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SITE INVESTIGATION REPORT

US 70 DRUM DUMP
NC D981472624
Morganton, N.C.

August 1987

By

Pat DeRosa, Waste Management Specialist
NC Solid and Hazardous Waste Management Branch
Environmental Health Section
CERCLA Unit

CERCLA

EXECUTIVE SUMMARY

The US 70 Drum Dump is located in Burke County, NC about 10 miles west of Morganton and 2 miles east of the McDowell County line. The site is at the bottom of an embankment on the south side of US 70, approximately 0.2 miles east of the Dysartsville Road intersection. A pile of 55-gallon drums and other trash were discovered blocking the culvert under US 70 on July 2, 1986. The drums were rusted and waste material was reportedly spilled onto the ground around the pile. The source of the drums was unknown.

Preliminary waste samples were collected by Burke County Emergency Management and NC Solid & Hazardous Waste Management Branch on July 2, 1986. On July 8, 1986, NC CERCLA Unit personnel conducted a site inspection at the site. Additional samples of waste, soil, and groundwater were collected. All of the above samples were submitted to the NC State Laboratory of Public Health on July 10, 1986, for organic and inorganic analyses. No inorganic contaminants were detected at levels significantly above background. Three organic contaminants, chlorobenzene, bis (2-ethylhexyl) phthalate, and methenamine were measured at or significantly above detection limits in soil and waste. Methenamine, the predominant contaminant identified, is not, however, listed as a CERCLA hazardous substance. No contaminants were detected in groundwater. The site was unfenced, accessible, and appeared to pose a direct contact hazard to local residents.

On March 13-14, 1987, EPA Region IV, Emergency and Remedial Response Branch, collected composite waste and soil samples at the site. No background soil sample was collected. Total lead was the only inorganic contaminant detected at levels significantly higher in solid waste than in soil. Twelve organic compounds were measured in waste; chlorobenzene, ethyl benzene, methylene chloride, tetrachloroethylene, xylene, 1,2-dichlorobenzene, 1,2,4-trichlorobenzene. Subsequently, fifty-nine 55-gallon drums of waste were removed from the site, overpacked, and shipped off site for incineration or disposal. No soil was removed.

Currently, the direct contact hazard at the site has been eliminated. Reedy Creek, the nearest downstream surface water is 1.75 miles from the site. It is used for fishing and canoeing. City water from unthreatened surface water sources is available to some residents within three miles. The remaining residents are dependent on private wells. An estimated 3,125 local residents are using groundwater for water supply. Wells are set in the saprolite or bedrock at an average depth of 175 feet. The water table is encountered around 52 feet and the unsaturated zone is a "clayey" soil/saprolite.

There is no evidence of surface water or groundwater contamination at the site. Follow-up work at the site might include soil sampling to ensure that no residual contaminants remain.

BACKGROUND

Location

The US 70 Drum Dump is located in Burke County, NC about 10 miles west of Morganton and 2 miles east of the McDowell County line. The site is at the bottom of an embankment on the south side of US 70, approximately 0.2 miles east of the Dysartsville Road intersection. The coordinates at the site are: Latitude: 35° 41' 53"; Longitude: 081° 51' 17" (Map 1 and 2, Appendix A).

Site Layout

The site occupies an area approximately 30 by 50 feet square at the mouth of a culvert under US 70. It is located on the northeast corner of the Jim Crawley property, bordered by US 70 to the north and the Elgie McGalliard property to the east (3,11). The McGalliard residence is about 200 feet southeast of the site (Map 1, Appendix A). Drums and trash were piled at the bottom of the embankment blocking the mouth of the culvert. Waste was scattered and spilled as far as 50 feet south of the highway. Vegetation was grown up around the pile; however, the area was unfenced and accessible (3,31).

Ownership History

The ownership history of the site, from the current owner going back approximately 15 years, is listed below (11):

Jim Crawley (current owner)
Mrs. Johnny Baker
Thomas Mack Ray
Jack Farris

These individuals reside in the Morganton area.

Site Use History

The site was discovered on July 2, 1986, by a backhoe team from the NC Department of Transportation (DOT). The backhoe operator was attempting to clear debris from the mouth of the culvert when he hit the drums. Approximately 25-30 drums were estimated on site at that time. Some drums were empty, however, others appeared to contain dried paint waste, white granular material, and a greenish, grease-like substance. Some waste was spilled when the backhoe pierced the drums. One drum reportedly contained liguid that coagulated on exposure to air. A strong odor of chlorine or ammonia was also reported (31). The current property owner and adjacent land owner had no knowledge of the source or contents of the drums (3).

Permit and Regulatory History

The site is not known to have any prior permit or regulatory history.

Remedial Actions to Date

Following the subject field investigation, the NC CERCLA Unit requested that a removal action be initiated at this site by EPA Region IV, Emergency and Remedial Response Branch (32). On March 9, 1987, a removal action was initiated, and EPA began staging and temporary storage of the drums. Composite waste and soil samples were collected on March 13-14, 1987. Drums were moved to the Burke County Landfill on Kirksey Road on March 16-17, 1987. On receipt of the sampling results, drums were overpacked and, on April 14-15, 1987, drums were shipped off site for disposal (15).

Summary Trip Report

On July 7, 1986, NC CERCLA Unit personnel, Lee Crosby, Pat DeRosa, and Mary Giguere visited the subject site. Keith Masters, NC DHR/DHS, Solid and Hazardous Waste Management Branch, directed us to the site and provided background information. We observed 25 to 30 rusted 55-gallon drums at the bottom of a 30 ft. embankment on the south side of US 70. The topography was such that surface water would drain from the south onto the site and through the culvert to the other side of the road. However, no surface water was observed and the drain pipe appeared to be plugged with drums and debris. Tires, household trash, and rolls of paper about four feet wide, were also observed in the culvert. The drums had been covered with a clear plastic tarp and the eastern embankment had been taped off to discourage public entry to the site. We met briefly with the McGalliard family, the owners of the property adjoining the site to the east. We also met with Jim Crawley, the site owner. Both land owners gave us their permission to enter the property and collect samples as needed. Neither Mr. Crawley nor the McGalliards, however, had any information as to the source or contents of the drums. Later that day, we also met with Nick Waters and Dale Murphy from Burke County Emergency Management to discuss the site.

On July 8, 1986, we met with Mr. Crawley again to collect a sample from an inactive well at his shop approximately 0.2 miles west of the site. A sample could not be obtained, however, due to a break in the pipe between the pump and the tap. We then proceeded to the site, donned protective clothing, and began sampling at 0950. At that time, the weather was sunny and hot (approximately 90°F), with no noticeable wind. Two waste samples were collected from an accessible open drum and spill area. The drum contained white rubbery chips and the spill appeared to be a greasy material with a caramel-like consistency. Additional waste samples could not be collected due to the physical hazard posed by the unstable drum and trash pile. HNu readings monitored throughout sampling did not exceed background. A surface soil sample was collected 5 ft. south of the drums and a background soil sample was collected approximately 150 ft. upgradient. The nearest well, located at the residence of Ray Allison approximately 400 ft. west of the site, was also sampled. Sampling was completed by 1130. Samples were submitted to the NC State Laboratory of Public Health for organic and inorganic analyses.

Observers on site during sampling included: Clint Patton, Burke County Fire Marshall's Office; Jim Fulmer, Burke County Maintenance Engineer; Steve Foster, Burke County Training Officer for Emergency Management; Dale Meyer, Burke County Division of Solid Waste; and Elgie McGalliard, adjacent property owner. After sampling, we met briefly with Steve Foster to discuss the site.

ENVIRONMENTAL SETTING

Topography

The site is in Burke County on the western edge of the Piedmont physiographic province. Gentle hills and broad valleys of the Piedmont give way to the steep, eastern front of the Blue Ridge Mountains to the northwest (17). The site is located at the bottom of an embankment on the south side of US 70 (3). Drums at the site were observed from 0 - 50 feet from the highway. An estimated one foot drop in elevation over this 50 foot horizontal distance yields an average facility slope of 2% (11).

Surface Water

Surface drainage from the site, flows northeast under US 70 to an intermittent creek. The nearest downstream surface water is Reedy Creek. The distance from the site to Reedy Creek, measured along the intermittent creek is 1.75 miles or 9,240 feet. The change in elevation over this horizontal distance is 1292' - 1080' above mean sea level, or 212 feet (6,11). The slope of the intervening terrain is therefore 2.3% (1).

From Reedy Creek, surface water flows 0.5 miles to Muddy Creek which continues 1.75 miles to the Catawba River (6). There are no surface water intakes for drinking water supply or irrigation of food crops within 3 miles downstream of the site (8,9,10). Parts of this stream segment, however, are heavily used for fishing and canoeing (12).

Geology and Soils

The site lies within the Blue Ridge-Inner Piedmont hydrogeologic unit. As is typical of the NC Piedmont and Mountain regions, the site is underlain by a layer of soil and saprolite derived from the underlying fractured bedrock (13,17). The bedrock is comprised of a granitic gneiss or quartz-biotite gneiss complex which weathers to a reddish-clay saprolite (17). The average thickness of the saprolite, based on well casing depths, is 63 feet (17).

Groundwater

Private wells within 3 miles of the site are set in either the saprolite or the bedrock layer (17,18). These layers function as a single aquifer and are hydraulically connected (18,19). Groundwater is stored in the saprolite and transmitted through the bedrock via a fracture system which functions as a groundwater pipeline (13). The movement of water from the water table to the fractured bedrock is therefore unconfined.

Wells within 3 miles of the site average around 175 feet deep with 63 feet of casing. The water table aquifer or "aquifer of concern" is generally encountered in the saprolite layer at an average of 52 feet below land surface (17). The unsaturated zone of the soil/saprolite layer is described as "clayey" with an estimated average hydraulic conductivity of 10^{-5} cm/sec (19). The fractured bedrock has an estimated hydraulic conductivity of 10^{-3} cm/sec (1).

Climate and Meteorology

In the Morganton area, mean annual precipitation is 52 inches and mean annual evaporation is 36 inches. Net annual precipitation is therefore 16 inches. The 1 year 24-hr. rainfall for the area is 3.5 inches (1).

Land Use

The site is approximately 10 miles west of the City of Morganton and 3 miles west of the Town of Glen Alpine (Map 2, Appendix A). This is a lightly populated rural residential/commercial area along the south side of US 70 . The nearest residence is approximately 200 feet southeast of the site (Map 1, Appendix A).

Population Distribution

Three circles, representing a 1-, 2- and 3-mile radius around the site, were constructed on the 1962 USGS 7.5' quadrangle maps for Glen Alpine, NC and Marion East, NC (Map 1, Appendix A). Due to the age of these maps, additional sources were sought to obtain more accurate population values. Tax maps, from the Burke County Tax Office, were used to count all homes within 3 miles of the site in Burke County (24,25,26). House count values were multiplied by 3.8 persons per home (1). No tax maps were available for McDowell County, therefore, the relative increase in the rural population between 1960 and 1980 was applied to a house count obtained from the 1962 USGS quadrangle maps (6,27,28). The total populations estimated within 1, 2, and 3 miles of the site are listed below:

1 mile:	1178 persons
2 miles:	4030 persons
3 miles:	6627 persons

Water Supply

City water from the Glen Alpine and the Brentwood Water Systems is available to some residents within 3 miles of the site. Both systems purchase their water from Morganton which uses an unthreatened surface water source (22,23). There are no community well systems within 3 miles (20,21). The remaining residents without access to city water are assumed to be using private wells. In addition, approximately 5% of the individuals with access to city water use private wells (23). The total population using groundwater within 3 miles of the site is estimated at 3,125 residents (24 - 28).

The nearest well is located approximately 400 feet west of the site at the Ray Allison residence. This well also supplies water to a neighboring home (11). Wells in the area average around 175 feet in depth with 63 feet of casing (17).

Critical Environments

The site is located in the western Piedmont region of North Carolina. There are no coastal wetlands within 2 miles of the site and no freshwater wetlands have been identified within 1 mile (Map 1, Appendix A). In addition, there are no critical habitats of federally listed endangered species within 1 mile of the site (7).

WASTE TYPES & QUANTITIES

Waste Quantities

Fifty-five 55-gallon drums of solid waste and four 55-gallon drums of liquid waste were found and removed from the site (15). These drums were overpacked in larger drums and manifested off site for disposal (16).

Waste Disposal Method

Waste in steel, 55-gallon drums was apparently piled or dumped over the embankment into the mouth of the culvert. No additional containment was observed (3,15).

Waste Types

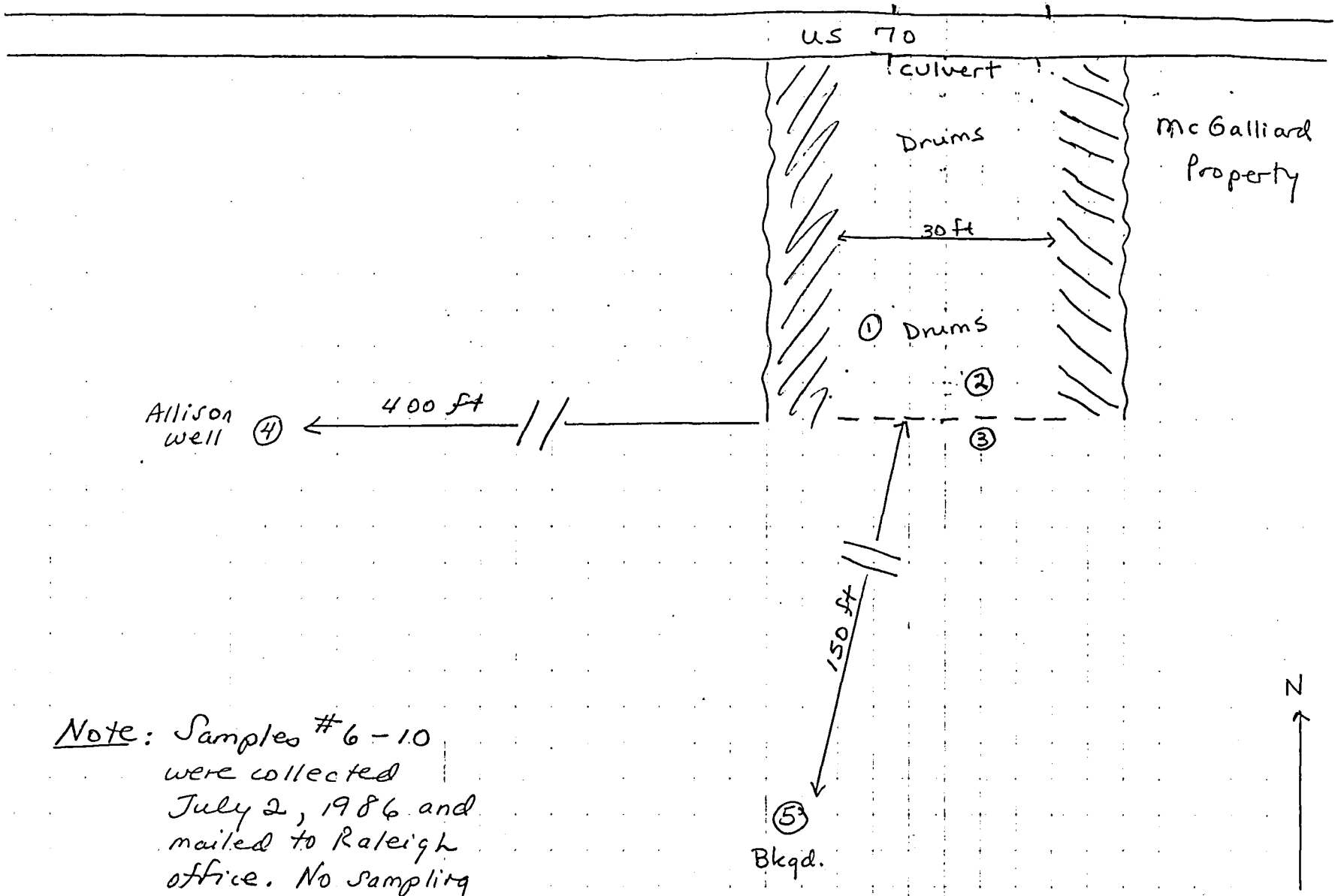
The source of the solid and liquid wastes disposed on site is yet unknown. Wastes were described as "white rubbery chips or resin, dried paint waste, white granular material, greasy caramel-like waste, and grease-like material with a greenish cast" (2,3,31). The hazardous constituents detected in the wastes are discussed in "LABORATORY DATA."

LABORATORY DATA

Preliminary waste samples were collected by Burke County Emergency Management and NC Solid & Hazardous Waste Management Branch on July 2, 1986. Additional samples of waste, soil, and groundwater were collected by NC CERCLA Unit personnel on July 8, 1986. Sampling locations are shown in Figure 1. All of the above samples were submitted to the NC State Laboratory of Public Health on July 10, 1986 for organic and inorganic analyses (2,3). No inorganic contaminants were detected at levels significantly above background. Three organic contaminants, chlorobenzene, bis (2-ethylhexyl) phthalate, and methenamine were measured at or significantly above detection limits in soil and waste (2). Methenamine, the predominant contaminant identified, is not, however, listed as a CERCLA hazardous substance (30). No contaminants were detected in groundwater (3). A copy of these laboratory results is included in Appendix B and summarized in Table 1.

On March 13-14, 1987, EPA Region IV, Emergency and Remedial Response Branch, collected composite waste and soil samples at the site (15). No background soil sample was collected. Total lead was the only inorganic contaminant detected at significantly higher levels in solid waste than in soil. Twelve organic compounds were measured in waste sampled at the site (5). The results of these analyses are summarized in Table 2.

FIGURE 1 - SAMPLING LOCATIONS, SAMPLES COLLECTED JULY 8, 1986



Note: Samples #6 - 10 were collected July 2, 1986 and mailed to Raleigh office. No sampling diagram was provided.

TABLE 1

SUMMARY DATA: SAMPLES COLLECTED JULY 2, 8, 1986

LOCATION #	TYPE	DESCRIPTION	CONTAMINANTS DETECTED (PPB)
1	Waste Solid	White resin material	Methenamine 831,884 J Chlorobenzene 50
2	Waste Sludge	Viscous spilled material	Methenamine 431,667 J
3	Soil	5 ft. south of drums, surface soil	Bis (2-ethylhexyl) 224,000 phthalate Chlorobenzene 50
4	Soil	Background, surface soil ~150 ft. upgradient (South)	None detected
5	Private Well	Ray Allison residence	None detected
6	Soil	Purplish surface soil	None detected
7	Waste Sludge	Greasy material from spilled drum	Methenamine 28,542 (ppm)
8	Waste Solid	White granular solid from open drum	Methenamine 7,833 J
9	Waste Liquid	Standing liquid from drum area	None detected

J = Estimated value

TABLE 2

SUMMARY DATA: COMPOSITE SAMPLES COLLECTED MARCH 13-14, 1987

Contaminant Detected	Soil	Sludge & Liquid	Solid Waste Waste
Lead (Total)	< 1 ppm	0.29 ppm	25.8 ppm
Chlorobenzene	< 10 ppb	70.96 ppm	<10 ppb
Ethylbenzene	< 10 ppb	1,005 ppm	<10 ppb
Methylenechloride	< 10 ppb	86.63 ppm	<10 ppb
Tetrachloroethylene	<10 ppb	< 1 ppm	79 ppb
Toluene	<10 ppb	28.88 ppm	< 10 ppb
Trichloroethylene	< 10 ppb	103.7 ppm	< 10 ppb
Xylene	< 10 ppb	3139 ppm	< 10 ppb
1,2-Dichlorobenzene	< 0.1 ppm	346 ppm	< 0.1 ppm
1,3-Dichlorobenzene	< 0.1 ppm	183 ppm	< 0.1 ppm
1,4-Dichlorobenzene	< 0.1 ppm	387 ppm	< 0.1 ppm
1,2,4-Trichlorobenzene	< 0.1 ppm	85 ppm	3.46 ppm

LEAD

CAS RN: 7439921 NIOSH #: OF 7525000
mf: Pb; mw: 207.19

Bluish-gray, soft metal. mp: 327.43°, bp: 1740°, d: 11.34 @ 20°/4°. vap. press: 1 mm @ 973°.

SYNS:

C.I. 77575	LEAD S2
LEAD FLAKE	OLOW (POLISH)

TOXICITY DATA: 3	CODEN:
orl-rat TDLo:790 mg/kg (MGN)	AEHLAU 23,102,71
orl-rat TDLo:1140 mg/kg (14D pre-21D post)	PHMCAA 20,201,78
orl-mus TDLo:1120 mg/kg (MGN)	AEHLAU 23,102,71
orl-mus TDLo:6300 mg/kg (1-21D preg)	EXPEAM 31,1312,75
orl-mus TDLo:12600 mg/kg (1-21D preg)	EXPEAM 31,1312,75
orl-mus TDLo:4800 mg/kg (1-16D preg)	BECTA6 18,271,77
ivn-ham TDLo:50 mg/kg/(8D preg):TER	EXPEAM 25,56,69
orl-dom TDLo:662 mg/kg (1-21W preg)	TXAPA9 25,466,73
ivn-ham TDLo:50 mg/kg/(8D preg):TER	EXPEAM 25,56,69
orl-wmn TDLo:450 mg/kg/6Y:CNS	JAMAAP 237,2627,77
ipr-rat LDLo:1000 mg/kg	EQSSDX 1,1,75
orl-pgn LDLo:160 mg/kg	HBAMAK 4,1289,35

Carcinogenic Determination: Indefinite IARC** 23, 325,80.

TLV: AIR: 0.15 mg/m3 DTLVS* 4,243,80; *Toxicology Review:* TRBMAV 33(1),85,75; PGMJAO 51(601),783,75; JDSCAE 58(12),1767,75; IRXPAT 12,1,73; CTPHBG 55,147,71; CTOXAO 6(3),377,73; QURBAW 7(1),75,74; RREVAH 54,55,75; JAVMA4 164(3),277,74; AEMBAP 40,239,73; CTOXAO 5(2),151,72; FOREAE 7,313,42; KOTTAM 11(11),1300,75; GEIGAI 20(3),291,73; STEVA8 2(4),341,74; CLCHAU 19,361,73; AJMEAZ 38,409,65; 85DHAX PB,254,72; PDTNBH 6,204,77; AMTODM 3,209,77. OSHA Standard: Air: TWA 200 ug/m3 (SCP-O) FEREAC 39,23540,74. Occupational Exposure to Inorganic Lead recm std: Air: TWA 0.10 mg(Pb)/m3 NTIS**. "NIOSH Manual of Analytical Methods" VOL 1 102,191,195,200,208,214,262, VOL 3 S341. Reported in EPA TSCA Inventory, 1980.

THR: See lead compounds. A hmn CNS. HIGH orl; MOD irr. A common air contaminant. It is a ± CAR of the lungs and kidney and an exper TER.

Fire Hazard: Mod, in the form of dust when exposed to heat or flame. See also powdered metals.

Explosion Hazard: Mod, in the form of dust when exposed to heat or flame.

Incomp: NH_4NO_3, ClF_3, H_2O_2, NaN_3, Na_2C_2, Zr. disodium acetylide; oxidants.

Disaster Hazard: Dangerous; when heated, emits highly tox fumes; can react vigorously with oxidizing materials.

For further information see Vol. 1, No. 1 of *DPIM Report.*

XYLENE

CAS RN: 1330207 NIOSH #: ZE 2100000
mf: C_8H_{10}; mw: 106.18

SYNS:

DIMETHYLBENZENE	XYLENEN (DUTCH)
KSYLEN (POLISH)	XYLOL
XILOLI (ITALIAN)	XYLOLE (GERMAN)

TOXICITY DATA: 3-2-1	CODEN:
ihl-rat TCLo:1000 mg/m3/24H (9-14D preg)	TXCYAC 11,55,78
eye-hmn 200 ppm	JIHTAB 25,282,43
skn-rbt 100% MOD	AMIHAB 14,387,56
skn-rbt 500 mg/24H MOD	28ZPAK -,24,72
eye-rbt 87 mg MLD	AMIHAB 14,387,56
eye-rbt 5 mg/24H SEV	28ZPAK -,24,72
ihl-hmn TCLo:200 ppm:IRR	JIHTAB 25,282,43
ihl-man LCLo:10000 ppm/6H	BMJOAE 3,442,70
orl-rat LD50:4300 mg/kg	AMIHAB 14,387,56
ihl-rat LC50:5000 ppm/4H	NPIRI* 1,123,74
scu-rat LD50:1700 mg/kg	NPIRI* 1,123,74
ipr-mus LD50:1570 ug/kg	AGGHAR 18,109,60
ipr-gpg LDLo:2000 mg/kg	AIHAAP 35,21,74
ipr-mam LDLo:2000 mg/kg	AJHYA2 7,276,27

Aquatic Toxicity Rating: TLm96:100-10 ppm WQCHM* 2,-,74.

Toxicology Review: 27ZTAP 3,153,69. OSHA Standard: Air: TWA 100 ppm (SCP-U) FEREAC 39,23540,74. Occupational Exposure to Xylene recm std: Air: TWA 100 ppm; CL 200 ppm/10M NTIS**. "NIOSH Manual of Analytical Methods" VOL 1 127, VOL 3 S318. Reported in EPA TSCA Inventory, 1980. EPA TSCA 8(a) Preliminary Assessment Information Proposed Rule FERREAC 45,13646,80.

THR: A hmn eye irr; A skn eye irr. A hmn IRR and MOD ipr, scu, ihl; LOW orl.

Disaster Hazard: When heated to decomp it emits acrid smoke and fumes.

Sax, N.I. Dangerous Properties of Industrial Materials, 6th edition. Van Nostrand Reinhold Company, NY, 1984.

BENZENE CHLORIDE

CAS RN: 108907 NIOSH #: CZ 0175000
mf: C_6H_5Cl; mw: 112.56

Clear, colorless liquid. bp: 131.7°, lel = 1.3%, uel = 7.1%, @ 150°, mp: −45°, flash p: 85°F (CC), d: 1.113 @ 15.5°/15.5°, autoign. temp.: 1180°F, vap. press: 10 mm @ 22.2°, vap. d: 3.88.

SYNS:

CHLOORBENZEEN (DUTCH)
CHLORBENZENE
CHLORBENZOL
CHLOROBENZEN (POLISH)
CHLOROBENZENE
CLOROBENZENE (ITALIAN)
MONOCHLOORBENZEEN (DUTCH)
MONOCHLORBENZENE
MONOCHLORBENZOL (GERMAN)
MONOCHLOROBENZENE
MONOCLOROBENZENE (ITALIAN)
NCI-c54886
PHENYL CHLORIDE

TOXICITY DATA: 2-1	CODEN:
orl-rat LD50:2910 mg/kg	14CYAT 2,1334,63
ipr-rat LDLo:7400 mg/kg	RMSRA6 16,449,1896
scu-rat LDLo:7000 mg/kg	RMSRA6 16,449,1896
ihl-mus LCLo:15 gm/m3	GISAAA 20(8),19,55
orl-rbt LD50:2830 mg/kg	14CYAT 2,1394,63
ipr-gpg LDLo:4100 mg/kg	RMSRA6 16,449,1896

Aquatic Toxicity Rating: TLm96:100-1 ppm WQCHM* 2,-,74.

TLV: Air: 75 ppm DTLVS* 4,84,80. OSHA Standard: Air: TWA 75 ppm (SCP-I) FEREAC 39,23540,74. DOT: Flammable Liquid, Label: Flammable Liquid FEREAC 41,57018,76. Currently Tested by NTP for Carcinogenesis by Standard Bioassay Protocol as of December 1980. "NIOSH Manual of Analytical Methods" VOL 2 S133. Reported in EPA TSCA Inventory, 1980. EPA TSCA 8(a) Preliminary Assessment Information Proposed Rule FERREAC 45,13646,80.

THR: MOD orl; LOW ipr, scu, ihl. Monochlorobenzol is a fairly strong narcotic and possesses only slight irr qualities. For cats, conc of 1,200 ppm are quite narcotic, and conc of 3,700 ppm are fatal after several hours. The dichlorobenzols are strongly narcotic, 1,000 ppm causing narcosis in guinea pigs followed by death after 20 hrs exposure. Knowledge of the effects on man of repeated exposure to subnarcotic concentrations is meager. In general, it appears that the chlorobenzols are not as toxic as benzol. Some of the symptoms described (methemoglobinemia) suggest that other substances, such as nitrobenzol, may have been partially responsible for the few cases of industrial illness reported. It is possible that prolonged exposure to chlorobenzol may cause kidney and liver damage.

