674SERBSF10,638

674SERBSF10,638

Site Name (Subject):	SPRAGUE ELECTRIC COMPANY
Site ID (Document ID):	NCD003167780
Document Name (DocType):	Contractor Report (CONTR)
Report Segment:	
Description:	FIT Report: Final Site Inspection Prioritization
Date of Document:	5/13/1993
Date Received:	
Box: *Enter SF and # with no spaces*	SF10,638
Access Level:	PUBLIC
Division:	WASTE MANAGEMENT
Section:	SUPERFUND
Program (Document Group):	SERB (SERB)
Document Category:	FACILITY

Print Report for Record | Go to New Blank Record | Go to New Record - (default to last record values) | Delete Record

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

RECEIVED
MAY 17 1993
SUPERFUND SECTION

4WD-WPB

MAY 13 1993

Ms. Pat DeRosa
CERCLA Branch
North Carolina Department of Environment,
Health and Natural Resources
P.O. Box 27687
Raleigh, North Carolina 27611-7687

Dear Ms. DeRosa:

Enclosed please find a copy of the Final Site Inspection Prioritization (SIP) Report for the Sprague Electric Company site in Lansing, Ashe County, North Carolina (NCD003167780). This report was prepared for EPA Region IV by Black & Veatch Waste Science and Technology Corp.

Based on a review of the report, it has been determined that the site warrants further action under federal authority. An observed release of heavy metals has been documented in the North Fork of the New River, which is classified as a fishery. Therefore, an Expanded Site Inspection (ESI) has been recommended on a low priority basis to assess the threat to the human food chain population.

If you should have any questions, please feel free to contact me at (404) 347-5065.

Sincerely yours,

Craig A. Benedikt

Craig A. Benedikt
EPA NC CERCLA Project Officer

Enclosure

Printed on Recycled Paper

DATE REPORT ACCEPTED 12/9/92
DISPOSITION ESI - Lower Priority
SAM SIGNATURE Craig A. Benedict

FINAL
SITE INSPECTION PRIORITIZATION

RECEIVED
MAY 17 1993
SUPERFUND SECTION
NOV 06 1992

Sprague Electric Company
Lansing, Ashe County, North Carolina

EPA ID № NCD003167780
WasteLAN № 02619

Prepared under
EPA Contract № 68-W9-0055

CERCLA

Prepared for
WASTE MANAGEMENT DIVISION
U.S. Environmental Protection Agency

Prepared by
B&V Waste Science and Technology Corp
BVWST Project № 52012.070

October 21, 1992

Prepared by:	Reviewed by:	Approved by:
Victor Blix Site Manager	Tancie Hatcher for Bryan Williams Technical Reviewer	Hubert Wieland Project Manager

FINAL
SITE INSPECTION PRIORITIZATION
Sprague Electric Company
Lansing, Ashe County, North Carolina
NCD003167780
WasteLAN № 02619

TABLE OF CONTENTS

Page №

1.0 Introduction 1

2.0 Site Description and History 1

3.0 Groundwater Pathway 4

3.1 Hydrogeologic Setting 4

3.2 Groundwater Targets 5

4.0 Surface Water Pathway 6

5.0 Air and Soil Exposure Pathway 6

6.0 Conclusion 7

TABLES — Following Page №

Table 1 Surface Soil Samples 4
Table 2 Subsurface Soil Samples 4
Table 3 Surface Soil Samples 4
Table 4 Sediment Samples 4

FIGURES — Following Page №

Figure 1 Site Location Map 1
Figure 2 Site Layout Map 3
Figure 3 Sample Location Map 4

SITE ASSESSMENT

Final Site Inspection Prioritization
Sprague Electric Company
Lansing, Ashe County, North Carolina

NCD003167780

WasteLAN № 02619

1.0 Introduction

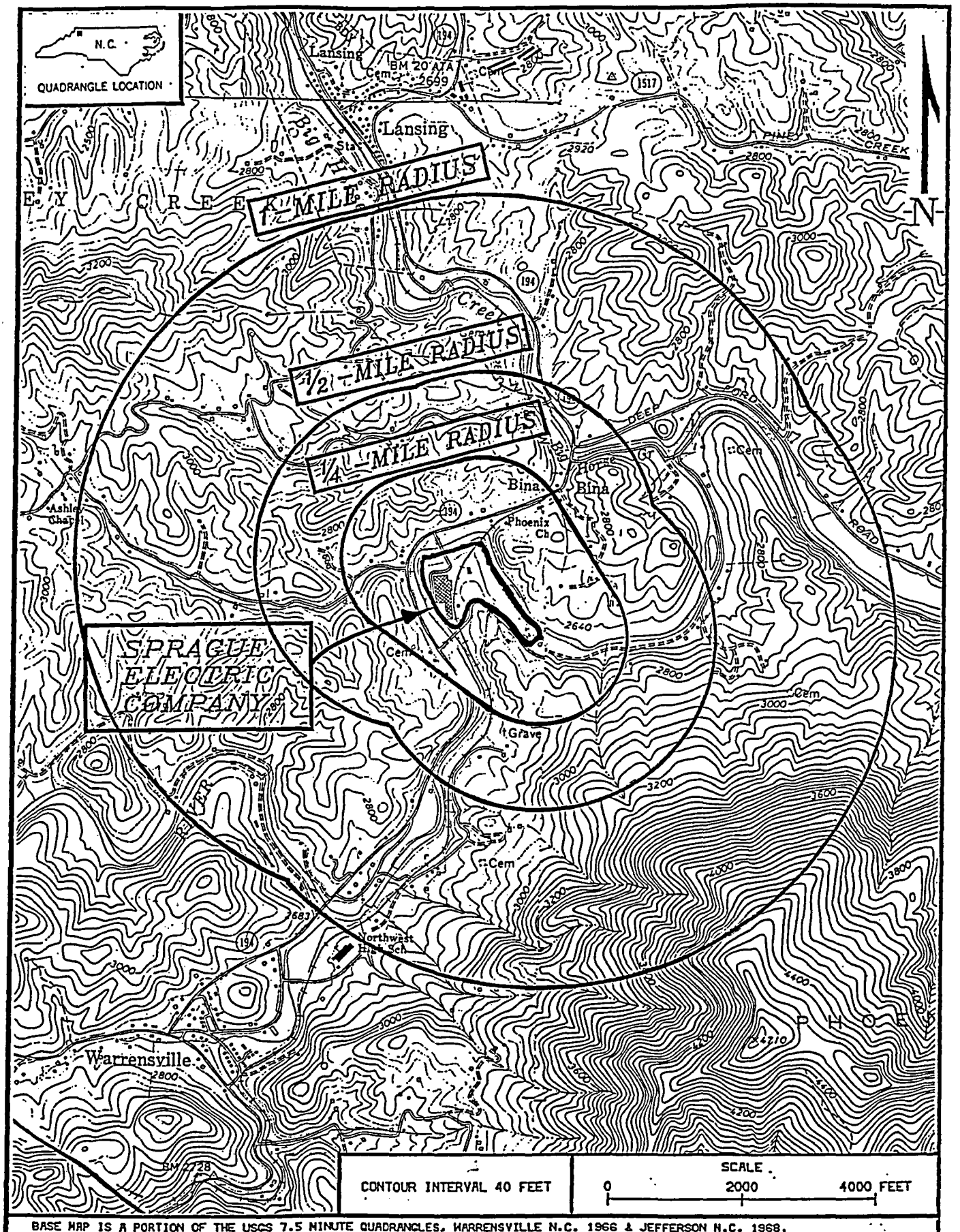
B&V Waste Science and Technology was tasked to conduct a Site Investigation Prioritization (SIP) for the Sprague Electric Company in Lansing, Ashe County, North Carolina. This study was performed under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA).

The SIP will update the Site Inspection conducted by the Halliburton NUS Environmental Corporation on September 6, 1991, which was performed prior to the implementation of the revised Hazard Ranking System. Sources of information used in this evaluation include EPA CERCLA file material, as well as documentation generated during a target survey. The SIP will quantify the threats posed by the site and provide sufficient documentation in order to decide on the appropriate future course of action.

2.0 Site Description and History

The Sprague Electric Company, located in Lansing, Ashe County, North Carolina, occupies approximately 60 acres of land located off of Highway 194 approximately 1.25 miles south of Lansing (Figure 1). The facility has been in operation since 1953 and is the only known industry that has ever occupied the site (Refs. 1, p. 3; 2, 3).

The only known operation conducted at the facility involved the manufacture of aluminum electrolytic capacitors. The manufacturing process used involves the etching of aluminum foil in an electrochemical bath. Aluminum oxides formed in the process are recovered from a wastewater treatment system. Waste dimethylformamide (DMF) was also used in the process (Refs. 2, 3). Available information



BASE MAP IS A PORTION OF THE USGS 7.5 MINUTE QUADRANGLES, WARRENSVILLE N.C. 1966 & JEFFERSON N.C. 1968.

SITE LOCATION MAP
SPRAGUE ELECTRIC COMPANY
LANSING, ASHE COUNTY, NORTH CAROLINA

FIGURE 1

indicates that wastes were handled in essentially the same manner since operations commenced (Ref. 3).

On November 17, 1980, Sprague Electric Company filed a RCRA Part A Hazardous Waste Permit Application for treatment of wastes. According to the application, the facilities operations resulted in a discharge to U.S. waters. In addition, 250,000,000 pounds of corrosive waste (D002) were treated per year at the facility (Ref. 4). According to a letter to the U.S. Environmental Protection Agency (USEPA) at the time of filing, Sprague Electric Company officials were in doubt as to whether or not the Lansing plant was a waste treatment, storage, or disposal facility under the Resource Conservation and Recovery Act, and that the application was submitted as a precaution in case this location was such a facility (Ref. 5). Sprague Electric Company was advised by the USEPA on December 16, 1981 that they acknowledged receipt of Sprague's request for withdrawal of their application under RCRA (Ref. 6). On March 4, 1982, the North Carolina Solid and Hazardous Waste Management Branch (NCHWMB) accepted Sprague's request for deletion as a treatment, storage, or disposal facility of hazardous waste under RCRA (Ref. 7). On July 1, 1983, Sprague was also deleted as a large quantity generator of hazardous waste under RCRA (Ref. 8). According to a March 13, 1984 letter, Sprague was advised by NCHWMB that their interim status was formally terminated. This was in response to a November 14, 1983, letter in which Sprague advised the NCHWBM that a Part B application for the facility would not be filed (Ref. 9). The facility is currently listed by RCRA as a small-quantity generator (Ref. 10).

The facility has been actively engaged in the manufacturing of aluminum electrolytic capacitors (Refs. 2, 3). Raw materials used in the production process include aluminum foil, nitric acid, tartaric acid, sodium hydroxide, calcium hydroxide, sodium chloride, sulfuric acid, and dimethylformamide (DMF) (Refs. 2, 3). A wastewater treatment lagoon system was formerly operated on site to allow for the settling and treatment of aluminum oxide wastewaters (Ref. 1, p. 6). Aluminum oxides were formed from a manufacturing process involving the etching of aluminum foil in an electrochemical bath. They were then recovered from the wastewater treatment system by filtering and settling in the lagoon, and then mined and sold (Refs. 2, 3).

Wastewater from this system was not allowed to be discharged to the New River but rather depended upon evaporation and percolation to remove the wastewater (Ref. 11). These lagoons are therefore believed to be unlined and the treatment process has been discontinued (Ref. 1). Non-contact boiler water and wastewater from the sewage treatment plant was discharged into the New River. Both discharges were NPDES permitted (Ref. 11). Waste dimethylformamide (DMF) used in the process is shipped off-site in drums (Ref. 2). Available information indicates that wastes have been handled in essentially the same manner since operations commenced (Ref. 1, p. 6; 3).

The facilities at the Sprague Electric site consist of the main facility building, housing office and warehouse space, assembly and etching operations, and shipping and receiving areas. Adjacent to the facility are paved access roads and parking areas. Areas further away from the facility are grassed and/or landscaped (Ref. 1, p. 6). A wastewater treatment lagoon system, located east of the facility and adjacent to the New River, is no longer in operation (Refs. 1, p. 6; 2, 3, Figure 2). A drum storage area, a tank storage area, and a sewage treatment plant also exist on site (Refs. 1, p. 6; 12, Figure 2). The tank storage area contains two sulfuric acid and two nitric acid storage tanks (Refs. 1, p. 6; 12). Three industrial wells also exist onsite; however, only one of them is currently in use (Refs. 1, p. 6; 12). The facility is enclosed within a 6-foot-high chain-link fence, and access to the property is restricted to a main entrance gate located along the facility's south side (Ref. 12). The site layout is detailed in Figure 2. The surrounding area is primarily a sparsely populated residential and agricultural district. The geographical coordinates are 36°28'48" North Latitude and 81°30'10" West Longitude (Ref. 13). The site is at 2760 feet above mean sea level (amsl)(Ref. 13).

The average annual precipitation for Lansing is 49 inches, and the mean annual lake pan evaporation is 33 inches, yielding a net annual precipitation of 16 inches (Ref. 14, pp. 13, 63). The 2-year, 24-hour rainfall for the area is 2.9 inches (Ref. 15).

The Site Inspection (SI) being updated was completed by the Halliburton NUS Environmental Corporation, on September 6, 1991. During the SI, sixteen surface

soil, subsurface soil, sediment, and surface water samples were collected to determine if contamination was present onsite (Figure 3). Cyanide, calcium, manganese, sodium, and zinc are a few contaminants of concern that can be attributed to the site. Sample results are presented in Tables 1, 2, 3, and 4 (Ref. 1).

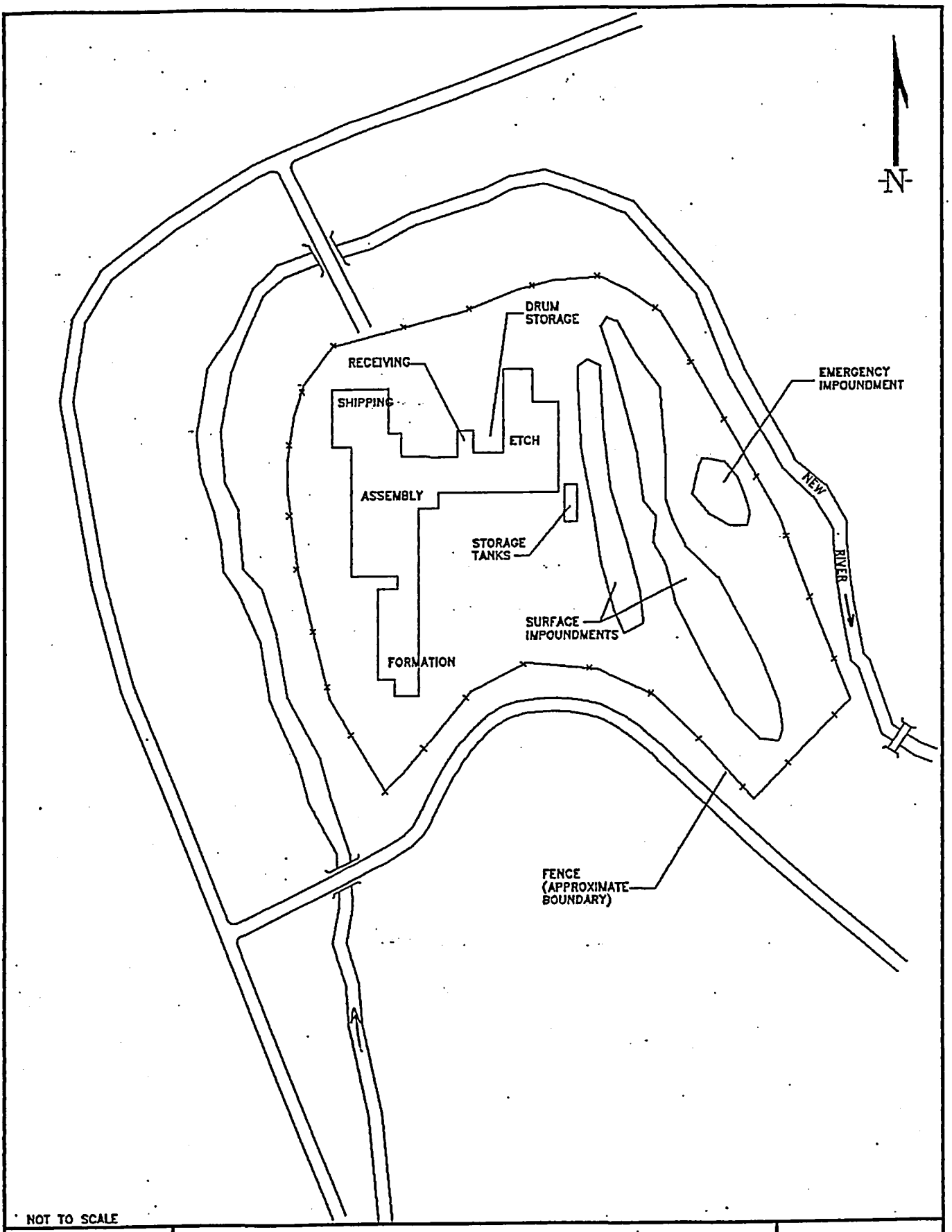
3.0 Groundwater Pathway

3.1 Hydrogeologic Setting

The Sprague Electric Company is located in the Blue Ridge Physiographic Province. This region is characterized by a thick layer of residual soil and weathered rock overlying fractured crystalline and metamorphosed sedimentary and metamorphosed granitic rocks (Refs. 16, 17). Locally, the area of the site is underlain by residual soils ranging from 25 to 36 feet thick. The residuum is underlain by blue and white metamorphosed granite rocks of the Late Proterozoic Era (Ref. 18).

The Sprague Electric Company is located in the Piedmont Blue Ridge groundwater region. The aquifer used in the area is the metamorphosed granite aquifer system (Ref. 18). Two wells drilled in the city of Warrensville, 1.5 miles south of the facility, were 80 and 130 feet deep. The 80-foot deep well reached water at 70 and 75 feet below land surface (bls). The 130-foot deep well reached water at 50 feet bls (Ref. 18). Water levels in the immediate area of the facility are less than 25 feet bls because of its proximity to the New River. The direction of groundwater flow in the local area is north toward the North Fork of the New River (Ref. 13).

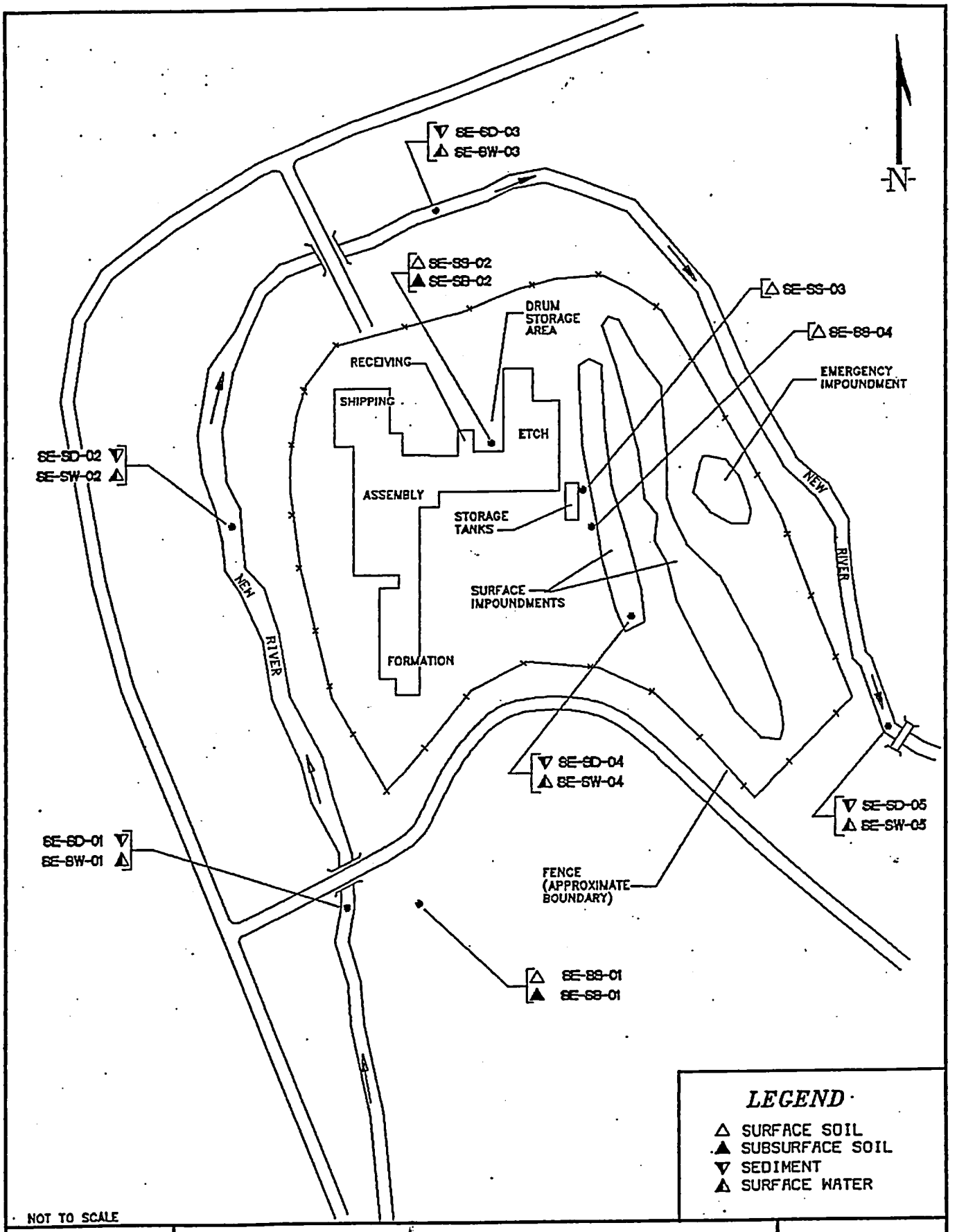
Groundwater flows along the fractures in the bedrock and in the intergranular pore spaces of the residual soils. Some igneous dikes are found in the Piedmont region, but these have few fractures and contain little water (Ref. 19). Fractured granite typically has a hydraulic conductivity 1.0×10^{-2} to 1.0×10^{-6} cm/s (Ref. 20). The residual soils and bedrock are hydraulically interconnected (Ref. 17). The porosity and the hydraulic conductivity of the soil decreases as depth increases (Ref. 19). The unsaturated zone of the residual soils represents the layer of lowest hydraulic



NOT TO SCALE

SITE LAYOUT MAP
SPRAGUE ELECTRIC COMPANY
LANSING, ASHE COUNTY, NORTH CAROLINA

FIGURE 2



SAMPLE LOCATION MAP
SPRAGUE ELECTRIC COMPANY
LANSING, ASHE COUNTY, NORTH CAROLINA

FIGURE 3

Table 1
Surface Soil Samples
Quantified Analytical Data
Sprague Electric Company
Lansing, Ashe County, North Carolina

Parameters	SE–SS–01 (mg/kg)	SE–SS–02 (mg/kg)	SE–SS–03 (mg/kg)	SE–SS–04 (mg/kg)
Inorganic Compounds and/or Elements	Background	Drum Storage Area	Storage Tank Area	Near Surface Impoundments
Cadmium	1.1U	2.4	–	–
Lead	13J	33J	14J	40J
Manganese	590U	650	1,300	700
Mercury	0.13U	0.40J	–	–
Nickel	35	190	35	38
Zinc	76	260	68	86
Cyanide	0.66U	–	0.86	0.89
Pesticide/PCB Compounds	**(ug/kg)**	**(ug/kg)**	**(ug/kg)**	**(ug/kg)**
4,4'–DDE (P,P'–DDE)	22U	51	–	–

– Material analyzed for but not detected above minimum quantitation limit (MQL).
J Estimated Value
U Material was analyzed for but not detected. The number given is the MQL.
▒ 3 times background or greater than or equal to MQL, CRDL, or CRQL.

Table 2
Subsurface Soil Samples
Quantified Analytical Data
Sprague Electric Company
Lansing, Ashe County, North Carolina

Inorganic Elements	SE–SB–01 (mg/kg)	SE–SB–02 (mg/kg)
	Background	Drum Storage Area
Beryllium	0.53U	1.6

U Material was analyzed for but not detected. The number given is the MQL.
▒ 3 times background or greater than or equal to MQL, CRDL, or CRQL.

Table 3
Surface Water Samples
Quantified Analytical Data
Sprague Electric Company
Lansing, Ashe County, North Carolina

Inorganic Elements	SE–SW–01 (ug/l)	SE–SW–02 (ug/l)	SE–SW–03 (ug/l)	SE–SW–04 (ug/l)	SE–SW–05 (ug/l)
	Background	New River West of Site	New River North of Site	Surface Impoundment	Downstream of Site
Barium	20U	–	18	–	28
Calcium	3,500	3,300	4,500	11,000	4,500
Copper	4U	29	–	–	–
Iron	190U	–	–	–	800
Manganese	20U	–	–	120	100
Potassium	1,100U	–	1,300	–	1,600
Sodium	2,500U	13,000	–	47,000	3,400
Zinc	6U	43	–	–	–

– Material analyzed for but not detected above minimum quantitation limit (MQL).
U Material was analyzed for but not detected. The number given is the MQL.
▒ 3 times background or greater than or equal to MQL, CRDL, or CRQL.

Table 4
Sediment Samples
Quantified Analytical Data
Sprague Electric Company
Lansing, Ashe County, North Carolina

Inorganic Compounds and/or Elements	SS-SD-01 (mg/kg)	SS-SD-04 (mg/kg)
	Background	Surface Impoundment
Aluminum	37,000	290,000
Mercury	0.18U	0.80J
Sodium	360U	9,100
Cyanide	0.91U	1.7

– Material analyzed for but not detected above minimum quantitation limit (MQL).
J Estimated Value
U Material was analyzed for but not detected. The number given is the MQL.
▒ 3 times background or greater than or equal to MQL, CRDL, or CRQL.

conductivity. Soils of this type have been shown to have hydraulic conductivities that range between 1×10^{-3} cm/sec and 1×10^{-5} cm/sec (Ref. 20).

3.2 Groundwater Targets

Residents in the 4-mile radius of the Sprague Electric site obtain potable water from two municipal systems and from private wells. The Lansing Water System serves 65 connections from two wells located approximately 1.5 miles north of the facility (Ref. 21, p. 5, 6). These wells serve approximately 161 people within the Lansing corporate boundary (Refs. 21, p. 5, 6; 23). There are no known private wells in the Lansing city limits (Refs. 13, 21, p. 5, 6).

The Jefferson Water Department well system serves 535 connections in the Jefferson area. There are seven wells in this system. Only one of these wells, however, is situated within the 4-mile radius and is located 3.9 miles southeast of the facility. The portion of the Jefferson wellfield within 4 miles of the site provides potable water to approximately 190 people (Refs. 13, 21, p. 6-8; 23). Wells in the Jefferson Water System may potentially serve more than the listed number of persons because the entire system is blended. Although it is probable that there are some private wells located within the Jefferson Water Department service area, all residences have access to municipal water (Ref. 21, p. 6-8).

Residences not served by municipal systems are assumed to obtain their potable water from private wells. Based on estimates made from available topographic maps in conjunction with municipal water service data, approximately 2,617 persons within 4 miles of the facility are served by private wells. The closest of these lies approximately 500 feet west of the facility (Refs. 13, 21, p. 5-8).

4.0 Surface Water Pathway

Surface water run-off from the site migrates north, east, and west into the North Fork of the New River located adjacent to the facility. The 15-mile surface water pathway expires in the New River. The average flow for the North Fork of the New River is 259 cfs (Ref. 23). There are no surface water intakes used for potable purposes along the surface water migration pathway (Ref. 13, 24).

Sensitive environments found within a 4-mile radius of the site include the ranges of several federally endangered and threatened species, or species whose status is under review. These are the Bog turtle and the Riffle beetle (Ref. 25). Recreational fishing occurs in the North Fork of the New River (Ref. 26). In addition, no wetlands were identified along the surface water pathway, nor within a 0.5 mile radius of the site (Ref. 13).

5.0 Air and Soil Exposure Pathways

The Sprague Electric Company is comprised of the main facility building, housing office and warehouse space, assembly and etching operations, as well as shipping and receiving areas. Areas adjacent to the facility are paved access roads and parking areas, while areas further away from the facility are comprised of grassy areas. Additionally, a wastewater treatment lagoon system located east of the facility and adjacent to the New River was constructed to allow for the settling of aluminum oxides. This system is no longer in operation. A drum storage area, a tank storage area, and a sewage treatment plant also exist on site (Refs. 1, 2, 3, 12).

