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316SERBSF10,617

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Site ID (Document ID):	NCD990715658
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SUPERFUND

NORTH CAROLINA

DHR/DHS

Southern Manufacturing, Inc.
NCD990715658
Site Investigation

June 1989

CERCLA

By D. Mark Durway
Hydrogeologist
SUPERFUND BRANCH
SOLID WASTE MANAGEMENT SECTION

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

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

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

June 30, 1989

Ms. Denise Smith
EPA NC CERCLA Project Officer
EPA Region IV Waste Division
345 Courtland Street, N.E.
Atlanta, GA 30365

SUBJECT: Site Investigation Report

SITE: Southern Manufacturing, Inc.
NCD 990715658
1000 Seaboard Street
Charlotte, NC 28206

Dear Ms. Smith:

Submitted herewith is the Site Investigation Report for the subject site. This report is based upon communication with persons knowledgeable of the site, pertinent site documents, and a site visit conducted on 3-13-89.

Southern Manufacturing Inc, began operation in about 1920 as a manufacturer of asbestos textiles, including yarn, cloth, rope, tubing, wick, and tape. In 1972, the company phased out asbestos, except when buyers specially requested it, and in about 1986, asbestos was phased out completely. Fiberglass and kevlar fabric are the principal materials now used in place of asbestos at Southern Manufacturing.

Southern Manufacturing generated as much as 250 tons of asbestos dust per year in its early years. This annual waste quantity is expected to have begun decreasing in about 1972 when the company began using other materials in place of asbestos; in fact, the company reported in a North Carolina Division of Health Services survey that only 4,547 pounds of asbestos dust were generated at Southern Manufacturing during the first three quarters of 1982.

Asbestos waste generated at Southern Manufacturing is reported to have either been disposed of in the city landfill or sold, but not to have been disposed of on site. Soil borings performed this year by a private engineering firm at an on-site area of less than 0.5 acre indicated that asbestos fibers were present in soil to depths as great as 12.5′ in some areas; however, the on-site waste volume was not quantified at this location.

Southern Manufacturing uses isopropyl alcohol, methyl ethyl ketone, and toluene in some of its dyes. However, neither these wastes nor asbestos are regulated under RCRA at this facility.

In about 1980, Southern Manufacturing applied for a RCRA Part A permit. Shortly thereafter, however, asbestos was delisted as a hazardous waste under RCRA. Southern Manufacturing is not regulated under RCRA at this time.

Ground water in the site area is derived from the granite, diorite, and associated saprolite which underlies the site. Together, the granite, diorite, and saprolite function as a single, unconfined, aquifer which may yield between about 1 and 100 gpm.

There are no current records of ground water use within a three mile radius of Southern Manufacturing, though at least one private well is suspected to the north within three miles of but no fewer than two miles from the site. There is also a system which serves 49 homes located 3.8 miles north of the site. Since the city-county municipal system serves nearly all persons within four miles of the site, an extensive door-door survey would be required to identify private well users. Ground water is not known to be used for irrigation within a four mile radius of the site.

The nearest surface water body to Southern Manufacturing is Irwin Creek located 1800′ west of the site. Irwin Creek has been designated as a Class C stream by the NC Department of Natural Resources and Community Development because of its poor water quality and is not recommended for drinking or recreational purposes within three miles downstream of the site. There are no drinking water intakes within fifteen miles downgradient of the site though it is believed that downgradient surface waters are used for recreational purposes within this distance.

Surface water from the Charlotte-Mecklenburg Utilities Department serves almost all residents living within a four mile radius of Southern Manufacturing. Surface water is not known to be used for irrigation within a four mile radius of the site.

There are an estimated 8500 persons living within a one mile radius of Southern Manufacturing. There are no critical habitats, wetlands, or sensitive environments within four miles of the site.

Distances to commercial and industrial areas, schools, and parks range from approximately 1000' - 3000' from Southern Manufacturing. Commercial agricultural areas are not known to exist within a four mile radius of the site (Ref. 19).

There is no evidence on file to indicate that an off-site air release has occurred at Southern Manufacturing, though it is conceivable that some asbestos dust has blown from the site since the plant opened nearly seventy years ago.

Based on the available information, there are insufficient waste quantities at Southern Manufacturing to warrant further investigation or action under the federal Superfund program at this site. It is therefore recommended that no further action be taken at this facility.

Please contact me at (919) 733-2801, if additional information is required.

Sincerely,

D. Mark Durway

D. Mark Durway, Hydrogeologist
Superfund Branch
Solid Waste Management Section

DMD/SOMFG.SI

cc. Kelly Cain

SITE INVESTIGATION REPORT

Southern Manufacturing, Inc.
NCD 990715658
Charlotte, NC

June 1989

Superfund Branch
Solid Waste Management Section
North Carolina Division of Health Services

Prepared by:

D. Mark Durway
Hydrogeologist

Ed Wallingford
Environmental Chemist

TABLE OF CONTENTS

Executive Summary

1.0 Background

1.1 Location
1.2 Site Layout
1.3 Ownership and Site Use History
1.4 Permit and Regulatory History
1.5 Remedial Actions to Date
1.6 Summary Trip Report

2.0 Environmental Setting

2.1 Topography
2.2 Surface Water
2.3 Geology, Soils, and Ground Water
2.4 Climate and Meterology
2.5 Land Use
2.6 Population Distribution and Water Supply
2.7 Critical Environments

3.0 Waste Types and Quantities

Appendix A: Maps

Appendix B: Laboratory Analyses

Appendix C: References

Appendix D: Site Inspection Report Form

Appendix E: Site Safety Plan and Toxicological Data

EXECUTIVE SUMMARY

Southern Manufacturing Inc, began operation in about 1920 as a manufacturer of asbestos textiles, including yarn, cloth, rope, tubing, wick, and tape. In 1972, the company phased out asbestos, except when buyers specially requested it, and in about 1986, asbestos was phased out completely. Fiberglass and kevlar fabric are the principal materials now used in place of asbestos at Southern Manufacturing.

Southern Manufacturing generated as much as 250 tons of asbestos dust per year in its early years. This annual waste quantity is expected to have begun decreasing in about 1972 when the company began using other materials in place of asbestos; in fact, the company reported in a North Carolina Division of Health Services survey that only 4,547 pounds of asbestos dust were generated at Southern Manufacturing during the first three quarters of 1982.

Asbestos waste generated at Southern Manufacturing is reported to have either been disposed of in the city landfill or sold, but not to have been disposed of on site. Soil borings performed this year by a private engineering firm at an on-site area of less than 0.5 acre indicated that asbestos fibers were present in soil to depths as great as 12.5′ in some areas; however, the on-site waste volume was not quantified at this location.

Southern Manufacturing uses isopropyl alcohol, methyl ethyl ketone, and toluene in some of its dyes. However, neither these wastes nor asbestos are regulated under RCRA at this facility.

In about 1980, Southern Manufacturing applied for a RCRA Part A permit. Shortly thereafter, however, asbestos was delisted as a hazardous waste under RCRA. Southern Manufacturing is not regulated under RCRA at this time.

Ground water in the site area is derived from the granite, diorite, and associated saprolite which underlies the site. Together, the granite, diorite, and saprolite function as a single, unconfined, aquifer which may yield between about 1 and 100 gpm.

There are no current records of ground water use within a three mile radius of Southern Manufacturing, though at least one private well is suspected to the north within three miles of but no fewer than two miles from the site. There is also a system which serves 49 homes located 3.8 miles north of the site. Since the city-county municipal system serves nearly all persons within four miles of the site, an extensive door-door survey would be required to identify private well users. Ground water is not known to be used for irrigation within a four mile radius of the site.

The nearest surface water body to Southern Manufacturing is Irwin Creek located 1800' west of the site. Irwin Creek has been designated as a Class C stream by the NC Department of Natural Resources and Community Development because of its poor water quality and is not recommended for drinking or recreational purposes within three miles downstream of the site. There are no drinking water intakes within fifteen miles downgradient of the site though it is believed that downgradient surface waters are used for recreational purposes within this distance.

Surface water from the Charlotte-Mecklenburg Utilities Department serves almost all residents living within a four mile radius of Southern Manufacturing. Surface water is not known to be used for irrigation within a four mile radius of the site.

There are an estimated 8500 persons living within a one mile radius of Southern Manufacturing. There are no critical habitats, wetlands, or sensitive environments within four miles of the site.

Distances to commercial and industrial areas, schools, and parks range from approximately 1000' - 3000' from Southern Manufacturing. Commercial agricultural areas are not known to exist within a four mile radius of the site (Ref. 19).

There is no evidence on file to indicate that an off-site air release has occurred at Southern Manufacturing, though it is conceivable that some asbestos dust has blown from the site since the plant opened nearly seventy years ago. Since previous sampling had confirmed presence of asbestos in on-site soil, no additional samples were collected during the 3-13-89 site investigation.

Previous site sampling indicated that subsurface asbestos contamination existed at Southern Manufacturing. For this reason, additional sampling was not performed. Overall, the site had a neat appearance, and no loose asbestos was observed on the land surface (Ref. 23).

1.0 Background

1.1 Location

Southern Manufacturing is located on an 11.5 acre property in inner-city Charlotte on 1000 Seaboard Street. The area surrounding the site is both residential and commercial in nature. Site coordinates are 35° 14′ 22" N latitude and 80° 50′ 45" W longitude (Ref. 14).

1.2 Site Layout

The site consists of a manufacturing building, an office building, and a water tower, which serves as part of the plant's fire protection system. There are several underground fuel oil storage tanks on the west side of the plant. During the inspection, there was no visible evidence of on-site waste disposal. There is a six foot high cyclone fence with three strands of barbed-wire which encompasses the entire Southern Manufacturing plant (Ref. 21).

1.3 Ownership and Site Use History

Southern Manufacturing Inc, began operation in about 1920 as a manufacturer of asbestos textiles, including yarn, cloth, rope, tubing, wick, and tape. In 1972, the company phased out asbestos, except when buyers specially requested it, and in about 1986, asbestos was phased out completely. Fiberglass and kevlar fabric are the principal materials now used in place of asbestos at Southern Manufacturing (Refs. 1,2,5).

1.4 Permit and Regulatory History

In about 1980, Southern Manufacturing applied for a RCRA Part A permit. Shortly thereafter, however, asbestos was delisted as a hazardous waste under RCRA. Southern Manufacturing is not regulated under RCRA at this time (Ref. 8). The facility has numerous Mecklenburg County air permits (Ref. 14).

1.5 Remedial Actions to Date

There have been no remedial actions at this facility to date.

1.6 Summary Trip Report

On 3-15-89, Mark Durway and Ed Wallingford made a site sampling visit to Southern Manufacturing. Company vice-president S. Douglas Robertson met us upon arrival. Gerald Wooten of the Mecklenburg County Department of Environmental Health indicated prior to the visit that he would be unable to accompany us.

2.0 Environmental Setting

2.1 Topography

Southern Manufacturing is located in the Piedmont Physiographic Province at an elevation of approximately 700′ MSL. Maximum relief within a one mile radius of the site is about 170′, and site slope is less than three percent (see Maps and Photos).

2.2 Surface Waters

The nearest surface water body to Southern Manufacturing is Irwin Creek located 1800′ west of the site (Ref. 14). Irwin Creek has been designated as a Class C stream by the NC Department of Natural Resources and Community Development because of its poor water quality and is not recommended for drinking or recreational purposes within three miles downstream of the site (Refs. 2,6,7). There are no drinking water intakes within fifteen miles downgradient of the site (Refs. 14,17) though it is believed that downgradient surface waters are used for recreational purposes within this distance.

Surface water from the Charlotte-Mecklenburg Utilities Department serves almost all residents living within a four mile radius of Southern Manufacturing (Ref. 4). Surface water is not known to be used for irrigation within a four mile radius of the site (Ref. 19).

2.3 Geology, Soils, and Ground Water

Ground water in the site area is derived from the granite, diorite, and associated saprolite which underlies the site. Together, the granite, diorite, and saprolite function as a single, unconfined, aquifer which may yield between about 1 and 100 gpm (Refs. 15,16). Permeability of the Cecil-Urban sandy loam to clay soil commonly found in the site area is on the order of 10^{-3} to 10^{-4} cm/sec (Ref. 11). Based on the available information (Ref. 15), depth to ground water at the site is estimated to be 20′ to 40′ below land surface.

2.4 Climate and Meteorology

The 1-year 24-hour rainfall in the site vicinity is approximately 2.8". Net precipitation in the site area is about 5.5 " (Ref. 20).

2.5 Land Use

The Southern Manufacturing site is located in inner-city Charlotte. Land within a one mile vicinity of the site is used for industrial, commercial, and residential purposes.

2.6 Population Distribution and Water Supply

There are an estimated 8500 persons living within a one mile radius of Southern Manufacturing, based on 1980 Mecklenburg County census information (Ref. 12). Assuming a symmetrical population distribution of the same density within a four-mile radius of the site, the number of persons in the site area would be as follows:

0.25 mile radius	531 persons
.5 mile radius	2126 persons
1.0 mile radius	8500 persons
2.0 mile radius	34,017 persons
3.0 mile radius	76,538 persons
4.0 mile radius	136,068 persons

Distances to commercial and industrial areas, schools, and parks range from approximately 1000′ - 3000′ from Southern Manufacturing. Commercial agricultural areas are not known to exist within a four mile radius of the site (Ref. 19).

Surface water from the Charlotte-Mecklenburg Utilities Department serves almost all residents living within a four mile radius of Southern Manufacturing (Ref. 4).

There are no current records of ground water use within a three mile radius of Southern Manufacturing, though at least one private well is suspected to exist to the north within three miles of but no fewer than two miles from the site. There is also a community ground water system which serves 49 homes located 3.8 miles north of the site (Ref. 17). An extensive door-to-door survey would be required to identify private well users. Ground water is not known to be used for irrigation within a four mile radius of the site (Ref. 19).

2.7 Critical Environments

There are no critical habitats, wetlands, or sensitive environments within four miles of the site (Ref. 18).

3.0 Waste Types and Quantities

Southern Manufacturing generated as much as 250 tons of asbestos dust per year in its early years (Ref. 1). This annual waste quantity is expected to have begun decreasing in about 1972 when the company began using other materials in place of asbestos (Ref. 5); in fact, the company reported in a North Carolina Division of Health Services survey that only 4,547 pounds of asbestos dust were generated at Southern Manufacturing during the first three quarters of 1982 (Ref. 10).

Asbestos waste generated at Southern Manufacturing is reported to have either been disposed of in the city landfill or sold, but not to have been disposed of on site (Refs. 1,2,5). Soil borings performed this year by a private engineering firm at an on-site area of less than 0.5 acre indicated that asbestos fibers were present in soil to depths as great as 12.5′ in some areas; however, the on-site waste volume was not quantified at this location (Ref. 3).

Southern Manufacturing uses isopropyl alcohol, methyl ethyl ketone, and toluene in some of its dyes (Ref. 2). However, neither these wastes nor asbestos are regulated under RCRA at this facility (Refs. 8,9,10). Fuel oil is also used and stored on site in underground tanks (Ref. 2).

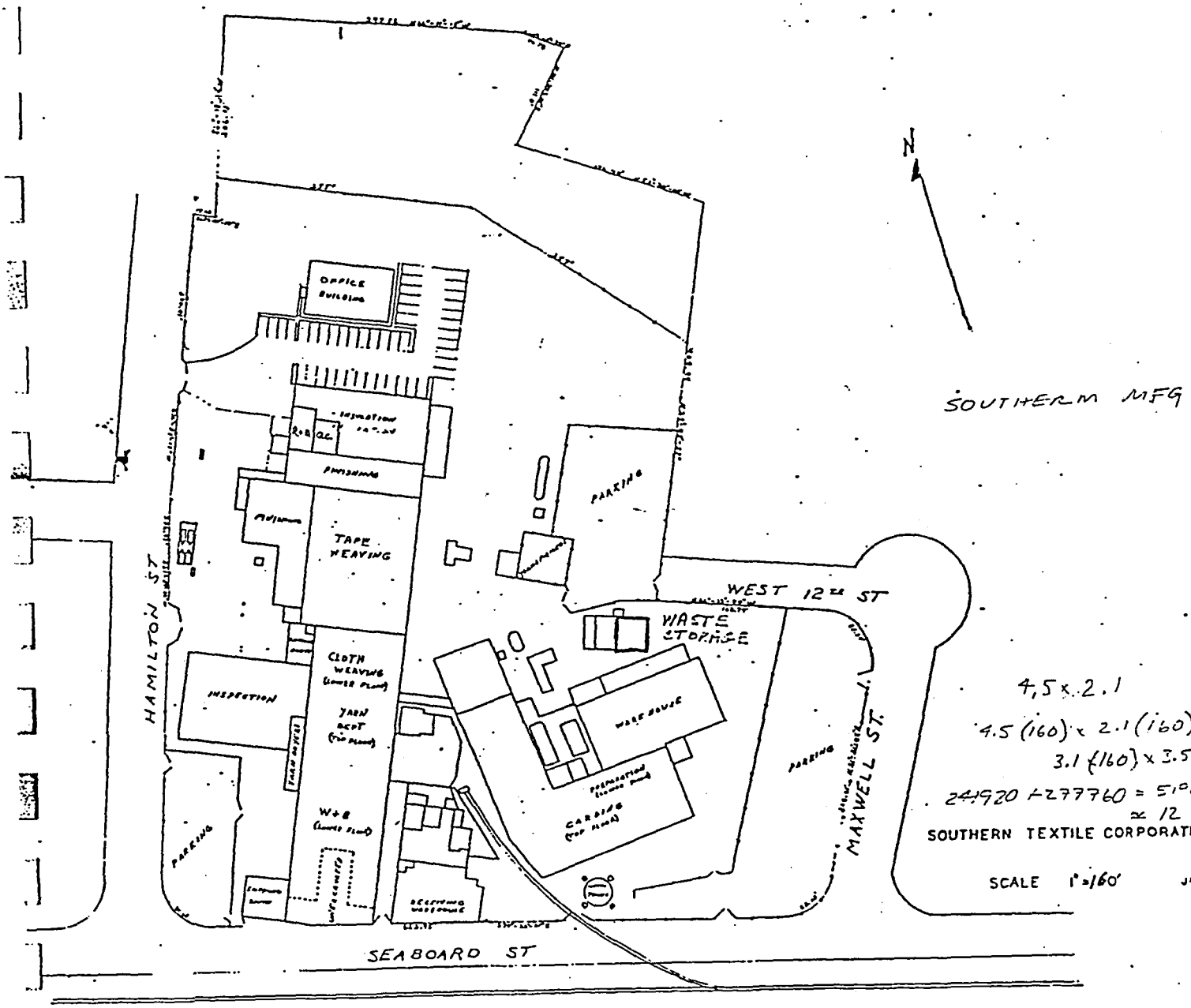
There is no evidence on file to indicate that an off-site air release has occurred at Southern Manufacturing, though it is conceivable that some asbestos dust blew off site during the period from 1919, when the plant opened, to about 1986, when the manufacture of asbestos products ceased.

Appendix A

Maps

V. FACILITY DRAWING *(see page 4)*

SITE LAYOUT MAP

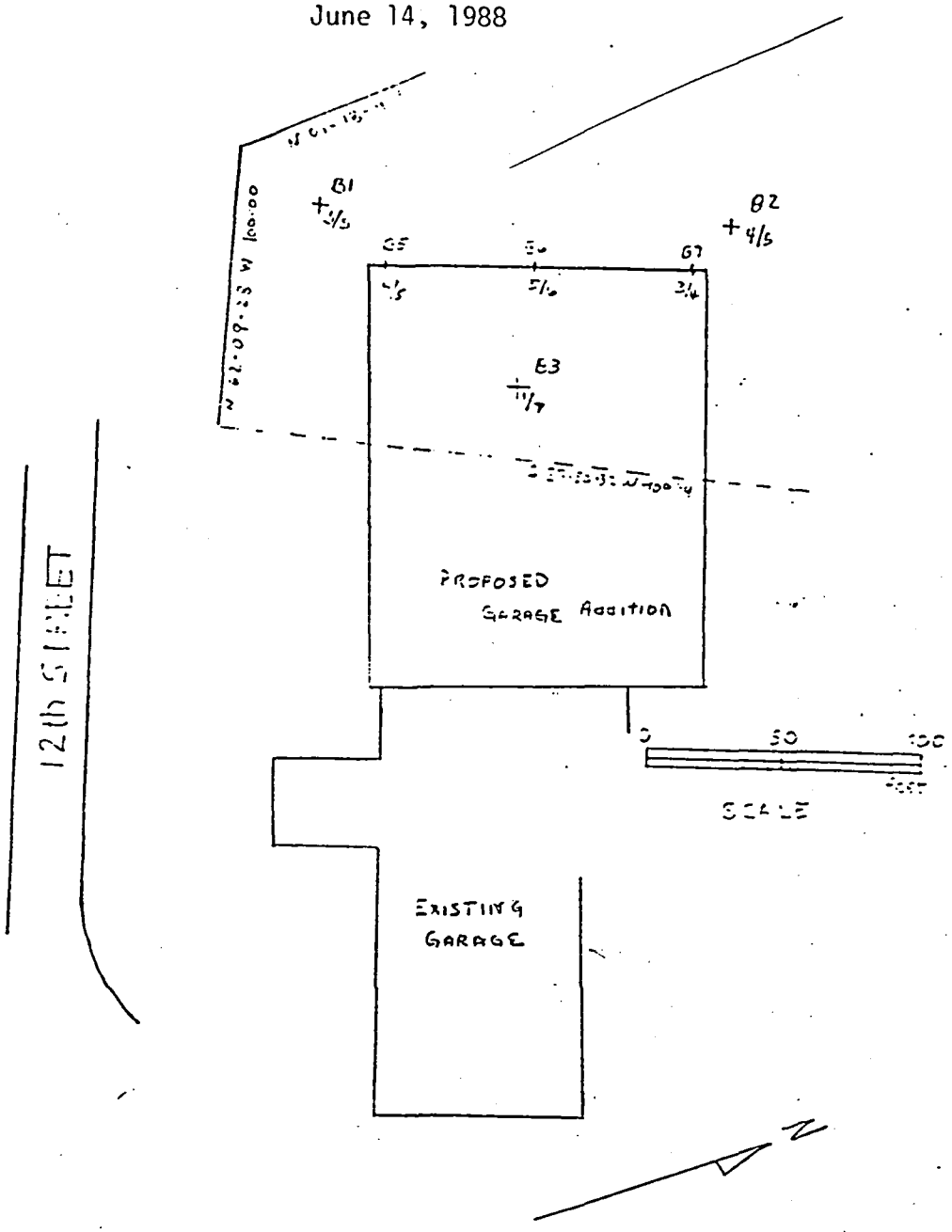


Appendix B

Laboratory Data

Results of Soil Test Boring

Proposed Garage Addition
June 14, 1988

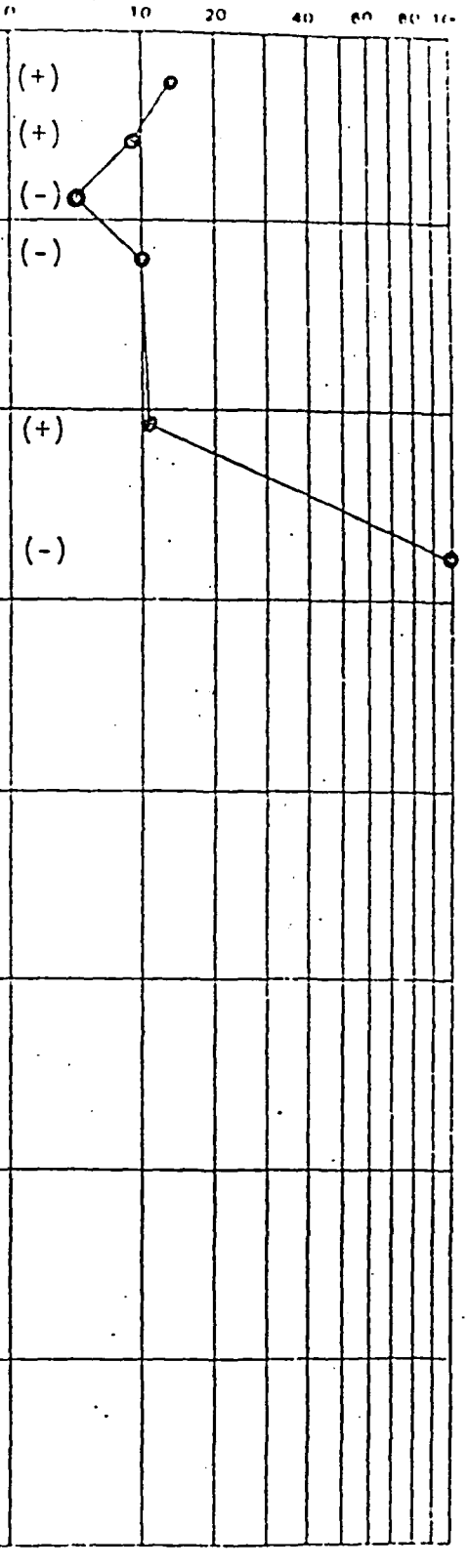


Legend

+ Boring Sites
# Positive Asbestos samples/#Samples Analyzed

DEPTH FT.	DESCRIPTION	N	ELEV
0.0	Crushed stone		
1.5	Roots and gravel	14	(+)
3.0	Fill- Firm to Stiff light brown and tan fine to coarse sandy SILT with roots	9	(+)
		5	(-)
		10	(-)
7.5	Stiff fine to coarse sandy SILT with roots		
		11	(+)
12.25	Very dense tan and brown silty medium to coarse SAND	50	(-)
14.0	Auger refusal at 14.0 feet	.2	

PENETRATION-BLOWS PER FT.



(+) Positive for chrysotile asbestos
(-) Negative for chrysotile asbestos

FROEHLING & ROBERTSON, INC.

BORING AND SAMPLING MEETS ASTM D 1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN I.D. SAMPLER 1 FT.

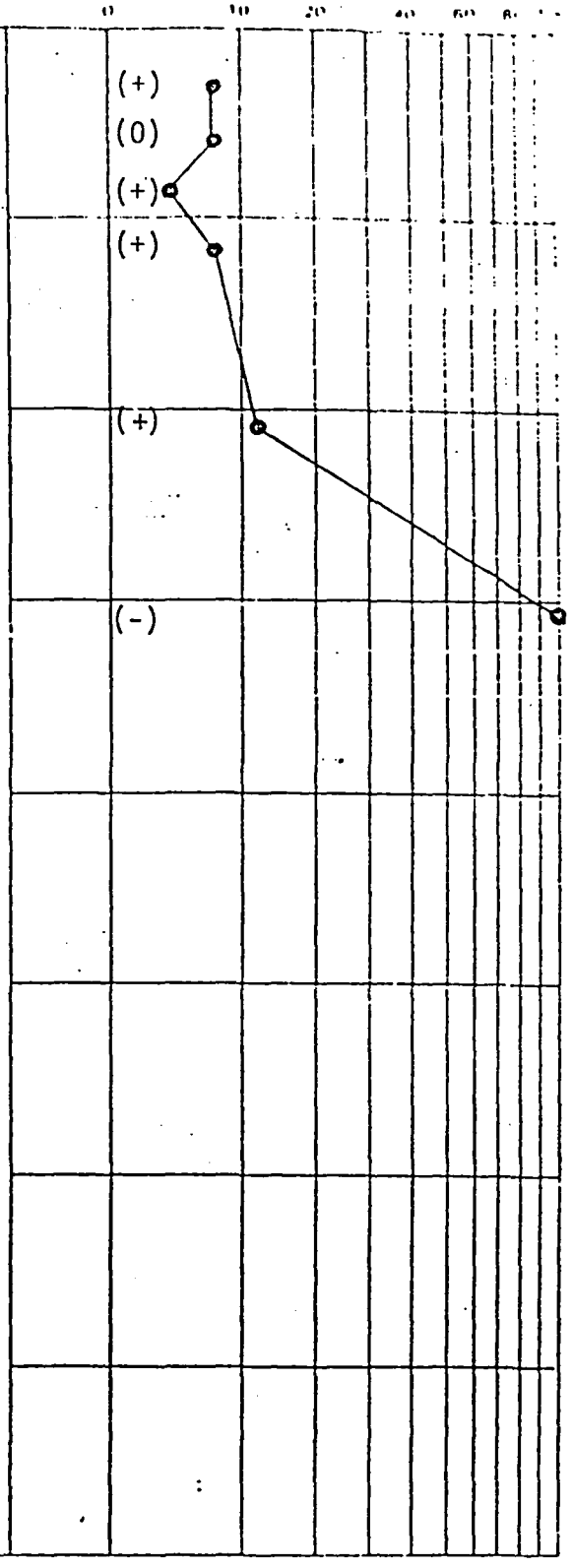
UNDISTURBED SAMPLE

WATER TABLE

TEST BORING RECORD

BORING NO. B-1
DATE DRILLED 5-6-88

DEPTH Ft.	DESCRIPTION	ELEV	PENETRATION BLOWS PER FT.	
0.0	[illegible]	11		
1.[illegible]	[illegible]	7		(+)
[illegible]	[illegible]	7		(0)
4.5	Roots and organics with little clay	5		(+)
	Firm light brown and tan fine sandy CLAY with roots	7		(+)
7.5	Stiff tan fine sandy CLAY	12		(+)
12.25	Very dense tan and grey medium to coarse SAND	50/.5		(-)
18.0	Auger refusal at 18.0 feet			



(+) Positive for chrysotile asbestos
(-) Negative for chrysotile asbestos
(0) No sample received

FROEHLING & ROBERTSON, INC.

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

| 60 | % ROCK CORE RECOVERY

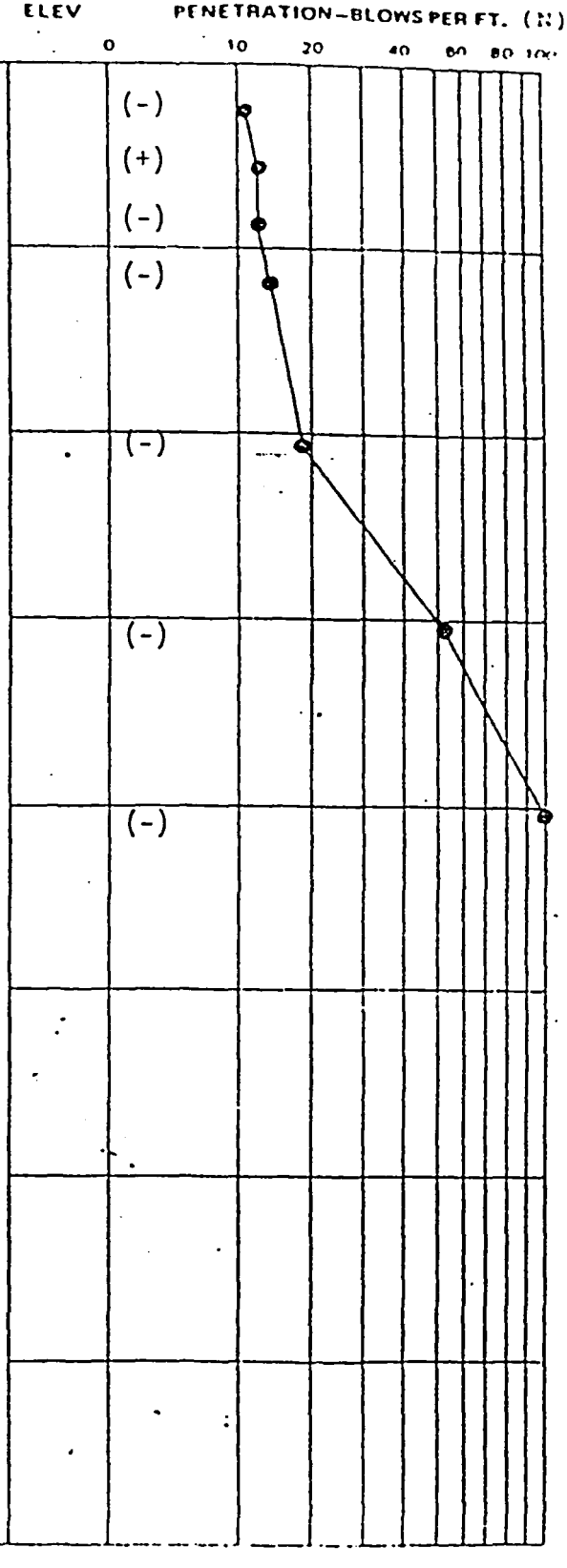
WATER TABLE, 48 HR.
WATER TABLE, 1 HR.

TEST BORING RECORD

BORING NO. B-2
DATE DRILLED 5-6-88
LAB NO. 63
JOB NO. P-63-034

DEPTH FT.	DESCRIPTION	N	ELEV
0.0	Stiff red and brown fine sandy CLAY	11	(-)
1.5	Stiff red and tan fine sandy CLAY with traces of mica	13	(+)
3.0	Stiff red and tan silty CLAY with traces of mica	13	(-)
4.5	Medium light brown, tan and white silty medium to coarse SAND	14	(-)
		19	(-)
12.25	Very dense light brown, tan and grey medium to coarse SAND	53	(-)
20.5	Boring terminated at 20.5 feet	50/.5	(-)

NOTE: No Ground Water Encountered Upon Completion of Drilling



(+) Positive for chrysotile asbestos
(-) Negative for chrysotile asbestos

FROEHLING & ROBERTSON, INC.

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE WATER TABLE 24 HR

TEST BORING RECORD

BORING NO. B-3
DATE DRILLED 5-6-88

Depth in Ft.	Description		Remarks
0.0	Fill material	+	Located directly [illegible] asphalt + gravel.
0.3	STIFF RED TO TAN SILTY CLAY	+	
1.0	STIFF RED TO TAN SILTY CLAY	+	
1.8	STIFF RED TO TAN SILTY CLAY	−	Extension added to split spoon.
2.8	STIFF RED TO TAN SILTY CLAY	+	
3.5			

(+) Positive for Chrysotile asbestos

(-) Negative for chrysotile asbestos

6/14/89

DEPTH IN FT.	DESCRIPTION		REMARKS
0.0	STIFF RED to Orange Silty CLAY Very visual fibrous material	+	
1.0	1.2' - 1.9' Compacted fibers 1.9 - 2.0' STIFF RED TO TAN SILTY CLAY	+	0.8' - 1.2' Gap in core sample possibly due to compaction of fibrous material
2.0			
2.3	STIFF RED TO TAN SILTY CLAY	+	Extension added to splitspoon
	STIFF RED TO TAN SILTY CLAY	+	
3.3	STIFF RED TO TAN SILTY CLAY	−	
4.3	STIFF RED TO TAN SILTY CLAY	+	
5.05			

7/14/89

DEPTH IN FT.	DESCRIPTION		REMARKS
0.0	STIFF RED TO TAN SILTY CLAY	–	
1.0	STIFF RED TO TAN SILTY CLAY	+	
2.0	STIFF RED TO TAN SILTY CLAY	+	
2.95	FIBEROUS MATERIAL, VERY LITTLE RECOVERY	+	EXTENSION ADDED TO SPLITSPOON
3.40			

B5

The pavement was broken & again removed
Two samples were taken at 0.8' (just below pavement and gravel; Fibers were present

Samples

0 - 1.0
1.0 - 1.8 Extension added to split spoon
1.8 - 2.8
2.8 - 3.5

B6

0.0 - 0.8' Red organic clay w/ little to no visible fibers
0.8' - 1.2' Gap (loss of) due to compacting of fibrous material
1.2' - 2.35' First 0.1' compacted fibers, the remainder is clay.
2.35' - 5.05' continue in red clay.