Somnolence, loss of consciousness, twitchings of the extremities, cyanosis, deep, rapid respirations and a small, irregular pulse are the chief symptoms occurring in acute exposures. The urine may be burgundy red, and the red blood cells show degenerative and regenerative changes.

Fire Hazard: Dangerous, when exposed to heat or flame. Also violent reaction with $AgClO_4$, dimethyl sulfoxide.

Spontaneous Heating: No.

Explosion Hazard: Mod, when exposed to heat or flame.

Disaster Hazard: Dangerous; see chlorine compounds; can react vigorously with oxidizing materials.

To Fight Fire: Foam, CO_2, dry chemical, water to blanket fire.

For further information see Chlorobenzene, Vol. 2, No. 4 of *DPIM Report.*

POLYCHLORINATED BIPHENYL (AROCLOR 1254)

CAS RN: 11097691 NIOSH #: TQ 1360000

Composed of 11% tetra-, 49% penta-, 34% hexa- and 6% heptachlorobiphenyls (FCTXAV 12,63,74)

SYNS:

AROCHLOR 1254
AROCLOR 1254
CHLORIERTE BIPHENYLE, CHLORGEHALT 54% (GERMAN)
CHLORODIPHENYL (54% Cl)
CLORODIFENILI, CLORO 54% (ITALIAN)
DIPHENYLE CHLORE, 54% DE CHLORE (FRENCH)
NCI-c02664

TOXICITY DATA: 3	CODEN:
orl-rat TDLo:188 mg/kg (MGN)	FCTXAV 12,63,74
orl-rat TDLo:645 mg/kg (MGN)	FCTXAV 12,63,74
orl-rat TDLo:90 mg/kg (7-15D preg)	FCTXAV 11,471,73
orl-rbt TDLo:350 mg/kg (1-28D preg)	EVPHBI 1,67,71
orl-rat TDLo:4 gm/kg/2Y-I:ETA	NCITR* NCI-CG-TR-38,78
orl-mus TDLo:17 gm/kg/48W-C:NEO	JNCIAM 53,547,74
skn-mus TDLo:4 mg/kg:ETA	BECTA6 18,552,77
orl-rat LD50:1295 mg/kg	FCTXAV 12,63,74
ivn-rat LD50:358 mg/kg	FCTXAV 12,63,74
ipr-mus LD50:2840 mg/kg	BECTA6 8,245,72

Carcinogenic Determination: Human Suspected IARC** 18,43,78.

TLV: Air: 0.5 mg/m3 DTLVS* 4,89,80. *Toxicology Review:* EVHPAZ 1,105,72; ARVPAX 14,139,74; RREVAH 44,1,73; STEVA8 2(4),305,74; BISNAS 20,958,70. OSHA Standard: Air: TWA 500 ug/m3 (skin) (SCP-I) FEREAC 39,23540,74. Occupational Exposure to Polychlorinated Biphenyls recm std: Air: TWA 1.0 ug/m3 NTIS**. NCI Carcinogenesis Bioassay Completed; Results Indefinite: Rat (NCITR* NCI-CG-TR-38,78). "NIOSH Manual of Analytical Methods" Vol. 2 S121.

THR: An exper ETA, NEO. A susp hmn CARC. HIGH ivn; MOD orl, ipr. See also PCB's.

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

For further information see Chlorinated Diphenyls, Vol. 1, No. 3 of *DPIM Report.*

METHANE DICHLORIDE

CAS RN: 75092 NIOSH #: PA 8050000
mf: CH_2Cl_2; mw: 84.93

Colorless volatile liquid. bp: 39.8°, lel = 15.5% in O_2, uel = 66.4% in O_2, fp: −96.7°, d: 1.326 @ 20°/4°, autoign. temp.: 1139°F, vap. press: 380 mm @ 22°, vap. d: 2.93.

SYNS:

CHLORURE DE METHYLENE (FRENCH)
DICHLOROMETHANE (DOT)
FREON 30
METHYLENE BICHLORIDE
METHYLENE CHLORIDE (DOT)
METHYLENE DICHLORIDE
METYLENU CHLOREK (POLISH)
NCI-c50102

TOXICITY DATA: 3	CODEN:
skn-rbt 810 mg/24H SEV	JETOAS 9,171,76
eye-rbt 162 mg MOD	JETOAS 9,171,76
eye-rbt 10 mg MLD	TXCYAC 6,173,76
eye-rbt 17500 mg/m3/10M	TXCYAC 6,173,76
mmo-sat 5700 ppm	MUREAV 56,245,78
mma-sat 5700 ppm	MUREAV 56,245,78
dni-hmn:fbr 5000 ppm/1H-C	MUREAV 81,203,81
dni-ham:lng 5000 ppm/1H-C	MUREAV 81,203,81
sce-ham:lng 5000 ppm/1H-C	MUREAV 81,203,81
ihl-rat TCLo:4500 ppm/24H (1-17D preg)	TXAPA9 52,29,80
ihl-rat TCLo:1250 ppm/7H (6-15D preg)	TXAPA9 32,84,75
ihl-mus TCLo:1250 ppm/7H (6-15D preg)	TXAPA9 32,84,75
ihl-rat TCLo:500 ppm/6H/2Y:ETA	TXAPA9 48,A185,79
ihl-hmn TCLo:500 ppm/1Y-I:CNS	ABHYAE 43,1123,68
ihl-hmn TCLo:500 ppm/8H:BLD	SCIEAS 176,295,72
orl-rat LD50:167 mg/kg	DOWSD* 1/26/76
ihl-rat LC50:88000 mg/m3/30M	FAVUAI 7,35,75
ihl-mus LC50:14400 ppm/7H	NIHBAZ 191,1,49
ipr-mus LD50:1500 mg/kg	TXAPA9 9,139,66
scu-mus LD50:6460 mg/kg	TXAPA9 4,354,62
orl-dog LDLo:3000 mg/kg	QJPPAL 7,205,34
ihl-dog LCLo:14108 ppm/7H	NIHBAZ 191,1,49
ipr-dog LDLo:950 mg/kg	TXAPA9 10,119,67
scu-dog LDLo:2700 mg/kg	QJPPAL 7,205,34
ivn-dog-LDLo:200 mg/kg	QJPPAL 7,205,34
ihl-cat LCLo:43400 mg/m3/4.5H	AHBAAM 116,131,36
orl-rab LDLo:1900 mg/kg	HBTXAC 1,94,56
scu-rbt LDLo:2700 mg/kg	QJPPAL 7,205,34
ihl-gpg LCLo:5000 ppm/2H	FLCRAP 1,197,67

Aquatic Toxicity Rating: TLm96:1000-100 ppm WQCHM* 3,-,74. Carcinogenic Determination: Indefinite IARC** 20,449,79.

TLV: Air: 100 ppm DTLVS* 4,275,80. *Toxicology Review:* FAZMAE 18,365,74; 27ZTAP 3,94,69. OSHA Standard: Air: TWA 500 ppm; CL 1000; Pk 2000/5M/2H (SCP-J) FEREAC 39,23540,74. DOT-ORM-A, Label: None FEREAC 41,57018,76. Occupational Exposure to Methylene Chloride recm std: Air: TWA 75 ppm; Pk 500 ppm/15M NTIS**. Currently tested by NTP for Carcinogenesis by Standard Bioassay Protocol as of December 1980. "NIOSH Manual of Analytical Methods" Vol 1 127, Vol 3 S329. Reported in EPA TSCA Inventory, 1980. EPA TSCA 8(a) Preliminary Assessment Information Proposed Rule FERREAC 45,13646,80.

THR: MUT data. A skn, eye irr. An exper ETA, ± CARC. A hmn CNS, BLD. HIGH orl, ivn; MOD ipr, orl, scu, ihl; LOW ihl, scu. See also chlorinated aliphatic hydrocarbons. Very dangerous to the eyes. Except for its property of inducing narcosis, it has very few other acute toxicity effects. Its narcotic powers are quite strong, and in view of its great volatility, care should be taken in its use. It will not form explosive mixtures with air at ordinary temp. However, it can be decomp by contact with hot surfaces and open flame, and it can then yield toxic fumes, which are irr and will thus give warning of their presence. It has been used as an anesthetic in Europe and is still used there for local anesthesia. Exper have shown that 25,000 ppm conc for 2 hr exposures were not lethal. Conc of 7,200 ppm after 8 min caused paresthesia of the extremities; after 16 min, acceleration of the pulse to 100; during the first 20 min, congestion in the head, a sense of heat and slight irr of the eyes. At a level of 2,300 ppm, there was no feeling of dizziness during 1-hr exposures, but nausea did occur after 30 min of exposure. The limit of perception by smell is set at 25-50 ppm conc. Can cause a dermatitis upon prolonged skin contact. A respirator for organic vapors and fumes should be worn to avoid excessive inhal. Used as a food additive permitted in food for human consumption.

Fire Hazard: Reacts violently with Li, NaK, potassium-*tert*-butoxide, (KOH + *n*-methyl-*n*-nitrosourea).

Explosion Hazard: None under ordinary conditions, but will form explosive mixtures in atmosphere having high oxygen content, in liquid O_2, N_2O_4, K, Na, NaK.

Disaster Hazard: Dangerous; when heated to decomp, emits highly tox fumes of phosgene.

1,1,2,2-TETRACHLOROETHYLENE

CAS RN: 127184 NIOSH #: KX 3850000
mf: C_2Cl_4; mw: 165.82

Colorless liquid, chloroform-like odor. mp: −23.35°, bp: 121.20°, flash p: none, d: 1.6311 @ 15°/4°, vap. press: 15.8 mm @ 22°, vap. d: 5.83.

SYNS:

CARBON BICHLORIDE
CARBON DICHLORIDE
CZTEROCHLOROETYLEN (POLISH)
DOW-PER
ETHYLENE TETRACHLORIDE
NCI-c04580
PERCHLOORETHYLEEN, PER (DUTCH)
PERCHLORAETHYLEN, PER (GERMAN)
PERCHLORETHYLENE, PER (FRENCH)
PERCHLOROETHYLENE
PERCLENE
PERCLOROETILENE (ITALIAN)
TETRACHLOORETHEEN (DUTCH)
TETRACHLORAETHEN (GERMAN)
TETRACHLOROETHYLENE (DOT)
TETRACLOROETENE (ITALIAN)

TOXICITY DATA: 3	CODEN:
ihl-rat TCLo:1000 ppm/24H (14D pre/1-22D preg)	APTOD9 19,A21,80
ihl-rat TCLo:1000 ppm/24H (1-22D preg)	APTOD9 19,A21,80
ihl-rat TCLo:900 ppm/7H (7-13D preg)	TJADAB 19,41A,79
ihl-rat TCLo:300 ppm/7H (6-15D preg)	TXAPA9 32,84,75
ihl-mus TCLo:300 ppm/7H (6-15D preg)	TXAPA9 32,84,75
skn-rbt 810 mg/24H SEV	JETOAS 9,171,76
eye-rbt 162 mg MLD	JETOAS 9,171,76
mmo-sat 50 uL/plate	NIOSH* 5AUG77
mma-sat 200 uL/plate	NIOSH* 5AUG77
orl-mus TDLo:195 gm/kg/50W-I:CAR	NCITR* NCI-CG-TR-13,77
orl-mus TD:240 gm/kg/62W-I:CAR	NCITR* NCI-CG-TR-13,77
ihl-hmn TCLo:96 ppm/7H:SYS	NTIS** PB257-185
ihl-man TCLo:280 ppm/2H:EYE	AMIHBC 5,566,52
ihl-man TCLo:600 ppm/10M:CNS	AMIHBC 5,566,52
orl-rat LD50:8850 mg/kg	NPIRI* 1,96,74
ihl-rat LCLo:4000 ppm/4H	JOCMA7 4,262,62
orl-mus LD50:8100 mg/kg	NTIS** PB257-185
ihl-mus LCLo:23000 mg/m3/2H	AHBAAM 116,131,36
ipr-mus LD50:4700 mg/kg	NTIS** PB257-185
orl-dog LDLo:4000 mg/kg	AJHYA2 9,430,29
ipr-dog LD50:2100 mg/kg	TXAPA9 10,119,67
ivn-dog LDLo:85 mg/kg	QJPPAL 7,205,34
orl-cat LDLo:4000 mg/kg	AJHYA2 9,430,29
orl-rbt LDLo:5000 mg/kg	AJHYA2 9,430,29
scu-rbt LDLo:2200 mg/kg	QJPPAL 7,205,34

Aquatic Toxicity Rating: TLm96:100-10 ppm WQCHM* 3,-,74. Carcinogenic Determination: Animal Positive IARC** 20,491,79.

TLV: Air: 50 ppm (skin) DTLVS* 4,325,80. *Toxicology Review:* AJMEAZ 38,409,65; 27ZTAP 3,139,69. OSHA Standard: Air: TWA 100 ppm; CL 200; Pk 300/5M/3H (SCP-J) FEREAC 39,23540,74. DOT: ORM-A, Label: None FEREAC 41,57018,76. Occupational Exposure to Tetrachloroethylene recm std: Air: TWA 50 ppm; CL 100 ppm/15M NTIS**. NCI Carcinogenesis Bioassay Completed; Results Positive: Mouse (NCITR* NCI-CG-TR-13,77). NCI Carcinogenesis Bioassay Completed; Results Negative: Rat (NCITR* NCI-CG-TR-13,77). Currently Tested by NTP for Carcinogenesis by Standard Bioassay Protocol as of December 1980."NIOSH Manual of Analytical Methods" VOL 1 127, VOL 3 S335. NIOSH Current Intelligence Bulletin 20, 1978. Reported in EPA TSCA Inventory, 1980. EPA TSCA 8E No: 05780146-Followup Sent as of April, 1979.

THR: MOD via inhal, oral, scu, ipr and dermal routes. HIGH via ivn route. Not corrosive or dangerously acutely reactive, but toxic by inhal, by prolonged or repeated contact with the skin or mu mem, or when ingested by mouth. The liquid can cause injuries to the eyes; however, with proper precautions it can be handled safely. The symptoms of acute intoxication from this material are the result of its effects upon the nervous system.

Exposures to higher conc than 200 ppm cause irr, lachrymation and burning of the eyes and irr of the nose and throat. There may be vomiting, nausea, drowsiness, an attitude of irresponsibility, and even an appearance resembling alcoholic intoxication. This material also acts as an anesthetic, through the inhalation of excessive amounts within a short time. The symptoms of fatal intoxication are irritation of the eyes, nose and throat, then fullness in the head, mental confusion; there may be headache stupefaction, nausea and vomiting, personnel suffering from subacute poisoning may suffer from such symptoms as headache, fatigue, nausea, vomiting, mental confusion and temporary blurring of the vision. This can occur when inadequate ventilation results in concentrations higher than 200 ppm, or where the vapor conc are intermittently high due to faulty handling of the material, or when an individual fails to take adequate precautionary measures.

This material can cause dermatitis, particularly after repeated or prolonged contact with the skin. The dermatitis is preceded by a reddening and burning and more rarely, a blistering of the skin. In any event, the skin becomes rough and dry, due largely to the removal of skin oils by material. The skin then cracks easily and is readily susceptible to infection. Upon ingestion it causes irr of the gastrointestinal tract, which, in turn, causes nausea, vomiting, diarrhea and bloody stools. However, such effects are usually less severe than the effects of swallowing similar amounts of other chlorinated hydrocarbons. An exper CARC. MUT data.

It may be handled in the presence or absence of air, water, and light with any of the common construction materials at temp. up to 140°C. This material is extremely stable and resists hydrolysis. A common air contaminant. Reacts violently with Ba, Be, Li; N_2O_4; metals; NaOH.

Disaster Hazard: Dangerous; when heated to decomp it emits high tox fumes of chlorides.

For further information see Perchloroethylene Vol. 1, No. 2 of *DPIM Report.*

ETHYL BENZENE

CAS RN: 100414 NIOSH #: DA 0700000
mf: C_8H_{10}; mw: 106.18

Colorless liquid, aromatic odor. Misc in alcohol and ether, insol in NH_3; sol in SO_2. bp: 136.2°, fp: −94.9°, flash p: 59°F, d: 0.8669 @ 20°/4°, autoign. temp.: 810°F, vap. press: 10 mm @ 25.9°, vap. d: 3.66, lel = 1.2%, uel = 6.8%.

SYNS:

AETHYLBENZOL (GERMAN)
ETHYLBENZEEN (DUTCH)
ETHYLBENZOL
ETILBENZENE (ITALIAN)
ETYLOBENZEN (POLISH)
NCI-C56393
PHENYLETHANE

TOXICITY DATA: 2-1	CODEN:
skn-rbt 15 mg/24H open MLD	AIHAAP 23,95,62
eye-rbt 100 mg	AJOPAA 29,1363,46
ihl-rat TCLo:97 ppm/7H (15D preg)	BATTL* JAN,81
ihl-rat TCLo:985 ppm/7H (1-19D preg)	BATTL* JAN,81
ihl-rat TCLo:96 ppm/7H (1-19D preg)	BATTL* JAN,81
ihl-rbt TCLo:99 ppm/7H (1-18D preg)	BATTL* JAN,81
ihl-hmn TCLo:100 ppm/8H TFX:IRR	AIHAAP 31,206,70
orl-rat LD50:3500 mg/kg	AMIHAB 14,387,56
ihl-rat LCLo:4000 ppm/4H	AIHAAP 23,95,62
skn-rbt LD50:5000 mg/kg	FCTXAV 13,681,75
ihl-gpg LCLo:10000 ppm	PHRPA6 45,1241,30

Aquatic Toxicity Rating: TLm96: 100-10 ppm WQCHM* 2,-,74.

TLV: Air: 100 ppm DTLVS* 4,176,80. OSHA Standard: Air: TWA 100 ppm (skin) (SCP-C) FEREAC 39, 23540,74. DOT: Flammable Liquid, Label: Flammable Liquid FEREAC 41,57018,76. Selected by NTP Carcinogenesis Bioassay as of December 1980. "NIOSH Manual of Analytical Methods" VOL 2 S29. Reported in EPA TSCA Inventory, 1980. EPA TSCA 8(a) Preliminary Assessment Information Proposed Rule FERREAC 45,13646,80.

THR: MOD via irr to skn, eyes, mu mem and via oral and inhal routes. The liquid is an irr to the skn and mu mem. A conc of 0.1% of the vapor in air is an irr to the eyes of hmns, and a conc of 0.2% is extremely irr at first, then causes dizziness, irr of the nose and throat and a sense of constriction of the chest. Exposure of guinea pigs to 1% conc has been reported as causing ataxia, loss of consciousness, tremor of the extremities and finally death through respiratory failure. The pathological findings were congestion of the brain and lungs, with edema. No data are available regarding the effect of chronic exposure. An exper TER.

Erythema and inflammation of the skin may result from contact of the skn with the liquid. Exposure to the vapor causes lachrymation and irr of the nose and throat, dizziness, and a sense of constriction of the chest. The irr properties are sufficient to cause workers to leave an atmosphere containing 0.5% of the vapor.

Fire Hazard: Dangerous, when exposed to heat or flame; can react vigorously with oxidizing materials.

Spontaneous Heating: No.

Disaster Hazard: Dangerous; keep away from heat and open flame.

To Fight Fire: Foam, CO_2, dry chemical.

For further information see Vol. 2, No. 6 of *DPIM Report.*

BIS(2-ETHYLHEXYL)PHTHALATE

CAS RN: 117817 NIOSH #: TI 0350000
mf: $C_{24}H_{38}O_4$; mw: 390.62

SYNS:

BIS(2-ETHYLHEXYL)-1,2-BENZENEDICARBOXYLATE
DI(2-ETHYLHEXYL)ORTHO-PHTHALATE
DI(2-ETHYLHEXYL)PHTHALATE
DI-SEC-OCTYL PHTHALATE.
DOP
2-ETHYLHEXYL PHTHALATE
NCI-C52733
OCTOIL

TOXICITY DATA: 3-2-1	CODEN:
skn-rbt 500 mg/24H MLD	28ZPAK -,48,72
eye-rbt 500 mg	AJOPAA 29,1363,46
eye-rbt 500 mg/24H MLD	28ZPAK -,48,72
ipr-rat TDLo:30 gm/kg/(5-15D preg):TER	JPMSAE 61,51,72
orl-mus TDLo:7500 mg/kg/(8D preg):TER	TJADAB 14,259,76
orl-man TDLo:143 mg/kg:GIT	JIHTAB 27,130,45
orl-rat LD50:31 gm/kg	UCDS** 7/20/67
ipr-rat LD50:30700 mg/kg	JIHTAB 27,130,45
ivn-rat LD50:250 mg/kg	TXAPA9 45,230,78
unk-rat LD50:37000 mg/kg	GTPZAB 24(3),25,80
orl-mus LD50:30 gm/kg	TJADAB 14,259,76
ipr-mus LD50:14 gm/kg	JPMSAE 55,158,66
unk-mus LD50:37000 mg/kg	GTPZAB 24(3),25,80
orl-rbt LD50:34 gm/kg	EVHPAZ 4,3,73
skn-rbt LD50:25 gm/kg	JIHTAB 27,130,45
skn-gpg LD50:10 gm/kg	EVHPAZ 4,3,73
unk-gpg LD50:37000 mg/kg	GTPZAB 24(3),25,80
ihl-mam LC50:30000 mg/m3	GTPZAB 24(3),25,80
orl-rat TDLo:35 mg/kg (14D male/14D pre)	FCTXAV 15,389,77
orl-rat TDLo:8400 ug/kg (7D male)	TXAPA9 53,35,80
orl-rat TDLo:17200 mg/kg (MGN)	NEZAAQ 31,507,76
orl-rat TDLo:43 gm/kg (MGN)	NEZAAQ 31,507,76
ipr-rat TDLo:10 gm/kg (5-15D preg)	JPMSAE 61,51,72
ipr-rat TDLo:5 gm/kg (5-15D preg)	JPMSAE 61,51,72
orl-mus TDLo:1 gm/kg (7D preg)	JEPTDQ 4,533,80
orl-mus TDLo:1260 mg/kg (1-18D preg)	ENVRAL 22,245,80
orl-mus TDLo:3420 mg/kg (1-18D preg)	ENVRAL 22,245,80
orl-mus TDLo:7200 mg/kg (1-18D preg)	ENVRAL 22,245,80

TLV: Air: 5 mg/m3 DTLVS* 4,159,80. *Toxicology Review:* EVHPAZ (3),73,73; RREVAH 54,1,75; JOCMA7 15(10),808,73; CMIVAS 10(3),49,73; ESKHA5 93,1,75; TXAPA9 45,1,78. OSHA Standard: Air: TWA 5 mg/m3 (SCP-D) FEREAC 39,23540,74. NTP Carcinogenesis Bioassay Completed as of December 1980. "NIOSH Manual of Analytical Methods" Vol 1 S40. Reported in EPA TSCA Inventory, 1980. EPA TSCA 8(a) Preliminary Assessment Information Proposed Rule FERREAC 45,13646,80.

THR: An exper TER, GIT (man). Possible hmn CARC. HIGH ivn; LOW orl, ipr, unk, skn; MLD skn, eye irr.

Disaster Hazard: When heated to decomp it emits acrid smoke.

For further information see Di-(2-Ethylhexyl)Phthalate, Vol. 1, No. 7 and Vol. 2, No. 2 of *DPIM Report.*

O-DICHLOROBENZENE

CAS RN: 955501 NIOSH #: CZ 4500000
mf: $C_6H_4Cl_2$; mw: 147.00

Clear liquid. mp: −17.5°, bp: 180°-183°, fp: −22°, flash p: 151°F, d: 1.307 @ 20°/20°, vap. d: 5.05, autoign. temp.: 1198°F, lel = 2.2%, uel = 9.2%.

SYNS:

O-DICHLOR BENZOL
O-DICHLOROBENZENE
1,2-DICHLOROBENZENE
NCI-C54944

TOXICITY DATA: 2	CODEN:
eye-rbt 100 mg/30S rns MLD	AMIHAB 17,180,58
orl-rat LD50:500 mg/kg	WRPCA2 7,135,68
ihl-rat LCLo:821 ppm/7H	AMIHAB 17,180,58
ipr-rat LD50:840 mg/kg	MEPAAX 20,519,69
ivn-mus LDLo:400 mg/kg	JPBAA7 44,281,37
orl-rbt LD50:500 mg/kg	85ARAE 3,32,76
ivn-rbt LDLo:250 mg/kg	JPBAA7 44,281,37
orl-gpg LDLo:2000 mg/kg	14CYAT 2,1336,63
ihl-gpg LCLo:800 ppm/24H	JPBAA7 44,281,37

Carcinogenic Determination: Indefinite IARC** 7, 231,74.

TLV: Air: 50 ppm DTLVS* 3,76,71. *Toxicology Review:* 27ZTAP 3,49,69. OSHA Standard: Air: CL 50 ppm (SCP-J) FEREAC 39,23540,74. DOT: ORM-A, Label: None FEREAC 41,57018,76. Currently Tested by NTP for Carcinogenesis by Standard Bioassay Protocol as of December 1980. "NIOSH Manual of Analytical Methods" VOL 3 S135. Reported in EPA TSCA Inventory, 1980. EPA TSCA 8(a) Preliminary Assessment Information Proposed Rule FERREAC 45,13646,80.

THR: MOD via inhal and oral routes. See chlorobenzene. The *o*-isomer is probably more toxic than the *m*- or *p*-forms. It is irr to skn and mu mem. Exper produced liver and kidney injury. An exper ± CARC. An eye irr.

Fire Hazard: Mod, when exposed to heat or flame.

Disaster Hazard: Dangerous; see chloride; can react vigorously with oxidizing materials.

To Fight Fire: Water, foam, CO_2 dry chemical.

Incomp: aluminium.

P-DICHLOROBENZENE

CAS RN: 106467 NIOSH #: CZ 4550000
mf: $C_6H_4Cl_2$; mw: 147.00

White crystals, penetrating odor. mp: 53°, bp: 173.4°, flash p: 150°F (CC), d: 1.4581 @ 20.5°/4°, vap. press: 10 mm @ 54.8°, vap. d: 5.08.

SYNS:

1,4-DICHLOORBENZEEN (DUTCH)
P-DICHLORBENZOL (GERMAN)
P-DICHLOROBENZOL
1,4-DICHLOROBENZENE
1,4-DICLOROBENZENE (ITALIAN)
NCI-C54955
PARADICHLOROBENZOL

TOXICITY DATA: 3	CODEN:
eye-hmn 80 ppm	AMIHAB 14,138,56
mmo-asn 200 mg/L	CJMIAZ 16,369,70
orl-hmn TDLo:300 mg/kg:SYS	PCOC** -,851,66
unk-man LDLo:221 mg/kg	85DCAI 2,73,70
orl-rat LD50:500 mg/kg	WRPCA2 9,119,70
ipr-rat LD50:2562 mg/kg	JAPMA8 38,124,49
orl-mus LD50:2950 mg/kg	GUCHAZ 6,183,73
scu-mus LD50:5145 mg/kg	TOIZAG 20(5/6),772,73
orl-gpg LDLo:2800 mg/kg	14CYAT 2,1338,63

Carcinogenic Determination: Indefinite IARC** 7, 231,74.

TLV: Air: 75 ppm DTLVS* 4,126,80. *Toxicology Review:* 31ZNAA 1(1),93,71; 27ZTAP 3,49,69. OSHA Standard: Air: TWA 75 ppm (SCP-T) FEREAC 39, 23540,74. DOT: ORM-A, Label: None FEREAC 41,57018,76. Currently Tested by NTP for Carcinogenesis by Standard Bioassay Protocol as of December 1980. "NIOSH Manual of Analytical Methods" VOL 3 S281. Reported in EPA TSCA Inventory, 1980. EPA TSCA 8(a) Preliminary Assessment Information Proposed Rule FERREAC 45,13646,80.

THR: MOD via ipr and inhal; HIGH oral. An insecticide. Has been reported to cause liver injury in hmns. An exper CARC. MUT data.

Fire Hazard: Mod, when exposed to heat, flame or oxidizers.

Spontaneous Heating: No.

Disaster Hazard: Dangerous; see chlorides; can react vigorously with oxidizing materials.

To Fight Fire: Water, foam, CO_2, dry chemical.

TOLUENE

CAS RN: 108883 NIOSH #: XS 5250000
mf: C_7H_8; mw: 92.15

Colorless liquid, benzol-like odor. Flammable. mp: −95° to −94.5°, bp: 110.4°, flash p: 40°F (CC), ulc: 75-80, lel = 1.27%, uel = 7%, d: 0.866 @ 20°/4°, autoign. temp.: 896°F, vap. press: 36.7 mm @ 30°, vap. d: 3.14. Insol in water; sol in acetone; misc in absolute alc, ether, chloroform.