The population within the 4 mile radius of the site is 3,985. The populations within 0-0.25, 0.25-0.5, 0.5-1, 1-2, 2-3, and 3-4 mile radii of the site are 35, 40, 129, 194, 2,106, and 1,481, respectively (Refs. 12, 22, 27). The nearest residence is 300 feet west of the property (Ref. 13). The closest school is 1 mile south-southwest of the site (Ref. 13). Presently, the closest individuals are 525 onsite workers (Ref. 28).

The facility is enclosed within a 6-foot-high chain-link fence, and access to the property is restricted to a main entrance gate located along the facility's south side (Ref. 12).

As mentioned previously, the federally listed endangered and threatened species that are known to inhabit Ashe County include the Bog turtle, Bewick's wren, Regal fritillary, Riffle beetle, Glade spurge, Spreading avens, Mountain bluet, Heller's blazing star, Gray's lily, Carolina saxifrage, and the Virginia spiraea. Additionally, the state listed endangered and threatened species include the Cooper's hawk, Warbling vireo, Rock gnome lichen, Bob rose, Cone-shaped sedge, Robin runaway, Fringed gentian, and the Roseroot (Ref. 25).

6.0 Conclusion

The Sprague Electric Company site was evaluated to assess the threat posed to human health and the environment and to determine the need for additional investigation. From the information gathered in the study of the Sprague Electric Company, further action is recommended. The surface water pathway is the primary concern due to actual contamination of the North Fork of the New River. The North Fork of the New River is documented as a fishery. The groundwater pathway is also a concern at the site due to the number of groundwater users in the area. In addition, the soil exposure pathway is of concern due to the presence of contaminants at or near surface level, and because the ranges of several federally endangered species are found within 4 miles of the site.

8. O.W. Strickland, Head, North Carolina Soild and Hazardous Waste Management Branch, letter to Edward A. Stone, Sprague Electric Company, July 1, 1983. Subject: Notification of facility status change.

9. O.W. Strickland, Head, North Carolina Soild and Hazardous Waste Management Branch, letter to Edward A. Stone, Sprague Electric Company, March 13, 1984. Subject: Sprague Electric Company.

10. North Carolina Department of Human Resources, Solid and Hazardous Waste Management, Alphabetical List of Hazardous Waste Facilities, August 10, 1989. Subject: Sprague Electric Company.

11. Jack Hardin, Sprague Electric Company, Lansing, North Carolina, telephone conversation with Eric Corbin, Halliburton NUS Environmental Corporation, March 14, 1991. Subject: Wastewater discharges.

12. NUS Corporation Field Logbook No. F4-2661 for Sprague Electric Company, TDD No. F4-9010-25. Documentation of Phase II Screening Site Inspection, December 11-12, 1990.

13. U.S. Geological Survey (USGS), 7.5 minute series Topographic Quadrangle Maps of North Carolina: Warrensville 1966, Jefferson 1968, Park 1959 (Photorevised 1978), Grassy Creek 1966 (Photorevised 1978), Scale 1:24,000.

14. U.S. Department of Commerce, Climatic Atlas of the United States, June 1968 (Reprinted 1983).

15. U.S. Department of Commerce, Rainfall Frequency Atlas of the United States, Technical Paper Number 40 (Washington, D.C.: GPO, 1961).

16. Oscar E. Meinzer, The Occurrence of Groundwater in the United States, U. S. Geological Survey Water Supply Paper Nº 489, (Washington, D. C.: GPO, 1023).

17. Linda Aller, et al., DRASTIC: A Standardized System for Evaluating Ground-Water Pollution Using Hydrogeologic Settings. EPA-600/2-87-035 (Ada, Oklahoma: EPA, April 1987), pp. 251, 252.

18. Mrs. Ray Taylor, Taylor Well Drilling, telephone conversation with Brant McCanless, NUS Corporation, March 12, 1990. Subject: Geology and groundwater levels in the Warrensville, North Carolina area.

19. Charles C. Daniel, III and N. Bonar Sharpless, Groundwater Supply Potential and Procedures for Well-Site Selection Upper Cape Fear River Basin, (North Carolina Department of Natural Resources and Community Development, Raleigh, North Carolina, October 1983), pp. 10, 12-15.

20. R. Allen Freeze and John A. Cherry, Groundwater (Englewood Cliffs, N. J.: Prentice-Hall, Inc. 1979), p. 29.

21. NUS Corporation Field Logbook Nº F4-9998 for Sprague Electric Company, TDD Nº F4-9001-132. Documentation of facility reconnaissance, February 12, 1990.

22. U.S. Department of Commerce, Proof Copy of table generated for 1990, Table 6, CPH-1: Summary Population and Housing Characteristics, issued by Bureau of Census, (April 1991).

23. Mike Scoville, North Carolina Environmental Resources, telephone conversation with Victor Blix, B&V Waste Science and Technology Corp., July 20, 1992. Subject: Stream gauge information.

24. Halliburton NUS Enviromental Corporation Project Note, North Carolina Surface Water Intakes, July 11, 1990. Subject: Ashe County, North Carolina.

25. North Carolina Natural Heritage Program Element List for Ashe County, June 30, 1989, p. 2.

26. Sonny Williams, Game Warden, Ashe County, North Carolina, telephone conversation with Eric Corbin, NUS Corporation, March 14, 1990. Subject: Recreational uses of the New River.

27. U.S. Environmental Protection Agency, Graphical Exposure Modeling System (GEMS) Data Base. Compiled from U.S. Bureau of the Census data (1983).

28. Sandy Gambill, Ashe County Chamber of Commerce, telephone conversation with Victor Blix, B&V Waste Science and Technology Corp., July 9, 1992. Subject: Number of employees working onsite.

R-586-9-1-2

REFERENCE 1

FINAL REPORT

SITE INSPECTION
SPRAGUE ELECTRIC COMPANY
LANSING, ASHE COUNTY, NORTH CAROLINA
EPA ID NO.: NCD003167780

Prepared Under
TDD No. F4-9010-25
Contract No. 68-01-7346

Revision 0

FOR THE

WASTE MANAGEMENT DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

SEPTEMBER 6, 1991

HALLIBURTON NUS ENVIRONMENTAL CORPORATION
SUPERFUND DIVISION

Prepared By	Reviewed By	Approved By
Eric Corbin Project Manager		Phil Blackwell Regional Project Manager

TABLE OF CONTENTS

Section No.		Page
EXECUTIVE SUMMARY		ES-1
1.0	INTRODUCTION	1
1.1	Objectives	1
1.2	Scope of Work	1
2.0	SITE CHARACTERIZATION	3
2.1	Site History	3
2.2	Site Description	6
	2.2.1 Site Features	6
	2.2.2 Waste Characteristics	6
3.0	REGIONAL POPULATIONS AND ENVIRONMENTS	7
3.1	Population and Land Use	7
	3.1.1 Demography	7
	3.1.2 Land Use	7
3.2	Surface Water	8
	3.2.1 Climatology	8
	3.2.2 Overland Drainage	8
	3.2.3 Potentially Affected Water Bodies	8
3.3	Groundwater	8
	3.3.1 Hydrogeology	8
	3.3.2 Aquifer Use	9
4.0	FIELD INVESTIGATION	10
4.1	Sample Collection	10
	4.1.1 Sample Collection Methodology	10
	4.1.2 Duplicate Samples	10
	4.1.3 Description of Samples and Sample Locations	10
	4.1.4 Field Measurements	14
4.2	Sample Analysis	14
	4.2.1 Analytical Support and Methodology	14
	4.2.2 Analytical Data Quality and Data Qualifiers	14
	4.2.3 Presentation of Analytical Results	16
5.0	SUMMARY	27
REFERENCES		28
APPENDIX A	Topographic Map	
APPENDIX B	Analytical Data	
APPENDIX C	Site Inspection Report	

TABLES

Number		Page
Table 1	Sample Codes, Descriptions, Locations, and Rationale	11
Table 2	Field Measurements	15
Table 3	Summary of Inorganic Analytical Results - Surface Soil Samples	17
Table 4	Summary of Inorganic Analytical Results - Subsurface Soil Samples	19
Table 5	Summary of Inorganic Analytical Results - Sediment Samples	20
Table 6	Summary of Inorganic Analytical Results - Surface Water Samples	21
Table 7	Summary of Organic Analytical Results - Surface Soil Samples	23
Table 8	Summary of Organic Analytical Reseults - Subsurface Soil Samples	25
Table 9	Summary of Organic Analytical Results - Sediment Samples	26

FIGURES

Figure 1	Site Location Map	4
Figure 2	Site Layout Map	5
Figure 3	Sample Location Map	13

EXECUTIVE SUMMARY

The Sprague Electric Company facility is situated on a tract of land located off of Highway 194 approximately 1.25 miles south of Lansing, Ashe County, North Carolina. The facility began operations at this location in 1953 and has been actively engaged in the manufacturing of aluminum electrolytic capacitors.

The manufacturing process utilized involved the etching of aluminum foil in an electrochemical bath resulting in the formation of aluminum oxide wastes which were recovered from a wastewater treatment system and then sold. Raw materials utilized in the production process include aluminum foil, nitric acid, tartaric acid, sodium hydroxide, calcium hydroxide, sodium chloride, sulfuric acid, and dimethylformamide.

The facility is located in the Blue Ridge physiographic province and Piedmont Blue Ridge groundwater region. The region is characterized by a thick layer of residual soil and weathered rock overlying fractured crystalline and metamorphosed sedimentary rocks. Geologically, the area of the electric company is underlain by residual soils ranging from 25 to 36 feet thick with the residuum being underlain by blue and white metamorphosed granite rocks of the Late Proterozoic era. The aquifer used in the area is the unconfined crystalline rock aquifer system. Water levels in the immediate area of the facility are less than 25 feet below land surface because of its proximity to the New River.

The surface water pathway was determined to be of concern for this facility. Because the facility is surrounded by the New River on three sides, surface water runoff leaving the facility via various onsite drainage routes enters the river directly. Additionally, wastewater from the sewage treatment plant and non-contact boiler water are discharged into the New River. Water from the aluminum oxide treatment lagoon system was never discharged to the river, but rather either percolated into the ground or evaporated. Due to the lagoons' proximity to the river, percolation into the river may have occurred. This process has now been discontinued. The river is utilized for recreational swimming, fishing, and boating. The groundwater pathway is also of concern. All totaled, 600 municipal customers and 800 private residences (2.89 x 1,400 = 4,046 people) utilize groundwater for potable purposes within a 4-mile site radius and would be at potential risk if contamination to groundwater occurs. Due to restricted site access, the air pathway is of least concern; however, onsite employees could be potentially exposed to organic and inorganic contaminants detected in onsite surface soil samples.

Sixteen environmental samples were collected during the field investigation associated with this study. No site-related organic contaminants were detected in the onsite samples. Surface and subsurface soil samples collected from near the drum storage area and storage tank area contained a total of five metals at elevated levels. A sediment sample collected from a surface impoundment contained elevated levels of three different metals. Results from the analysis of surface water samples collected downstream of the facility and from one of the facility's surface impoundments revealed the presence of six inorganic substances at elevated levels.

The predominant heavy metals detected throughout the samples were mercury and zinc. Metals such as aluminum, beryllium, copper, iron, lead, nickel, and manganese were also reported at many times the background level. These and other impurities can be removed from aluminum in the etching bath process. Sample results also indicated the presence of mercury. Mercury is utilized in electrical applications.

Based on the analysis of possible migration pathways, the results of the sampling investigation, and the information obtained from the references, FIT 4 recommends that this site be evaluated using the HRS (effective March 14, 1991).

1.0 INTRODUCTION

The HALLIBURTON NUS Environmental Corporation Region 4 Field Investigation Team (FIT) was tasked by the U.S. Environmental Protection Agency (EPA), Waste Management Division to conduct a Site Inspection (SI) at the Sprague Electric Company facility in Lansing, Ashe County, North Carolina. The investigation was performed under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA). The task was performed to satisfy the requirements stated in Technical Directive Document (TDD) number F4-9010-25. The field investigation was conducted December 11-12, 1990.

1.1 OBJECTIVES

The objectives of this inspection were to determine the nature of contaminants present at the site and to determine if a release of these substances has occurred or may occur. Further, this inspection sought to determine the possible pathways by which contamination could migrate from the site and the populations and environments it would potentially affect. Through these objectives, a recommendation was made regarding future activities at the site.

1.2 SCOPE OF WORK

The objectives were achieved through the completion of a number of specific tasks. These activities were to:

- Obtain and review relevant background materials.
- Obtain information on local water systems.
- Determine location of and distance to nearest potable well.
- Evaluate potentially affected populations and environments associated with the groundwater, surface water, air, and soil exposure pathways.

- Develop a site sketch.
- Collect environmental samples.

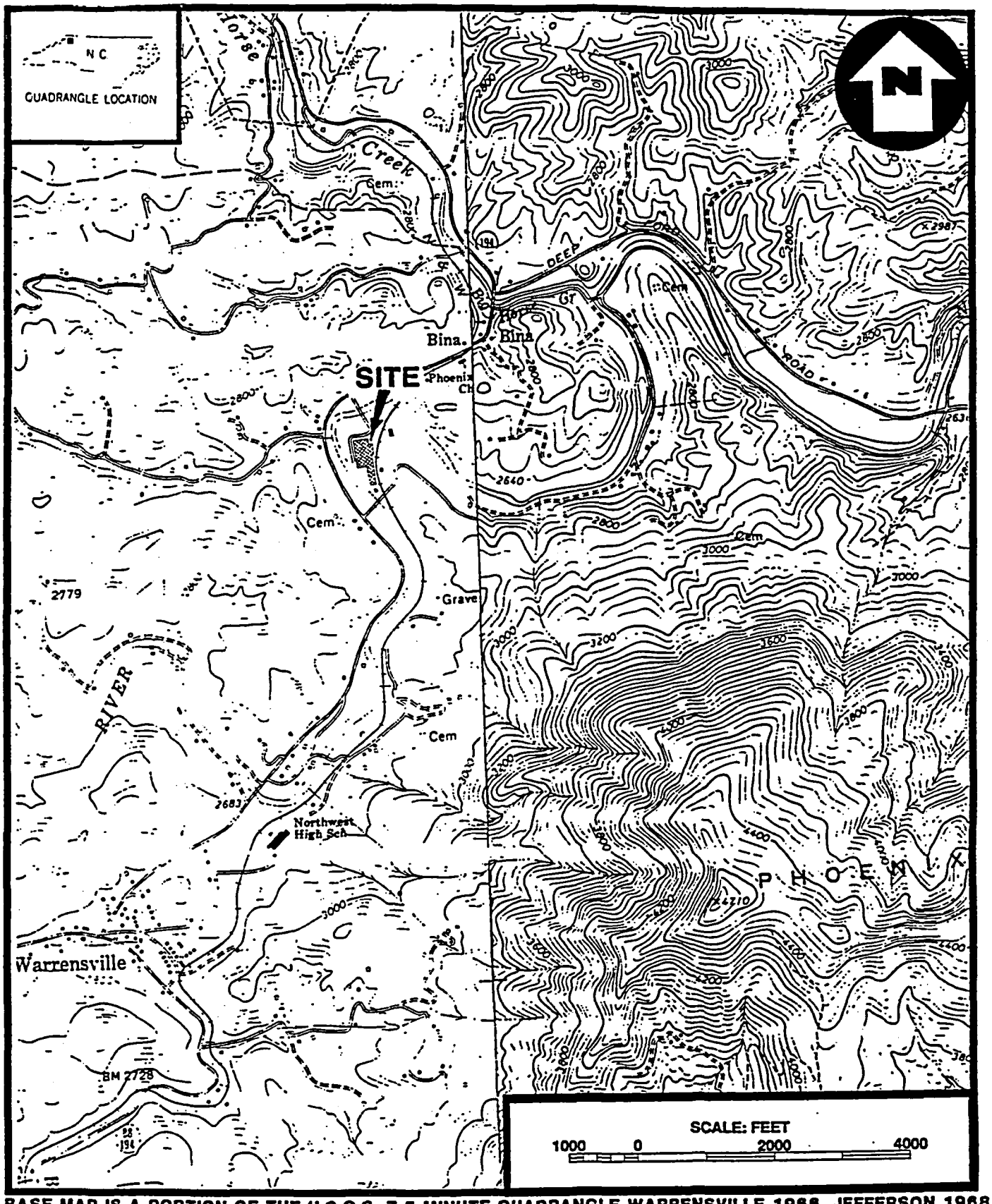
2.0 SITE CHARACTERIZATION

2.1 SITE HISTORY

The Sprague Electric Company facility is situated on a tract of land located off of Highway 194 approximately 1.25 miles south of Lansing, Ashe County, North Carolina (Ref. 1, Appendix A). The facility location is shown in Figure 1, and the facility layout is shown in Figure 2. The facility has been actively engaged in the manufacturing of aluminum electrolytic capacitors since 1953 and is the only known industry that has ever occupied the facility area (Refs. 1, 2).

The manufacturing process involves the etching of aluminum foil in an electrochemical bath. Aluminum oxides formed in the process are recovered from a wastewater treatment system. Waste dimethylformamide (DMF) was also used in the process (Refs. 1, 2). Available information indicates that wastes were handled in essentially the same manner since operations commenced (Ref. 2).

On November 17, 1980, Sprague Electric Company filed a RCRA Part A hazardous waste permit application for treatment of wastes. They reported that their facility conducted operations that resulted in a discharge to U.S. waters and that 250,000,000 pounds of corrosive waste (D002) were treated per year (Ref. 3). At the time of filing, Sprague Electric Company officials advised the U.S. Environmental Protection Agency that they were in doubt as to whether or not the Lansing plant was a waste treatment, storage, or disposal facility under the Resource Conservation and Recovery Act, and that the application was submitted as a precaution in case this location was such a facility (Ref. 4). On December 16, 1981, the USEPA advised Sprague Electric Company that they acknowledged receipt of Sprague's request for withdrawal of their permit application under RCRA (Ref. 5). On March 4, 1982, the North Carolina Solid and Hazardous Waste Management Branch (NCHWMB) granted Sprague's request for deletion as a treater, storer, or disposer of hazardous waste under RCRA (Ref. 6). On July 1, 1983, Sprague was also deleted as a large quantity generator of hazardous waste under RCRA (Ref. 7). On November 14, 1983, Sprague advised the NCHWBM that a Part B application for the facility would not be filed. On March 13, 1984, the NCHWMB advised Sprague that their interim status was formally terminated (Ref. 8). The facility is currently listed as a small-quantity generator (Ref. 9).

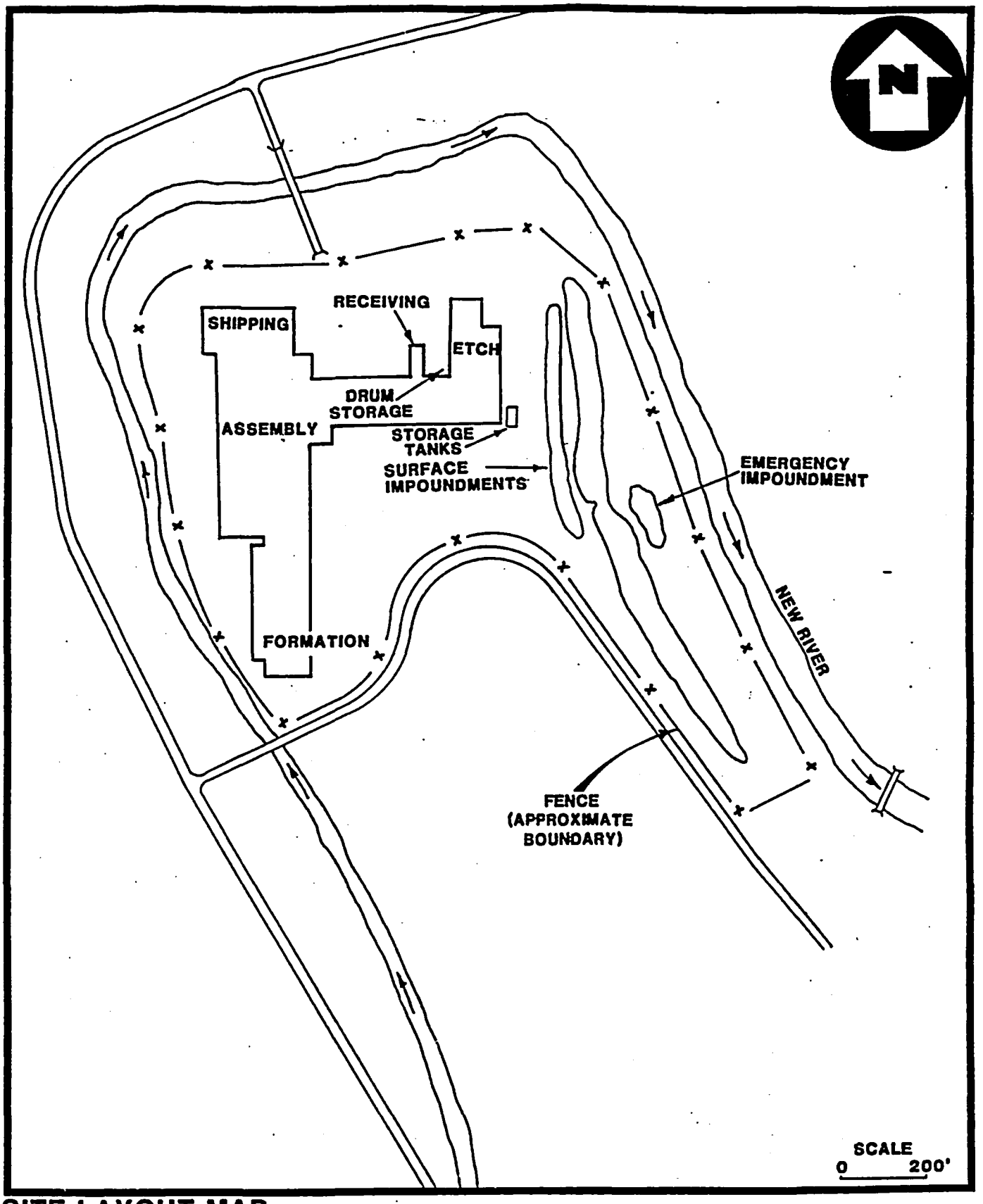


BASE MAP IS A PORTION OF THE U.S.G.S. 7.5 MINUTE QUADRANGLE WARRENSVILLE 1966, JEFFERSON 1968, NORTH CAROLINA.

SITE LOCATION MAP
SPRAGUE ELECTRIC COMPANY
LANSING, ASHE COUNTY, NORTH CAROLINA

FIGURE 1

NUS CORPORATION



SITE LAYOUT MAP
SPRAGUE ELECTRIC COMPANY
LANSING, ASHE COUNTY, NORTH CAROLINA

FIGURE 2

NUS CORPORATION

2.2 SITE DESCRIPTION

2.2.1 Site Features

The currently active facility is situated on a 60-acre tract of property located adjacent to Highway 195 approximately 1.25 miles south of Lansing, North Carolina, in a rural section of Ashe County (Ref. 1, Appendix A). The facility is enclosed within a 6-foot-high chain-link fence, and access to the property is restricted to a main entrance gate located along the facility's south side (Ref. 10). The operation is comprised of the main facility building housing office and warehouse space, assembly and etching operations, as well as shipping and receiving areas (Ref. 10, Figure 2). Areas adjacent to the facility are paved access roads and parking areas, while areas further away from the facility are comprised of grassy areas (Ref. 10, Figure 2). Additionally, a wastewater treatment lagoon system located east of the facility and adjacent to the New River was constructed to allow for the settling of aluminum oxides (Refs. 1, 2, Figure 2). This system is no longer in operation (Ref. 10). A drum storage area, a tank storage area, and a sewage treatment plant also exist on site (Ref. 10, Figure 2). The tank storage area contains two sulfuric acid and two nitric acid storage tanks (Ref. 10). Three industrial wells also exist on site, however, only one of them is currently in use (Ref. 10).

2.2.2 Waste Characteristics

The facility, since inception, has been actively engaged in the manufacturing of aluminum electrolytic capacitors (Refs. 1, 2). Raw materials utilized in the production process include aluminum foil, nitric acid, tartaric acid, sodium hydroxide, calcium hydroxide, sodium chloride, sulfuric acid, and dimethylformamide (DMF) (Refs. 1, 2). A wastewater treatment lagoon system was formerly operated on site to allow for the settling and treatment of aluminum oxide wastewater (Refs. 1, 2, Figure 2). Aluminum oxides formed from a manufacturing process involving the etching of aluminum foil in an electrochemical bath were recovered from the wastewater treatment system by filtering and settling in the lagoon, then were mined and sold (Refs. 1, 2). Wastewater from this system was not allowed to be discharged to the New River but rather was allowed to percolate into the ground or evaporate (Ref. 11). These lagoons are therefore believed to be unlined and this treatment process has been discontinued. Wastewater from the sewage treatment plant and non-contact boiler water are discharged into the New River and are NPDES permitted (Ref. 11). Waste dimethylformamide (DMF) used in the process is stored in drums and shipped off site (Refs. 1, 2). A drum storage area also exists adjacent to the former etching building (Ref. 10). Available information indicates that wastes have been handled in essentially the same manner since operations commenced (Ref. 2).

3.0 REGIONAL POPULATIONS AND ENVIRONMENTS

3.1 POPULATION AND LAND USE

3.1.1 Demography

The Sprague Electric Company facility is located in a rural portion of Ashe County approximately 1.25 miles south of Lansing, North Carolina (Appendix A). Most of the population in the area consists of full-time residents. Population density increases most sharply near Lansing (Appendix A). The population within a 1-mile radius is approximately 258; within a 4-mile radius, the population is estimated to be 2,300 (Ref. 12, Appendix A). The nearest residence is located approximately 400 feet west of the facility. No day-care centers are located adjacent to the facility. The nearest school identified is located approximately 1.1 miles south of the facility (Appendix A). Direct access to the facility is limited by a chain-link fence which restricts unauthorized entry (Figure 2).

3.1.2 Land Use

The majority of the land area within a 1-mile radius of the facility is rural (Appendix A). Cattle production is the primary type of agricultural activity practiced in the county. The county has about 34,500 head of cattle and ranks second in the state in cattle production. Permanent pastureland accounts for a large portion of the local land use, with the remainder in forestland (Ref. 13, Appendix A). Forest products, hay, tobacco, corn, and truck crops account for the remaining agriculture (Ref. 13). Only small towns exist in the study area which include Lansing, Smithport, and Warrensville (Appendix A). The area is best characterized as hilly and mountainous and has many relatively high mountain peaks (Ref. 13, Appendix A).

Phoenix Mountain, located approximately 1 mile southeast of the facility, is a sensitive environment which supports 11 peripherally rare plant species plus several endangered species (Ref. 14). The Cooper's hawk (Occipiter cooperii), bog rose (Arethusa bulbosa), robin runaway (Dalibarda repens), fringed gentian (Gentianopsis crinita), spreading avens (Geum radiatum), virginia spiraea (Spiraea virginiana), and the roseroot (Sedum rosea) are state endangered species in Ashe County. In addition, several state listed threatened species also exist in Ashe County (Ref. 15).

3.2 SURFACE WATER

3.2.1 Climatology

The average annual rainfall in the Ashe County region is approximately 50 inches per year. Mean annual evaporation is approximately 33 inches per year. Net rainfall is, therefore, 17 inches per year. In the month of July, the site area receives most of its normal precipitation (approximately 6 inches) (Ref. 16). The site area receives the least precipitation during the month of October (approximately 3 inches) (Ref. 16). The 2-year, 24-hour rainfall is approximately 3 inches (Ref. 17). In winter, the average temperature is 34°F, and in summer the average temperature is 67°F (Ref. 13).

3.2.2 Overland Drainage

Surface water run-off from the facility has the potential to migrate north, east, and west into the North Fork of the New River located adjacent to the facility. The North Fork of the New River follows a meandering path to the northeast, beyond 15 miles downstream from the facility (Appendix A). Since the facility property is located adjacent to the river, run-off has the potential to enter the river directly.

