD. SAMPLE IS SILTY FINE SAND, TRACES OF LEAF WOOD, [HC S ODOR] FURNISHED SPLIT SAMPLE TO R. KNOX.

11/9/98

SWP GULF NCD 053 488 557 11/9/98

ESF FOLLOW-UP SAMPLING

1050 - 1115 HIKED UPSTREAM DOWNSTREAM TO DESIGN PROPERTY LINE [WEST] OF SWP SITE. MEASURED 275' BACK UPSTREAM TO SAMPLING LOCATION SW-042-SD.

11-16 D.L. COLLECTED SW-042-SD. SEDIMENTS IN THIS STRETCH GENERALLY COARSER. DL TARGETED TO GET FINES SIMILAR TO OTHER SAMPLES. SAMPLE IS BROWN SILTY CLAY TO FINE SAND. FURNISHED SPLIT SAMPLE TO RIC

1200 RETURNED TO SITE. DR/DM TEAM STILL SAMPLING EAST OF SITE. RETURNED TO SITE (AFTER NOTING THEIR VEHICLE LOCATION) TO SAMPLE SW 043 SD AND SW 143 SD. USED DRY DITCH (PARALLEL TO PPE DRAINAGE) TO ACCESS CREEK BENEATH SITE FENCE, WHICH HAD BEEN ERECTED SINCE LAST SAMPLING EVENT

1240 D LAMONTAGNE COLLECTED SW 043 SD FROM LOWER END OF SHALLOW POOL, 25-30' DOWNSTREAM OF PPE. SAMPLE IS STIFF BROWN SANDY CLAY, AS IS REST OF STREAMBED AT THIS LOCATION. COLLECTED DUPLICATE SAMPLE SW 143-SD AND FURNISHED SPLIT SAMPLE TO R. KNOX (SCHNABEL).

11/9/98

SWP GULF NCD 053 488 SS7 11/9/98

EST FOLLOW-UP SAMPLING.

MET W/ DR AND DM TO BRIEF FOR LUNCH

1345-1425 LUNCH

1445 ONSITE, PROCEED TO COLLECT SAMPLES

SW044SD [CEDAR CR, 200 FT BELOW PAE]

SW045SD [20' ABOVE TWB, 0.25 MI BELOW PAE]

1500 PROCEEDED TO SW044 LOCATION ON CEDAR CREEK MEASURED 200 FT BELOW PAE SAMPLE (SW043) LOCATION. SFP STEPPED ONTO EMBEDDED AND SUBSEQUENTLY OBSERVED SHEEN AND CREOSITE ODOR AT FOOTPRINT. (BOOTPRINT).

DM COLLECTED SAMPLE SW044SD AT 15:18 AND NOTED ADDITIONAL SHEEN AND ODOR ON CREEK WHERE SAMPLED, SAME LOCATION AS ABOVE.

FURNISHED SPLIT SAMPLE TO RICNOX.

1540 ARRIVED AT TRIBUTARY (UNNAMED) AND MADE VOICE CONTACT W/ D. RUMFOLD TEAM.

CREEK IS TOO DEEP/STEEP SIDED AT CONFLUENCE TO COLLECT SEDIMENT BY HAND/SCOOP, SO MOVED TO A SHALLOWER INTERVAL MEASURED AT 130 FT UPSTREAM OF CONFLUENCE-

~~LFG~~

11/9/98

SWP GULF NCD 053 488 557 (11/9/95)

ESI FIELD STAFF SAMPLE

1545 - 2 LABORATORY COLLECTED SW 045 SD
135' UPSTREAM OF CONFLUENCE OF UNNAMED TRIBUTARY OF CEDAR CREEK. SAMPLE WAS BROWN ~~SILT~~ CLAYEY SILT, LITTLE SAND, LEAVES COVERED BOTTOM AS IN OTHER SAMPLE LOCATIONS. FURNISHED SPLIT SAMPLE TO R. KNOX. RETURNED TO VEHICLES AND SECURED SAMPLES @ 1615.

1640 MET W/ D MUMFORD & D MOORE TO COMPLETE SAMPLE SPLIT/RECAP FORMS FOR SCRAPBOOK.

17:00 LEFT SITE FOR OFFICE

11/9/95