SYNS:

METHYLBENZENE	TOLUEEN (DUTCH)
METHYLBENZOL	TOLUEN (CZECH)
NCI-C07272	TOLUOL
PHENYLMETHANE	TOLUOLO (ITALIAN)

TOXICITY DATA: 3	CODEN:
cyt-rat-scu 12 gm/kg/12D-I	GTPZAB 17(3),24,73
ihl-rat TCLo:1500 mg/m3/24H (1-8D preg)	TXCYAC 11,55,78
ihl-rat TCLo:1000 mg/m3/24H (7-14D preg)	FMORAO 28,286,80
orl-mus TDLo:9 gm/kg (6-15D preg)	TJADAB 19,41A,79
orl-mus TDLo:15 gm/kg (6-15D preg)	TJADAB 19,41A,79
orl-mus TDLo:30 gm/kg (6-15D preg)	TJADAB 19,41A,79
ihl-mus TCLo:500 mg/m3/24H (6-13D preg)	TXCYAC 11,55,78
unk-rat LD50:6900 mg/kg	GISAAA 45(12),64,80
unk-mus LD50:2000 mg/kg	GISAAA 45(12),64,80
eye-hmn 300 ppm	JIHTAB 25,282,43
skn-rbt 435 mg MLD	UCDS** 7/23/70
eye-rbt 870 ug MLD	UCDS** 7/23/70
eye-rbt 2 mg/24H SEV	28ZPAK -,23,72
cyt-rat-ihl 610 mg/m3/16W-I	GISAAA 42(1),32,77
ihl-hmn TCLo:200 ppm:CNS	JAMAAP 123,1106,43
ihl-man TCLo:100 ppm:PSY	WEHSAL 9,131,72
orl-rat LD50:5000 mg/kg	AMIHAB 19,403,59
ihl-rat LCLo:4000 ppm/4H	AIHAAP 30,470,69
ipr-rat LDLo:800 mg/kg	TXAPA9 1,156,59
ihl-mus LC50:5320 ppm/8H	JIHTAB 25,366,43
ipr-mus LD50:1120 ug/kg	AGGHAR 18,109,60
skn-rbt LD50:14 gm/kg	UCDS** 7/23/70
scu-frg LDLo:920 mg/kg	AEPPAE 130,250,28

Aquatic Toxicity Rating: TLm96:100-10 ppm WQCHM* 4,-,74.

TLV: Air: 100 ppm DTLVS* 4,400,80. *Toxicology Review:* AEHLAU 22,373,71; CTOXAO 11(5),549,77; FNSCA6 2,67,73; MUREAV 47(2),75,78; CTOXAO 11(5),549,77; 27ZTAP 3,144,69. OSHA Standard: Air: TWA 200 ppm; CL 300; Pk 500/10M (SCP-V) FEREAC 39,23540,74. DOT: Flammable Liquid, Label: Flammable Liquid FEREAC 41,57018,76. Occupational Exposure to Toluene recm std: Air: TWA 100 ppm; CL 200 ppm/10M NTIS**. Currently Tested by NTP for Carcinogenesis by Standard Bioassay Protocol as of December 1980. Reselected by NTP Carcinogenesis Bioassay as of December 1980. "NIOSH Manual of Analytical Methods" VOL 1 127, VOL 3 S343. Reported in EPA TSCA Inventory, 1980. EPA TSCA 8(a) Preliminary Assessment Information Proposed Rule FERREAC 45,13646,80. EPA TSCA 8E No. 02780079P-Followup Sent as of April, 1979.

THR: MUT data. A skn, eye irr. A hmn CNS, PSY. MOD ihl, ipr, scu; HIGH ipr; LOW orl, skn. Toluene is derived from coal tar, and commercial grades usually contain small amounts of benzene as an impurity. Acute poisoning, resulting from exposures to high conc of the vapors, are rare with toluene. Inhal of 200 ppm of toluene for 8 hrs may cause impairment of coordination and reaction time; with higher conc (up to 800 ppm) these effects are increased and are observed in a shorter time. In the few cases of acute toluene poisoning reported, the effect has been that of a narcotic, the workman passing through a stage of intoxication into one of coma. Recovery following removal from exposure has been the rule. An occasional report of chronic poisoning describes an anemia and leucopenia, with biopsy showing a bone marrow hypoplasia. These effects, however, are less common in people working with toluene, and they are not as severe.

Exposure to conc up to 200 ppm produces few symptoms. At 200-500 ppm, headache, nausea, eye irr, loss of appetite, a bad taste, lassitude, impairment of coordination and reaction time are reported, but are not usually accompanied by any laboratory or physical findings of significance. With higher conc, the above complaints are increased and in addition, anemia, leucopenia and enlarged liver may be found in rare cases.

A common air contaminant.

Fire Hazard: Slight, when exposed to heat, flame or oxidizers.

Explosion Hazard: Mod, when exposed to flame or reacted with (H_2SO_4 + HNO_3), N_2O_4, $AgClO_4$, BrF_3, UF_6.

Disaster Hazard: Mod dangerous; when heated it emits irr fumes; can react vigorously with oxidizing materials.

To Fight Fire: Foam, CO_2, dry chemical.

For further information see Vol. 2, No. 1 of *DPIM Report.*

TRICHLORO ETHYLENE

CAS RN: 79-01-6 NIOSH #: KX 4550000
mf: C_2HCl_3; mw: 131.38

Mobile liquid; characteristic odor of chloroform. d: 1.4649 @ 20°/4°; bp: 86.7°; flash p: 89.6°F; lel = 12.5%; uel = 90% @ above 30°; mp: −73°; fp: −86.8°; autoign. temp.: 788°F; vap. press: 100 mm @ 32°; vap. d: 4.53.

SYNS:

ACETYLENE TRICHLORIDE
1-CHLORO-2,2-DICHLOROETHYLENE
1,1-DICHLORO-2-CHLOROETHYLENE
DOW-TRI
ETHYLENE TRICHLORIDE
NCI-C04546
TRICHLOORETHEEN (DUTCH)
TRICHLORAETHEN (GERMAN)
TRI-CLENE
TRICLORETENE (ITALIAN)
VESTROL

SKIN AND EYE IRRITATION DATA: 3	CODEN:
eye-hmn 5 ppm	JOCMA7 2,383,60
skn-rbt 500 mg/24H SEV	28ZPAK -,28,72
eye-rbt 20 mg/24HSEV	28ZPAK -,28,72

MUTATION DATA:	CODEN:
mmo-sat 100 uL/plate	NIOSH* 5AUG77
mma-sat 5 pph/2H	ARTODN 41,249,79
mma-smc 10 mL/L	MUREAV 48,173,77
slt-mus-ipr 1 mmol/L	MUREAV 46,202,77
dns-mus-orl 2500 mg/L	NTIS** AD-A080-636
dns-mus:bmr 1 mmol/L	NTIS** AD-A080-636
hma-mus/smc 400 mg/kg	JEPTDQ 1,411,78

REPRODUCTIVE EFFECTS DATA:	CODEN:
ihl-rat TCLo:1800 ppm/24H (1-2D preg)	APTOD9 19,A22,80
ihl-rat TCLo:100 ppm/4H (6-22D preg)	JPHYA7 276,24P,78
ihl-rat TCLo:1800 ppm/6H (1-20D preg)	TXCYAC 14,153,79

TUMORGENIC DATA:	CODEN:
ihl-rat TCLo:500 ppm/6H/77W-I:ETA	ARTODN 43,237,80
orl-mus TDLo:455 g/kg/78W-I:CAR	NCITR* NCI-CG-TR-2,76
ihl-mus TCLo:100 ppm/6H/77W-I:ETA	ARTODN 43,237,80
ihl-ham TCLo:100 ppm/6H/77W-I:ETA	ARTODN 43,237,80
orl-mus TD:912 g/kg/78W-I:CAR	NCITR* NCI-CG-TR-2,76
ihl-mus TC:500 ppm/6H/77W-I:ETA	ARTODN 43,237,80

TOXICITY DATA:	CODEN:
orl-hmn LDLo:7 g/kg	ARTODN 35,295,76
ihl-hmn TCLo:6900 mg/M³/10M:CNS	AHBAAM 116,131,36
ihl-hmn TCLo:160 ppm/83M:CNS	AIHAAP 23,167,62
ihl-hmn TDLo:812 mg/kg:SYS	BMJOAE 2,689,45
ihl-man TCLo:110 ppm/8H:IRR	BJIMAG 28,293,71
ihl-man LCLo:2900 ppm	NZMJAX 50,119,51
orl-rat LD50:4920 mg/kg	AIHAAP 30,470,69
ihl-rat LCLo:8000 ppm/4H	AIHAAP 30,470,69
orl-mus LD50:2402 mg/kg	NTIS** AD-A080-636
ihl-mus LCLo:3000 ppm/2H	AEPPAE 141,19,29
ipr-mus LD50:3000 mg/kg	JETOAS 7(4),247,74
ivn-mus LD50:34 mg/kg	CBCCT* 6,141,54
orl-dog LDLo:5860 mg/kg	12VXA5 8,1069,68
ipr-dog LD50:1900 mg/kg	TXAPA9 10,119,67
scu-dog LDLo:150 mg/kg	HBTXAC 5,76,59
ivn-dog LDLo:150 mg/kg	QJPPAL 7,205,34
orl-cat LDLo:5866 mg/kg	NBTXAC 5,76,59
ihl-cat LCLo:32500 mg/M³/2H	AMBAAM 116,131,36
orl-rbt LDLo:7330 mg/kg	HBTXAC 5,76,59
scu-rbt LDLo:1800 mg/kg	QJPPAL 7,205,34
ihl-gpg LCLo:37200 ppm/40M	HBTXAC 5,76,59

Aquatic Toxicity Rating:TLm96:1000-100 ppm WQCHM* 3,-,74. Carcinogenic Determination: Animal Positive IARC** 20,545,79; IARC** 11,263, 76.

TLV: TWA 50 ppm; STEL 150 ppm DTLVS* 4,406, 80.

Toxicology Review: JTEHD6 2(3),671,77; CLPTAT 8, 91,67; JOCMA7 16(3),194,74; JOCMA7 17(9),603,75; FNSCA6 2,67,73; BNYMAM 54,413,78; 27ZTAP 3,146,69. OSHA Standard: Air: TWA 100 ppm; C1200; Pk 300/5M/2H (SCP-J) FEREAC 39,23540,74. DOT: ORM-A, Label: None FEREAC 41,57018,76. Occupational Exposure to Trichloroethylene recm std: Air: TWA 100 ppm; CL 150 ppm/10M NTIS**. Occupational Exposure to Waste Anesthetic Gases and Vapors recm std: Air: CL 2 ppm/1H NTIS**. NCI Carcinogenesis Bioassay Completed; Results Positive: Mouse (NCITR*NCI-CG-TR-2,76); Results Negative: Rat (NCITR(NCI-CG-TR-2,76). Currently tested by NTP for carcinogenesis by Standard Bioassay Protocol as of April 1982. NTP Carcinogenesis Bioassay Completed as of April 1982. "NIOSH Manual of Analytical Methods" VOL 1 127, Vol 3, S336. NIOSH Current Intelligence Bulletin 2, 1975. Reported in EPA TSCA Inventory, 1980. EPA TSCA 8e NO: 05780146-Followup sent as of April, 1979.

THR: A strong skn, eye irr. MUT data. An exper TER, ETA, CARC. HIGH ivn, scu, ihl; MOD ihl, orl, ipr; LOW orl, ihl. Inhal of high conc causes narcosis and anesthesia. A form of addiction has been observed in exposed workers. Prolonged inhal of mod conc causes headache and drowsiness. Fatalities following severe, acute exposure have been attributed to ventricular fibrillation resulting in cardiac failure. There is damage to liver and other organs from chronic exposure. Cases have been reported but are of questionable validity. Determination of the metabolites trichloracetic acid and trichloroethanol in urine reflects the absorption of trichloroethylene. A food additive permitted in food for human consumption. A common air contaminant.

Fire Hazard: Low, when exposed to heat or flame. High conc of trichloroethylene vapor in high-temp air can be made to burn mildly if plied with a strong flame. Though such a condition is difficult to produce, flames or arcs should not be used in closed equipment which contains any solvent residue or vapor.

Spontaneous Heating: No.

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

For further information see Vol. 1, No. 2 and Vol. 3, No. 1 of *DPIM Report.*

Incomp: Can react violently with Al, Ba, N_2O_4, Li, Mg, liquid O_2, O_3, KOH, KNO_3, Na, NaOH, Ti.

HEXAMETHYLENETETRAMINE

CAS RN: 100970 NIOSH #: MN 4725000
mf: $C_6H_{12}N_4$; mw: 140.22

Odorless rhombic crystals from alcohol. mp: 280° sublimes, flash p: 482°F, d: 1.33 @ −5°. V. sl sol in hot eth.

SYNS:

AMMONIOFORMALDEHYDE	HEXAMINE
FORMAMINE	HEXILMETHYLENAMINE
HEXAFORM	METHENAMINE
HEXAMETHYLENAMINE	1,3,5,7-TETRAAZAADAMANTANE
HEXAMETHYLENTETRAMIN (GERMAN)	UROTROPINE

TOXICITY DATA: 3-2-1	CODEN:
dnr-esc 6 mg/well/16H	CBINA8 15,219,76
cyt-hmn:hle 1 mmol/L	HUMAA7 4,112,67
dlt-mus-ipr 25 gm/kg	DMWOAX 92,2315,67
dlt-mus-orl 25 gm/kg	HUMAA7 4,112,67
scu-rat TDLo:140 gm/kg/78W-I:ETA	FAONAU 50A,77,72
scu-rat LDLo:200 mg/kg	HBTXAC 1,84,56
ivn-rat LD50:9200 mg/kg	AEPPAE 221,166,54
orl-mus LDLo:512 mg/kg	NTIS** AD-A066-307
ipr-mus LDLo:512 mg/kg	CBCCT* 3,126,51
scu-mus LDLo:450 mg/kg	HBTXAC 1,84,56
scu-cat LDLo:200 mg/kg	HBTXAC 1,84,56
scu-gpg LDLo:300 mg/kg	HBTXAC 1,84,56

Toxicology Review: CMTVAS 10(3),49,73; 27ZTAP 3,92,69. "NIOSH Manual of Analytical Methods" VOL 4 263*. Reported in EPA TSCA Inventory, 1980. EPA TSCA 8(a) Preliminary Assessment Information Proposed Rule FERREAC 45,13646,80.

THR: HIGH scu; LOW via ivn route. A MOD irr to skn, eyes and mu mem. An exper NEO. Some persons suffer a skn rash if they come in contact with this material or the fumes evolved when it is heated. Pure hexamethylenetetramine may be taken internally in small amounts and is used in medicine as a urinary antiseptic. Its major industrial use is in the manufacture of phenolic resins. It is combustible and can be readily ignited when a flame is applied directly to its surface. It liberates formaldehyde on decomp.

Fire Hazard: Mod, when exposed to heat or flame; can react with oxidizing materials. Reacts violently with Na_2O_2.

APPENDIX A

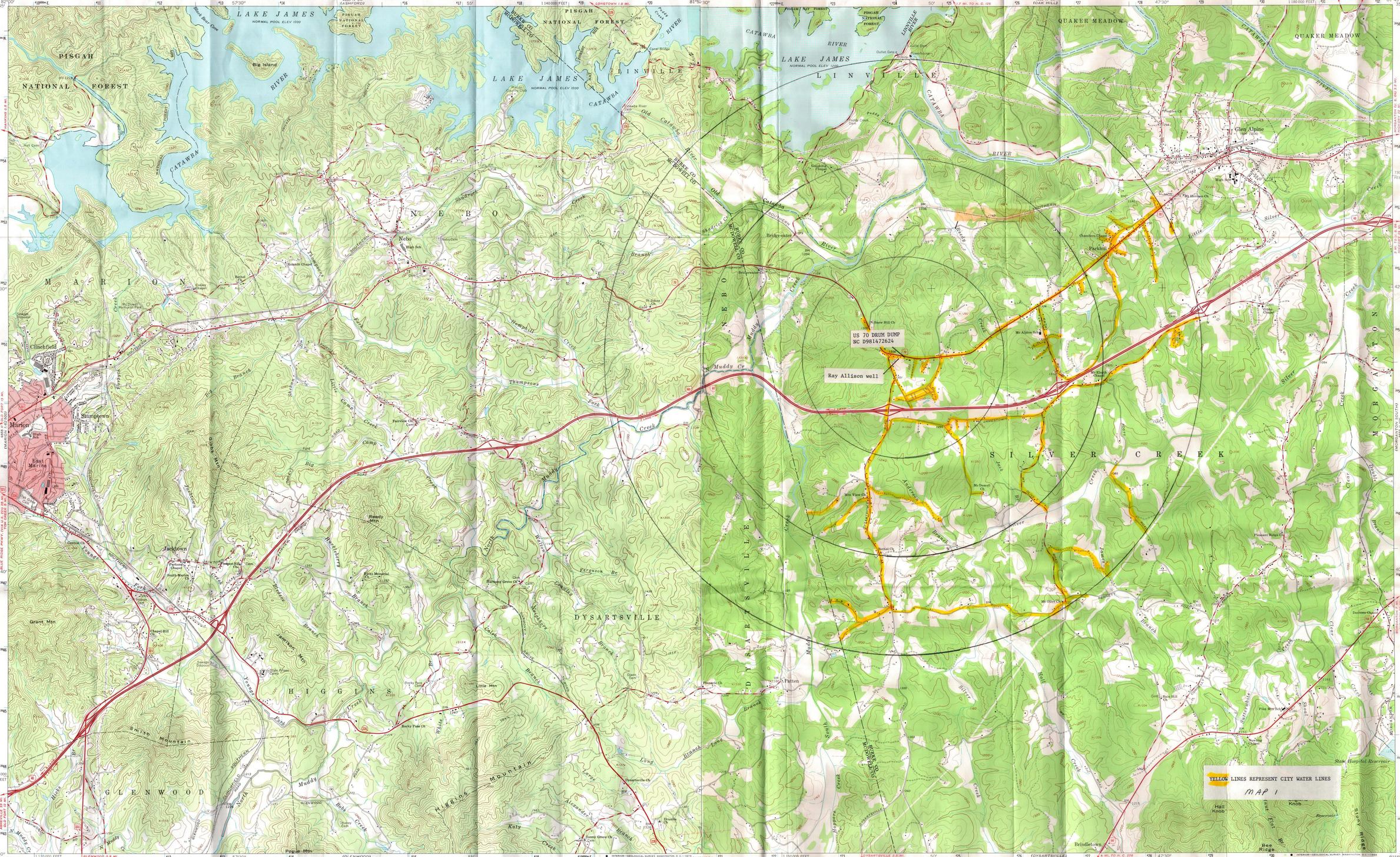
MAPS AND PHOTOGRAPHS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

MARION EAST QUADRANGLE
NORTH CAROLINA
7.5 MINUTE SERIES (TOPOGRAPHIC)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

GLEN ALPINE QUADRANGLE
NORTH CAROLINA
7.5 MINUTE SERIES (TOPOGRAPHIC)



Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1960. Field checked 1962

Polyconic projection. 1927 North American datum
10,000-foot grid based on North Carolina coordinate system
1000-meter Universal Transverse Mercator grid ticks, zone 17, shown in blue

Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked

Red tint indicates area in which only landmark buildings are shown

UTM GRID AND 1962 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT 20 FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION
Heavy-duty — Light-duty
Medium-duty — Unimproved dirt
Interstate Route — U. S. Route — State Route

QUADRANGLE LOCATION

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, WASHINGTON, D. C. 20242
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

MARION EAST, N. C.
N3537.5—W8152.5/7.5

1962

AMS 4655 III NW—SERIES V842

Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1960. Field checked 1962

Polyconic projection. 1927 North American datum
10,000-foot grid based on North Carolina coordinate system
1000-meter Universal Transverse Mercator grid ticks, zone 17, shown in blue

Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked

UTM GRID AND 1962 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT 20-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION
Heavy-duty — Light-duty
Medium-duty — Unimproved dirt
Interstate Route — U. S. Route — State Route

QUADRANGLE LOCATION

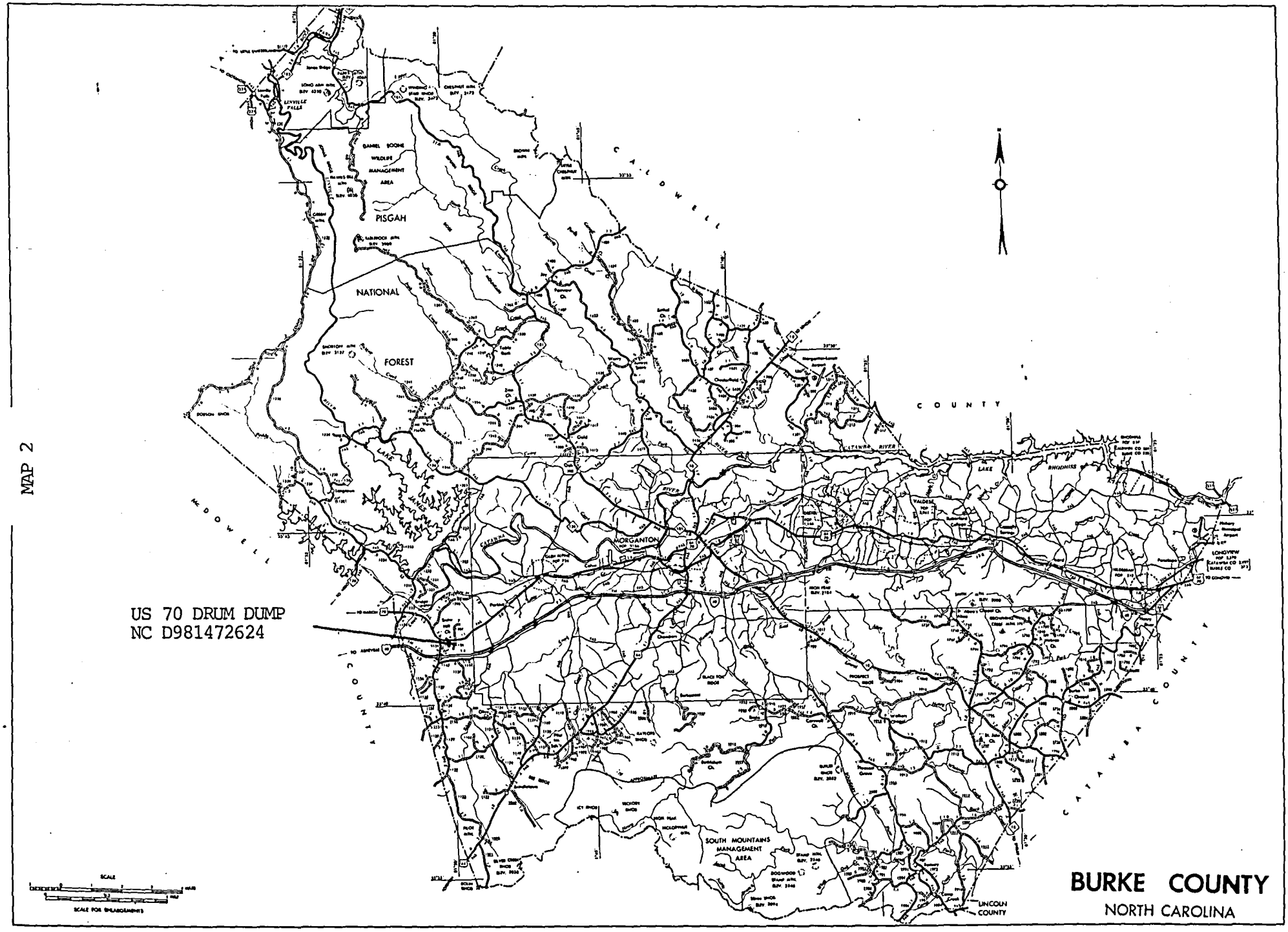
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, WASHINGTON 25, D. C.
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

GLEN ALPINE, N. C.
N3537.5—W8145/7.5

1962

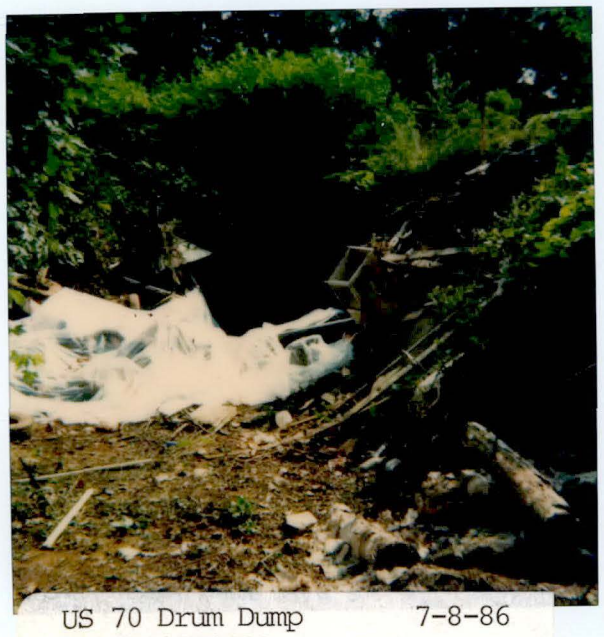
AMS 4655 III NE—SERIES V842

MAP 2


US 70 DRUM DUMP
NC D981472624
BURKE COUNTY
NORTH CAROLINA
PISGAH
NATIONAL
FOREST
DANIEL BOONE
WILDLIFE
MANAGEMENT
AREA
LAKE
JAMES
MORGANTON
CATAWBA
RIVER
LAKE
RHODHISS
CATAWBA
COUNTY
MCDOWELL
COUNTY
SOUTH MOUNTAINS
MANAGEMENT
AREA
LINCOLN
COUNTY
SCALE

US 70 Drum Dump 7-8-86
NC D981472624

East side of waste pile.



US 70 Drum Dump 7-8-86
NC D981472624

East side of waste pile.

US 70 Drum Dump 7-8-86
NC D981472624

West side of waste pile.

US 70 Drum Dump 7-8-86
NC D981472624

Recovering waste pile after sampling.

US 70 Drum Dump 7-8-86
NC D981472624

Waste pile from eastern embankment.

US 70 Drum Dump 7-8-86
NC D981472624

Sample #3- Surface soil 5 ft. south of waste pile.

APPENDIX B

LABORATORY DATA

Ref. 2

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

cc: FN

SAMPLE ANALYSES REQUEST

Received 10-16-86

3

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

Site Number 12D981472624 Field Sample Number 3363

Name of Site US 70 Drum Dump Site Location Morganton, NC

Collected By Pat DeRosa ID# 38 Date Collected July 8, 1986 Time 0950

Type of Sample:

Environmental	Concentrate	Comments
___ Groundwater (1)	✓ Solid (5)	#1 white resin material
___ Surface Water (2)	___ Liquid (6)	
___ Soil (3)	___ Sludge (7)	* not enough sample submitted
___ Other (4)	___ Other (8)	

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
___ Arsenic		___ Arsenic		___ Silver	
___ Barium		___ Barium		___ Sulfates	
___ Cadmium		___ Cadmium		___ Zinc	
___ Chromium		___ Chloride		___ Ph	
___ Lead		___ Chromium		___ Conductivity	
___ Mercury		___ Copper		___ TDS	
___ Selenium		___ Fluoride		___ TOC	
___ Silver		___ Iron			
		___ Lead			
		___ Manganese			
		___ Mercury			
		___ Nitrate			
		___ Selenium			

ORGANIC CHEMISTRY

Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
✓ P&T:GC/MS		___ EDB		___ Methoxychlor	
✓ Acid:B/N Ext.		✓ PCB's	<0.1 ppm	___ Toxaphene	
___ TOX		___ Petroleum		___ 2,4-D	*
		___ Endrin		___ 2,4,5-TP (silvex)	*
		___ Lindane			

MICROBIOLOGY

Parameter
___ (MF) Coliform Colonies/100mls
___ (MPN) Coliform Colonies/100mls

RADIOCHEMISTRY

Parameter	Results PCi/1
___ Gross Alpha	
___ Gross Beta	

Date Received 7-10-86 V.P.