3.2.3 Potentially Affected Water Bodies

There are no known surface water intakes utilized for potable purposes located along the drainage pathway; however, fishing, boating, and swimming are recreational uses of the river (Refs. 18, 19). The New River is utilized for irrigational purposes (Ref. 18).

3.3 GROUNDWATER

3.3.1 Hydrogeology

The Sprague Electric Company is located in the Blue Ridge physiographic province and Piedmont-Blue Ridge groundwater region. This region is characterized by a thick layer of residual soil and weathered rock overlying fractured crystalline and metamorphosed sedimentary rocks (Refs. 20, plate 28; 21, pp. 251, 252). The immediate area around the facility consists of high hills and steeply sloped, narrow valleys (Appendix A).

Geologically, the area of the electric company is underlain by residual soils ranging from 25 to 36 feet thick. The residuum is underlain by blue and white metamorphosed granite rocks of the Late

Proterozoic era (Ref. 22). The aquifer used in the area is the crystalline rock aquifer system (Ref. 23, p. 331). Two wells drilled in the city of Warrensville, 1.5 miles south of the facility, were 80 and 130 feet deep. The 80-foot deep well reached water at 70 and 75 feet below land surface (bls). The 130-foot deep well reached water at 50 feet bls (Ref. 22). Water levels in the immediate area of the facility are less than 25 feet bls because of its proximity to the New River. The direction of groundwater flow is in the local area downgradient toward the North Fork of the New River (Appendix A).

Groundwater flows along the fractures in the bedrock and in the intergranular pore spaces of the residual soils. The porosity and the hydraulic conductivity of the soil decreases as depth increases (Ref. 24, pp. 12-14). Some igneous dikes are found in the Piedmont region, but these have few fractures and contain little water (Ref. 24, p. 10). The residual soils and bedrock are hydrologically interconnected (Ref. 21, pp. 252, 253). The unsaturated zone of the residual soils represents the layer of lowest hydraulic conductivity. Soils of this type have been shown to have hydraulic conductivities that range between 1×10^{-3} cm/sec and 1×10^{-5} cm/sec (Ref. 25, p. 29).

3.3.2 Aquifer Use

Two municipal water systems exist within a 4-mile radius of the facility. The nearby town of Lansing obtains its water from two wells located approximately 1.5 miles north of the facility and within the Lansing corporate boundary (Ref. 26, Appendix A). This system currently provides service to 65 customers (2.89 x 65 = 187 people) within the corporate boundary (Ref. 26). The Jefferson Water Department provides service to a very small segment of the study area located approximately 3.8 miles southeast of the facility (Appendix A). This system obtains its water from seven wells located in and near Jefferson, North Carolina (Ref. 26, Appendix A). Only one of these wells, however, is situated within the 4-mile radius and is located approximately 3.9 miles southeast of the facility. The water from these wells is mixed prior to distribution (Ref. 26, Appendix A). This system currently provides service to 535 customers (2.89 x 535 = 1,546 people) (Ref. 26). Residences not served by these municipal systems rely on wells and springs to supply their potable water needs. Information derived from a house count on USGS 7.5 minute series topographic quadrangle maps was used to approximate the number of private wells and springs being utilized. Within a 4-mile radius of the facility, approximately 800 residences and 600 municipal customers (2.89 x 1,400 = 4,046 people) utilize groundwater from private wells or springs for potable purposes. The nearest well is located approximately 500 feet west of the facility (Appendix A).

4.0 FIELD INVESTIGATION

4.1 SAMPLE COLLECTION

During the field investigation, conducted the week of December 11, 1990, FIT 4 attempted to identify and characterize contaminants which may be present in the environment as a result of activities that were conducted at Sprague Electric Company. To accomplish this, FIT 4 collected environmental surface soil, subsurface soil, sediment, and surface water samples from a number of strategic locations. These locations were selected based on historical information, hydrogeological data for the region and site area, and direct observation at the site.

4.1.1 Sample Collection Methodology

All sample collection, sample preservation, and chain-of-custody procedures used during this investigation were in accordance with the standard operating procedures as specified in Sections 3 and 4 of the Engineering Support Branch Standard Operating Procedures and Quality Assurance Manual; United States Environmental Protection Agency, Region IV, Environmental Services Division, April 1, 1986.

4.1.2 Duplicate Samples

Duplicate samples were offered to and declined by Thomas Miller, a designated representative of Sprague Electric Company. Receipt for sample forms are on file at FIT 4.

4.1.3 Description of Samples and Sample Locations

During the sampling investigation, a total of 16 environmental samples were collected. Surface and subsurface soil samples were collected from near the aboveground storage tank area and from the drum storage area. Background samples for these media were collected south of the facility adjacent to the New River. Surface water and sediment samples were collected from locations upstream and downstream of the facility on the New River. An additional surface water sample and a sediment sample were also collected from an onsite surface impoundment. No groundwater samples were collected due to the depth to groundwater and the presence of rock at shallow depths (Ref. 10). Sample codes, descriptions, locations, and rationale are presented in Table 1. All sample locations are shown in Figure 3.

TABLE 1

SAMPLE CODES, DESCRIPTIONS, LOCATIONS, AND RATIONALE
SPRAGUE ELECTRIC COMPANY
LANSING, ASHE COUNTY, NORTH CAROLINA

Sample Code	Description	Location	Rationale
SE-SS-01	Surface Soil	From an area south of the facility adjacent to the New River	To assess background conditions
SE-SS-02	Surface Soil	From the northern side of the main facility adjacent to a drum storage area	To determine presence or absence of contaminants
SE-SS-03	Surface Soil	From the eastern side of the main facility adjacent to the nitric and sulfuric acid storage tanks	To determine presence or absence of contaminants
SE-SS-04	Surface Soil	From an area located approximately 20 feet east of the nitric and sulfuric acid storage tanks	To determine presence or absence of contaminants
SE-SB-01	Subsurface Soil	From an area south of the facility adjacent to the New River at 3 to 4 feet bls	To assess background conditions
SE-SB-02	Subsurface Soil	From the northern side of the main facility adjacent to a drum storage area at 4 feet bls	To determine presence or absence of contaminants
SE-SW-01	Surface Water	From an upstream location on the New River south of the facility	To assess upstream (background) surface water conditions
SE-SW-02	Surface Water	From a downstream location west of the facility on the New River from a facility discharge pipe	To determine presence or absence of contaminants
SE-SW-03	Surface Water	From a location north and downstream of the facility on the New River	To assess downstream surface water conditions
SE-SW-04	Surface Water	From a surface impoundment located east of the facility	To determine presence or absence of contaminants
SE-SW-05	Surface Water	From a location southeast and downstream of the facility on the New River	To assess downstream surface water conditions
SE-SD-01	Sediment	From an upstream location on the New River south of the facility	To assess upstream sediment conditions

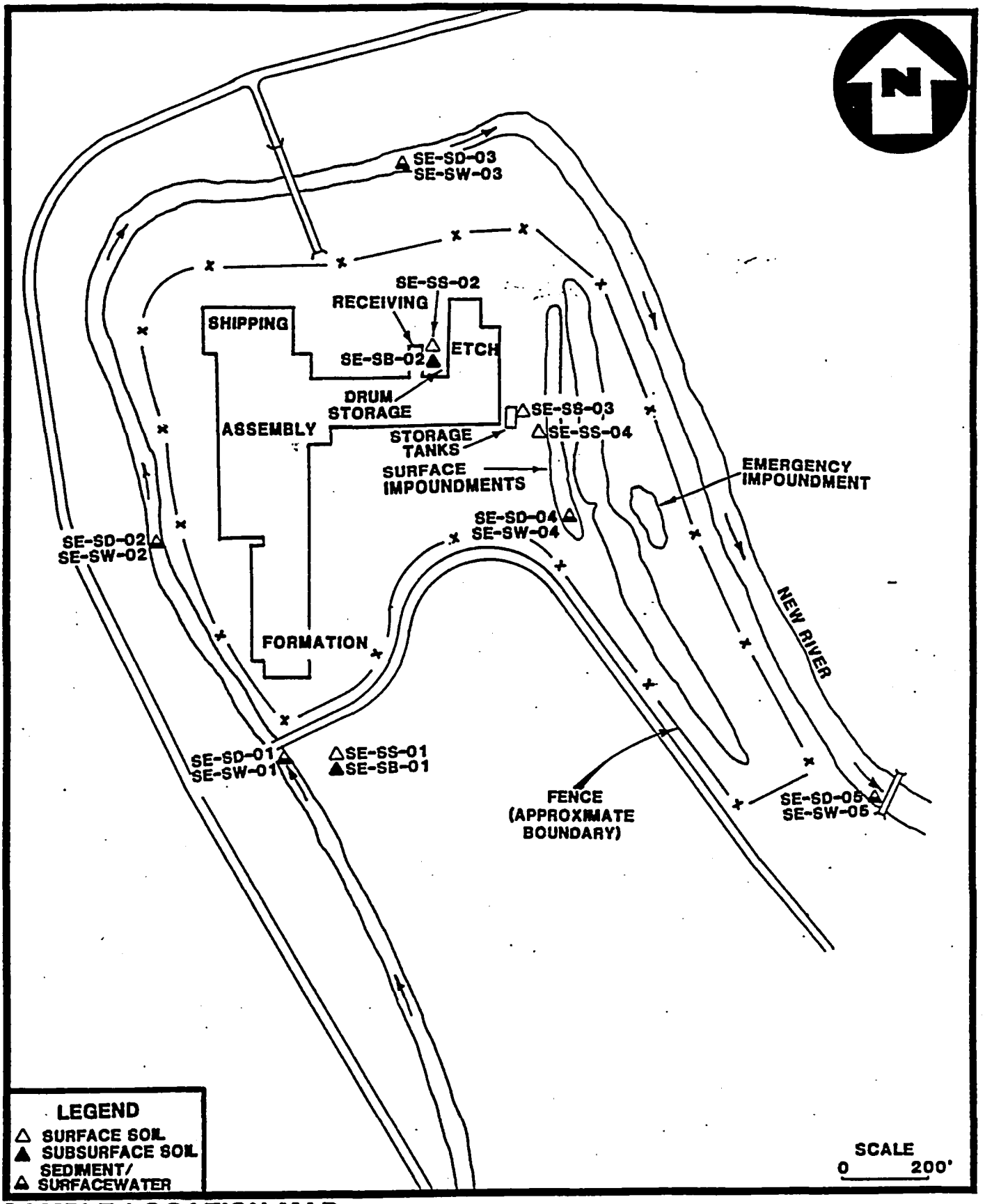
SE - Sprague Electric Company
SS - Surface Soil
SB - Subsurface Soil
SD - Sediment
SW - Surface Water
bls - Below Land Surface

TABLE 1

SAMPLE CODES, DESCRIPTIONS, LOCATIONS, AND RATIONALE
SPRAGUE ELECTRIC COMPANY
LANSING, ASHE COUNTY, NORTH CAROLINA

Sample Code	Description	Location	Rationale
SE-SD-02	Sediment	From a downstream location west of the facility on the New River, near a facility discharge pipe	To determine presence or absence of contaminants
SE-SD-03	Sediment	From a location north and downstream of the facility on the New River	To assess downstream sediment conditions
SE-SD-04	Sediment	From a surface impoundment located east of the facility	To determine presence or absence of contaminants
SE-SD-05	Sediment	From a location southeast and downstream of the facility on the New River	To assess downstream sediment conditions

SE - Sprague Electric Company
SS - Surface Soil
SB - Subsurface Soil
SD - Sediment
SW - Surface Water
bls - Below Land Surface



SAMPLE LOCATION MAP
SPRAGUE ELECTRIC COMPANY
LANSING, ASHE COUNTY, NORTH CAROLINA

FIGURE 3

NUS CORPORATION

4.1.4 Field Measurements

Field measurements were performed on all water samples (Table 2). Parameters measured included temperature, pH, and conductivity of the sample at time of collection. No field measurements were performed on the soil samples during this investigation.

4.2 SAMPLE ANALYSIS

4.2.1 Analytical Support and Methodology

All samples collected were analyzed under the Contract Laboratory Program (CLP) and analyzed for all organic and inorganic parameters listed in the Target Compound List (TCL). Organic analysis of soil and water samples was performed by Compuchem of Research Triangle Park, North Carolina. Inorganic analysis of soil and water samples was performed by S-Cubed of San Diego, California.

All laboratory analyses and laboratory quality assurance procedures used during this investigation were in accordance with standard procedures and protocols as specified in the Laboratory Operations and Quality Control Manual, United States Environmental Protection Agency, Region IV, Environmental Services Division, issued October 24, 1990; or as specified by the existing United States Environmental Protection Agency standard procedures and protocols for the Contract Laboratory Program (CLP) Statement of Work (SOW), as applicable.

4.2.2 Analytical Data Quality and Data Qualifiers

All analytical data were subjected to a quality assurance review as described in the EPA Environmental Services Division laboratory data evaluation guidelines. In the tables, some of the concentrations of the organic and inorganic parameters have been flagged with a "J". This indicates that the qualitative analysis was acceptable, but the quantitative value has been estimated. A few other compounds are flagged with an "N", indicating that they were detected based on the presumptive evidence of their presence. This means that the compound was tentatively identified, and its detection cannot be used as positive identification of its presence. Results for some background samples are reported with a "U" flag. This flag means that the material was analyzed for but not detected. The reported number is the laboratory-derived minimum quantitation limit (MQL) for the compound or element in that sample. At times, miscellaneous organic compounds that do not appear on the target compound list are reported with a data set. These compounds are labeled as "JN", indicating that they are tentatively identified at estimated quantities. Because these

TABLE 2

FIELD MEASUREMENTS
SPRAGUE ELECTRIC COMPANY
LANSING, ASHE COUNTY, NORTH CAROLINA

Sample Code	pH	Conductivity (umhos/cm)	Temp. (°F)
SE-SW-01	7.65	54	53.1
SE-SW-02	8.94	990	72.9
SE-SW-03	7.57	578	57.4
SE-SW-04	5.03	328	47.2
SE-SW-05	7.05	91	43.5

SE - Sprague Electric
SW - Surface Water

compounds are not routinely analyzed for or reported, background levels or MQL values are not generally available for comparison. The complete analytical data sheets and analytical data qualifier reports are presented in Appendix B.

4.2.3 Presentation of Analytical Results

This section presents a discussion and interpretation of the analytical results from the environmental samples collected during the investigation at Sprague Electric Company. Results of surface soil, subsurface soil, sediment, and surface water samples are presented in Tables 3, 4, 5, 6, 7, 8, and 9. Background samples have been designated for all media. Values for background sample results are presented as either a measured value or as the minimum quantitation limit (MQL). Samples containing concentrations of contaminants greater than three times the background level or MQL of these contaminants are considered to be elevated. These samples are noted in the text.

Summaries of inorganic analytical results can be found in Tables 3, 4, 5, and 6. There were four surface soil samples collected during the investigation. Sample SE-SS-02 was collected from the north side of the main facility adjacent to a drum storage area. This sample contained elevated levels of mercury (0.40J mg/kg; 3 times MQL), nickel (190 mg/kg; 5 times background), and zinc (260 mg/kg; 3 times background). Another surface soil sample containing elevated levels of metals was SE-SS-04, collected 20 feet east of the nitric and sulfuric acid storage tanks. This sample contained lead at an estimated level 3 times background (40J mg/kg). The remaining two surface soil samples contained no elevated levels of metals.

There were two subsurface soil samples collected. The onsite sample SE-SB-02 was taken from the same location as the corresponding surface soil sample (north of the main building adjacent to the drum storage area). It was determined that this sample contained beryllium at a level 3 times MQL (1.6 mg/kg).

There were five locations at which a sediment and a surface water sample were collected. Of the five sediment samples, only one, SE-SD-04, contained inorganics at elevated concentrations. This sediment sample was collected from a surface impoundment located east of the facility building. SE-SD-04 contained aluminum (290,000 mg/kg; 8 times background), mercury (0.8J mg/kg; 4 times MQL), and sodium (9100 mg/kg; 25 times MQL).

TABLE 3

SUMMARY OF INORGANIC ANALYTICAL RESULTS
SURFACE SOIL SAMPLES
SPRAGUE ELECTRIC COMPANY
LANSING, ASHE COUNTY, NORTH CAROLINA

PARAMETERS (mg/kg)	Background SE-SS-01	North of Main Building, Adjacent to Drum Storage Area SE-SS-02	West of Main Building, Adjacent to the Nitric and Sulfuric Acid Storage Tanks SE-SS-03	20 feet West of Nitric and Sulfuric Acid Storage Tanks SE-SS-04
ALUMINUM	43,000	25,000	69,000	41,000
ARSENIC	3.5	-	2.7	-
BARIUM	270	380	210	640
CADMIUM	1.1U	2.4	-	-
CALCIUM	2700	5400	5500	2600
CHROMIUM	88	45	93	92
COBALT	24	22	52	25
COPPER	42	100	42	37
IRON	48,000	36,000	58,000	54,000
LEAD	13J	33J	14J	40J
MAGNESIUM	7600	7700	5600	13,000
MANGANESE	590U	650	1300	700
MERCURY	0.13U	0.40J	-	-
NICKEL	35	190	35	38
POTASSIUM	3700	4900	1600	9900

- Material analyzed for but not detected above minimum quantitation limit (MQL).
J Estimated value.
U Material was analyzed for but not detected. The number given is the MQL.

TABLE 3

SUMMARY OF INORGANIC ANALYTICAL RESULTS
SURFACE SOIL SAMPLES
SPRAGUE ELECTRIC COMPANY
LANSING, ASHE COUNTY, NORTH CAROLINA

PARAMETERS (mg/kg)	Background	North of Main Building, Adjacent to Drum Storage Area	West of Main Building, Adjacent to the Nitric and Sulfuric Acid Storage Tanks	20 feet West of Nitric and Sulfuric Acid Storage Tanks
	SE-SS-01	SE-SS-02	SE-SS-03	SE-SS-04
SODIUM	3600	-	-	-
VANADIUM	120	110	170	130
ZINC	76	260	68	86
CYANIDE	0.66U	-	0.86	0.89

- Material analyzed for but not detected above minimum quantitation limit (MQL).
J Estimated value.
U Material was analyzed for but not detected. The number given is the MQL.

TABLE 4

SUMMARY OF INORGANIC ANALYTICAL RESULTS
SUBSURFACE SOIL SAMPLES
SPRAGUE ELECTRIC COMPANY
LANSING, ASHE COUNTY, NORTH CAROLINA

PARAMETERS (mg/kg)	Background SE-SB-01	North of Main Building, Adjacent to Drum Storage Area SE-SB-02
ALUMINUM	22,000	26,000
BARIUM	170	360
BERYLLIUM	0.53U	1.6
CADMIUM	0.96U	-
CALCIUM	2900	6600
CHROMIUM	68	37
COBALT	23	23
COPPER	36	37
IRON	30,000	39,000
LEAD	5.6J	3.2J
MAGNESIUM	6300	9000
MANGANESE	560	620
NICKEL	24	18
POTASSIUM	2700	6300
VANADIUM	81	120
ZINC	47	39

- Material analyzed for but not detected above minimum quantitation limit (MQL).
J Estimated value.
U Material was analyzed for but not detected. The number given is the MQL.

TABLE 5

SUMMARY OF INORGANIC ANALYTICAL RESULTS
SEDIMENT SAMPLES
SPRAGUE ELECTRIC COMPANY
LANSING, ASHE COUNTY, NORTH CAROLINA

PARAMETERS (mg/kg)	Background SS-SD-01	Downstream, West of Facility on the New River SE-SD-02	Downstream, North of Facility on the New River SE-SD-03	Surface Impoundment East of Facility SE-SD-04	Downstream, Southeast of Facility on the New River SE-SD-05
ALUMINUM	37,000	6000	17,000	290,000	12,000
BARIUM	290	51	120	55	98
CALCIUM	2400	1500	3400	750	1500
CHROMIUM	48	17	36	23	26
COBALT	28	6.8	17	5.7	12
COPPER	32	35	53	46	22
IRON	49,000	12,000	25,000	13,000	18,000
LEAD	31J	17J	27J	7.3J	9.2J
MAGNESIUM	7800	1800	4400	1200	3600
MANGANESE	920	210	480	110	360
MERCURY	0.18U	-	-	0.80J	-
NICKEL	28	28	21	15	14
POTASSIUM	4500	-	2500	1600	2100
SODIUM	360 U	-	-	9100	-
VANADIUM	100	32	67	43	45
ZINC	99	39	100	48	49
CYANIDE	0.91U	-	-	1.7	-

- Material analyzed for but not detected above minimum quantitation limit (MQL).
J Estimated value.
U Material was analyzed for but not detected. The number given is the MQL.

TABLE 6

SUMMARY OF INORGANIC ANALYTICAL RESULTS
SURFACE WATER SAMPLES
SPRAGUE ELECTRIC COMPANY
LANSING, ASHE COUNTY, NORTH CAROLINA

PARAMETERS (ug/l)	Trip Blank SE-TB-01W	Background SE-SW-01	Downstream, West of Facility on the New River SE-SW-02	Downstream, North of Facility on the New River SE-SW-03	Surface Impoundment East of Facility SE-SW-04	Downstream, Southeast of Facility on the New River SE-SW-05
BARIUM	-	20U	-	18	-	28
CALCIUM	-	3500	3300	4500	11,000	4500
COPPER	-	4U	29	-	-	-
IRON	-	190U	-	-	-	800
MAGNESIUM	-	1300	1200	1700	2600	1800
MANGANESE	-	20U	-	-	120	100
POTASSIUM	-	1100U	-	1300	-	1600
SODIUM	-	2500U	13,000	-	47,000	3400
ZINC	-	6U	43	-	-	-

\- Material analyzed for but not detected above minimum quantitation limit (MQL).
U Material was analyzed for but not detected. The number given is the MQL.

Elevated inorganic concentrations were detected in three of the surface water samples. Sample SE-SW-02, collected downstream on the New River west of the site, contained copper (29 ug/l; 7 times MQL), sodium (13,000 ug/l; 5 times MQL), and zinc (43 ug/l; times MQL). The surface water collected from a surface impoundment (SE-SW-04) contained calcium (11,000 ug/l; 3 times background), manganese (120 ug/l; 6 times MQL), and sodium (47,000 ug/l; 19 times MQL). SE-SW-05 was collected downstream on the New River southeast of the site. This sample contained elevated concentrations of iron (800 ug/l; 4 times MQL) and manganese (100 ug/l; 5 times MQL).

Most of the metals detected can be attributed to operations at the facility. The plant manufactures aluminum electrolytic capacitors. Many metals are commonly found in a binary system with aluminum, including beryllium, copper, iron, manganese, nickel, lead, and zinc (Ref. 27). These and other impurities can be removed from aluminum in the etching bath process. This could explain their presence in samples collected during the investigation. The source of the mercury (identified in estimated values in two of the samples) is uncertain. The major use of mercury is in electrical applications such as batteries, electric lamps, wiring and switching devices (Ref. 28).

Summaries of organic results can be found in Tables 7, 8, and 9. There were no organic compounds detected at elevated levels in any of the samples collected. There were, however, several polynuclear aromatic hydrocarbons detected in estimated concentrations in a few of the onsite soil samples. These contaminants were not, however, at concentrations above the MQLs for those compounds.

TABLE 7

SUMMARY OF ORGANIC ANALYTICAL RESULTS
SURFACE SOIL SAMPLES
SPRAGUE ELECTRIC COMPANY
LANSING, ASHE COUNTY, NORTH CAROLINA

PARAMETERS (ug/kg)	Trip Blank SE-TB-01S	Background SE-SS-01	North of Main Building, Adjacent to Drum Storage Area SE-SS-02	West of Main Building, Adjacent to the Nitric and Sulfuric Acid Storage Tanks SE-SS-03	20 feet West of Nitric and Sulfuric Acid Storage Tanks SE-SS-04
EXTRACTABLE COMPOUNDS					
ACENAPHTHENE	-	890U	81J	-	-
FLUORENE	-	890U	86J	-	-
PHENANTHRENE	-	890U	780J	130J	-
ANTHRACENE	-	890U	190J	-	-
FLUORANTHENE	-	890U	-	160J	-
PYRENE	-	890U	480J	-	-
CHRYSENE	-	890U	310J	-	-
BENZO(B AND/OR K)FLUORANTHENE	-	890U	420J	-	-
BENZO-A-PYRENE	-	890U	430J	-	-
INDENO (1,2,3-CD) PYRENE	-	890U	210J	-	-
BENZO(GHI)PERYLENE	-	890U	230J	-	-
UNIDENTIFIED COMPOUNDS	-	7000J/5	800J	3000J/3	-
BENZACEPHENANTHRYLENE(1)			500JN		

- Material analyzed for but not detected above minimum quantitation limit (MQL).
J Estimated value.
U Material was analyzed for but not detected. The number given is the MQL.
N Presumptive evidence of presence of material.
(1) Tentatively identified and unidentified compound. This compound is not on Target Compound List and is reported only as detected in individual samples; MQL not determined.

TABLE 8

SUMMARY OF ORGANIC ANALYTICAL RESULTS
SUBSURFACE SOIL SAMPLES
SPRAGUE ELECTRIC COMPANY
LANSING, ASHE COUNTY, NORTH CAROLINA

PARAMETERS (ug/kg)	Background SE-SB-01	North of Main Building, Adjacent to Drum Storage Area SE-SB-02
EXTRACTABLE COMPOUNDS		
PHENANTHRENE	810U	110J
FLUORANTHENE	810U	91J

J Estimated value.
U Material was analyzed for but not detected. The number given is the MQL.

TABLE 9

SUMMARY OF ORGANIC ANALYTICAL RESULTS
SEDIMENT SAMPLES
SPRAGUE ELECTRIC COMPANY
LANSING, ASHE COUNTY, NORTH CAROLINA

PARAMETERS (ug/kg)	Background SE-SD-01	Downstream, West of Facility on the New River SE-SD-02	Downstream, North of Facility on the New River SE-SD-03	Surface Impoundment West of Facility SE-SD-04	Downstream, Southeast of Facility on the New River SE-SD-05
PURGEABLE COMPOUNDS					
CHLOROFORM	10U	-	6J	-	-
EXTRACTABLE COMPOUNDS					
PHENANTHRENE	1300U	-	170J	-	-
DI-N-BUTYLPHTHALATE	1300U	-	170J	-	-
FLUORANTHENE	1300U	-	220J	-	-
PYRENE	1300U	-	120J	-	-
BENZO-A-PYRENE	380J	-	-	-	-
UNIDENTIFIED COMPOUNDS	10,000J/5	-	3000J/2	30,000J/14	5000J/5
PHOSPHORIC ACID, DIOCTADECYLESTER(1)	2000JN				1000JN
PETROLEUM PRODUCT(1)				N	
HYDROXYPHENYLMETHYLPHENOL(1)					700JN

- Material analyzed for but not detected above minimum quantitation limit (MQL).
J Estimated value.
U Material was analyzed for but not detected. The number given is the MQL.
N Presumptive evidence of presence of material.
(1) Tentatively identified and unidentified compound. This compound is not on Target Compound List and is reported only as detected in individual samples; MQL not determined.

5.0 SUMMARY

The surface water pathway is of concern from operations conducted at Sprague Electric Company. Contaminants can enter the river directly via surface water run-off, or indirectly by downward leakage through surface and subsurface soils, through percolation from the lagoon system, or by rainfall, until they reach the water table which eventually discharges into the New River. The New River is utilized for recreational fishing, boating and swimming. The groundwater pathway is also of concern due to the use of the unconfined crystalline rock aquifer in the area. Within a 4-mile site radius, approximately 600 municipal customers and 800 private residences utilize groundwater to supply their potable water needs. The air migration and onsite exposure pathways are of least concern at the facility due to restricted site access, however, onsite employees could be potentially exposed to organic and inorganic contaminants detected in onsite surface soil samples.

The sampling investigation consisted of the collection of 16 environmental samples: four surface soil, two subsurface soil, five sediment, and five surface water samples. No organic compounds were detected at concentrations above the MQLs for those compounds. Several polynuclear aromatic compounds were detected at estimated concentrations in a few of the onsite soil samples, but they are not believed to be site related. Surface and subsurface soil samples collected near the drum storage area and near the storage tank area were found to be contaminated with five different inorganic contaminants. Inorganic contaminants of greatest concern include lead and zinc, which are potential impurities removed from aluminum in the etching bath process. Mercury, which is utilized in electrical applications, was detected in a subsurface soil sample collected near the drum storage area. A sediment sample collected from a surface impoundment contained several metals including aluminum and mercury which are potentially site related. Analysis of surface water samples collected downstream of the facility and from one of the facility's surface impoundments revealed the presence of six inorganic substances. Most notably, copper, iron, manganese, and zinc were detected, and all are potential constituents of the aluminum etching bath process. It appears that these inorganic contaminants have the potential to enter the New River.