Samples

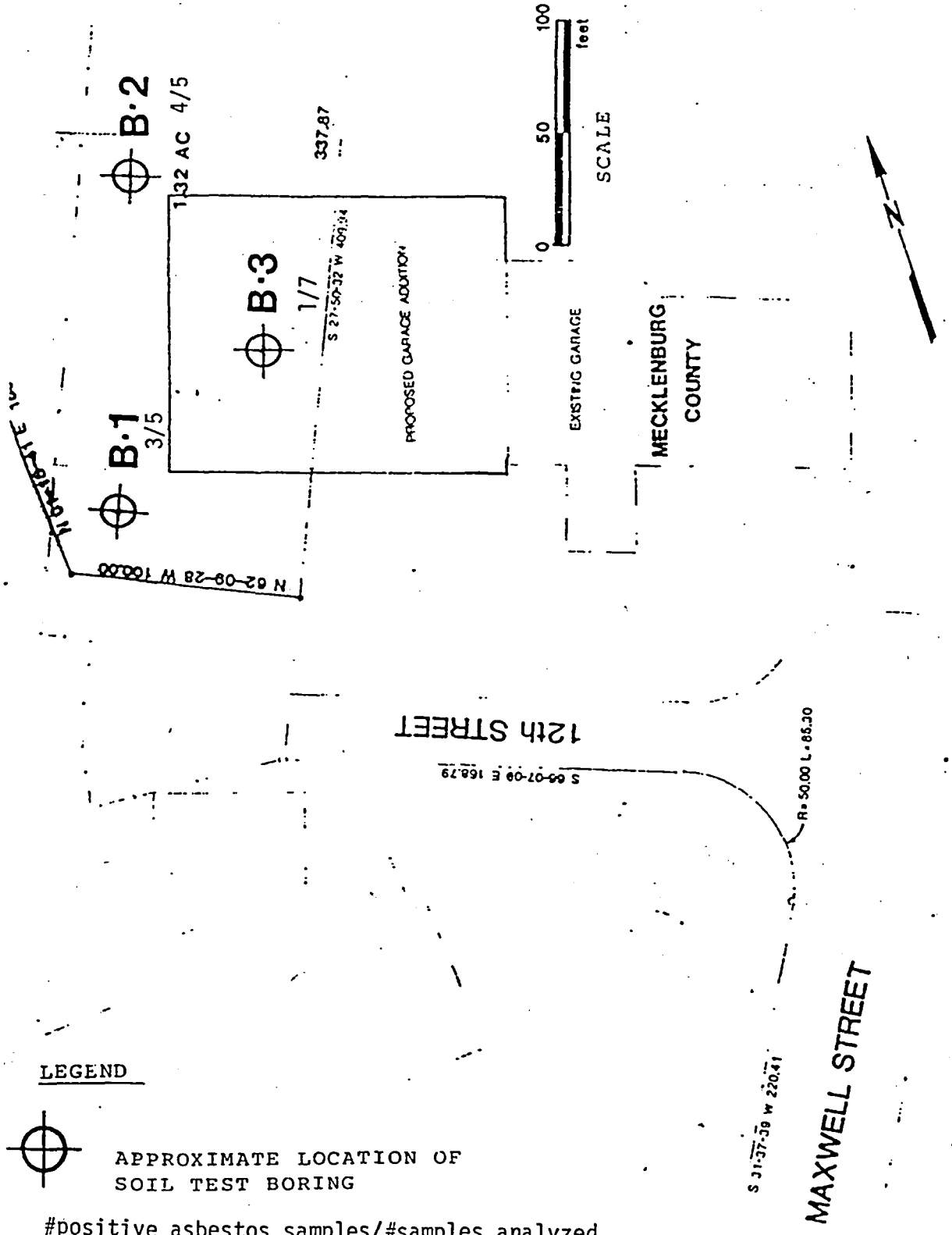
0.0 - 1.0
1.0 - 2.0
2.0 - 2.3 Extension added to split spoon
2.3 - 3.3
3.3 - 4.3
4.3 - 5.05

B7

0.0 - 2.75 Clay (continuous)
2.75 - 3.40 Fibers. (After extension was added very little recovery)

Samples

0.0 - 1.0
1.0 - 2.0
2.0 - 2.95 Extension added to split spoon
2.95 - 3.4



LEGEND

APPROXIMATE LOCATION OF SOIL TEST BORING

#positive asbestos samples/#samples analyzed

FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES • ENGINEERS & CHEMISTS
"OVER ONE HUNDRED YEARS OF SERVICE"

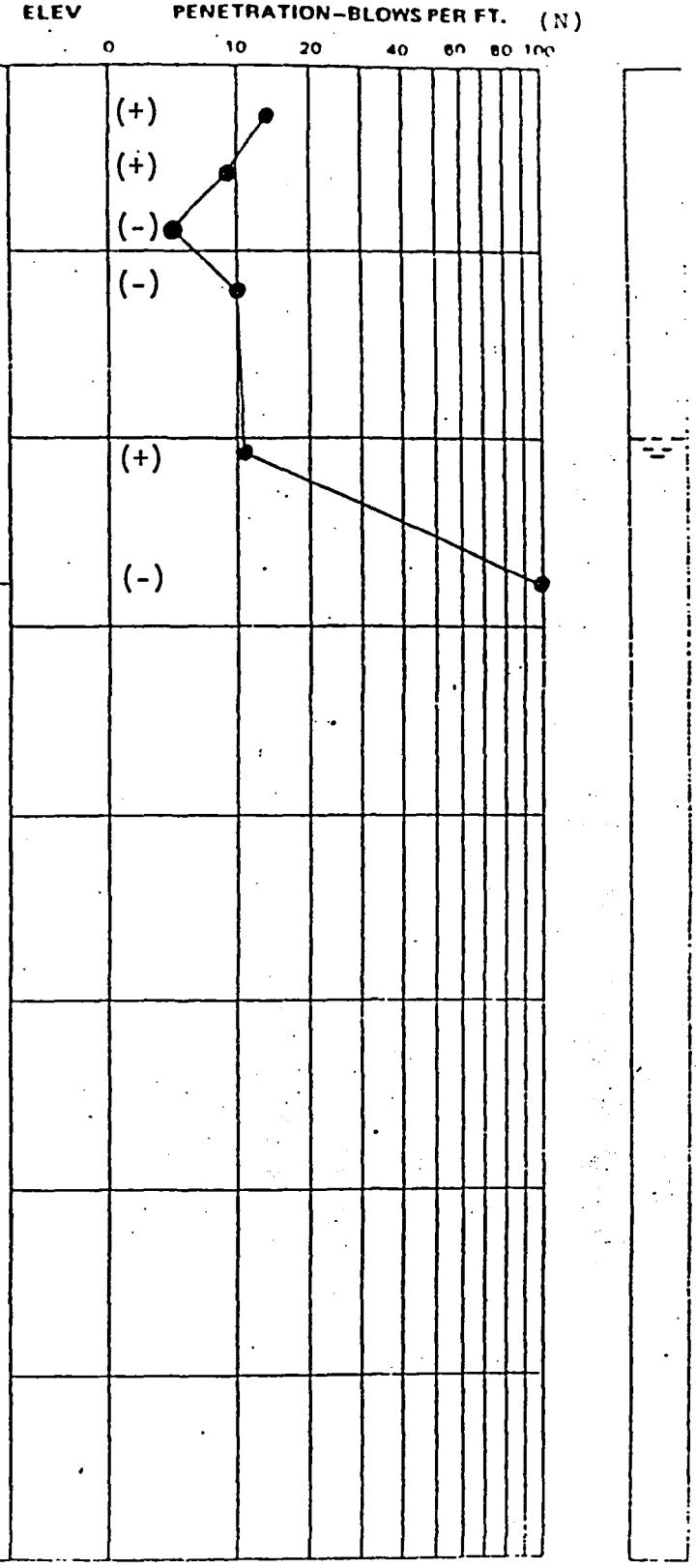
DATE:	5-18-88
SCALE:	AS SHOWN
DRWN:	EB

BORING LOCATION PLAN
MECKLENBURG COUNTY PROPOSED GARAGE ADDITION
CHARLOTTE, NORTH CAROLINA

DWG. NO. 1

Form No.: 103

DEPTH FT.	DESCRIPTION	N	ELEV
0.0	Crushed stone		
1.5	Roots and gravel	14	
3.0	Fill- Firm to Stiff light brown and tan fine to coarse sandy SILT with roots	9	
		5	
		10	
7.5	Stiff fine to coarse sandy SILT with roots		
		11	
12.25	Very dense tan and brown silty medium to coarse SAND	50	
14.0	Auger refusal at 14.0 feet	.2	



(+) Positive for chrysotile asbestos
(-) Negative for chrysotile asbestos

FROEHLING & ROBERTSON, INC.

BORING AND SAMPLING MEETS ASTM D 1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

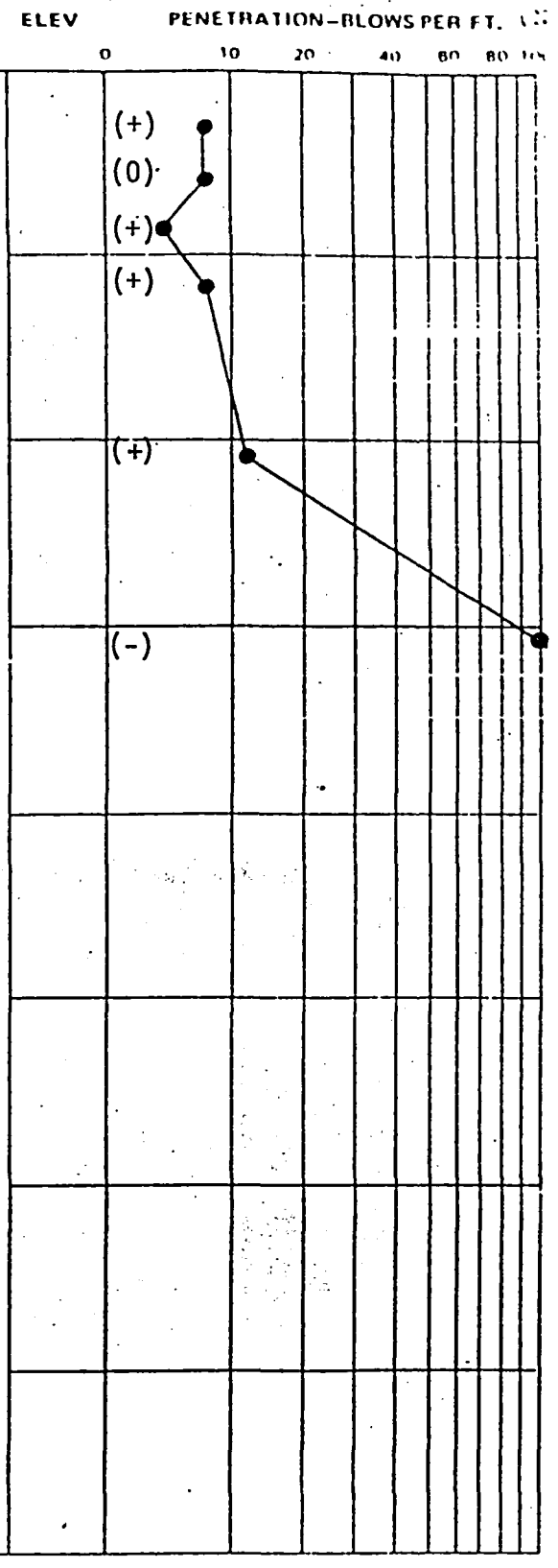
UNDISTURBED SAMPLE

WATER TABLE, 24 HR.
WATER TABLE, 1 HR

TEST BORING RECORD

BORING NO. B-1
DATE DRILLED 5-6-88
LAB NO. 63

DEPTH FT.	DESCRIPTION	ELEV	N
0.0	Crushed stone		7
1.5	Rubble fill		7
3.0	Roots and organics with little clay		5
4.5	Firm light brown and tan fine sandy CLAY with roots		7
7.5	Stiff tan fine sandy CLAY		12
12.25	Very dense tan and grey medium to coarse SAND		50/.5
18.0	Auger refusal at 18.0 feet		



(+) Positive for chrysotile asbestos
(-) Negative for chrysotile asbestos
(0) No sample received

FROEHLING & ROBERTSON, INC.

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

| 60 | % ROCK CORE RECOVERY

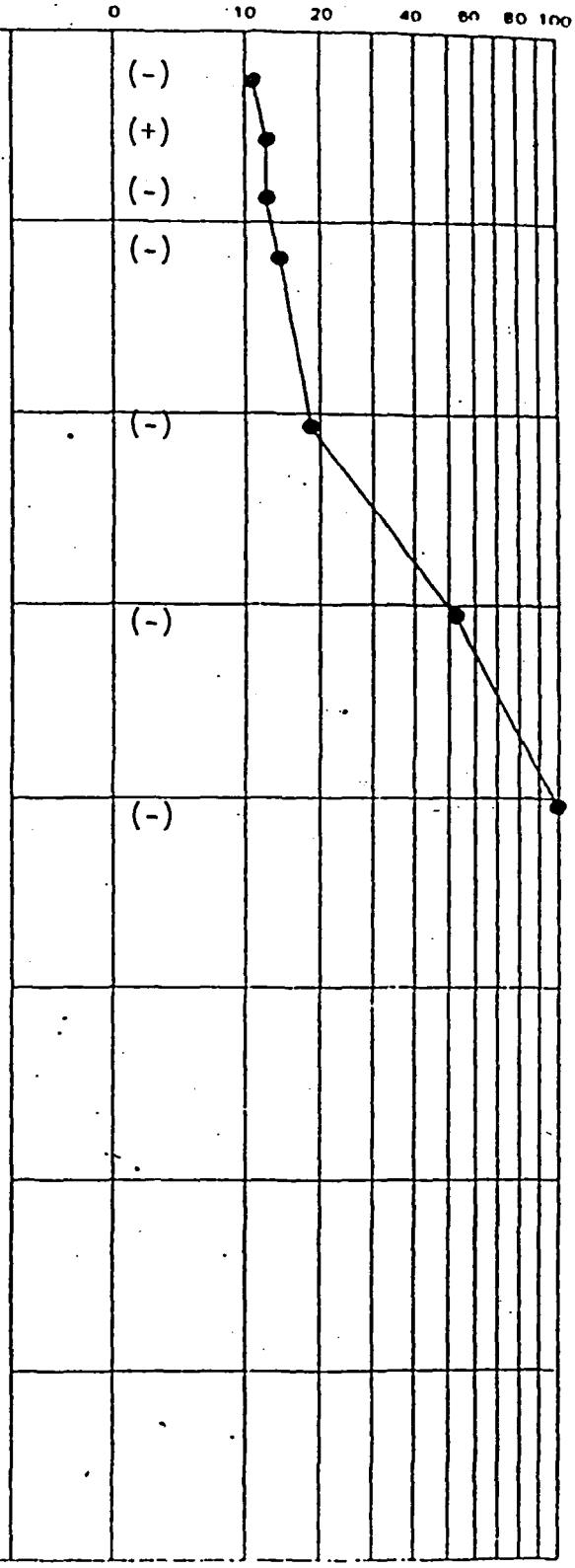
WATER TABLE, 48 HR.
WATER TABLE, 1 HR.
◀ LOSS OF DRILLING WATER

TEST BORING RECORD

BORING NO. B-2
DATE DRILLED 5-6-88
LAB NO. 63
JOB NO. P-63-034

DEPTH FT.	DESCRIPTION	N	ELEV	PENETRATION–BLOWS PER FT. (N)
0.0	Stiff red and brown fine sandy CLAY	11	(-)	
1.5	Stiff red and tan fine sandy CLAY with traces of mica	13	(+)	
3.0	Stiff red and tan silty CLAY with traces of mica	13	(-)	
4.5	Medium light brown, tan and white silty medium to coarse SAND	14	(-)	
		19	(-)	
12.25	Very dense light brown, tan and grey medium to coarse SAND	53	(-)	
20.5	Boring terminated at 20.5 feet	50/.5	(-)	

NOTE: No Ground Water Encountered Upon Completion of Drilling



(+) Positive for chrysotile asbestos
(-) Negative for chrysotile asbestos

FROEHLING & ROBERTSON, INC.

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

60 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

TEST BORING RECORD

BORING NO. B-3

DATE DRILLED 5-6-88

LAB NO. 63

Appendix C

References

REFERENCES

1. Preliminary Assessment letter and form (EPA form 2070-12/7-81) for Southern Manufacturing, Inc., prepared by Grover Nicholson, 11-27-85.

2. Durway, D.M., memo re. telephone conversation with Don Willard, 9-6-88.

3. Willard, D.R., memo to Bobby Shields re Southern Manufacturing Property, 6-22-88, and attached Froehling and Robertson soil test boring logs.

4. Charlotte-Mecklenburg Utility Department, water and sewer distribution system map, 2-86.

5. Nicholson, Grover, memo re. Southern Manufacturing, 11-27-85.

6. NC Department of National Resources and Community Development, Division of Environmental Management, administrative code section 15 NCAC 2 B .0100-.0200, effective 1-1-85.

7. NC Department of Natural Resources and Community Development, classifications and water quality standards assigned to the waters of the Catawba River basin, from 15 NCAC 2B. 0308.

8. Strickland, O.W., letter to S.D. Roberton, 8-27-84.

9. NC Department of Human Resources, Division of Health Services, application for change in classification under RCRA, re: Southern Manufacturing, 6-17-84.

10. NC Department of Human Resources, Division of Health Services, small hazardous waste generator survey, DHS form 3061, re: Southern Manufacturing, 9-27-82.

11. US Department of Agriculture, Soil Conservation Service, Soil Survey of Mecklenburg County, North Carolina, issued 6-80.

12. Mecklenburg County tract and block number map, and census information, 1980, and attachment.

13. US Environmental Protection Agency, RCRA permit application (EPA form 3510-1/6-80) from Southern Textile Corporation, and attachments.

14. Mecklenburg County Department of Environmental Health Air Quality Control Section, Certificate of Operation, Southern Textile Corporation, issued 4-10-80.

15. Legrand, H.E. and M.J. Mundorff, Geology and Ground Water in the North Carolina Area, USGS Bulletin No. 63, 1952.

16. Heath, R.C., Basic Elements of Ground Water Hydrology with Reference to Conditions in North Carolina, USGS open file report 80-44, 1980.

17. Adams, J., letter to M. Durway re. ground water and surface water use, 9-88.

18. Parker, W.T., letter to P. DeRosa, 6-21-85, and attachments.

19. Durway, D.M., memo re. irrigation and agriculture near Southern Manufacturing, 9-20-88.

20. Uncontrolled Hazardous Waste Site Ranking System: A Users Manual, published in the Federal Register, July 16, 1982.

21. Durway, D.M., memo re. site accessibility at Southern Manufacturing 9-19-88.

22. Durway, D.M., memo to G. Nicholson re. recommendation from J. Gibson, 3-14-89.

23. Durway, D.M., letter to R. Morris re. site sampling visit summary trip report for Southern Manufacturing, 3-15-89.

DMD/SOMFG.SI

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

20 December 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
Southern Manufacturing, Inc. NC D990715658
Formerly: Southern Textile
1000 Seaboard Street
Charlotte, NC 28206

Dear Ms. Bland:

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

A. This facility began operations in 1920 as an asbestos textile plant. It is owned by Southern Industrial Products, Inc., doing business as Southern Manufacturing, Inc., 1000 Seaboard Street, Charlotte, NC 28206. The production process in the past has consisted of the manufacture of asbestos yarn, cloth, rope, tubing, wick, and tape. About 250 tons of asbestos dust was generated each year. Presently, however, asbestos has been replaced by fiberglass and Kelvar in the production process. Asbestos products are produced only on order.

B. Asbestos dust, as a waste, was put in polyethylene bags, placed in the on-site dumpster, and taken to the Charlotte city landfill for disposal. No hazardous wastes are generated. Asbestos has been delisted as a hazardous waste and the facility has been delisted as a generator.

C. A company representative reports that there has been no burial, treatment, or disposal of hazardous wastes on-site. However, since the facility has been in operation since 1920 and since past waste generating and disposal practices are not clear, a Low priority for inspection is recommended.

D. Data sources are listed on EPA Form 2070-12.

On 19 December 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: Fay Sweat, Groundwater Section and Glen Ross, Air Quality Section.

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

Sincerely,

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

GN/tb/0210b

NAME CHANGE: FORMERLY SOUTHERN TEXTILE

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NC	D990715658

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Southern Manufacturing, Inc.	1000 Seaboard St., P.O. Box 32427 28232

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Charlotte	NC	28206	Mecklenburg	60	09

09 COORDINATES LATITUDE	LONGITUDE
35 14 22 .	080 50 45 .

10 DIRECTIONS TO SITE (Starting from nearest public road)

From I-77 in Charlotte, exit onto Trade St. going southeast. Go about 3000 ft. on Trade St. to Graham St. Go northeast on Graham St. 5 blocks to 8th St. Go northwest one block to Smith St. Go northeast on Smith St. two blocks to Seaboard St.

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)
Southern Industrial Products, Inc. (Doing Business As) Southern Manufacturing, Inc.	1000 Seaboard St.

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
Charlotte	NC	28206	(704) 372-2880

07 OPERATOR (If known and different from owner)	08 STREET (Business, mailing, residential)

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
			( )

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: 08/29/80 (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

1920 (BEGINNING YEAR) | Present (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

This company applied for interim status under RCRA because of waste asbestos dust generated during the manufacture of asbestos yarn, cloth, rope, tubing, wick, and tape. Estimated annual quantity of asbestos was set at 240 tons.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

The dust was put in polyethylene bags, placed in a dumpster, and eventually taken to the city landfill. Reportedly, no other hazardous wastes were generated. Asbestos has been delisted as a hazardous waste and the company has been delisted as a generator and storer.

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
S.D. Robertson, V.P. of Manufacturing	Southern Manufacturing, Inc.	(704) 372-2880

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Grover Nicholson	NC DHR/DHS	SHW Mgmt. Br.	919 733-2178	11 27 85 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

SOUTHERN MNFG. INC.
NCD 990 715 658
CHARLOTTE EAST QUADRANGLE
NORTH CAROLINA–MECKLINBURG CO
7.5 MINUTE SERIES (TOPOGRAPHIC)
SCALE 1:24000
1 MILE
7000 FEET
1 KILOMETER
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
MN
GN
4½°
80 MILS
0°06'
2 MILS
UTM GRID AND 1980 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET
Johnson Smith University
Fairview Sch
Pinewood Cem
Bryan Park
Good Samaritan Hospital
Second Ward High Sch
Central Piedmont Community College
Thompson Orphanage
Dilworth Sch
Presbyterian Hospital
Independence Park
Piedmont Jr High Sch
Alexander Sch
First Ward Sch
Radio Tower (WSOC)
Water Tank

September 6, 1988

TO: FILE

FROM: D. MARK DURWAY DMD

RE: TELEPHONE CONVERSATIONS WITH DON WILLARD RE. SOUTHERN MANUFACTURING

On 8-31-88 and 9-2-88, I spoke to Donald R. Willard, Division Manager with the Mecklenburg County Department of Environmental Protection (tel. 704/376-4603) about the county's interest in purchasing part of the Southern Manufacturing property on Seaboard Street in downtown Charlotte. Mr. Willard provided me with the following information:

1) Mecklenburg County will purchase part of the parking lot by the end of 1989. The lot is or will be paved.

2) Ground water is not used for drinking purposes within the site vicinity, as far as he is aware, since CMUD (Charlotte-Mecklenburg Utilities Department) water is available within the area.

3) Based on soil borings and other information, he doesn't believe that the site poses a public health threat.

4) Irwin Creek, which would receive any runoff from the site, has been designated by NC NRCD as a Class C stream.

Mountain Island Lake, NC
1969

DERITA, N. C.
N3515—W8045/7.5
1972

SOUTHERN MANUFACTURING CO.
(NCD 990715658)

CHARLOTTE WEST, N. C.
N3507.5—W8052.5/7.5
1968
PHOTOREVISED 1975

CHARLOTTE EAST, N. C.
N3507.5—W8045/7.5
1967

MN GN
4½°
80 MILS
0°06'
2 MILS

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 MILE
5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

Mountain Island Lake, NC
1969

DERITA, N. C.
N3515—W8045/7.5
1972

SOUTHERN MANUFACTURING CO.
(NCD 990715658)

CHARLOTTE WEST, N. C.
N3507.5—W8052.5/7.5
1968
PHOTOREVISED 1950

CHARLOTTE EAST, N. C.
N3507.5—W8045/7.5

SCALE 1:24 000

1 MILE
7000 FEET
1 KILOMETER

4½°
80 MILS
0°06'
2 MILS

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

26'.4

MECKLENBURG COUNTY
Department of Environmental Protection

June 22, 1988

M E M O R A N D U M

TO: Bobby Shields, Deputy Director
County Engineering

FROM: Don R. Willard, Division Manager

SUBJECT: Southern Manufacturing Property

Attached are the results completed on June 14, 1988 from the soil samples taken by the Health Department and the Department of Environmental Protection (DEP) . Asbestos was analyzed at all three new sites (B5-B7) located at the building perimeter. All samples were analyzed for the presence of asbestos by the DEP lab. Samples were not analyzed for percent volume asbestos since it would be extremely time consuming and unnecessary for the information required for a decision to purchase the property. The results from sites B1 through B3 and B5 through B7 are summarized as follows:

Site	#Positive Samples/ #Samples	Depth Range of Samples (ft.) Min.	Max.
B1	3/5	0	12.5
B2	4/5	0	12.5
B3	1/7		1.5
B5	4/5	0.0	3.5
B6	5/6	0.0	5.5
B7	3/4	1.0	3.4

Comments

- Results indicate that a large part if not all the property in question is contaminated with asbestos just below the surface and to depths of 12.5 feet. Any soil contaminated with asbestos would necessarily be required to be treated as asbestos.
- Any disturbance of asbestos would require special handling and DEP should be consulted in advance. This action would help to prevent unnecessary public exposure and worker exposure, limit County liability and insure proper handling of this toxic substance.

1200 Blythe Boulevard • Charlotte, North Carolina 28203 • (704) 376-4603

- DEP knows of no current requirements to remove the asbestos and therefore believes the best management practice is to leave it in place with a minimum cover of 2 feet of stabilized material. This cover should be maintained indefinitely. There are no guarantees that this management practice will be considered adequate in the future.
- It is DEP's understanding that NCGS 130A-310.8 "Abandoned Sites Law" would require the site to be recorded with the Register of Deeds. It is our understanding that the site is already on the "Wasteland Report 20", (approximately 750 potential superfund sites). Sites on this list must be addressed. Lee Crosby, Head, North Carolina Superfund Branch is in the process of discussing the site with EPA and having it ranked which will provide more insight into any future actions needed.

I will continue to update you as new information is received.

Please contact if you have any further questions.

DRW/sce

cc: Marie Shook
County Manager

Marvin Bethune
County Attorney

Ken Hoffman
Engineering Department

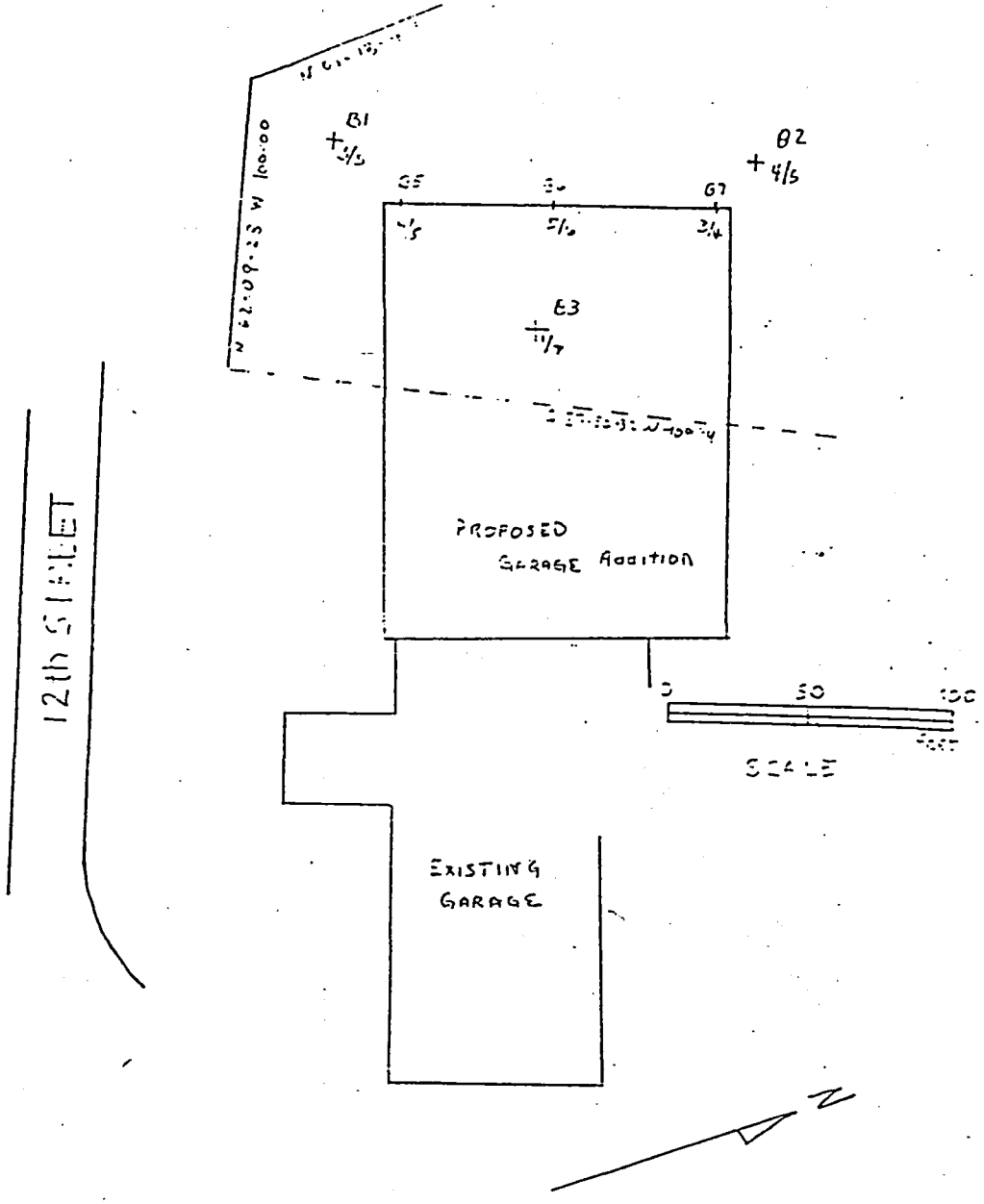
Bobby Cobb
Health Department

John M. Barry
DEP

Randy Goers
County Garage

Results of Soil Test Boring

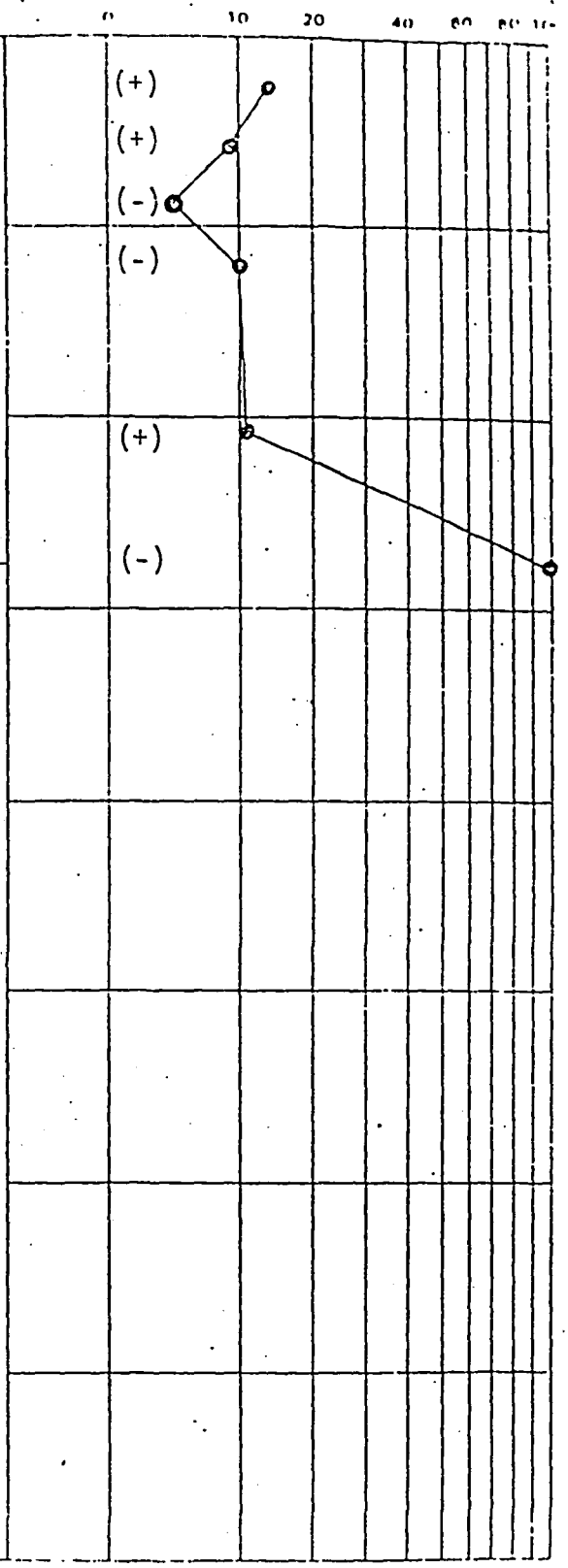
Proposed Garage Addition
June 14, 1988



Legend

+ Boring Sites
# Positive Asbestos samples/#Samples Analyzed

DEPTH FT.	DESCRIPTION	N	ELEV	PENETRATION–BLOWS PER FT.
0.0	Crushed stone	1.5		(+)
1.5	Roots and gravel	9		(+)
3.0	Fill- Firm to Stiff light brown and tan fine to coarse sandy SILT with roots	5		(-)
		10		(-)
7.5	Stiff fine to coarse sandy SILT with roots	11		(+)
12.25	Very dense tan and brown silty medium to coarse SAND	50		(-)
14.0	Auger refusal at 14.0 feet	.2		



(+) Positive for chrysotile asbestos
(-) Negative for chrysotile asbestos

FROEHLING & ROBERTSON, INC.

BORING AND SAMPLING MEETS ASTM D 1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN I.D. SAMPLER 1 FT.

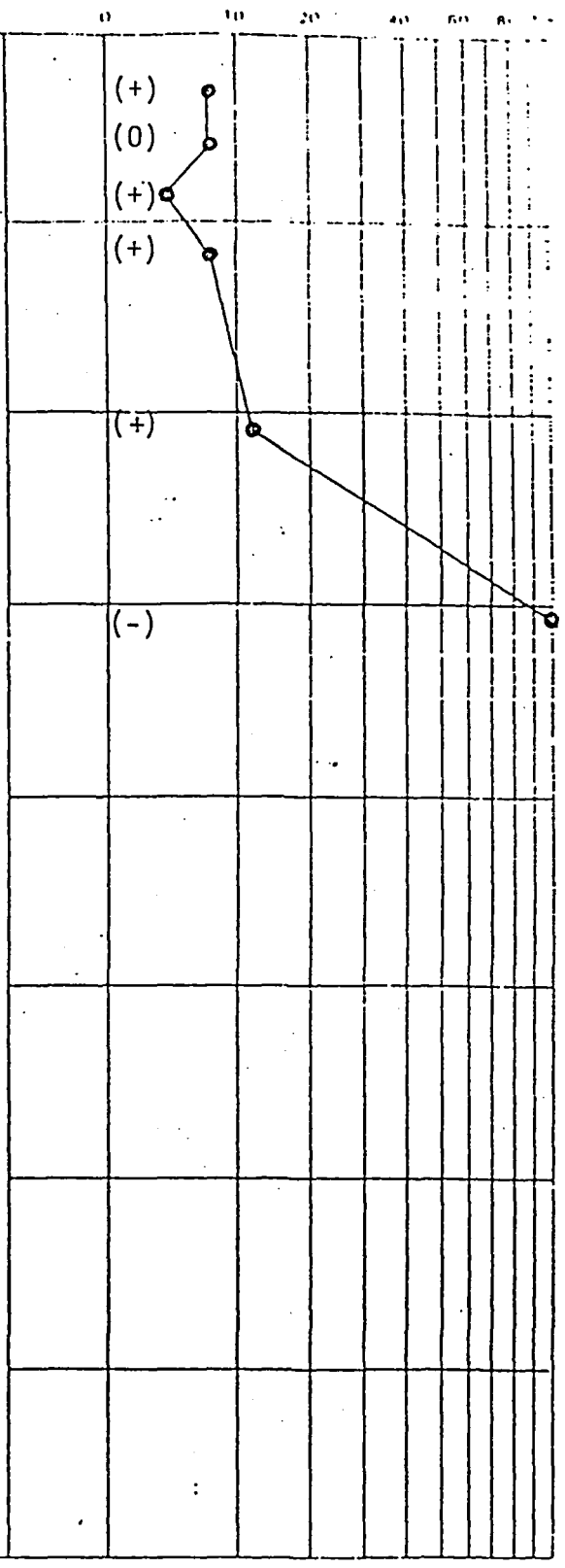
UNDISTURBED SAMPLE — WATER TABLE

TEST BORING RECORD

BORING NO. B-1
DATE DRILLED 5-6-88

DEPTH Ft.	DESCRIPTION	ELEV	PENETRATION BLOWS PER FT.
0.0	Topsoil [illegible]		
1.[illegible]	Sandy fill		
[illegible]	Roots and organics with little clay		
4.5	Firm light brown and tan fine sandy CLAY with roots		
7.5	Stiff tan fine sandy CLAY		
12.25	Very dense tan and grey medium to coarse SAND		
18.0	Auger refusal at 18.0 feet		

Blows	Result
7	(+)
7	(0)
5	(+)
7	(+)
12	(+)
50/.5	(-)



(+) Positive for chrysotile asbestos
(-) Negative for chrysotile asbestos
(0) No sample received

FROEHLING & ROBERTSON, INC.