Date Reported 10-15-86

Date Extracted ~~08/19/86~~ 8/19/86 V.P.; BNA 8/20/86 BD

Date Analyzed PCB's 8-26-86 V.P. BNA 9-5-86 BD PT 8-28/9-2-9

Reported By John L. Neal

Lab Number 601946

DHS 3191 (Revised 7/85)
Solid and Hazardous Waste (Review 7/87)

#601946-601955

3

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

SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

Site Number ~~NCD 980~~ 12D981472624 Field Sample Number 3364

Name of Site US 70 Drum Dump Site Location Morganton, NC

Collected By Pat DeRosa ID# 38 Date Collected July 8, 1986 Time 1000

Type of Sample:

Environmental	Concentrate	Comments
____ Groundwater (1)	____ Solid (5)	#2. viscous spilled material
____ Surface Water (2)	____ Liquid (6)	
____ Soil (3)	✓ Sludge (7)	
____ Other (4)	____ Other (8)	

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
____ Arsenic		____ Arsenic		____ Silver	
____ Barium		____ Barium		____ Sulfates	
____ Cadmium		____ Cadmium		____ Zinc	
____ Chromium		____ Chloride		____ Ph	
____ Lead		____ Chromium		____ Conductivity	
____ Mercury		____ Copper		____ TDS	
____ Selenium		____ Fluoride		____ TOC	
____ Silver		____ Iron			
		____ Lead			
		____ Manganese			
		____ Mercury			
		____ Nitrate			
		____ Selenium			

ORGANIC CHEMISTRY

Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
✓ P&T:GC/MS		____ EDB		✓ Methoxychlor	<0.1 ppm
✓ Acid:B/N Ext.		✓ PCB's	<0.1 ppm	✓ Toxaphene	<0.2 ppm
____ TOX		____ Petroleum		✓ 2,4-D	<0.1 ppm
		✓ Endrin	<0.01 ppm	✓ 2,4,5-TP (silvex)	<0.1 ppm
		✓ Lindane	<0.04 ppm		

MICROBIOLOGY

Parameter
____ (MF) Coliform Colonies/100mls
____ (MPN) Coliform Colonies/100mls

RADIOCHEMISTRY

Parameter	Results PCi/1
____ Gross Alpha	
____ Gross Beta	

Date Received 7-10-86 V.P. Date Reported

Date Extracted PEST 08/19/86 V.P.; BNA 8/20/86 ~~[illegible]~~ Herb 9-4-86 BD Date Analyzed PEST.+PCB's 8-26-86 V.P. Herb 9-5-86 BD

Reported By Lab Number G 11947

DHS 3191 (Revised 7/85)
Solid and Hazardous Waste (Review 7/87)

2

3

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

SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

Site Number 12D981472624 ~~NCD 981 472 624~~ Field Sample Number 3365

Name of Site US 70 Drum Dump Site Location Morganton, NC

Collected By Pat DeRosa ID# 38 Date Collected July 8, 1986 Time 1030

Type of Sample:

Environmental	Concentrate	Comments
____ Groundwater (1)	____ Solid (5)	#3 - Soil ~5 ft. S. of drums
____ Surface Water (2)	____ Liquid (6)	
✓ Soil (3)	____ Sludge (7)	* not enough sample submitted
____ Other (4)	____ Other (8)	

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
____ Arsenic		____ Arsenic		____ Silver	
____ Barium		____ Barium		____ Sulfates	
____ Cadmium		____ Cadmium		____ Zinc	
____ Chromium		____ Chloride		____ Ph	
____ Lead		____ Chromium		____ Conductivity	
____ Mercury		____ Copper		____ TDS	
____ Selenium		____ Fluoride		____ TOC	
____ Silver		____ Iron			
		____ Lead			
		____ Manganese			
		____ Mercury			
		____ Nitrate			
		____ Selenium			

ORGANIC CHEMISTRY

Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
✓ P&T:GC/MS		____ EDB		✓ Methoxychlor	<0.1 ppm
✓ Acid:B/N Ext.		✓ PCB's	<0.1 ppm	✓ Toxaphene	<0.2 ppm
____ TOX		____ Petroleum		✓ 2,4-D	*
		✓ Endrin	<0.01 ppm	✓ 2,4,5-TP (silvex)	*
		✓ Lindane	<0.04 ppm		

MICROBIOLOGY

Parameter
____ (MF) Coliform Colonies/100mls
____ (MPN) Coliform Colonies/100mls

RADIOCHEMISTRY

Parameter	Results PCi/1
____ Gross Alpha	
____ Gross Beta	

Date Received 7-10-86 V.P. Date Reported

Date Extracted Acid 08/19/86 VP; B/A 8/20/86 Date Analyzed PEST. + PCBS 8-26-86 V.P.

Reported By Lab Number 6U038

DHS 3191 (Revised 7/85)
Solid and Hazardous Waste (Review 7/87)

3

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

SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

Site Number 12D981472624 ~~NCD 981~~ Field Sample Number 3366

Name of Site US 70 Drum Dump Site Location Morganton, NC

Collected By Pat DeRosa ID# 38 Date Collected July 8, 1986 Time 1040

Type of Sample:

Environmental	Concentrate	Comments
___ Groundwater (1)	___ Solid (5)	#4 Bkgd. Soil
___ Surface Water (2)	___ Liquid (6)	
✓ Soil (3)	___ Sludge (7)	
___ Other (4)	___ Other (8)	

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
Arsenic		Arsenic		Silver	
Barium		Barium		Sulfates	
Cadmium		Cadmium		Zinc	
Chromium		Chloride		Ph	
Lead		Chromium		Conductivity	
Mercury		Copper		TDS	
Selenium		Fluoride		TOC	
Silver		Iron			
		Lead			
		Manganese			
		Mercury			
		Nitrate			
		Selenium			

ORGANIC CHEMISTRY

Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
✓ P&T:GC/MS		EDB		✓ Methoxychlor	<0.1 ppm
✓ Acid:B/N Ext.		✓ PCB's	<0.1 ppm	✓ Toxaphene	<0.2 ppm
TOX		Petroleum		✓ 2,4-D	<0.1
		✓ Endrin	<0.01 ppm	✓ 2,4,5-TP (silvex)	<0.1
		✓ Lindane	<0.04 ppm		

MICROBIOLOGY

Parameter
(MF) Coliform Colonies/100mls
(MPN) Coliform Colonies/100mls

RADIOCHEMISTRY

Parameter	Results PCi/1
Gross Alpha	
Gross Beta	

Date Received 7-10-86 Y.P.

Date Reported

Date Extracted Pest 8/19/86 YP; 8/20/86 YP; 8K/A Herb 9-4-86 BD

Date Analyzed PEST. & PCB'S 8-26-86 Y.P. Herb 9-5-86 BD

Reported By

Lab Number 601949

DHS 3191 (Revised 7/85)
Solid and Hazardous Waste (Review 7/87)

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

SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

12D981472624

Site Number [illegible] Field Sample Number 3367

Name of Site US 70 Drum Dump Site Location Morganton, NC

Collected By Pat DeRusk ID# 38 Date Collected July 8, 1986 Time 1125

Type of Sample:

Environmental	Concentrate	Comments
✓ Groundwater (1)	___ Solid (5)	#5 - Allison res. well
___ Surface Water (2)	___ Liquid (6)	
___ Soil (3)	___ Sludge (7)	* not enough sample submitted
___ Other (4)	___ Other (8)	

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
___ Arsenic		___ Arsenic		___ Silver	
___ Barium		___ Barium		___ Sulfates	
___ Cadmium		___ Cadmium		___ Zinc	
___ Chromium		___ Chloride		___ Ph	
___ Lead		___ Chromium		___ Conductivity	
___ Mercury		___ Copper		___ TDS	
___ Selenium		___ Fluoride		___ TOC	
___ Silver		___ Iron			
		___ Lead			
		___ Manganese			
		___ Mercury			
		___ Nitrate			
		___ Selenium			

ORGANIC CHEMISTRY

Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
___ P&T:GC/MS		___ EDB		✓ Methoxychlor	<0.001 ppm
✓ Acid:B/N Ext.		✓ PCB's	<0.0001 ppm	✓ Toxaphene	<0.002 ppm
___ TOX		___ Petroleum		✓ 2,4-D	*
		✓ Endrin	<0.0001 ppm	✓ 2,4,5-TP (silvex)	*
		✓ Lindane	<0.0004 ppm		

MICROBIOLOGY

Parameter
___ (MF) Coliform Colonies/100mls
___ (MPN) Coliform Colonies/100mls

RADIOCHEMISTRY

Parameter	Results PCi/1
___ Gross Alpha	
___ Gross Beta	

Date Received 7-10-86 V.P. Date Reported

Date Extracted PEST. 8-8-86 V.P. ; L.D. BNA 8/28/86 TP Date Analyzed PEST. 8-8-86 V.P.

Reported By Lab Number 601050

DHS 3191 (Revised 7/85)
Solid and Hazardous Waste (Review 7/87)

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

SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

Site Number ~~NCD 981472624~~ 12D981472624 Field Sample Number 3368

Name of Site U.S. 70 Drum Dump Site Location Morganton, NC

Collected By Pat De Rosa ID# 38 Date Collected July 8, 1986 Time 1125

Type of Sample:

Environmental	Concentrate	Comments
✓ Groundwater (1)	___ Solid (5)	#5 - Allison res. well
___ Surface Water (2)	___ Liquid (6)	
___ Soil (3)	___ Sludge (7)	
___ Other (4)	___ Other (8)	

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
___ Arsenic		___ Arsenic		___ Silver	
___ Barium		___ Barium		___ Sulfates	
___ Cadmium		___ Cadmium		___ Zinc	
___ Chromium		___ Chloride		___ Ph	
___ Lead		___ Chromium		___ Conductivity	
___ Mercury		___ Copper		___ TDS	
___ Selenium		___ Fluoride		___ TOC	
___ Silver		___ Iron			
		___ Lead			
		___ Manganese			
		___ Mercury			
		___ Nitrate			
		___ Selenium			

ORGANIC CHEMISTRY

Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
✓ P&T:GC/MS		___ EDB		___ Methoxychlor	
___ Acid:B/N Ext.		___ PCB's		___ Toxaphene	
___ TOX		___ Petroleum		___ 2,4-D	
		___ Endrin		___ 2,4,5-TP (silvex)	
		___ Lindane			

MICROBIOLOGY

Parameter
___ (MF) Coliform Colonies/100mls
___ (MPN) Coliform Colonies/100mls

RADIOCHEMISTRY

Parameter	Results PCi/1
___ Gross Alpha	
___ Gross Beta	

Date Received 7-10-86 V.P. Date Reported

Date Extracted Date Analyzed 8-20-86 mw

Reported By Lab Number 61251

DHS 3191 (Revised 7/85)
Solid and Hazardous Waste (Review 7/87)

→ Submit HR & my Pat De Rosa #38

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

SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

Site Number ~~NCD~~ 12 D981472624 Field Sample Number 3369

Name of Site US 70 Drum Dump Site Location Morganton, NC

Collected By Keith Masters ID# 01 Date Collected 7-2-86 Time 1700

Type of Sample:

Environmental	Concentrate	Comments
____ Groundwater (1)	____ Solid (5)	#6 Purplish soil
____ Surface Water (2)	____ Liquid (6)	
✓ Soil (3)	____ Sludge (7)	
____ Other (4)	____ Other (8)	

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
____ Arsenic		____ Arsenic		____ Silver	
____ Barium		____ Barium		____ Sulfates	
____ Cadmium		____ Cadmium		____ Zinc	
____ Chromium		____ Chloride		____ Ph	
____ Lead		____ Chromium		____ Conductivity	
____ Mercury		____ Copper		____ TDS	
____ Selenium		____ Fluoride		____ TOC	
____ Silver		____ Iron			
		____ Lead			
		____ Manganese			
		____ Mercury			
		____ Nitrate			
		____ Selenium			

ORGANIC CHEMISTRY

Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
✓ P&T:GC/MS		____ EDB		____ Methoxychlor	
✓ Acid:B/N Ext.		____ PCB's		____ Toxaphene	
____ TOX		____ Petroleum		____ 2,4-D	
		____ Endrin		____ 2,4,5-TP (silvex)	
		____ Lindane			

MICROBIOLOGY

Parameter
____ (MF) Coliform Colonies/100mls
____ (MPN) Coliform Colonies/100mls

RADIOCHEMISTRY

Parameter	Results PCi/1
____ Gross Alpha	
____ Gross Beta	

Date Received 7-10-86 V.P. Date Reported

Date Extracted 8/20/86 BKP Date Analyzed

Reported By Lab Number 601953

DHS 3191 (Revised 7/85)
Solid and Hazardous Waste (Review 7/87)

Pat DeRosa #38

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

SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

Site Number ~~AFD~~ 12 981472624 Field Sample Number 3370

Name of Site US 70 Drum Dump Site Location Morganton, NC

Collected By Keith Mathews ID# 01 Date Collected 7-2-86 Time 1700

Type of Sample:

Environmental	Concentrate	Comments
___ Groundwater (1)	___ Solid (5)	#7 - Greasy material from spilled drum
___ Surface Water (2)	___ Liquid (6)	
___ Soil (3)	✓ Sludge (7)	* ~~quick~~ "quick + dirty" extraction only
___ Other (4)	___ Other (8)	

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
___ Arsenic		___ Arsenic		___ Silver	
___ Barium		___ Barium		___ Sulfates	
___ Cadmium		___ Cadmium		___ Zinc	
___ Chromium		___ Chloride		___ Ph	
___ Lead		___ Chromium		___ Conductivity	
___ Mercury		___ Copper		___ TDS	
___ Selenium		___ Fluoride		___ TOC	
___ Silver		___ Iron			
		___ Lead			
		___ Manganese			
		___ Mercury			
		___ Nitrate			
		___ Selenium			

ORGANIC CHEMISTRY

Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
✓ P&T:GC/MS		___ EDB		___ Methoxychlor	
✓ Acid:B/N Ext.	*	___ PCB's		___ Toxaphene	
___ TOX		___ Petroleum		___ 2,4-D	
		___ Endrin		___ 2,4,5-TP (silvex)	
		___ Lindane			

MICROBIOLOGY

Parameter
___ (MF) Coliform Colonies/100mls
___ (MPN) Coliform Colonies/100mls

RADIOCHEMISTRY

Parameter	Results PCi/1
___ Gross Alpha	
___ Gross Beta	

Date Received 7-10-86 V.P. Date Reported

Date Extracted Date Analyzed

Reported By Lab Number 61955

DHS 3191 (Revised 7/85)
Solid and Hazardous Waste (Review 7/87)

Pat DeRosa #38

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

SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

Site Number ~~NED~~ 12 D981472624 Field Sample Number 3371

Name of Site US 70 Drum Dump Site Location Morganton, NC

Collected By Keith Masters ID# 01 Date Collected 7-2-86 Time 1700

Type of Sample:

Environmental	Concentrate	Comments
___ Groundwater (1)	✓ Solid (5)	#8 - white granular solid from open drum
___ Surface Water (2)	___ Liquid (6)	* not enough sample submitted
___ Soil (3)	___ Sludge (7)	
___ Other (4)	___ Other (8)	

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
Arsenic		Arsenic		Silver	
Barium		Barium		Sulfates	
Cadmium		Cadmium		Zinc	
Chromium		Chloride		Ph	
Lead		Chromium		Conductivity	
Mercury		Copper		TDS	
Selenium		Fluoride		TOC	
Silver		Iron			
		Lead			
		Manganese			
		Mercury			
		Nitrate			
		Selenium			

ORGANIC CHEMISTRY

Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
✓ P&T:GC/MS		EDB		✓ Methoxychlor	<0.1 ppm
✓ Acid:B/N Ext.		PCB's		✓ Toxaphene	<0.2 ppm
TOX		Petroleum		✓ 2,4-D	*
		✓ Endrin	<0.01 ppm	✓ 2,4,5-TP (silvex)	*
		✓ Lindane	<0.04 ppm		

MICROBIOLOGY

Parameter
(MF) Coliform Colonies/100mls
(MPN) Coliform Colonies/100mls

RADIOCHEMISTRY

Parameter	Results PCi/1
Gross Alpha	
Gross Beta	

Date Received 7-10-86 V.P. Date Reported

Date Extracted PEST 08/19/86 VP; BN/A 8/20/86 Date Analyzed PEST. 8-26-86 V.P.

Reported By Lab Number 61952

DHS 3191 (Revised 7/85)
Solid and Hazardous Waste (Review 7/87)

Pat DeRosa #38

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

SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

Site Number ~~ATD~~ 12 981472624 Field Sample Number 3372

Name of Site US 70 Drum Dump Site Location Morganton, NC

Collected By EMS, Burke City ID# — Date Collected 7-7-86 Time —

Type of Sample:

Environmental	Concentrate	Comments
___ Groundwater (1)	___ Solid (5)	#9 - Liquid from Area
___ Surface Water (2)	✓ Liquid (6)	
___ Soil (3)	___ Sludge (7)	
___ Other (4)	___ Other (8)	

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
___ Arsenic		___ Arsenic		___ Silver	
___ Barium		___ Barium		___ Sulfates	
___ Cadmium		___ Cadmium		___ Zinc	
___ Chromium		___ Chloride		___ Ph	
___ Lead		___ Chromium		___ Conductivity	
___ Mercury		___ Copper		___ TDS	
___ Selenium		___ Fluoride		___ TOC	
___ Silver		___ Iron			
		___ Lead			
		___ Manganese			
		___ Mercury			
		___ Nitrate			
		___ Selenium			

ORGANIC CHEMISTRY

Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
✓ P&T:GC/MS		___ EDB		___ Methoxychlor	
___ Acid:B/N Ext.		___ PCB's		___ Toxaphene	
___ TOX		___ Petroleum		___ 2,4-D	
		___ Endrin		___ 2,4,5-TP (silvex)	
		___ Lindane			

MICROBIOLOGY

Parameter
___ (MF) Coliform Colonies/100mls
___ (MPN) Coliform Colonies/100mls

RADIOCHEMISTRY

Parameter	Results PCi/1
___ Gross Alpha	
___ Gross Beta	

Date Received 7-10-86 V.P. Date Reported

Date Extracted Date Analyzed 8-20-86 MW

Reported By Lab Number 611354

DHS 3191 (Revised 7/85)
Solid and Hazardous Waste (Review 7/87)

DIVISION OF HEALTH SERVICES
SOLID AND HAZARDOUS WASTE MANAGEMENT BRANCH

Chain of Custody Record

Hazardous Waste Materials

Location of Sampling: ___ Generator ___ Transporter ___ Treatment Facil
___ Storage Facility ___ Disposal Facility ___ Landfill
✓ Other: Drum Dump

Company's Name US 70 Telephone( )

Address Morganton, NC.

Collector's Name Pat De Nora (signature) Telephone (919) 733-2801

Date Sampled July 8, 1986 Time Sampled 0950 – 1125

Type of Process Generating Waste unknown

Field Information

Drum dump on southern embankment of US 70

Field Sample No. 3363 3364 3365 3366 3367 3368

Chain of Possession:

1. Pat De Nora (signature) Waste Man Spec (title) 7/8/86 – 7/10/86 (inclusive dates)

2. Vicki S. Painter (signature) Chemical Analyst (title) 7-10-86 (inclusive dates)

3. ___ (signature) ___ (title) ___ (inclusive dates)

Results reported

___ (signature) ___ (title) ___ (date)

Instructions: Complete all applicable information including signatures, and submit with analysis request forms.

DIVISION OF HEALTH SERVICES
SOLID AND HAZARDOUS WASTE MANAGEMENT BRANCH

03

Chain of Custody Record

Hazardous Waste Materials

Location of Sampling: ___ Generator ___ Transporter ___ Treatment Facil
___ Storage Facility ___ Disposal Facility ___ Landfill
✓ Other: Drum Dump

Company's Name US 70 Telephone( )

Address Morganton, NC

Collector's Name Keith Masters (signature) Telephone (919) 733-2801 Pat DeNova

Date Sampled 7-2-86 Time Sampled 1700

Type of Process Generating Waste Unknown

Field Information

Sampled by Keith Masters 7-2-86, mailed, and received by Pat DeNova 7-8-86

Field Sample No. 3369 3370 3371

Chain of Possession:

1. Pat DeNova (signature) Waste Mon. Spec. (title) 7/9/86-7/10/86 (inclusive dates)

2. Vicki S. Printer (signature) Chemical Analyst (title) 7-10-86 (inclusive dates)

3. ___ (signature) ___ (title) ___ (inclusive dates)

Results reported

___ (signature) ___ (title) ___ (date)

Instructions: Complete all applicable information including signatures, and submit with analysis request forms.

DIVISION OF HEALTH SERVICES
SOLID AND HAZARDOUS WASTE MANAGEMENT BRANCH

Chain of Custody Record

Hazardous Waste Materials

Location of Sampling: ___ Generator ___ Transporter ___ Treatment Facil
___ Storage Facility ___ Disposal Facility ___ Landfill
✓ Other: Drum Dump

Company's Name US 70 Telephone( )

Address Morganton, NC

Collector's Name Emergency Management Services Burke County ~~signature~~ Telephone(919) Pat DeRosa 733-2801

Date Sampled 7-2-86 Time Sampled ——

Type of Process Generating Waste Unknown

Field Information

Sampled by EMS 7-2-86 transferred to Keir Masters 7-2-86, mailed, and received by Pat DeRosa 7-9-86.

Field Sample No. 3372

Chain of Possession:

1. Pat DeRosa — signature; Waste Man. Spec. — title; 7-9-86 — 7-10-86 — inclusive dates

2. Vicki S. Painter — signature; Chemical Analyst — title; 7-10-86 — inclusive dates

3. ___ signature ___ title ___ inclusive dates

Results reported

___ signature ___ title ___ date

Instructions: Complete all applicable information including signatures, and submit with analysis request forms.

(1)

STATE LABORATORY OF PUBLIC HEALTH
DIVISION OF HEALTH SERVICES, N.C. DEPARTMENT OF HUMAN RESOURCES
P.O. BOX 28047 - 306 N. WILMINGTON, ST., RALEIGH, N.C. 27611

ORGANIC CHEMICAL ANALYSIS

BASE/NEUTRAL AND ACID EXTRACTABLES	LAB NO	601946	601947	601948	601949	601950	601951
	FIELD #	3363	3364	3365	3366	3367	3368
COMPOUND	TYPE	(5)	(7)	(3)	(3)	(1)	(1)
	UNITS	µg/l (µg/kg)	µg/l (µg/kg)	µg/l (µg/kg)	µg/l (µg/kg)	(µg/l) µg/kg	(µg/l) µg/kg
nitrosodimethylamine	10/330	U	U	U	U	U	NA
s(2-chloroethyl)ether	↓	↓	↓	↓	↓	↓	↓
2-chlorophenol	↓	↓	↓	↓	↓	↓	↓
enol	↓	↓	↓	↓	↓	↓	↓
3-dichlorobenzene	↓	↓	↓	↓	↓	↓	↓
1,4-dichlorobenzene	↓	↓	↓	↓	↓	↓	↓
1,2-dichlorobenzene	↓	↓	↓	↓	↓	↓	↓
s(2-chloroisopropyl)ether	↓	↓	↓	↓	↓	↓	↓
exachloroethane	↓	↓	↓	↓	↓	↓	↓
-nitroso-di-n-propylamine	↓	↓	↓	↓	↓	↓	↓
trobenzene	↓	↓	↓	↓	↓	↓	↓
ophorone	↓	↓	↓	↓	↓	↓	↓
2-nitrophenol	↓	↓	↓	↓	↓	↓	↓
2,4-dimethylphenol	↓	↓	↓	↓	↓	↓	↓
s(2-chloroethoxy)methane	↓	↓	↓	↓	↓	↓	↓
2,4-dichlorophenol	↓	↓	↓	↓	↓	↓	↓
1,2,4-trichlorobenzene	↓	↓	↓	↓	↓	↓	↓
phthalene	↓	↓	↓	↓	↓	↓	↓
xachlorobutadiene	↓	↓	↓	↓	↓	↓	↓
-chloro-m-cresol	↓	↓	↓	↓	↓	↓	↓
xachlorocyclopentadiene	↓	↓	↓	↓	↓	↓	↓
4,6-trichlorophenol	↓	↓	↓	↓	↓	↓	↓
2-chloronaphthalene	↓	↓	↓	↓	↓	↓	↓
cenaphthylene	↓	↓	↓	↓	↓	↓	↓
methyl phthalate	↓	↓	↓	↓	↓	↓	↓
6-dinitrotoluene	↓	↓	↓	↓	↓	↓	↓
cenaphthene	↓	↓	↓	↓	↓	↓	↓
4-dinitrophenol	50/1600	↓	↓	↓	↓	↓	↓
4-dinitrotoluene	10/330	↓	↓	↓	↓	↓	↓
-nitrophenol	50/1600	↓	↓	↓	↓	↓	↓
uorene	10/330	↓	↓	↓	↓	↓	↓
chlorophenylphenylether	↓	↓	↓	↓	↓	↓	↓
iethyl phthalate	↓	↓	↓	↓	↓	↓	↓
6-dinitro-o-cresol	50/1600	↓	↓	↓	↓	↓	↓
phenylamine	10/330	↓	↓	↓	↓	↓	↓
obenzene	50/1600	↓	↓	↓	↓	↓	↓
-bromophenylphenylether	10/330	↓	↓	↓	↓	↓	↓
xachlorobenzene	10/330	↓	↓	↓	↓	↓	↓
ntachlorophenol	50/1600	↓	↓	↓	↓	↓	↓
henanthrene	10/330	↓	↓	↓	↓	↓	↓
thracene	↓	↓	↓	↓	↓	↓	↓
butyl phthalate	↓	↓	↓	330 K	330 K	↓	↓
luoranthene	↓	↓	↓	U	U	↓	↓

- Estimated value.
< - Actual value is known to be less than value given.
L - Actual value is known to be greater than value given.
U - Material was analyzed for but not detected. The number is the Minimum Detection Limit.
- Not analyzed.
- Tentative identification.
P/ - On NRDC List of Priority Pollutants.

C. Division of Health Services
S 3068-0 (4/86 Laboratory)

(2)

STATE LABORATORY OF PUBLIC HEALTH
DIVISION OF HEALTH SERVICES, N.C. DEPARTMENT OF HUMAN RESOURCES
P.O. BOX 28047 - 306 N. WILMINGTON, ST., RALEIGH, N.C. 27611

ORGANIC CHEMICAL ANALYSIS

BASE/NEUTRAL AND ACID EXTRACTABLES	LAB NO	601946	601947	601948	601949	601950	601951
	FIELD #	3363	3364	3365	3366	3367	3368
COMPOUND	TYPE	(5)	(7)	(3)	(3)	(1)	(1)
	UNITS	µg/l µg/kg	µg/l µg/kg	µg/l µg/kg	µg/l µg/kg	µg/l µg/kg	µg/l µg/kg
pyrene	10/330	U	U	U	U	U	NA
benzidine	50/1600						
butyl benzyl phthalate	10/330						
benz(a)anthracene							
chrysene							
3,3-dichlorobenzidine	50/1600						
bis(2-ethylhexyl)phthalate	10/330			224,000			
di-n-octyl phthalate	10/330			U			
benzo(b)fluoranthene	50/1600						
benzo(k)fluoranthene							
benzo(a)pyrene							
indeno(1,2,3-cd)pyrene							
dibenzo(a,h)anthracene							
benzo(g,h,i)perylene							
aniline	50/1600	U	U	U	U	U	NA
benzoic acid	50/1600						
benzyl alcohol	10/330						
4-chloroaniline							
dibenzofuran							
2-methylnaphthalene							
2-methylphenol							
4-methylphenol							
2-nitroaniline	50/1600						
3-nitroaniline							
4-nitroaniline							
2,4,5-trichlorophenol							
Methenamine	N.D.	831,884J	431,667J	U	U	U	NA

J - Estimated value.
K - Actual value is known to be less than value given.
L - Actual value is known to be greater than value given.
U - Material was analyzed for but not detected. The number is the Minimum Detection Limit.
NA - Not analyzed.
1/ - Tentative identification.
2/ - On NRDC List of Priority Pollutants.