Based on the analysis of possible migration pathways, the results of the sampling investigation, and the information obtained from the references, FIT 4 recommends that this site be evaluated using the HRS (effective March 14, 1991).

REFERENCES

1. Stan Atwood, North Carolina Solid and Hazardous Waste Management Branch, letter to Denise Bland, EPA NC CERCLA Project Officer, November 27, 1985. Subject: *Preliminary Assessment Report.*

2. Stan Atwood, North Carolina Solid and Hazardous Waste Management Branch, letter to file, November 19, 1985. Subject: Sprague Electric Company.

3. EPA Notification of Hazardous Waste Site (EPA Form 3510-1) for Sprague Electric Company. Completed by Robert D. Smith, V.P., Materials and Manpower, Sprague Electric Company, November 17, 1980.

4. Fred A. Windover, Sprague Electric Company, letter to EPA Region IV, November 17, 1980. Subject: Hazardous Waste Permit Application for Sprague Electric Company.

5. James H. Scarbrough, Chief, Residuals Management Branch, letter to Fred A. Windover, Sprague Electric Company, December 16, 1981. Subject: Acknowledgement of request for withdrawal of RCRA permit application.

6. O.W. Strickland, Head, North Carolina Solid and Hazardous Waste Management Branch, letter to Fred A. Windover, Sprague Electric Company, March 4, 1982. Subject: Notification of facility status change.

7. O.W. Strickland, Head, North Carolina Solid and Hazardous Waste Management Branch, letter to Edward A. Stone, Sprague Electric Company, July 1, 1983. Subject: Notification of facility status change.

8. O.W. Strickland, Head, North Carolina Solid and Hazardous Waste Management Branch, letter to Edward A. Stone, Sprague Electric Company, March 13, 1984. Subject: Sprague Electric Company.

9. North Carolina Department of Human Resources, Solid and Hazardous Waste Management, Alphabetical List of Hazardous Waste Facilities, August 10, 1989. Subject: Sprague Electric Company.

10. NUS Corporation Field Logbook No. F4-2661 for Sprague Electric Company, TDD No. F4-9010-25. Documentation of Phase II Screening Site Inspection, December 11-12, 1990.

11. Jack Hardin, Sprague Electric Company, Lansing, North Carolina, telephone conversation with Eric Corbin, HALLIBURTON NUS Environmental Corporation, March 14, 1991. Subject: Wastewater discharges.

12. U.S. Environmental Protection Agency, Graphical Exposure Modeling System (GEMS) Data Base, compiled from the U.S. Bureau of the Census Data (1980).

13. U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of Ashe County, North Carolina, (January 1984).

14. North Carolina Natural Heritage Program Natural Areas Database for Ashe County, July 5, 1989, p. 9.

15. North Carolina Natural Heritage Program Element List for Ashe County, June 30, 1989, p. 2.

16. U.S. Department of Commerce, Climatic Atlas of the United States, (Washington, D.C.: GPO, June 1968) Reprint: 1983, National Oceanic and Atmospheric Administration, pp. 43, 63.

17. U.S. Department of Commerce, Rainfall Frequency Atlas of the United States, Technical Paper No. 40 (Washington, D.C.: GPO, 1961), p. 95.

18. Sonny Williams, Game Warden, Ashe County, North Carolina, telephone conversation with Eric Corbin, NUS Corporation, March 14, 1990. Subject: Recreational uses of the New River.

19. HALLIBURTON NUS Environmental Corporation Project Note, North Carolina Surface Water Intakes, July 11, 1990. Subject: Ashe County, North Carolina.

20. Oscar E. Meinzer, The Occurrence of Groundwater in the United States, U.S. Geological Survey Water Supply Paper No. 489 (Washington, D.C.: GPO, 1923).

21. Linda Aller, et al., DRASTIC: A Standardized System for Evaluating Ground-Water Pollution Using Hydrogeologic Settings, EPA-600/2-87-035 (Ada, Oklahoma: EPA, April 1987), pp. 251, 252.

22. Mrs. Ray Taylor, Taylor Well Drilling, telephone conversation with Brant McCanless, NUS Corporation, March 12, 1990. Subject: Geology and groundwater levels in the Warrensville, North Carolina area.

23. U.S. Geological Survey, National Water Summary 1984: Hydrologic Events, Selected Water Quality Trends, and Ground-Water Resources, Water Supply Paper 2275 (1984), pp. 329-334.

24. Charles C. Daniel, III and N. Bonar Sharpless, Ground-Water Supply Potential and Procedures for Well-Site Selection Upper Cape Fear River Basin, (North Carolina Department of Natural Resources and Community Development, Raleigh, North Carolina, October 1983), pp. 10, 12-15.

25. R. Allan Freeze and John A. Cherry, Groundwater (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1979), p. 29.

26. NUS Corporation Field Logbook No. F4-9998 for Sprague Electric Company, TDD No. F4-9001-132. Documentation of facility reconnaissance, February 12, 1990.

27. W.A. Anderson and W.E. Haupin, "Aluminum and Alloys," Kirk-Othmer Encyclopedia of Chemical Technology, 3rd ed., Vol. 2 (New York: John Wiley & Sons, 1978).

28. Harold J. Drake, "Mercury," Kirk-Othmer Encyclopedia of Chemical Technology, 3rd ed., Vol. 15 (New York: John Wiley & Sons, 1981).

REFERENCE 2

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

James G. Martin, Governor
Phillip J. Kirk, Jr., Secretary

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

27 November 1985

Ms. Denise Bland
EPA NC CERCLA Project Officer
Air and Hazardous Material Division
345 Courtland Street, N.E.
Atlanta, GA 30365

SUBJECT: Preliminary Assessment Report
Sprague Electric Co. NC D003167780
Highway 194
Lansing, NC 28643

Dear Ms. Bland:

Enclosed please find the Preliminary Assessment report for the subject site. This priority is based on review of available data.

Sprague Electric Company is about a 60 acre site located off NC 194 south of Lansing, NC. The plant has manufactured aluminum electrolytic capacitors since 1953. No other business has ever occupied the site.

The company uses aluminum foil, nitric acid, tartaric acid, sodium hydroxide, calcium hydroxide, sodium chloride, and dimethylformamide (DMF) in the production process. Aluminum oxides are formed when the aluminum foil is etched in an electrochemical bath. Aluminum oxides are recovered from the waste water, by filtering and settling in a lagoon, and sold. Effluent pH was reported between 3 and 4. Waste DMF is shipped off site in drums.

Several wells were reported to be on the site; however, only one is presently in use. The well water is tested periodically for bacteria and iron content. Soil, well, and impoundment sampling is recommended to confirm that no hazardous constituents are present. Based on the available information, a low priority is recommended for inspection of this site.

On 27 November 1985, this Preliminary Assessment was reviewed by CERCLA Unit personnel and by the following representatives from the North Carolina Department of Natural Resources and Community Development, Division of Environmental Management: Doug Dixon, Groundwater Section; Glen Ross, Air Quality Section; and Howard Bryant, Water Quality Section.

If you have any questions, please call me at (919) 733-2178.

Sincerely,

Stan Atwood

Stan Atwood, Toxicologist
Solid and Hazardous Waste Management Branch
Environmental Health Section

SA/tb/0221b

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NC	D003167780

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
Sprague Electric Co.	Highway 194				
03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Lansing	NC	28643	Ashe	005	5
09 COORDINATES LATITUDE	LONGITUDE				
36 28 48 .N	08 1 30 10 .W				

10 DIRECTIONS TO SITE (Starting from nearest public road)

Take highway 194 South of Lansing about 1½ to 2 miles. Plant is located on the left across the river.

III. RESPONSIBLE PARTIES

01 OWNER (if known)	02 STREET (Business, mailing, residential)			
General Cable Corp.				
03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER	
Greenwich	CT		( )	
07 OPERATOR (if known and different from owner)	08 STREET (Business, mailing, residential)			
Sprague Electric Co.	87 Marshall Street			
09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER	
North Adams	MA	01247	(413 664-4411	

13 TYPE OF OWNERSHIP (Check one)

☒ A. PRIVATE ☐ B. FEDERAL: _____ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL

☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

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

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

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION

☐ YES DATE ___/___/___ (MONTH DAY YEAR)

☒ NO

BY (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR

☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)

CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)

☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION

1953 (BEGINNING YEAR) | _____ (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

Sprague Electric manufactures Aluminum electrolytic capacitors. Nitric acid and sodiu hydroxide are used and consumed in the process. Waste water (pH 3 to 4) containing aluminum oxides is held in a surface impoundment. The aluminum oxides settle and are mined and sold. Nitric acid is stored in above ground tanks. Dimethylformamide (DMF) is also used. DMF wastes are stored in drums and transported off site. Several wells were reported on site; only one is currently used. Potential hazards exist for spills of nitric acid. No hazardous constituents were reported for their waste stream.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)

☐ A. HIGH (Inspection required promptly) ☐ B. MEDIUM (Inspection required) ☒ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)			03 TELEPHONE NUMBER
Ron Watson, Plant Engineer	Sprague Electric Co.			(919) 384-2551
04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Stan Atwood/Pat DeRosa	NC DHR/DHS	SHW Mgmt. Br.	(919) 733-2178	11 / 20 / 85 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NC	D003167780

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [X] A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — [X] POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

Large surface impoundment.

01 [X] B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — [X] POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

North Fork of the New River traverses the site.

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — [X] POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 [X] F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ (Acres) — 04 NARRATIVE DESCRIPTION

Surface impoundment or spills.

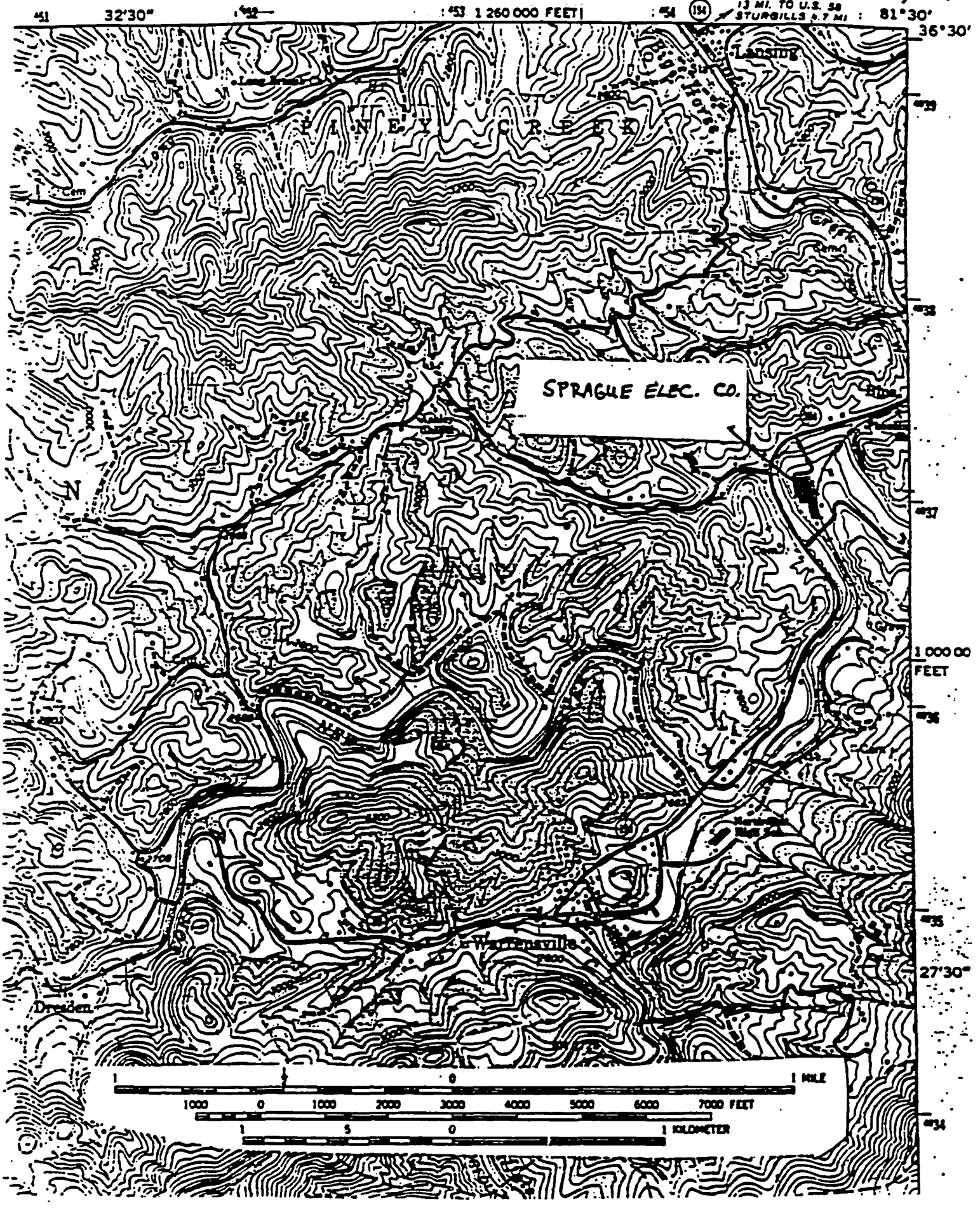
01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 [X] H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — [X] POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

Handling and use of nitric acid.

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

WARREN_ /ILLE QUADRANGLE
NORTH CAROLINA—ASHE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



REFERENCE 3

DATE: 19 November 1985

TO: File

FROM: Stan Atwood SA

SUBJECT: Sprague Electric Co. NC D003167780

I called Sprague Electric Co., (919) 384-2551, and talked to Arlie Keith, Manager Manufacturing Eng., Ron Watson, Plant Eng., and Gene Hunsucker, Manager Foil Processing.

Sprague Electric has manufactured aluminum electrolytic capacitors since 1953 and is the only industry that has ever occupied the site. Raw materials include aluminum foil, nitric acid, tartaric acid, sodium hydroxide, calcium hydroxide, sodium chloride and dimethylformamide. Sulfuric acid was used in the past. Nitric acid is stored in tanks outside the building.

The manufacturing process involves etching of aluminum foil in an electrochemical bath. Aluminum oxides are formed in the process which are filtered and settled in a lagoon. The aluminum oxides are mined and sold. Effluent to the lagoon has a pH of 3 to 4. Dimethylformamide (DMF) is also used in the process. Spent DMF is stored in drums and shipped off site. Waste were reported to have been handled in essentially the same manner since operations began.

There are several wells on site - only one is presently being used. The wells are sampled periodically and tested by Burlington Labs for bacteria, BOD, and iron. I requested a copy of lab results and they said they would mail me a copy.

SA/tb/0221b

Please print or type in the unshaded areas only
(fill-in areas are spaced for elite type, i.e. [illegible])

Approved OMB No. 158-R01

FORM 1 GENERAL

EPA

REFERENCE 4

I.D. NUMBER: CD003167 7

LABEL ITEMS

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

RECEIVED
SEP 1 1 1980
PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also if the preprinted data is absent (the label space lists the items that should appear), please provide it in the proper fill-in area(s) below. If the preprinted data is complete and correct, you need not enter items I, III, V, and VI (except VI-B which must be completed regardless). Complete items II and IV if not labeled, but be sure to provide the "Instructions" for detailed descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to questions you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK "X" YES	NO	FORM ATTACHED	SPECIFIC QUESTIONS	MARK "X" YES	NO	FORM ATTACHED
A. Is this a facility which currently results in discharges to waters of the U.S. (FORM 2A)		X		B. Does or will this facility (either existing or proposed) include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)			
C. Is this a facility which currently results in discharges to waters of the U.S., other than those described in A or B above? (FORM 2C)	X		*	D. Is this a proposed facility (other than those described in A or B above) which will result in a discharge to waters of the U.S.? (FORM 2D)			
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)	X		X	F. Do you or will your inject at this facility industrial or municipal effluent below the lowermost stratum containing within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)			
G. Do your or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)			
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X		J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)			

III. NAME OF FACILITY

1 SPRAGUE ELECTRIC COMPANY

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)	B. PHONE (area code & no.)
2 ORTMAN JOHN FACILITIES ENG MGR	413 664 4411

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 87 MARSHALL STREET

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 NORTH ADAMS	MA	01247

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 HIGHWAY 194

B. COUNTY NAME

ASHE

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE (if known)

VII. SIC CODES (4-digit, in order of priority)

A. FIRST	B. SECOND
3675 (specify) CAPACITORS - ELECTRONIC	(specify)
C. THIRD	**D. FOURTH**
(specify)	(specify)

VIII. OPERATOR INFORMATION

A. NAME: SPRAGUE ELECTRIC COMPANY

B. Is the name listed in Item VIII-A also the owner? ☒ YES ☐ NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)
F = FEDERAL, M = PUBLIC (other than federal or state), S = STATE, O = OTHER (specify), P = PRIVATE: P (specify)

D. PHONE (area code & no.): A 413 664 4411

E. STREET OR P.O. BOX: 87 MARSHALL STREET

F. CITY OR TOWN: NORTH ADAMS

G. STATE: MA

H. ZIP CODE: 01247

IX. INDIAN LAND
Is the facility located on Indian land? ☐ YES ☐ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water): N NC0000019

D. PSD (Air Emissions from Proposed Sources): P

B. UIC (Underground Injection of Fluids): U

E. OTHER (specify): 4519 (specify) FILTER BACKWASH

C. RCRA (Hazardous Wastes): R

F. OTHER (specify): (specify)

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS (provide a brief description)

Manufacture aluminum electrolytic capacitors. Raw aluminum foil is etched formed, rolled, inserted in appropriate container, assembled, tested, packaged and shipped.

XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in application, I believe that the 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.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
Robert D. Smith V. P., Materials & Manpower	Robert D. Smith	11/17/80

COMMENTS FOR OFFICIAL USE ONLY

Please print or type in the unshaded areas only
(fill-in areas are spaced for elite type, i.e., 1.7 characters/inch).

Form Approved OMB No. 158-S80004

FORM 3 RCRA

EPA

ENVIRONMENTAL PROTECTION AGENCY

HAZARDOUS WASTE PERMIT APPLICATION

Consolidated Permits Program

(This information is required under Section 3005 of RCRA.)

I. EPA I.D. NUMBER

F	N	C	D	0	0	3	1	6	7	7	8

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr., mo., & day)	COMMENTS

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below *(mark one box only)* to indicate whether this is the first application you are submitting for your fa revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your f EPA I.D. Number in Item I above.

A. FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

[X] 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

[ ] 2. NEW FACILITY *(Complete item b*

FOR EXISTING FACILITIES, PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

C	YR.	MO.	DAY
8	5 3	0 3	1 5

FOR NEW FA PROVIDE THE *(yr., mo., & day* TION BEGAN EXPECTED TO

YR.	MO.	DAY

B. REVISED APPLICATION *(place an "X" below and complete Item I above)*

[ ] 1. FACILITY HAS INTERIM STATUS

[ ] 2. FACILITY HAS A RCRA PERMIT

III. PROCESSES — CODES AND DESIGN CAPACITIES

A. PROCESS CODE — Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provi entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes bel describe the process *(including its design capacity)* in the space provided on the form *(Item III-C)*.

B. PROCESS DESIGN CAPACITY — For each code entered in column A enter the capacity of the process.

1. AMOUNT — Enter the amount.
2. UNIT OF MEASURE — For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the uni measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER *(barrel, drum, etc.)*	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS

PROCESS	PROCESS CODE	APPROPRIATE UNIT MEASURE FOR PRO DESIGN CAPACIT
Treatment:		
TANK	T00	GALLONS PER DAY O LITERS PER DAY
SURFACE IMPOUNDMENT	T01	GALLONS PER DAY O LITERS PER DAY
INCINERATOR	T02	TONS PER HOUR OR METRIC TONS PER H GALLONS PER HOUR LITERS PER HOUR
OTHER *(Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Item III-C.)*	T04	GALLONS PER DAY O LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	U M
GALLONS	G	LITERS PER DAY	V	ACRE-FEET	
LITERS	L	TONS PER HOUR	D	HECTARE-METER	
CUBIC YARDS	Y	METRIC TONS PER HOUR	W	ACRES	
CUBIC METERS	C	GALLONS PER HOUR	E	HECTARES	
GALLONS PER DAY	U	LITERS PER HOUR	H		

EXAMPLE FOR COMPLETING ITEM III *(shown in line numbers X-1 and X-2 below)*: A facility has two storage tanks, one tank can hold 200 gallons other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

C	D-U P				

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT	2. UNIT OF MEASURE (enter code)	O
X-1	S 0 2	600	G		5				
X-2	T 0 3	20	E		6				
1	T 0 2	6000	E		7				
2					8				
3					9				

III. PROCESSES *(continued)*

C. SPACE FOR ADDITIONAL PROCESS CODES OR F[illegible]ESCRIBING OTHER PROCESSES *(code "T04")*. [illegible]R EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

IV. DESCRIPTION OF HAZARDOUS WASTES

A. EPA HAZARDOUS WASTE NUMBER — Enter the four—digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four—digit number*(s)* from 40 CFR, Subpart C that describes the charac tics and/or the toxic contaminants of those hazardous wastes.

B. ESTIMATED ANNUAL QUANTITY — For each listed waste entered in column A estimate the quantity of that waste that will be handled on an an basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non—listed waste*(s)* that will be hac which possess that characteristic or contaminant.

C. UNIT OF MEASURE — For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the approp codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:

For listed hazardous wastes: For each listed hazardous waste entered in column A, select the code*(s)* from the list of process codes contained in Ite to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non—listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code*(s)* from the list of process contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non—listed hazardous wastes that po that characteristic or toxic contaminant.

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" i extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code*(s)*.

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER — Haza dous wastes that can be describ more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B, C, and D by estimating the total a quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line "included with above" and make no other entries on that line.
3. Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

EXAMPLE FOR COMPLETING ITEM IV *(shown in line numbers X-1, X-2, X-3, and X-4 below)* — A facility will treat and dispose of an estimated 900 po per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non—listed wastes. Two w are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estir 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. EPA HAZARD. WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*	D. PROCESSES 2. PROCESS DESCRIPTION *(If a code is not entered in D(1))*
X-1	K 0 5 4	900	P	T 0 3 D 8 0	
X-2	D 0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2				*included with above*

Continued from page 2.

NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

Form Approved OMB No. 158-S800C

EPA I.D. NUMBER (enter from page 1)																FOR OFFICIAL USE ONLY					
W	N	C	D	0	0	3	1	6	7	7	8	0	T/A	C	1	W	DUP	T/A	C	2	DUP

IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)				2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	D002	250,000,000	P	T02				
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								

IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE

EPA I.D. NO. (enter from page 1)

F	N	C	D	0	0	3	1	6	7	7	8	0	T/A	6

V. FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail)*.

VI. PHOTOGRAPHS

All existing facilities must include photographs *(aerial or ground—level)* that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas *(see instructions for more detail)*.

VII. FACILITY GEOGRAPHIC LOCATION

LATITUDE (degrees, minutes, & seconds)	LONGITUDE (degrees, minutes, & seconds)
36 28 048	081 30 010

VIII. FACILITY OWNER

☐ A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. (area code)
E	

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE
F	G		

IX. OWNER CERTIFICATION

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.

A. NAME (print or type)	B. SIGNATURE	C. DATE SIGNED
Robert D. Smith V. P., Materials & Manpower	Robert D. Smith	11/17/80

X. OPERATOR CERTIFICATION

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.

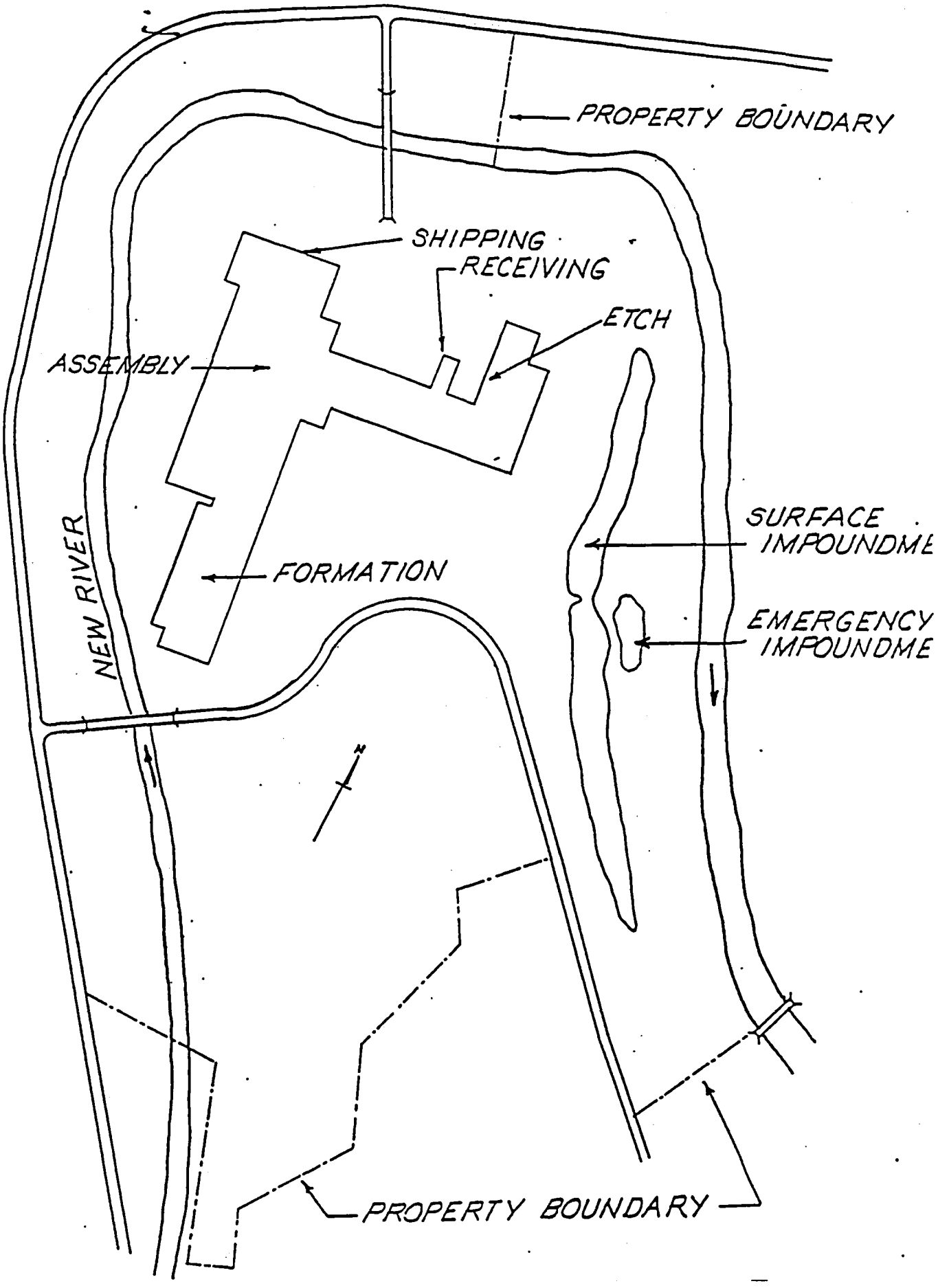
A. NAME (print or type)	B. SIGNATURE	C. DATE SIGNED

CONTINUE

Continued from page 4.

Form Approved OMB No. 158-S

V. FACILITY DRAWING (see page 4)



REFERENCE 5

S

NORTH ADAMS, MASSACHUSETTS

01247

FRED A. WINDOVER
ASSOCIATE GENERAL COUNSEL
AND ASSISTANT SECRETARY

R

NOV 19 1980

November 17, 1980

EPA Region IV.
RCRA Activities
345 Courtland, N.E.
Atlanta, Georgia 30308

Gentlemen:

Enclosed please find a Hazardous Waste Permit Application for the Sprague Electric Company manufacturing plant in Lansing, North Carolina.

Please be advised that we are in doubt as to whether or not the Lansing plant is indeed a waste treatment, storage, or disposal facility under the Resource Conservation & Recovery Act Regulations, and this Application is submitted as a caution so that in case this location is such a facility, we will be in interim status. We are in doubt regarding some of the definitions of the RCRA Regulations as well as some of the facts regarding this manufacturing location.