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

| 60 | × ROCK CORE RECOVERY

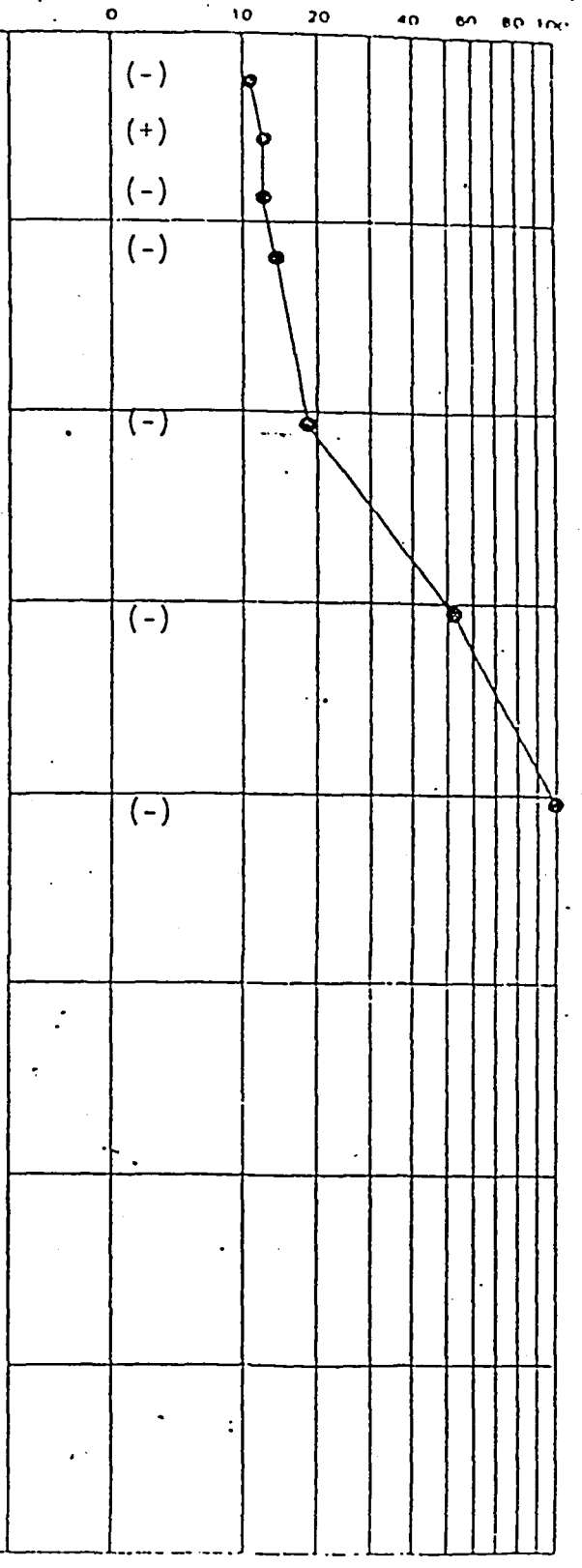
WATER TABLE, 48 HR.
WATER TABLE, 1 HR.

TEST BORING RECORD

BORING NO. B-2
DATE DRILLED 5-6-88
LAB NO. 63
JOB NO. P-63-034

DEPTH FT.	DESCRIPTION	N	ELEV
0.0	Stiff red and brown fine sandy CLAY	11	(-)
1.5	Stiff red and tan fine sandy CLAY with traces of mica	13	(+)
3.0	Stiff red and tan silty CLAY with traces of mica	13	(-)
4.5	Medium light brown, tan and white silty medium to coarse SAND	14	(-)
		19	(-)
12.25	Very dense light brown, tan and grey medium to coarse SAND	53	(-)
20.5	Boring terminated at 20.5 feet	50/.5	(-)

NOTE: No Ground Water Encountered Upon Completion of Drilling



(+) Positive for chrysotile asbestos
(-) Negative for chrysotile asbestos

FROEHLING & ROBERTSON, INC.

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

WATER TABLE 24 HR

TEST BORING RECORD

BORING NO. B-3

DATE DRILLED 5-6-88

Depth in ft.	Description		Remarks
0.0	Fill/road material	+	Located adjacent [illegible] asphalt + curb.
0.3	STIFF RED TO TAN SILTY CLAY	+	
1.0	STIFF RED TO TAN SILTY CLAY	+	
1.8	STIFF RED TO TAN SILTY CLAY	−	Extension added to split spoon.
2.8	STIFF RED TO TAN SILTY CLAY	+	
3.5			

(+) Positive for Chrysotile asbestos

(−) Negative for chrysotile asbestos

6/14/89

DEPTH IN FT.	DESCRIPTIONS		REMARKS
0.0	STIFF RED to Orange Silty CLAY w/ visual fibrous material	+	0.8'-1.2' Gap in core sample possibly due to compaction of fibrous material
1.0	1.2'-1.9' Compacted fibres 1.9-2.0' STIFF RED TO TAN SILTY CLAY	+	
2.0			
2.3	STIFF RED TO TAN SILTY CLAY	+	Extension added to splitspoon
	STIFF RED TO TAN SILTY CLAY	+	
3.3	STIFF RED TO TAN SILTY CLAY	−	
4.3	STIFF RED TO TAN SILTY CLAY	+	
5.05			

7/14/88

DEPTH IN FT.	DESCRIPTION		REMARKS
0.0	STIFF RED TO TAN SILTY CLAY	−	
1.0	STIFF RED TO TAN SILTY CLAY	+	
2.0	STIFF RED TO TAN SILTY CLAY	+	
2.95	FIBEROUS MATERIAL, VERY LITTLE RECOVERY	+	EXTENSION ADDED TO SPLITSPOON
3.45			

B5

The pavement was broken & then removed
Two samples were taken at 0.8' (just below pavement and gravel) Fibers were present

Samples

0 - 1.0
1.0 - 1.8 Extension added to split spoon
1.8 - 2.8
2.8 - 3.5

B6

0.0 - 0.8' [illegible] little to no visible fibers
0.8' - 1.2' Gap (possibly due to compaction of fibrous material
1.2' - 2.35' First 0.1' compacted fibers, the remainder is clay.
2.35' - 5.05' Continue in red clay.

Samples

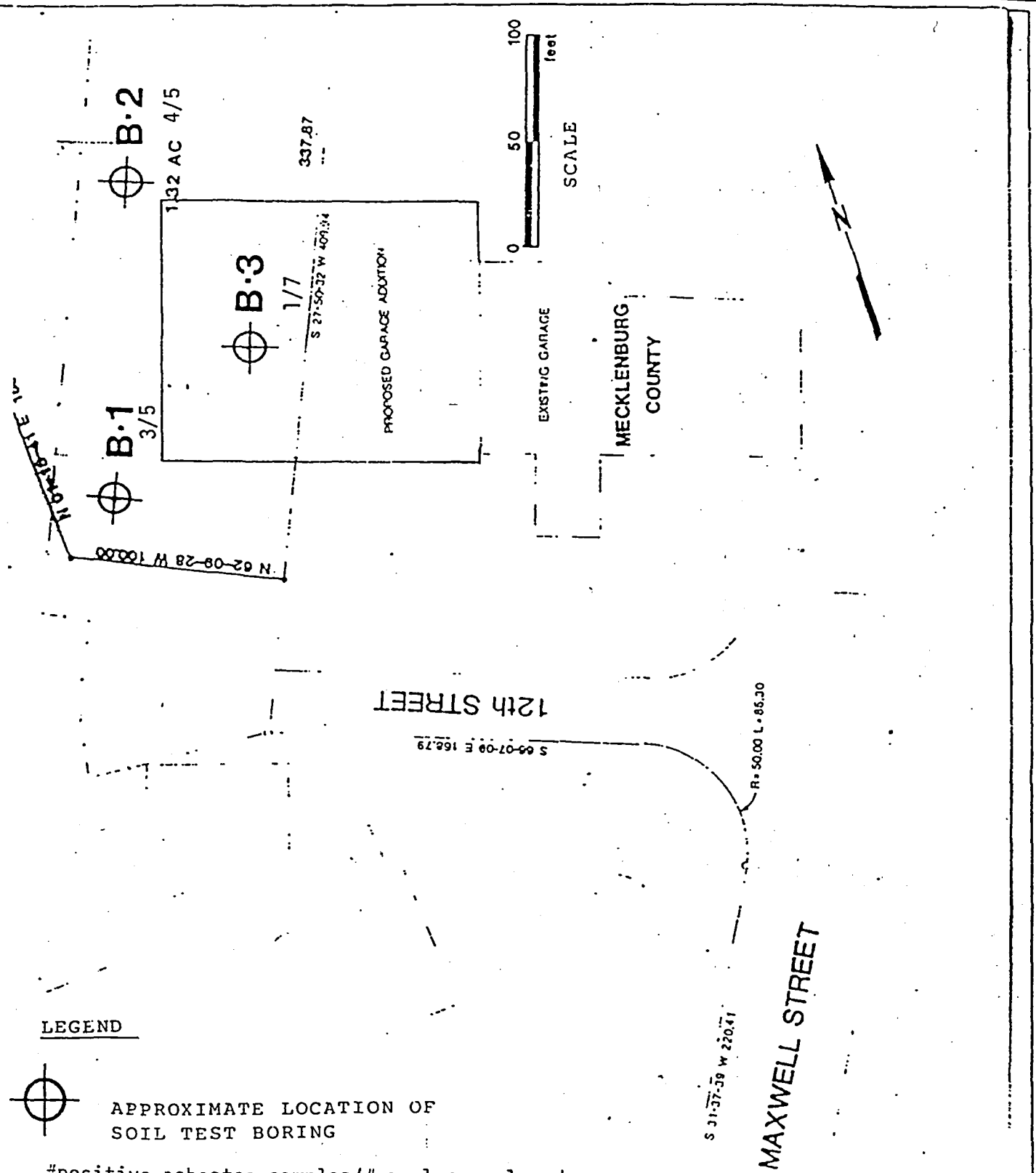
0.0 - 1.0
1.0 - 2.0
2.0 - 2.3 Extension added to split spoon
2.3 - 3.3
3.3 - 4.3
4.3 - 5.05

B7

0.0 - 2.75 Clay [illegible]
2.75 - 3.40 Fibers. (After extension was added very little recovery)

Samples

0.0 - 1.0
1.0 - 2.0
2.0 - 2.95 Extension added to split spoon
2.95 - 3.4



LEGEND

APPROXIMATE LOCATION OF SOIL TEST BORING

#positive asbestos samples/#samples analyzed

FROEHLING & ROBERTSON, INC.
FULL SERVICE LABORATORIES • ENGINEERS & CHEMISTS
"OVER ONE HUNDRED YEARS OF SERVICE"

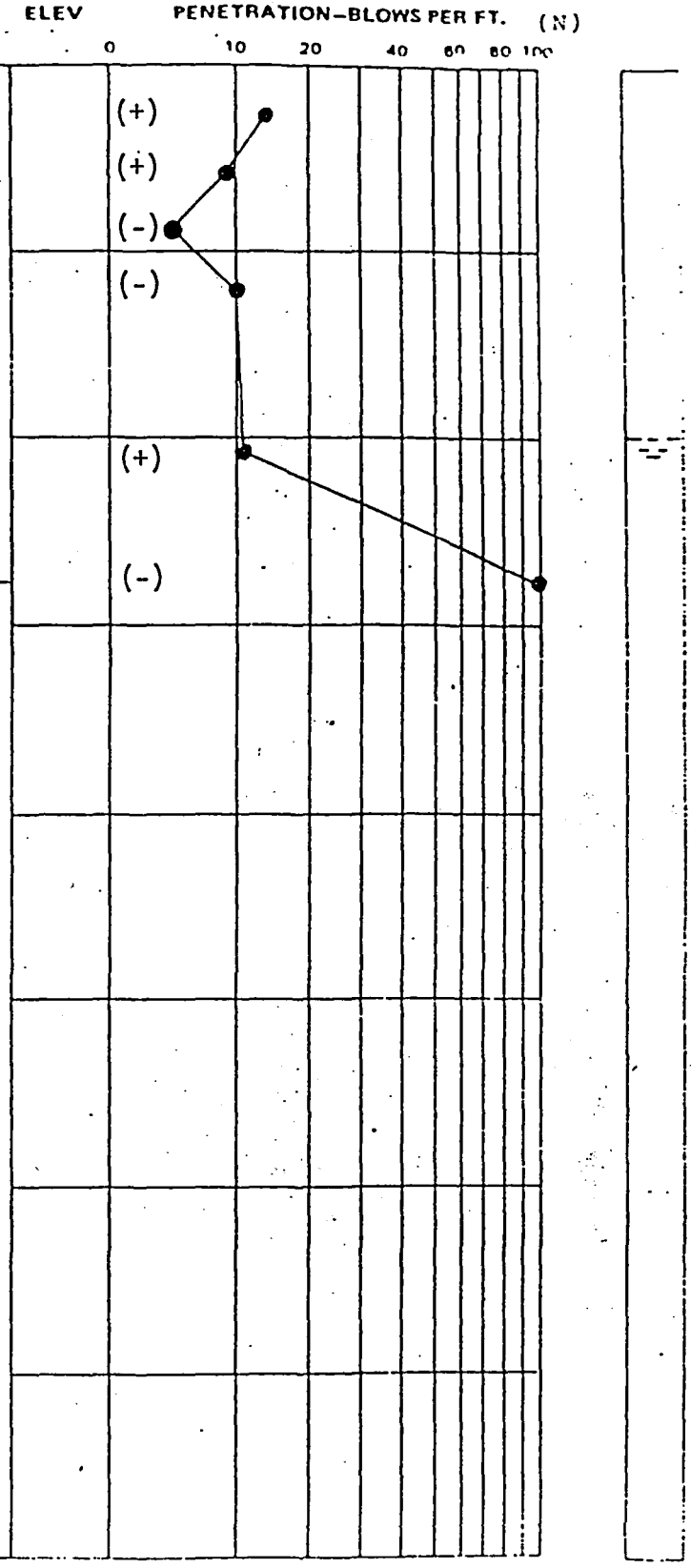
DATE:	5-18-88
SCALE:	AS SHOWN
DRWN:	EB

BORING LOCATION PLAN
MECKLENBURG COUNTY PROPOSED GARAGE ADDITION
CHARLOTTE, NORTH CAROLINA

DWG. NO. 1

Form No. 1

DEPTH FT.	DESCRIPTION	N	ELEV
0.0	Crushed stone		
1.5	Roots and gravel	14	
3.0	Fill- Firm to Stiff light brown and tan fine to coarse sandy SILT with roots	9	
		5	
		10	
7.5	Stiff fine to coarse sandy SILT with roots		
		11	
12.25	Very dense tan and brown silty medium to coarse SAND	50	
14.0	Auger refusal at 14.0 feet	.2	



(+) Positive for chrysotile asbestos
(-) Negative for chrysotile asbestos

FROEHLING & ROBERTSON, INC.

BORING AND SAMPLING MEETS ASTM D 1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

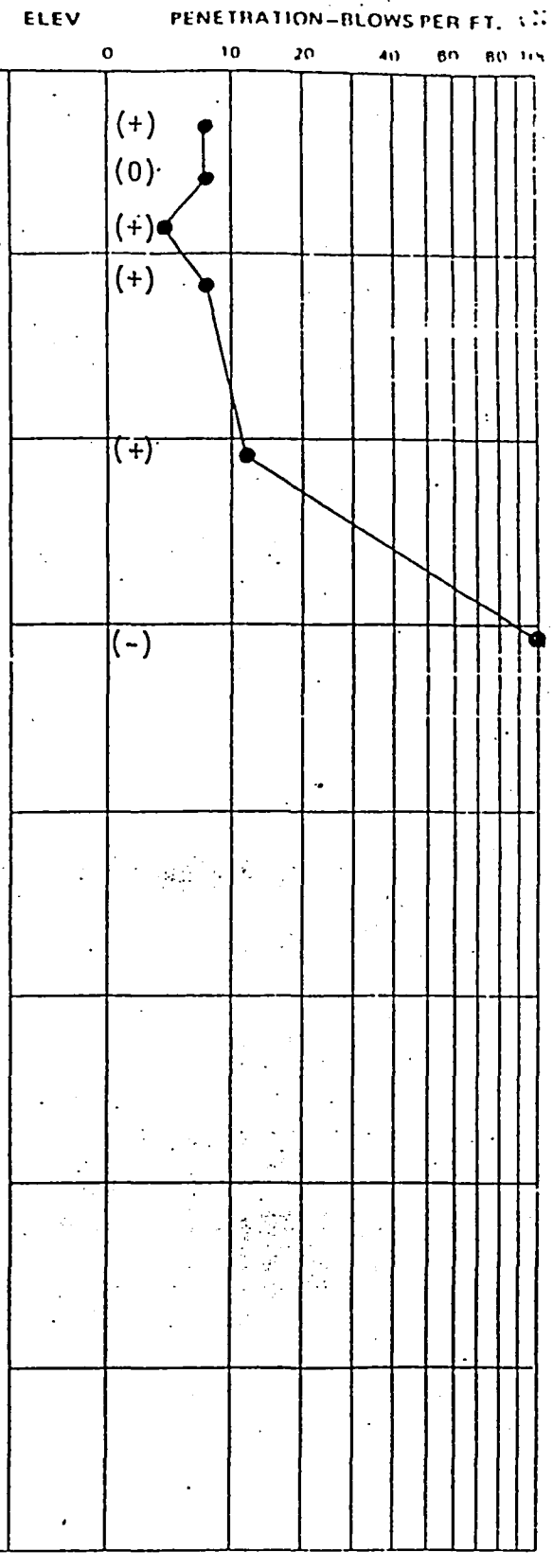
UNDISTURBED SAMPLE

WATER TABLE, 24 HR.

TEST BORING RECORD

BORING NO. B-1
DATE DRILLED 5-6-88
LA 63

DEPTH FT.	DESCRIPTION	N	ELEV
0.0			
	Crushed stone	7	
1.5			
	Rubble fill	7	
3.0			
	Roots and organics with little clay	5	
4.5			
	Firm light brown and tan fine sandy CLAY with roots	7	
7.5			
	Stiff tan fine sandy CLAY	12	
12.25			
	Very dense tan and grey medium to coarse SAND	50/.5	
18.0			
	Auger refusal at 18.0 feet		



(+) Positive for chrysotile asbestos
(-) Negative for chrysotile asbestos
(0) No sample received

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CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

| 60 | % ROCK CORE RECOVERY

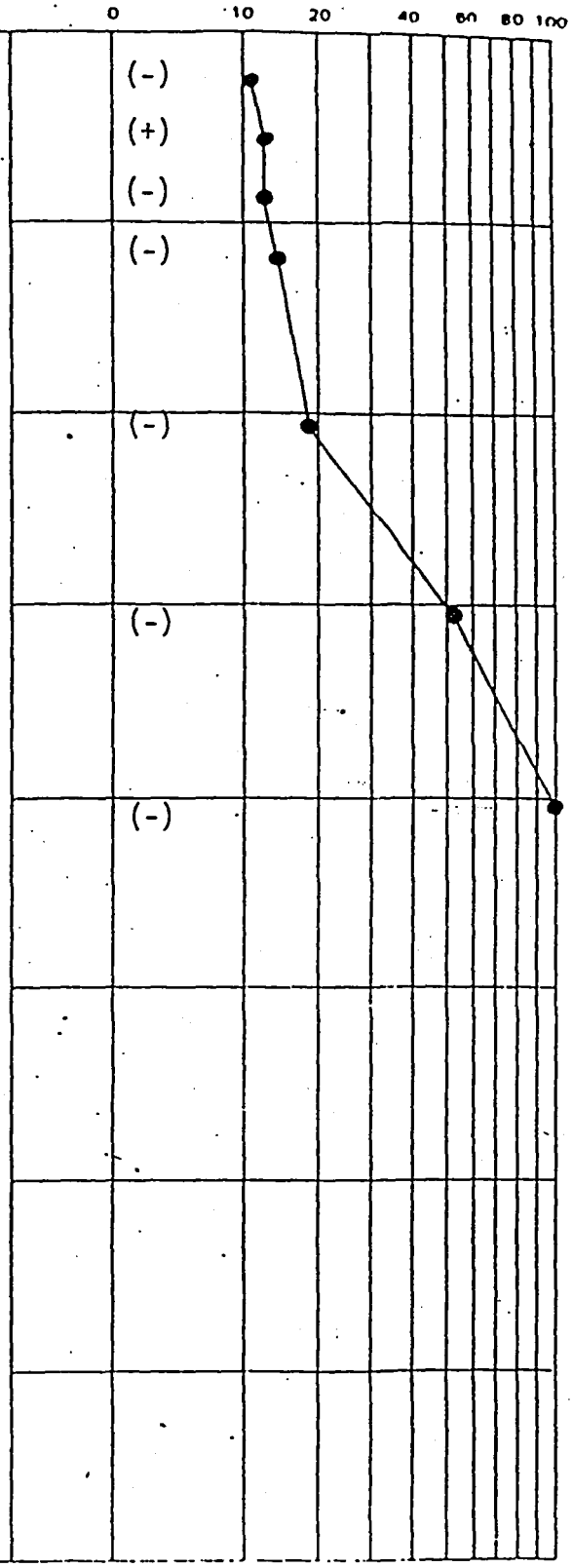
WATER TABLE, 48 HR.
WATER TABLE, 1 HR.
◀ LOSS OF DRILLING WATER

TEST BORING RECORD

BORING NO. B-2
DATE DRILLED 5-6-88
LAB NO. 63
JOB NO. P-63-034

DEPTH FT.	DESCRIPTION	N	ELEV	PENETRATION–BLOWS PER FT. (N)
0.0	Stiff red and brown fine sandy CLAY	11	(-)	
1.5	Stiff red and tan fine sandy CLAY with traces of mica	13	(+)	
3.0	Stiff red and tan silty CLAY with traces of mica	13	(-)	
4.5	Medium light brown, tan and white silty medium to coarse SAND	14	(-)	
		19	(-)	
12.25	Very dense light brown, tan and grey medium to coarse SAND	53	(-)	
20.5	Boring terminated at 20.5 feet	50/.5	(-)	

NOTE: No Ground Water Encountered Upon Completion of Drilling



(+) Positive for chrysotile asbestos
(-) Negative for chrysotile asbestos

FROEHLING & ROBERTSON, INC.

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

WATER TABLE, 24 HR.

WATER TAB

TEST BORING RECORD

BORING NO. B-3

DATE DRILLED 5-6-88

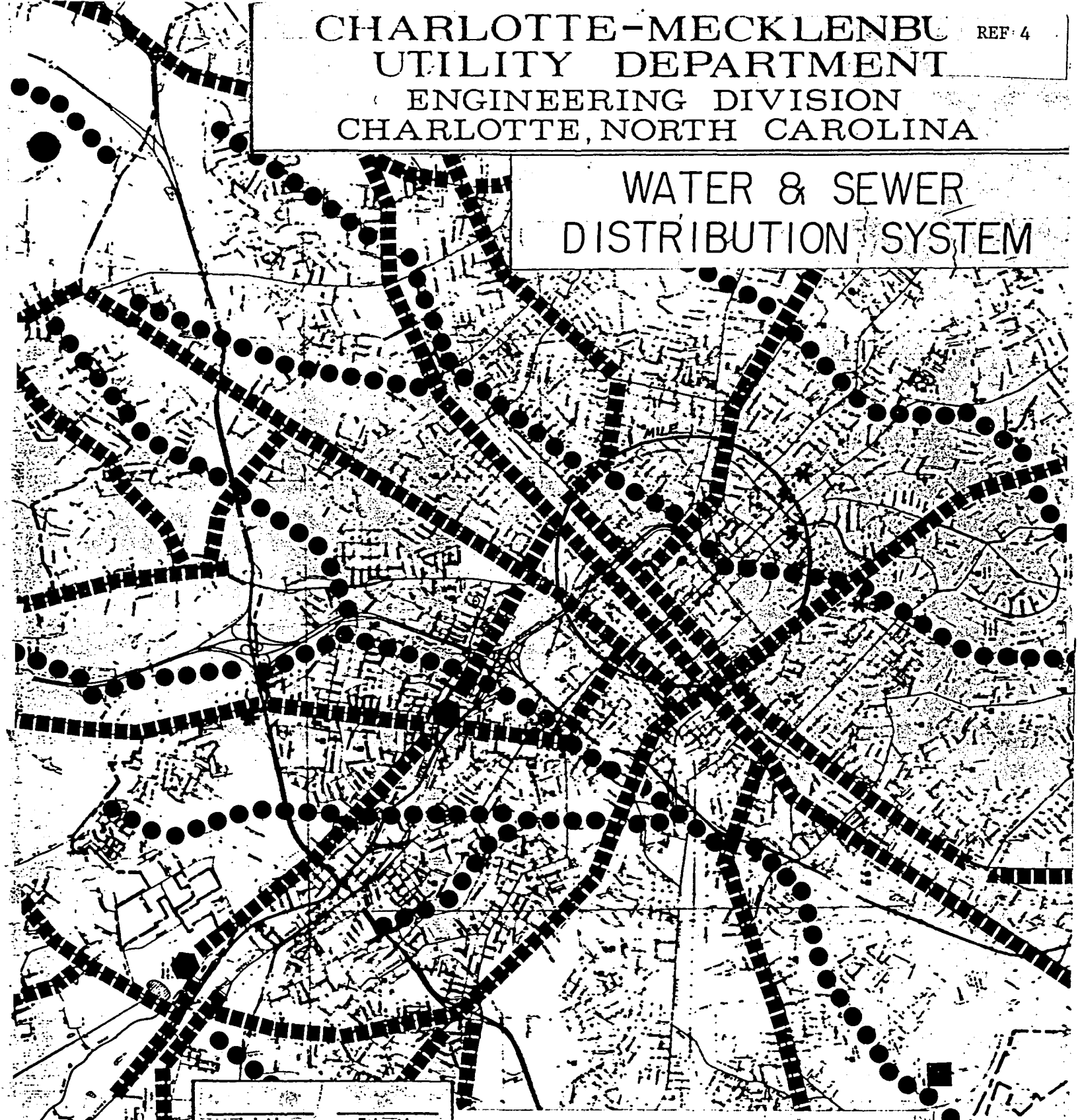
LAB NO. 63

CHARLOTTE-MECKLENBU UTILITY DEPARTMENT

REF 4

ENGINEERING DIVISION
CHARLOTTE, NORTH CAROLINA

WATER & SEWER DISTRIBUTION SYSTEM



Job No. File No.

Scales

PLAN 1" = 1 MILE

PROFILE Hor.

Vert.

As Built Date

MAJOR WATER MAINS
MAJOR SEWER OUTFALLS
WATER TREATMENT PLANTS
WASTEWATER TREATMENT PLANTS

MAJOR WATER & SEWER LINES

Surveyed By	Designed By	Drawn By	Project-Engr	Approved By	Date	Sheet	Of
		J.C.C			2/86	1	1

DATE: November 27, 1985

TO: File

FROM: Grover Nicholson

SUBJECT: Southern Manufacturing Company, Inc.

I talked by telephone with Doug Robertson, Vice President of Manufacturing, Southern Manufacturing Company, Inc. He has been with the company since 1969. He told me the following information:

The facility began as a new plant in about 1920 and has always been used as an asbestos textile plant. To the best of his knowledge, there were no buildings on the site prior to the 1920 date. In 1972, the major product shifted from an asbestos fiber to fiberglass and kelvar fabric. Asbestos textiles are still made on order. Asbestos dust has been the only waste generated since start-up. The dust has always been bagged in airtight plastic and put in the city landfill.

Mr. Robertson also reports that, to the best of his knowledge, there has been no treatment, disposal, or burial of any wastes on-site.

GN/tb/0210b

REF 8

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

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

Date: July 27, 1984

Mr. S. D. Robertson
Southern Manufacturing, Inc.
1000 Seaboard Street
Charlotte, NC 28206

Re: Facility ID No. NCD 990 715 658

Dear Mr. Robertson:

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 /KL: tl

cc: Doug McCurry
EPA Region IV
Emil Breckling

Mack Henderson
Mecklenburg County Health Department

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

REF 9

RECEIVED JUL 1 SOLID & HAZARDOUS WASTE MANAGEMENT BRANCH

Department of Human Resources
Division of Health Services
Solid and Hazardous Waste Management Branch

APPLICATION FOR CHANGE IN CLASSIFICATION UNDER RCRA

Date: 6-17-84

Company Name: Southern Manufacturing, Inc

Company Address: 1000 Seaboard St
Charlotte

EPA ID No: NCD990715658

Mr. O. W. Strickland, Head
Solid & Hazardous Waste Management Branch
Division of Health Servic
Post Office Box 2091
Raleigh, N.C. 27602

Dear Mr. Strickland:

Our Company requests the following change in its classification under RCRA (check all that apply):

Add As	Delete As	
☐	☑	Generator
☐	☐	Transporter
☐	☐	Treater
☐	☐	Storer
☐	☐	Disposer
☐	☐	Small Generator

The reason for this request is:

THIS FACILITY DOES NOT GENERATE NOR DISPOSE OF HAZARDOUS WASTE. (RE: 1983 ANNUAL REPORT)
ASBESTOS HAS BEEN DELISTED AS AN RCRA HAZARDOUS WASTE. (RE: YOUR LETTER OF DEC. 21, 1982.)

NOTES: 1) Be specific. Give all pertinent information. This may be a change in your process; a change in your handling procedures; new analyses, or the like.

2) This is not a delisting petition with respect to a listed waste.

North Carolina Department of Human Resources
Division of Health Services

COUNTY OF Mecklenburg EPA I.D.# NCD990715658

SMALL HAZARDOUS WASTE GENERATOR SURVEY

1. GENERAL INFORMATION:

Name of Facility: Southern Textile Corporation

Facility Contact: Geoff. V. Brandwood Phone: (704) 372-2880

Facility Location: P.O. Box 32427

Street: 1000 Seaboard St.

City: Charlotte, N.C. Zip Code: 28232

ENTERED OCT 1 1982 DATA PROCESSING

2. NATURE OF BUSINESS: (Provide Brief Description)

Manufacturer of Asbestos Textiles such as cloth, tape, tubing, & cord. Blend asbestos fibre with fiberglass fibre then card, spin, weave into cloth:

3. NATURE OF HAZARDOUS WASTES: (Provide Brief Explanation)

Only waste produced is the asbestos dust collected from air cleaning device from manufacturing plant which they put in polyethylene bags, place in a B.F.I. dumpster which goes to city landfill -

4. DESCRIPTION OF HAZARDOUS WASTE:

A	B	C	D	E	F*	G*	H
Hazardous Waste #	Annual Quantity	Unit Meas.	Storage	Treat-ment	Transpor-tation	Disposal	Manifest Available (Yes or No)
(Asbestos)	4,547	P	S05		T52C	D80	

*Provide name, address and I.D. # of transporter and disposal site in comments.

5. COMMENTS:

Southern Textile stores a short asbestos fibre #2 in bags until they get a truck load and then they sell it. Since EPA has taken Asbestos off the hazardous waste list this facility does not generate any hazardous waste nor do they store any.

6. DATE OF SURVEY: 9-27-82

By: Zamy Fox Department: Human Resources S&HW MB

A change of classification form was given to Mr. Brandwood to fill out and send to Raleigh office to change their status. This facility was listed as a large generator and a storer but the facility is not any of these.

LOGGED TO EPA OCT 11 1982

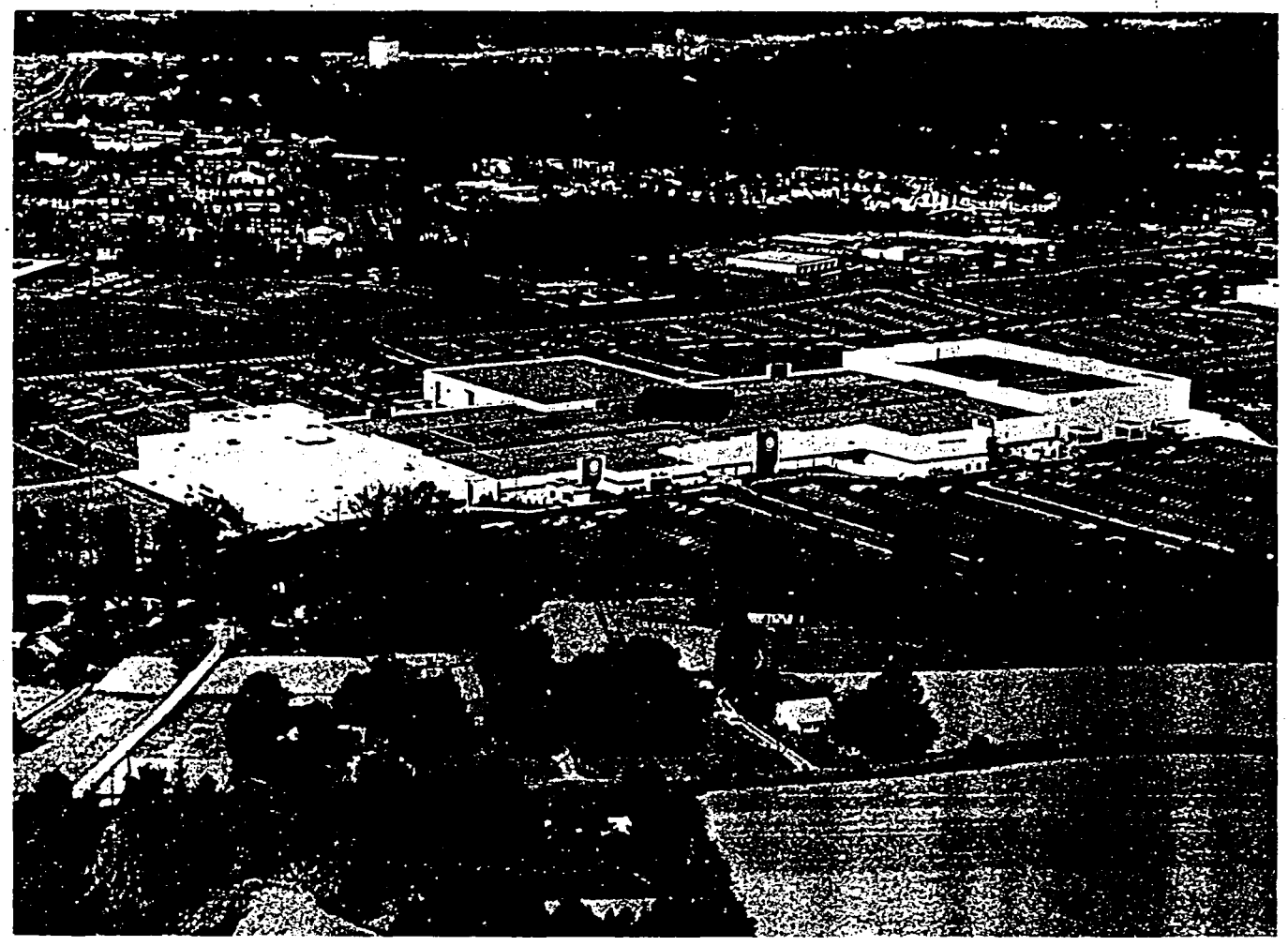
(Instructions on Reverse)

DHS Form 3061
Solid & Hazardous Waste Management Branch

REF 11

Soil survey of

Mecklenburg County, North Carolina



United States Department of Agriculture
Soil Conservation Service
in cooperation with
Mecklenburg County Board of Commissioners and
North Carolina Agricultural Experiment Station

Issued June 1980

1. Cecil

Gently sloping to strongly sloping, well drained soils that have a predominantly clayey subsoil; formed in residuum from acid igneous and metamorphic rock

This unit occurs throughout most of the county on broad smooth ridges and side slopes on the uplands. It makes up about 41 percent of the county. It is about 65 percent Cecil soils and 35 percent soils of minor extent.

Cecil soils have a yellowish red sandy clay loam surface layer and a red clay and clay loam subsoil.

Minor in this unit are areas of the steeper Pacolet soils, areas of Helena soils in depressions and around the heads of drainageways, and small scattered areas of Mecklenburg and Enon soils where the parent rock is less acid.

This unit is used mainly as cropland or pasture. Erosion is the main limitation in farming.

The Cecil soils in this unit have moderate potential for most row crops, moderate potential for woodland, and high potential for most urban uses.

2. Cecil-Urban land

Nearly level to strongly sloping urban areas on well drained soils that have a predominantly clayey subsoil; formed in residuum from acid igneous and metamorphic rock

This unit, the business and commercial district of downtown Charlotte and the commercial, industrial, and residential areas around the edges of the city, makes up about 18 percent of the county. It is about 52 percent the Cecil-Urban land complex, 20 percent Urban land, and 28 percent soils of minor extent.

The Cecil-Urban land complex part of this unit is 50 to 70 percent Cecil soils and 15 to 35 percent Urban land. It is mainly around the edges of the city. Cecil soils have a yellowish red sandy clay loam surface layer and a red clay and clay loam subsoil. Urban land is covered mostly by houses, paved streets and sidewalks, apartment buildings, small shopping centers, schools, churches, paved parking lots, and recreational areas.

The Urban land part of this unit consists of areas where more than 85 percent of the surface is covered by asphalt, concrete, buildings, or other impervious cover. It is mainly in the central business district of Charlotte and along major traffic arteries around the city.

Minor in this unit are scattered areas of Mecklenburg and Enon soils. These soils are underlain by thin strata of acidic and basic rocks and are thus less acid than Cecil soils. Also in this unit are reshaped areas, as a result of site preparation during construction, and cut and fill areas. In the cut areas most or all of the natural soil has been removed. In the fill areas the original surface is covered with more than 20 inches of fill material.