N.C. Division of Health Services
DHS 3068-0 (4/86 Laboratory)

(3)

STATE LABORATORY OF PUBLIC HEALTH
DIVISION OF HEALTH SERVICES, N.C. DEPARTMENT OF HUMAN RESOURCES
P.O. BOX 28047 - 306 N. WILMINGTON, ST., RALEIGH, N.C. 27611

ORGANIC CHEMICAL ANALYSIS

BASE/NEUTRAL AND ACID EXTRACTABLES	LAB NO	601952	601953	601954	601955		
	FIELD #	3371	3369	3372	3370		
COMPOUND	TYPE	(5)	(3)	(6)	(7)	( )	( )
	UNITS	µg/l (µg/kg)	µg/l (µg/kg)	µg/l (µg/kg)	µg/l (µg/kg)	µg/l µg/kg	µg/l µg/kg
nitrosodimethylamine		4	4	NA	4		
s(2-chloroethyl)ether							
2-chlorophenol							
enol							
3-dichlorobenzene							
1,4-dichlorobenzene							
2-dichlorobenzene							
s(2-chloroisopropyl)ether							
exachloroethane							
N-nitroso-di-n-propylamine							
trobenzene							
ophorone							
2-nitrophenol							
4-dimethylphenol							
s(2-chloroethoxy)methane							
2,4-dichlorophenol							
2,4-trichlorobenzene							
phthalene							
exachlorobutadiene							
4-chloro-m-cresol							
xachlorocyclopentadiene							
4,6-trichlorophenol							
2-chloronaphthalene							
enaphthylene							
methyl phthalate							
2,6-dinitrotoluene							
acenaphthene							
4-dinitrophenol							
4-dinitrotoluene							
4-nitrophenol							
uorene							
chlorophenylphenylether							
diethyl phthalate							
4,6-dinitro-o-cresol							
phenylamine							
azobenzene							
4-bromophenylphenylether							
xachlorobenzene							
ntachlorophenol							
phenanthrene							
thracene							
butyl phthalate			330K				
fluoranthene			4				

- Estimated value.
K - Actual value is known to be less than value given.
L - Actual value is known to be greater than value given.
- Material was analyzed for but not detected. The number is the Minimum Detection Limit.
- Not analyzed.
- Tentative identification.
2/ - On NRDC List of Priority Pollutants.

C. Division of Health Services
HS 3068-0 (4/86 Laboratory)

(4)

STATE LABORATORY OF PUBLIC HEALTH
DIVISION OF HEALTH SERVICES, N.C. DEPARTMENT OF HUMAN RESOURCES
P.O. BOX 28047 - 306 N. WILMINGTON, ST., RALEIGH, N.C. 27611

ORGANIC CHEMICAL ANALYSIS

BASE/NEUTRAL AND ACID EXTRACTABLES	LAB NO	601952	601953	601954	601955		
	FIELD #	3371	3369	3372	3370		
COMPOUND	TYPE	(5)	(3)	(6)	(7)	( )	( )
	UNITS	µg/l µg/kg	µg/l µg/kg	µg/l µg/kg	µg/l µg/kg	µg/l µg/kg	µg/l µg/kg
pyrene		4	4	NA	4		
benzidine		↓	↓	↓	↓		
butyl benzyl phthalate							
benz(a)anthracene							
chrysene							
3,3-dichlorobenzidine							
bis(2-ethylhexyl)phthalate							
di-n-octyl phthalate							
benzo(b)fluoranthene							
benzo(k)fluoranthene							
benzo(a)pyrene							
indeno(1,2,3-cd)pyrene							
dibenzo(a,h)anthracene							
benzo(g,h,i)perylene		↓	↓	↓	↓		
aniline	(2)	4	4	NA	4		
benzoic acid		↓	↓	↓	↓		
benzyl alcohol							
4-chloroaniline							
dibenzofuran							
2-methylnaphthalene							
2-methylphenol							
4-methylphenol							
2-nitroaniline							
3-nitroaniline							
4-nitroaniline							
2,4,5-trichlorophenol		↓	↓	↓	↓		
Methenamine		7,833 J	4	NA	28,542 ppm		

J - Estimated value.
K - Actual value is known to be less than value given.
L - Actual value is known to be greater than value given.
U - Material was analyzed for but not detected. The number is the Minimum Detection Limit.
NA - Not analyzed.
1/ - Tentative identification.
2/ - On NRDC List of Priority Pollutants.

(5)

STATE LABORATORY OF PUBLIC HEALTH
DIVISION OF HEALTH SERVICES, N.C. DEPARTMENT OF HUMAN RESOURCES
P.O. BOX 28047 - 306 N. WILMINGTON, ST., RALEIGH, N.C. 27611

ORGANIC CHEMICAL ANALYSIS

PURGEABLE COMPOUNDS	LAB NO	601946	601947	601948	601949	601951	601952
	FIELD #	3363	3364	3365	3366	3368	3371
COMPOUND	TYPE	(5)	(7)	(3)	(3)	(1)	(5)
	UNITS	µg/l (µg/kg)	µg/l (µg/kg)	µg/l (µg/kg)	µg/l (µg/kg)	(µg/l) µg/kg	µg/l (µg/kg)
chloromethane	100	u	u	u	u	u	u
bromomethane	100						
dichlorodifluoromethane	200						
vinyl chloride	100						
chloroethane	100						
methylene chloride	50	2/		10, 12 2/			
trichlorofluoromethane	200	u		u			
ethene, 1,1-dichloro	50						
ethane, 1,1-dichloro-							
1,2-trans-dichloroethene							
chloroform							
ethane, 1,2-dichloro-							
ethane, 1,1,1-trichloro-							
carbontetrachloride							
bromodichloromethane							
propane, 1,2-dichloro-							
1,3-trans-dichloropropene							
trichloroethylene							
chlorodibromomethane							
benzene							
ethane, 1,1,2-trichloro-							
1,3-cis-dichloropropene							
2-chloroethyl vinyl ether	100						
bromoform	50						
ethane, 1,1,2,2-tetrachloro-							
ethene, tetrachloro-							
toluene		2/		2/			
chlorobenzene		50		50			
ethylbenzene							
acetone	100	u	u	u	u	u	u
2-butanone	100						
carbondisulfide	50						
2-hexanone	100						
4-methyl-2-pentanone	100						
styrene	50						
vinyl acetate	100						
o-xylene	50						
	MIX						

J - Estimated value.
K - Actual value is known to be less than value given.
L - Actual value is known to be greater than value given.
U - Material was analyzed for but not detected. The number is the Minimum Detection Limit.
NA - Not analyzed.
1/ - Tentative identification.
2/ - On NRDC List of Priority Pollutants.

2/ Low concentration possible.

N.C. Division of Health Services
DHS 3068-O (4/86 Laboratory)

(6)

STATE LABORATORY OF PUBLIC HEALTH
DIVISION OF HEALTH SERVICES, N.C. DEPARTMENT OF HUMAN RESOURCES
P.O. BOX 28047 - 306 N. WILMINGTON, ST., RALEIGH, N.C. 27611

ORGANIC CHEMICAL ANALYSIS

PURGEABLE COMPOUNDS	LAB NO	601953	601954	601955			
	FIELD #	3369	3372	3370			
COMPOUND	TYPE	(3)	(6)	(7)	( )	( )	( )
	UNITS	µg/l µg/kg	µg/l µg/kg	µg/l µg/kg	µg/l µg/kg	µg/l µg/kg	µg/l µg/kg
chloromethane		u	u	u			
bromomethane							
dichlorodifluoromethane							
vinyl chloride							
chloroethane							
methylene chloride							
trichlorofluoromethane							
ethene, 1,1-dichloro							
ethane, 1,1-dichloro-							
1,2-trans-dichloroethene							
chloroform							
ethane, 1,2-dichloro-							
ethane, 1,1,1-trichloro-							
carbontetrachloride							
bromodichloromethane							
propane, 1,2-dichloro-							
1,3-trans-dichloropropene							
trichloroethylene							
chlorodibromomethane							
benzene							
ethane, 1,1,2-trichloro-							
1,3-cis-dichloropropene							
2-chloroethyl vinyl ether							
bromoform							
ethane, 1,1,2,2-tetrachloro-							
ethene, tetrachloro-							
toluene							
chlorobenzene							
ethylbenzene		↓	↓	↓			
acetone		u	u	u			
2-butanone							
carbondisulfide							
2-hexanone							
4-methyl-2-pentanone							
styrene							
vinyl acetate							
o-xylene		↓	↓	↓			
2-propanol	+/-	⊖	⊕	⊖			

Not Detected

See Page 5

J - Estimated value.
K - Actual value is known to be less than value given.
L - Actual value is known to be greater than value given.
U - Material was analyzed for but not detected. The number is the Minimum Detection Limit.
NA - Not analyzed.
1/ - Tentative identification.
2/ - On NRDC List of Priority Pollutants.

received
8-22-86

Inorg

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

SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

12D981472624

Site Number ~~NCD-TBA~~ Field Sample Number 3700

Name of Site US 70 Drum Dump Site Location Morganton, NC

Collected By Pat DeRose ID# ~~[illegible]~~ 38 Date Collected July 8, 1986 Time 0950

Type of Sample: –

Environmental	Concentrate	Comments
____ Groundwater (1)	✓ Solid (5)	#1 white resin material
____ Surface Water (2)	____ Liquid (6)	
____ Soil (3)	____ Sludge (7)	
____ Other (4)	____ Other (8)	

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/1	Parameter	Results mg/Kg	Parameter	Results mg/Kg
✓ Arsenic	0.03	✓ Arsenic	<0.5	✓ Silver	<2.5
✓ Barium	<0.1	✓ Barium	<4.9	Sulfates	
✓ Cadmium	<0.05	✓ Cadmium	<2.5	Zinc	
✓ Chromium	<0.05	✓ Chloride		Ph	
✓ Lead	<0.1	✓ Chromium	<2.5	Conductivity	
✓ Mercury	<0.02	Copper		TDS	
✓ Selenium	<0.005	Fluoride		TOC	
✓ Silver	<0.05	Iron			
		✓ Lead	<4.9		
		Manganese			
		✓ Mercury	<0.1		
		Nitrate			
		✓ Selenium	<2.5		

ORGANIC CHEMISTRY

Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
P&T:GC/MS		EDB		Methoxychlor	
Acid:B/N Ext.		PCB's		Toxaphene	
TOX		Petroleum		2,4-D	
		Endrin		2,4,5-TP (silvex)	
		Lindane			

MICROBIOLOGY

Parameter
(MF) Coliform Colonies/100mls
(MPN) Coliform Colonies/100mls

RADIOCHEMISTRY

Parameter	Results PCi/1
Gross Alpha	
Gross Beta	

Date Received ____ Date Reported 22 Aug 86

Date Extracted ____ Date Analyzed ____

Reported By ____ Lab Number 14586 JUL 10 86

DHS 3191 (Revised 7/85)
Solid and Hazardous Waste (Review 7/87)

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

SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

Site Number ~~NCD 7B4~~ NCD 980472624 Field Sample Number 3701

Name of Site US 70 Drum Dump Site Location Morganton, NC

Collected By Pat DeRosa ID# ~~[illegible]~~ 38 Date Collected July 8, 1986 Time [illegible]

Type of Sample:

Environmental	Concentrate	Comments
___ Groundwater (1)	___ Solid (5)	#2 [illegible] spilled [illegible]
___ Surface Water (2)	___ Liquid (6)	
___ Soil (3)	✓ Sludge (7)	
___ Other (4)	___ Other (8)	

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/1	Parameter	Results mg/Kg	Parameter	Results mg/Kg
✓ Arsenic	<0.10	✓ Arsenic	<0.5	✓ Silver	<2.3
✓ Barium	<0.1	✓ Barium	<4.7	Sulfates	
✓ Cadmium	<0.05	✓ Cadmium	<2.3	Zinc	
✓ Chromium	<0.05	Chloride		Ph	
✓ Lead	<0.1	✓ Chromium	3.8	Conductivity	
✓ Mercury	<0.02	Copper		TDS	
✓ Selenium	<0.005	Fluoride		TOC	
✓ Silver	<0.05	Iron			
		✓ Lead	4.7		
		Manganese			
		✓ Mercury	<0.1		
		Nitrate			
		✓ Selenium	<2.3		

ORGANIC CHEMISTRY

Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
P&T:GC/MS		EDB		Methoxychlor	
Acid:B/N Ext.		PCB's		Toxaphene	
TOX		Petroleum		2,4-D	
		Endrin		2,4,5-TP (silvex)	
		Lindane			

MICROBIOLOGY

Parameter
(MF) Coliform Colonies/100mls
(MPN) Coliform Colonies/100mls

RADIOCHEMISTRY

Parameter	Results PCi/1
Gross Alpha	
Gross Beta	

Date Received ___ Date Reported 22 Aug 86

Date Extracted ___ Date Analyzed ___

Reported By ___ Lab Number 14587 JUL 10 86

DHS 3191 (Revised 7/85)
Solid and Hazardous Waste (Review 7/87)

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

SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

Site Number ~~NCD 980 TRA~~ NCD 980 728 724 Field Sample Number 3702-

Name of Site US 70 Drum Dump Site Location Morganton, NC

Collected By Pat DeRosa ID# 38 Date Collected July 8, 1986 Time 10:30

Type of Sample:

Environmental	Concentrate	Comments
___ Groundwater (1)	___ Solid (5)	#3 Dark [illegible] S. of drums
___ Surface Water (2)	___ Liquid (6)	
✓ Soil (3)	___ Sludge (7)	
___ Other (4)	___ Other (8)	

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/1	Parameter	Results mg/Kg	Parameter	Results mg/Kg
✓ Arsenic	<0.01	✓ Arsenic	2.5	✓ Silver	<2.5
✓ Barium	<0.1	✓ Barium	34	Sulfates	
✓ Cadmium	<0.05	✓ Cadmium	<2.5	Zinc	
✓ Chromium	<0.05	Chloride		Ph	
✓ Lead	<0.1	✓ Chromium	48	Conductivity	
✓ Mercury	<0.02	Copper		TDS	
✓ Selenium	<0.005	Fluoride		TOC	
✓ Silver	<0.05	Iron			
		✓ Lead	64		
		Manganese			
		✓ Mercury	0.1		
		Nitrate			
		✓ Selenium	<2.5		

ORGANIC CHEMISTRY

Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
P&T:GC/MS		EDB		Methoxychlor	
Acid:B/N Ext.		PCB's		Toxaphene	
TOX		Petroleum		2,4-D	
		Endrin		2,4,5-TP (silvex)	
		Lindane			

MICROBIOLOGY

Parameter
(MF) Coliform Colonies/100mls
(MPN) Coliform Colonies/100mls

RADIOCHEMISTRY

Parameter	Results PCi/1
Gross Alpha	
Gross Beta	

Date Received ___ Date Reported 22 Aug 86

Date Extracted ___ Date Analyzed ___

Reported By ___ Lab Number 14588 JUL 10 86

LHS 3191 (Revised 7/85)
Solid and Hazardous Waste (Review 7/87)

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

SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

12N 981 472.624

Site Number ~~NCD 981~~ Field Sample Number 3-70-3

Name of Site U.S. 70 Drum Dump Site Location Morganton, NC

Collected By Pat DeRosa ID# ~~[illegible]~~ 38 Date Collected July 8, 1986 Time 1040

Type of Sample:

Environmental	Concentrate	Comments
____ Groundwater (1)	____ Solid (5)	#4 Black soil
____ Surface Water (2)	____ Liquid (6)	
✓ Soil (3)	____ Sludge (7)	
____ Other (4)	____ Other (8)	

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/1	Parameter	Results mg/Kg	Parameter	Results mg/Kg
✓ Arsenic	<0.01	✓ Arsenic	<20	✓ Silver	<2.5
✓ Barium	<0.1	✓ Barium	20	Sulfates	
✓ Cadmium	<0.05	✓ Cadmium	<2.5	Zinc	
✓ Chromium	<0.05	~~Chloride~~		Ph	
✓ Lead	<0.1	✓ Chromium	42	Conductivity	
✓ Mercury	<0.02	Copper		TDS	
✓ Selenium	<0.005	Fluoride		TOC	
✓ Silver	<0.05	Iron			
		✓ Lead	40		
		Manganese			
		✓ Mercury	<0.1		
		Nitrate			
		✓ Selenium	<2.5		

ORGANIC CHEMISTRY

Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
P&T:GC/MS		EDB		Methoxychlor	
Acid:B/N Ext.		PCB's		Toxaphene	
TOX		Petroleum		2,4-D	
		Endrin		2,4,5-TP (silvex)	
		Lindane			

MICROBIOLOGY

Parameter
(MF) Coliform Colonies/100mls
(MPN) Coliform Colonies/100mls

RADIOCHEMISTRY

Parameter	Results PCi/1
Gross Alpha	
Gross Beta	

Date Received ____ Date Reported 22 Aug 86

Date Extracted ____ Date Analyzed ____

Reported By ____ Lab Number 14589 JUL 10 86

DHS 3191 (Revised 7/85)
Land Hazardous Waste (Revised 7/87)

cc: Martin

Received 7-23-86

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

SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

12D 981472624

Site Number NCD-RBA Field Sample Number 3704

Name of Site US 70 Drum Dump Site Location Morganton, NC

Collected By Pat DeRosa ID# 38 Date Collected July 8, 1986 Time 11:25

Type of Sample:

Environmental	Concentrate	Comments
✓ Groundwater (1)	___ Solid (5)	#5 - Allison res. well
___ Surface Water (2)	___ Liquid (6)	
___ Soil (3)	___ Sludge (7)	
___ Other (4)	___ Other (8)	

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
___ Arsenic		✓ Arsenic	<0.01	✓ Silver	<0.05
___ Barium		✓ Barium	<0.1	___ Sulfates	
___ Cadmium		✓ Cadmium	<0.005	___ Zinc	
___ Chromium		___ Chloride		___ Ph	
___ Lead		✓ Chromium	<0.01	___ Conductivity	
___ Mercury		___ Copper		___ TDS	
___ Selenium		___ Fluoride		___ TOC	
___ Silver		___ Iron			
		✓ Lead	<0.03		
		___ Manganese			
		✓ Mercury	<0.0002		
		___ Nitrate			
		✓ Selenium	<0.005		

ORGANIC CHEMISTRY

Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
___ P&T:GC/MS		___ EDB		___ Methoxychlor	
___ Acid:B/N Ext.		___ PCB's		___ Toxaphene	
___ TOX		___ Petroleum		___ 2,4-D	
		___ Endrin		___ 2,4,5-TP (silvex)	
		___ Lindane			

MICROBIOLOGY

Parameter
___ (MF) Coliform Colonies/100mls
___ (MPN) Coliform Colonies/100mls

RADIOCHEMISTRY

Parameter	Results PCi/1
___ Gross Alpha	
___ Gross Beta	

Date Received ___ Date Reported 7-18-86

Date Extracted ___ Date Analyzed ___

Reported By ___ Lab Number 14645 JUL 1 1 00

RECEIVED JUL 22 1986 HAZARDOUS WASTE MANAGEMENT

DHS 3191 (Revised 7/85)
Solid and Hazardous Waste (Review 7/87)

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

SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

Site Number ~~FED~~ 12 D981472624 Field Sample Number 3105

Name of Site US 70 Drum Dump Site Location Morganton, NC

Collected By Keith Masters ID# 01 Date Collected 7-2-86 Time 1700

Type of Sample:

Environmental	Concentrate	Comments
___ Groundwater (1)	___ Solid (5)	#6 Purgeable soil
___ Surface Water (2)	___ Liquid (6)	
✓ Soil (3)	___ Sludge (7)	
___ Other (4)	___ Other (8)	

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/1	Parameter	Results mg/Kg	Parameter	Results mg/Kg
✓ Arsenic	<0.01	✓ Arsenic	<20	✓ Silver	<2.4
✓ Barium	0.1	✓ Barium	15	Sulfates	
✓ Cadmium	<0.05	✓ Cadmium	<2.4	Zinc	
✓ Chromium	<0.05	Chloride		✓ Ph	Insufficient Sample
✓ Lead	<0.1	✓ Chromium	13	Conductivity	
✓ Mercury	<0.02	Copper		TDS	
✓ Selenium	<0.005	Fluoride		TOC	
✓ Silver	<0.05	Iron			
		✓ Lead	29		
		Manganese			
		✓ Mercury	<0.1		
		Nitrate			
		✓ Selenium	<2.4		

ORGANIC CHEMISTRY

Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
P&T:GC/MS		EDB		Methoxychlor	
Acid:B/N Ext.		PCB's		Toxaphene	
TOX		Petroleum		2,4-D	
		Endrin		2,4,5-TP (silvex)	
		Lindane			

MICROBIOLOGY

Parameter
(MF) Coliform Colonies/100mls
(MPN) Coliform Colonies/100mls

RADIOCHEMISTRY

Parameter	Results PCi/1
Gross Alpha	
Gross Beta	

Date Received ___ Date Reported 22 Aug 86

Date Extracted ___ Date Analyzed ___

Reported By ___ Lab Number 14590 JUL 10 86

DHS 3191 (Revised 7/85)
Solid and Hazardous Waste (Review 7/87)

Fort DeRussy 11 3d

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

SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

Site Number NED981472624 (12) Field Sample Number 3706

Name of Site US 70 Dump Dump Site Location Morganton, NC

Collected By Keith Matthews ID# C1 Date Collected 7-2-86 Time 1700

Type of Sample:

Environmental	Concentrate	Comments
___ Groundwater (1)	___ Solid (5)	#7 - Organic Acid Dump
___ Surface Water (2)	___ Liquid (6)	Spilled Drum
___ Soil (3)	✓ Sludge (7)	
___ Other (4)	___ Other (8)	

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/1	Parameter	Results mg/Kg	Parameter	Results mg/Kg
✓ Arsenic	<0.10	✓ Arsenic	<9.7	✓ Silver	<2.5
✓ Barium	<0.1	✓ Barium	<4.9	Sulfates	
✓ Cadmium	<0.05	✓ Cadmium	<2.5	Zinc	
✓ Chromium	<0.05	Chloride		✓ Ph	8.6
✓ Lead	<0.1	✓ Chromium	<2.5	Conductivity	
✓ Mercury	<0.02	Copper		TDS	
✓ Selenium	<0.05	Fluoride		TOC	
✓ Silver	<0.05	Iron			
		✓ Lead	<4.9		
		Manganese			
		✓ Mercury	<0.1		
		Nitrate			
		✓ Selenium	<2.5		

ORGANIC CHEMISTRY

Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
P&T:GC/MS		EDB		Methoxychlor	
Acid:B/N Ext.		PCB's		Toxaphene	
TOX		Petroleum		2,4-D	
		Endrin		2,4,5-TP (silvex)	
		Lindane			

MICROBIOLOGY

Parameter
(MF) Coliform Colonies/100mls
(MPN) Coliform Colonies/100mls

RADIOCHEMISTRY

Parameter	Results PCi/1
Gross Alpha	
Gross Beta	

Date Received ___ Date Reported 22 Aug 86

Date Extracted ___ Date Analyzed ___

Reported By ___ Lab Number 14597 JUL 10 86

DHS 3191 (Revised 7/85)
Solid and Hazardous Waste (Review 7/87)

Pit Drum #35

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

SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

Site Number ~~AFD~~ 12- 981472624 Field Sample Number 3767

Name of Site US 70 Drum Dump Site Location Morganton, NC

Collected By EMS, Burke Cty ID# — Date Collected 7-3-86 Time

Type of Sample: —

Environmental	Concentrate	Comments
___ Groundwater (1)	___ Solid (5)	#9 - Liquid from the -
___ Surface Water (2)	✓ Liquid (6)	
___ Soil (3)	___ Sludge (7)	
___ Other (4)	___ Other (8)	

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
___ Arsenic		✓ Arsenic	<0.2	✓ Silver	<1.0
___ Barium		✓ Barium	<2.0	___ Sulfates	
___ Cadmium		✓ Cadmium	<1.0	___ Zinc	
___ Chromium		___ Chloride		✓ Ph	8.3
___ Lead		✓ Chromium	<1.0	___ Conductivity	
___ Mercury		___ Copper		___ TDS	
___ Selenium		___ Fluoride		___ TOC	
___ Silver		___ Iron			
		✓ Lead	<2.0		
		___ Manganese			
		✓ Mercury	<0.02		
		___ Nitrate			
		✓ Selenium	<1.0		

ORGANIC CHEMISTRY

Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
___ P&T:GC/MS		___ EDB		___ Methoxychlor	
___ Acid:B/N Ext.		___ PCB's		___ Toxaphene	
___ TOX		___ Petroleum		___ 2,4-D	
		___ Endrin		___ 2,4,5-TP (silvex)	
		___ Lindane			

MICROBIOLOGY

Parameter
___ (MF) Coliform Colonies/100mls
___ (MPN) Coliform Colonies/100mls

RADIOCHEMISTRY

Parameter	Results PCi/1
___ Gross Alpha	
___ Gross Beta	

Date Received ___ Date Reported 22 Aug 86

Date Extracted ___ Date Analyzed ___

Reported By ___ Lab Number 14592 JUL 30 86

DHS 3191 (Revised 7/85)
Solid and Hazardous Waste (Review 7/87)

Pat DeRuit #38

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

SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

Site Number NCD 981 472 624 Field Sample Number 3708

Name of Site US 70 Down Dump Site Location Morganton, NC

Collected By CMS, Bob Only ID# — Date Collected 7-2-86 Time —

Type of Sample: —

Environmental	Concentrate	Comments
___ Groundwater (1)	✓ Solid (5)	#10 - white granular solid from open drum
___ Surface Water (2)	___ Liquid (6)	
___ Soil (3)	___ Sludge (7)	
___ Other (4)	___ Other (8)	

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/1	Parameter	Results mg/Kg	Parameter	Results mg/Kg
✓ Arsenic	<0.01	✓ Arsenic	<0.5	✓ Silver	<2.5
✓ Barium	<0.1	✓ Barium	<5.0	Sulfates	
✓ Cadmium	<0.05	✓ Cadmium	<2.5	Zinc	
✓ Chromium	<0.05	Chloride		✓ Ph	8.1
✓ Lead	<0.1	✓ Chromium	<2.5	Conductivity	
✓ Mercury	<0.02	Copper		TDS	
✓ Selenium	<0.005	Fluoride		TOC	
✓ Silver	<0.05	Iron			
		✓ Lead	<5.0		
		Manganese			
		✓ Mercury	<0.1		
		Nitrate			
		✓ Selenium	<2.5		

ORGANIC CHEMISTRY

Parameter	Results mg/1	Parameter	Results mg/1	Parameter	Results mg/1
P&T:GC/MS		EDB		Methoxychlor	
Acid:B/N Ext.		PCB's		Toxaphene	
TOX		Petroleum		2,4-D	
		Endrin		2,4,5-TP (silvex)	
		Lindane			

MICROBIOLOGY

Parameter
(MF) Coliform Colonies/100mls
(MPN) Coliform Colonies/100mls

RADIOCHEMISTRY

Parameter	Results PCi/1
Gross Alpha	
Gross Beta	

Date Received ___ Date Reported 22 Aug 86

Date Extracted ___ Date Analyzed ___

Reported By ___ Lab Number 14593 JUL 10 86

DHS 3191 (Revised 7/85)
Solid and Hazardous Waste (Review 7/87)

SOLID AND HAZARDOUS WASTE MANAGEMENT BRANCH

Chain of Custody Record

Hazardous Waste Materials

Location of Sampling: ___ Generator ___ Transporter ___ Treatment Facil:
___ Storage Facility ___ Disposal Facility ___ Landfill
✓ Other: Drum Dump

Company's Name I-85 70 Telephone( )

Address Morganton, NC

Collector's Name Pat DeNova (signature) Telephone (919) 733-2801

Date Sampled July 8, 1986 Time Sampled 0950 - 1125

Type of Process Generating Waste unknown

Field Information

Drum dump on southern embankment of I-85 70

Field Sample No. 3700 3701 3702 3703 3704

Chain of Possession:

	signature	title	inclusive dates
1.	Pat DeNova	Waste Man Spec	7/8/86 - 7/10/86
2.	[illegible]	Chemist	9 Jul 86
3.			

Results reported

signature	title	date
[illegible]	Lab Tech	22 Aug 86

Instructions: Complete all applicable information including signatures, and submit with analysis request forms.

DIVISION OF HUMAN SERVICES
SOLID AND HAZARDOUS WASTE MANAGEMENT BRANCH

Chain of Custody Record

Hazardous Waste Materials

Location of Sampling: ___ Generator ___ Transporter ___ Treatment Facil
___ Storage Facility ___ Disposal Facility ___ Landfill
✓ Other: Drum Dump

Company's Name US 70 Telephone( )

Address Morganton, NC

Collector's Name Keith Masters (signature) Telephone(919) Pat DeRosa 733-2801

Date Sampled 7-2-86 Time Sampled 1700

Type of Process Generating Waste Unknown

Field Information

Sampled by Keith Masters 7-2-86; mailed and received by Pat DeRosa 7-8-86

Field Sample No. 3705 3706

Chain of Possession:

	signature	title	inclusive dates
1.	Pat DeRosa	Waste Man. Spec.	7/9/86-7/10/86
2.	[illegible]	Chemist	9 Jul 86
3.	[illegible]	Lab Tech	22 Aug 86

Results reported

signature title date

Instructions: Complete all applicable information including signatures, and submit with analysis request forms.