Please be advised that on November 19, 1980, we will begin compliance with the Interim Status Standards set forth in Part 265 of the Regulations.

However, in the event that further clarification of the Regulations, and/or further investigations by us of the facts regarding the facility, determine that this facility is not a waste treatment, storage, or disposal facility under RCRA, we will notify you of such determination and naturally, cease compliance with the interim standards.

Please be assured that until we are confident that this facility is not a waste treatment, storage, or disposal facility under RCRA, we will abide by all regulations applicable to such a facility.

Very truly yours,

Fred A. Windover

Fred A. Windover

FAW:gej

Enclosure

REFERENCE 6

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

DEC 16 1981

REF: 4AW-RM

Fred A. Windover
Sprague Electric Company
North Adams, MA 01247

Re: EPA ID No. NCD003167780/Lansing NC

Gentlemen:

This letter is to acknowledge receipt of your request for withdrawal of your application for a permit under the Resource Conservation and Recovery Act (RCRA), as amended. Your letter indicated that you no longer treat, store, or dispose of hazardous waste.

It has been our general experience that the RCRA regulations and the amendments which have been published since May 19, 1980, have caused confusion, and have been subjected to misinterpretation. This confusion on the part of the regulated community has been compounded, due to EPA's and the State's overlapping responsibilities for implementation of the hazardous waste regulatory program during the period of interim authorization.

Withdrawal of your permit application constitutes revokation of interim status, as defined by Section 3005(e) of the Act. Consequently, under the Federal program, you would no longer be allowed to treat, store, or dispose of hazardous waste. However, as you are probably aware, the State has been authorized to implement certain requirements of the program in lieu of the Federal regulatory requirements. Therefore, withdrawal of your applications also directly affect the State program.

In light of the foregoing, EPA plans to proceed as follows. EPA will place your file in our "suspense" file. This action, in essence, revokes you interim status under the Federal program. However, we will forward the request to the State for formal action. The State will contact you if further information relating to your request is required. If the State agrees that your waste is not hazardous, and that you do not need a RCRA permit, the State will notify you of this determination, and by carbon copy of this notification sent to EPA, your application will be formally withdrawn, and your file will be inactivated.

In conclusion, this letter should <u>not</u> be construed as EPA's concurrence with your determination that RCRA regulatory requirements are not applicable to your facility. Furthermore, this letter does not relieve you of your responsibility to comply with State and Local hazardous waste regulatory requirements.

Finally, your request to withdraw interim status means that you may not treat, store, or dispose of hazardous waste without a permit issued under the authority of §3005 of the Act and 40 CFR 264.

If for any reason you wish to reconsider this withdrawal request, please advise this office and the State within the next ten days. You should be receiving a formal response to your request from the State in the near future. If you require further clarification, please contact John Herrmann of my staff (404) 881-3433 or a representative of the State hazardous waste program.

Sincerely yours,

James H. Scarbrough

James H. Scarbrough, Chief
Residuals Management Branch

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

STATE HEALTH DIRECTC

Keith

REFERENCE 7

Date: March 4, 1982

Mr. Fred A. Windover
Sprague Electric Company
87 Marshall Street
North Adams, Massachusetts 01247

Re: Facility ID NO. NCD003167780

Dear Mr. Windover:

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: John Herrmann
EPA Region IV
Emil Breckling

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

REFERENCE 8

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

Date: July 1, 1983

Mr. Edward A. Stone
Sprague Electric Co.
87 Marshall St.
North Adams, Massachusetts

Re: Facility ID No. NCD003167780

Dear Mr. Stone:

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
Bob Apple
Jackie Blackburn

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

REFERENCE 9

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

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

March 13, 1984

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Edward A. Stone
Sprague Electric Co.
87 Marshall St.
North Adams, Massachusetts 01247

Re: NCD003167780

Dear Mr. Stone:

On November 14, 1983, in response to a formal call for part B of a permit application, an officer of your company advised this Branch that a part B application would not be filed. Following this, on January 29, 1984 and February 1, 1984, the Solid and Hazardous Waste Management Waste Management Branch of the Department of Human Resources published a legal notice in the Raleigh papers, announcing its intention to deny a permit and terminate interim status for a numb of plants, including yours.

You are now advised that this plant has been denied a permit as a hazardous waste treatment, storage, or disposal facility and its interim status has been formally terminated. As of March 30, 1984, the operators of it may not treat or dispose of hazardous waste, nor store it for more than 90 days from the of accumulation.

If you have any questions about this matter, please call or write to Mr. Kei Lawson at this office.

Very sincerely,

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

OWS/KL: tl

ALPHABETIC LIST OF HAZARDOUS WASTE FACILITIES

FACILITY ID	FACILITY NAME / CONTACT	FACILITY ADDRESS		MAILING ADDRESS		SG	G	TRN	TR	ST	DS	TELEPHONE AREA	NUMBER
NCD986172435	SPECTRUM-NATIONWIDE ENVIRONMEN HAMILTON, STEPHEN M	7200 KILLINGDEER LANE CHARLOTTE	28226	PO BOX 7351 CHARLOTTE	NC 28241			X				803	548-4734
NCD982147241	SPEIZMAN INDUSTRIES, INC. REYNOLDS, GARY	305 WEST FIFTH STREET CHARLOTTE	28202	PO BOX 31215 CHARLOTTE	NC 28231		X					704	372-3751
NCD986166536	SPEVCO INC. THARPE, MARTY	7620 PHOENIX ROAD WINSTON SALEM	27106	7620 PHOENIX ROAD WINSTON SALEM	NC 27106		E					919	721-0462
NCD982139594	SPHINX BIOTECHNOLOGIES CORP. LISTER, MARK	2 UNIVERSITY PLACE DURHAM	27707	PO BOX 52330 DURHAM	NC 27717		E					919	489-0909
NCD981862618	SPINDALE LAUNDRY & CLEANERS AVANT, W.M.	11 EAST MAIN SPINDALE	28160	11 EAST MAIN SPINDALE	NC 28160		X					704	286-3472
NCD003147485	SPINDALLE MILLS INC. YELTON, CHARLES	100 SPINDALE STREET SPINDALE	28160	BOX 217 SPINDALE	NC 28160		X					704	286-3491
NCD122959513	SPORTSMAN BOATWORKS, INC. DAUGHTRY, R.L.	BEVERLY DRIVE WANCHESE	27981	PO BOX 340 WANCHESE	NC 27981		X					919	473-1161
NCD003167780	SPRAGUE ELECTRIC COMPANY MILLER, MICKEY	HIGHWAY 58 NEAR HIGHWAY 1 LANSING	28643	BOX 1 SPRAGUE ROAD LANSING	NC 28643		X					919	384-2551
NCD981476708	SPRAGUE ENERGY CORPORATION HART, RON	1101 SOUTH FRONT STREET WILMINGTON	28401	PO BOX 570 WILMINGTON	NC 28402		X					919	251-1020
NCD982147183	SPRING FRESH CLNRS INC. KUREK, KEN	4800 MONROE ROAD MATTHEWS	28105	PO BOX 25610 SUITE CHARLOTTE	NC 28229		X					704	847-7864
NCD003158078	SPRING SVC & ALIGNMENT CO. MILLS, TED P.	6613 STATESVILLE ROAD CHARLOTTE	28213	PO BOX 217067 CHARLOTTE	NC 28221		X					704	597-0373
651705	SPRINGS MILLS INC AILEEN PLANT DOOM, RALPH	HIGHWAY 220 SOUTH BISCOE	27209	PO BOX 39 BISCOE	NC 27209		E					803	547-2901
391689	SPRINGS MILLS INC SPRINGFIELD DOOM, RALPH	HIGHWAY 79 LAUREL HILL	28351	GENERAL DELIVERY LAUREL HILL	NC 28351		X					803	547-2901
214574	SPRUANCE SOUTHERN INC PLYLER, MIKE	HIGHWAY 52 SOUTH WINSTON SALEM	27102	ROUTE 9 BOX 305-D WINSTON SALEM	NC 27107		X					919	764-0940
751878	SQUARE D COMPANY PHILLIPS, DAVID W.	126 BINGHAM ROAD ASHEVILLE	28806	PO BOX 3107 ASHEVILLE	NC 28802		X					704	252-0300
203752	SQUARE D COMPANY BUCHANAN, BILL	HIGHWAY 64 KNIGHTDALE	27545	PO BOX 27446 RALEIGH	NC 27611		X				X	919	266-3671
773000	SQUARE D COMPANY HYATT, PAMELA W.	1809 AIRPORT ROAD MONROE	28110	PO BOX 5002 MONROE	NC 28110		X					704	283-7411

SG - SMALL QNTY. GENERATOR; G - GENERATOR; TRN - TRANSPORTER;
DS - DISPOSER; ST - STORER; TR - TREATOR

REFERENCE 10

NUS CORPORATION AND SUB: REFERENCE 11 **TELECON NOTE**

CONTROL NO.	DATE: 03-14-91	TIME: 1000

DISTRIBUTION:

BETWEEN: Jack Hardin	OF: Sprague Electric Company	PHONE: (919) 384-2551

AND: Eric Corbin, HALLIBURTON NUS Environmental Corporation

Eric Corbin 08-16-91

DISCUSSION:

I contacted Mr. Hardin in an effort to determine the wastewater discharges at Sprague. He stated that only two discharges that enter the New River exist at the facility. He stated that one of these discharges was from the sewage treatment plant and that the other one was for the non-contact boiler water. He also stated that the aluminum oxide wastewater treatment lagoon system was never allowed to discharge to the New River but rather depended upon evaporation and percolation to remove the wastewater and is currently not in operation. The discharges are NPDES permitted. The formerly operated etching house also had an effluent discharge and was regulated under NPDES #005.

REFERENCE 12

Due to the fact that only one of the two industrial wells was in use and that it was over 1,000 feet deep and could not be being abandoned and became not temporary but solid grouts, gives no guarantee

LOGBOOK REQUIREMENTS
REVISED - NOVEMBER 29, 1988

NOTE: ALL LANGUAGE SHOULD BE FACTUAL AND OBJECTIVE

1. Record on front cover of the Logbook: TDD No., Site Name, Site Location, Project Manager.
2. All entries are made using ink. Draw a single line through errors. Initial and date corrections.
3. Statement of Work Plan, Study Plan, and Safety Plan discussion and distribution to field team with team members' signatures.
4. Record weather conditions and general site information
5. Sign and date each page. Project Manager is to review and sign off on each logbook daily.
6. Document all calibration and pre-operational checks of equipment. Provide serial numbers of equipment used onsite.
7. Provide reference to Sampling Field Sheets for detailed sampling information.
8. Describe sampling locations in detail and document all changes from project planning documents.
9. Provide a site sketch with sample locations and photo locations.
10. Maintain photo log by completing the stamped information at the end of the logbook.
11. If no site representative is on hand to accept the receipt for samples, an entry to that effect must be placed in the logbook.
12. Record I.D. numbers of COC and receipt for sample forms used. Also record numbers of destroyed documents.
13. Complete SMO information in the space provided.

All entries in this logbook will be made by myself, Eric Carlin, Project Manager. Each page will be signed and dated. Any and all corrections will be properly initialed (E.C.)

Signature: Eric A. Carlin

All notes and observations made during this Phase II, SST Inspection will be documented in this logbook.

This logbook is an extension of Work Plan TDD#14-9010-25.

12-11-90 E. A. Carlin

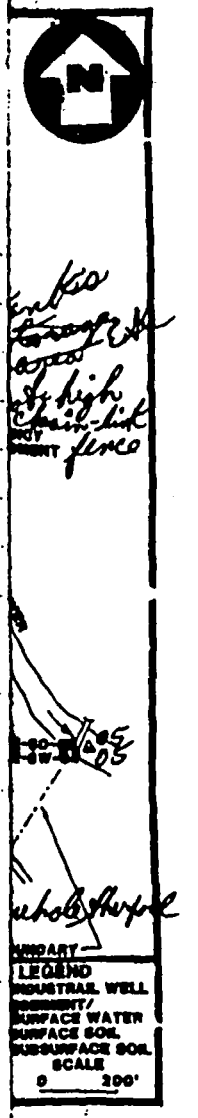


FIGURE 3

Due to the fact that only one of the three industrial wells was in use and that it was over 1,000 feet downhill not be sampled prior to its being abandoned and because no temporary wells could be installed due to solid granite gneiss no groundwater samples were taken.

NUS CORPORATION

The following NUS personnel herein listed have read and understand the following NUS/EPA documents listed:

Work Plan
~~Safety Plan~~
~~Study Plan~~

As our confirmation of having read and having understood the above listed documents, we the undersigned place our signatures.

Eric Corbin - Eric Corbin
Ralph Hagelton - Ralph Hagelton
Harry Price - Harry Price
Jim Miller - Jim Miller

10-11-90 S. Cook

0745 Review maps for direction to location and discuss the plan of action for this investigation.

0755 Tailgate trip & preparative work w/ the helicopter crew.

0850 Arrive at Sprague Aluminum Company formerly known as Sprague Electric Company. Drove at the front office and met with Mr. Mickey, Miller Environmental Engineer for the Company. Mr. Miller took us on a tour of the plant property and pointed out to us the drum storage area, the sewer system, the aqueous waste acid storage tank area, and the ground.

10-11-90 S. Cook

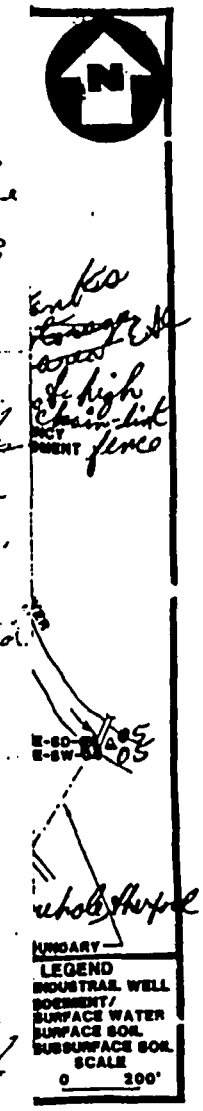


FIGURE 3

NUS CORPORATION

Due to the fact that only one of the three industrial wells was in use and that it was over 1,000 feet deep, one could not be sampled prior to its being eliminated and because no temporary well could be installed due to solid granite gneiss, no groundwater samples were taken.

water around the facility is believed to be about 25 feet bls. No PID readings recorded. The area around the facility appeared well kept and no hazardous waste disposal was noticed. Begin up to collect background samples. Setting up the slagging and behind the plant shipping location.

1050 Have isolated a background surface and subsurface soil sampling area located in the southwest of the facility adjacent to the New River and the facility access road.

1115 - Sample time SE-SS-01 & a grab surface soil background sample was collected 12-11-90 E.V. Cole

from a naturally appearing area located near the southwest corner of the facility, near the facility access road and @ 150 feet east of the New River. Samples were from the Fairy Green. Surface soil was brown in color and a mixture of topsoil & clay. No PID or OVA readings recorded. See field sheets for log info. No splits have been requested by PRP Rep Mike Miller

1130 - Sample time - SE-SB-01 A grab background surface soil sample was collected from the same location as SE-SS-01 from @ 3-1/2 feet bls. This is also our matrix spike/spike dup.
12-11-90 E.V. Cole

FIGURE 3

NUS CORPORATION

Due to the fact that only one of the three industrial wells was in use and that it was over 1,000 feet deep and could not be sampled prior to its being eliminated and because no temporary well could be installed due to solid granite gneiss, no groundwater samples were taken.

Sample 1 Hi was blue brown in color and contained a small amount of clay. Samples were taken by Larry Green, Jim Miller, Ron Miller and myself. See field sheets for log info.

1140 - Preparing to advance a borehole adjacent to the New River in an attempt to collect a temporary groundwater sample. Have advanced a borehole to 5 feet bls and no groundwater was encountered. Solid rock was encountered at this depth however and appears to preclude us from collecting any ~~quality~~ temporary groundwater samples. The individual wells, gas pipe, and are not in operation

1200 - Sample time - SE-SW-01 (grab background upstream sample was collected from a located at the Appalachian Electric Co. facility access bridge that crosses the New River. This is our matrix dup. for water. Samples were Jim Miller and Larry Green. See field sheets for log info.

pH 7.65 Temp 53.1°F

Cond - 54 Samples preserved

1210 - Sample time - SE-SD-01 - (grab background

12-11-90 E. A. Cook

Due to the fact that only one of the three industrial wells was in use and that it was over 1,000 feet downgradient, not be sampled prior to its being abandoned and the other two temporary wells could not be installed due to solid granite gneiss, no groundwater samples were taken.

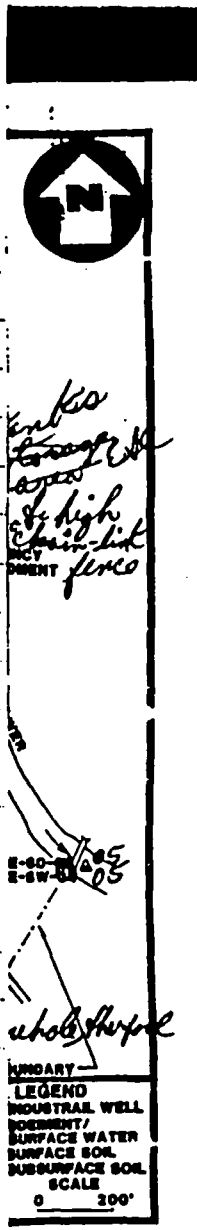


FIGURE 3

NUS CORPORATION

Sediment sample was collected from the same location as SL-01. Sediment was light brown in color & contained sand & some clay with trace amounts of organics were few. Mr. Miller & Larry Brien were field contacts for today.

The facility is cooling for Mr. Miller has several surface water discharges around the plant that are blow such as for non-contact cooling water and one for the plant sewage treatment operation for domestic sewage.

1300 - Beginning up to collect the onsite surface & subsurface soil sample from the drum

12-11-87 J. Clark

storage area located near the receiving dock for the facility.

1305 - 1310 Sample time - SL-55-02

A grab onsite surface soil sample was collected from the drum storage area located near the receiving dock for the facility. Drums are being stored laterally in two piles in a grassy area adjacent to the former etching building. Samples were for PCB's & Heavy Metals. Surface soil was light brown in color and contained various amounts of gravel & clay soil. See field sheets for details.

12-11-87 J. Clark

FIGURE 3

NUS CORPORATION

Due to the fact that only one of the three industrial wells was in use and that it was over 1,000 feet deep it could not be sampled prior to being abandoned and because not enough well could be installed due to solid granite gneiss no groundwater samples were obtained.

1310 Sample time - SC-SD-02, grab subsurface soil. Sample was collected from the same location as SC-02 but @ 4 feet b/s. Soil was dark brown in color & contained clay. Samples were for Mike Harry, Lewis, see field sheets for log info. There was only a small amount of drum debris seen on the surface of the ground. Sample was collected in the saprolite zone.

1320 - Beginning up to collect a surface water & sediment sample from a location on the New River West of the facility at a discharge point. Have located the discharge pipe w/ water pouring out of it and will collect a

12-11-90 E.A. Corbin

sample downstream of the outfall.

1325 Sample time - SC-SW-02 A grab downstream surface water sample was collected at a location below the plant on the New River at a point where a discharge from the plant enters the river. The water is very clear and appears to be non-contact discharge water. Samples are for Larry, Lewis & Jim Miller. See field sheets for log info. No readings on the instruments nearby. Temp. - 72.9°F pH - 8.94 Cond. - 990

1330 Sample time - SC-SD-02 A grab sediment sample was collected from the same location as SC-SW-02. Sediment

12-11-90 E.A. Corbin

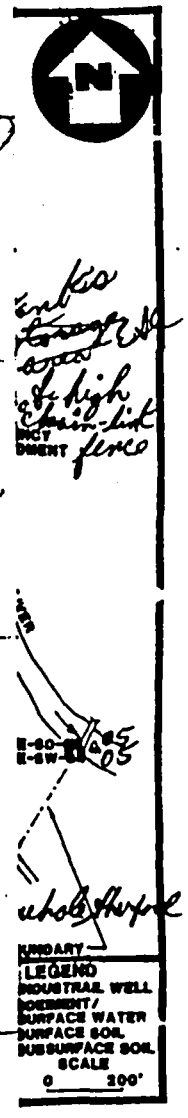


FIGURE 3

Due to the fact that only one of the three industrial wells was in use and that it was over 1,000 feet deep and could not be sampled prior to its being shipped and because no temporary well could be installed due to solid granite gneiss, no groundwater samples were taken.

NUS CORPORATION

were light brown in color & contained varying amounts of sand interspersed. Samples were Larry Brien & Jim Miller. See field sheets for logging. Discharge water is warm but clear w/ no apparent detectable odor.

Temp. 74 pH 7.1 C

Cond.

1350 Going up to collect surface & subsurface soil samples from an area downgradient of the Nitric acid & sulfuric acid ~~and~~ tanks.

1405 Sample time - SC-SS-03
A grab onsite surface soil sample was collected from a line downslope of the Nitric and sulfuric

12-11-90 E. J. Carli

acid tanks & locaded adjacent to the former storage building. There are two large HCl tanks, one nitric acid tank and two large sulfuric acid tanks here. Samples were J. Miller and Larry Brien. Soil sample was brown in color w/ some clay interspersed. See field sheets for logging. No reading recorded on the instrument.

1410 Sample time. SC-SW-03
A grab surface water sample was collected at a location due north of the facility on the New River adjacent to the plant side of the property. The sample was collected near the

12-11-90 E. J. Carli

FIGURE 3

NUS CORPORATION

Due to the fact that only one of the three industrial wells was in use and that it was over 1,000 feet deep, it could not be sampled prior to its being abandoned and because no temporary well could be installed due to solid granite gneiss, no groundwater samples were taken.

outfall from the sewage treatment plant. Samples were taken by Eric Carlin. See field sheets for log info. The water was clear. Ground the effluent was also clear. Temp. 57.4°F pH - 7.57 Cond. 578

1415 - Sample line - SC-SD-03 A grab sediment sample was collected from the same location as SC-SD-03. The sediment was light brown in color and high in organic content. Samples were taken by Eric Carlin & Jim Miller. See field sheets for log info.

12-11-90 E.A. Carlin

0700 Awake for breakfast. Weather forecast calls for clear skies w/ highs in the upper 50's to low 60's.

0845 Arrive at the facility & check in w/ Mickey Miller.

0900 Begin to set up staging area.

0950 ~~0945~~ Sample line - SC-SS-04 A grab surface soil sample was collected from an area located @ 20 feet downgrade of the nitric & sulfuric acid tanks. The surface soil was dark brown in color & was primarily comprised of residual surface soil & some humans. Some clay samples were taken by Eric Carlin & Jim Miller. See field sheets for log.

12-12-90 E.A. Carlin

FIGURE 3

NUS CORPORATION

Due to the fact that only one of the three industrial wells was in use and that it was over 1,000 feet downcourse, it could not be sampled prior to its being eliminated and because no temporary well could be installed due to solid granite gneiss, no groundwater samples were taken.

info.

1000 Sample time [illegible] 05 EC
[illegible]

1005 Sample time SC SD 05 EC
[illegible]

1015 From Jim Mc Calister
[illegible]

Due to the fact that only one of the three indicated wells was in use and that it was over 1,000 feet deep and could not be sampled prior to its being eliminated and because no temporary wells could be installed due to solid granite gneiss no groundwater samples were obtained.

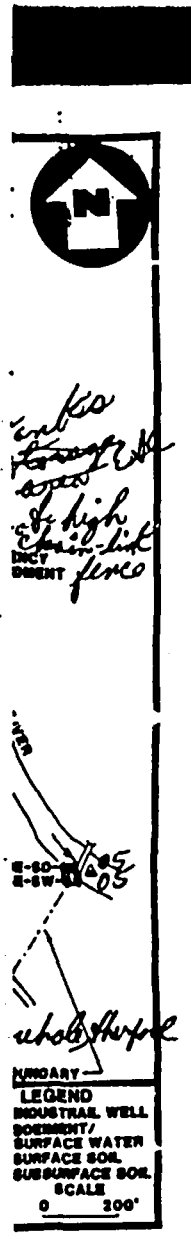


FIGURE 3

NUS CORPORATION

1030 Same time - SL SW-04
Light red-orange color
sample was collected
from the sediment
impoundment to the one
nearest to the factory.
The water is cloudy
clay-like particles
milky in appearance.
Samples were E. Cook
after Miller. Sediment
sample to be 9 oz and
N.S.C.S. Cont. 3.5
Temp. 47.2°F

1040 Sample time - 1 SW-04
Again sediment samples
were collected from the
same location as SL SW-04.
The sediment was brown
in color. Receipt
to Mr. Miller these
~~points contain aluminum~~
impoundments contain aluminum
hydroxide precipitates.
12-12-94 E. Cook

Similar page for Mr. Miller
& Eric Cook. See field
sheets for details.
Impoundments are currently
inactive

1130 - Took pictures & prepare
to leave facility
P.M. Mickey Miller signed
the receipt for samples
form and we leave
facility to ship samples.

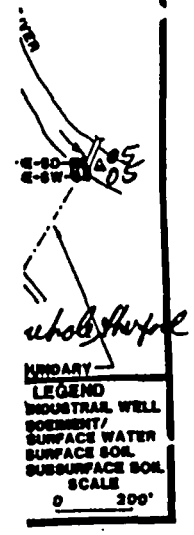


FIGURE 3

SPRAGUE

THOMAS M. ("MICKEY") MILLER
Safety/Environmental Engineer

ALUMINUM ELECTROLYTIC CAPACITOR DIVISION
SPRAGUE ELECTRIC COMPANY
Sprague Road
Box 1
Lansing, NC 28643-9503

Tel. 919/384-2551
FAX 919/384-3721

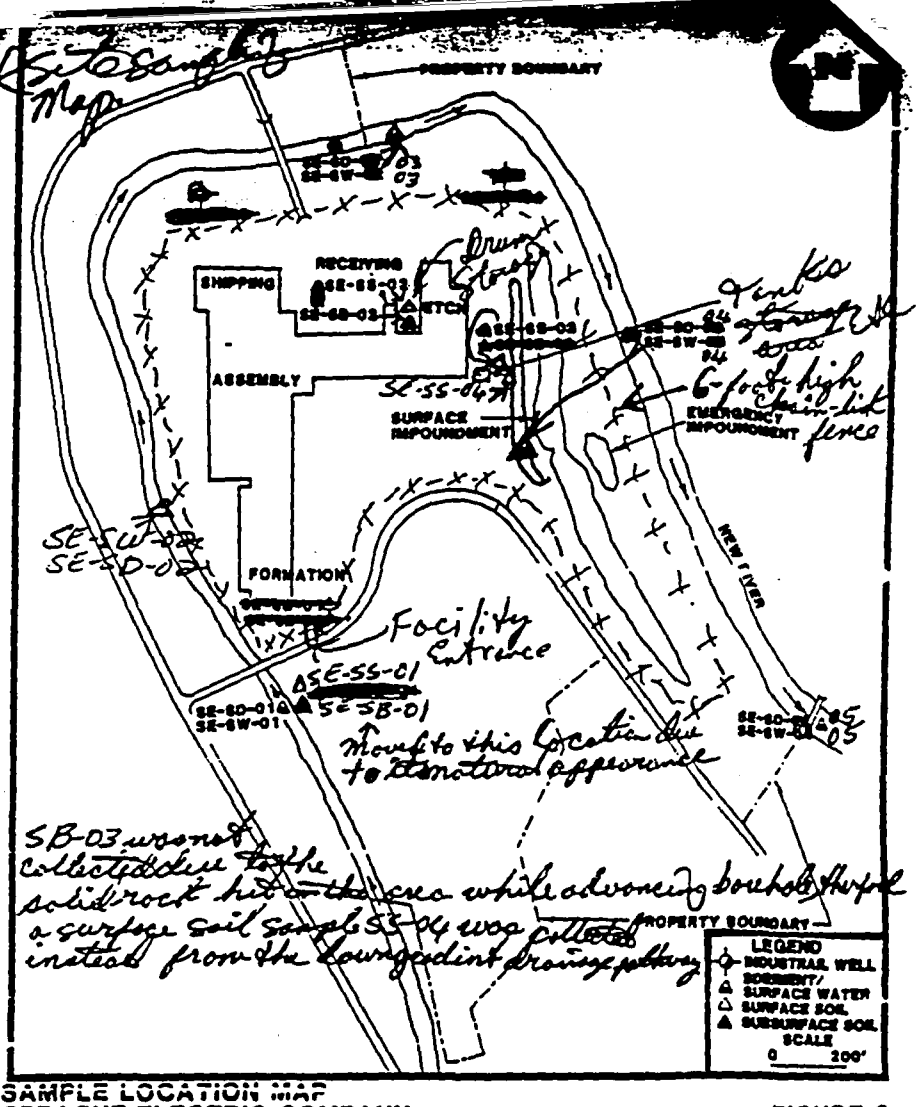
12-12-94 E. Cook

17

NUS CORPORATION

Due to the fact that only one of the three industrial wells was in use and that it was over 1,000 feet downround not be sampled prior to its being eliminated and because no temporary wells could be installed due to solid granite gneiss, no groundwater samples were taken.