This unit is used almost entirely for urban purposes.

3. Iredell-Mecklenburg

Nearly level to strongly sloping, moderately well drainec and well drained soils that have a predominantly clayey subsoil; formed in residuum from diorite, gabbro, anc other rock high in ferromagnesian minerals

The largest areas of this unit are in the southwesterr and south-central parts of the county. Other areas are ir the northeastern and northwestern parts. The landscape is one of broad flats and gentle side slopes. The flats are broken by many large knolls of slightly higher eleva tion.

This unit makes up about 11 percent of the county. I is about 40 percent Iredell soils, 35 percent Mecklenburg soils, and 25 percent soils of minor extent.

Iredell soils are moderately well drained. They are oı the broad flats and gentle side slopes. The surface laye is olive brown fine sandy loam, and the subsoil is ligh olive brown clay and clay loam.

Mecklenburg soils are well drained. They occupy th broad ridges, the gently sloping to strongly sloping sid slopes, and the large knolls on the flat landscape. Th surface layer is dark reddish brown fine sandy loam, an the subsoil is yellowish red clay.

The minor soils in this unit are mostly Wilkes an Davidson in the southern part of the county and Enoı Wilkes and Helena in the northern part.

This unit is used mainly as cropland and pasture. Th wetter areas are mostly forest. Erosion and wetness aı the main limitations in farming.

The major soils in this unit have moderately high p tential for most crops, moderate potential for woodlan and low potential for most urban uses.

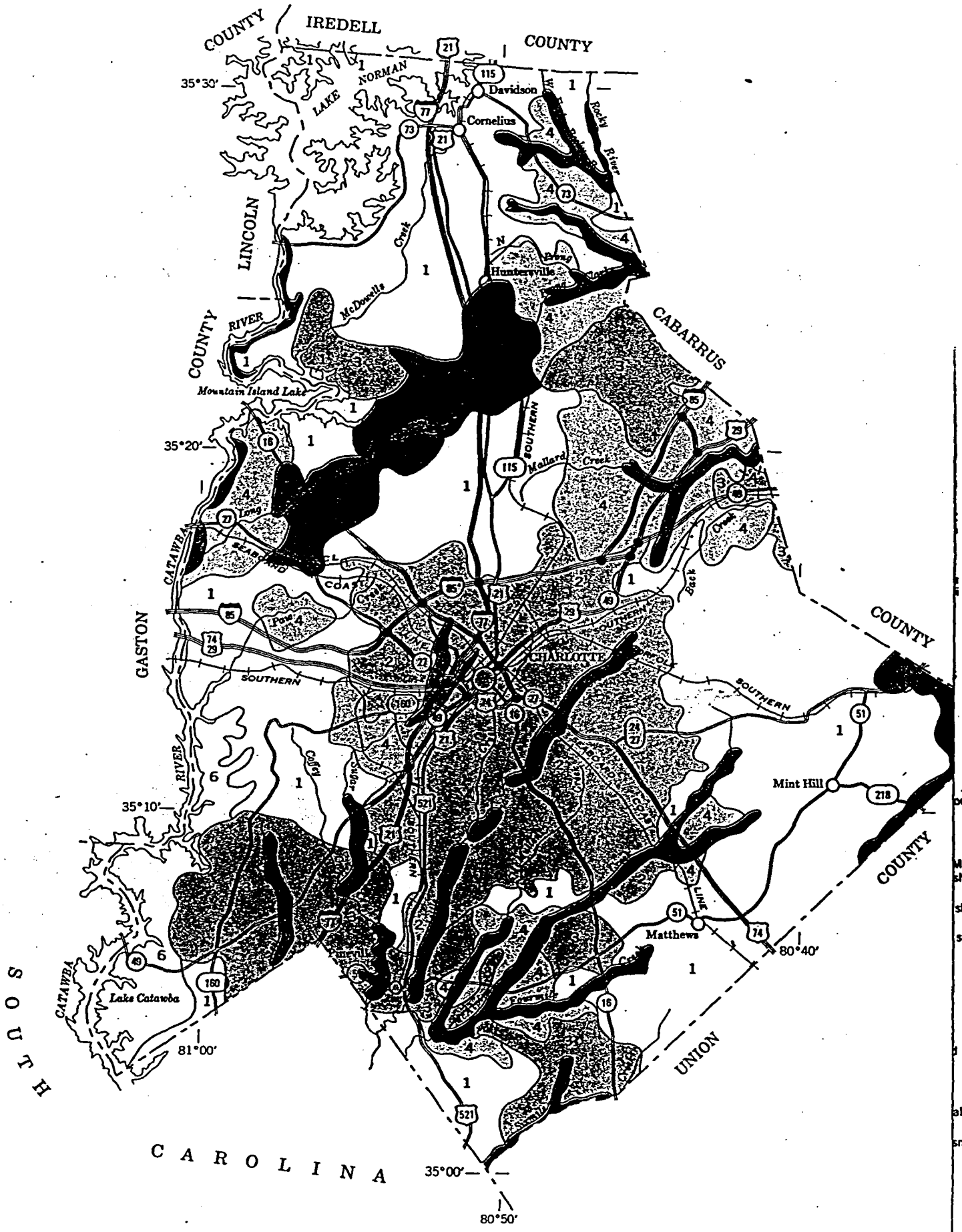
4. Wilkes-Enon

Gently sloping to steep, well drained soils that have predominantly clayey subsoil; formed in residuum frc diorite, hornblende schist, and other basic rock, or frc mixed acidic and basic rock

This map unit occurs as scattered areas throughc the county on broad and narrow ridges and stron sloping to steep side slopes. It makes up 13 percent the county. It is about 40 percent Wilkes soils, 30 p cent Enon soils, and 30 percent soils of minor exte

Wilkes soils are on narrow ridges and moderat steep to steep side slopes adjacent to drainagewa The surface layer is dark grayish brown loam, and t subsoil is strong brown clay and clay loam.

Enon soils are on broad ridges and gently sloping strongly sloping side slopes. The surface layer is bro sandy loam. The subsoil is yellowish brown sandy c loam, clay, and clay loam.



Each area outlined on this map consists more than one kind of soil. The map is meant for general planning rather than for decisions on the use of specific tract

LEGEND

1 — CECIL: Gently sloping to strongly sloping, well drained soils that have a predominantly clayey subsoil; formed in residuum from acid igneous and metamorphic rock

2 — CECIL-URBAN land: Nearly level to strongly sloping urban areas on well drained soils that have a predominantly clayey subsoil; formed in residuum from acid igneous and metamorphic rock

3 — IREDELL-MECKLENBURG: Nearly level to strongly sloping, moderately well drained and well drained soils that have a predominantly clayey subsoil; formed in residuum from diorite, gabbro, and other rock high in ferromagnesian minerals

4 — WILKES-ENON: Gently sloping to steep, well drained soils that have a predominantly clayey subsoil; formed in residuum from diorite, hornblende schist, and other basic rock, or from mixed acidic and basic rock

ENON-HELENA-VANCE: Gently sloping to strongly sloping, well drained and moderately well drained soils that have a predominantly clayey subsoil; formed in residuum from mixed acidic and basic igneous and metamorphic rock

6 — PACOLET-CECIL: Gently sloping to steep, well drained soils that have a predominantly clayey subsoil; formed in residuum from acid igneous and metamorphic rock

MONACAN: Nearly level, somewhat poorly drained soils that have a predominantly loamy subsoil; formed in fluvial sediment on flood plains

GEORGEVILLE-GOLDSTON-LIGNUM: Gently sloping to strongly sloping, well drained and moderately well drained soils that have a clayey or loamy subsoil; formed in residuum from fine grained schist or slate

Compiled 1978

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
NORTH CAROLINA AGRICULTURAL EXPERIMENT STATION
MECKLENBURG COUNTY BOARD OF COMMISSIONERS

N

GENERAL SOIL MAP

MECKLENBURG COUNTY, NORTH CAROLINA

Scale 1:253,440

1 0 1 2 3 4 Miles

1 0 4 8 Km

of
hus
a basis

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than; > means greater than. The erosion tolerance factor (T) is for the entire profile. Absence of an entry means data were not available or were not estimated]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T
	In	In/hr	In/in	pH			
ApB, ApD--------- Appling	0-11	2.0-6.0	0.10-0.15	4.5-5.5	Low----------	0.24	4
	11-43	0.6-2.0	0.15-0.17	4.5-5.5	Moderate--------	0.20	
	43-66	0.6-2.0	0.12-0.16	4.5-5.5	Low----------	0.24	
CeB2, CeD2------- Cecil	0-6	0.6-2.0	0.13-0.15	4.5-6.0	Low----------	0.28	3
	6-53	0.6-2.0	0.13-0.15	4.5-5.5	Moderate--------	0.28	
	53-65	---	---	---	----------	---	
CuB*, CuD*:							
Cecil----------	0-6	0.6-2.0 *	0.13-0.15	4.5-6.0	Low----------	0.28	3
	6-53	0.6-2.0	0.13-0.15	4.5-5.5	Moderate--------	0.28	
	53-65	---	---	---	----------	---	
Urban land.							
DaB, DaD, DaE---- Davidson	0-7	0.6-2.0	0.14-0.18	4.5-6.5	Low----------	0.28	5
	7-16	0.6-2.0	0.15-0.18	4.5-6.0	Low----------	0.32	
	16-99	0.6-2.0	0.12-0.16	4.5-6.0	Low----------	0.24	
EnB, EnD--------- Enon	0-7	2.0-6.0	0.11-0.15	5.1-6.5	Low----------	0.37	4
	7-36	0.06-0.2	0.15-0.20	5.1-7.8	High----------	0.32	
	36-60	---	---	---	----------	---	
GeB2, GeD2------- Georgeville	0-5	0.6-2.0	0.13-0.18	4.5-6.0	Low----------	0.37	3
	5-35	0.6-2.0	0.13-0.18	4.5-5.5	Low----------	0.37	
	35-49	0.6-2.0	0.13-0.18	4.5-5.5	Low----------	0.43	
	49-99	0.6-2.0	0.05-0.10	4.5-5.5	Low----------	0.43	
GoB, GoD--------- Goldston	0-8	2.0-6.0	0.10-0.15	4.0-6.0	Low----------	0.20	2
	8-16	2.0-6.0	0.10-0.15	4.0-6.0	Low----------	0.20	
	16-24	2.0-6.0	0.05-0.10	4.0-6.0	Low----------	0.20	
	24-62	---	---	---	----------	---	
HeB---------- Helena	0-8	2.0-6.0	0.10-0.12	4.5-6.0	Low----------	0.37	3
	8-11	0.2-0.6	0.13-0.15	4.5-5.5	Moderate--------	0.37	
	11-40	0.06-0.2	0.13-0.15	4.5-5.5	High----------	0.32	
	40-64	---	---	---	----------	---	
HuB*:							
Helena----------	0-8	2.0-6.0	0.10-0.12	4.5-6.0	Low----------	0.37	3
	8-11	0.2-0.6	0.13-0.15	4.5-5.5	Moderate--------	0.37	
	11-40	0.06-0.2	0.13-0.15	4.5-5.5	High----------	0.32	
	40-64	---	---	---	----------	---	
Urban land.							
IrA, IrB--------- Iredell	0-6	2.0-6.0	0.12-0.15	5.6-7.3	Low----------	0.32	3
	6-24	0.06-0.2	0.16-0.22	6.1-7.3	Very high------	0.20	
	24-28	0.06-0.6	0.14-0.18	6.1-7.8	High----------	0.28	
	28-65	---	---	---	----------	---	
IuB*:							
Iredell---------	0-6	2.0-6.0	0.12-0.15	5.6-7.3	Low----------	0.32	3
	6-24	0.06-0.2	0.16-0.22	6.1-7.3	Very high------	0.20	
	24-28	0.06-0.6	0.14-0.18	6.1-7.8	High----------	0.28	
	28-65	---	---	---	----------	---	
Urban land.							
LgB---------- Lignum	0-5	0.6-2.0	0.11-0.18	4.5-5.5	Low----------	0.43	2
	5-37	0.06-0.6	0.10-0.18	4.5-5.5	Moderate--------	0.43	
	37-50	---	---	---	----------	---	

See footnote at end of table.

* $(.6\ in/hr)(2.54\ cm/in) \times \frac{1\ hr}{3600\ sec} = 4.23 \times 10^{-4}\ cm/sec$

$(2)(2.54)(1/3600) = 1.41 \times 10^{-3}\ cm/sec$

STATE OF NORTH CAROLINA

DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT

DIVISION OF ENVIRONMENTAL MANAGEMENT

ADMINISTRATIVE CODE SECTION:

15 NCAC 2B .0100 - PROCEDURES FOR ASSIGNMENT OF WATER QUALITY STANDARDS

15 NCAC 2B .0200 - CLASSIFICATIONS AND WATER QUALITY STANDARDS APPLICABLE TO SURFACE WATERS OF NORTH CAROLINA

EFFECTIVE JANUARY 1, 1985

ENVIRONMENTAL MANAGEMENT COMMISSION

RALEIGH, NORTH CAROLINA

examiner or examiners, will adopt its final action with respect to the assignment of classifications applicable to the waters under consideration. The commission will publish such action, together with the effective date for the application of the provisions of General Statute 143-215.1 and 143-215.2, as amended, as a part of the commission's official regulations.

(8) The final action of the commission with respect to the assignment of classification with its accompanying standards shall contain the commission's conclusions relative to the various factors given in General Statute 143-214.1(d), and shall specifically include the class or classes to which such specifically designated waters in the watershed or watersheds shall be assigned on the basis of best usage in the interest of the public.

(A) Freshwater Classifications.

(i) Class WS-I; waters protected as water supplies which are in natural and uninhabited or predominantly undeveloped (not urbanized) watersheds; no point source discharges are permitted and local land management programs to control nonpoint source pollution are required; suitable for all Class C uses;

(ii) Class WS-II; water protected as water supplies which are in low to moderately developed (urbanized) watersheds; discharges are restricted to primarily domestic wastewater or industrial non-process waters specifically approved by the commission; local land management programs to control nonpoint source pollution are required; suitable for all Class C uses;

(iii) Class WS-III; water supply segment with no categorical restrictions on watershed development or discharges; suitable for all Class C uses;

(iv) Class B; suitable for swimming, primary recreation and all Class C uses;

(v) Class C; suitable for secondary recreation and fish propagation;

(B) Tidal Salt Water Classifications.

(i) Class SA; suitable for commercial shellfishing and all other tidal salt water uses;

(ii) Class SB; suitable for swimming and primary recreation and all Class SC uses;

Effluent Characteristics	Monthly Average	Weekly Average
BOD(5)	30 mg/l	45 mg/l

(21) Primary recreation shall include swimming, skin diving, skiing, and similar uses involving human body contact with water where such activities take place in an organized or on a frequent basis.

(22) Secondary recreation shall include wading, boating, other uses not involving human body contact with water, and activities involving human body contact with water where such activities take place on an infrequent, unorganized, or incidental basis.

(23) Shellfish culture shall include the use of waters for the propagation, storage and gathering of oysters, clams, and other shellfish for market purposes.

(24) Source of water supply for drinking, culinary or food-processing purposes shall mean any source, either public or private, the waters from which are used for human consumption, or used in connection with the processing of milk, beverages, food, or other purpose which requires water meeting the maximum contaminant levels (mcls) in the North Carolina Rules Governing Public Water Supplies, 10 NCAC 10D .1600 as well as mcls promulgated by the Environmental Protection Agency pursuant to the Public Health Service Act, 42 U.S.C. 201 et seq., as amended by the Safe Drinking Act, 42 U.S.C. 300(f) et seq.

(25) Swamp waters shall mean those waters which are so designated by the Environmental Management Commission and which are topographically located so as to generally have very low velocities and certain other characteristics which are different from adjacent streams draining steeper topography. They are designated by "Sw" following the water classification.

(26) Tidal salt waters shall mean all tidal waters which are so designated by the Environmental Management Commission and which generally have a natural chloride ion content in excess of 500 parts per million.

(27) Toxic substance means any substance or combination of substances including disease-causing agents, which after discharge and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction) or physical deformities in such organisms or their offspring.

STATE OF NORTH CAROLINA

DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT

CLASSIFICATIONS AND WATER QUALITY STANDARDS ASSIGNED TO THE WATERS OF THE CATAWBA RIVER BASIN

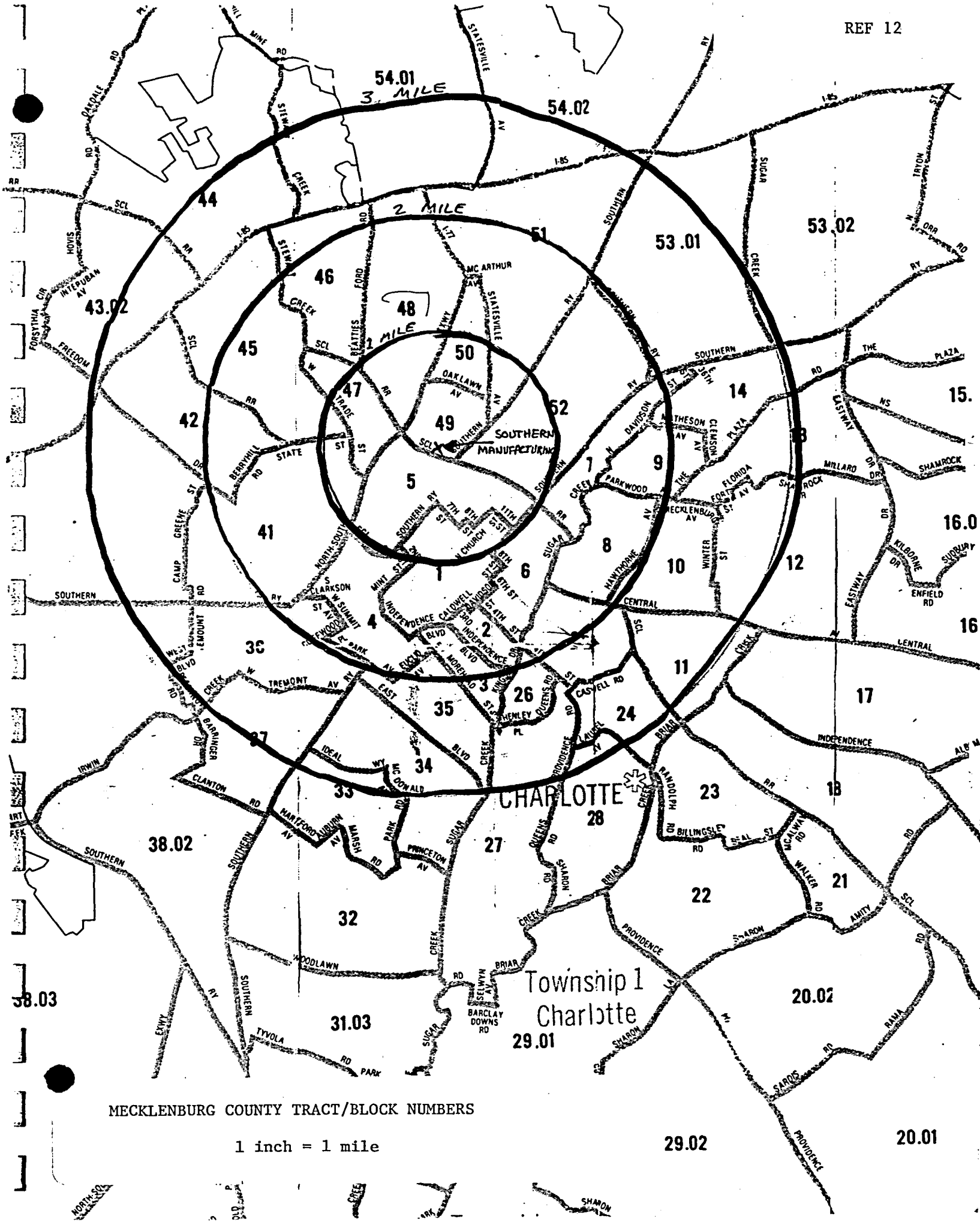
DIVISION OF ENVIRONMENTAL MANAGEMENT

RALEIGH, NORTH CAROLINA

Reprint from North Carolina Administrative Code: 15 NCAC 2B .0308
Current through: September 1, 1981

Name of Stream	Description	Classification Class	Classification Date	Index No.
Oakland Lake	Entire lake and connecting stream to Crowders Creek	C	9/1/74	11-135-6
Blackwood Creek	From source to Crowders Creek	C	9/1/74	11-135-7
Ferguson Branch	From source to Crowders Creek	C	9/1/74	11-135-8
McGill Branch	From source to Crowders Creek	C	9/1/74	11-135-9
South Fork Crowders Creek	North Carolina Portion	C	3/1/62	11-135-10
South Crowders Creek	From source to South Fork Crowders Creek	C	3/1/62	11-135-10-1
Unnamed Tributary at Sparrow Springs Lake (Sparrow Springs Lake)	From source to Dam at Sparrow Springs Lake	B	3/1/62	11-135-10-1-1-(1)
Unnamed Tributary at Sparrow Springs Lake	From Dam at Sparrow Springs Lake to South Fork Crowders Creek	C	3/1/62	11-135-10-1-1-(2)
Rocky Branch	From source to North Carolina-South Carolina State Line	C	9/1/74	11-135-11
Torrence Branch	From source to North Carolina-South Carolina State Line	B	3/1/77	11-136
Sugar Creek	From source to North Carolina-South Carolina State Line	C	9/1/74	11-137
Irwin Creek	From source to Sugar Creek	C	9/1/74	11-137-1
Dillons Twins Lakes and Lake Jo	Entire lakes and connecting streams to Irwin Creek	C	9/1/74	11-137-1-1
Stewart Creek	From source to Irwin Creek	C	9/1/74	11-137-1-2
Taggart Creek (Taggard Creek)	From source to Sugar Creek	C	9/1/74	11-137-2
Glenwood Lake	Entire lake and connecting stream to Sugar Creek	C	9/1/74	11-137-3
Coffey Creek	From source to Sugar Creek	C	9/1/74	11-137-4
Whippoorwhill Lake	Entire lake and connecting stream to Coffey Creek	C	9/1/74	11-137-4-1
Eagle Branch (Watt Lake, Eagle Lake)	From source to Dam at Eagle Lake	B	3/1/62	11-137-4-2-(1)
Eagle Branch	From Dam at Eagle Lake to Coffey Creek	C	9/1/74	11-137-4-2-(2)
Maynard Lake	Entire lake and connecting stream to Coffey Creek	C	9/1/74	11-137-4-3
Moody Lake	Entire lake and connecting stream to Coffey Creek	C	9/1/74	11-137-4-4
Johnson Lake	Entire lake and connecting stream to Coffey Creek	C	9/1/74	11-137-4-5
Spratt Lake	Entire lake and connecting stream to Sugar Creek	C	9/1/74	11-137-5
Kings Branch	From source to Sugar Creek	C	9/1/74	11-137-6
McCullough Branch	From source to Sugar Creek	C	9/1/74	11-137-7
Little Sugar Creek	From source to North Carolina-South Carolina State Line	C	9/1/74	11-137-8
Dairy Branch	From source to Little Sugar Creek	C	9/1/74	11-137-8-1
Brier Creek	From source to Little Sugar Creek	C (1)	3/1/77	11-137-8-2
Edwards Branch	From source to Brier Creek	C	3/1/77	11-137-8-2-1
Little Hope Creek	From source to Little Sugar Creek	C (1)	3/1/77	11-137-8-3
McAlpine Creek (Waverly Lake)	From source to North Carolina-South Carolina State Line	C	9/1/74	11-137-9
Campbell Creek	From source to McAlpine Creek	C	9/1/74	11-137-9-1
Irvins Creek (McEwen Lake)	From source to McAlpine Creek	C	9/1/74	11-137-9-2
Lake Windermere and Chillis Lake	Entire lakes and connecting streams to McAlpine Creek	C	9/1/74	11-137-9-3
Fourmile Creek	From source to McAlpine Creek	C	9/1/74	11-137-9-4
Rocky Branch	From source to Fourmile Creek	C	9/1/74	11-137-9-4-1
Lake Providence	Entire lake and connecting stream to Rocky Branch	C	9/1/74	11-137-9-4-1-1

REF 12



MECKLENBURG COUNTY TRACT/BLOCK NUMBERS

1 inch = 1 mile

ST	CO	MCD or Place	Pre-cinct	Area Name	Total Population	White	Black	Amer. Indian, Eskimo and Aleut	Asian and Pacific Islander[1]	Other[2]	Persons of Spanish Origin[3]
37	119			Mecklenburg County	404270	291442	107006	1412	2804	1606	3962
				By Tract/Block Numbering Area:							
				Tract 0001	623	338	281	3	-	1	1
				Tract 0002	2	2	-	-	-	-	-
				Tract 0003	662	430	228	3	1	-	1
				Tract 0004	1104	510	581	5	3	5	20
				Tract 0005	1516	550	962	3	1	-	5
				Tract 0006	1901	66	1825	3	2	5	24
				Tract 0007	757	90	665	-	2	-	3
				Tract 0008	3346	95	3246	5	-	-	57
				Tract 0009	2636	434	2187	5	2	8	24
				Tract 0010	2717	2105	574	10	17	11	36
				Tract 0011	2983	2721	183	21	43	15	75
				Tract 0012	4978	4601	314	32	10	21	45
				Tract 0013	4275	3674	527	19	40	15	40
				Tract 0014	2799	1981	745	58	-	15	52
				Tract 0015.01	6891	4231	2596	16	23	25	73
				Tract 0015.03	5047	4292	714	9	13	19	26
				Tract 0015.04	4728	3868	807	14	23	16	53
				Tract 0016.02	5401	5232	93	14	17	45	82
				Tract 0016.03	3351	3192	102	16	23	18	25
				Tract 0016.04	4028	3690	250	17	41	30	35
				Tract 0017	7399	6892	372	13	72	50	58
				Tract 0018	4031	3506	428	20	37	42	56
				Tract 0019.03	5150	4650	335	22	105	38	50
				Tract 0019.04	7257	6775	337	26	63	56	70
				Tract 0019.05	4895	4458	325	15	64	33	68
				Tract 0019.06	4526	4002	463	12	28	21	28
				Tract 0019.07	3777	3705	37	8	23	4	10
				Tract 0020.01	8966	8580	132	12	220	22	47
				Tract 0020.02	4798	4710	49	1	34	4	24
				Tract 0021	2168	1891	223	15	19	20	24
				Tract 0022	3224	2941	258	3	14	8	17
				Tract 0023	2732	227	2374	4	114	13	45
				Tract 0024	2409	2291	81	9	16	12	35
				Tract 0025	1687	1455	189	23	7	13	42
				Tract 0026	1058	223	829	5	-	1	6
				Tract 0027	6641	6480	117	4	28	12	32
				Tract 0028	3208	3204	1	-	1	2	7
				Tract 0029.01	6318	6210	42	2	40	24	42
				Tract 0029.02	7718	7583	50	6	64	15	66
				Tract 0030.01	7650	7554	34	3	40	19	55
				Tract 0030.03	5830	5623	51	3	128	25	62
				Tract 0030.04	5752	5587	44	3	117	1	33
				Tract 0031.02	3452	3321	46	18	59	8	24
				Tract 0031.03	4811	4672	38	16	60	25	40
				Tract 0031.04	6176	5595	358	21	163	39	92
				Tract 0031.05	2824	2777	8	2	27	10	28

ST	CC	MCD or CD	Place	Precinct	Area Name	Total Population	RACE White	Black	American Indian, Eskimo and Aleut	Asian and Pacific Islander (1)	Other (2)	Persons of Spanish Origin (3)
					Tract 0032	6403	5860	362	18	82	81	151
					Tract 0033	3020	2939	26	21	11	23	34
					Tract 0034	3822	3521	192	68	24	17	34
					Tract 0035	2240	2034	136	8	48	14	22
					Tract 0036	4613	537	4051	22	3	-	51
					Tract 0037	2562	6	2547	7	2	-	23
					Tract 0038.02	4911	366	4518	-	4	23	45
					Tract 0038.03	5564	3277	2158	60	14	55	88
					Tract 0038.04	6125	3792	2157	19	86	71	139
					Tract 0039	9716	1205	8480	12	15	4	140
					Tract 0040	5191	4411	673	51	39	17	62
					Tract 0041	4159	912	3228	5	10	4	65
					Tract 0042	3914	2340	1537	18	12	7	45
					Tract 0043.01	5760	5449	269	11	14	17	50
					Tract 0043.02	5219	3170	1971	40	13	25	51
					Tract 0044	2392	1135	1228	16	5	8	20
					Tract 0045	4852	452	4373	15	2	10	49
					Tract 0046	3846	5	3835	-	4	2	37
					Tract 0047	2410	2	2400	1	1	6	33
					Tract 0048	4645	29	4600	1	4	11	21
					Tract 0049	215	-	215	-	-	-	7
					Tract 0050	3491	6	3475	-	2	8	67
					Tract 0051	2883	60	2808	-	3	12	45
					Tract 0052	3200	175	3013	6	-	6	41
					Tract 0053.01	2754	1668	984	11	40	51	56
					Tract 0053.02	12454	4103	8156	35	22	138	141
					Tract 0054.01	4052	1108	2939	-	3	2	23
					Tract 0054.02	4473	3286	1128	40	4	15	68
					Tract 0055	6536	5299	1157	72	7	1	38
					Tract 0056	8912	7988	815	25	33	51	77
					Tract 0057.01	6063	5869	109	66	10	9	30
					Tract 0057.02	9175	9004	110	26	20	15	57
					Tract 0058.01	8638	8081	385	45	105	22	73
					Tract 0058.02	11458	9496	1648	41	235	38	129
					Tract 0059	9858	8221	1559	26	21	31	64
					Tract 0060.01	6155	5500	575	23	47	10	28
					Tract 0060.02	4936	4672	240	11	4	9	22
					Tract 0061	7679	5456	2187	28	7	1	28
					Tract 0062	5494	4795	651	28	19	1	25
					Tract 0063	4040	3271	747	13	2	7	12
					Tract 0064	6238	4930	1263	4	23	18	33

TO: FILE
R: POP w/i 1 MILE OF SOUTHERN MFG.

Approx. percentages of Blocks within 1 mile of Southern Mfg.

Block #	%		Pop w/i block		Pop. w/i 1 mile
1	40	x	623	=	249
5	100	x	1516	=	1516
41	10	x	4159	=	415
45	5	x	4852	=	242
47	60	x	2410	=	1446
48	30	x	4645	=	1393
49	100	x	215	=	215
50	55	x	3491	=	1920
51	5	x	2883	=	144
52	30	x	3200	=	960

* TOTAL POP w/i 1 MILE = 8500

* Assumes equal pop. dist.

DMD/82

(fill-in areas are spaced for elite type, i.e., 12 characters/inch). Form

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

REF 13

I. EPA F N C D 9 9 0 7 1 5 6 5 8 D

LABEL ITEMS

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

0 0 0 5 1

NCD990715658

~~SOUTHERN ASBESTOS COMPANY~~
~~PO BOX 10516~~
CHARLOTTE, NC ~~28205~~

RECEIVED
EPA/REGION

NOV 13 11 24 AM

1000 SEABOARD ST
CHARLOTTE, NC 28206

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it 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 any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill-in area*(s)* below. If the label is complete and correct, you need not complete Items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all Items if no label has been provided. Refer to the instructions for detailed item 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 any 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	MARK "X" NO	MARK "X" FORM ATTACHED	SPECIFIC QUESTIONS	MARK "X" YES	MARK "X" NO	MARK "X" FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge 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)		X	
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)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)	X		X	F. Do you or will you 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)		X	
G. Do you 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)		X	
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)		X	

III. NAME OF FACILITY

1 SKIP SOUTHERN TEXTILE CORP

IV. FACILITY CONTACT

A. NAME & TITLE *(last, first, & title)*	B. PHONE *(area code & no.)*
2 EARGLE LLOYD M ENG MGR	704 372 2880

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 PO BOX 32427

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 CHARLOTTE	NC	28232

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 1000 SEABOARD STREET

B. COUNTY NAME

MECKLENBURG

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE *(if known)*
6 CHARLOTTE	NC	28232	

(Fill—in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-S80004

FORM 3 RCRA

EPA

U.S. 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 M C D 9 9 0 7 1 5 6 5 8 — T/A 1

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 facility or a 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 facility's 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.)*

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

C 8 — YR. 1 9 — MO. 0 1 — DAY 0 1

[ ] 2. NEW FACILITY *(Complete item below.)*

FOR NEW FACILITIES, PROVIDE THE DATE *(yr., mo., & day)* OPERATION BEGAN OR IS EXPECTED TO BEGIN

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 provided for 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 below, then 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 unit of 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 UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR 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 OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G	LITERS PER DAY	V	ACRE-FEET	A
LITERS	L	TONS PER HOUR	D	HECTARE-METER	F
CUBIC YARDS	Y	METRIC TONS PER HOUR	W	ACRES	B
CUBIC METERS	C	GALLONS PER HOUR	E	HECTARES	Q
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 and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

DUP — T/A 1

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	B. 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT	B. 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S 0 2	600	G		5				
X-2	T 0 3	20	E		6				
1	[illegible] 0 1	.06	D		7				
2	S 0 3	2cc	Y		8				
3					9				
					10				

Continued from page 2.

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

Form Approved OMB No. 158-S80004

EPA I.D. NUMBER (enter from page 1)		FOR OFFICIAL USE ONLY	
W N C D 9 9 0 7 1 5 6 5 8	T/A C 1	W DUP	T/A C 2 DUP

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)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
1	U013	240	T	~~S01~~ S03	
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
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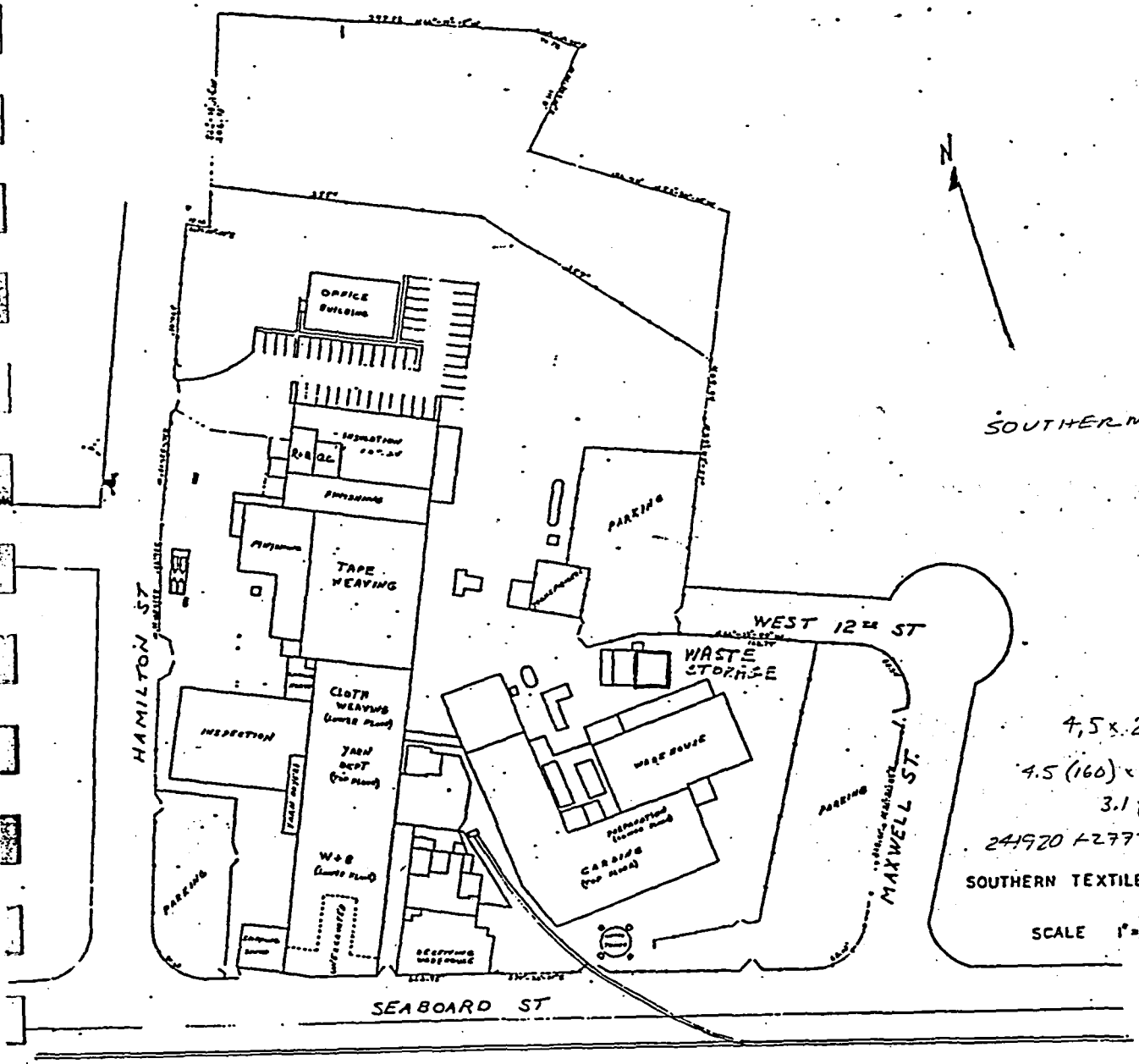
21					
22					
23					
24					
25					
26					

CONTINUE ON REVERSE

V. FACILITY DRAWING *(see page 4)*



4.5 x 2.1

4.5 (160) x 2.1 (160) + 3.1 (160) x 3.5 (160) =

241920 + 277760 = 519680 ft²

≈ 12 acres

SOUTHERN TEXTILE CORPORATION

SCALE 1" = 160' JAN 79

MECKLENBURG COUNTY
DEPARTMENT OF ENVIRONMENTAL HEALTH
ENVIRONMENTAL MANAGEMENT DIVISION
AIR QUALITY CONTROL SECTION

Date Issued April 10, 1980

Date Expires April 15, 1982

Certificate Number See Below

CERTIFICATE OF OPERATION

In accordance with the provisions of the Mecklenburg County Air Pollution Control Regulations,

PERMISSION IS HEREBY GRANTED TO

Southern Textile Corporation
1000 Seaboard Street
Charlotte, North Carolina

FOR THE OPERATION OF

Certificates of Operation numbered: 02-0077, 04-0019, 04-0020, 04-0021, 04-0022, 12-0001, 12-0002, 12-0003, 12-0004, 12-0005, 12-0006, 12-0007, 12-0008, 12-0009, 12-0010, and 12-0015.