DIVISION OF HUMAN SERVICES
SOLID AND HAZARDOUS WASTE MANAGEMENT BRANCH

Chain of Custody Record

Hazardous Waste Materials

Location of Sampling: ___ Generator ___ Transporter ___ Treatment Facil
___ Storage Facility ___ Disposal Facility ___ Landfill
✓ Other: Drum Dump

Company's Name US 70 Telephone( )

Address Morganton, NC

Collector's Name Emergency Management Services Burke Cty signature Telephone(919) Pat De Rosa 733-2801

Date Sampled 7-2-86 Time Sampled —

Type of Process Generating Waste Unknown

Field Information

Sampled by EMS 7-2-86 transferred to Keil Masters 7-2-86, mailed, and received by Pat DeRosa 7-9-86.

Field Sample No. 3707 3708

Chain of Possession:

	signature	title	inclusive dates
1.	Pat DeRosa	Waste Man. Spec.	7-9-86 — 7-10-86
2.	[illegible]	Chemist	7-11-86
3.			

Results reported

signature	title	date
[illegible]	Lab Tech	22 Aug 86

Instructions: Complete all applicable information including signatures, and submit with analysis request forms.

APPENDIX C

REFERENCES

REFERENCES

1. Uncontrolled Hazardous Waste Site Ranking System, A User's Manual, (HW-10) US EPA, 1984. Federal Register, Vol. 47, No. 137, July 16, 1982, p. 31180.

2. State Laboratory of Public Health, NC DHR, Raleigh, NC. Laboratory Results: Soil, waste, and groundwater samples collected July 8, 1986. Site Investigation: US 70 Drum Dump, Morganton, NC, CERCLA Unit, NC DHR, Raleigh, NC.

3. Summary Trip Report: Site Investigation, US 70 Drum Dump, Morganton, NC. Letter from Pat DeRosa, NC CERCLA Unit, to Denise Smith, US EPA Region IV, Atlanta, GA, July 16, 1986.

4. Laboratory results from Advanced Chemistry Labs, Atlanta, GA, to HAZTECH, Inc., Decatur, GA, April 6, 1987. HAZTECH Project#: 321-87-636.

5. Sax, N.I. Dangerous Properties of Industrial Materials, 6th edition. Van Nostrand Reinhold Company, NY, 1984.

6. USGS 7.5' Quadrangle Maps: Glen Alpine, NC, 1962; Marion East, NC, 1962.

7. Letter and attachments, from Warren T. Parker, US Fish and Wildlife Service, to Pat DeRosa, NC CERCLA Unit, June 21, 1985.

   Memo to CERCLA Unit Staff, from Pat DeRosa, NC CERCLA Unit, August 12, 1986. Telephone conversation with John Fridell, US Fish and Wildlife Service.

   Federal Register, Volume 51, No. 133, Friday, July 11, 1986 p. 25219-25223.

8. Memo to file from Pat DeRosa, NC CERCLA Unit, June 15, 1987. Personal communication with Dick Caspar, Water Supply Branch, NC DHR, Raleigh, NC.

9. NC Department of Transportation map, Burke County, NC.

10. Memo to file from Pat DeRosa, NC CERCLA Unit, June 16, 1987. Telephone conversation with Leslie Miller, Agricultural Extension Service, Burke County, NC.

11. Fieldnotes and photographs: Site Investigation, US 70 Drum Dump, Morganton, NC, July 8, 1986. Pat DeRosa, NC CERCLA Unit, Raleigh, NC.

12. Memo to file from Pat DeRosa, NC CERCLA Unit, June 16, 1987. Telephone conversation with Robert Brown, NC Wildlife Resources Commission, Burke County, NC.

13. Heath, R.C., "Basic Elements of Groundwater Hydrology with Reference to Conditions in NC," 1980. US Geological Survey, Water Resources Investigations, Open-File Report 80-44, Raleigh, NC.

14. Memo to file from Pat DeRosa, NC CERCLA Unit, June 18, 1987. Telephone conversation with Mario DeLuca, Agricultural Extension Service, McDowell County, NC.

15. Memo to file from Pat DeRosa, NC CERCLA Unit, July 1, 1987. Telephone conversation with Carol Walsh, EPA Region IV, Atlanta, GA.

16. Uniform Hazardous Waste Manifests, 0636A, 0636B, Generator #NCTMP0001334, US EPA Region IV/Hwy. 70 Site, Atlanta, GA.

17. Sumsion, C.T. and Laney, R.L., "Geology and Groundwater Resources of the Morganton Area North Carolina," Groundwater Bulletin No. 12, March 1967. Prepared cooperatively by the Geological Survey, US Department of the Interior, and the NC Department of Water Resources.

18. Well records, Burke County, 1968-1982. Mooresville Regional Office, Groundwater Section, Division of Environmental Management, NC Department of Natural Resources & Community Development, Mooresville, NC.

19. Memo to file from Pat DeRosa, NC CERCLA Unit, June 22, 1987. Telephone conversation with Eric Klingel, Groundwater Section, DEM, NC NRCD, Mooresville, NC.

20. Memo to file from Pat DeRosa, NC CERCLA Unit, June 16, 1987. Telephone conversation with Wade Knox, Water Supply Branch, NC DHR, Black Mountain, NC.

21. Memo to file from Pat DeRosa, NC CERCLA Unit, June 18, 1987. Personal communication with Martha Moore, Water Supply Branch, NC DHR, Raleigh, NC.

22. Memo to file from Pat DeRosa, NC CERCLA Unit, June 15, 1987. Telephone conversation with Glen Berry, City of Morganton, NC.

23. Memo to file from Pat DeRosa, NC CERCLA Unit, June 16, 1987. Telephone conversation with Danny Henson, Brentwood Water System, Morganton, NC.

24. Burke County Tax Maps, 1987. Burke County Tax Office, Morganton, NC.

25. Memo to file from Pat DeRosa, NC CERCLA Unit, July 20, 1987. Telephone conversation with Louise Greg, Burke County Tax Office, Morganton, NC.

26. Memo to file from Pat DeRosa, NC CERCLA Unit, July 20, 1987. Telephone conversation with Danny Henson, Brentwood Water System, Morganton, NC.

27. Memo to file from Pat DeRosa, NC CERCLA Unit, July 20, 1987. Telephone conversation with Joe Silver, McDowell County Tax Office, Marion, NC.

28. NC State Government Statistical Abstract, 5th Edition. NC State Data Management. Raleigh, NC, 1984.

29. Preliminary Assessment: US 70 Drum Dump, Morganton, NC, July 3, 1986. Mary Giguere, NC CERCLA Unit, Solid & Hazardous Waste Management Branch, Raleigh, NC.

30. 40 CFR Part 302, July 1, 1986. Table 302.4-"List of Hazardous Substances & Reportable Quantities".

31. Memo to file from Mary Giguere, NC CERCLA Unit, July 3, 1986. Telephone conversation with Keith Masters, Solid & Hazardous Waste Management Branch, Bakersville, NC.

32. Letters to Carol Walsh, EPA Region IV, Atlanta, GA, from Pat DeRosa, NC CERCLA Unit, Raleigh, NC, August 21, 1986, October 6, 1986, October 30, 1986.

Memo to Lee Crosby from Pat DeRosa, NC CERCLA Unit, October 31, 1987, December 2, 1987, March 2, 1987. Re: US 70 Drum Dump.

Ref. 3

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

July 16, 1986

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

Dear Ms. Bland:

SUBJECT: Summary Trip Report
Site Investigation, July 8, 1986
US 70 Drum Dump NC D981472624
US 70
Morganton, NC 28655

The US 70 Drum Dump is located on US 70, approximately 0.2 miles west of the Dysartsville Road intersection. The site is about 10 miles west of Morganton and 2 miles east of the McDowell County line, within Burke County.

Approximately 25 to 30 55-gallon drums were discovered in a culvert beside US 70 on July 2, 1986. A backhoe operator from the NC Department of Transportation was attempting to clear debris from the entrance to a drainage pipe running beneath the road when he hit the drums. Some material spilled when the backhoe pierced the drums. One drum reportedly contained liquid that coagulated when exposed to the air. A strong odor of chlorine or ammonia was also reported. Preliminary waste samples were collected by Burke County Emergency Management and NC DHR/DHS, Solid and Hazardous Waste Management Branch.

On July 7, 1986, NC CERCLA Unit personnel, Lee Crosby, Pat DeRosa, and Mary Giguere visited the subject site. Keith Masters, NC DHR/DHS, Solid and Hazardous Waste Management Branch, directed us to the site and provided background information. We observed 25 to 30 rusted 55-gallon drums at the bottom of a 30 ft. embankment on the south side of US 70. The topography was such that surface water would drain from the south onto the site and through the culvert to the other side of the road. However, no surface water was observed and the drain pipe appeared to be plugged with drums and debris.

Tires, household trash, and rolls of paper about 4 ft. wide, were also observed in the culvert. The drums had been covered with a clear plastic tarp and the eastern embankment had been taped off to discourage public entry to the site. We met briefly with the McGalliard family, the owners of the property adjoining the site to the east. We also met with Jim Crawley, the site owner. Both land owners gave us their permission to enter the property and collect samples as needed. Neither Mr. Crawley nor the McGalliards, however, had any information as to the source or contents of the drums. Later that day, we also met with Nick Waters and Dale Murphy from Burke County Emergency Management to discuss the site.

On July 8, 1986, we met with Mr. Crawley again to collect a sample from an inactive well at his shop approximately 0.2 miles from the site. A sample could not be obtained, however, due to a break in the pipe between the pump and the tap. We then proceeded to the site, donned protective clothing, and began sampling at 0950. At that time, the weather was sunny and hot (approximately 90°F), with no noticeable wind. Two waste samples were collected from an accessible open drum and spill area. The drum contained white rubbery chips and the spill appeared to be a greasy material with a caramel-like consistency. Additional waste samples could not be collected due to the physical hazard posed by the unstable drum and trash pile. HNu readings monitored throughout sampling did not exceed background. A surface soil sample was collected 5 ft. south of the drums and a background soil sample was collected approximately 150 ft. upgradient. The nearest well, located at the residence of Ray Allison approximately 400 ft. west of the site, was also sampled. Sampling was completed by 1130. Samples were submitted to the NC State Laboratory of Public Health for organic and inorganic analyses.

Observers on site during sampling included: Clint Patton, Burke County Fire Marshall's Office; Jim Fulmer, Burke County Maintenance Engineer; Steve Foster, Burke County Training Officer for Emergency Management; Dale Meyer, Burke County Division of Solid Waste; and Elgie McGalliard, adjacent property owner. After sampling, we met briefly with Steve Foster to discuss the site.

If you have any questions please contact me at (919) 733-2801.

Sincerely,

Pat DeRosa

Pat DeRosa
Waste Management Specialist
Solid and Hazardous Waste Management Branch
Environmental Health Section

PD/tb/0221b

Hwy 70
4-6-87

Ref. 4

ACL

ADVANCED CHEMISTRY LABS, INC.

DR. STEVE N. TSOUKALAS
CHIEF CHEMIST

P.O. BOX 88610 • ATLANTA, GEORGIA 30356
TELEPHONE (404) 455-1266

Client: HAZTECH, INC.
5280 Panola Industrial Blvd.
Decatur, GA 30035-4013

Attention: Neville Kingham

Client Project No.: #321-87-636
ACL Project No.: #0826
Date Received: 3/19/87
Report Date: 4/6/87

PARAMETERS (ppm)	Soil #001 3796	S & L #002 3797	S.Waste #003 3798
*Antimony	2.2	< 0.02	3.9
*Arsenic			
*Beryllium	0.24	< 0.005	< 0.05
*Cadmium	< 0.5	0.02	0.7
*Chromium	172	0.19	246
*Copper	36.9	0.39	73.8
*Lead	< 1	0.29	25.8
*Nickel	91.7	0.15	138
*Selenium	< 1	0.03	< 1
*Silver	< 0.5	< 0.02	1.7
*Thallium	< 0.5	< 0.02	< 0.5
*Zinc	59.9	0.79	270
Cyanides	< 0.5	< 0.5	< 0.5
Phenols	< 1	< 1	< 1

*Total Metals

Steve N. Tsoukalas
Steve Tsoukalas, Ph.D.
Director of Chemistry

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Date Received: 3/19/87
Report Date: 4/6/87

TEST REQUIRED	Sample Type : Soil Station # : 001 Sample #ACL : 3796 Results (ppb)	Sample Type : S & L Station # : 002 Sample #ACL : 3797 Results (ppm)	Sample Type : S.Waste Station # : 003 Sample #ACL : 3798 Results (ppb)
GC/MS FRACTION - VOLATILE COMPOUNDS			
Acrolein	---	---	---
Acrylonitrile	---	---	---
Benzene	< 10	< 1.0	< 10
Bis (Chloromethyl) ether	< 10	< 1.0	< 10
Bromoform	< 10	< 1.0	< 10
Carbon tetrachloride	< 10	< 1.0	< 10
Chlorobenzene	< 10	70.96	< 10
Chlorodi-bromomethane	< 10	< 1.0	< 10
Chloroethane	< 10	< 1.0	< 10
2-Chloroethylvinyl ether	< 10	< 1.0	< 10
Chloroform	< 10	< 1.0	< 10
Dichlorobromomethane	< 10	< 1.0	< 10
Dichlorodifluoromethane	< 10	< 1.0	< 10
1,1-Dichloroethane	< 10	< 1.0	< 10
1,2-Dichloroethane	< 10	< 1.0	< 10
1,1-Dichloroethylene	< 10	< 1.0	< 10
1,2-Dichloropropane	< 10	< 1.0	< 10
1,2-Dichloropropylene	< 10	< 1.0	< 10
Ethylbenzene	< 10	1005	< 10
Methyl bromide	< 10	< 1.0	< 10
Methyl chloride	< 10	< 1.0	< 10
Methylene chloride	< 10	86.63	< 10
1,1,2,2-Tetrachloroethane	< 10	< 1.0	< 10
Tetrachloroethylene	< 10	< 1.0	79
Toluene	< 10	28.88	< 10
1,2-Trans-Dichloroethylene	< 10	< 1.0	< 10
1,1,1-Trichloroethane	< 10	< 1.0	< 10
1,1,2-Trichloroethane	< 10	< 1.0	< 10
Trichloroethylene	< 10	103.7	< 10
Trichlorofluoromethane	< 10	< 1.0	< 10
Vinyl chloride	< 10	< 1.0	< 10
Xylene	< 10	3139	< 10

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GC/MS FRACTION - ACID COMPOUNDS			
2-Chlorophenol	< 0.1	< 1	< 0.1
2,4-Dichlorophenol	< 0.1	< 1	< 0.1
2,4-Dimethylphenol	< 0.1	< 1	< 0.1
4,6-Dinitro-O-cresol	< 0.1	< 1	< 0.1
2,4-Dinitrophenol	< 0.1	< 1	< 0.1
2-Nitrophenol	< 0.1	< 1	< 0.1
4-Nitrophenol	< 0.1	< 1	< 0.1
P-chloro-M-cresol	< 0.1	< 1	< 0.1
Pentachlorophenol	< 0.1	< 1	< 0.1
Phenol	< 0.1	< 1	< 0.1
2,4,6-Trichlorophenol	< 0.1	< 1	< 0.1

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GC/MS FRACTION - BASE/ NEUTRAL COMPOUNDS			
Acenaphthene	< 0.1	< 1	< 0.1
Acenaphthylene	< 0.1	< 1	< 0.1
Anthracene	< 0.1	< 1	< 0.1
Benzidine	< 0.1	< 1	< 0.1
Benzo (a) anthracene	< 0.1	< 1	< 0.1
Benzo (a) pyrene	< 0.1	< 1	< 0.1
3,4- Benzo-fluoranthene	< 0.1	< 1	< 0.1
Benzo (ghi) perylene	< 0.1	< 1	< 0.1
Benzo (k) fluoranthene	< 0.1	< 1	< 0.1
Bis (2-chloroethoxy) methane	< 0.1	< 1	< 0.1
Bis (2-chloroethyl) ether	< 0.1	< 1	< 0.1
Bis (2-chloroisopropyl) ether	< 0.1	< 1	< 0.1
Bis (2-ethyl-hexyl) phthalate	< 0.1	< 1	< 0.1
4-Bromophenyl phenyl ether	< 0.1	< 1	< 0.1
Butyl benzyl phthalate	< 0.1	< 1	< 0.1
2-Chloronaphthalene	< 0.1	< 1	< 0.1
4-Chlorophenyl phenyl ether	< 0.1	< 1	< 0.1
Chrysene	< 0.1	< 1	< 0.1
Dibenzo (a,h) anthracene	< 0.1	< 1	< 0.1
1,2-Dichlorobenzene	< 0.1	346	< 0.1
1,3-Dichlorobenzene	< 0.1	183	< 0.1
1,4-Dichlorobenzene	< 0.1	387	< 0.1
3,3'-Dichlorobenzidine	< 0.1	< 1	< 0.1
Diethyl phthalate	< 0.1	< 1	< 0.1
Dimethyl phthalate	< 0.1	< 1	< 0.1
Di-N-Butyl phthalate	< 0.1	< 1	< 0.1
2,4-Dinitrotoluene	< 0.1	< 1	< 0.1
2,6-Dinitrotoluene	< 0.1	< 1	< 0.1
Di-N-Octyl phthalate	< 0.1	< 1	< 0.1
1,2-Diphenylhydrazine	< 0.1	< 1	< 0.1

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ACL Project No.: #0826
Date Received: 3/19/87
Report Date: 4/6/87

TEST REQUIRED	Sample Type : Soil Station # : 001 Sample #ACL : 3796 Results (ppm)	Sample Type : S & L Station # : 002 Sample #ACL : 3797 Results (ppm)	Sample Type : S.Waste Station # : 003 Sample #ACL : 3798 Results (ppm)
GC/MS FRACTION - BASE/ NEUTRAL COMPOUNDS (CONT'D)			
Fluoranthene	< 0.1	< 1	< 0.1
Fluorene	< 0.1	< 1	< 0.1
Hexachlorobenzene	< 0.1	< 1	< 0.1
Hexachlorobutadiene	< 0.1	< 1	< 0.1
Hexachlorocyclopentadiene	< 0.1	< 1	< 0.1
Hexachloroethane	< 0.1	< 1	< 0.1
Indeno (1,2,3,-cd) pyrene	< 0.1	< 1	< 0.1
Isophorone	< 0.1	< 1	< 0.1
Naphthalene	< 0.1	< 1	< 0.1
Nitrobenzene	< 0.1	< 1	< 0.1
N-Nitrosodi-methylamine	< 0.1	< 1	< 0.1
N-Nitrosodi-N-propylamine	< 0.1	< 1	< 0.1
N-Nitro-sodiphenylamine	< 0.1	< 1	< 0.1
Phenanthrene	< 0.1	< 1	< 0.1
Pyrene	< 0.1	< 1	< 0.1
1,2,4-Trichlorobenzene	< 0.1	85	3.46

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GC/MS FRACTION-PESTICIDES			
Aldrin	< 0.2	< 10	< 0.2
BHC-alpha	< 0.2	< 10	< 0.2
BHC-beta	< 0.2	< 10	< 0.2
BHC-delta	< 0.2	< 10	< 0.2
BHC-gamma	< 0.2	< 10	< 0.2
Chlordane	< 0.2	< 10	< 0.2
4,4'-DDT	< 0.2	< 10	< 0.2
4,4'-DDE	< 0.2	< 10	< 0.2
4,4'-DDD	< 0.2	< 10	< 0.2
Dieldrin	< 0.2	< 10	< 0.2
Endosulfan-alpha	< 0.2	< 10	< 0.2
Endosulfan-beta	< 0.2	< 10	< 0.2
Endosulfan sulfate	< 0.2	< 10	< 0.2
Endrin	< 0.2	< 10	< 0.2
Endrin aldehyde	< 0.2	< 10	< 0.2
Heptachlor	< 0.2	< 10	< 0.2
Heptachlor epoxide	< 0.2	< 10	< 0.2
Toxaphene	< 0.2	< 10	< 0.2
PCB-1242	< 0.2	< 10	< 0.2
PCB-1254	< 0.2	< 10	298
PCB-1221	< 0.2	< 10	< 0.2
PCB-1232	< 0.2	< 10	< 0.2
PCB-1248	< 0.2	< 10	< 0.2
PCB-1260	< 0.2	< 10	< 0.2
PCB-1016	< 0.2	< 10	< 0.2

RC 8/13/87
cj w

ACL

ADVANCED CHEMISTRY LABS, INC.

DR. STEVE N. TSOUKALAS
CHIEF CHEMIST

P.O. BOX 88610 • ATLANTA, GEORGIA 30356
TELEPHONE (404) 455-1266

Client: HAZTECH, INC.
5280 Panola Industrial Blvd.
Decatur, GA 30035

Attention: Jack Scott

Client Project No.: #321-87-636
ACL Project No.: #0826
Date Received:
Report Date: 7/6/87

STATION: Soil #001
ACL #3796

EP-Toxicity Chromium = < 0.02

US 70 Dump

Steve Tsoukalas, Ph.D.
Director of Chemistry

Ref. 7

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

12 August 1986

TO: CERCLA Unit Staff

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 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

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.

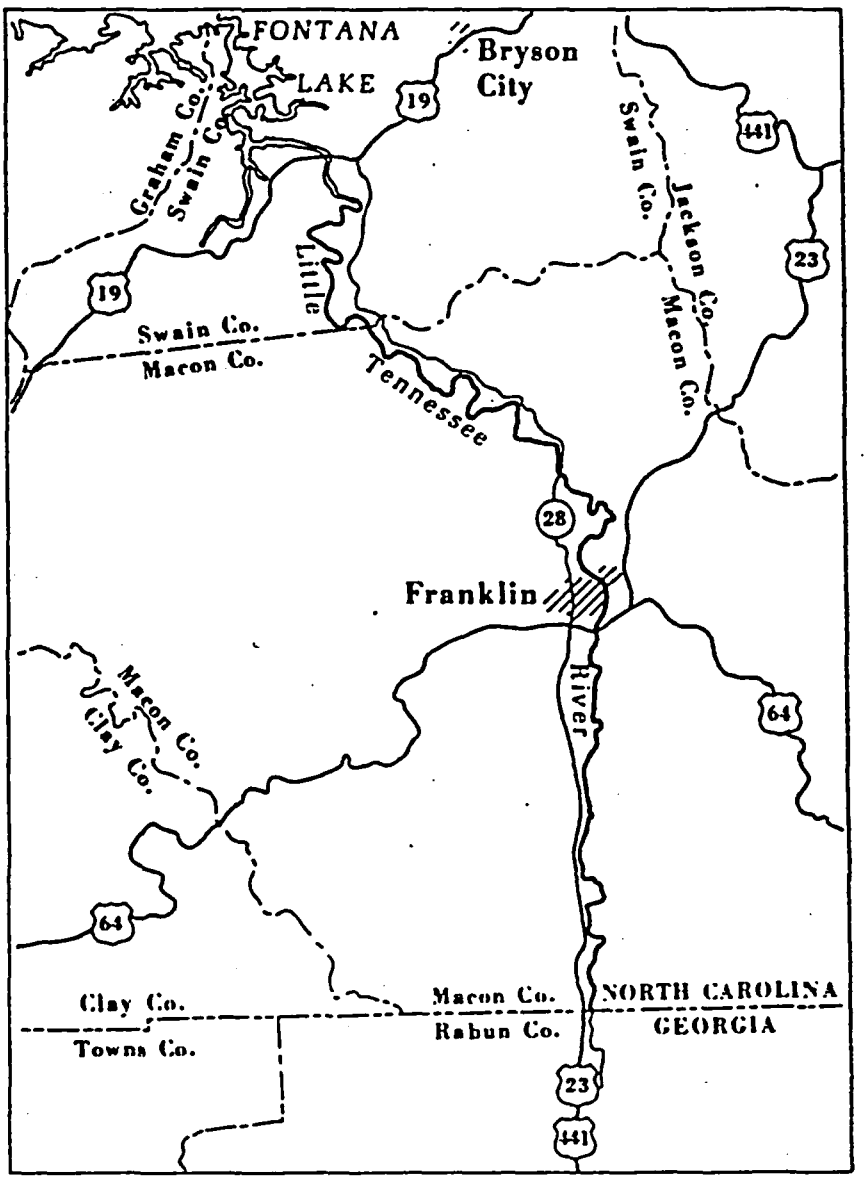
Sincerely yours,

Warren T. Parker
Field Supervisor

NORTH CAROLINA - Critical Habitat

Hybopsis monacha, "spotfin chub"

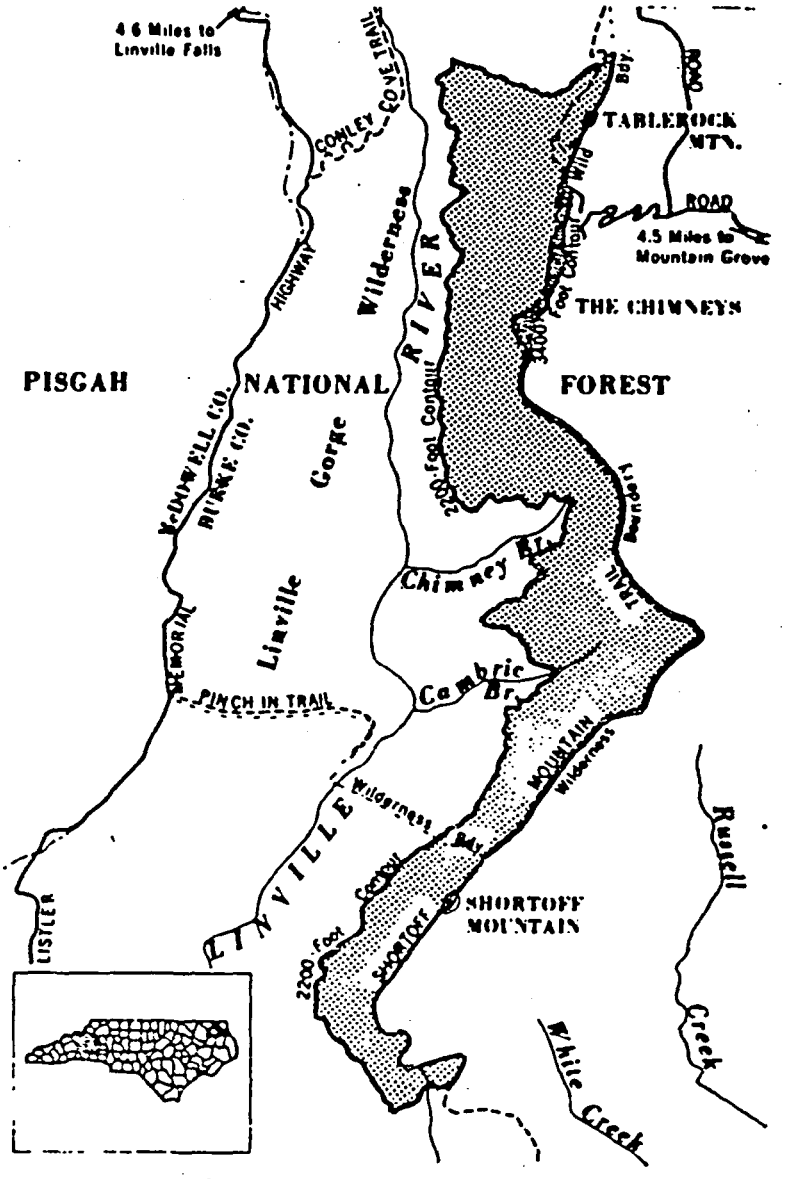
Macon and Swain Counties. Little Tennessee River, main channel from the backwaters of Fontana Lake upstream to the North Carolina-Georgia state line.