Site Sample Map



SB-03 was not collected due to the solid rock hit in the area while advancing borehole. Instead a surface soil sample SS-04 was collected from the downgradient drainageway.

SAMPLE LOCATION MAP
SPRAGUE ELECTRIC COMPANY
LANSING, ASHE COUNTY, NORTH CAROLINA

FIGURE 3

NUS CORPORATION

Due to the fact that only one of the three industrial wells was in use and that it was over 1,000 feet deep and could not be sampled prior to its being changed out, and because not enough wells could be installed due to solid granite gneiss, no groundwater samples were taken.

of private wells and that we were needing information on the Lansing Water System. She stated that they only serve the area within the Lansing City Boundary with potable water. She stated that they have 65 customers and obtain all their water from two wells located within the Lansing City Boundary. She located the wells on our topographic map and traced the boundary on our topographic map as well. She stated that everyone outside the city bound are utilizing either wells or springs for their potable water needs.

155- Arrive at the Jefferson Town Hall in Jefferson, N.C. and speak with Meredith Ballew, Town Manager of Jefferson. Mr. Ballew

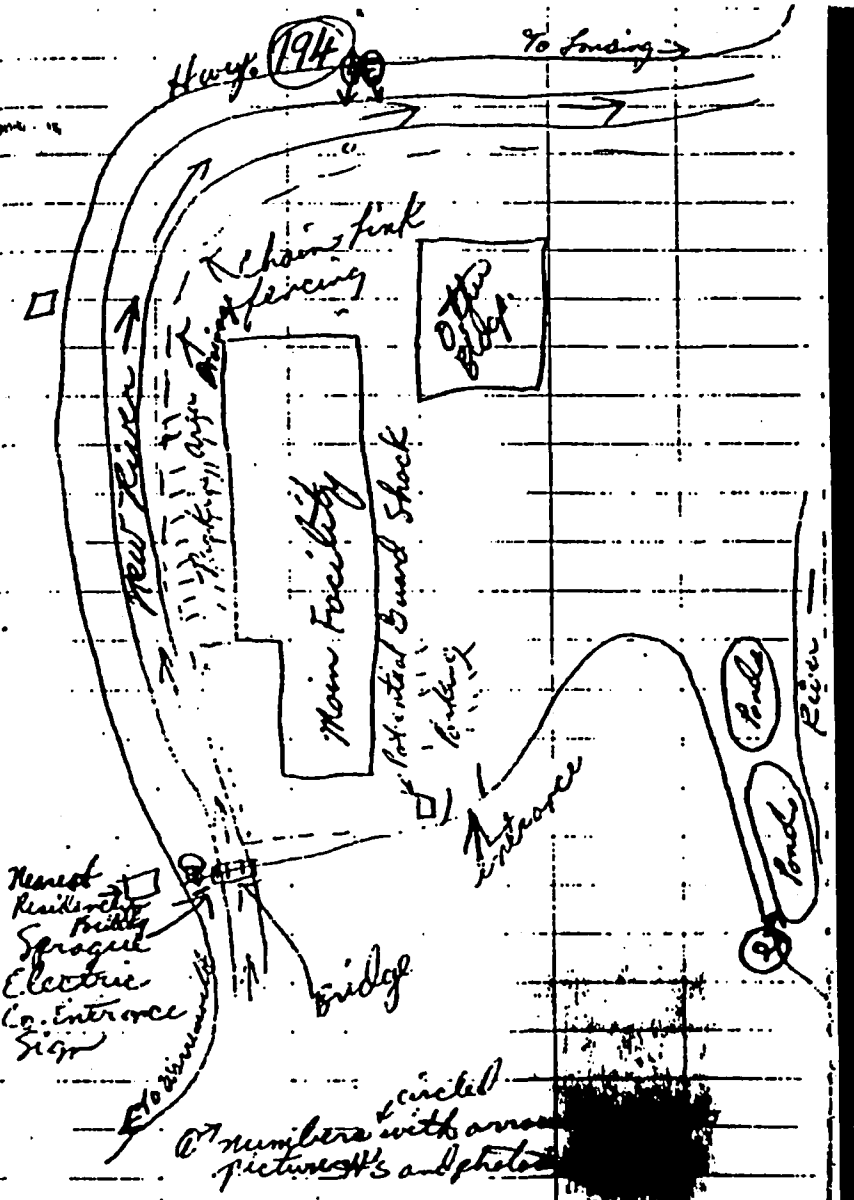
02/12/90 E.A. Corbin

is over the towns water system. I explained to Mr. Ballew that we were conducting a private well survey and that we needed information on the town water system in order to isolate areas served by wells or springs. He stated that they basically provide service to most all areas within the Jefferson City boundary. He stated that they serve about approximately 535 bills/month and obtain all of their water from seven (7) wells which he located for us on our topographical map. Only one of these wells fell within the four (4) mile radius, showing the water from all seven wells is piped prior to distribution. He [redacted] their line locat[redacted]

02/12/90 E.A. Corbin

topographical map. He stated that people not served by their municipal system rely on wells or springs to supply their municipal potable water needs.

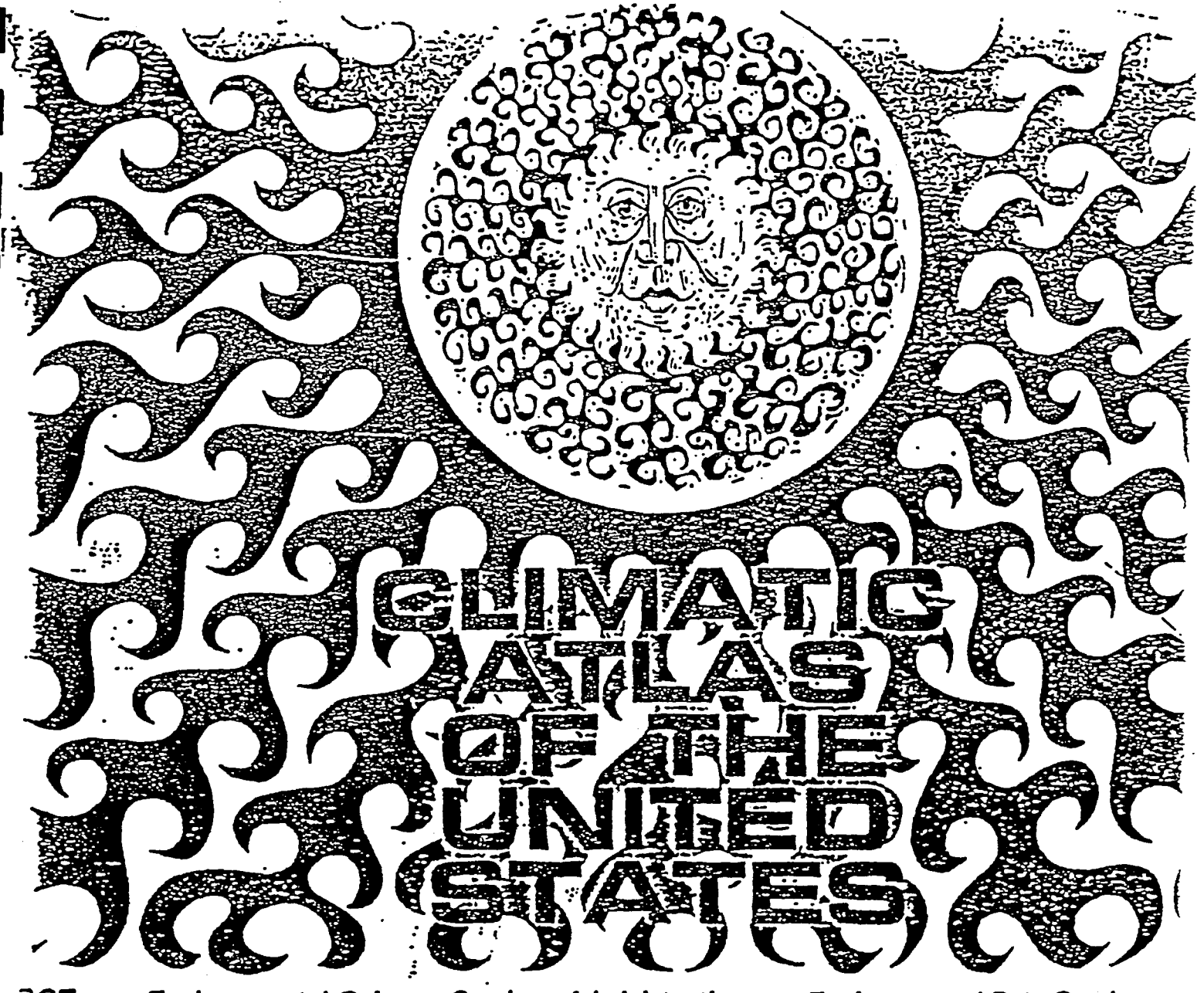
02/12/90 E. J. Carbin



02/12/90 E. J. Carbin

PARK, N.C.–VA.
N3630—W8130/7.5
1959
PHOTOREVISED 1978
DMA 4657 II SE-SERIES V842
GRASSY CREEK, N.C.–VA.
SW/4 MOUTH OF WISON 15' QUADRANGLE
N3630—W8122.5/7.5
PHOTOREVISED 1978
AMS 4757 III SE-SERIES V842
4-MILE RADIUS
3-MILE RADIUS
2-MILE RADIUS
1-MILE RADIUS
½-MILE RADIUS
¼-MILE RADIUS
SPRAGUE ELECTRIC COMPANY
Lansing
Jefferson
Smethport
Warrensville
Clifton
Dresden
Comet
Brandon
Tuckerdale
PINEY CREEK
CLIFTON
WEST JEFFERSON
PHOENIX MOUNTAIN
WALNUT
THREE TOP MOUNTAIN
FLAT TOP RIDGE
Zach Ridge
SCALE 1:24 000
1 MILE
7000 FEET
1 KILOMETER
LEGEND
LANSING WATER SYSTEM
JEFFERSON WATER SYSTEM
WARRENSVILLE, N. C.
N3622.5—W8130/7.5
1966
AMS 4656 I NE—SERIES V842
JEFFERSON, N. C.
N3622.5—W8122.5/7.5
1966
AMS 4756 IV NW—SERIES V842

REFERENCE 14



RCE • Environmental Science Services Administration • Environmental Data Service

U.S. DEPARTMENT OF COMMI
C. R. Smith, Secretary

ENVIRONMENTAL SCIENCE SERVICES ADMIT
Robert M. White, Administrator

ENVIRONMENTAL DATA SERVICE
Woodrow C. Jacobs, Director

JUNE 1968

REPRINTED BY THE
NATIONAL OCEANIC AND ATMOSPHERIC ADM
1983

.AKE EVAPORATION

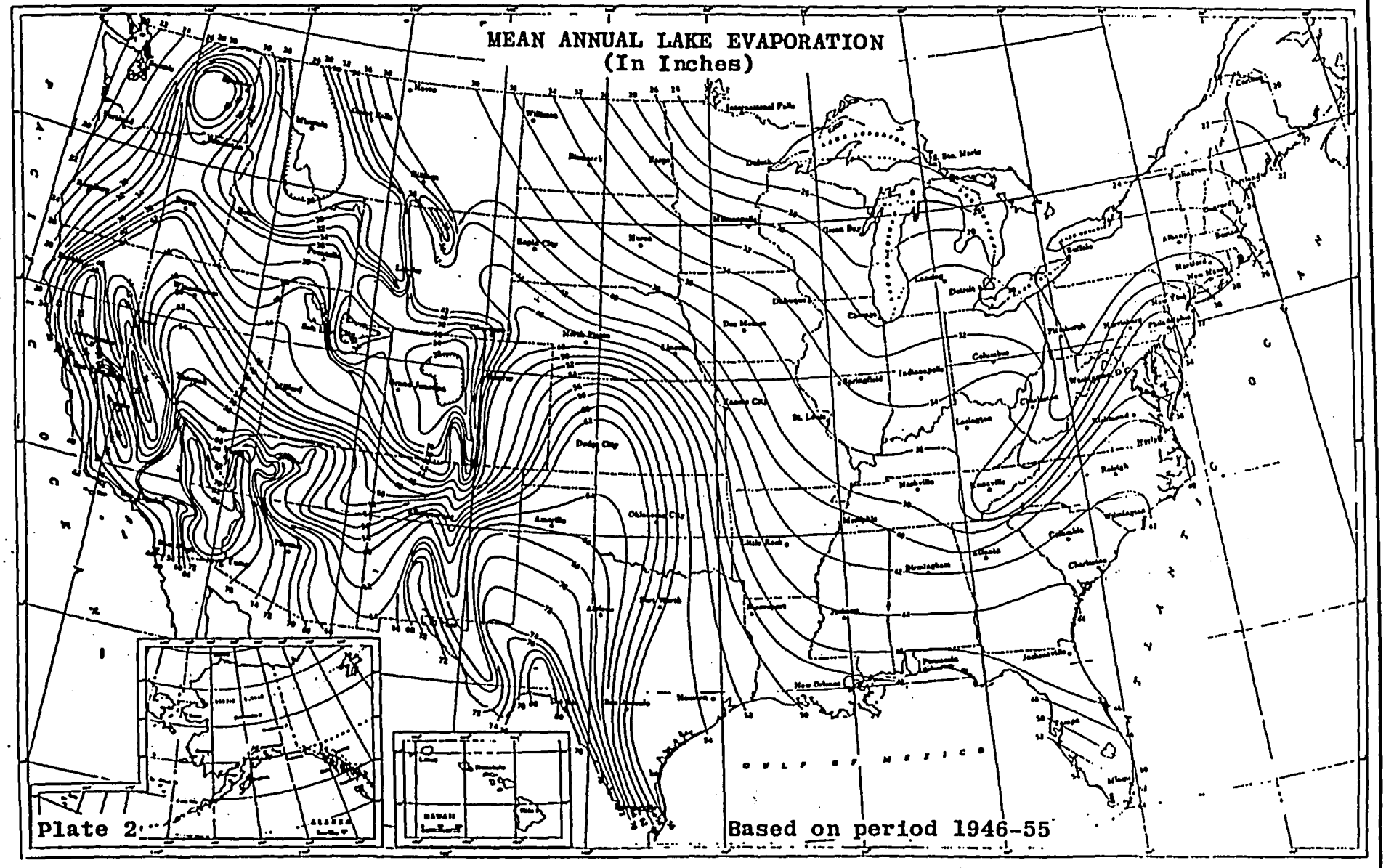
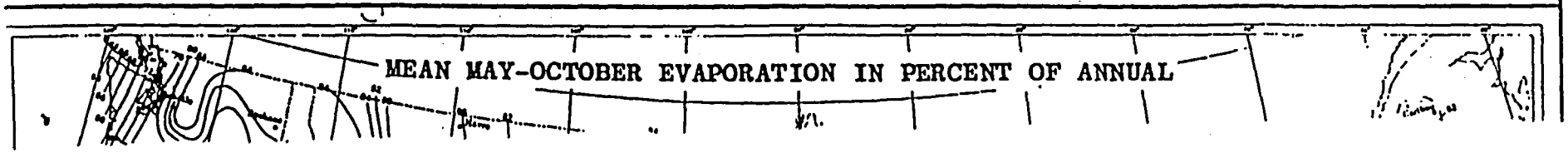
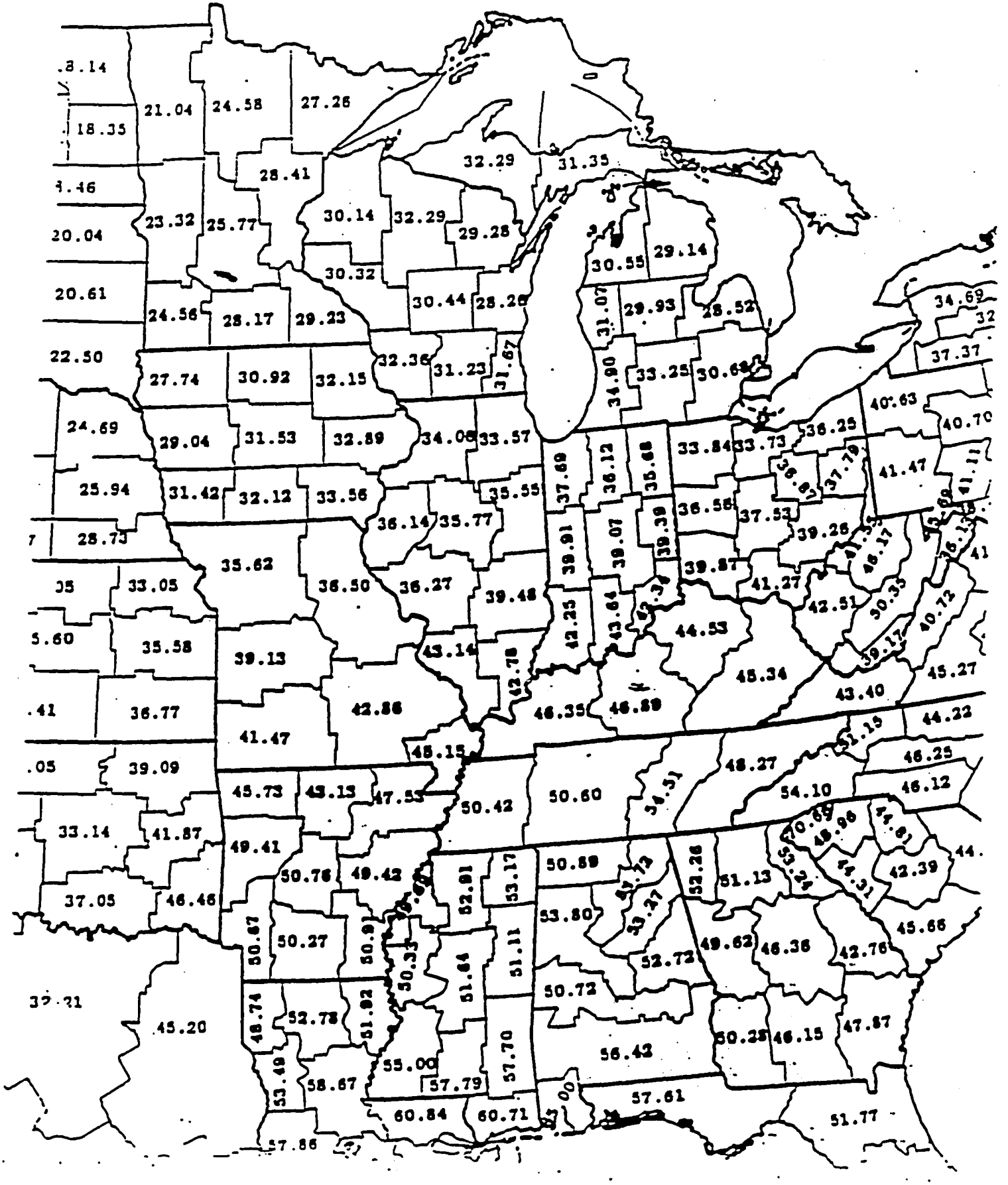
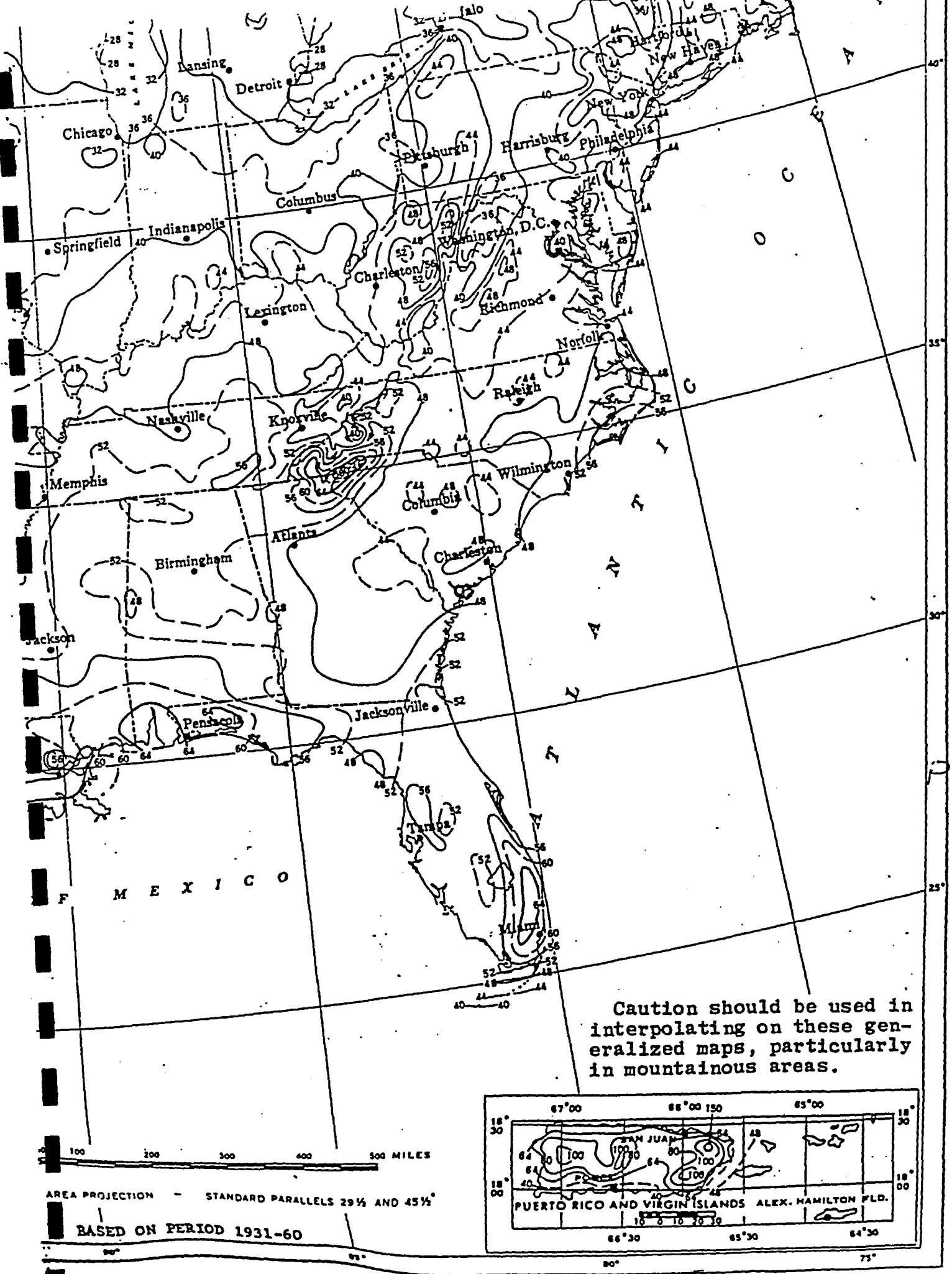


Plate 2




21.04
24.58
27.26
18.35
28.41
32.29
31.35
23.32
25.77
30.14
32.29
29.28
20.04
30.55
29.14
30.32
20.61
24.56
28.17
29.23
30.44
28.26
31.07
29.93
28.52
34.69
22.50
27.74
30.92
32.15
32.36
31.23
31.67
34.90
33.25
30.68
37.37
24.69
29.04
31.53
32.89
34.06
33.57
40.63
40.70
25.94
31.42
32.12
33.56
35.55
37.69
36.12
35.68
33.84
33.73
36.25
41.47
36.14
35.77
36.58
37.53
39.28
28.73
35.62
39.91
39.07
39.30
39.87
41.27
42.51
33.05
36.50
36.27
39.48
42.25
43.64
44.53
35.58
39.13
43.14
42.78
45.34
43.40
45.27
36.77
42.86
46.35
46.89
44.22
41.47
45.15
39.09
48.27
46.25
45.73
43.13
47.53
50.42
50.60
54.10
46.12
33.14
41.87
49.41
50.89
52.26
51.13
42.39
37.05
46.46
50.76
49.42
52.81
53.17
53.80
45.66
50.67
50.27
50.91
51.11
49.62
46.36
42.76
52.72
50.72
45.20
48.74
52.78
51.82
57.70
56.42
50.28
46.15
47.87
53.40
58.67
55.00
57.79
57.61
60.84
60.71
51.77
57.86