This certificate shall be effective from April 16, 1980 until April 15, 1982 unless sooner revoked and shall be subject to the following specified conditions and limitations:

1. This certificate can be revoked at any time that it is found that said equipment operates or is operated in such a manner that it no longer complies with the provisions of the Mecklenburg County Air Pollution Control Regulations.

2. Unauthorized modifications, repairs, or alterations to the said equipment, which change its emission characteristics, will be cause for revocation of this certificate.

3. This certificate shall not exempt the holder from prosecution for emissions or discharge of air pollutants prohibited by the Mecklenburg County Air Pollution Control Regulations.

4. The owner or operator shall submit all reports as may be required by the Mecklenburg County Department of Environmental Health.

Harold H. Caudle
Department Representative

POST IN CONSPICUOUS

PLACE NEAR EQUIPMENT

SOUTHERN TEXTILE CORPORATION
1000 SEABOARD STREET
CHARLOTTE, NORTH CAROLINA

Certificate #	Operation
02-0077	One (1) 12.5 mm BTU/hr Superior boiler fueled by matural gas or residual oil.
04-0019	One (1) Marshall Williams tenter frame.
04-0020	One (1) Langley oven with temperature controls andl treatments to prevent visible emissions.
04-0021	One (1) Langley stationary oven.
04-0022	One (1) Kingsley yarn dryer.
12-0001	Seventeen (17) machines for spinning of asbestos yarns (Spinnbau type RFNE) with integral dust suppressiom, mechanisms and exhaust connections to convey remaiming dust to existing bag type collector in the Yarn Department.
12-0002	Equipment for the twisting of asbestos yarns(Type Allmot D2 200/450) with integral dust suppression mechanisms and the conveyance of remaining dust to an existing bag type collector in the Yarn Department.
12-0003	Asbestos fiber blending operations with particulates being controlled by a Fuller Draco Plenum-Pulse dust collector (Model 3-8-24).
12-0004	An asbestos fiber reclaiming operation with particulates controlled by a Fuller Draco Plenum-Pulse dust collector (Model 3-8-24).
12-0005	An asbestos fiber preparation department with particulates controlled by a Wheelabrator dust collector (Model 210 Special).
12-0006	A carding department with particulate emissions comtrolled by a Wheelabrator dust collector (Model 210 Special).
12-0007	A yarn department with particulate emissions controlled by a Wheelabrator dust collector (Model 210 Special). (New duct work installed in 1977 to upgrade system.)
12-0008	A cloth weaving department with particulate emissions controlled by a Wheelabrator dust collector (Model 210 Special).
12-0009	The tape or narrow fabric weaving department with particulate emissions controlled by a Wheelabrator dust collector (Model 210 Special).
12-0010	An asbestos insulation production department and a winding, warping and beaming department connected in 1976 by 300' ductwork, with particulate emissions controlled by a Wheelabrator dust collector (Model 210 Special).
12-0015	One (1) Bemis series 11000 compression bagger to control

REF 15

NORTH CAROLINA
DEPARTMENT OF CONSERVATION AND DEVELOPMENT
GEORGE R. ROSS, *Director*

DIVISION OF MINERAL RESOURCES
JASPER L. STUCKEY, *State Geologist*

BULLETIN NUMBER 63

GEOLOGY AND GROUND WATER
IN THE
Charlotte Area, North Carolina

By
H. E. LEGRAND and M. J. MUNDORFF
Geologists, U. S. Geological Survey

PREPARED COOPERATIVELY BY THE GEOLOGICAL SURVEY,
UNITED STATES DEPARTMENT OF THE INTERIOR

1952

most places. The limestone proper is generally less than 100 feet thick, as a result of which its ar tent is small. In contrast to the quartzite it weathers readily, forming longitudinal valleys along its

Keith[7] has named this rock the Gaffney marble because of its prominence near Gaffney, S. C. It i ly gray in color and contains, in addition to calcite and dolomite, such impurities as quartz, mica, gr and hornblende.

Diorite and granite complex.—Rocks of the diorite and granite group cover a large area in Ca and Mecklenburg Counties, and they also occur in eastern Gaston and Lincoln Counties. They are b to have a wide distribution outside the Charlotte area, although very little geological study has been of rocks of this complex.

A mafic component, chiefly diorite, and a felsic component, chiefly granite, form this complex, (The mafic component varies in composition, being a gabbro in some places and a diorite in others, b convenience, it is called diorite in this report. The felsic component is granite in all places.

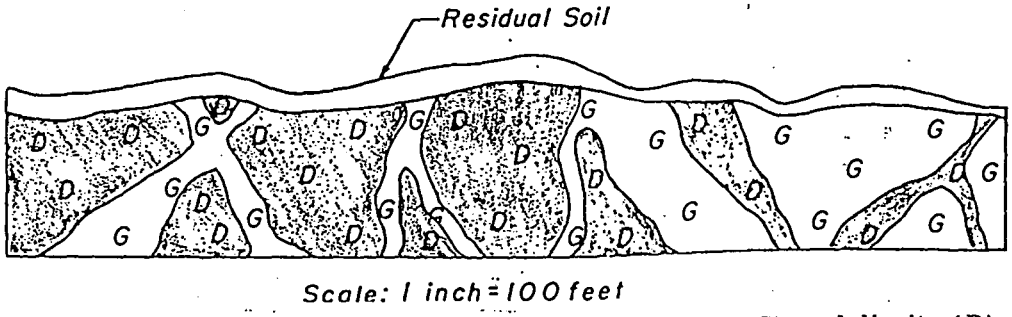


FIGURE 3.—*Diagrammatic sketch showing the relation of granite (G) and diorite (D) in Cabarrus and Mecklenburg Counties.*

So closely spaced are individual rocks within the complex that not even the larger bodies c shown on the accompanying maps. It was decided to split the complex proper into two units, one in the diorite predominates and the other in which the granite predominates. In using this subdivisio boundaries between these units are necessarily arbitrary and somewhat indefinite.

The most conspicuous occurrence of the granite is as discrete bodies veining and penetrating the rite in random fashion. Thus, in most places, it is evident that granite was intruded into the di although each type of rock is clearly separated from the other, without any appreciable modificatio either.

The diorite in a semiweathered state, commonly seen, is a dark-blue or gray medium-textured composed predominantly of hornblende and feldspar and containing varying amounts of quartz, bi pyroxene, and other accessory minerals. The rock granulates readily near the surface of the ground, the soil may be composed in part of individual hornblende and feldspar crystals typical of the Mec burg soil types.

The granite forming the complex with the diorite is light in color, being composed almost entire feldspar and quartz. Biotite, muscovite, and the accessory minerals common to most granites are conspicuous. Like the diorite with which it is associated, the granite disintegrates readily near the face, breaking down into pea-size aggregates of quartz and feldspar.

Some of the diorite is strongly schistose and much of the granite is sheared. The wide range in de of metamorphism of the diorite suggests that basic rocks of different ages are included in this com Laney[8] describes a group of diorite dikes younger than the granite and diorite and cutting both.

The source of the granite forming the complex with the diorite is not known. It is in contact a large granite mass near Kannapolis in Cabarrus County and with the syenite ring dike south of cord. Although differing in general appearance from the other granites of the Charlotte area, ge field relations suggest that the various granites may be of the same age. Where granite occurs in l

[7]Op cit., p. 6.

[8]Laney, F. B., Gold Hill mining district of North Carolina: North Carolina Geol. and Econ. Survey Bull. 21, p. 56, 1910.

amounts than diorite it appears that the granite was emplaced after the diorite, and this relation may exist also in areas where the granite is dominant over the diorite. It is possible that the granite and diorite are genetically related and that the emplacement of the granite followed quickly that of the diorite. Although some outcrops show that granite has assimilated the diorite locally, these two rocks normally occur as distinct bodies. In places where the granite is subordinate the basic component may be a gabbro, suggesting that the diorite of the complex is related to the gabbro-diorite rocks not included in the complex.

Syenite.—A more or less circular belt or ring dike of augite-syenite occurs about 4 miles southwest of Concord in Cabarrus County (fig. 9). Inside the ring is massive gabbro-diorite. The area is about 6 miles wide although the width of the ring averages less than 1 mile.

The rock is described[9] as "of uniformly coarse texture over the entire area, of massive structure and composed of large bluish gray feldspar individuals, without pronounced crystal outline (allotriomorphic). It contains little of the other minerals, as a rule, but is largely made up of the coarse crystallization of feldspar . . .

". . . The small amount of groundmass present in the rock is coarse-textured and dark gray from the proportion of the dark bisilicates present."

Large boulders, characteristic of the syenite, indicate that vertical joints are widely spaced. Its massiveness appears to be a factor in its resistance to erosion because it stands slightly higher than the mafic and felsic rocks along both the inner and outer edges. The syenite disintegrates readily but decomposes slowly, resulting in a granulated and crumbly weathered rock and soil composed almost entirely of feldspar crystals or aggregates.

In 1944 Dr. William A. White of the University of North Carolina and M. J. Mundorff mapped the syenite outcrop in some detail and studied its relation to adjacent rocks. At that time its concentric-ring outline was ascertained—an almost circular ring which is broken on the southeast side by gaps that total less than 2 miles. The rock within the ring is, for the most part, gabbro-diorite and that on the outside is chiefly the diorite injection complex, there being some granite in the town of Concord.

The origin and underground shape of the syenite ring dike are not known. The circular shape of the dike at the surface suggests that the syenite filled a peripheral fault after the central core had subsided, perhaps during late Palezoic time. The syenite is not interpenetrated by other rocks and is not metamorphosed. It may be younger than the granites.

Slates and related volcanic rocks.—In the eastern part of Cabarrus and Mecklenburg Counties a series of sedimentary slates is interbedded with volcanic rocks. These rocks form the western edge of a northeastward-trending belt that extends across the State and is generally known as the Carolina Slate Belt. The contained ore deposits, chiefly gold, have led to detailed study of parts of the belt. A part of the belt lying in the northeast corner of Cabarrus County and extending into Rowan and Stanly Counties has been described by Laney.[10].

The most common rock of the Slate Belt is a slate that appears to represent sedimentary beds of shale. The slate, blue and dense where fresh, shows distinct bedding planes especially near the Cabarrus-Stanly County line. The slates and the volcanic rocks that they enclose strike northeastward.

The volcanic rocks, chiefly tuffs of rhyolite and andesite, are interbedded with the slates and grade into them. The fine-grained tuff is dense and resembles chert; it grades into the slate and also into coarser tuffs which show fragments of coarse feldspar and quartz.

The rocks of the slate belt represent a period of intermittent volcanic activity. During the active intervals lavas of rhyolite and andesite were thrown out. The commingling of volcanic ash and other ejecta with some land waste led to the formation of tuffs. During the more quiet intervals beds of finer materials were deposited. Some of the beds, especially the finer tuffs and slates, are believed to have been deposited in water.

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[9]Watson, T. L., and Laney, F. B., The building and ornamental stones of North Carolina: North Carolina Geol. Survey Bull. 2, p. 94, 1906.

[10]Laney, F. B., Op. cit., pp. 25-42.

The slates are generally regarded as being of pre-Cambrian age. Detailed studies of local a the slate belt by Laney,[11] Pogue,[12] and Stuckey,[13] and regional investigations by King[14] indicate t age is conjectural.

Greenstone schist.—The greenstone schist crops out in a thin belt extending northeastward t the eastern parts of Mecklenburg and Cabarrus Counties. The greenstone includes an assemblage o that were mapped together because it is difficult to separate them in the field. All are green in are slightly to highly schistose, and are mafic rocks of igneous origin. The typical greenstone grained and in the more massive facies[15] phenocrysts of dark-green hornblende and greenish-yello dotized feldspars are distinguishable. The rock probably represents a basic lava flow. Along its w border the greenstone is coarser and is similar to the schistose diorite with which it is in contact west side. The contact was not observed, chiefly because of the thick cover of decomposed rock.

Insofar as the capacity to yield ground water is concerned, the greenstone is similar to the r the slate belt in structure, showing strong schistosity and prominent joints transverse to the schi It is similar to the diorite in general chemical composition and in the quality of ground water yields. Both the greenstone and diorite are intruded by granite, whereas the slate is not.

GROUND WATER

Ground water in the Charlotte area is derived from precipitation as rain or snow. The avera nual precipitation of the area is about 47 inches.

The surficial materials at many places are relatively impermeable clays, and the fraction of itation that reaches the water table may be somewhat less than one-third. Thus, recharge to the g water reservoir probably is between 10 and 15 inches per year. Seasonal fluctuations of the wate are considerable, and there may be considerable change in water level between dry and wet years. ever, over a period of many years the net change in water level is small, indicating that the avera nual discharge of ground water is about equal to the average annual recharge.

Ground water is discharged by springs and seeps, by evaporation and transpiration, and by Most of the water discharged by springs and seeps enters the streams and maintains their flow periods of fair weather.

OCCURRENCE AND MOVEMENT

Large quantities of water are contained below the land surface in the openings or interstices rocks. These range in size from the minute pores in clays to large tunnels and caverns in lav limestones. The interstices in unconsolidated sedimentary rocks, such as gravel, sand, and clay, mary interstices consisting of pores or openings between the sand or clay particles. Crystallin such as granite, diorite, gneiss, and schist, have little primary pore space between the component The important interstices in these rocks are the joints, fractures, cleavage planes, planes of sch bedding planes, and solution channels. Consolidated sedimentary rocks have had their primary o reduced by compaction and cementation. However, in these rocks jointing and fracturing have p secondary interstices in which water may accumulate.

The porosity of a rock is the percentage of the total volume that is occupied by the interstic porosity of the different rock materials covers a wide range, that of some clays, for example, may than 50 percent, whereas that of some crystalline rocks may be less than 1 percent. The porosity sands and gravels generally is between 20 and 40 percent. Sands and clays that are cemented a pacted to form sandstones and shales have a much lower porosity.

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[11]Laney, F. B., Op. cit., p. 74.
[12]Pogue, J. E., Jr., Cid mining district of Davidson County: North Carolina Geol. and Econ. Survey Bull. 22, p. 95, 191
[13]Stuckey, J. L., The pyrophyllite deposits of North Carolina: North Carolina Dept. Cons. and Dev. Bull. 37, p. 25, 1928.
[14]King, P. B., Tectonic framework of the Southeastern States: Proc. Symposium on the mineral resources of the So United States, University of Tennessee Press, Knoxville, p. 18, 1949.
[15]Laney, F. B., Op. cit., p. 43.

Many of the secondary interstices in the igneous and metamorphic rocks are formed or enlarged by weathering processes near the earth's surface; therefore they decrease in number and size with depth. Solution of mineral constituents of the soil and decay of vegetal matter in it may result in a porosity of 50 percent or more, but the porosity decreases downward in the subsoil and the partially decomposed and disintegrated bedrock. The solid bedrock may have a very low porosity.

A material may have a high porosity and yet yield little water, even though saturated and allowed to drain for a long time. For example, a clay having a porosity of 50 percent might not yield any water because of the smallness of the pores, the water being retained because of molecular attraction. Some water may be retained in a rock also because the pores are isolated or poorly interconnected. The ratio of the volume of water that saturated material will yield to the total volume is known as the specific yield and is stated as a percentage.

One of the most important characteristics of an aquifer is its permeability, that is, its relative ability to transmit water. Permeability and porosity are not necessarily related; a clay having a porosity of 50 percent may transmit water very slowly or not at all, whereas a sand or gravel having half the porosity may transmit water with relative rapidity.

The movement of ground water generally is due to the force of gravity and the velocity of flow varies directly with the hydraulic gradient. Normally the places at which ground water discharges are at lower altitudes than the areas of recharge. In a humid region such as the Charlotte area, recharge occurs in the interstream areas and the discharge is into streams, lakes, and swamps. Rain falling on the land surface percolates downward to the water table and then moves laterally toward the points of discharge. During the winter and spring, when the water table is higher, the head is greater; therefore the velocity is higher and the volume of ground water discharged is greater than in summer and autumn when the water table is lower.

THE WATER TABLE

A part of the rain falling on an area percolates downward through the soil until it reaches the zone of saturation. In this zone all the pores and interstices are completely filled with water. The top of the zone of saturation is known as the water table, which is not a stationary surface, but one which is continually fluctuating, rising during and immediately after periods of rainfall and declining during periods of fair weather. In humid regions such as the Charlotte area, the water table is an undulating surface reflecting in a subdued way the irregularities of the topography. The relief, that is the difference in altitude between high and low points of the water table, generally is much less than the relief of the topography.

The depth to the water table depends chiefly upon the climate, the topography, and the character of the rocks. In the Charlotte area the climate is fairly uniform and the various rocks are similar in regard to porosity and permeability, so that differences in depth to the water table depend largely upon topography. In valleys the water table generally is at or near the surface; on wide flat uplands the water table generally is not more than a few tens of feet below the surface; and on sharp hills the water table may be more than 100 feet below the surface. The relation of the water table to the topography, in homogeneous materials, is shown in figure 4.

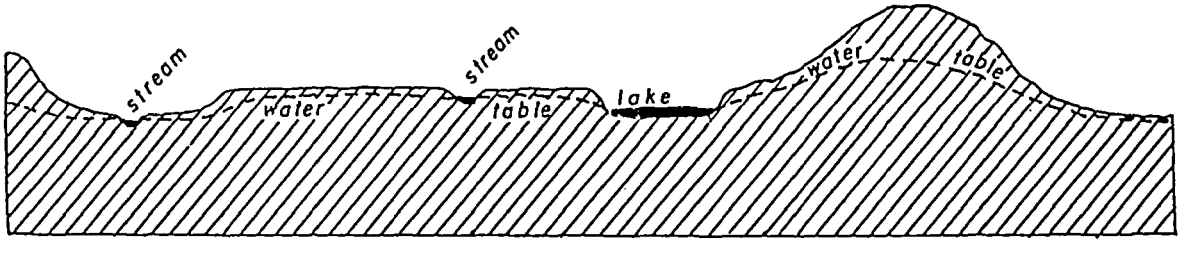


FIGURE 4.—*Diagrammatic section illustrating the relation of the water table to the topography.*

MECKLENBURG COUNTY

(Area 542 square miles; population in 1950, 197,052)

Geography and physiography.—Mecklenburg County, in the southeast part of the Charlotte area, is the most densely populated county in the area. Charlotte, the only city, is the county seat; it is the largest city in the State and had a population of 133,219 according to the 1950 U. S. census. The county is the center of the textile industry of the State, many of the mills lying in the close environs of Charlotte.

That part of the Piedmont Province that includes Mecklenburg County consists of a series of moderately level interstream areas which are appreciably hilly near the larger streams. No hills stand out prominently above the general level of the upland. The highest land in the county is near Davidson, in the extreme northern part of the county, where the altitude is slightly more than 850 feet above sea level, and the lowest land is on the Catawba River at the South Carolina line, where the altitude is about 520 feet.

The western part of Mecklenburg County is drained by the Catawba River, whereas the eastern part is drained by small streams tributary to Rocky River, which itself is in the drainage basin of the Pee Dee River. The major divide formed by these drainage systems extends from Davidson in the north through Derita to the vicinity of Matthews. The Catawba River flows southward along the western border of the county, whereas the Rocky River flows along the northeast part. These rivers are only 10 miles apart in the northern part of the county, and as a consequence the interstream area is narrow and much dissected. On the other hand, Catawba and Rocky Rivers in the southern part of the county are more widely spaced which results in longer tributaries of lower gradients extending to the major divide. Thus, the topography in the southern part is rather gentle.

Geology.—The most striking feature of the geology of Mecklenburg County is the near absence of schistose rocks (fig. 17). With the exception of a thin belt of slaty rocks in the extreme east, the rocks of the county are, for the most part, massive and are generally lacking in regional structural trends.

Rocks of the Carolina slate belt occur in the southeastern part of the county where they extend southward from Cabarrus County. Although several types of rock occur within the belt only two are shown on the accompanying geologic map; they are the greenstone and undifferentiated rocks, including slates and associated volcanic rocks. The slates are generally composed of dense, fine-grained siliceous material. At least a part of the slate is well bedded and resembles the slate at Monroe,[28] which is a distinctive part of the Carolina slate belt. The slates, as a rule, are well jointed and possess a gentler dip than other rocks in the Charlotte area.

With the exception of the rocks of the Carolina slate belt in the east, the rocks of Mecklenburg County belong to the diorite-granite complex or are believed to be associated with it. Gabbro-diorite is widely exposed along N. C. Route 49 south of Shopton in the southwest part of the county. It is a massive medium- to coarse-grained dark colored igneous rock composed mostly of pyroxene or hornblende and plagioclase feldspars. It is exposed in a few road cuts and as isolated boulders above the generally flat land surface. It is locally referred to as "blackjack" and is the source of the Mecklenburg soil type.[29] The extent of the gabbro-diorite to the south in South Carolina is not known, but it is bounded in Mecklenburg County by rocks of the diorite-granite complex.

The diorite-granite complex proper covers a large area around Charlotte. Bodies of diorite are locally separate from bodies of granite, but as a whole the two rocks are too closely intermixed to map separately. Outcrops are not common enough to ascertain the predominance of one type over the other except in a general way. However, the granite component is everywhere conspicuous and appears to make up the greater part of the complex. It appears to be subordinate to the diorite in a band bordering the gabbro-diorite in the south and along the Cabarrus County line in the northeast.

Rocks in the northern part of the county do not fall easily into the classification of rocks designed for the Charlotte area. They are granitic but contain considerable hornblende and biotite in places. They

[28]Stuckey, J. L., Personal communication.
[29]Report on Mecklenburg County Soils, Agriculture, and Industry: North Carolina Dept. Agriculture County Soil Report No. 1, vol. 38, no. 4, p. 32, 1917.

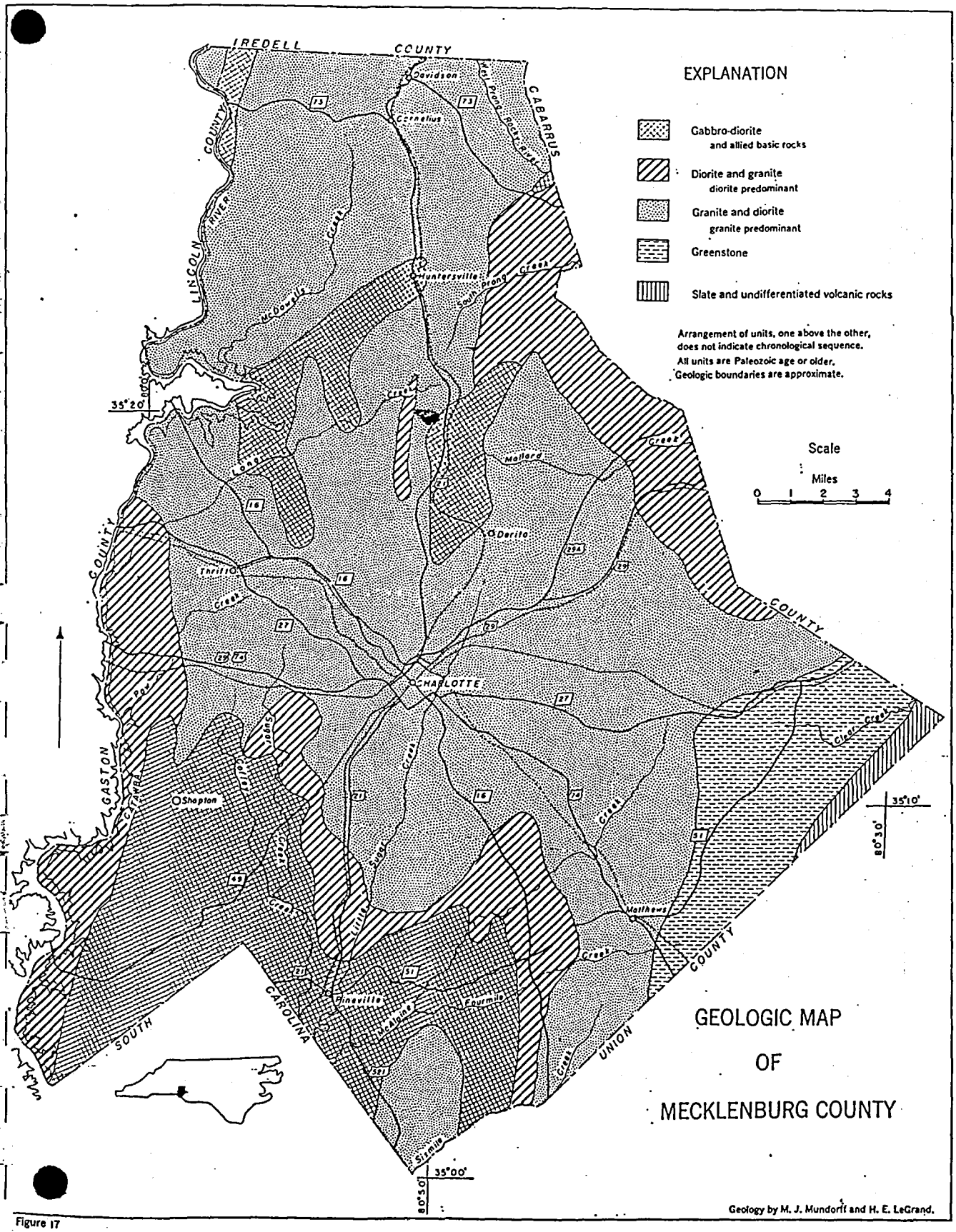


Figure 17

FIGURE 17.—GEOLOGIC MAP OF MECKLENBURG COUNTY.

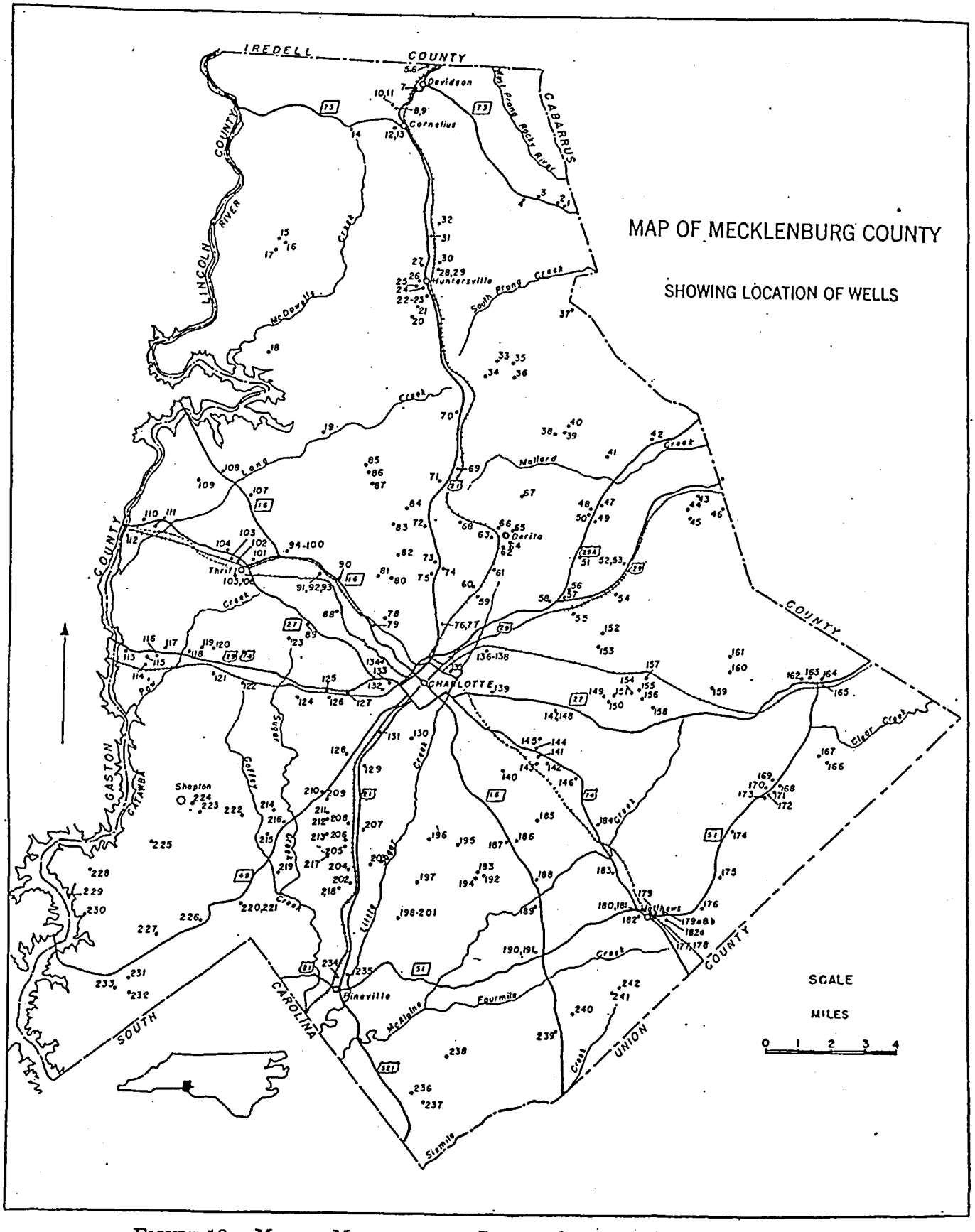


FIGURE 18.—MAP OF MECKLENBURG COUNTY SHOWING LOCATION OF WELLS.

are shown on the geologic map of Mecklenburg County as predominantly granite although they contain a greater quantity of black minerals than other granites in the Charlotte area. These rocks appear to have the same composition as those of the diorite-granite complex if a complete mixing of diorite and granite had occurred. Thus this approximate equivalence and the juxtaposition of these rocks suggest that they may be genetically related and that the hornblende-biotite granite in the northern part of the county may represent a nearly complete mixing of the diorite and granite components.

The soil derived from the hornblende-biotite granite has a deeper color than soils from other granites of the Charlotte area and contains many yellow flakes of vermiculite.

The rock weathers deeply, owing to the sharp relief in its area of outcrop, thus allowing a thick zone of weathering above the general water table.

Ground water.—Nearly all domestic water supplies and three municipal water supplies are obtained from wells (fig. 18).

Dug wells are extensively used for domestic supplies in rural districts. Normally they are from about 15 to 50 feet deep and 2½ to 4 feet in diameter. As these wells cannot easily penetrate hard rock, they generally yield adequate water as long as the water table does not fall below the surface of the hard rock, or more specifically as long as the water table does not fall below the bottom of the well. Where the bedrock lies at or near the surface, as in much of the area underlain by diorite and gabbro in the southwestern part of the county, wells may not be dug deep enough to prevent them from going dry during long periods of dry weather.

Records of more than 245 drilled wells are given in the tables of well data for Mecklenburg County. Many of these, especially in the rural areas, were core-drilled with chilled shot and are 2 or 3 inches in diameter. Their cheapness makes them suitable for domestic use, but inasmuch as 7 or 8 gallons a minute is the maximum rate at which water can be removed from a 2-inch well by a deep-well pump they are not generally used where large supplies of water are desired. Most industrial and public-supply wells are drilled with a percussion drill and are from 4 to 8 inches in diameter. The large-diameter wells might encounter fractures and cracks than missed by small-diameter wells. Also, more water can be pumped from a large-diameter well. Also, pumps with greater capacities can be installed in the larger wells.

The rocks penetrated by wells in Mecklenburg County are chiefly granite and diorite. The gabbroid rocks, occurring mostly in the southwestern part of the county, are included, for the purposes of ground-water description, with the diorite. A few wells in the eastern part of the county are drilled in slate but complete data on these wells are lacking. As the diorite and granite are rather closely intermingled, some wells doubtless penetrate both rocks. Table 13 presents characteristics of the wells as related to rock types and topographic locations.

TABLE 13.—SUMMARY OF DATA ON WELLS IN MECKLENBURG COUNTY

ACCORDING TO ROCK TYPE

Type of Rock	Number of wells	Average depth (feet)	Yield (gallons a minute)			Percent of wells yielding 1 gallon a minute or less.
			Range	Average	Per foot of well	
Diorite	41	117	1—75	17.9	0.153	2
Granite	54	124	2—65	11.5	.092	0
All wells	95	132	1—75	14.3	.109	1

[1] Drilled wells 2 inches or more in diameter.

SUMMARY OF DATA ON WELLS IN MECKLENBURG COUNTY
(Drilled wells 3 inches or more in diameter)

ACCORDING TO ROCK TYPE

Type of Rock	Number of wells	Average depth (feet)	Yield (gallons a minute)			Percent of wells yielding 1 gallon a minute or less.
			Range	Average	Per foot of well	
Diorite	30	155	3—75	22.6	.147	0
Granite	36	136	3—100	14.8	.109	0
All wells	66	144	3—100	18.4	.128	0

ACCORDING TO TOPOGRAPHIC LOCATION

Topographic location	Number of wells	Average depth (feet)	Yield (gallons a minute)			Percent of wells yielding 1 gallon a minute or less.
			Range	Average	Per foot of well	
Hill	41	125	1-65	8.5	0.068	2
Flat	13	119	2—40	13.1	.110	0
Slope	19	144	2—75	15.9	.110	0
Draw	21	144	5—75	24.9	.173	0
Valley	1	97	----------	8	.082	0

According to table 13 wells in diorite have greater yield and average yield per foot of well than wells in granite. The average yield of all diameters for which information is available in diorite is 17.9 gallons a minute as compared with an average of 11.5 gallons a minute for wells in granite. If only 3-inch and larger wells are considered, those in diorite yield 22.6 gallons a minute and those in granite 14.8 gallons a minute.

Although granite occurs extensively throughout the county, the data on wells do not indicate that it yields more water at one place than another, if topography is disregarded. The same condition holds true for the diorite. According to topographic location, wells on hills yield less water than wells on any other topographic site, yielding only .068 gallons a minute per foot of well. This is slightly more than one-third of the yield of wells in the most favorable locations, draws, that yield .173 gallon a minute per foot of well. Thus wells in draws have an average depth of 144 feet and an average yield of 24.9 gallons a minute. The average yield might be appreciably higher if only 3-inch and larger wells were considered.

As no particular part of the county can be designated as unusually poor and no part as exceptionally good, it appears advisable to give considerable attention to local conditions in locating a well. West of the slate belt, diorite, the best aquifer, occurs sporadically in almost every square mile. Thus in many cases it is possible to locate a well in the dark-colored diorite or gabbro without sacrificing convenience of location. As topography is an important consideration, the location of wells in lowlands or especially in draws should be attempted if relatively large yields are desired.

The quality of ground water in Mecklenburg County is good almost everywhere. (See table of analysis.) Analyses of water from wells penetrating granite in Mecklenburg County vary considerably in the concentration of dissolved mineral solids. This is doubtless due to the penetration of one or more small bodies of dioritic material in the granite. By virtue of their relatively insoluble mineral constituents the granites should contain water lower in mineral matter. Analyses of water from wells 27, 133, and 180 suggest that, although the predominant rock is granite, a large part of the mineral matter in solution comes from dioritic or mafic bodies penetrated by the wells.

W[illegible] 235, at Pineville, drilled in a large area of dark-colored gabbroid rocks, yields water containing [illegible] per million dissolved solids. Although this water is considered more or less typical of that in [illegible]o-diorite, it is doubtful if any of the ground waters in the county greatly exceed this in mineral mat- [illegible]most of the ground waters should contain much less.

Temperatures range from 59° to 63° F and average 61° F.

Municipal supplies.—Huntersville, population 763 (1940 census), obtains its supply from deep wells. [illegible]r deep wells have been drilled for the municipal supply and yields of 5, 9, 22, and 35 gallons a minute [illegible]eported for individual wells. The well yielding 5 gallons a minute originally yielded 20, and the [illegible] yielding 9 gallons a minute originally yielded 40. The decline in yields in these two wells may be due [illegible]terference of wells. In 1945 the average daily use was 30,000 gallons. The water is not treated. The [illegible]mical quality of the water, as shown by the analysis of well 27, is good.