NORTH CAROLINA - Critical Habitat

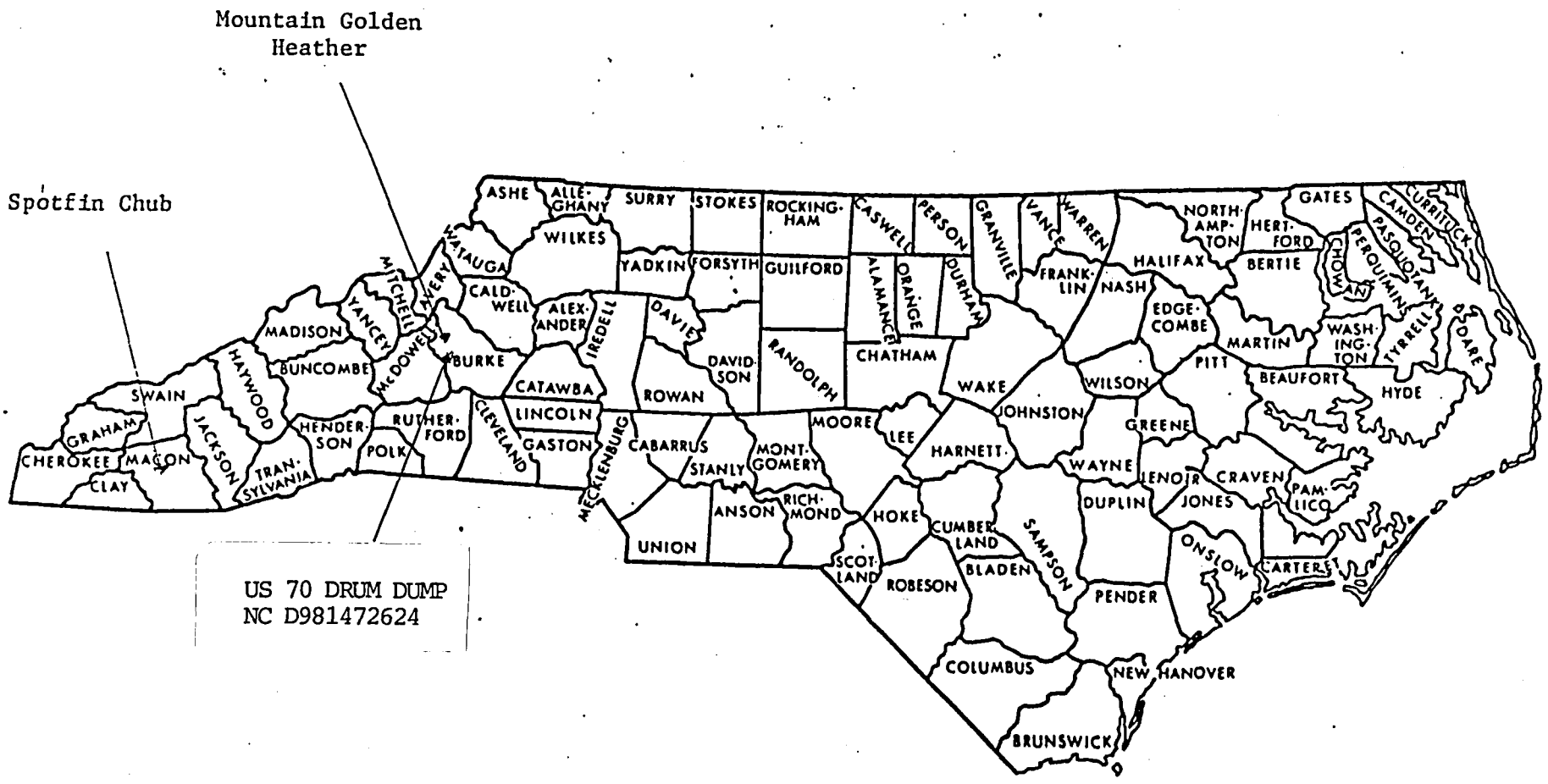
Hudsonia montana, "mountain golden heather"

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

$$R = \frac{C_{TRS}}{C_{RG}} \times 100 \quad \text{Eq. 15A-A}$$

7. Bibliography

1. American Society for Testing and Materials. Annual Book of ASTM Standards. Part 31: Water, Atmospheric Analysis. Philadephia, Pennsylvania. 1974. p. 40–42.
2. Blosser, R.O., H.S. Oglesby, and A.K. Jain. A study of Alternate SO_2 Scrubber Designs Used for TRS Monitoring. National Council of the Paper Industry for Air and Stream Improvement, Inc., New York, New York. Special Report 77–05. July 1977.
3. Curtis, F., and G.D. McAlister. Development and Evaluation of an Oxidation/Method 6 TRS Emission Sampling Procedure. Emission Measurement Branch, Emission Standards and Engineering Division, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711. February 1980.
4. Gellman, I. A Laboratory and Field Study of Reduced Sulfur Sampling and Monitoring Systems. National Council of the Paper Industry for Air and Stream Improvement, Inc., New York, New York. Atmospheric Quality Improvement Technical Bulletin No. 81. October 1975.
5. Margeson, J.H., J.E. Knoll, M.R. Midgett, B.B. Ferguson, and P.J. Schworer. A Manual Method for TRS Determination. Journal of Air Pollution Control Association. 35:1280–1286. December 1985.

[FR Doc. 86-15268 Filed 7-10-86; 8:45 am]

BILLING CODE 6560-50-M

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Proposal to List the Cape Fear Shiner as an Endangered Species with Critical Habitat

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: The Service proposes to list the Cape Fear shiner (*Notropis mekistocholas*) as an endangered species with critical habitat under the Endangered Species Act of 1973, as amended. This fish has recently undergone a reduction in range and population. It is currently known from only three small populations in the Cape Fear River drainage in Randolph, Moore, Lee, and Chatham Counties, North Carolina. Due to the species' limited distribution, any factor that degrades habitat or water quality in the short river reaches it inhabits—e.g., land use changes, chemical spills, wastewater discharges, impoundments, changes in stream flow, or increases in agricultural runoff—could threaten the species' survivial. Comments and information pertaining to this proposal are sought from the public.

DATES: Comments from all interested parties must be received by September 9, 1986. Public hearing requests must be received by August 25, 1986.

ADDRESSES: Comments and materials concerning this proposal should be sent to Field Supervisor, Endangered Species Field Office, U.S. Fish and Wildlife Service, 100 Otis Street, Room 224, Asheville, North Carolina 28801. Comments and materials received will be available for public inspection, by appointment, during normal business hours at the above address.

FOR FURTHER INFORMATION CONTACT: Richard G. Biggins, at the above address (704/259-0321 or FTS 672-0321).

SUPPLEMENTARY INFORMATION:

Background

The Cape Fear shiner (*Noropis mekistocholas*), the only endemic fish known from North Carolina's Cape Fear River drainage, was discovered in 1962 and described by Snelson (1971). This fish has been collected from nine stream reaches in North Carolina (Bear Creek, Rocky River, and Robeson Creek, Chatham County; Fork Creek, Randolph County; Deep River, Moore and Randolph Counties; Deep River, Chatham and Lee Counties; and Cape Fear River, Kenneth Creek, and Parkers Creek, Harnett County (Snelson 1971, W. Palmer and A. Braswell, North Carolina State Museum of Natural History, personal communication 1985, Pottern and Huish 1985, 1986). Based on a recently completed Service-funded study (Pottern and Huish 1985, 1986) involving extensive surveys in the Cape Fear River Basin (including all historic sites) and a review of historical fish collection records from the Cape Fear, Neuse, and Yadkin River systems, the fish is now restricted to only three populations. The strongest population (101 individuals collected in 1984 and 1985) is located around the junction of the Rocky River and Deep River in Chatham and Lee Counties where the fish inhabits the Deep River from the upstream limits of the backwaters of Locksville Dam upstream to the Rocky River then upstream from the Rocky River to Bear Creek and upstream from Bear Creek to the Chatham County Road 2156 Bridge. A few individuals were collected just downstream of the Locksville Dam, but because of the limited extent of Cape Fear shiner habitat at this site, it is not believed this is a separate population. Instead, it is thought these fish represent a small number of individuals that periodically drop down from the population above Locksville Dam pool.

The second population, represented by the collection of a specimen near State Highway Bridge 902 in Chatham County, is located above the Rocky River Hydroelectric Dam. This population was historically the best, but the area yielded only the one specimen after extensive surveys by Pottern and Huish (1985). The third population was found in the Deep River system in Randolph and Moore Counties. This population is believed to be small (Pottern and Huish 1985, 1986). Three individuals were found above the Highfalls Hydroelectric Reservoir; one in Fork Creek, Randolph County, and two in the Deep River, Moore County. The species was also found downstream of the highfalls Dam. However, the extent of suitable habitat in this stream reach is limited, and it is thought that these individuals likely result from downstream movement from above the reservoir where Cape Fear shiner habitat is more extensive.

The Caper Fear shiner is small, rarely exceeding 2 inches in length. The fish's body is flushed with a pale silvery yellow, and a black band runs along its sides (Snelson 1971). The fins are yellowish and somewhat pointed. The upper lip is black, and the lower lip bears a thin black bar along its margin. The Cape Fear shiner, unlike most other members of the large genus *Notropis*, feeds extensively in plant material, and its digestive tract is modified for this diet by having an elongated, convoluted intestine. The species is generally associated with gravel, cobble, and boulder substates and has been observed to inhabit slow pools, riffles, and slow runs (Snelson 1971, Pottern and Huish 1985). In these habitats, the species is typically associated with schools of other related species, but it is never the numerically dominant species. Juveniles are often found in slackwater, among large rock outcrops in mid-stream, and in flooded side channels and pools (Pottern and Huish 1985). No information is presently available on breeding behavior, fecundity, or longevity.

The Cape Fear shiner may always have existed in low numbers. However, its recent reduction in range and its small population size (Pottern and Huish 1985, 1986) increases the species' vulnerability to a catastrophic event, such as a toxic chemical spill. Dam construction in the Cape Fear system has probably had the most serious impact on the species by inundating the species' rocky riverine habitat. Dams

presently under study by the U.S. Department of the Army, Corps of Engineers (COE), for the Deep River and changes in flow regulation at existing hydroelectic facilities could further threaten the species. The deterioration of water quality has likely been another factor in the species' decline. The North Carolina Department of Natural Resources and Community Development (1983) classified water quality in the Deep River, Rocky River, and Bear Creek as good to fair, and referred to the Rocky river below Siler City as an area where their sampling indicates degradation. That report also stated: "Within the Cape Fear Basin, estimated average annual soil losses from cropland ranged from 3 tons per acre in the lower basin to 12 tons in the headwaters." The North Carolina State Division of Soil and Water Conservation considers 5 tons of soil loss per acre as the maximum allowable.

The Cape Fear shiner was one of 29 fish species included in a March 18, 1975, Notice of Review published by the Service in the Federal Register (40 FR 12297). On December 30, 1982, the Service announced in the Federal Register (47 FR 58454) that the Cape Fear shiner, along with 147 other fish species, was being considered for possible addition to the list of Endangered and Threatened Wildlife. On April 4, 1985, the Service notified Federal, State, and local governmental agencies and interested parties that the Asheville Endangered Species Field Station was reviewing the species' status. That notification requested information on the species' status and threats to its continued existence. Twelve responses to the April 4, 1985, notification were received. The COE, Wilmington District; North Carolina Division of Parks and recreation, Natural Heritage Program; and the North Carolina State Museum of Natrual History provided for the species. Concern for the species' welfare was also expressed by private individuals. The other respondents provided no information on threats, and did not take a position on the species' status. The Cape Fear shiner was included in the Services' September 18, 1985, Notice of review of Vertebrate Wildlife (50 FR 37958) as a category 1 species, indicating that the Service had substantial biological data to support a proposal to list the species as endangered or threatened.

Summary of Factors Affecting the Species

Section 4(a)(1) of the Endangered Species Act (16 U.S.C. 1531 *et seq.*) and regulations (50 CFR Part 424) promulgated to implement the listing provisions of the Act set forth the procedures for adding species to the Federal Lists. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). These factors and their application to the Cape Fear shiner (*Notropis mekistocholas*) are as follows:

A. *The present or threatened destruction, modification, or curtailment of its habitat or range.* A review of historic collection records (Snelson 1971, W. Palmer and A. Braswell personal communication 1985), along with recent survey results (Pottern and Huish 1985, 1986), indicates that the Cape Fear shiner is presently restricted to only three populations (see "Background" section). Three historic populations have apparently been extirpated (Pottern and Huish 1985, 1986). Robeson Creek, Chatham County, was believed lost when Jordan Lake flooded part of the creek. The reasons for the loss of populations from Parkers Creek and Kenneth Creek in Harnett County are not known. The shiner has also not been recollected (Pottern and Huish 1985) from the Cape Fear River in Harnett County. However, review of historical and current collection records reveals that only one specimen has ever been collected from this river, and the fish likely was a stray individual from an upstream or tributary population. Since much of the Deep, Haw, and Cape Fear Rivers and their major tributaries has been impounded for hydroelectric power, and much of the rocky shoal habitat inundated, other populations and population segments that were never discovered have likely been lost to these reservoirs.

Of the three remaining populations, only the one located around the confluence of the Deep and Rocky Rivers in Chatham and Lee Counties (inhabiting a total of about 7.3 river miles) appears strong (Pottern and Huish 1985). The second population in the Rocky River, above the Rocky River hydroelectric facility, was the source of the type specimens used to describe the species (Snelson 1971). Historic records (W. Palmer and A. Braswell, personal communication 1985) reveal that collections of 15 to 30 specimens could be expected in this stretch of the Rocky River (State Route 902 or Chatham County Road 1010 Bridge) during a sampling visit in the late 1960s and early 1970s. Pottern and Huish (1985) sampled the Rocky River throughout this reach on numerous occasions and were able to collect only one specimen. The reason for the apparent decline in this population is unknown. The third population, located in the Deep River system in Moore and Randolph Counties, is represented by the collection of six individuals (Pottern and Huish 1986). Three individuals were taken from below the dam. As the available habitat below the dam is limited, it is believed these fish are migrants from the upstream population.

Potential threats to the species and its habitat could come from such activities as road construction, stream channel modification, changes in stream flows for hydroelectric power, impoundments, land use changes, wastewater discharges, and other projects in the watershed if such activities are not planned and implement with the survival of the species and the protection of its habitat in mind. The species is also potentially threatened by two U.S. Army Corps of Engineers projects presently under review for the Deep River. The Randleman Dam project would consist of a reservoir of the Deep River in Randolph County, above known Cape Fear shiner habitat. The Howards Mill Reservoir would be on the Deep River in Moore and Randolph Counties and would flood presently used Cape Fear shiner habitat.

B. *Overutilization for commercial, recreational, scientific, or educational purposes.* Most of the present range of the Cape Fear shiner is relatively inaccessible and overutilization of the species has not been and is not expected to be a problem.

C. *Disease or predation.* Although the Cape Fear shiner is undoubtedly consumed by predatory animals, there is no evidence that this predation is a threat to the species.

D. *The inadequacy of existing regulatory mechanisms.* North Carolina State law (Subsection 113-272.4) prohibits collecting wildlife and fish for scientific purposes without a State permit. However, this State law does not protect the species' habitat from the potential impacts of Federal actions. Federal listing will provide protection for the species under the Endangered Species Act by requiring a Federal permit to take the species and requiring Federal agencies to consult with the Service when projects they fund, authorize, or carry out may affect the species.

E. *Other natural or manmade factors affecting its continued existence.* The major portion of the best Cape Fear shiner population is located at the junction of the Deep and Rocky Rivers in Chatham and Lee Counties. A major toxic chemical spill at the U.S. Highway 15-105 Bridge upstream of this site on

the Rocky River could jeopardize this population, and as the other populations are extremely small and tenuous, the species' survival could be threatened.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by this species in determining to propose this rule. Based on this evaluation, the preferred action is to list the Cape Fear shiner (*Notropis mekistocholas*) as an endangered species. Because of the species' restricted range and vulnerability of these isolated populations to a single catastrophic accident, threatened status does not appear to be appropriate for this species (see "Critical Habitat" section for a discussion of why critical habitat is being proposed for the Cape Fear shiner).

Critical Habitat

Critical habitat, as defined by section 3 of the Act means: (i) The specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protection, and (ii) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Section 4(a)(3) of the Act requires that critical habitat be designated to the maximum extent prudent and determinable concurrently with the determination that a species is endangered or threatened. Critical habitat is being proposed for the Cape Fear shiner to include: (1) Approximately 5 miles of the Rocky River in Chatham County, North Carolina; (2) approximately 8 miles of Bear Creek, Rocky River, and Deep River in Chatham and Lee Counties, North Carolina; (3) approximately 6 miles of Fork Creek and Deep River in Randolph and Moore Counties, North Carolina.

(See "Regulation Promulgation" section for this proposed rule for the precise description of critical habitat.) These stream sections contain gravel, cobble, and boulder substrates with pools, riffles, and shallow runs for adult fish and slackwater areas with large rock outcrops and side channels and pools for juveniles. These areas also provide water of good quality with relatively low silt loads.

Section 4(b)(8) requires, for any proposed or final regulation that designates critical habitat, a brief description and evaluation of those activities (public or private) that may adversely modify such habitat or may be affected by such designation. Activities which presently occur within the designated critical habitat include, in part, fishing, boating, scientific research, and nature study. These activities, at their present use level, do not appear to be adversely impacting the area.

There are also Federal activities that do or could occur within the Deep River Basin and that may be affected by protection of critical habitat. These activities include, construction of impoundments (in particular, U.S. Army Corps of Engineers reservoirs under study for the upper Deep River), stream alterations, bridge and road construction, and discharges of municipal and industrial wastes, and hydroelectric facilities. These activities could, if not carried out with the protection of the species in mind, degrade the water and substrate quality of the Deep River, Rocky River, Bear Creek, and Fork Creek by increasing siltation, water temperatures, organic pollutants, and extremes in water flow. If any of these activities may affect the critical habitat area and are the result of a Federal action, section 7(a)(2) of the Act, as amended, requires the agency to consult with the Service to ensure that actions they authorize, fund, or carry out, are not likely to destroy or adversely modify critical habitat.

Section 4(b)(2) of the Act requires the Service to consider economic and other impacts of designating a particular area as critical habitat. The Service will consider the critical habitat designation in light of all additional relevant information obtained at the time of final rule.

Available to Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Endangered Species Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies, groups, and individuals. The Endangered Species Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. Such actions are initiated by the Service following listing. The protection required of Federal agencies and the prohibitions against taking and harm are discussed, in part, below.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to it critical habitat, if any is being proposed or designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR Part 402 (see revision at 51 FR 19926; June 3, 1986). Section 7(a)(4) requires Federal agencies to confer informally with the Service on any action that is likely to jeopardize the continued existence of a proposed species or result in the destruction or adverse modification of proposed critical habitat. If a species is subsequently listed, section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with the Service. The Service is presently aware of only two Federal actions under consideration (Randleman and Howards Mill Reservoirs) that may affect the species and the proposed critical habitat. The Service has been in contact with the U.S. Army Corps of Engineers concerning the potential impacts of these projects on the species and its habitat. The Act and implementing regulations found at 50 CFR 17.21 set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to take, import or export, ship in interstate commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. It also is illegal to prossess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions would apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered wildlife species under certain circumstances. Regulations governing permits are at 50 CFR 17.22 and 17.23. Such permits are available for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in connection with otherwise lawful activities. In some instances, permits may be issued during a specified period of time to relieve undue economic hardship that would be suffered if such relief were not available.

Public Comments Solicited

The Service intends that any final action from this proposal will be as accurate and as effective as possible. Therefore, any comments or suggestions from the public, other concerned governmental agencies, the scientific community, industry, or any other interested party concerning any aspect of this proposal are hereby solicited. Comments particularly are sought concerning:

(1) Biological, commercial trade, or other relevant data concerning any threat (or lack thereof) to this species;

(2) The location of any additional populations of this species and the reasons why any habitat should or should not be determined to be critical habitat as provided by section 4 of the Act;

(3) Additional information concerning the range and distribution of this species;

(4) current or planned activities in the subject area and their possible impacts on this species; and

(5) Any foreseeable economic and other impacts resulting from the proposed designation of critical habitat.

Final promulgation of the regulations on this species will take into consideration the comments and any additional information received by the Service, and such communications may lead to adoption of a final regulation that differs from this proposal.

The Endangered Species Act provides for a public hearing on this proposal, if requested. Requests must be filed within 45 days of the date of the proposal. Such requests must be made in writing and addressed to the Endangered Species Field Office, 100 Otis Street, Room 224, Asheville, North Carolina 28801.

National Environmental Policy Act

The Fish and Wildlife Service has determined that an Environmental Assessment, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the Federal Register on October 25, 1983 (48 FR 49244).

References Cited

North Carolina Department of Natural Resources and Community Development. 1983. Status of Water Resources in the Cape Fear River Basin. 135 pp.

Pottern, G.B., and M.T. Huish. 1985. Status survey of the Cape Fear shiner (*Notropis mekistocholas*). U.S. Fish and Wildlife Service Contract No. 14-16-0009-1522. 44 pp.

Pottern, G.B., and M.T. Huish. 1986. Supplement to the status survey of the Cape Fear shiner (*Notropis mekistocholas*). U.S. Fish and Wildlife Service Contract No. 14-16-0009-1522. 11 pp.

Snelson, F.F. 1971. *Notropis mekistocholas*, a new cyprinid fish endemic to the Cape Fear River basin, North Carolina. Copeia 1971:449-462.

Author

The primary author of this proposed rule is Richard G. Biggins, Endangered Species Field Office, 100 Otis Street, Room 224, Asheville, North Carolina 28801 (704/259-0321 or FTS 672-0321).

List of Subjects in 50 CFR Part 17

Endangered and threatened wildlife, Fish, Marine mammals, Plants (agriculture).

Proposed Regulations Promulgation.

PART 17—[AMENDED]

Accordingly, it is hereby proposed to amend Part 17, Subchapter B of Chapter I, Title 50 of the Code of Federal Regulations, as set forth below:

1. The authority citation for Part 17 continues to read as follows:

Authority: Pub. L. 93-205, 87 Stat. 884; Pub. L. 94-359, 90 Stat. 911; Pub. L. 95-632, 92 Stat. 3751; Pub. L. 96-159, 93 Stat. 1225; Pub. L. 97-304, 96 Stat. 1411 (16 U.S.C. 1531 *et seq.*).

2. It is proposed to amend § 17.11(h) by adding the following, in alphabetical order under "FISHES," to the List of Endangered and Threatened Wildlife:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Species: Common name	Species: Scientific name	Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
FISHES							
Shiner, Cape Fear	*Notropis mekistocholas*	U.S.A. (NC)	Entire	E		17.95(e)	NA

3. It is further proposed to amend § 17.95(e) by adding critical habitat of the "Cape Fear shiner," in the same alphabetical order as the species occurs in § 17.11(h).

§ 17.95 Critical habitat—fish and wildlife.

(e) * * *

* * * * *

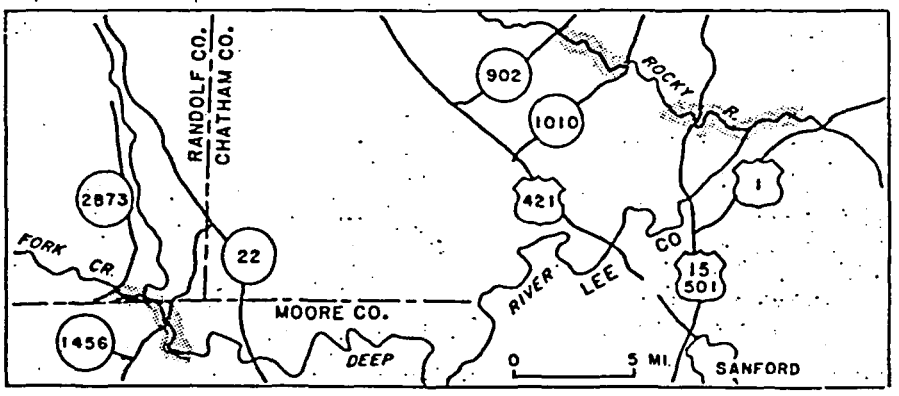
Cape Fear Shiner

(Notropis mekistocholas)

(1) *North Carolina.* Chatham County. Approximately 4.1 miles of the Rocky River from North Carolina State Highway 902 Bridge downstream to Chatham County Road 1010 Bridge;

(2) *North Carolina.* Chatham and Lee Counties. Approximately 0.5 miles of Bear Creek, from Chatham County Road 2156 Bridge downstream to the Rocky River, then downstream in the Rocky River (approximately 4.2 miles) to the Deep River, then downstream in the Deep River (approximately 2.6) in Chatham and Lee Counties, to a point 0.3 river miles below the Moncure, North Carolina, U.S. Geological Survey Gaging Station; and

(3) *North Carolina.* Randolph and Moore Counties. Approximately 1.5 miles of Fork Creek, from a point 0.1 creek miles upstream of Randolph County Road 2873 Bridge downstream to the Deep River then downstream appoximately 4.1 miles to the Deep River in Randolph and Moore Counties, North Carolina, to a point 2.5 river miles below Moore County Road 1456 Bridge.



10

Constituent elements include clean streams with gravel, cobble, and boulder substrates with pools, riffles, shallow runs and slackwater areas with large rock outcrops and side channels and pools with water of good quality with relatively low silt loads.

* * * * *

Dated: May 30, 1986.

P. Daniel Smith,

Acting Assistant Secretary for Fish and Wildlife and Parks.

[FR Doc. 86-15643 Filed 7-10-86; 8:45 am]

BILLING CODE 4310-55-M

15 June 1987

To: File

From: Pat DeRosa

Re: US 70 Drum Dump
NCD 981472624

On June 10, 1987, I spoke with Dick Caspar, Water Supply Branch, NC DHR, Raleigh, NC (919) 733-2321 regarding surface water supply intake within 3 miles downstream of the subject site. According to Branch records, there are no intakes located within 3 miles downstream of the probable point of entry of contaminants from the site to surface water. The nearest intake is located on the Catawba River approximately 10 miles downstream of the site. This intake serves the City of Morganton water supply system.

PD/pw/0384b

June 16, 1987

TO: File

FROM: Pat DeRosa PD

RE: US 70 Drum Dump
NCD 981472624

On June 11, 1987, I spoke by telephone with Leslie Miller, Agricultural Extension Agent, Burke County, NC (704) 433-4050. I described the site area and downstream surface water segment to Mr. Miller. Mr. Miller knew of no wells in the area used for irrigation. He also knew of no irrigation of food crops from Reedy Creek to the Catawba River 3 miles downstream of the site.

PD/pw/0384b

7/8/86 - US 70 Drum Site

Pat DeRosa
Mary Cigueroa
Lee Crosby

- Arrived at Jim Crawley residence 8:25 AM
sunny, 75°F, no wind
(704) 584-0627 business
-2694 home

pump hooked up, well not currently in use
leak in line, couldn't take sample
well ~65 ft deep

HNu bkgd reading
1 ppm ~ 9:15 AM

— well at
Ray Allison, residence
also serves neighboring
home Buster x
Rt 2 Box 416
Mocksville
→ 584-2554
>3 PM
well depth
→ drilled well
≥15 yrs old
-Rich

well located ~400 ft from
site
samples 11:25 AM

Ref. 11

Temp 33.5°C outdoor

Water -
temp 18.5°C
ph - 6.0
Conductivity 8.1 µmho
200 scale

→ this well is located
~ 400 feet west of the site
- and upgradient during sampling T ≈ 90°C

sample #1 - 9^50 AM
white-rubbery resin
material from open drum on
south end of drum pile.
10 org, 9 inorg.