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

DEPARTMENT OF COMMERCE
[illegible] H. Hodges, Secretary

WEATHER BUREAU
F. W. Reichelderfer, Chief

REFERENCE 15

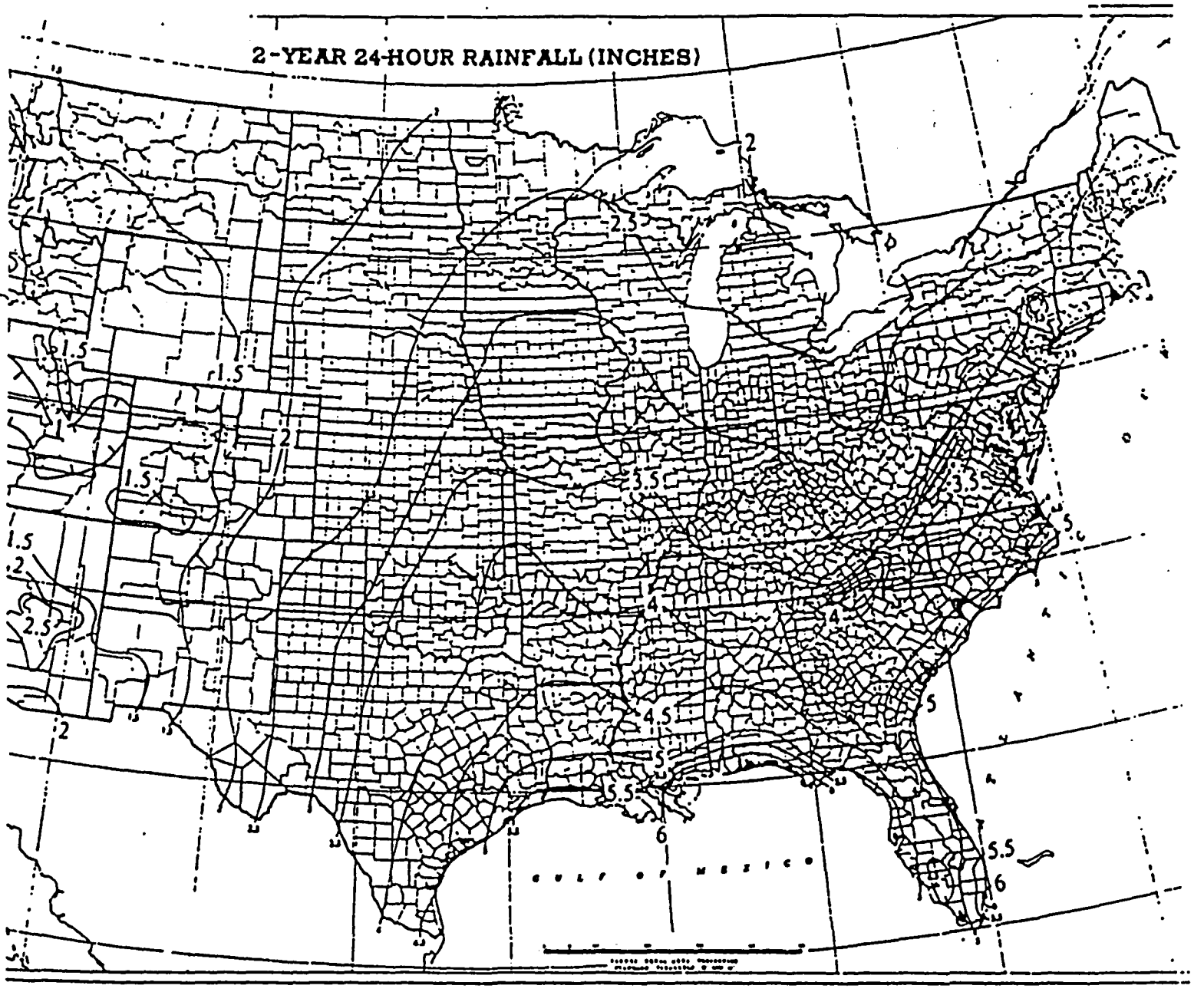
TECHNICAL PAPER NO. 40

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

PROPERTY OF EPA
FIT IV


2-YEAR 24-HOUR RAINFALL (INCHES)
2
2.5
3
1.5
1.5
2
1.5
3.5
3.5
5
1.5
2
2.5
4
4
2
4.5
5
5
5.5
6
5.5
6
GULF OF MEXICO

REFERENCE 16

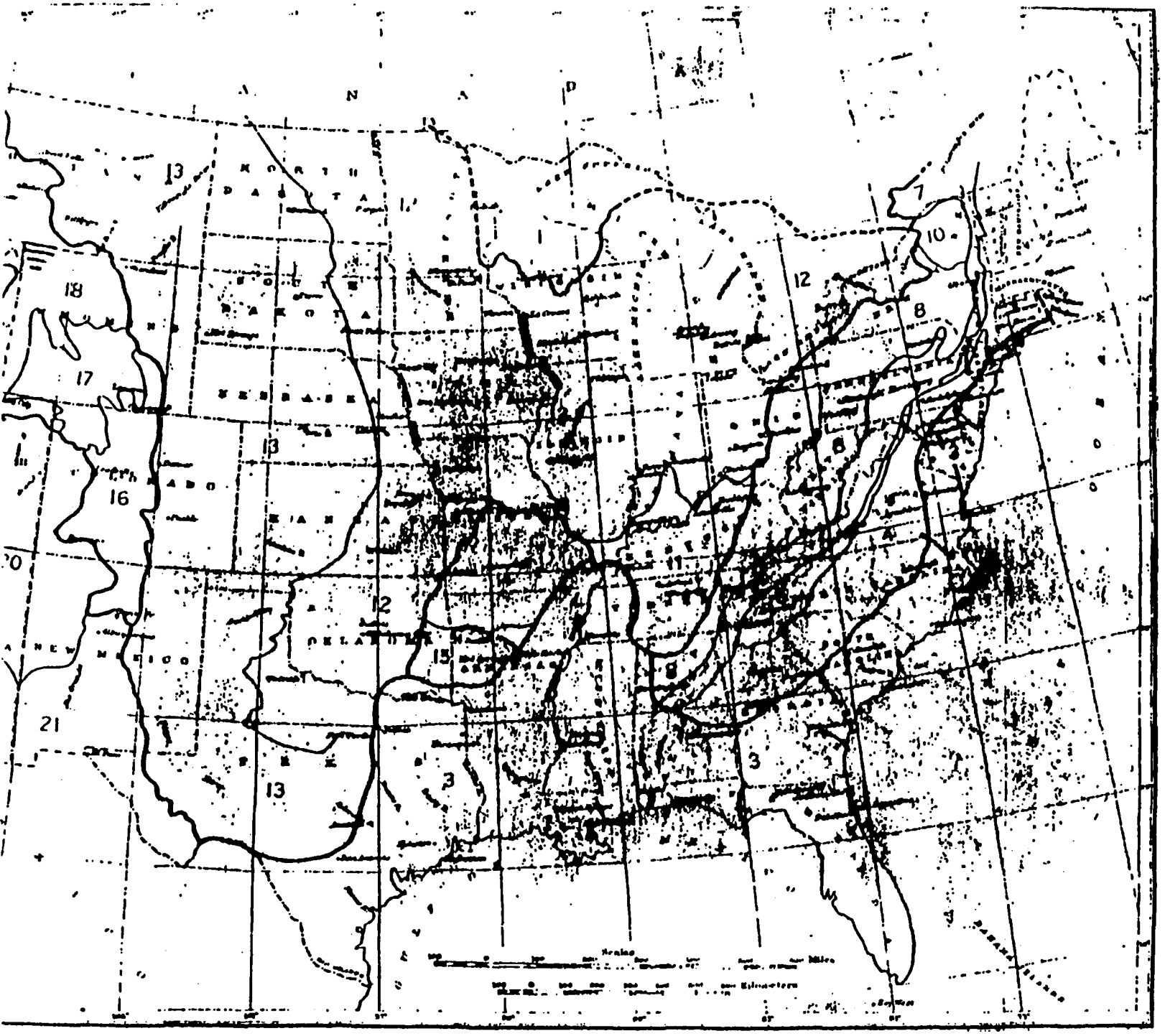
The Occurrence of Ground Water in the United States

With a Discussion of Principles

By OSCAR EDWARD MEINZER

GEOLOGICAL WATER-SUPPLY PAPER 489

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1923



PHYSIOGRAPHIC DIVISIONS

MAJOR DIVISION	PROVINCE
Laurentian Upland	1. Superior Upland
Atlantic Plain	2. Continental Shelf (submerged)
	3. Atlantic Coastal Plain
Appalachian Highlands	4. Piedmont province
	5. Blue Ridge province
	6. Appalachian Valley province
	7. St. Lawrence Valley
	8. Appalachian Plateau
	9. New England province
	10. Adirondack province
Interior Plains	11. Interior Low Plateau
	12. Central Lowland
	13. Great Plains
Interior Highlands	14. Ozark Plateaus
	15. Ouachita province
Rocky Mountain region	16. Southern Rocky Mountains
	17. Wyoming Basin
	18. Northern Rocky Mountains
Intermontane Plateaus	19. Columbia Plateau
	20. Colorado Plateau
	21. Basin and Range province
Pacific Mountain region	22. Sierra Nevada and Cascade Mountains
	23. Pacific Border province
	24. Lower California province

STATES SHOWING MAJOR PHYSIOGRAPHIC DIVISIONS AND PHYSIOGRAPHIC PROVINCES

on map prepared by a committee of the Association of American Geographers, N. M. Fenneman, chairman

REFERENCE 17

EPA-600/2-87-035
April 1987

DRASTIC: A Standardized System for Evaluating Ground Water Pollution Potential Using Hydrogeologic Settings

by

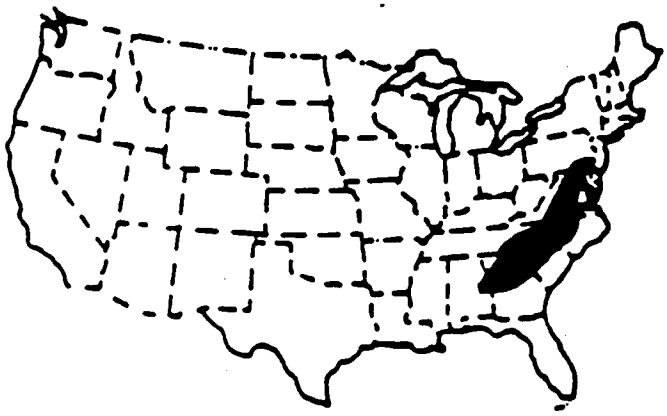
Linda Aller
Truman Bennett
Jay H. Lehr
Rebecca J. Petty
and
Glen Hackett
National Water Well Association
Dublin, Ohio 43017

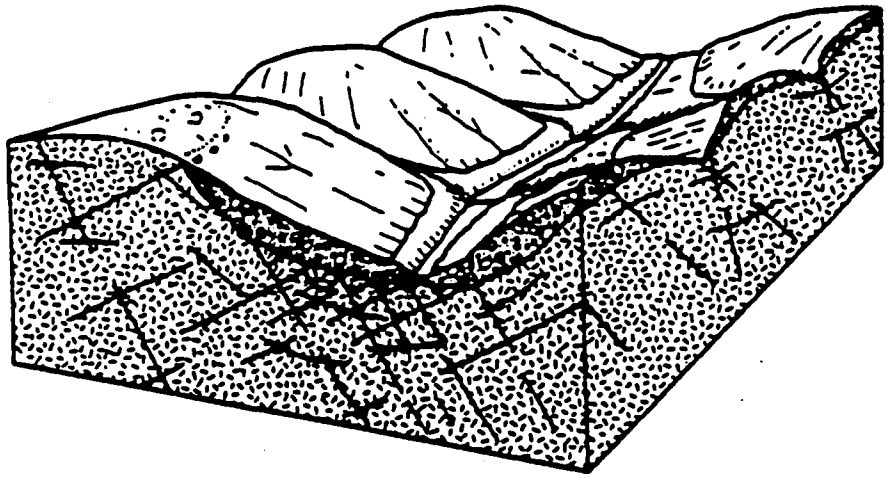
Cooperative Agreement CX-810715-01

Project Officer
Jerry Thornhill
Applications and Assistance Branch
Robert S. Kerr Environmental Research Laboratory
Ada, Oklahoma 74820

ROBERT S. KERR ENVIRONMENTAL RESEARCH LABORATORY
OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
ADA, OKLAHOMA 74820

8. PIEDMONT BLUE RIDGE GROUND-WATER REGION





8A	Mountain Slopes
8B	Alluvial Mountain Valleys
8C	Mountain Flanks
8D	Regolith
8E	River Alluvium
8F	Mountain Crests
8G	Swamp/Marsh

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 km2 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 trending 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). 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. 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 availble drawdown.

REFERENCE 18

NUS CORPORATION AND SUBSI

LECON NOTE

CONTROL NO.	DATE: March 12, 1990	TIME: 1530

DISTRIBUTION: Warrensville, Ashe County, North Carolina

BETWEEN: Mrs. Ray Taylor	OF: Taylor Well Drilling	PHONE: (919) 246-6431

AND: Brant McCanless, NUS Corporation

Brant McCanless

DISCUSSION:

Mrs. Taylor told me the well logs of two wells:

1st well: 130 feet deep, casing to rock at 27 feet
10gpm, water at 50 feet below land surface
0-3 feet topsoil
3-27 feet residual soil, gravel
27-130 feet blue and white grantie

2nd well: 80 feet deep, casing to rock at 36 feet
75gpm, water at 70 and 75 feet below land surface
0-3 feet topsoil
3-36 feet residual soil, gravel
36-80 feet blue and white granite

REFERENCE 19

GROUND-WATER SUPPLY POTENTIAL
AND
PROCEDURES FOR WELL-SITE SELECTION
UPPER CAPE FEAR RIVER BASIN

CAPE FEAR RIVER BASIN STUDY

Sponsored by

North Carolina Department of Natural
Resources and Community Development
and
U. S. Water Resources Council

1155 Archdale Building
P. O. Box 27687
Raleigh, NC 27611

(919) 733-4064

October, 1983

PREFACE

This report was prepared by Charles C. Daniel, III and N. Bonar Sharpless of the U.S. Geological Survey, North Carolina District Office, Raleigh, N.C., for the Cape Fear River Basin Study.

noted southeast of the Greensboro-High Point Regional Airport, and spacings of 3 to 6 inches are common. On the other hand, schists and gneisses containing an abundance of flexible sheetlike minerals such as mica and chlorite, which deform by gliding and bending, are subject to plastic deformation and may exhibit little fracturing.

An example of the influence of plastic deformation on well yields is found in the numerous metamorphosed basaltic dikes that occur throughout the upper Cape Fear River basin. The younger basaltic dikes in the area have not been metamorphosed to any great extent, are brittle, and many exhibit open fractures. The older metamorphosed dikes, however, contain the minerals chlorite and serpentine, which are soft and flexible, and although the dikes show evidence of intense deformation they usually contain very few open fractures, and wells drilled into these dikes produce little water.

Differences in fracturing can also be related to tectonic history. The granitic rocks in the upper Cape Fear River basin provide an excellent example of rocks having similar compositions that are apparently of different ages and tectonic histories. Mundorff (1948) subdivided the granitic rocks (fig. 2) into porphyritic granite and sheared granite. The porphyritic granite is massive and contains few fractures. The sheared granite locally shows evidence of having been subjected to great tectonic stresses and exhibits varying degrees of gneissic foliation and fracturing. The porphyritic granite is apparently younger than the sheared granite and was emplaced after the last major episode of deformation that caused the fracturing of the sheared granite.

The influence of rock type and tectonic history on fracture formation and its relation to well yields will be discussed in a later section of this report.

GEOHYDROLOGY

The principal components of the ground-water system in the study area are illustrated schematically in figure 3. The regolith consists of an unconsolidated or semiconsolidated mixture of clay and fragmental material ranging in size from silt and sand to boulders. The porosity of the regolith is on the order of 35 to 55 percent near land surface but decreases with depth as the degree of weathering decreases. Because of its high porosity, the regolith acts as a reservoir which slowly feeds water downward into the bedrock. The consolidated bedrock contains very little intergranular pore space. Rather, the water within the bedrock is contained primarily in planar secondary openings developed as a result of fracturing. Secondary porosity ranges from 1 to 10 percent in fractured crystalline rock (Freeze and Cherry, 1979, table 2.4). Porosities of 10 percent are atypical, whereas values of 1 to 3 percent are much more representative of the North Carolina Piedmont.

As a general rule, very few open fractures occur in bedrock of the Piedmont at depths greater than 400 feet (LeGrand, 1967). At greater depths, the pressure of the overlying material, or lithostatic pressure, holds these fractures closed and the porosity can be less than 1 percent. Fractures are most numerous and have the largest openings near the top of the bedrock. These fractures are the openings along which water can move.

The implications for the drilling of wells is obvious. The chances of penetrating open fractures and obtaining water (or additional water) at depths below 400 feet is low. In fact, 85 percent of the total possible yield from the average well is already obtained at a depth of 200 feet; the average yield increases only 5 percent by drilling to 300 feet (LeGrand, 1967). From the standpoint of ground-water production, two 200-foot deep wells are more effective, on

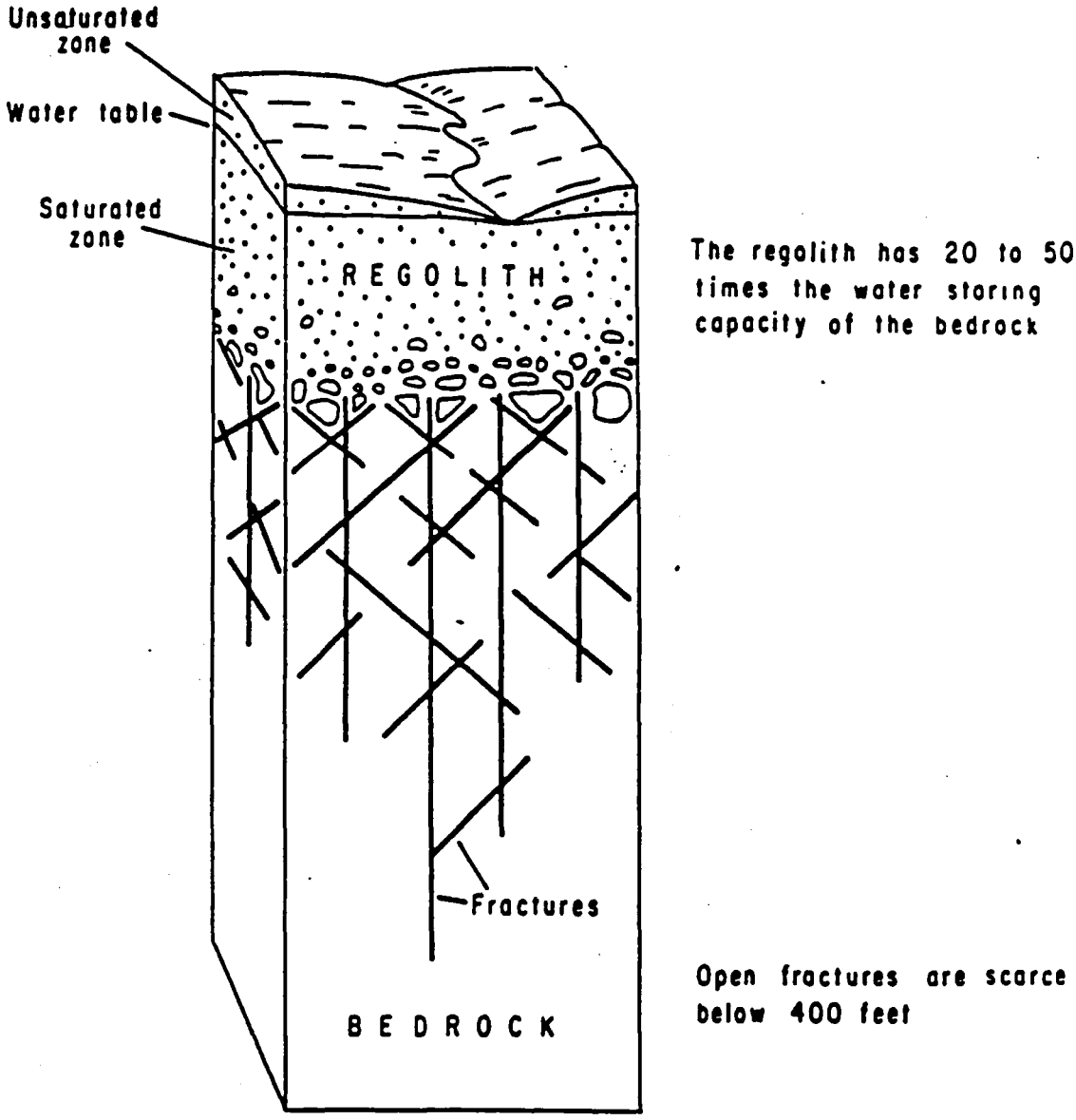


Figure 3.--Principal components of the ground-water system in the Piedmont and Blue Ridge provinces in North Carolina (modified from Heath, 1978).

average, than one 400-foot well. In addition, bedrock wells in areas mantled by thick regolith will generally have greater sustained yields than wells where the regolith is thin or absent.

A conceptual view of the saturated zone, the water table, and directions of ground-water flow for a typical area in the Piedmont and Blue Ridge provinces of North Carolina is shown in figure 4. Under natural conditions, ground water in the bedrock fractures and intergranular pore spaces of the regolith is derived from infiltration of precipitation. As shown, water enters the ground-water system in the recharge areas, which generally include all the land surface above the lower parts of stream valleys. Following infiltration, the water slowly moves downward through the unsaturated zone to the water table, which is the top of the saturated zone. Water moves laterally through the saturated zone, discharging as seepage springs on steep slopes and as bank and channel seepage into streams, lakes, or swamps.

The depth to the water table varies from place to place and from time to time depending on the topography, climate, and properties of the water-bearing materials. However, the climate throughout the upper Cape Fear River basin is relatively uniform and the water-bearing properties of the different bedrock lithologies and regoliths are similar. Therefore, topography probably has the greatest influence on the depth to the water table in a specific area.

In stream valleys and areas adjacent to ponds and lakes, the water table may be at or very near land surface. On the upland flats and broad interstream divides, the water table generally ranges from a few feet to a few tens of feet beneath the surface, but on hills and rugged ridge lines, the water table may be at considerably greater depths. The depth to the water table and its relation to the saturated thickness of the regolith is an important consideration in selecting sites for wells. The significance of this consideration will be discussed later in the section on site selection criteria.

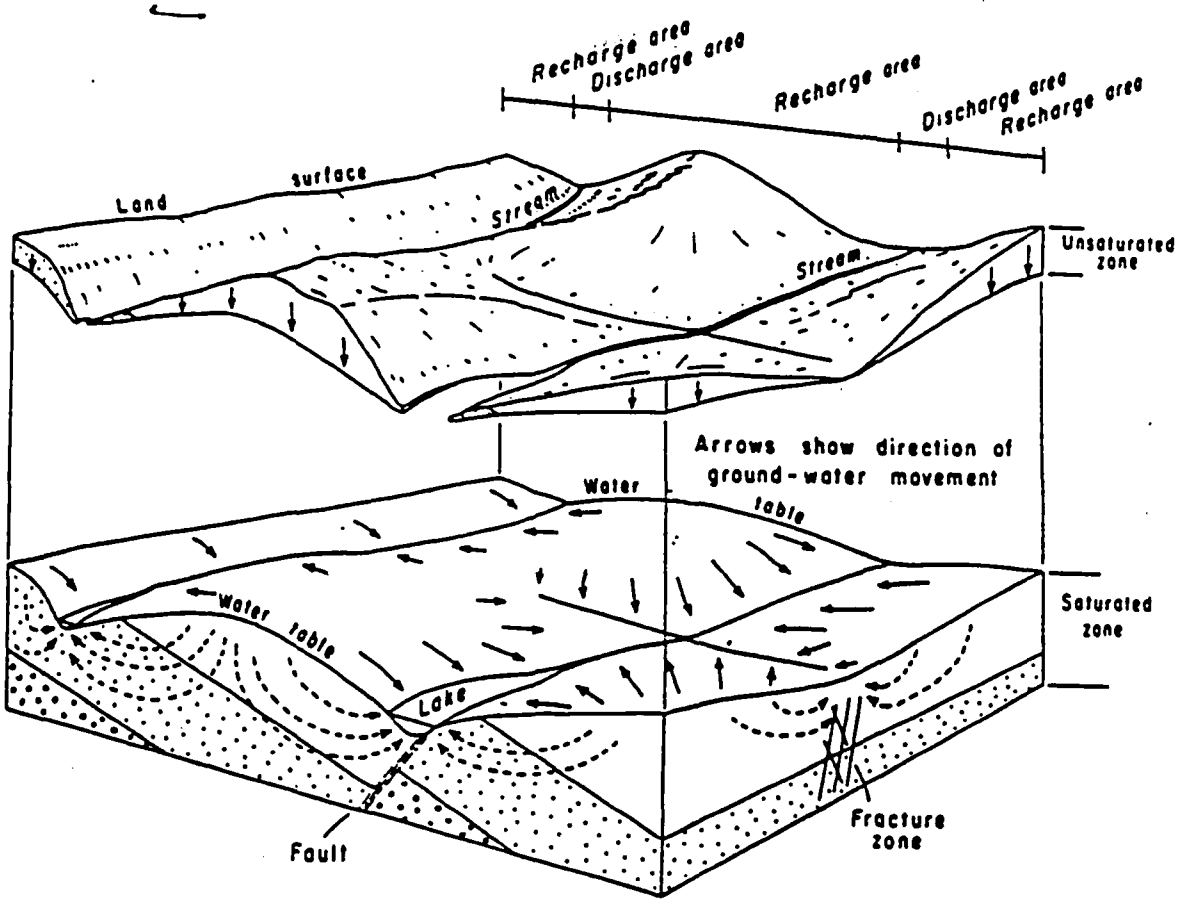


Figure 4.--Conceptual view of the unsaturated zone (lifted up), the water-table surface, and the direction of ground-water flow for a typical area in the Piedmont and Blue Ridge provinces of North Carolina.

REFERENCE 20

R. Allan Freeze

Department of Geological Sciences
University of British Columbia
Vancouver, British Columbia

John A. Cherry

Department of Earth Sciences
University of Waterloo
Waterloo, Ontario

GROUNDWATER

Prentice-Hall, Inc.
Englewood Cliffs, New Jersey 07632

Table 2.2 Range of Values of Hydraulic Conductivity and Permeability

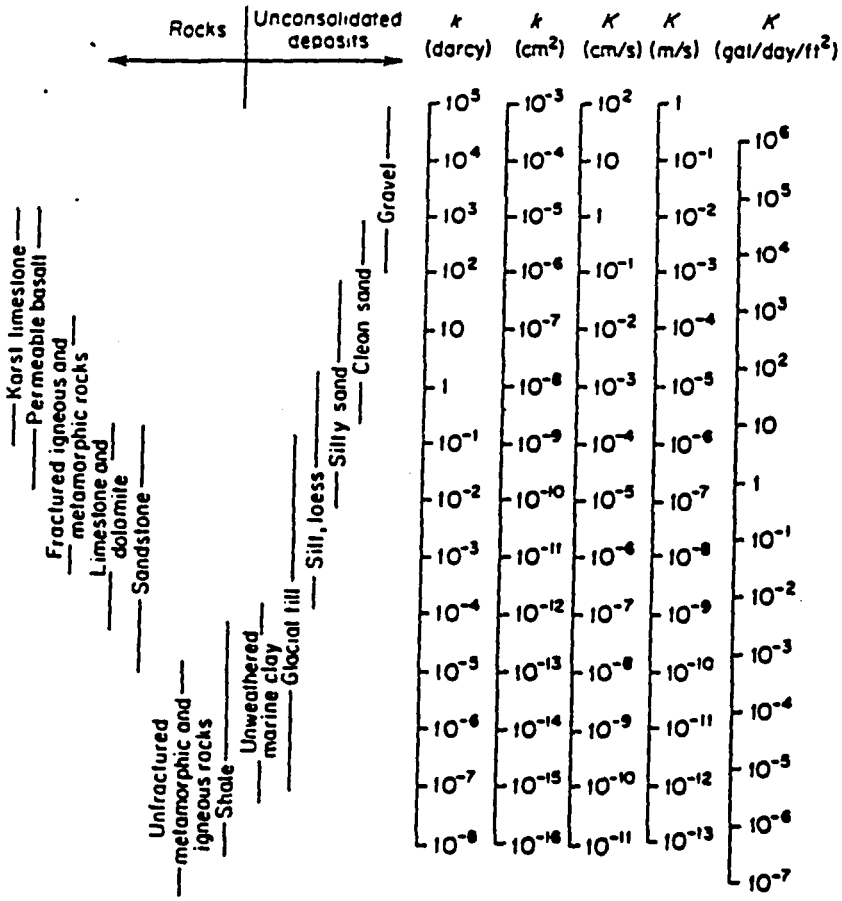


Table 2.3 Conversion Factors for Permeability and Hydraulic Conductivity Units

	Permeability, k*			Hydraulic conductivity, K		
	cm²	ft²	darcy	m/s	ft/s	U.S. gal/day/ft²
cm²	1	1.08×10^{-3}	1.01×10^{8}	9.80×10^{2}	3.22×10^{3}	1.85×10^{9}
ft²	9.29×10^{2}	1	9.42×10^{10}	9.11×10^{5}	2.99×10^{6}	1.71×10^{12}
darcy	9.87×10^{-9}	1.06×10^{-11}	1	9.66×10^{-6}	3.17×10^{-5}	1.82×10^{1}
m/s	1.02×10^{-3}	1.10×10^{-6}	1.04×10^{5}	1	3.28	2.12×10^{6}
ft/s	3.11×10^{-4}	3.35×10^{-7}	3.15×10^{4}	3.05×10^{-1}	1	6.46×10^{5}
U.S. gal/day/ft²	5.42×10^{-10}	5.83×10^{-13}	5.49×10^{-2}	4.72×10^{-7}	1.55×10^{-6}	1

*To obtain k in ft², multiply k in cm² by 1.08×10^{-3}.

REFERENCE 21

Rite in the Rain®

ALL-WEATHER

LEVEL

Notebook No. 311

FY-1998

Sprague Electric Company
TDD# FY-~~8907-34~~ 9001-132
Fanning, Ashe County, North Carolina
Eric Corbin - Project Manager
EPA ID No. NCD003167780

LOGBOOK REQUIREMENTS
REVISED - NOVEMBER 29, 1988

NOTE: ALL LANGUAGE SHOULD BE FACTUAL AND OBJECTIVE

1. Record on front cover of the Logbook: TDO No., Site Name, Site Location, Project Manager.
2. All entries are made using ink. Draw a single line through errors. Initial and date corrections.
3. Statement of Work Plan, Study Plan, and Safety Plan discussion and distribution to field team with team members' signatures
4. Record weather conditions and general site information
5. Sign and date each page. Project Manager is to review and sign off on each logbook daily
6. Document all calibration and pre-operational checks of equipment. Provide serial numbers of equipment used onsite
7. Provide reference to Sampling Field Sheets for detailed sampling information.
8. Describe sampling locations in detail and document all changes from project planning documents.
9. Provide a site sketch with sample locations and photo locations.
10. Maintain photo log by completing the stamped information at the end of the logbook.
11. If no site representative is on hand to accept the receipt for samples, an entry to that effect must be placed in the logbook.
12. Record I.D. numbers of COC and receipt for sample forms used. Also record numbers of destroyed documents.
13. Complete SMO information in the space provided.