Matthews, population 486 (1940 census), obtains its water from a deep well drilled in greenstone, [illegible]ch yields 20 gallons a minute. The water is not treated.

RECORDS OF WELLS IN MECKLENBURG COUNTY

Location	Owner	Driller	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water level (feet below surface)	Yield (g.p.m.)	Total hardness (field tests) (p.p.m.)	Remarks
1¾ miles NE. of Huntersville	H. G. Bradford	Sherril	Cr-Dr	160	2					Granite. Adequate yield, slightly hard water. Flat.
do	R. G. Summers	Earl Torrence	Cr-Dr	83	2	60		7		Granite. Water slightly hard. Hill.
[illegible] miles NE of Huntersville	John G. Caldwell J. H. Stillwell		Cr-Dr	70	2			2-3		Granite. Moderately soft water. Hill.
do	R. C. Bradford		Cr-Dr	85	3			6+		Granite; 61° F. Hard water. Hill.
Davidson	Davidson Cotton Mills Inc.		Cr-Dr	80±	2		22	4	65	62½° F. Well at machine shop. Draw.
do	do		Cr-Dr	60-80				14		7 wells in group. Aggregate yield 14 g.p.m. to suction pump. When drilled 6 of the 7 wells flowed. Draw.
do	Davidson Ice & Fuel Co.	Jim Robbins	Cr-Dr	100	4	35		11	80	Rock at 30 feet. Slope.
Cornelius	Cornelius Mills, Inc.		Cr-Dr	115	3	90±		15	60	Rock reported at 90 feet. Schist. Flat.
do	do		Cr-Dr	127	2			8		Schist. Flat.
do	do	W. A. Kirkley	Cr-Dr	106	4			70		Schist. Water level 60 feet below surface when pumped at 20 g.p.m. Flat.
do	do	do	Cr-Dr	55	4			50		Schist. Flat.
do	Gem Yarn Mills		Cr-Dr	90±	2			5		Schist. Draw.
do	do		Cr-Dr	160	2			3¾		Do.
1¾ miles W. of Cornelius	Mrs. Mary C. Hager		Cr-Dr	45	2			3	40	Schist. Hill.
4½ miles W. of Huntersville	Mrs. J. C. Blythe		Dug	30	24	30	23.24			Schistose diorite. Hill.
do	Joe L. Blythe		Cr-Dr	175	3	100		5+	40	Do.
do	J. L. Norket		Cr-Dr	125	2			6	35	Schistose diorite. Slope.
5 miles SW. of Huntersville	W. O. Hollingsworth		Cr-Dr						60	Schistose diorite.
do	Long Creek High School	Hickory Drilling Co.	Dr	101	6			65	25	Granite. 62½° F. Hill.
2 miles S. of Huntersville	Prison Camp		Cr-Dr	225	3			2½	100	Granite. 60½° F. Rock at 20 feet. Hill.
1¾ miles S. of Huntersville	do		Cr-Dr	97	3			7½	65	Granite. 59¾° F. Valley.
1¾ miles S. of Huntersville	County Sanatorium		Dr	120+	8		16	15	35	62° F.
do	do		Dr	140+	8			11	50	63° F. Draw.
Huntersville	Town well 1		Dr	70	5		40	9	55	62° F. Originally 110 ft. deep, 8 in. in diameter. Yielded 40 g.p.m. Filled with sand and was redrilled. Draw.
H[illegible]ille	Town well 2	Abernathy	Dr	210	8	100	30	22	65	62½° F. Draw.
do	Town well 3	Ralph Robbins	Dr	97	5	97		5	50	Granite. Originally yielded 20 g.p.m. Draw.

RECORDS OF WELLS IN MECKLENBURG COUNTY—*Continued*

Well no.	Location	Owner	Driller	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water level (feet below surface)	Yield (g.p.m.)	Total hardness (field tests) (p.p.m.)	Remarks
27	Huntersville	Town well 4	R. E. Faw	Dr	190	8	100±	20	35	64	Analysis. Granite. Draw.
28	do	Anchor Mills Co.		Cr-Dr	38-81	2	38 to 81	5 to 30	27½	105	62° F. Combined yield of 10 wells. 27½ g.p.m. Draw.
29	do	do	Robbins	Dr	185	5			10-12		Hard water reported. Draw.
30	do	do		Cr-Dr	300 or 400	3			12	70	63° F. Hill.
31	1¼ miles N. of Huntersville	G. R. Fleenor	Sherril	Cr-Dr	72	2			10	35	Flat.
32	1½ miles N. of Huntersville	Ralph Johnson		Cr-Dr	140	2	100		3		Flat.
33	2½ miles SE. of Huntersville	D. B. Jordan J. R. Westbrook, tenant		Dug	62	40	62	58			Granite. Hill.
34	3 miles SE. of Huntersville	Plantation Pipeline Co.		Dr	260	8				15	Granite. Draw.
35	2¾ miles SE. of Huntersville	F. M. Fite	Robbins	Cr-Dr	116½	3	20	45	3	70	61° F. Granite. Hill.
36	3½ miles SE of Huntersville	B. C. Zeigler		Cr-Dr	50+	2				55	Diorite. Water contains iron. Hill.
37	4½ miles E. of Huntersville	M. B. Wallace		Cr-Dr	69	2	45±	15	5	580	Diorite. Laboratory test. "Black jack" soil. Draw.
38	3½ miles NE. of Derita	B. W. Alexander		Cr-Dr	118	2	18		2	110	Diorite. Slope.
39	do	James I. Crenshaw	Va. Mach. Co.	Dr	85	6			12	95	Diorite. Water contains iron. Hill.
40	4 miles NE. of Derita	O. B. Cochran	do	Dr	38	6			4-5	50	Granite. Water contains iron. Hill.
41	do	Clarence Pender	Will Fortner	Cr-Dr	96	2				65	Diorite. 61¾° F. Adequate yield. Hill.
42	5½ miles NE of Derita	Henry Doster		Cr-Dr		2				237	Diorite. (Laboratory test). Adequate yield. Draw.
43	3½ miles NE. of Newell	Frank Cochran	Bowers	Cr-Dr	132	3			8	85	Diorite. Slope.
44	2½ miles NE. of Newell	L. W. Austin		Dug	32½	30		31.58			Diorite. Hill.
45	2¾ miles NE. of Newell	J. R. Austin		Cr-Dr	137	2			7½		Diorite. Slope.
46	3½ miles NE. of Newell	James Caldwell	Bostin	Cr-Dr	79	4	58	20	20		Diorite. Slightly hard water. Hill.
47	2 miles N. of Newell	County Home	Hinson	Dr	162	10			60	140	Diorite. 64° F. Use, about 35,000 to 40,000 gallons a day. Draw.
48	do	Victor Penninger	Bowers	Cr-Dr	92	2	86	23	5	45	Pump in basement, 8 feet below surface. Granite. Slope.
49	2 miles N. of Newell	N. M. Christenbury	J. Torrence	Cr-Dr	133	2	35±		5	75	Granite. Hill.
50	do	J. W. Dierstein		Cr-Dr	80	2		14.5	2½	50	Granite. 61¾° F. Slope.
51	1½ miles NW. of Newell	S. P. Moyer		Cr-Dr	90	2			½	65	Diorite. Hill.
52	Newell	High School		Cr-Dr	335	3			8	30	Granite. 62½° F. Slope.
53	do	do		Cr-Dr	80	3			8		Granite. Slope.
54	¾ mile S. of Newell	Mrs. Annie Babb	W. A. Kirkley	Cr-Dr	96½	3	35	16	8	30	Granite. Hill.
55	5 miles E. of Charlotte	Galloway Estate		Cr-Dr	113	2			7		Do.
56	5¼ miles NE. of Charlotte	F. S. Neal Estate		Cr-Dr	196	2½		22	5-10	45	Flat.
57	4¾ miles NE. of Charlotte	Mecklenburg Furniture Shop	E. Mullis	Cr-Dr	134	3	94		9	60	Flat.
58	4½ miles NE. of Charlotte	W. S. Abernathy	Montgomery	Cr-Dr	165	2			12	35	Draw.
59	1¾ miles SW. of Derita	J. E. Heafner	do	Cr-Dr	130	2	130	9	7	50	Draw.
60	1½ miles SW. of Derita	E. T. Robinson	Everett Mullis	Cr-Dr	116	3	100		7	55	Granite. Flat.
61	1 mile SW. of Derita	B. J. Hunter	Allen (?)	Cr-Dr	380	2			3	60	61¾° F. Rock at 80 feet. Hill.
62	Derita	Louis G. Ratcliffe, Inc.	Bill Brathn	Cr-Dr	92 to 135	2	92-135		11 to 35 each	55	Group of 4 wells used at greenhouses. Draw.
63	do	Bob Farington		Cr-Dr	65	3		21	12		Draw.
64	¾ mile E. of Derita	H. L. Young		Dug	38	36	36	31.5		15	60° F. Adequate supply. Hill.
65	Derita	School		Dr	90	6			20		Hill.
66	do	B. J. Hunter	Ed. Hunter	Cr-Dr	92	2	61	21	12	30	Supplies 27 houses. Hill.
67	1½ miles NE. of Derita	C. A. Seegar		Cr-Dr	99	2				20	Draw.
68	1 mile NW. of Derita	J. H. Stevens		Dug	40	36	40	23.5			
69	2½ miles NW. of Derita	P. J. Penninger		Dug	21	36	21	13	1½	55	Granite. Flat.
70	4 miles NW. of Derita	J. E. Penninger	Homer Sherril	Cr-Dr	125½	2	80	12	5	30	Granite. 62° F. Supplies 3 buildings. Flat.
71	2½ miles NW. of Derita	Clyde Hunter	Martin	Cr-Dr	146	3		20-25	7		Soft water. Flat.
72	4½ miles N. of Charlotte	C. E. Collins	Robbins	Cr-Dr	113	2	40	21	3	65	Gneiss. Flat.

RECORDS OF WELLS IN MECKLENBURG COUNTY—*Continued*

ll no.	Location	Owner	Driller	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth casing (feet)	Water level (feet below surface)	Yield (g.p.m.)	Total hardness (field tests) (p.p.m.)	Remarks
:	3¾ miles N. of Charlotte	G. V. Burris	W. A. Ivester	Cr-Dr	48	2			15		Moderately soft water. Draw.
74	do	C. T. Stallings	Robbins	Cr-Dr	71½	2	31		6		Slightly hard water. Draw.
75	3¾ miles N. of Charlotte	Mrs. Eva Mae Ellis		Cr-Dr	96	2			2½		Gneiss. Hard water. Hill.
76	2½ miles NE. of Charlotte	Interstate Granite Corporation	W. A. Kirkley	Cr-Dr	165	4			35		Granite. Slope.
	do	do	do	Cr-Dr	200	4			35		Granite. Draw.
78	2½ miles NW. of Charlotte	G. V. Keller	Hinson	Dr	190	6	190	26	10–15	65	Diorite. Hill.
79	do	Planters Fertilizers & Phosph. Co.		Dug	31	30		25	5		
	3 miles N. of Charlotte	I. T. Hutchison		Cr-Dr	110	2		22	5	25	Hill.
	3½ miles NW. of Charlotte	T. P. Caldwell	Montgomery	Cr-Dr	158	2	83	30	3½		Diabase dike. 63° F. Soft water. Well was dynamited to increase yield. Hill.
82	4 miles N. of Charlotte	E. C. Glenn		Cr-Dr	150	2			5±	25	Hill.
	4¾ miles N. of Charlotte	J. W. Buchanan		Cr-Dr	85	2			7½	50	Hill.
	5½ miles N. of Charlotte	F. W. Dotzer		Cr-Dr	82	2	78		7	35	Diorite. Hill.
85	7 miles N. of Charlotte	P. V. Humphrey	Geo. Stephenson	Cr-Dr	100	2	99		5	35	
86	do	R. W. Parker	do	Cr-Dr	140	2	85	25	6		No water until well was dynamited.
	do	H. T. Reavis	do	Cr-Dr	130	2	100	25	5		Do. Slope.
	3½ miles NW. of Charlotte	Chadwick-Hoskins Co.	Sydnor	Dr	549	10			100	80	63° F. Well at plant 2 supplies both plants and school. Draw.
89	4 miles NW. of Charlotte	Mecklenburg Nurseries		Cr-Dr	135	2	90		4–5	60	Dug well, nearly went dry in 1941–1942. Hill.
	do	Godley Bros.		Cr-Dr	80	3			6		Soft water. Hill.
91	4¼ miles NW. of Charlotte	National Carbon Co.	W. A. Kirkley	Cr-Dr	150	4	100		18	35	63° F. Company well 1. Draw
92	do	do	do	Cr-Dr	135	4	102		8		62° F. Company well 2. Draw
93	do	do	do	Cr-Dr	108	4	84		7		Company well 3. Slope.
	1¼ miles NE. of Paw Creek	Leaksville Woolen Mill Co.	Sydnor	Dr	350	10			36	55	62½° F. Company well 4. Draw.
95	do	do		Dr	300	10			60	75	59° F. Company well 5. Temperature taken after pumping 35 minutes—7/17/45. Draw.
96	do	do	do	Dr	1,166½	10			68	170	63° F. Company well 6. Pumping level 173 feet below surface in 1942. Draw.
1	1¼ miles NE. of Paw Creek	Leaksville Woolen Mills Co.	Sydnor	Dr	1,074	10			67¼	72	61½° F. Company well 7. Temperature after pumping 20 minutes. Draw.
98	do	do	do	Dr	250	8			30		Company well 1. Not in use. Draw.
9	do	do		Dr	250	10–8			50		Company well 2. Never used Water too hard.
00	do	do		Dr	250	10			25		Company well 3. Not used. Originally yielded 100 g.p.m.
0	Paw Creek	High School	Carolina Drill. Co.	Dr	140	6			30		Slope.
0	do	Standard Oil Plant	J. S. Hinson	Dr	306	6			55	40	Draw.
03	do	Shell Oil Plant	Heater Well Co.	Dr	148	6	80½	21	36	40	61½° F. Draw.
04	do	American Oil Co. Plant		Cr-Dr	85	3				80	62° F. Draw.
0	do	Kendall Mills Thrift Plant		Dr	600	10–8	60	32	55	150	63° F. Slope.
06	do	do		Cr-Dr	33 to 65	2½	33 to 65	½ to 2	14	60	59½° F. Group of 6 wells. Valley.
07	2 miles N. of Paw Creek	McClure Lumber Co.		Cr-Dr	115	3	76		4		Granite. Hill.
0	3 miles NW. of Paw Creek	M. L. Dunn	Robbins	Cr-Dr	54	2			3	50	Granite. Flat.
0	3¼ miles NW. of Paw Creek	James Costevens		Dug	30	12	30	23.0			Adequate water supply. Soft water. Flat.
10	3¼ miles NW. of Paw Creek	R. C. Beatty	Geo. Stevenson	Cr-Dr	90	3			10	80	61½° F. Granite "sand". Draw.
11	do	C. O. Hager		Dug	80	36		65			Supplies 12 houses. Soft water. Hill.
12	4 [illegible] NW. of Paw Creek	Southern Dyestuff Corp.	Sydnor	Dr	221	6	60		38	450	61¾° F. Laboratory test.

RECORD OF WELLS IN MECKLENBURG COUNTY—*Continued*

Well no.	Location	Owner	Driller	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth casing (feet)	Water level (feet below surface)	Yield (g.p.m.)	Total hardness (field tests) (p.p.m.)	Remarks
113	8¾ miles W. of Charlotte	K. M. Beaty		Dug	39½	18	39½	34.7			
114	8¼ miles W. of Charlotte	Paul Thompson	Helms	Cr-Dr	115	2			4-5		Granite. Soft water. Flat.
115	do	C. E. Berryhill		Cr-Dr	126	2			5-6	40	Granite. Slope.
116	8 miles W. of Charlotte	Cathey Brothers		Dr	80	6			18	40	Granite. Supplies house and dairy. Hill.
117	7½ miles W. of Charlotte	Otis Keeter	W. A Kirkley	Cr-Dr	136	3			25	45	Recreational Park. Hill.
118	7¼ miles W. of Charlotte	(Willamette Park) R. A. Suttle	Ralph Robbins	Dr	95	6	30	10 to 12	17		Recreational park. Draw.
119	6¾ miles W. of Charlotte	E. E. Williams		Cr-Dr	120					95	Hill.
120	6 miles W. of Charlotte	E. L. Black	Everett Mullis	Cr-Dr	77	2	25		5		Granite. Hill.
121	6¼ miles W. of Charlotte	Berryhill High School	Abernathy	Dr	110	6			12	25	Always has furnished adequate supply. Flat.
122	5 miles W. of Charlotte	Douglas Airport		Dr	300	6					Not used. Slope.
123	4¼ miles W. of Charlotte	J. L. Todd		Cr-Dr	181	2					Slope.
124	4 miles W. of Charlotte	Plato-Price High School		Dr	90	6			20		Slope.
125	2¾ miles W. of Charlotte	American Cyanimide Co.	Robbins	Dr	149	6			28	42	Diorite.
126	3 miles W. of Charlotte	Carolina Golf Course		Dr	70	6		1.8			Draw.
127	2½ miles W. of Charlotte	Southern Engineering Co.	Robbins	Dr	42½	5 5/8	40	4	25	55	Used for cooling. Draw.
128	3½ miles SW. of Charlotte	W. W. Davis		Dug	21	36	21	15.9			Adequate supply; soft water. Slope.
129	do	Diamond Point Grocery	W. A. Kirkley	Cr-Dr	80	3			30	40	
130	Charlotte	Scholtz Greenhouses	do	Cr-Dr	225	4	60	20	22	60	64° F. Slope.
131	do	Shoenith Candy Co.		Dug	110	72			10	40	62° F. Well is abandoned mine shaft. Slope.
132	do	Charlotte Pipe and Foundry Co.	J. S. Hinson	Dr	196	6		20	10-15	105	62½° F. Slope.
133	do	Air Reduction Sales Co.	Sydnor	Dr	200	6	85		50	113	62° F. Analysis in table. Water used for cooling. Draw.
134	do	National Welding Supply Co.	W. A. Kirkley	Cr-Dr	150	3			18	55	61° F. Granite. Used for cooling. Draw.
135	do	Highland Park Mfg. Co., Plant 1		Cr-Dr	30 to 80	2			15		Group of 13 wells yield 15 g.p.m. Draw.
136	do	Highland Park Mfg. Co.	Ralph Robbins	Dr	75	6			14		Slope.
137	do	do	do	Dr	87	6			9		Slope.
138	do	do	do	Cr-Dr	30 to 60	2			40		Three groups of six wells each; combined yield 40 g.p.m. Draw.
139	2½ miles E. of Charlotte	Z. E. Hargett		Dr	150	6		26	25	60	61½° F. Granite. Slope.
140	4¼ miles SE. of Charlotte	A. C. Roundton	W. A. Kirkley	Cr-Dr	76	4		18	20		Granite. Slope.
141	4¾ miles SE. of Charlotte	Pure Oil Co.	Ralph Robbins	Dr	62	6			30	35	63° F. Draw.
142	do	Sharon Memorial Park		Dr	150	6					Slope.
143	do	W. W. Covington	E. Mullis	Cr-Dr	83	2			6	40	Granite. Slope.
144	4½ miles SE. of Charlotte	F. C. Thompson	W. A. Kirkley	Cr-Dr	95	2	85	15	9	50	Slope.
145	4½ miles SE. of Charlotte	Hudson Hosiery Co.	W. A. Kirkley	Cr-Dr	95	4	85	18	15	30	62¾° F. Granite. Draw.
146	5½ miles SE. of Charlotte	I. G. Wallace	Clayton Cooke	Cr-Dr	60	2	55	7	4-5	50	
147	4¼ miles E. of Charlotte	Joe W. Yandle		Dug	30	24	30	19.3			Well not used. Flat.
148	do	do		Cr-Dr	180	2			7-8	45	Draw.
149	5¼ miles E. of Charlotte	Sam Wallace		Cr-Dr	200	2			1½		Hill.
150	do	W. T. Harris		Cr-Dr	85	2			5½		Draw.
151	do	D. B. Wilson	Glosson	Cr-Dr	85	2	68	8	8		Soft water. Draw.
152	6 miles E. of Charlotte	H. G. Russell	do	Cr-Dr	60	2			4½	30	Granite. Slope.
153	do	C. E. Morris		Cr-Dr	190	4		19	12	35	Hill.
154	6 miles E. of Charlotte	S. M. Craig	Donaldson	Cr-Dr	95	2	90	20	4-5		Soft water. Slope.
155	6½ miles E. of Charlotte	Harvey Morris	Ralph Robbins	Dr	184½	5 5/8	128	23	20	35	
156	do	J. A. Smith	Sam Allen	Cr-Dr	195	3	100	23.6	8		Hill.
157	7 miles E. of Charlotte	Hickory Grove School	W. A. Mullis	Cr-Dr	135	2			5		Flat.
158	do	United Arco Service		Cr-Dr	149	3		18	30		Granite. Draw.

RECORDS OF WELLS IN MECKLENBURG COUNTY—*Continued*

Location	Owner	Driller	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth casing (feet)	Water level (feet below surface)	Yield (g.p.m.)	Total hardness (field tests) (p.p.m.)	Remarks
7. of Mint Hill	Clear Creek Negro School		Dr	91	6			60		Draw.
NW. of Mint Hill	Mrs. Montie Lucas		Cr-Dr	235	2			3		Soft water. Hill.
of Mint Hill	Mason Wallace	Mullis	Cr-Dr	170	2			2-3		Granite. Soft water. Hill.
3. of Mint Hill	Clear Creek High School	A. E. Beaver	Cr-Dr	110	3			12-15		Hill.
NE. of Mint Hill	Allen and Brooks Ginning Co.		Cr-Dr	178	4			12		Slate. Not in use. Slope.
3. of Mint Hill	do		Cr-Dr	134	2			5	50	Flat.
	C. G. Allen		Cr-Dr	100	2			4		Slate. Soft water. Flat.
of Mint Hill	T. S. Houston	Glosson	Cr-Dr	100½	2			7		Hill.
	R. C. Beaver		Dug	43	30		39.07			Hill.
	Kingcraft Hosiery Mill	Everett Mullis	Cr-Dr	110	2			8		
	C. J. McEwen	Duncan	Cr-Dr	180	2			7		Slope.
	R. J. McEwen & Son	W. C. Mullis	Cr-Dr	80	2			7	35	Draw.
	C. J. McEwen		Dug	33	30	33				Hill.
	W. F. Haigler	E. Mullis	Cr-Dr	155	2	100	12	5		Soft water. Slope.
	Mrs. J. W. McEwen	Beaver	Cr-Dr	210	3			5-6		Dynamited well to increase yield. Slope.
W. of Mint Hill	E. M. Gray	Mullis	Cr-Dr	105	2			5		Slope.
NE. of Matthews	L. H. Yandle	E. Mullis	Cr-Dr	92	2			5	55	Hill.
s E. of Matthews	D. B. Query	Sam Allen	Cr-Dr	100	2	70	25	6	50	Slope.
	E. M. Renfron	W. Donaldson	Cr-Dr	125	2			2½		Soft water. Slope.
	L. H. Yandle	Abernathy	Cr-Dr	74	3	50	18	10-12		Do.
	do	Will Mullis	Cr-Dr	75	3	40		20	35	Well at barn.
	do	Walter Abernathy	Dr	187	6		1½R	55		Used for domestic uses and swimming pool. Greenstone. Draw.
	C. L. Neal	Ben Aycock	Dr	87	4			45		Greenstone. Used for domestic uses and swimming pool. Draw.
	B. D. Funderburk	W. Abernathy	Dr	200	3		18	18	61	Analysis in table. Supplies six businesses and four families. Granite. Draw.
	do	do	Dr	125	3			7		Well at stable. Granite. Draw.
	Matthews School	do	Dr	160	3			7	55	Well dymanited to increase yield.
	Town	Ben Aycock	Dr	275	6	110		20		Greenstone. Distribution not yet installed. Slope.
s NW. of Matthews	Carlyle Thompson	Sam Allen	Dr	50	2			5		Granite. Hill.
NW. of Matthews	J. B. Fowler		Dr	95	3			7	60	Hill.
E. of Charlotte	J. J. Akers	Ralph Robbins	Dr	165	5 5/8	110		35	55	Diorite. Slope.
	John L. Hunter	W. A. Kirkley	Dr	96	3		36.78		45	Diorite. Flat.
	T. W. Pritchard	Ralph Robbins	Dr	147	5 5/8			15		Granite. Slope.
SE. of Charlotte	F. W. Alexander		Cr-Dr	165	2			5	95	Slope.
W. of Matthews	Providence School		Cr-Dr	100	3			5		
W. of Matthews	Eli B. Springs	Ben Aycock	Dr	190	6	30	17 to 20	60	150	Draw.
	do	W. A. Kirkley	Cr-Dr	150	3			15		Greenstone. Flat.
of Charlotte	C. R. Collins	Montgomery	Cr-Dr	180	3			5	60	Diorite. Hill.
S. of Charlotte	C. R. Collins	Ralph Robbins	Dr	60	55	20	18.00	5		Slope.
	do	Ben Aycock	Dr	100	6		3	18		Gabbro. Draw.
of Charlotte	Sharon School		Dr	65	6			15		Flat.
of Charlotte	Springside Dairy	Robbins	Cr-Dr	137	3	32		6		Soft water. Slope.
E. of Pineville	Harkey Bros. Nursery, Inc.		Dug	25	30	25	15.02		45	Greenstone.? Flat.
NE. of Pineville	Dr. A. M. Whisnant		Cr-Dr	139	2			4		Diorite. Abandoned; not sufficient water. Hill.
	do		Cr-Dr	209	3			8-10		Diorite. Abandoned; pumped sand. Hill.
	do	Ralph Robbins	Dr	102	5 5/8		45	20	45	Diorite. Draw.
	do	W. A. Kirkley	Cr-Dr	262	4-3			12		Diorite. Slope.
N. of Pineville	Mrs. Eunice E. Smith		Dug	65	48	65	47.0			Soft water. Hill.
N. of Pineville	Dr. T. N. Reed		Cr-Dr	200	3			5	85	Granite. Hill.
of Pineville	H. B. Smith	W. A. Kirkley	Cr-Dr	140					35	Hill.

RECORD OF WELLS IN MECKLENBURG COUNTY—*Continued*

Well no.	Location	Owner	Driller	Type of well	Depth of well (feet)	Diameter of well (inches)	Dept casing (feet)	Water level (feet below surface)	Yield (g.p.m.)	Total hardness (field tests) (p.p.m.)	Remarks
205	5¼ miles SW. of Charlotte	Ebenezer Presbyterian Church	W. A. Kirkley	Cr-Dr	156	3	60±		6	35	62° F. Slope.
206	do	H. R. Mauney		Cr-Dr	125	2					Moderately soft water. Slope.
207	4¾ miles SW. of Charlotte	C. N. Baker	W. A. Kirkley	Cr-Dr	93	4			8	35	Tested at 10 g.p.m. Hill.
208	4½ miles SW. of Charlotte	J. H. Huntley		Dug	26	36		20	2-3	30	Hill.
209	4¾ miles SW. of Charlotte	Mrs. L. J. Eller	W. A. Kirkley	Cr-Dr	145	4		14	18	30	Slope.
210	do	F. D. Hemphill	Hurley Helms	Cr-Dr	90	2			5	25	Slope.
211	5¼ miles SW. of Charlotte	E. L. Jenkins	W. A. Kirkley	Cr-Dr	92	3			10	45	Draw.
212	do	A. Y. Deal		Cr-Dr	88	2			5		Diorite. Flat.
213	5¾ miles SW. of Charlotte	Edwin Bruton	E. Mullis	Cr-Dr	108	2			7-8	45	Diorite. Draw.
214	6 miles SW. of Charlotte	R. S. Smith	W. A. Kirkley	Cr-Dr	108	4			3	50	Diorite. Hill.
215	6½ miles SW. of Charlotte	H. B. Hunter	Montgomery	Cr-Dr	204	3	60		8	60	62° F. Diorite. Hill.
216	5¾ miles SW. of Charlotte	J. N. Herron	W. A. Kirkley	Cr-Dr	127½	3	50		6-8	50	Hill.
217	6½ miles SW. of Charlotte	J. T. Greenwood		Dug	48	36		42.71			Diorite. Hill.
218	3¼ miles N. of Pineville	W.B.T. Radio Station	Montgomery	Cr-Dr	225	3			7-8		Slope.
219	4 miles NW. of Pineville	Arrowood	Abernathy	Dr	286	6	20		16	261	62¼° F. Laboratory test. Draw.
220	3¾ miles NW. of Pineville	U. S. Rubber Co. Shell Loading Plant	W. A. Kirkley	Cr-Dr	196	3		12	40		Gabbro. Well capped; not used. Flat.
221	do	do	do	Cr-Dr	145	3		12	30		Gabbro. Flat.
222	7 miles SW. of Charlotte	Miss Amanda Coffey	Tom Allen	Cr-Dr	112	2	80		5	60	61° F.
223	7¾ miles SW. of Charlotte	R. A. Grier		Cr-Dr						25	
224	do	Mrs. F. K. Byrum		Cr-Dr	100	2			6		Diorite. Flat.
225	9¼ miles SW. of Charlotte	Samuel Knox		Dug	20	24		14.54			Gabbro. Hill.
226	4½ miles NW. of Pineville	N. M. Boyd		Dug	21	30		10.55		125	Gabbro.
227	5¾ miles NW. of Pineville			Dug	17.5			11.79		185	Gabbro. Has always furnished adequate supply.
228	8 miles NW. of Pineville	O. B. Knox	Charles Montgomery	Cr-Dr	110	2			3	20	Diorite. Hill.
229	8½ miles NW. of Pineville	Island Point Club	do	Cr-Dr	100	2			2	105	Do.
230	8 miles NW. of Pineville	R. S. Smith	Ralph Robbins	Dr	181	5 5/8	83		25		Do.
231	6 miles W. of Pineville	J. R. Smith		Bored	52	12	52	43.08			Granite.
232	5¾ miles W. of Pineville	W. C. Stroup	Montgomery	Cr-Dr	128	3	80	20	15	25	62½° F. Granite. Hill.
233	6 miles W. of Pineville	H. M. Blackwelder	do	Cr-Dr	175	2			3-4	20	Granite. Hill.
234	Pineville	J. E. M. Davenport		Dr	132	6		12	75		Schistose diorite Slope.
235	do	Town		Dr	134	8		12	75	234	62½° F. Schistose diorite. Analysis. Draw.
236	4 miles SE. of Pineville	James K. Hall		Dr	90	2			5		Granite. Hill.
237	4¼ miles SE. of Pineville	R. G. Bryant	Robbins & Wilson	Cr-Dr	132	2	90	42	5	35	Do.
238	3¾ miles SE. of Pineville	Mrs. E. E. Niven		Dug	38	36	38	31.95			Adequate yield. Draw.
239	4½ miles SW. of Matthews	J. J. Grier		Bored	32	12	32	23.74		20	Hill.
240	3¾ miles SW. of Matthews	J. M. Knox		Dug	39	36		29.80		25	Well more than 50 years old; has never gone dry. Flat.
241	2½ miles SW. of Matthews	W. N. McKee	Abernathy	Cr-Dr	235	3-2	135		5	45	Granite. Hill.
242	2½ miles SW. of Matthews	Presley Smith	C. C. Montgomery	Cr-Dr	85	2	75		8-10		Granite.

ANALYSES OF GROUND WATER FROM MECKLENBURG COUNTY,[1] N. C.
(Numbers at heads of columns correspond to numbers in table of well data)
(parts per million)

	27	133	180	235
Silica (SiO_2)	35	37	39	60
Iron (Fe)	.12	.15	.06	.09
Calcium (Ca)	16	29	15	55
Magnesium (Mg)	5.8	9.8	5.8	26
Sodium and potassium (NA+K)	5.7	11	8.2	20
Carbonate (CO_3)	0	0	0	0
Bicarbonate (HCO_3)	70	108	62	185
Sulfate (SO_4)	3.9	29	2.8	94
Chloride (Cl)	4.5	10	12	22
Fluoride (F)	.1	.1	.2	.5
Nitrate (NO_3)	10	3.5	10	6.0
Dissolved solids	120	189	139	395
Total hardness as $CaCO_3$	64	113	61	244
Date of collection	6/12/45	7/21/45	6/25/45	6/25/47

[1] Analyzed by the U. S. Geological Survey.

POLK COUNTY

(Area 234 square miles; population in 1950, 11,627)

Geography and physiography.—Polk County forms the southwestern corner of the area included in report (figs. 1 and 20). Agriculture, which is favored by the relatively high annual rainfall distribut- throughout the year, is the principal industry in the county. Severe droughts are extremely rare. The r power afforded by the swift-flowing streams is an asset of the county.

The southern and eastern parts, including about three-fourths of the county, lie in the Piedmont Pla- This section is an undulating upland which is more hilly toward the west than toward the east. general altitude of the Plateau is about 1,000 feet above sea level.

Joining the Piedmont Plateau on the west and north and rising rather abruptly above it is a part of Blue Ridge province. The topography of the latter area is decidedly hilly and is generally unsuited for ing. At least two of the peaks in the county are more than 3,200 feet above sea level.

As the Blue Ridge province forms a major drainage divide in the northwestern section the streams ow devious but prevailingly southeastern courses toward the Broad River. The heavy rainfall pro- s considerable water for the numerous streams that arise within the county. The streams have cut er deep valleys below the general upland level and their steep gradients allow them to erode the d readily.

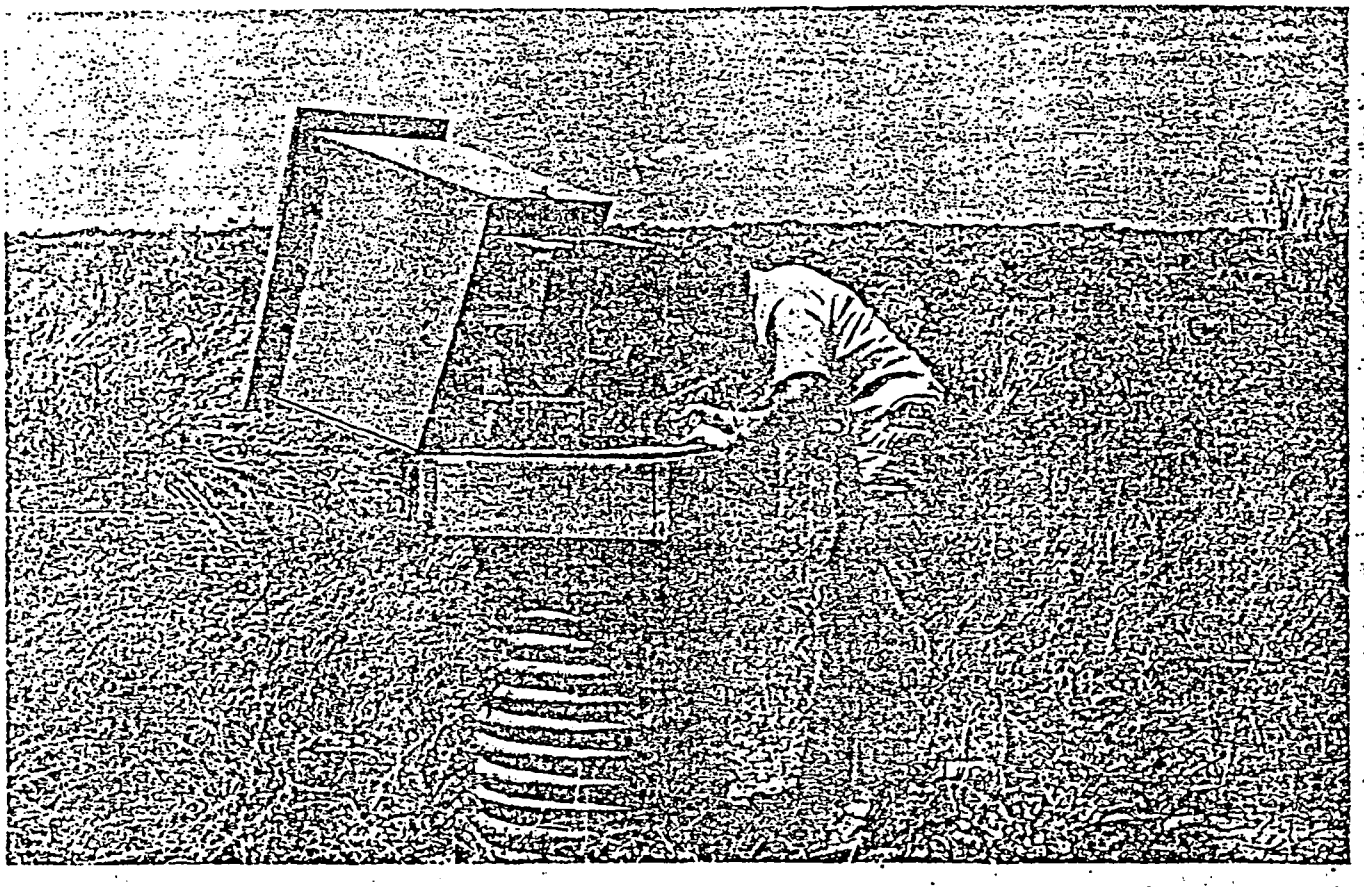
Geology.—A striking feature of the geology of Polk County is the absence of homogeneous rocks (fig. . Despite the great depth of weathering outcrops of rocks are more common than in other counties of Charlotte area, owing to the hilly topography.

The western and eastern parts of Polk County are underlain by a great series of rocks of which bio- granite gneiss and schist are the most prevelant. These rocks have a persistent northeast trend. nite, pegmatite, and mica schist are profusely interlayered with the granite gneiss and are locally pre- inant. Also common in this series is hornblende gneiss, which occurs as thin beds generally con- able with the foliation of the granite gneiss. The amount of hornblende gneiss in this series varies sid bly from place to place.

Hornblende gneiss forms the predominant rock in a belt extending northeastward from Tryon through Spring to the Rutherford County line. It has a prevailingly black color where fresh, but as generally

REF 16

Basic Elements of Ground-Water Hydrology with Reference to Conditions in North Carolina



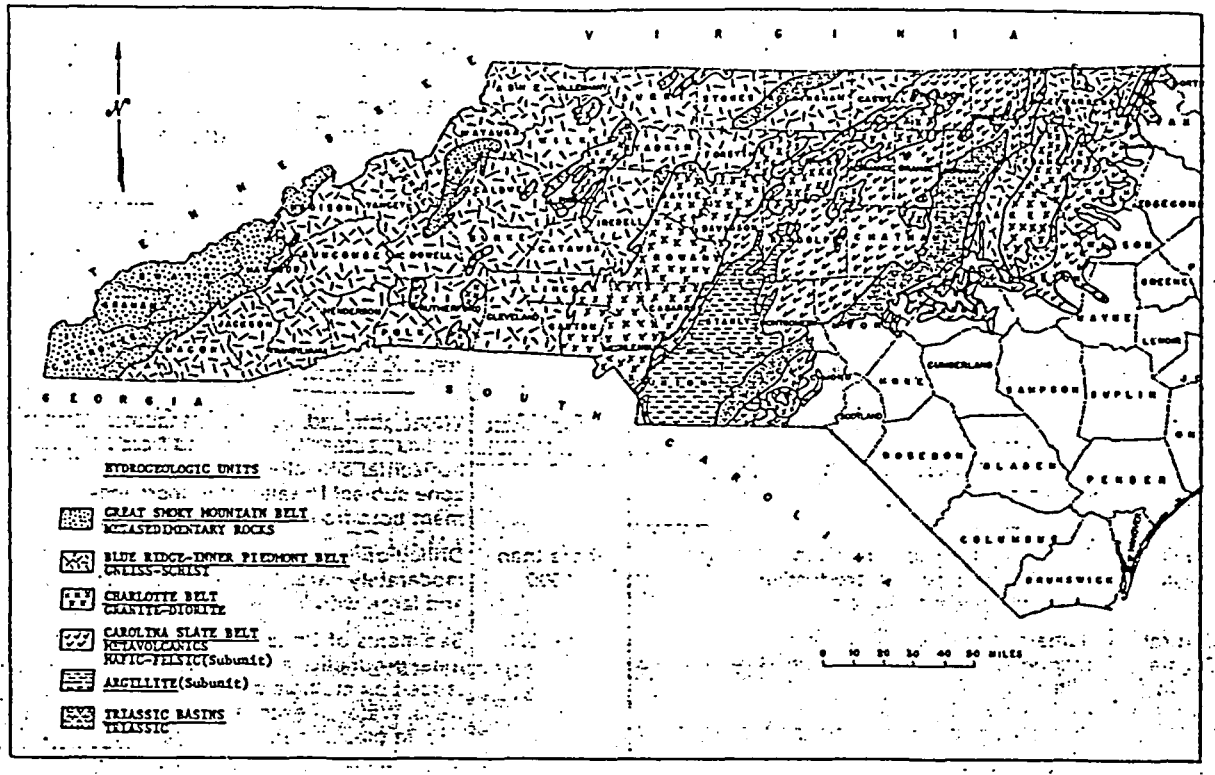
U.S. GEOLOGICAL SURVEY
WATER RESOURCES INVESTIGATIONS
OPEN-FILE REPORT 80-44

By: Ralph C. Heath

Prepared in cooperation with the
North Carolina Department of Natural
Resources and Community Development

Raleigh, NC 1980.

Rock Units and Aquifers in the Piedmont and Mountains



The rocks underlying the Piedmont and mountains can be divided into two groups: (1) bedrock, and (2) saprolite (or residuum). The saprolite underlies the land surface and ranges in thickness from a foot or two near bedrock outcrops to more than 100 ft. Bedrock underlies the saprolite and is the parent rock from which the saprolite was derived in the process referred to as weathering.

Many stream valleys, especially those of larger streams, are underlain by a layer of material similar in composition to saprolite. This material, which has been deposited by the streams during floods, is correctly referred to as *alluvium*. However, to avoid unnecessary complications, we will lump the alluvium in with the saprolite for the purpose of this discussion.

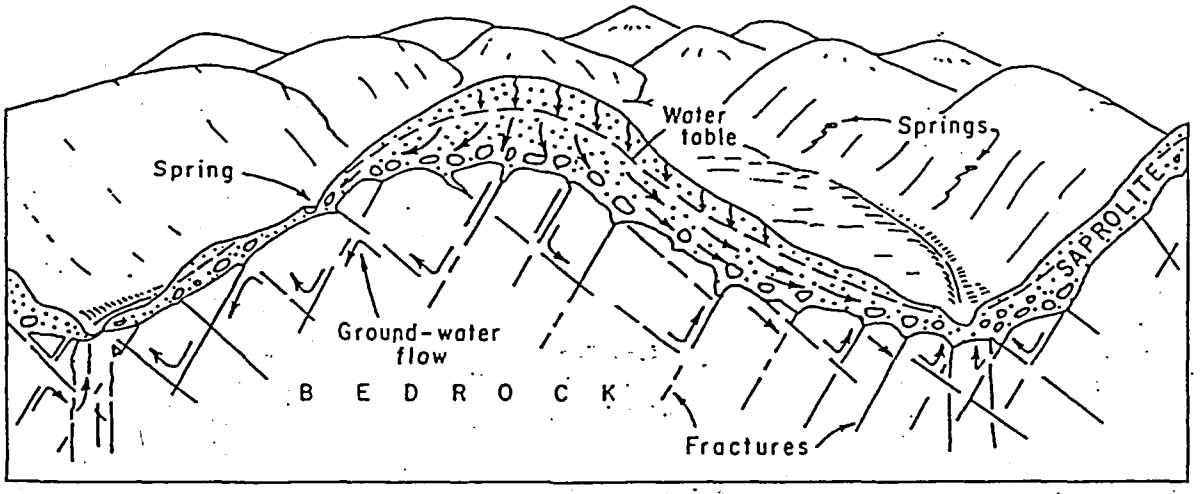
The bedrock underlying the Piedmont and mountains consists of many different types of igneous and metamorphosed igneous and sedimentary rocks. The Generalized Geological Map of North Carolina accompanying the discussion of WATER-BEARING ROCKS divides the bedrock in the Piedmont and mountains into six units. The 1:500,000 scale Geologic Map of North Carolina, published in 1958, divides the bedrock in the same area into 48 different units. But, a much larger number of units have been identified and are shown on large scale geologic maps.

The bedrock units differ from each other in mineral composition and other geologic characteristics. Fortunately, these differences do not result in large differences in hydraulic characteristics so that it is possible to combine the bedrock units into a relatively small number of hydrogeologic units.

The accompanying map shows the hydrogeologic units into which the bedrock in the Piedmont and mountains has been divided by the U.S. Geological Survey and the North Carolina Groundwater Section.

The most productive hydrogeologic units are the Great Smoky Mountain belt and the Blue Ridge-Inner Piedmont belt. The least productive units are the Carolina Slate Belt and the Triassic Basins. The Charlotte Belt is intermediate in productivity.

Ground-Water Situation in the Piedmont and Mountains



The *saprolite* (weathered rock) that forms the land surface in the Piedmont and mountains consists of unconsolidated granular material. It thus contains water in the pore spaces between rock particles.

The *bedrock*, on the other hand, does not have any significant intergranular (primary) porosity. It contains water, instead, in sheet-like openings formed along fractures (that is, breaks in the otherwise "solid" rock). Fractures in bedrock are of two types: (1) *joints*, which are breaks along which there has been no differential movement; and (2) *faults*, which are breaks along which the adjacent rocks have undergone differential movement.

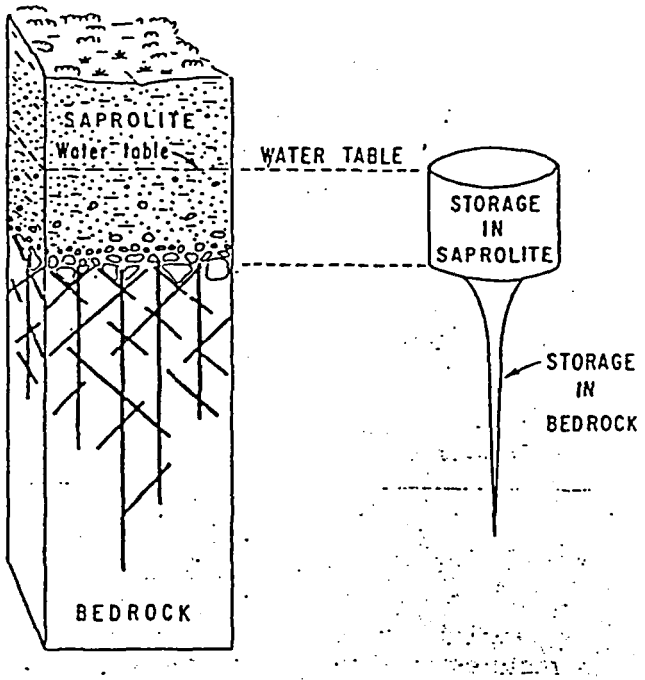
Faults are formed during earthquakes and generally contain larger and more extensive openings than those developed along joints. Joints, however, are far more numerous than faults.

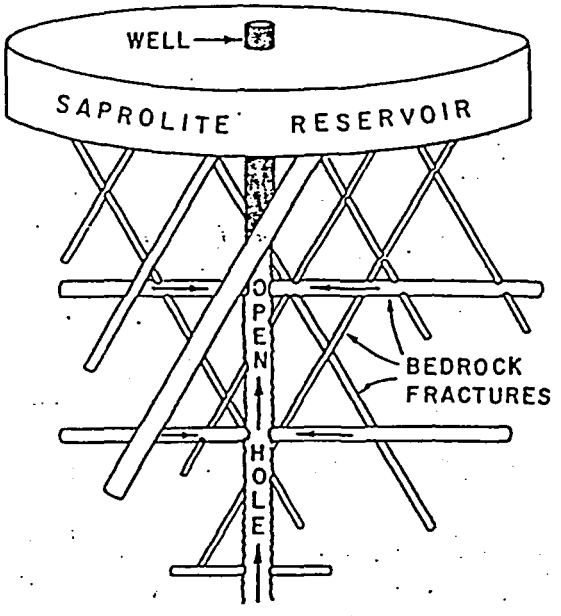
Fractures (joints and faults) are more abundant under valleys, draws, and other surface depressions than under hills. In fact, geologists assume that it is the presence of fractures that determined the position of valleys in the first place. Fractures tend to be more closely-spaced and the openings developed along them tend to be larger near the surface of the bedrock. Most fractures appear to be non water-bearing below a depth of 300 to 400 ft. Large water-bearing openings, penetrated below this depth are probably associated with faults.

The ground-water system in the Piedmont and mountains is recharged by precipitation on the interstream areas. A part of the precipitation infiltrates through the unsaturated zone to the water table, which normally occurs in the saprolite.

Ground water moves laterally and downward through the saprolite to points of ground-water seepage (springs) on the hillsides and to the streams in the adjacent valleys. Some of the water in the saprolite also moves downward into the bedrock and, thereafter, through the fractures to the adjacent valleys.

Hydraulic Characteristics of the Piedmont and Mountain Ground-Water System





One of the most basic concepts of ground-water hydrology is that aquifers function both as reservoirs, in which water is in storage, and as pipelines, which transmit water from one point to another. This is referred to as the *reservoir-pipeline concept*. This concept forms a useful basis on which to discuss the hydraulic characteristics of the Piedmont and mountain ground-water system.

The reservoir (storage) function of aquifers depends on the porosity. The pipeline function depends on the hydraulic conductivity and the thickness of the aquifer. The approximate range in porosity and hydraulic conductivity for the saprolite and bedrock is shown in the following table.

Rock type	Porosity in percent	Hydraulic conductivity in feet per day
Saprolite	20-30	1-20
Bedrock	0.1-1	1-20

The above values suggest that the principal difference between saprolite and bedrock is in water-storage capacity. In other words, the saprolite has the capacity to store a much larger quantity of water than does the bedrock. This is not the entire story, however.

As we noted above, the capacity of an aquifer to transmit water depends both on hydraulic conductivity and on aquifer thickness. The part of the bedrock containing water-bearing fractures is several times thicker than the saprolite.

We can then, without great error, view the ground-water system in the Piedmont and mountains as consisting of a saprolite reservoir overlying a bedrock pipeline consisting of numerous small, interconnected pipes. In the vicinity of a pumping well the bedrock fractures ("pipes") convey water from the saprolite reservoir to the well.

The yield of a well drawing from fractured bedrock depends on several factors. The most important of these are believed to be:

1. The number, size, areal extent, and degree of interconnection of the fractures penetrated by the well,
2. The thickness of saturated saprolite in the vicinity of the well and the specific yield of the saprolite, and
3. The hydraulic conductivity of the saprolite and the nature of the hydraulic connection between the saprolite and the bedrock.

The number and the size of the fractures control the rate at which water can enter the well. The areal extent and degree of interconnection of the fractures control the size of the area that supplies water to the well.

The thickness and the specific yield of the saprolite determines the volume of water available from storage in the saprolite. The hydraulic conductivity of the saprolite and the nature of the hydraulic connection between the saprolite and the bedrock determines the rate at which water can drain from the saprolite into the bedrock fractures.

Rusty Roselle

North Carolina Department of Human Resources
Western Regional Office • Black Mountain 28711

James G. Martin, Governor

David T. Flaherty, Secretary

September 19, 1988

Mr. Mark Durway
Solid Waste Branch
P. O. Box 2091
Raleigh, NC 27602

RE: Public Water Supply Locations
Southern Manufacturing Company
NCD990715658
Mecklenburg County

Dear Mr. Durway:

We have conducted an investigation and reviewed our records following your September 6, 1988 request for drinking water supply locations around the referenced company site. The following information was collected during our review:

Item #1 - The area's primary drinking water source is the Charlotte/Mecklenburg Utility Department. In the northern section (I-85 & north) of the 2 to 4 mile area, there may be some private water supplies, but no recorded information is available.

Item #2 - The only public water supply noted was Juniper water supply (ID #01-60-103) which serves 49 homes and is located approximately 3.8 miles north of the site (see attached map).

Item #3 - No records of private wells.

Item #4 - There are four surface water intakes within a 15-mile radius of the site.

West: Belmont, City of - Lake Wylie/Catawba River
NW: Mt. Holly, City of - Mtn. Island Lake/Catawba River
NW: Charlotte Mecklenburg Utility Dept. - Mtn. Island Lake/Catawba River
NNW: Charlotte Mecklenburg Utility Dept./Huntersville - Lake Norman/Catawba River

---

None of these locations would be influenced by direct runoff of this site since they are located upstream of this drainage basin.

Please let us know if we can be of further assistance in this matter.

Sincerely,

James P. Adams
Environmental Engineer

JPA/dgm

Enclosure

United States Department of the Interior
FISH AND WILDLIFE SERVICE
ENDANGERED SPECIES FIELD STATION
100 OTIS STREET, ROOM 224
ASHEVILLE, NORTH CAROLINA 28801

June 21, 1985

Ms. Pat Derosa
Solid and Hazardous Waste Management Branch
Environmental Health Section
North Carolina Department of Human Resources
P. O. Box 2091
Raleigh, North Carolina 27602

Dear Ms. Derosa,

In response to your telephone conversation with John Fridell on May 30, 1985, we are enclosing the following items of information:

A. North Carolina county distribution records of Federally listed, proposed and status review species,

B. map of the critical habitat of the threatened spotfin chub (Hybopsis monacha),

C. map of the critical habitat of mountain golden heather (Hudsonia montana), and

D. copy of the U.S. Fish and Wildlife Service interagency Section 7 consultation process guidelines (included for your information)

The abbreviations following the species names on the North Carolina species distribution records (A. above) indicate Federal status, i.e., E - endangered, T - threatened, PE - proposed endangered, PT - proposed threatened and SR - under status review. Status review species are not legally protected under the Endangered Species Act. However, they are subject to being listed and agencies should be cognizant of their potential presence in a project area.

Since additions and deletions are made to the list of species on a regular basis, questions regarding updates of the list should be made to this office.

We hope this information will be of use to you. If we can be of any further assistance, please call John Fridell or Nora Murdock at (704) 259-0321.

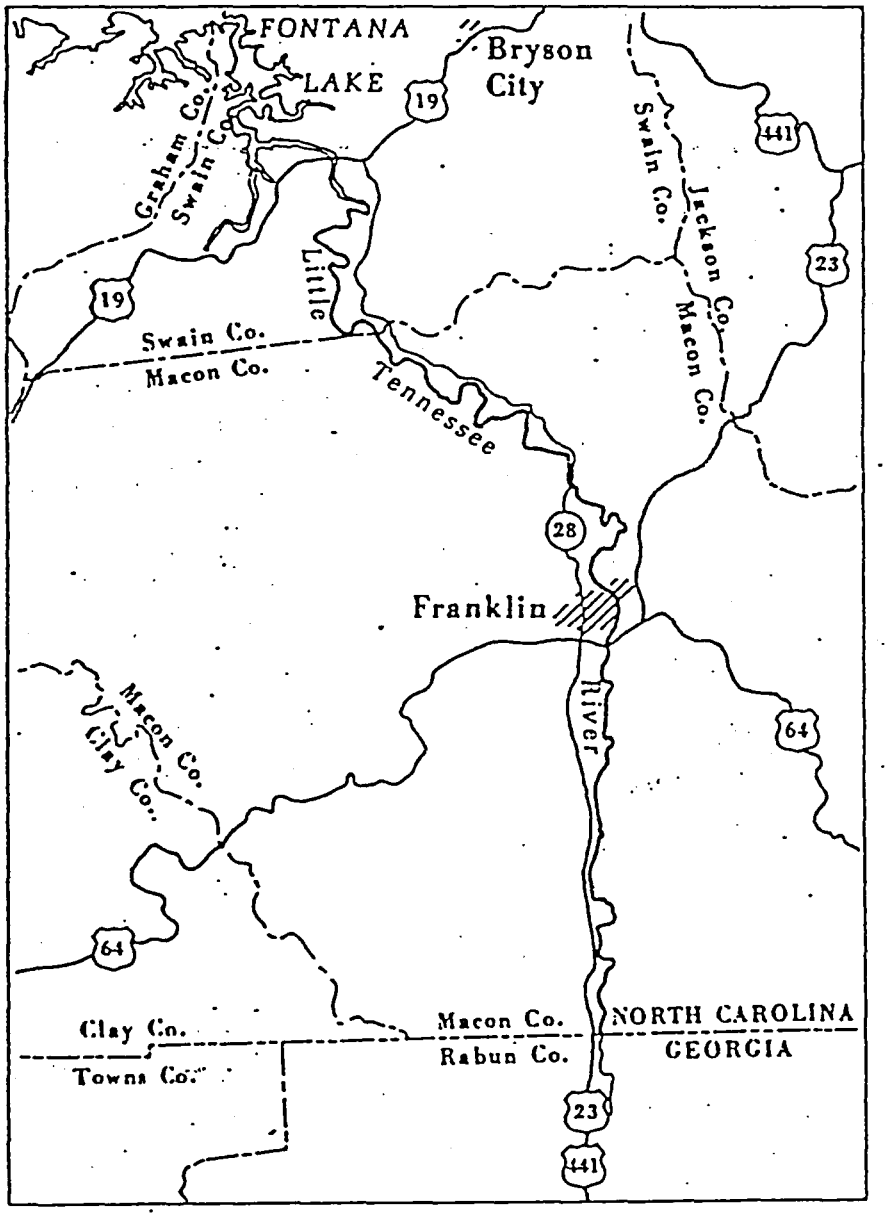
Sincerely yours,

Warren T. Parker
Field Supervisor

NORTH CAROLINA - Critical Habitat

Hybopsis monacha, "spotfin chub"

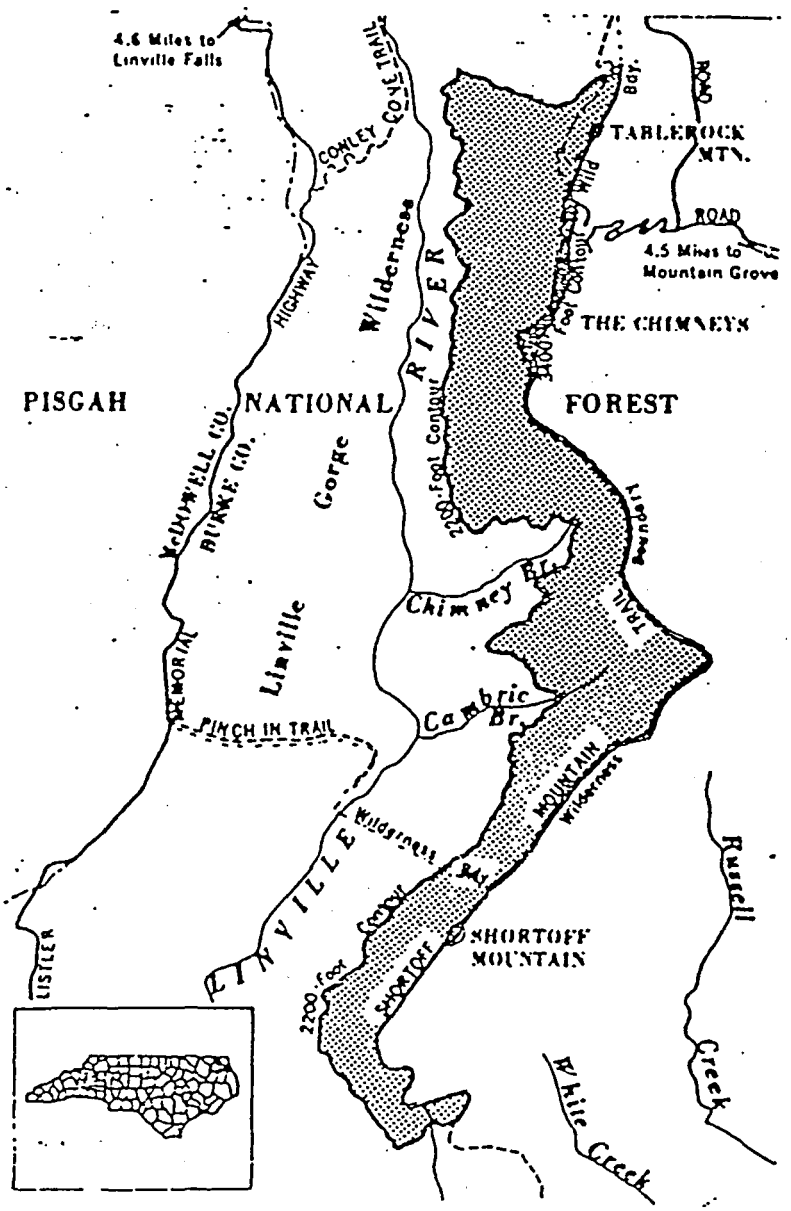
Macon and Swain Counties. Little Tennessee River, main channel from the backwaters of Fontana Lake upstream to the North Carolina-Georgia state line.



NORTH CAROLINA - Critical Habitat

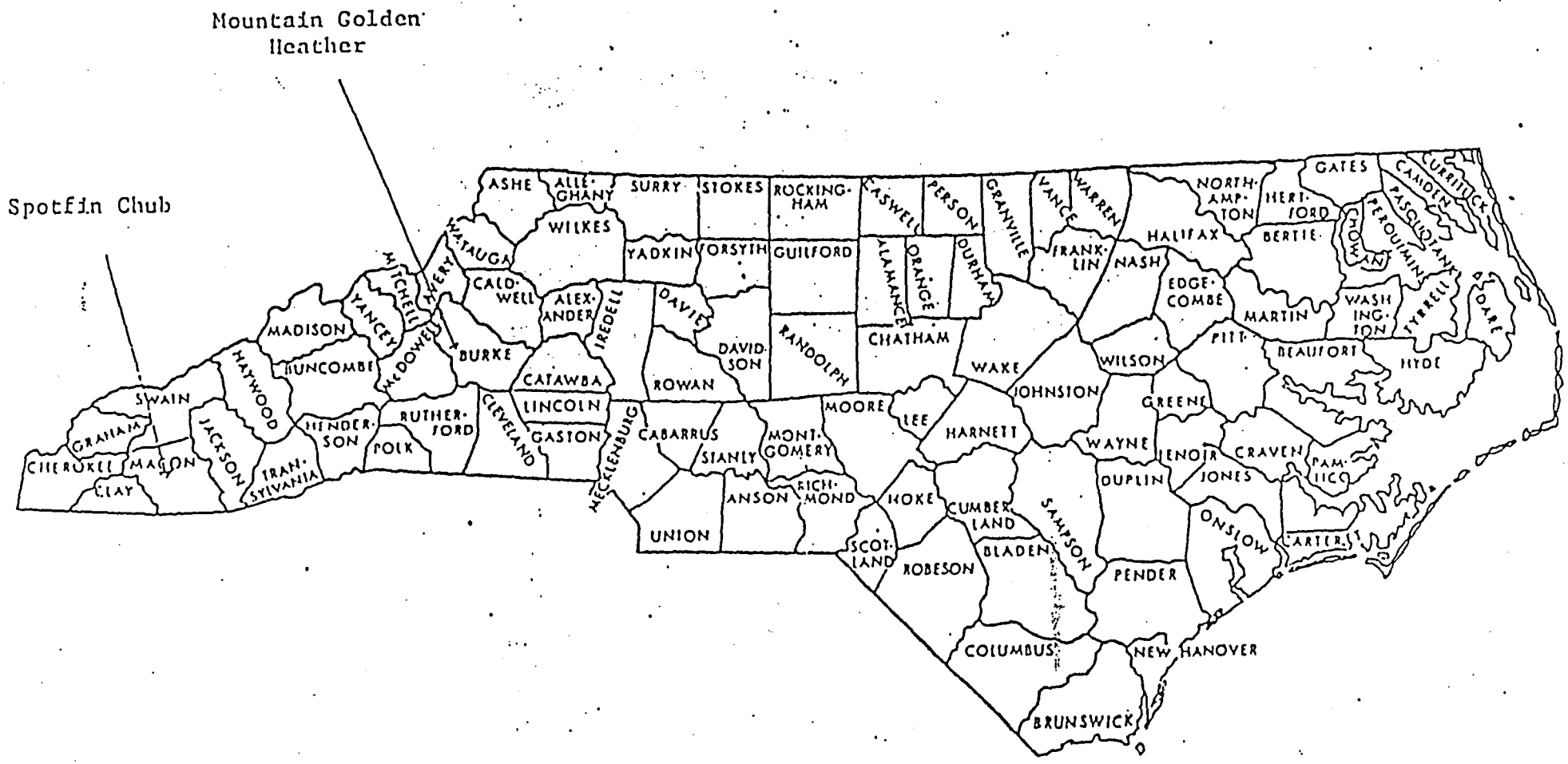
Hudsonia montana, "mountain golden heather"

Burke County. The area bounded by the following: on the west by the 2200' contour; on the east by the Linville Gorge Wilderness Boundary north from the intersection of the 2200' contour and the Shortoff Mountain Trail to where it intersects the 3400' contour at "The Chimneys"--then follow the 3400' contour north until it reintersects the Wilderness Boundary--then follow the Wilderness Boundary again northward until it intersects the 3200' contour extending west from its intersection with the Wilderness Boundary until it begins to turn south--at this point the Boundary extends due east until it intersects the 2200' contour.



CRITICAL HABITATS OF FEDERALLY LISTED

ENDANGERED SPECIES IN NC



1 inch = approx. 53 miles

12 August 1986

TO: CERCLA Unit Staff

FROM: Pat DeRosa

RE: Critical Habitats of Federally Listed Endangered Species in N.C.

I spoke by telephone today with John Fridell, US Fish and Wildlife Service (704) 259-0321 to request an update on critical habitats in NC. Mr. Fridell informed me that the only change since our previous correspondence of June 21, 1985 has been a "Proposal to List the Cape Fear Shiner as an Endangered Species with Critical Habitats" in NC. (FR Vol. 51, No. 133, July 11, 1986). A copy of the proposed rule is attached for your information.

PD/tb/0221b

15 June 1987

TO: File

FROM: Pat DeRosa PD

RE: Critical Habitats of Federally Listed Endangered Species in N.C.

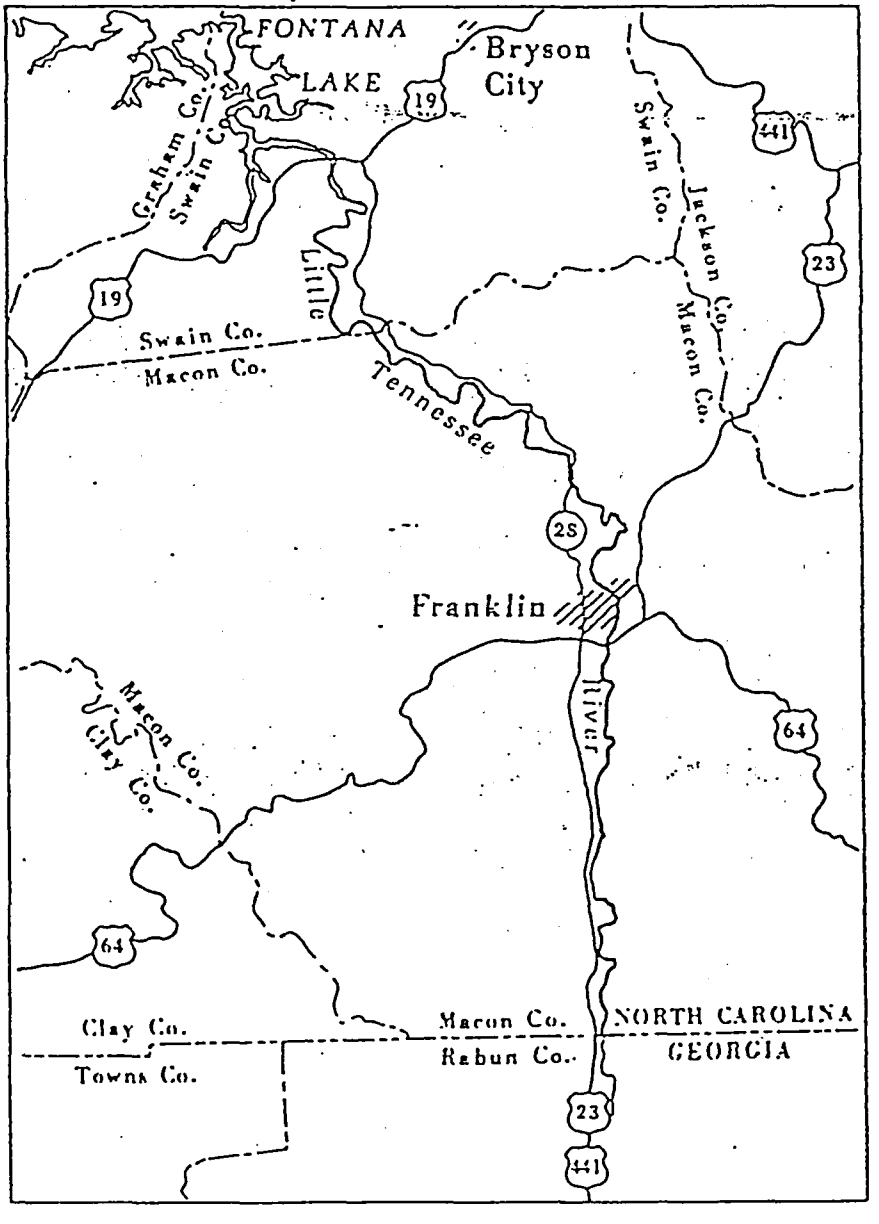
I spoke by telephone today with John Fridell, US Fish and Wildlife Service (704) 259-0321 to request an update on critical habitats in NC. Mr. Fridell informed me that there have been no changes since our previous correspondence of August 12, 1986. The "Proposal to List the Cape Fear Shiner as an Endangered Species with Critical Habitats" in NC (FR Vol. 51, No. 133, July 11, 1986) is expected to be finalized in the next month or so.

PD/tb/0338b

NORTH CAROLINA - Critical Habitat

Hybopsis monacha, "spotfin chub"

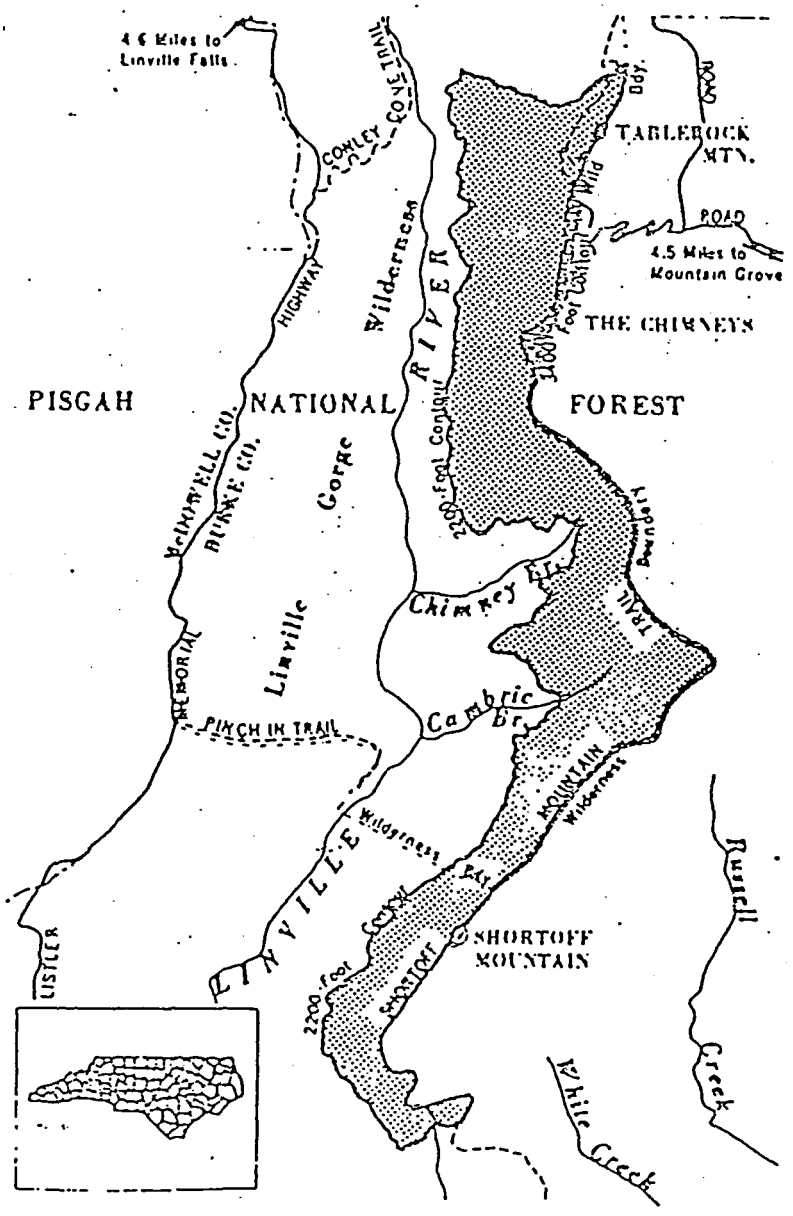
Macon and Swain Counties. Little Tennessee River, main channel from the backwaters of Fontana Lake upstream to the North Carolina-Georgia state line.



NORTH CAROLINA - Critical Habitat

Hudsonia montana, "mountain golden heather"

Burke County. The area bounded by the following: on the west by the 2200' contour; on the east by the Linville Gorge Wilderness Boundary north from the intersection of the 2200' contour and the Shortoff Mountain Trail to where it intersects the 3400' contour at "The Chimneys"--then follow the 3400' contour north until it reintersects the Wilderness Boundary--then follow the Wilderness Boundary again northward until it intersects the 3200' contour extending west from its intersection with the Wilderness Boundary until it begins to turn south--at this point the Boundary extends due east until it intersects the 2200' contour.