All entries in this logbook will be made by myself, Eric Corbin - Project Manager. Each page will be signed and dated. Any and all corrections will be properly initialed (E.A.C.)

Signature: Eric A. Corbin

All notes and observations made during this Phase I, SSI Inspection will be documented in this logbook.

This logbook is an extension of work plan # OD# F4-9001-132

02/12/90 E. A. Corbin

The following NUS personnel herein listed have read and understand the following NUS/EPA document listed.

Work Plan - TDD# F4-9001-132

As our confirmation of having read and having understood the above listed document, we the undersigned place our signatures.

Eric Corbin - Eric S. Corbin
Brant McCanless - Brant McCanless

02/12/90 E.S. Corbin

0800 Left Franklin, N.C. for the Asheville Regional Airport to pick up Brant McCanless.

0930 Met Brant McCanless at Asheville Regional Airport

1000 Leave Asheville, N.C. for Lansing, N.C. Weather forecast for today's weather calls for clear and cool weather with highs in the mid- to upper 50's

1200 Broke for lunch

1400 Arrive at Sprague Electric Company facility in Lansing, N.C. The facility is situated adjacent to the North Fork of the New River approximately 20 miles south of [illegible] N.C. on highway [illegible]

02/12/90 E.S. Corbin

facility is located in a rural, somewhat unpopulated portion of Ashe County. The facility is currently inactive and still known as Sprague Electric Company. The facility is fenced with a chain link fence which appeared to circumvent the facility. Entrance gates exist which can allow or restrict access to the facility by the use of gates. There is one main facility and a few smaller buildings adjacent to the large building. One east of the main building there exists several large concrete forms, purpose unknown. Drainage from the property would most likely enter the New River adjacent to the facility. The nearest identified homes to the facility are located [redacted] the New River and

02/12/90 E. L. Cobb

highway 194 west of the facility. No schools or day-care centers could be identified within a one mile radius of the facility. Pictures were taken of the facility area. No evidence of spills or waste disposal could be seen on-site from our view-point, however the entire facility could not be well ~~yes~~ viewed from our vantage point.

14:0 Arrive at the Jefferson, N.C. Town Hall. ~~Met with~~ Jane Powers (Mayor of Jefferson, N.C.) I told Mrs. Powers ~~that~~ we were conduct[redacted]ing

02/12/90 E. L. Cobb

Table 6. Household, Family, and Group Quarters Characteristics: 1990

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

State County Place and [In Selected States] County Subdivision	Persons in households	All households	Family households: Total	Family households: Married-couple family	Family households: Female householder, no husband present	Nonfamily households: Total	Nonfamily households: Householder living alone: Total	Nonfamily households: Householder living alone: 65 years and over: Total	Nonfamily households: Householder living alone: 65 years and over: Female	Persons per— Household	Persons per— Family	Persons in group quarters: Total	Persons in group quarters: Institutionalized persons	Persons in group quarters: Other persons in group quarters
The State	6 404 167	2 517 026	1 812 053	1 424 206	309 878	704 973	506 959	226 384	182 329	2.54	3.03	224 470	83 400	141 070
COUNTY														
Alamance County	105 327	42 652	30 745	24 295	5 130	11 907	10 467	4 508	3 748	2.47	2.94	2 886	1 173	1 713
Alexander County	27 245	10 331	8 049	6 715	952	2 282	2 022	839	651	2.64	3.02	299	299	-
Alleghany County	9 381	3 894	2 829	2 421	303	1 065	990	539	433	2.41	2.88	209	193	16
Anson County	23 117	8 531	6 359	4 552	1 475	2 172	2 042	1 075	860	2.71	3.23	357	344	13
Ashe County	21 965	8 848	6 748	5 843	816	2 100	1 935	1 014	809	2.48	2.89	244	220	24
Avery County	13 918	5 520	4 162	3 500	480	1 358	1 229	549	420	2.52	2.95	949	320	629
Beaufort County	41 704	16 157	11 840	9 140	2 186	4 317	3 915	1 974	1 605	2.58	3.07	579	441	138
Bertie County	20 321	7 412	5 501	3 831	1 419	1 911	1 797	957	755	2.74	3.28	67	67	-
Bladen County	28 150	10 760	8 017	5 854	1 762	2 743	2 579	1 243	1 000	2.62	3.11	513	509	4
Brunswick County	50 407	20 069	15 291	12 636	2 031	4 778	4 227	1 640	1 194	2.52	2.91	488	307	181
Buncombe County	169 713	70 802	49 335	39 637	7 684	21 467	18 868	8 174	6 642	2.40	2.90	5 108	2 966	2 142
Burke County	73 281	29 184	21 711	17 462	3 148	7 473	6 589	2 706	2 228	2.51	2.93	2 463	2 410	53
Cabarrus County	97 255	37 515	28 367	23 279	3 972	9 148	8 038	3 509	2 971	2.59	3.02	1 680	1 223	457
Caldwell County	69 917	27 172	20 656	16 653	2 944	6 516	5 660	2 287	1 846	2.57	2.97	792	735	57
Camden County	5 875	2 180	1 602	1 385	225	488	437	234	169	2.69	3.11	29	-	29
Carteret County	51 554	21 238	15 276	12 681	2 021	5 962	5 061	1 901	1 431	2.43	2.88	1 002	750	252
Caswell County	20 053	7 468	5 781	4 454	1 024	1 687	1 503	727	573	2.69	3.13	640	624	16
Catawba County	116 387	45 700	33 773	27 418	4 841	11 927	10 270	3 844	3 115	2.55	2.99	2 025	1 134	891
Chatham County	36 315	15 293	11 227	9 115	1 605	4 066	3 445	1 412	1 141	2.51	2.95	444	377	67
Cherokee County	19 809	7 966	6 069	5 065	765	1 897	1 764	975	759	2.50	2.91	271	196	75
Chowan County	13 233	5 113	3 775	2 842	767	1 338	1 238	641	499	2.59	3.07	273	273	-
Clay County	7 150	2 928	2 177	1 894	203	751	699	418	314	2.44	2.90	5	4	1
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
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
Craven County	78 014	29 542	22 481	18 189	3 511	7 061	6 121	2 436	1 930	2.64	3.07	3 599	811	2 788
Cumberland County	253 362	91 500	69 966	54 433	12 883	21 534	17 718	4 724	3 752	2.77	3.19	21 204	1 499	19 705
Currituck County	13 466	5 038	3 854	3 272	407	1 184	984	419	312	2.68	3.08	250	217	33
Dare County	22 542	9 349	6 425	5 498	682	2 924	2 264	714	522	2.41	2.88	204	140	64
Davidson County	125 358	48 944	37 176	30 410	5 120	11 768	10 262	4 189	3 310	2.56	2.96	1 319	1 277	42
Davie County	27 541	10 785	8 270	6 999	953	2 515	2 246	1 025	817	2.55	2.95	318	288	30
Duplin County	30 368	14 925	11 036	8 378	2 000	3 889	3 553	1 779	1 430	2.64	3.12	627	560	67
Durham County	173 310	72 297	45 965	33 614	10 321	26 312	20 860	5 553	4 471	2.40	2.99	8 525	2 175	6 350
Edgecombe County	55 858	20 319	15 065	10 000	4 293	5 234	4 703	2 124	1 717	2.75	3.25	702	657	45
Forsyth County	257 466	107 419	72 621	55 715	14 052	34 798	29 870	9 779	7 975	2.40	2.94	8 412	3 493	4 919
Franklin County	36 237	13 503	10 047	7 640	1 865	3 456	3 120	1 384	1 128	2.61	3.07	1 177	568	609
Gaston County	172 791	66 347	49 734	36 905	8 430	15 503	13 580	5 720	4 720	2.64	3.07	2 302	1 458	844
Gates County	9 302	3 352	2 393	2 040	404	759	705	304	258	2.75	3.19	123	122	1
Graham County	7 176	2 772	2 144	1 839	246	806	642	294	225	2.59	2.98	20	18	2
Granville County	36 191	13 134	9 883	7 501	1 857	3 251	2 869	1 236	978	2.68	3.13	3 154	3 079	75
Greene County	14 665	5 306	4 086	3 003	975	1 320	1 189	574	481	2.72	3.18	719	704	15
Guilford County	226 348	117 706	82 881	71 196	17 570	44 815	36 578	12 180	9 951	2.44	2.87	12 072	3 084	8 988
Halifax County	54 122	20 336	14 874	10 002	4 018	5 461	5 005	2 308	1 807	2.64	3.18	1 304	1 266	38
Harnett County	66 348	26 150	18 829	14 488	3 154	6 821	5 773	2 436	1 962	2.80	3.06	2 482	1 240	1 242
Haywood County	46 152	18 211	14 120	11 831	1 774	5 091	4 801	2 337	1 896	2.40	2.83	790	751	39
Henderson County	68 306	26 708	21 166	18 113	2 344	7 540	6 836	3 531	2 859	2.38	2.80	1 079	967	112
Hertford County	21 832	8 130	6 921	4 144	1 473	2 229	2 063	977	764	2.65	3.19	911	279	632
Hoke County	21 812	7 426	5 794	3 847	1 805	1 611	1 419	523	420	2.92	3.34	1 244	1 244	-
Hyde County	9 363	2 004	1 333	1 151	321	561	516	259	191	2.57	3.07	28	19	9
Iredell County	92 082	35 573	26 869	21 726	4 023	8 704	7 846	3 271	2 622	2.59	3.02	849	814	35
Jackson County	23 834	9 863	6 870	5 740	961	2 713	2 242	966	745	2.46	2.91	3 012	280	2 732
Johnston County	80 541	31 966	23 217	18 566	3 834	8 349	7 441	3 380	2 750	2.55	3.01	965	893	72
Jones County	9 412	3 482	2 630	2 054	482	853	774	406	311	2.70	3.17	2	2	-
Lee County	40 661	15 669	11 739	9 087	2 135	3 950	3 482	1 369	1 107	2.59	3.03	723	672	51
Lenoir County	58 662	21 938	15 611	11 131	3 798	6 327	5 706	2 580	2 073	2.54	3.06	1 622	1 559	63
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	-
McDowell County	36 044	13 680	10 366	8 578	1 363	3 314	2 906	1 309	1 135	2.56	2.99	617	416	201
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	274
Madison County	16 104	6 488	4 806	4 058	816	1 682	1 510	789	581	2.48	2.92	849	104	745
Martin County	24 613	9 317	6 900	5 087	1 518	2 417	2 213	1 100	906	2.66	3.17	265	257	8
Mecklenburg County	498 886	200 219	134 361	103 211	25 013	65 858	52 037	12 990	10 610	2.50	3.05	11 547	3 578	7 969
Mitchell County	14 283	5 779	4 420	3 777	479	1 359	1 265	669	539	2.47	2.88	145	130	15
Montgomery County	22 279	8 290	6 274	4 823	1 119	2 016	1 838	876	690	2.69	3.14	1 067	997	70
Moore County	58 010	23 827	17 443	14 312	2 473	6 344	5 662	2 744	2 201	2.43	2.87	1 003	970	33
Nash County	76 462	29 041	21 224	16 322	3 968	7 817	6 926	2 880	2 316	2.60	3.09	1 227	807	420
New Hanover County	116 999	48 139	32 400	24 723	6 363	15 739	12 434	4 372	3 512	2.43	2.95	3 285	1 321	1 964
Northampton County	20 055	7 801	5 644	3 958	1 436	1 947	1 816	968	704	2.64	3.13	743	742	1
Onslow County	115 274	40 658	32 871	28 037	3 843	7 687	6 271	1 752	1 384	2.84	3.16	34 564	954	33 610
Orange County	84 827	36 104	21 123	16 854	3 380	14 981	10 110	2 257	1 839	2.34	2.93	9 224	770	8 454
Pamlico County	11 347	4 523	3 382	2 717	547	1 141	1 055	528	410	2.49	2.93	125	112	13
Pasquotank County	28 864	11 364	8 328	6 356	1 681	3 058	2 725	1 342	1 065	2.63	3.13	1 414	383	1 031
Pender County	28 487	11 112	8 420	6 707	1 371	2 692	2 368	1 055	796	2.56	2.99	358	348	10
Perquimans County	10 303	3 968	3 038	2 444	468	950	862	443	342	2.58	3.02	144	144	-
Person County	29 830	11 423	8 570	6 607	1 547	2 853	2 808	1 209	994	2.61	3.07	350	304	46
Pitt County	102 400	40 491	26 434	19 369	5 857	14 057	10 412	3 104	2 511	2.53	3.10	5 524	946	4 578
Polk County	14 187	6 110	4 348	3 603	511	1 764	1 509	952	768	2.32	2.79	229	227	2
Randolph County	106 440	41 006	31 363	26 135	3 967	9 733	8 590	3 435	2 789	2.57	2.97	1 106	1 050	56
Richmond County	43 834	16 793	12 270	9 128	2 561	4 523	4 174	2 011	1 600	2.59	3.11	984	875	109
Robeson County	103 186	36 154	27 429	18 451	7 353	8 725	7 891	3 355	2 651	2.85	3.34	1 993	1 280	713
Rockingham County	85 242	33 446	24 671	19 351	4 193	8 775	7 959	3 669	2 982	2.55	3.02	822	781	41
Rowan County	107 079	42 512	31 055	25 100	4 618	11 457	10 236	4 748	3 815	2.52	2.99	3 526	2 408	1 118
Rutherford County	56 197	22 198	16 480	13 191	2 531	5 718	5 255	2 556	2 050	2.53	2.99	721	721	-
Sampson County	46 754	17 826	13 191	10 058	2 525	4 335	3 975	2 032	1 610	2.67	3.14	543	490	53
Scotland County	32 679	11 837	8 971	6 225	2 308	2 866	2 618	1 173	935	2.78	3.25	1 075	401	674
Stanly County	59 734	19 747	14 967	12 451	1 975	4 780	4 306	2 164	1 785	2.57	3.01	1 031	470	561
Stokes County	36 862	14 123	11 022	9 341	1 273	3 101	2 825	1 248	1 018	2.61	3.00	361	361	-
Surry County	60 950	24 252	18 252	15 253	2 341	6 000	5 474	2 732	2 256	2.51	2.94	754	650	104
Swain County	10 653	4 173	3 063	2 382	550	1 000	965	467	369	2.55	3.01	615	215	400
Transylvania County	24 283	9 924	7 496	6 442	797	2 428	2 224	1 131	912	2.45	2.86	1 237	178	1 059
Tyrrell County	3 852	1 471	1 078	810	213	393	359	208	148	2.62	3.13	4	4	-
Union County	82 633	29 307	23 530	19 607	3 063	5 777	5 018	2 148	1 755	2.82	3.18	1 578	455	1 123

TPII [POSTSCRIPT] CPH137 CENSUS90 72580800 04/23/91 5:06 PM MACHINE: C DATA:CENSUS90*PH1TPSDAT37, 04/23/91 16:51:04 OUTPUT:ONSITE-PS106 PAGE: 106
TSF:CENSUS90*62, 04/23/91 16:51:23 UTF:CENSUS90*93, 04/23/91 16:51:23 META:CENSUS90*PH1TABLE537, 04/23/91 17:02:14

NOTE: The population counts set
possible correction for undercount
Department of Commerce is consic
and will publish corrected counts, i

REFERENCE 22

B&V WASTE SCIENCE AND TECHNOLOGY CORP.

REFERENCE 23

TELEPHONE MEMORANDUM

US EPA
Sprague Electric Company
Stream Gauge Information

BVWST Project 52012.070
BVWST File
July 20, 1992
1:35 p.m.

To: Mike Scoville
Company: N. C. Environmental Resources
Phone No.: (919) 733-5083

Recorded by: Victor Blix

According to Mr. Scoville, there is a stream gauge located near Warrensville, North Carolina (approximately one mile upstream of the Sprague facility) in the North Fork of the New River. The historical average flow for this gauge is 259 cfs.

ms

REFERENCE 24

NUS CORPORATION | **PROJECT NOTES**

PROJECT NO.:	TASK NO.:	DIVISION NO.:	PROJECT MANAGER:	DATE:
			Eric Corbin	07-30-91

PROJECT TITLE: Sprague Electric Company

CLIENT: EPA Region III Superfund

START DATE:

CLOSE DATE:

COMMENTS:

According to the North Carolina Surface Water Intake Inventory, there are no surface water intakes located in Ashe County utilized for potable water supplies.

NUS 085A REVISED 0483

scientific and common name	state stat	fed stat	state rank	glo ran
ACCIPITER COOPERII	E		S2	G4
COOPER'S HAWK				
CLEMMYS MUHLENBERGII	T	C2	S3	G4
BOG TURTLE				
COCCYZUS ERYTHROPTHALMUS			S2	G5
BLACK-BILLED CUCKOO				
CORVUS CORAX	SC		S3	G5
COMMON RAVEN				
EXOGLOSSUM LAURAE	SC		S3	G4
TONGUETIED MINNOW				
PERCINA MACULATA	SC		S3	G5
BLACKSIDE DARTER				
PERCINA OXYRHYNCHA	SC		S1	G4
SHARPNOSE DARTER				
PIMEPHALES NOTATUS	SC		S3	G5
BLUNTNOSE MINNOW				
THRYOMANES BEWICKII	T	C1	SH	G5
BEWICK'S WREN				
VIREO GILVUS	T		S2	G5
WARBLING VIREO				
BOLORIA BELLONA	SR		S2	G5
MEADOW FRITILLARY				
DIXIORIA DACTYLIFERA	SC			G?
MILLIPED				
ERORA LAETA	SR		S1	G4
EARLY HAIRSTREAK				
HESPERIA LEONARDUS	UNK		S2?	G4
LEONARD'S SKIPPER				
SPEYERIA DIANA	SC		S3	G3
DIANA				
SPEYERIA IDALIA	SR	C2	S1	G3
REGAL FRITILLARY				
STENELMIS GAMMUNI	T	C2		G1G
RIFFLE BEETLE				
CAMPYLIUM STELLATUM	SR		S1	G5
YELLOW STARRY FEN MOSS				
CAMPYLOPUS ATROVIRENS	SR		S1	G3?
CLIFF CAMPYLOPUS				
CLADONIA PSOROMICA	C		S1	G1
BLUFF MOUNTAIN REINDEER LICHEN				
DICHODONTIUM PELLUCIDUM	SR		S2	G4G
A MOSS				
GYMNODERMA LINEARE	T		S1	G1
ROCK GNOME LICHEN				
LEPTO[illegible] FLEXIFOLIUM	SR		S1	G5
[illegible]INED LEPTODONTIUM				
LIND[illegible]ACHYPTERA	SR		S1	G5
[illegible]'S MAPLE-MOSS				
ORTHO[illegible]ORTUSIFOLIUM	SR		S1	G5
[illegible]STLE-MOSS				
RHYTIDIUM RUGOSUM	SR		S2	G5
GOLDEN GLADE-MOSS				
SPHAGNUM SUBSECUNDUM VAR SUBSECUNDUM	C		S1	G5T
ORANGE PEATMOSS				
ACONITUM RECLINATUM	C		S2	G2G
TRAILING WOLFSBANE				

(ash)

02/15/90

NORTH CAROLINA NATURAL HERITAGE PROGRAM ELEMENT LIST

scientific and common name	state stat	fed stat	state rank	o r.
ARETHUSA BULBOSA	E		S1	(
BOG ROSE				
CARDAMINE ROTUNDIFOLIA	SR		SH	(
MOUNTAIN WATERCRESS				
CAREX BUXBAUMII	C		S1	(
BUXBAUM'S SEDGE				
CAREX CONOIDEA	T		S1	(
CUNE-SHAPED SEDGE				
CAREX MANHARTII	C		S1	G
MANHART'S SEDGE				
CAREX MISERA	T	3C	S3	G
WRETCHED SEDGE				
CAREX WOODII	SR		S2	G
WOOD'S SEDGE				
CHENOPODIUM SIMPLEX	SR		S1	G
GIANT-SEED GOOSEFOOT				
CLADIUM MARISCOIDES	SR		S1	G
TWIG-RUSH				
CLEMATIS OCCIDENTALIS	SR		S1	G
ROCK CLEMATIS				
DALIBARDA REPENS	E		S1	G
ROBIN RUNAWAY				
EPILOBIUM LEPTOPHYLLUM	C		S2	G
NARROWLEAF WILLOWHERB				
EUPHORBIA PURPUREA	C	C2	S2	G
GLADE SPURGE				
GENTIANOPSIS CRINITA	E		S1	G
FRINGED GENTIAN				
GEUM RADIATUM	E	PE	S1	G
SPREADING AVENS				
GYMNOCARPIUM DRYOPTERIS			SRF	G
OAK FERN				
HELIANTHEMUM BICKNELLII	C		S1	G
PLAINS FROSTWEED				
HELIANTHEMUM PROPINQUUM	C		S1	G
CREEPING SUNROSE				
HOUSTONIA PURPUREA VAR MONTANA	C	PE	S1	G
MOUNTAIN BLUET				
HUPERZIA SELAGO	SR		S2	G
FIR CLUBMOSS				
LIATRIS ASPERA	SR		S1	G
ROUGH BAYFEATHER				
LIATRIS HELLERI	T	LT	S1	G
HELLER'S BLAZING STAR				
LILIUM GRAYI	T	C2	S2	G
GRAY'S LILY				
LIL[illegible]ILADELPHICUM	SR		S1	G
[illegible] LILY				
LI[illegible]	SR		S1	G
[illegible]L'S TWAYBLADE				
ME[illegible]CORDATA	SR		S2	G
[illegible]NIA				
MINUARTIA GROENLANDICA	C		S2	G
GREENLAND SANDWORT				
MUHLENBERGIA GLOMERATA	C		S1	G
BRISTLY MUHLY				

NORTH CAROLINA NATURAL HERITAGE PROGRAM ELEMENT LIST

scientific and common name	state stat	fed stat	state rank	glo rar
PANAX QUINQUEFOLIUS AMERICAN GINSENG	SC	3C	S4	G4
PANAX TRIFOLIUS DWARF GINSENG	SR		S2	G5
PARNASSIA GRANDIFOLIA LARGE-LEAVED GRASS-OF-PARNASSUS	C		S2	G2
PHLOX SUBULATA MOSS PINK	SR		S1	G5
PRENANTHES ROANENSIS ROAN RATTLESNAKEROOT	SR	3C	S3	G3
PYROLA ELLIPTICA ONE SHINLEAF	C		S1	G5
RHODODENDRON PRINOPHYLLUM ELECTION PINK	SR		S1	G5
RHYNCHOSPORA ALBA WHITE BEAKRUSH	C		S2	G5
SAXIFRAGA CAROLINIANA CAROLINA SAXIFRAGE	C	C2	S2	G2
SCIRPUS CESPITOSUS DEERHAIR BULRUSH	C		S2	G5
SCUTELLARIA SAXATILIS ROCK SKULLCAP	C		S1	G4
SEDUM ROSEA ROSEROOT	E		S1	G5
SENECIO PLATTENSIS ONE GROUNDSEL	C		S1	G5
SOLIDAGO ULIGINOSA BOG GOLDENROD	SR		SU	G4
SPIRAEA VIRGINIANA VIRGINIA SPIRAEA	E	PT	S1	G1
TAXUS CANADENSIS CANADA YEW	SR		S1	G5
TOFIELDIA GLUTINOSA STICKY BOG ASPHODEL	C		S1	G5
VACCINIUM MACROCARPON CRANBERRY	C		S2	G4
VERONICA AMERICANA AMERICAN SPEEDWELL	SR		S2	G5
WOODSIA ILVENSIS RUSTY WOODSIA	SR		S1	G5
WOODSIA SCOPULINA ALLEGHANY CLIFF FERN	SR		S1	G5

EXPLANATION OF SPECIES STATUS CODES

The attached output from the N.C. Natural Heritage Program database is a listing of the elements (rare species, geologic features, natural communities, special animal habitats) known to occur in your geographic area of interest. Following is an explanation of the four columns of status codes on the righthand side of the printout.

STATE STATUS

Plants:

From Sutter, R.D., L. Mansberg, and J.H. Moore. 1983. Endangered, threatened, and rare plant species of North Carolina: a revised list. ASB Bulletin 30:153-163, and updated lists of the Natural Heritage and Plant Conservation Programs.

E = Endangered
T = Threatened
SC = Special Concern
~~PP = Primary Proposed~~ C = Candidate
SR = Significantly Rare

E,T,and SC species are protected by state law (the Plant Protection and Conservation Act, 1979); the other two categories indicate rarity and the need for population monitoring, as determined by the Plant Conservation and Natural Heritage Programs.

Animals:

From Cooper, J.E., S.S. Robinson, and J.B. Funderburg (Eds.). 1977. Endangered and Threatened Plants and Animals of North Carolina. N.C. Museum of Natural History, Raleigh, NC. 444 pages + i-xvi, and updated lists of the Natural Heritage Program.

E = Endangered
T = Threatened
SR = Significantly Rare
SC = Special Concern
UNK= Undetermined
EX = Extirpated

FEDERAL STATUS

From Endangered & Threatened Wildlife and Plants, April 10, 1987. 50 CFR 17.11 & 17.12. Department of Interior. Established by the Endangered Species Act of 1973, as amended.

E = Taxa currently listed as Endangered
T = Taxa currently listed as Threatened
PE = Taxa currently proposed for listing as Endangered
PT = Taxa currently proposed for listing as Threatened

Taxa under review for possible listing ("candidate species"):

C1 = Taxa with sufficient information to support listing
C2 = Taxa without sufficient information to support listing

GLOBAL RANK (STATE RANK)

The Nature Conservancy's system of measuring rarity and threat status. "Global" refers to worldwide, "State" to statewide.

G1 = Critically imperiled globally because of extreme rarity or otherwise very vulnerable to exinction throughout its range.
G2 = Imperiled globally because of rarity or otherwise vulnerable to extinction throughout its range.
G3 = Either very rare and local throughout its range, or found locally in a restricted area.
G4 = Apparently secure globally, though it may be quite rare in parts of its range (especially at the periphery).
G5 = Demonstrably secure globally, though it may be quite rare in parts of its range (especially at the periphery).
GU = Possibly in peril but status uncertain; need more information.
GX = Believed to be extinct throughout range.
Q = a suffix attached to the Global Rank indicating questionable taxonomic status.
T_ = an additional status for the subspecies or variety; the G rank then refers only to the species as a whole.

State rank codes follow the same definitions, except substitute the words, "in the state," for "globally" or "throughout its range."

NUS CORPORATION AND SUBSIDI REFERENCE 26 **:CON NOTE**

CONTROL NO.	**DATE:** 03-14-90	**TIME:** 0945

DISTRIBUTION:

BETWEEN: Sonny Williams	**OF:** Game Warden, Ashe County	**PHONE:** (919) 384-2547

AND: Eric Corbin, NUS Corporation

DISCUSSION:

I contacted Sonny Williams to determine surface water use on the North Fork of the New River. He stated that the stretch near Lansing, North Carolina was used for canoeing, swimming, and fishing primarily in the summer months. Species of fish caught include smallmouth bass and muskie. He knew of no permanent surface water intakes withdrawing water from the river except for some irrigational uses of the river water.

Eric Corbin
03-14-90

Eric Corbin 04-18-90

NUS 067 REVISED 0685

REFERENCE 27

CENSUS DATA

sprague electric company
LATITUDE 36:28:45 LONGITUDE 81:29:41 1980 POPULATION

KM	0.00-.400	.400-.810	.810-1.60	1.60-3.20	3.20-4.80	4.80-6.40	SECTOR TOTALS
S 1	0	0	0	0	838	0	838
S 2	0	0	0	0	0	0	0
S 3	0	0	0	0	1268	0	1268
S 4	0	0	0	0	0	0	0
S 5	0	0	0	0	0	0	0
S 6	0	0	0	0	0	0	0
S 7	0	0	0	0	0	0	0
S 8	0	0	0	194	0	0	194
RING TOTALS	0	0	0	194	2106	0	2300

B&V WASTE SCIENCE AND TECHNOLOGY CORP.

REFERENCE 28

TELEPHONE MEMORANDUM

US EPA
Sprague Electric Company
Number of Employees Working On Site

BVWST Project 52012.070
BVWST File
July 9, 1992
2:30 p.m.

To: Sandy Gambill
Company: Ashe County Chamber of Commerce
Phone No.: (919) 246-9550

Recorded by: Victor Blix

According to Ms. Gambill, approximately 525 people work at the Sprague Electric Company facility.

ms