SEPTEMBER 20, 1988

TO: FILE

FROM: D. MARK DURWAY DMD

RE: IRRIGATION AND AGRICULTURE AROUND SOUTHERN MANUFACTURING IN CHARLOTTE, NC

In a telephone conversation today, Bill Skelton of the NCDA Agricultural Extension Service Southwestern District in Charlotte (704/336-2561) told me that neither surface water nor ground water is used for irrigation within a four-mile radius of Southwestern Manufacturing that he was aware. He also said that he was unaware of any commercial agriculture operations within this area.

Uncontrolled Hazardous Waste Site Ranking System

A[illegible]ers Manual

([illegible])

Originally Published in
the July 16, 1982, *Federal Register*

United States
Environmental Protection
Agency

1984

September 19, 1988

TO: FILE
FROM: D. MARK DURWAY DMD
RE: SITE ACCESSIBILITY AT SOUTHERN MANUFACTURING

In a telephone conversation with S.D. Robertson of Southern Manufacturing today (704/372-2880), Mr. Robertson said that the plant is completely surrounded by a 6' high cyclone fence with 3 strands of barbed wire on the top of it.

March 14, 1989

TO: GROVER NICHOLSON

FROM: D. MARK DURWAY DMD.

RE: RECOMMENDATION FROM JOHN GIBSON OF THE MECKLENBURG CO. DEPT. OF ENVIRONMENTAL PROTECTION REGARDING THE SOUTHERN MANUFACTURING SITE (NCD 990715658) IN CHARLOTTE

The Southern Manufacturing site was used for manufacturing asbestos cloth and related products from approximately 1920 until the early 1980s. Similar products continue to be manufactured at the Southern Manufacturing plant, except that kevlar and fiberglass raw materials, rather than asbestos, are now used. Despite the site's neat, well-maintained appearance, significant subsurface asbestos contamination is known to exist.

Rather than remove the buried asbestos and contaminated soil from the site, however, John Gibson has recommended the following:

1) That the state and county each write letters to Southern Manufacturing fully detailing what is known about the on-site contamination.

2) That these letters be incorporated into the property deed.

3) That site use restrictions be applied and recorded on the property deed.

4) That Southern Manufacturing be charged with permanently maintaining the integrity of the soil cap which now covers the asbestos and asbestos-contaminated soil.

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

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

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

March 15, 1989

Mr. Robert Morris
EPA NC CERCLA Project Officer
EPA Region IV Waste Division
345 Courtland Street, NE
Atlanta, GA 30365

SUBJECT: Site Sampling Visit Summary Trip Report

SITE: Southern Manufacturing, Inc.
NCD 990715658
1000 Seaboard Street
Charlotte, NC 28206

Dear Mr. Morris:

On March 13, 1989 Ed Wallingford and I made a site sampling visit to Southern Manufacturing. Company vice president S. Douglas Robertson met us upon arrival. Gerald Wooten of the Mecklenburg County Department of Environmental Health indicated prior to the visit that he would be unable to accompany us.

Previous site sampling indicated that subsurface asbestos contamination exists at Southern Manufacturing. For this reason, additional sampling was not performed during our visit. Overall, the site had a neat appearance, and no loose asbestos was observed on the land surface.

Please contact me at (919)733-2801, if you have additional questions about the site visit.

Sincerely,

D. Mark Durway

D. Mark Durway, Geologist
NC Superfund Branch

Appendix D

Site Inspection Form

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NCD	990715648

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Southern Manufacturing, Inc.	1000 Seaboard Street

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Charlotte	NC	28206	Mecklenburg	60	09

09 COORDINATES LATITUDE	LONGITUDE	10 TYPE OF OWNERSHIP (Check one)
35° 14' 22"	80° 50' 45"	☒ A. PRIVATE ☐ B. FEDERAL ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
3 , 13, 89 (MONTH, DAY YEAR)	☐ ACTIVE ☐ INACTIVE	1919 (BEGINNING YEAR) (ceased using asbestos in 1986) (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
☒ E. STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☐ G. OTHER _____ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
D. Mark Durway	Hydrogeologist	NC Superfund	(919) 733-2801
09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Ed Wallingford	Environmental Chemist	NC Superfund	(919) 733-2801
			( )
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
S.D. Robertson	VP - Mfg.	Southern Manufacturing	(704) 372-2880
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	AM	overcast, 40s°

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
S.D. Robertson	Southern Manufacturing	(704) 372-2880

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
D. Mark Durway	DHR/DHS	Superfund	919/733-2801	6 15 89 (MONTH DAY YEAR)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NCD	990715658

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☒ B. POWDER, FINES
- ☐ C. SLUDGE
- ☐ D. OTHER Dust (Specify)
- ☐ E. SLURRY
- ☐ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____

CUBIC YARDS _____

NO. OF DRUMS <1

03 WASTE CHARACTERISTICS (Check all that apply)

- ☐ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☒ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			Facility generated 250 tons/yr
SOL	SOLVENTS			of asbestos dust. This was
PSD	PESTICIDES			disposed of off site, according
OCC	OTHER ORGANIC CHEMICALS			to S.D. Robertson.
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
	Asbestos Dust	1332214	Placed in polyethylene	pure	
			bags and sent to landfill		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

References 1, 23

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NCD	990715658

II. HAZARDOUS CONDITIONS AND INCIDENTS

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

Unknown

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

Unknown

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

Potentially blew off-site during period 1919-1986 when asbestos was being used. Present potential for air release from soil is unknown.

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

None

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

Believed low to non-existent/site is fenced

01 ☒ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: 1988) ☐ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: unknown (Acres) 04 NARRATIVE DESCRIPTION

Soil boring showed presence of asbestos in soil

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

Not suspected

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

Unknown

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

Believed low to non-existent

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NCD	990715658

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Unknown

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

Unknown

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Unknown

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/Runoff/Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

Not believed to be unstable

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Unknown

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Unknown

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Unknown

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

Unknown

III. TOTAL POPULATION POTENTIALLY AFFECTED: Unknown

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

References 1,2,3

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NC	D990715658

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC				
☐ C. AIR				16 certificiates of
☐ D. RCRA				operation from Mecklenburg
☐ E. RCRA INTERIM STATUS				County.
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☒ F. LANDFILL	Off-site	
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER (Specify)		

04 TREATMENT (Check all that apply)
☐ A. INCENERATION
☐ B. UNDERGROUND INJECTION
☐ C. CHEMICAL/PHYSICAL
☐ D. BIOLOGICAL
☐ E. WASTE OIL PROCESSING
☐ F. SOLVENT RECOVERY
☐ G. OTHER RECYCLING/RECOVERY
☐ H. OTHER (Specify)

05 OTHER

☒ A. BUILDINGS ON SITE

06 AREA OF SITE

11.5 (Acres)

07 COMMENTS

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☒ A. ADEQUATE, SECURE ☐ B. MODERATE ☐ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☐ YES ☒ NO

02 COMMENTS

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

References 1,2,3,5

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NCD	990715658

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)	SURFACE	WELL	02 STATUS ENDANGERED	AFFECTED	MONITORED	03 DISTANCE TO SITE
COMMUNITY	A. ☐	B. ☒	A. ☐	B. ☐	C. ☒	A. 3.8 (mi)
NON-COMMUNITY	C. ☐	D. ☒	D. ☐	E. ☐	F. ☐	B. 2+ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING ☒ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 1-100 (est)

03 DISTANCE TO NEAREST DRINKING WATER WELL 2+ (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
(est) 20-40 (ft)	unknown	20-40 (ft)	1-100 gpm (gpd)	☒ YES ☐ NO

09 DESCRIPTION OF WELLS (Including usage, depth, and location relative to population and buildings)

Unknown

10 RECHARGE AREA		11 DISCHARGE AREA	
☐ YES ☐ NO	COMMENTS: Unknown	☐ YES ☐ NO	COMMENTS: Unknown

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☐ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☐ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
Irwin Creek	☐	(mi)
	☐	(mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. ____ NO. OF PERSONS	B. ____ NO. OF PERSONS	C. ____ NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION < 0.34 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE 100+

04 DISTANCE TO NEAREST OFF-SITE BUILDING 0.1 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, ..., suburban, urban area)

Facility is located in an inner-city area wich is industrial, commercial, and residential in nature within 1 mile of site.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NCD	990715658

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☒ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☒ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
est. 20-40 (ft)	≥ 12.5 (ft)	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
5/5 (in)	2.8 (in)	< 3 %	N	< 3 %

09 FLOOD POTENTIAL

SITE IS IN _____ YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. N/A (mi)

OTHER: B. N/A (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

> 3 (mi)

ENDANGERED SPECIES: _____

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A. <1 (mi)	B. > 3 (mi)	C. > 3 (mi)	D. >3 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Located in Piedmont Physiographic Province at an elevation of 700' MSL. Maximum relief within 1 mile of site is about 170'. Site slope averages less than 3%.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

References 4,7,9,11,13-20
Maps and photos.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NC	D990715658

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER		N/A (sufficient existing data)	
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☐ GROUND ☐ AERIAL

02 IN CUSTODY OF _____ (Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS NC Superfund Branch

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Reference 3

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NCD	990715658

II. CURRENT OWNER(S)			PARENT COMPANY (If applicable)		
01 NAME Southern Manufacturing, Inc.		02 D+B NUMBER	08 NAME		09 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
01 NAME		02 D+B NUMBER	08 NAME		09 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
01 NAME		02 D+B NUMBER	08 NAME		09 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
01 NAME		02 D+B NUMBER	08 NAME		09 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)			IV. REALTY OWNER(S) (If applicable; list most recent first)		
01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NCD	990715658

II. CURRENT OPERATOR (Provide if different from owner)			OPERATOR'S PARENT COMPANY (If applicable)		
01 NAME		02 D+B NUMBER	10 NAME		11 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)		13 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER				

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)			PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)		
01 NAME		02 D+B NUMBER	10 NAME		11 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)		13 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD				
01 NAME		02 D+B NUMBER	10 NAME		11 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)		13 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD				
01 NAME		02 D+B NUMBER	10 NAME		11 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)		13 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD				

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NCD	990715658

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
Southern Manufacturing, Inc.	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NCD	990715658

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ D. SPILLED MATERIAL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ E. CONTAMINATED SOIL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ F. WASTE REPACKAGED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ G. WASTE DISPOSED ELSEWHERE — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ H. ON SITE BURIAL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ I. IN SITU CHEMICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ J. IN SITU BIOLOGICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ K. IN SITU PHYSICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ L. ENCAPSULATION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ M. EMERGENCY WASTE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ N. CUTOFF WALLS — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ P. CUTOFF TRENCHES/SUMP — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Q. SUBSURFACE CUTOFF WALL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NCD	990715658

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

NONE

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NC	D990715658

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Appendix E

Site Safety Plan
and
Toxicological Information

SITE HEALTH AND SAFETY PLAN

A. General Information

Site Name: Southern Manufacturing ID #: NCD990715658

Location: 1000 Seaboard St., Charlotte, NC Date: 3-6-89

Purpose of Visit: ____ PA X SI ____ Other: ____

Proposed Date of Investigation: March 13, 1989

Date of Briefing: March 8, 1989

Date of Debriefing: March 14, 1989

Priority Ranking: X Low ____ Medium ____ High

Site Investigation Team

Personnel		Responsibilities
Team 1	Mark Durway	team leader, sampling
Team 1	Ed Wallingford	sampling
Team 2		
Team 2		

Plan Preparation:

Prepared By: David Lilley, Industrial Hygienist David Lilley

Reviewed By: Jack Butler, Environmental Engineer Jack Butler

B. SITE/WASTE CHARACTERISTICS

Waste Type(s): X Liquid X Solid ____ Sludge ____ Gas

Characteristics: ____ Corrosive X Ignitable ____ Radioactive

X Volatile X Toxic ____ Reactive ____ Other

List Known or Suspected Hazards (physical, chemical biological or radioactive) on Site and their toxicological effects. Also, if known, list chemical amounts

HAZARD	WARNING PROPERTIES AND EFFECTS	TLV
asbestos	Odor Threshold (OT) = no data	0.2f/cc
isopropyl alcohol	OT = 7.5 - 200 ppm	400 ppm
methyl ethyl ketone	OT = 0.25 - 50 ppm	200 ppm
toluene	OT = 0.17 - 40 ppm	100 ppm

ID # NCD990715658

Facility Description: Size total property size is 11.5 acres Buildings ?

Disposal Methods Being Investigated Asbestos dust generated during the manufacture of asbestos yarn, cloth, rope, tubing, wick, and tape.

Unusual Features on Site (dike integrity, power lines, terrain, etc.): The company is located on a 11.5 acre property in inner-city Charlotte in an area that is both residential and commercial. The company has underground storage tanks for fuel oil storage.

History of the Site: See attached sheet

C. HAZARD EVALUATION

The site can be toured and sampled in level D. While augering, the HNU will be used to monitor breathing zone air. If readings exceed 50 ppm with the 10.2 eV probe, don full face respirators with organic vapor cartridges. If levels exceed 100 ppm with the 10.2 eV probe, evacuate. PE gloves will be worn while taking water samples, PE gloves over nitrile gloves will be worn while collecting soil samples. Tyvek suits (saranex in wet conditions) are recommended to keep clothing clean. If auger samples are taken in the vicinity (within 100 feet) of the underground storage tanks or associated pipework, periodic air samples using the explosimeter will be taken in the auger hole. If levels exceed 10% but are less than 20% of LEL proceed with caution. If levels exceed 20% evacuate.

D. WORK PLAN INSTRUCTION

Map or Sketch Attached? yes

Perimeter Identified? no

Command Post Identified? no

Zones of Contamination Identified? no

Personal Protective Equipment

Level of Protection ___A ___B X C X D with upgrade to level C possible

Modifications Wear PVC gloves and goggles while preparing acid preserved samples, avoid breathing acid vapors.

Southern Manufacturing generated as much as 250 tons of asbestos dust per year in its early years. This annual waste quantity is expected to have started decreasing in about 1972 when the company began using other materials in place of asbestos. The company reported in a North Carolina Division of Health Services survey that only 4,547 pounds of asbestos dust were generated at Southern Manufacturing during the first three quarters of 1982.

Asbestos waste generated at Southern Manufacturing is reported to have either been disposed of in the city landfill or sold, but not to have been disposed of on site. Soil borings performed this year by a private engineering firm at an on-site area of less than 0.5 acre indicated that asbestos fibers were present in soil to depths as great as 12.5' in some areas; however, the on-site waste volume was not quantified at this location.

Southern Manufacturing uses isopropyl alcohol, methyl ethyl ketone, and toluene in some of its dyes. However, neither these wastes nor asbestos are regulated under RCRA at this facility.

ID # NCD990715658

Surveillance Equipment:

X	H Nu		Detector Tubes and Pumps
X	Explosimeter		02 Meter
	TLD		Radiation Monitor

Decontamination Procedures

X Level C Respirator wash, respirator removal, suit wash (if needed,) suit removal, boot wash, boot removal and glove removal.

X Level D Boot wash and rinse and boot removal, suit removal, glove and goggle removal.

Modifications Dispose of trash properly, on-site if possible

Work Schedule/Limitations Sampling will consist of on site surface and subsurface soil samples and possibly surface water samples.

EMERGENCY PRECAUTIONS

Route of Exposure	First Aid
Eye contact	flush immeidately with water
Skin contact	soap and water wash immediately
Ingestion	get medical attention immediately
Inhalation	artificial respiration

ID # NCD990715658

Location of Nearest Phone: on-site

Hospital (Address and Phone Number)

Mercy Hospital - can handle contaminated patients

2001 Vail Avenue, Charlotte, NC 28207 (704) 379-5827

Emergency Transportation Systems (Phone Numbers)

Fire Use 911

Ambulance Use 911

Rescue Squad Use 911

Emergency Route to Hospital Take a left onto 12th Street and travel for about 3 blocks, vear right onto 11th St. and travel about 12 blocks, then vear right onto McDowell St. Follow McDowell Street about 3 blocks, turn left onto 7th Street and follow for about 10 blocks, then left onto 5th Street, hospital will be on the right.

PREVAILING WEATHER CONDITIONS AND FORECAST Sleet and snow, high of 36°F

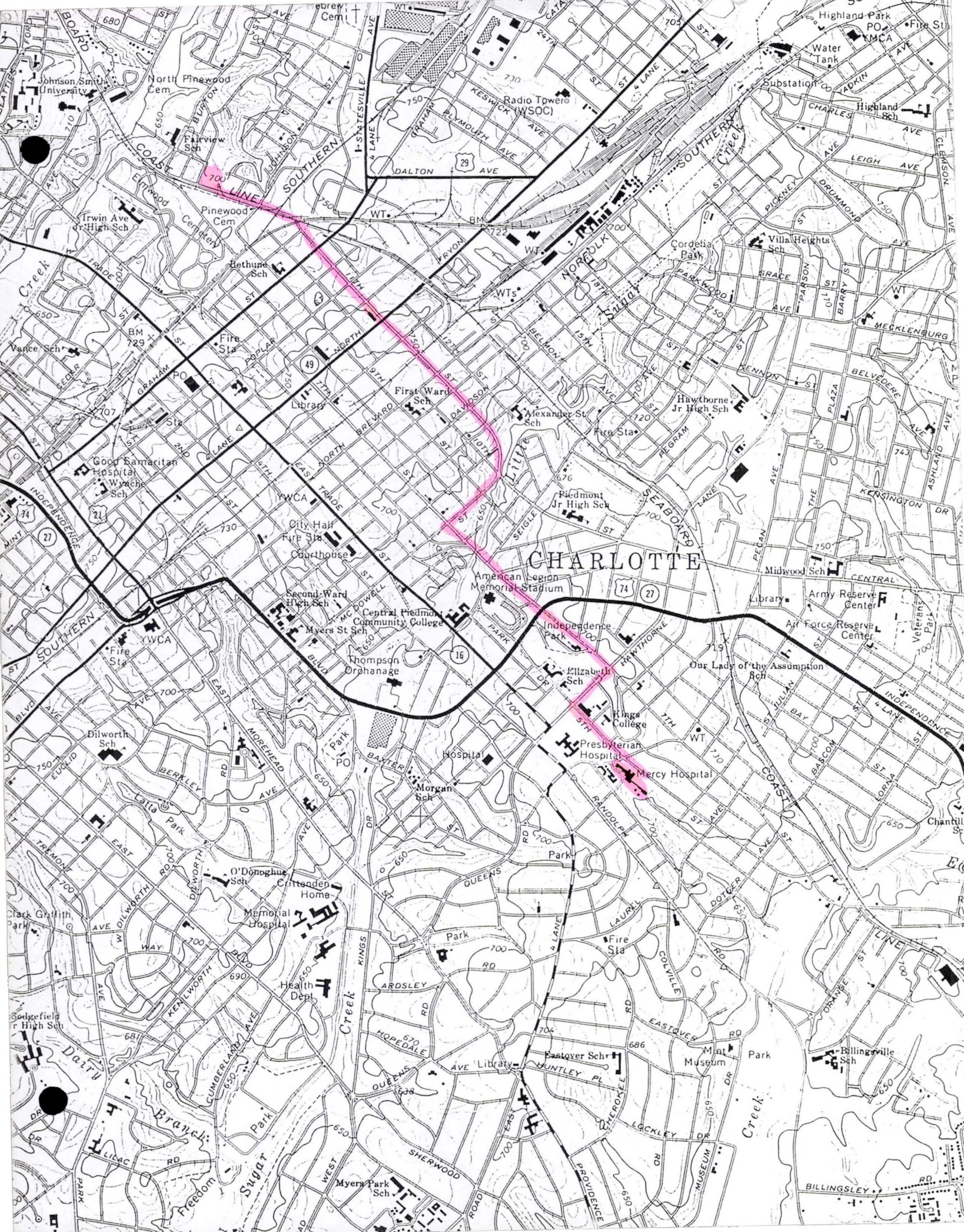
EQUIPMENT CHECKLIST

X	Air purifying respirator	X	First Aid Kit
X	Cartridges for respirator	X	3 gal. Distilled H20
X	Rainsuit	X	Gloves (poly/nitrile/cloth)
	02 Indicator	X	Boots/Boot Covers
X	Eye Wash Unit	X	Coveralls (tyvek/saranex)
X	H Nu	X	Eye Protection
	pH Meter	X	Hard Hat
X	Explosimeter	X	Decontamination Materials.
	Radioactive Monitor		
	Detector Tubes and Pump		

Poison Control Center - State Coordinator
Duke University Medical Center
Telephone: 1-800-672-1697
Box 3024
Durham, NC 27710

ASHEVILLE 704-255-4490	Western NC Poison Control Center Memorial Mission Hosp. 509 Biltmore Ave. 28801	HENDERSONVILLE 704-693-6522 Ext. 555,556	Margaret R. Pardee Memorial Hospital Fleming St., 28739
CHARLOTTE 704-379-5827	Mercy Hospital 2001 Vail Ave, 28207	HICKORY 704-322-6649	Catawba Mem. Hosp. Fairgrove Chur. Rd 28601
DURHAM 1-800-672-1697	Duke Univ. Med. Center Box 3007, 27710	JACKSONVILLE 919-577-2555	Onslow Mem. Hospital Western Blvd. 28540
GREENSBORO 919-379-4105	Moses Cone Hospital 1200 N. Elm St. 27420	WILMINGTON 919-343-7046	New Hanover Mem. Hospital 2131 S. 17th St. 28401

1-800-722-2222


CHARLOTTE
Johnson Smith University
North Pinewood Cem
Fairview Sch
Pinewood Cem
Irwin Ave Jr High Sch
Bethune Sch
Vance Sch
Fire Sta
Library
First Ward Sch
Good Samaritan Hospital
Wyache Sch
YWCA
City Hall
Fire Sta
Courthouse
Second Ward High Sch
Central Piedmont Community College
Myers St Sch
Thompson Orphanage
American Legion Memorial Stadium
Independence Park
Elizabeth Sch
Our Lady of the Assumption Sch
Kings College
Presbyterian Hospital
Mercy Hospital
Hospital
Morgan Sch
Dilworth Sch
Latta Park
O'Donoghue Sch
Crittenden Home
Memorial Hospital
Clark Griffith Park
Health Dept
Sedgefield Jr High Sch
Eastover Sch
Library
Mint Museum
Billingsville Sch
Myers Park Sch
Park
Fire Sta
Radio Towers (WSOC)
Highland Park
Water Tank
Substation
Highland Sch
Cordelia Park
Villa Heights Sch
Hawthorne Jr High Sch
Alexander St Sch
Piedmont Jr High Sch
Midwood Sch
Army Reserve Center
Air Force Reserve Center
Veterans Park
Sugar Creek
Little Sugar Creek
Freedom Branch
Dairy
COAST LINE
SOUTHERN
SEABOARD
NORFOLK
STATESVILLE AVE
BOARD
BURTON
JOHNSON
GRAHAM
PLYMOUTH AVE
KESWICK
DALTON AVE
LEIGH AVE
CHARLES
PICKNEY
DRUMMOND
GRACE
PARSON
BARRY
MECKLENBURG
BELVEDERE
KENNON
PLAZA
ASHLAND
KENSINGTON DR
THE PLAZA
PEGRAM
BELMONT
DAVIDSON
BREWARD
NORTH TRADE
EAST TRADE
POPLAR
CEDAR
MINT
INDEPENDENCE
MC DOWELL
PARK
SEIGLE
HAWTHORNE
BAXTER
RANDOLPH
MOREHEAD
BERKLEY
EUCLID
TREMONT
DILWORTH
KENILWORTH
CUMBERLAND AVE
QUEENS
LAUREL
COLVILLE
DOTGER
ARDSLEY
HOPEDALE
EASTOVER RD
HUNTLEY PL
CHEROKEE
LOCKLEY DR
SHERWOOD
PROVIDENCE
MUSEUM
BILLINGSLEY
ORANGE
BASCOM
LORNA
JULIAN
BAY
CENTRAL
KINGS
LILAC RD
WEST
ROAD
4 LANE
2 LANE

HAZARDOUS SUBSTANCE INFORMATION FORM

Chemical Name: Asbestos

I. PHYSICAL/CHEMICAL PROPERTIES

	Reference
Chemical Formula varies	1
Natural Physical State at 25°C solid	2
Vapor Pressure NA mm Hg at 20°C	1
Melting Point ____ °F/°C Boiling Point ____ °F/°C	
Flash Point (open or closed cup) NA °C/°F	1
Solubility - H_2O ____	
Other ____	

Physical Features: (odor, color, etc.) fine, slender, flaxy fibers, resists fire and most solvents (2).

II. TOXICOLOGICAL DATA

Standards: 0.2f/cc(3) TLV 0.2f/cc(2) PEL carcinogen IDLH 2

Routes of Exposure: Inhalation, ingestion

Acute/Chronic Symptoms: Interstitial fibrosis, restricted pulmonary function, finger clubbing, carcinogen, shortness of breath (2)

First Aid: Eye contact: flush with water immediately(2)

Chemical Name: Asbestos

III. HAZARDOUS CHARACTERISTICS — Reference

A. Combustibility Yes ___ No X — 1

Toxic by-products _____

B. Flammability LEL _____ UEL _____

C. Reactivity Hazard None — 2

D. Corrosivity Hazard yes/no pH: _____

Neutralizing agent: _____

E. Radioactive Hazard — Exposure Rate

Background	yes/no	
Alpha particles	yes/no	
Beta particles	yes/no	
Gamma radiation	yes/no	

IV. REFERENCES

(1) The Condensed Chemical Dictionary, 10th Edition

(2) Pocket Guide to Chemical Hazards, NIOSH, 1987

(3) Threshold Limit Values and Biological Exposure Indices, ACGIH, 1988-1989

HAZARDOUS SUBSTANCE INFORMATION FORM

Chemical Name: Isopropyl alcohol

I. PHYSICAL/CHEMICAL PROPERTIES

	Reference
Chemical Formula CH3CHOCH3	1,2,3
Natural Physical State at 25°C liquid	1,2,3
Vapor Pressure 33 mm Hg at 20°C	3
Melting Point -128 °F/°C Boiling Point 180 °F/°C	3
Flash Point (open or closed cup) 33 °C/°F	3
Solubility - H_2O miscible	3
Other	1,3

Physical Features: (odor, color, etc.) colorless liquid, rubbing alcohol odor. I.P. - 10.15 eV

II. TOXICOLOGICAL DATA

Standards: 400 ppm TLV 400 ppm PEL 20,000 ppm IDLH 3

Routes of Exposure: Inhalation

Acute/Chronic Symptoms: Irritating to eyes, nose and throat, will cause dizziness and will dry and crack skin.

First Aid: Eyes: flush immediately with water; Skin: soap and water wash; Inhalation: fresh air and artificial respiration; Ingestion: medical attn.

Chemical Name: Isopropyl alcohol

III. HAZARDOUS CHARACTERISTICS — Reference

A. Combustibility Yes ___ No X ___ — ___

Toxic by-products ___ — ___

___ — ___

B. Flammability LEL 1.8% UEL 8% — 3

C. Reactivity Hazard strong oxidizers, alkalies and acids. — 3

D. Corrosivity Hazard yes/no pH: ___ — ___

Neutralizing agent: ___ — ___

E. Radioactive Hazard — Exposure Rate

Background	yes/no	___	___
Alpha particles	yes/no	___	___
Beta particles	yes/no	___	___
Gamma radiation	yes/no	___	___

IV. REFERENCES

The Merck Index, 10th Edition, 1983.

Documentation of the TLV's, ACGIH, 1980.

Pocket Guide to Chemical Hazards, NIOSH, 1985.

HAZARDOUS SUBSTANCE INFORMATION FORM

Chemical Name: Methyl Ethyl Ketone (2 Butanone)

I. PHYSICAL/CHEMICAL PROPERTIES

	Reference
Chemical Formula C4 H8 0	1,2,3
Natural Physical State at 25°C liquid	1,2,3
Vapor Pressure 70.6 mm Hg at 20°C	2,3
Melting Point ____ °F/°C Boiling Point 80 °F/°C	2
Flash Point (open or closed cup) 35 °C/°F	1,2
Solubility - H_2O 27%	1,3
Other common organic solvents	2

Physical Features: (odor, color, etc.) clear, colorless liquid with acetone-like odor, odor detection 10 ppm IP - 9.48 eV Hnu sensitivity with 10.2 eV probe = 5.7

II. TOXICOLOGICAL DATA

Standards: 200 ppm TLV 200 ppm PEL 3000 ppm IDLH 3

Routes of Exposure: inhalation

Acute/Chronic Symptoms: irritation of eyes, nose and throat at approximately 200 ppm

First Aid: Eyes: irrigate immediately; skin: soap and water wash; inhalation: fresh air and artificial respiration; ingestion: medical attention.

Chemical Name: Methyl Ethyl Ketone

III. HAZARDOUS CHARACTERISTICS — Reference

A. Combustibility Yes x No ___ — 2

Toxic by-products _____ — _____

_____ — _____

B. Flammability LEL 12% UEL 20% — 2

C. Reactivity Hazard very strong oxidizers — 3

D. Corrosivity Hazard yes/no pH: _____ — _____

Neutralizing agent: _____ — _____

E. Radioactive Hazard — Exposure Rate

Background	yes/no	_____	_____
Alpha particles	yes/no	_____	_____
Beta particles	yes/no	_____	_____
Gamma radiation	yes/no	_____	_____

IV. REFERENCES

The Merck Index

Documentation of the TLV's

NIOSH Pocket Guide to Chemical Hazards

HAZARDOUS SUBSTANCE INFORMATION FORM

Chemical Name: Toluene (Methyl benzene, toluol)

I. PHYSICAL/CHEMICAL PROPERTIES

	Reference
Chemical Formula C7H8	1,2,3,4
Natural Physical State at 25°C liquid	1,2,3,4
Vapor Pressure 2 mm Hg at 20°C	4
Melting Point -95 °F/°C Boiling Point 110.6 °F/°C	1,3,4
Flash Point (open or closed cup) 40 °C/°F	1,2,3,4
Solubility - H_2O slightly soluble	1,3,4
Other miscible with alcohol, chloroform, ether, acetone, glacial acetic acid, carbon disulfide	1,3,4

Physical Features: (odor, color, etc.) colorless liquid with an aromatic odor, IP 8.82 eV, derived from coal tar oil or petroleum Relative response on HNU = 10

II. TOXICOLOGICAL DATA

Standards: 100 ppm TLV 200 ppm PEL 2000 ppm IDLH 4

Routes of Exposure: inhalation

Acute/Chronic Symptoms: Narcotic in high concentrations, headache, lassitude, and nausea. Chronic: anemia and dermatitis.

First Aid: Skin: soap and water wash immediately; eye: irrigate immediately; inhalation: fresh air and artificial respiration; ingestion: medical attention (4).

Chemical Name: Toluene

III. HAZARDOUS CHARACTERISTICS — Reference

A. Combustibility Yes X No ___ — 4

Toxic by-products _____

B. Flammability LEL 1.0% UEL 7.0% — 4

C. Reactivity Hazard strong oxidizers — 3

D. Corrosivity Hazard yes/no pH: _____

Neutralizing agent: _____

E. Radioactive Hazard — Exposure Rate

Background	yes/no		
Alpha particles	yes/no		
Beta particles	yes/no		
Gamma radiation	yes/no		

IV. REFERENCES

The Merck Index, 10th Edition, 1983

Documentation of the TLV, 4th Edition, 1980

NIOSH Pocket Guide for Chemical Hazards, 1985

NEPA, Protection Guide on Hazardous Materials, 8th Edition, 1984

SYN: ETHYL ESTER OF N-ACETYL-DL-SARCOSYLYL-DL-VALINE

TOXICITY DATA: 3	CODEN:
orl-rat LD50:59 mg/kg	FATOAO 33,472,70
ipr-rat LD50:187 mg/kg	PCJOAU 12,25,78
ims-rat LD50:17 mg/kg	FATOAO 33,472,70
rec-rat LD50:40 mg/kg	FATOAO 33,472,70

THR: HIGH orl, ipr, ims, rec. See also esters.

ASBESTOS

CAS RN: 1332214 NIOSH #: CI 6475000

Generic name for naturally occurring mineral silicate fibres of the Serpentine and Amphibole series (IARC** 14,11,77).

SYNS:

ACTINOLITE
AMIANTHUS
AMOSITE
AMPHIBOLE
ANTHOPHYLLITE
ASBESTOSE (GERMAN)
ASBESTOS FIBER
ASCARITE
CHRYSOTILE
CROCIDOLITE
TREMOLITE

TOXICITY DATA: 3	CODEN:
ihl-hmn TDLo:2.8 fibers/cc/5y	ENVRAL 23,292,80
ipl-rat TDLo:100 mg/kg:ETA	BJCAAI 41,918,80
itr-rat TDLo:13 mg/kg:ETA	ENVRAL 21,63,80
ihl-hmn TCLo:1.2 fibers/cc/19Y-C:PUL	ARDSBL 104,576,71

Carcinogenic Determination: Human Positive IARC** 14,1,77.

TLV: Air: 0.2 fb/cc DTLVS* 4,27,80. *Toxicology Review:* JPMSAE 64,1435,75; PEDIAU 57(4),462,76; JOCMA7 15(10),808,73; CANCAR 39,1792,77; 85CVA2 5,55,70; 31BYAP -,92,74; ZHPMAT 166, 113,78; NOSYBW 40,311,77; PEXTAR 12,102,69; NTIS** CONF-691001. OSHA Standard: Air: TWA 2 fb/cc; CL 10 fb/cc FEREAC 40,27073,75. Occupational Exposure to Asbestos recm std: Air: TWA 100000 fb/m3;CL 500000 fb/m3/15M NTIS**. "NIOSH Manual of Analytical Methods" VOL 1 239,245, VOL 5 309#. NIOSH Current Intelligence Bulletin 5, 1975. Reported in EPA TSCA Inventory, 1980.

THR: A CARC in hmn. An exper ETA. A hmn PUL. The essential lesion produced by asbestos dust is a diffuse fibrosis which probably begins as a "collar" about the terminal bronchioles. Usually, at least 4 to 7 years of exposure are required before a serious degree of fibrosis results. There is apparently less predisposition to tuberculosis than is the case with silicosis. Prolonged inhal can cause cancer of the lung, pleura and peritoneum, and has exper produced cancers of the peritoneum, intestine, bronchus and oropharynx. Clinically, the most striking sign is shortness of breath of gradually increasing intensity, often associated with a dry cough. In the early stages physical signs are absent or slight; in the later stages rales may be heard, and in long standing cases there is frequently clubbing of the fingers. In early stages of the disease the chest x-rays reveal a groundglass or granular change, chiefly in the lower lung fields; as the condition progresses the heart outline becomes "shaggy," and irregular patches of mottled shadowing may be seen. "Asbestos bodies" may be found in the sputum. At autopsy, the pleurae are thickened and adherent and thick subpleural fibrous plaques are often present. Where the disease is far advanced there are usually large areas of fibrosis, with emphysematous changes in the apices and bases. The alveolar walls are thickened, and the characteristic "asbestos bodies" are found. A common air contaminant. For further information see Vol. 1, No. 1 of *DPIM Report.*

ASCARIDOLE

CAS RN: 512856 NIOSH #: OT 0175000
mf: $C_{10}H_{16}O_2$; mw: 168.26

Colorless unstable liquid. mp: 3.3°, bp: 40° @ 2 mm; 115° @ 15 mm, d: 1.011 @ 13°/15°.

SYNS:

ASCARISIN
1,4-PEROXIDO-P-MENTHENE-2

TOXICITY DATA: 3	CODEN:
orl-dog LDLo:250 mg/kg	JPETAB 24,359,25
skn-mus TDLo:25 gm/kg/42W-I:NEO	JNCIAM 35,707,65
skn-mus TD:38 gm/kg/63W-I:ETA	14JTAF -,275,64
orl-rat LDLo:250 mg/kg	NCNSA6 5,24,53

THR: An exper NEO, ETA. HIGH orl. See oil of chenopodium and peroxides, organic.

Fire Hazard: Mod, by spont chemical reaction. An oxidizer.

Explosion Hazard: Explodes when heated above 130° or when exposed to organic acids.

Disaster Hazard: Dangerous; when heated it emits tox fumes and may explode; reacts with reducing materials.

ASCOFURANONE

CAS RN: 38462043 NIOSH #: CU 5181000

SYN: BENZALDEHYDE, 3-CHLORO-4,6-DIHYDROXY-2-METHYL-5-(3-METHYL-7-(TETRAHYDRO-5,5-DIMETHYL-4-OXO-2-FURANYL)-2,6-OCTADIENYL)-, (S-(E,E))-

TOXICITY DATA: 2	CODEN:
ipr-rat LD50:1350 mg/kg	JANTAJ 26,681,73
ipr-mus LD50:2220 mg/kg	JANTAJ 26,681,73

THR: MOD ipr. See also aldehydes.

Disaster Hazard: When heated to decomp it emits tox fumes of Cl^-.

L-ASCORBIC ACID

CAS RN: 50817 NIOSH #: CI 7650000
mf: $C_6H_8O_6$; mw: 176.14

White crystals, sol in water, slightly sol in alcohol, insol in ether, chloroform, benzene, petroleum ether; oils and fats. mp: 192°.

SYNS:

ASCORBIC ACID
L(+)-ASCORBIC ACID
ASCORBUTINA
CEVITAMIC ACID
CEVITAMIN
3-KETO-L-GULOFURANOLACTONE