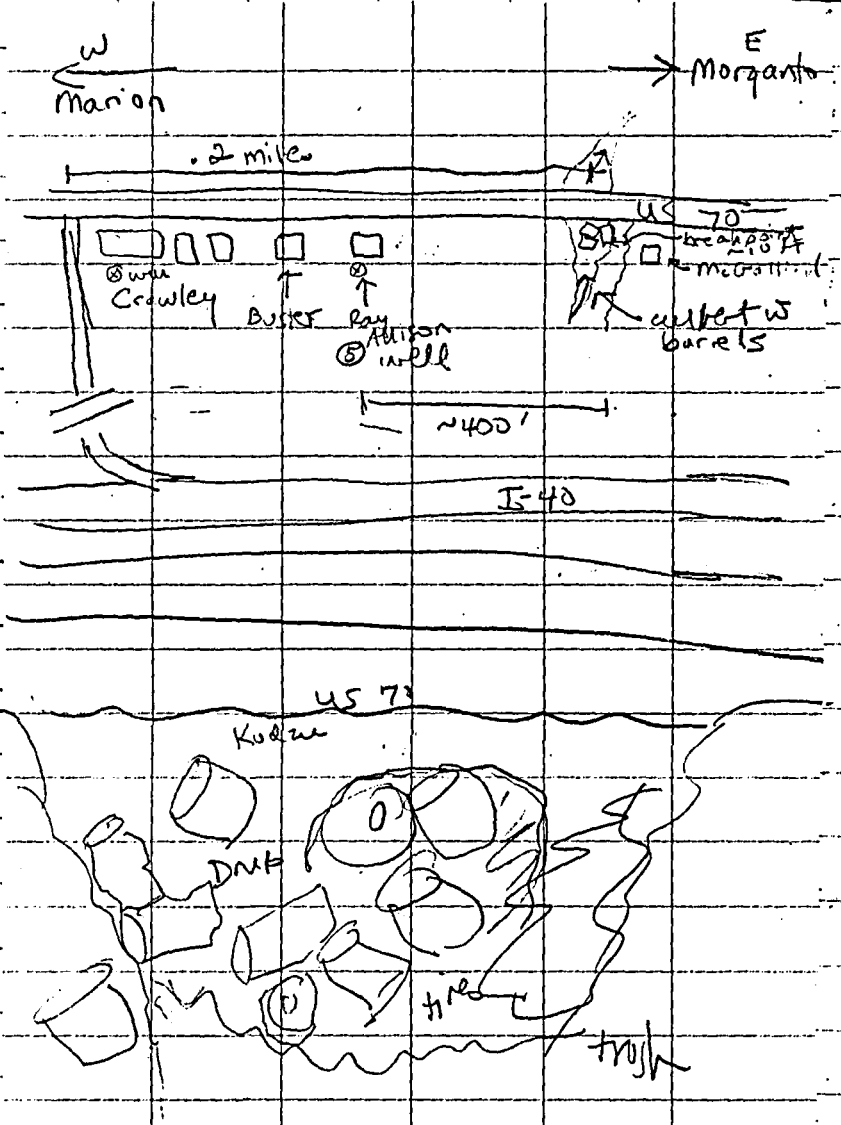
sample #2 - 10^20 AM
gooey material pulled
on soil, mulled coarse
south end texture.
10 org, 1 inorg

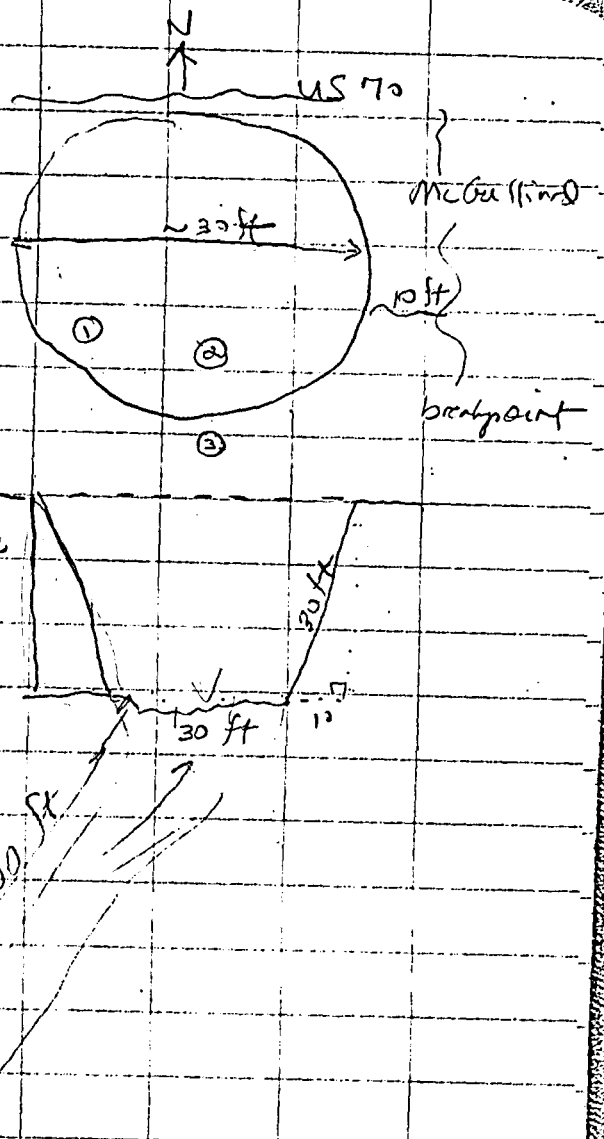
sample #3 - 10^30 AM
upgradient
soil sample ~ 5 ft south of
drum pile 10 org, 1 inorg.

sample #4 - 10^40 AM
bkgd soil sample ~ 150 ft
upgradient of drum pile
on west bank, 10 org, 1 inorg.

sample #5 11^25 AM
well from outside tap at
the home of Ray Allison
2 VOA, 1-2l, 2 cubes.

Note ~ 20-30 rusted barrels
in culvert on south
side of US 70 ~ .2 mile east
from turn off to I-40


W
Marion
E
Morganto
.2 miles
US 70
breakpoint
~10 ft
McCullind
Crowley
Buster
Ray
Allison
Well
wellset w
barrels
~400'
I-40
US 70
Kodak
DNR
tires
trash


N
US 70
McCullind
~30 ft
10 ft
breakpoint
~ 3 9/10 slope
30 ft
30 ft
10'
200 ft

NCD 981 472 624
US 70 Drum Dump — Pat DeRosa

Notes taken during site during SI July 7-8, 1986

1. send copy of report to Dale Meyer, EMS

2. Persons present at site on Wed. July 2, 1986 as per Keith Masters:

(704) 688-4237 ① Keith Masters, RCRA, S+HWM Br.
② Larry Fox, RCRA, S+HWM Br.
(704) 437-1911 ③ Nick Waters, Burke County Emergency Management Service
④ Dale Meyer, "
H(704) 663-7622
(W)(704) 663-1699 ⑤ Mike Parker, DEM Mooresville
⑥ John Angley, brother-in-law of Jim Crawley.
⑦ Homer Eppley, local resident
⑧ Jack Hughes } Crime Control + Public Safety, Morganton.
⑨ Brian Kinney }
⑩ Carl Dean, Ass't Cnty Manager
⑪ Larry Taylor, DOT

3. Contact Harry Houpe, police chief Glen Alpine about a dumping incident which occurred ~10 yrs. ago in the nearby area.

4. ~30 ft drop to culvert to top of embankment

5. According to DOT, 1 drum had a name on it, Synthron, of Morganton. LL Bott is the head of the company. He came down + identified the drum but not the material in it.

6. According to Mr McGalliard + Mr Crawley the ownership of their properties were

① McGalliard (since Jan 1, 1986)
② Tony Branch
③ Thomas "Mack" Ray { worked at Womsutter responsible for rolls of paper may not take kindly to questions
④ Jack Farris (704) 584-0355

(McGalliard property is believed to extend along eastern embankment)

① Jim Crawley (704) 584-0627 (bus)
(704) 584-2694 (work)
② Mrs Johnny Baker
③ Thomas Mack Ray (site on Crawley prop.)
④ Farris

7. Access to city water dist. has been avail 3-5 yrs Brentwood Water Supply, purchases water from Morganton.

8. Possible sources of waste

white granular material could be urea-formaldehyde resin or ammonia fertilizer??

Synthron, Fabric finishing? formaldehyde? Morganton

Tailored Chemical, Hickory (Jack Temple)

9. Elgie McGalliard (704) 584-4300

10. Samples collected by Keith or EMS 7/2/86

K
- #1 - purplish soil
- #2 - greasey-green
- #3 - barrel - white granular stuff

EMS
- #4 - surface water (liq.)
- #5 - unknown dried resiny (paint sludge?)
- #6 - white granular

Keith transferred all samples into soil jars with no aluminum foil liners.

June 16, 1987

To: File

From: Pat DeRosa PD

Re: US 70 Drum Dump
NCD 981472624

On June 15, 1987, I spoke by telephone with Robert Brown, Fisheries Biologist, Burke County, NC Wildlife Resources Commission (704) 437-1287 regarding surface water usage within 3 miles downstream of the site. I described the stream segment from Reedy Creek to Muddy Creek to the Catawba River. Mr. Brown said that parts of this stream segment support heavy fishing and canoeing.

PD/pw/0384b

Ref. 13

Bob

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

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

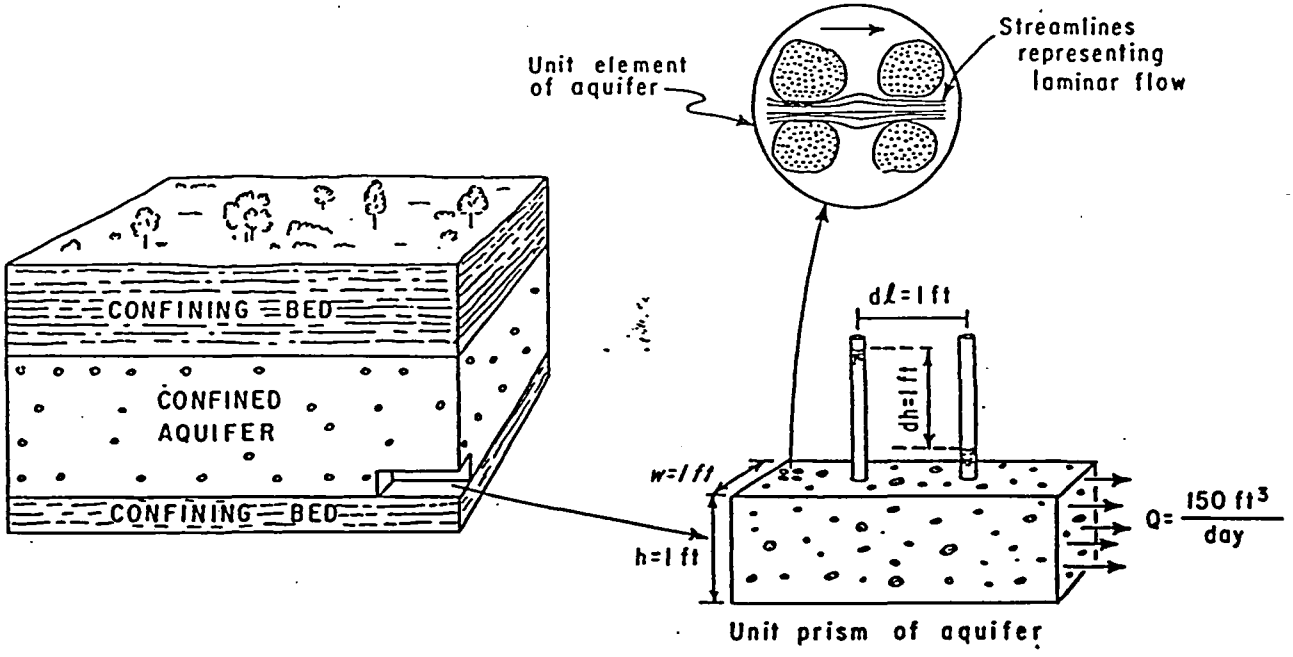
By Ralph C. Heath

U.S. Geological Survey
Water-Resources Investigations
Open-File Report 80-44

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

Raleigh, North Carolina
1980

Hydraulic Conductivity



Aquifers transmit water from recharge areas to discharge areas and thus function as pipelines. The factors controlling ground-water movement were first expressed in the form of an equation by Henry Darcy in 1856. Darcy's law is:

$$Q = KA\frac{dh}{dl} \qquad (1)$$

where

Q is the quantity of water,
K is hydraulic conductivity and depends on the size and arrangement of the water-transmitting openings (pores and fractures),
A is cross-sectional area through which the flow occurs, and
dh/dl is the hydraulic gradient.[1]

[1] Where hydraulic gradient is discussed as an independent entity, as in the preceding discussion of HEADS AND GRADIENTS, it is shown symbolically as h_L/L. Where hydraulic gradient appears as one of the factors in an equation, as in equation 1, it is shown symbolically as dh/dl to be consistent with other ground-water literature.

Because the quantity of water (Q) is directly proportional to the hydraulic gradient (dh/dl), we know that ground-water flow is *laminar* - that is, water particles tend to follow discrete streamlines and not mix with particles in adjacent streamlines.

Hydraulic conductivity is expressed in terms of a unit hydraulic gradient (such as foot per foot) in order to permit ready comparison of the water-transmitting capacity of different materials.

The units of hydraulic conductivity are those of velocity. Thus, if we rearrange equation 1 for K, we obtain

$$K = \frac{Qdl}{Adh} = \frac{(ft^3\ day^{-1})(ft)}{(ft^2)\ (ft)} = \frac{ft}{day} \qquad (2)$$

Hydraulic Conductivity of Selected Rocks

Material	Hydraulic conductivity (rounded values) (ft/day)	[(gal/day)/ft²]	(meters/day)
Coarse sand	200	1500	60
Medium sand	130	1000	40
Silt	1	5	0.2
Clay	0.001	0.01	0.0004
Limestone (Castle Hayne)	300	2000	80
Saprolite	5	50	2
Granite and gneiss	5	50	2
Slate	3	25	1

Hydraulic conductivity replaces the term "field coefficient of permeability" and should be used when referring to the water-transmitting characteristic of material in quantitative terms. It is still permissible to refer in qualitative terms to "permeable" and "impermeable" material.

PROBLEM - Determine the hydraulic conductivity of the confined aquifer shown in the preceding drawing in both feet per day and gallons per day per square foot.

(1) Solution in feet per day

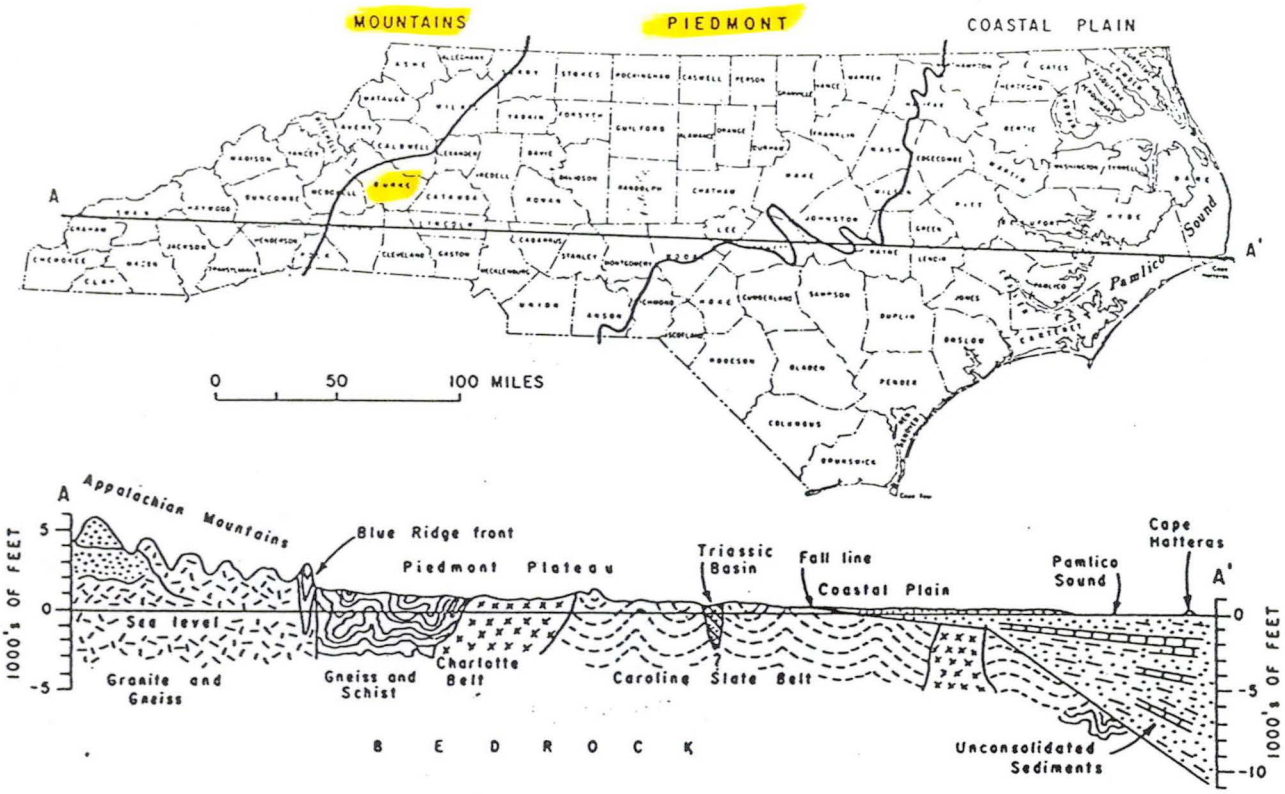
(Equation) (Q) (A) (dl/dh)

$$K = \frac{Qdl}{Adh} = \frac{150\ ft^3}{day} \times \frac{1}{ft^2} \times \frac{1\ ft}{1\ ft} = \frac{150\ ft^3}{day\ ft^2} = 150\ ft/day$$

(2) Conversion of feet per day to gallons per day per square foot

$$\frac{150\ ft^3}{day\ ft^2} \times \frac{7.5\ gal}{ft^3} = 1125\ (gal/d)/ft^2$$

Physical Setting of the Ground-Water System



From the standpoint of ground-water hydrology, North Carolina may be divided into two zones, one zone consisting of the Coastal Plain and the other consisting of the Piedmont Plateau and the Appalachian Mountains. Because differences in the ground-water system coincide with the different topographic divisions of the State, it will be useful to briefly review these divisions.

As Jasper L. Stuckey, former North Carolina State Geologist, has said, "The State of North Carolina extends from the crest of the Great Smoky and Unaka mountains on the west, to the Atlantic Ocean on the east and lies across three major topographic provinces of the United States. As a result, it is divided into three natural divisions—the Coastal Plain on the east, the Piedmont Plateau in the center, and the Appalachian Mountains on the west. Beginning at sea level at the eastern edge of the State the surface of North Carolina rises gradually in elevation and increases in irregularity until it reaches its maximum height and ruggedness in the Appalachian Mountains on the west."

The *Coastal Plain* includes almost one-half of the area of the State and extends west from the Atlantic Ocean to the *Fall Line*. The Fall Line is not a line but a zone 30 to 40 miles wide that is marked by discontinuous rapids where major streams leave the bedrock areas of the Piedmont and flow onto the unconsolidated sediments of the Coastal Plain. Altitudes in the Coastal Plain range from sea level at the coast to about 300 to 500 ft. along the Fall Line. The Coastal Plain can conveniently be divided into the Tidewater Region, in which the effect of tides and other oceanic influences are apparent, and the Inner Coastal Plain which, though underlain by unconsolidated (Coastal Plain) sediments, is not subject to direct oceanic effect.

The *Piedmont Plateau* contains about 20,000 mi², or two-fifths of the land area of the State. It lies between the Coastal Plain on the east and the Appalachian Mountains on the west. Altitudes in the Piedmont range from about 500 ft above sea level along the Fall Line to about 1500 to 2000 ft. along its western border. The Piedmont consists of well-rounded hills and long-rolling ridges with a northeast-southwest trend. Parts of the Piedmont contain prominent hills referred to as mountains, including the Uwharrie Mountains in Montgomery and Randolph Counties, the South Mountains in Burke and Rutherford Counties, and the Brushy Mountains in Wilkes County.

The Appalachian Mountains are bounded on the east by the Blue Ridge Mountains and on the west by the Great Smoky and Unaka Mountains. The mountain slopes are gentle, presenting smooth rounded outlines. The mountain region of North Carolina contains the highest peak east of the Mississippi, Mt. Mitchell at 6,684 ft., 43 peaks above 6,000 ft, and 82 peaks between 5,000 and 6,000 ft. in altitude. The eastern Continental Divide follows the Blue Ridge Mountains so that most of the mountain area drains west to the Gulf of Mexico. The streams are well graded and cascades and waterfalls are only locally abundant.

Reference: Stuckey, Jasper L., 1965, North Carolina: its geology and mineral resources: North Carolina Department of Conservation and Development, 550 p.

Water-Bearing Rocks

The rocks underlying the surface of North Carolina form the environment in which ground water occurs and moves.

Geologists divide all rocks exposed at the Earth's surface into one of two great classes: (1) igneous, or (2) sedimentary. *Igneous rocks* are those that have formed from a molten or partially-molten state. Some types of igneous rocks, including granite, solidify at great depth below the land surface and are referred to as intrusive igneous rocks. Other igneous rocks form from lava or volcanic ash ejected onto the surface and are referred to as extrusive igneous rocks.

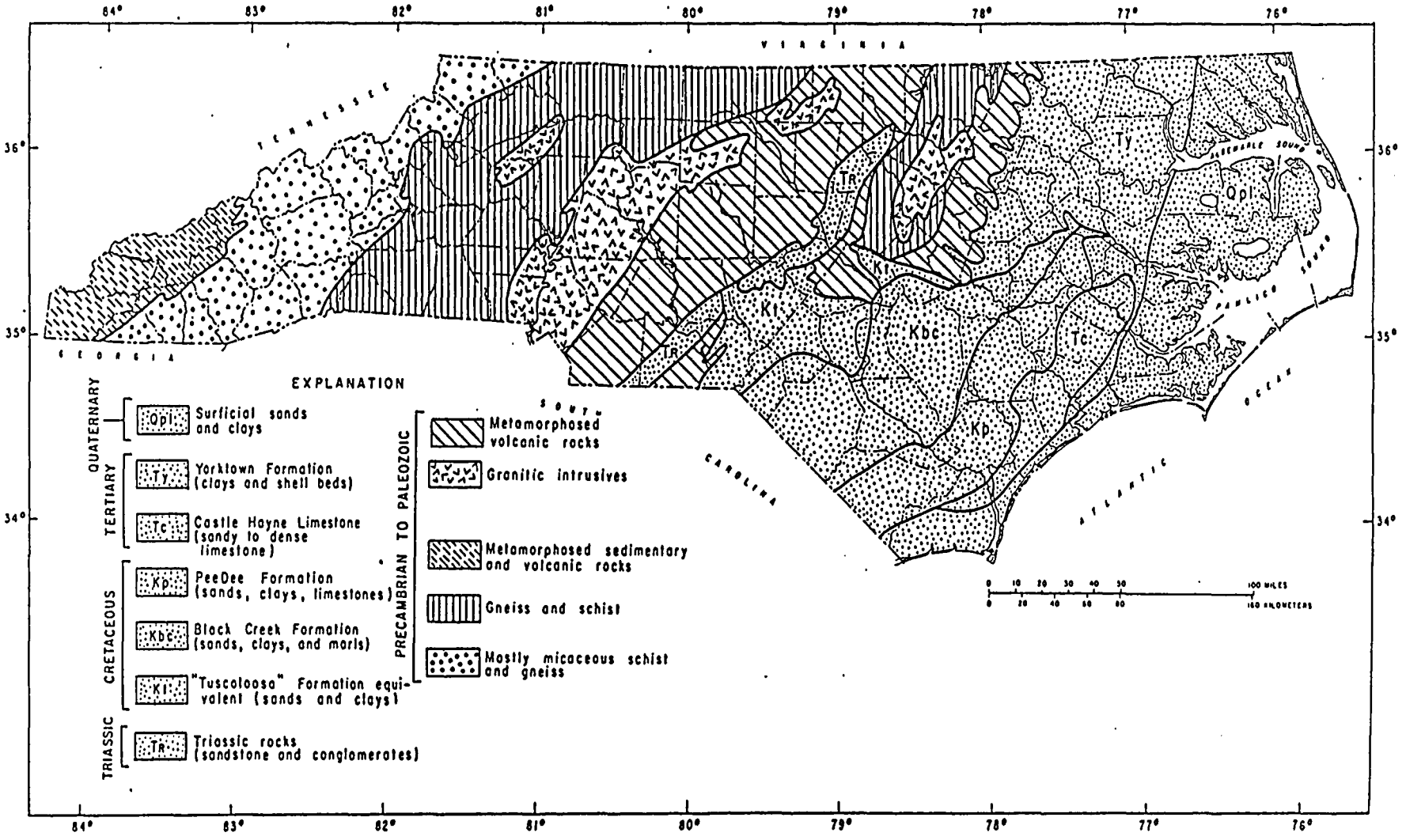
Sedimentary rocks are rocks formed by the accumulation of sediment in water or from the air. Most sedimentary rocks are unconsolidated (soil-like) at the time of formation. If they are, in time, buried deeply enough, or if they undergo certain chemical changes, they may become consolidated.

Both igneous and sedimentary rocks may, over the course of geologic time, reach depths beneath the Earth's crust at which they are subjected to great heat and pressure. This may alter both their structural characteristics and their mineral composition to such an extent that they are changed into *metamorphic rocks.* Depending on their original mode of origin, they may be referred to, for example, as metavolcanic or metasedimentary rocks.

North Carolina is underlain by an unusually large number of different types of rocks, including representatives of both the igneous and sedimentary classes and types of both classes that have been subjected to metamorphism. The major types of rocks are shown on the accompanying generalized geological map.

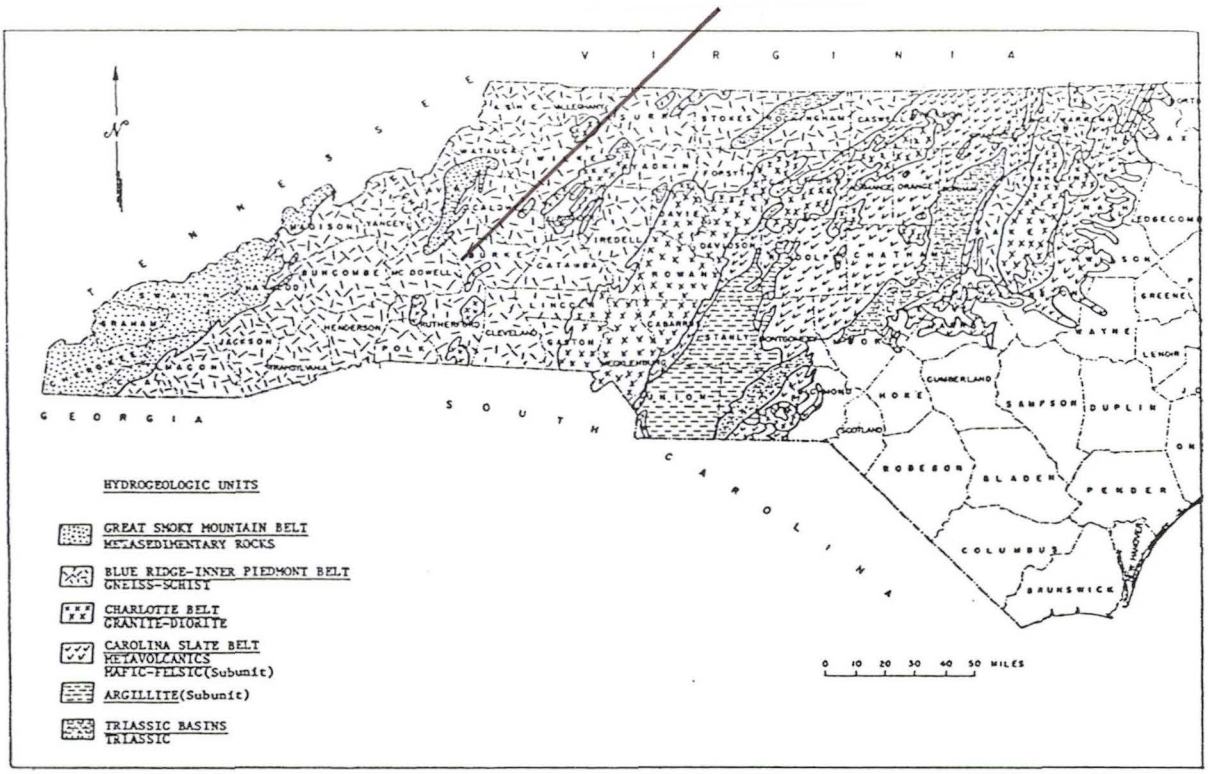
The Piedmont and mountain regions are underlain by igneous and metamorphosed igneous and sedimentary rocks that are referred to collectively as *bedrock*. They form broad northeast - southwest trending zones in which the rocks are of similar composition and origin. Most of these rocks were formed in the Precambrian and Paleozoic Erasof the Earth's history and thus are at least several hundred million years old. The bedrock in the Piedmont and mountains is exposed at the surface along steep hillsides and stream channels and in roadcuts. In most other areas they are covered by unconsolidated material formed from the breakdown of the bedrock in the process referred to by geologists as weathering. This layer of weathered material is referred to as *saprolite* or *residuum*.

The Coastal Plain region is also underlain by the same types of igneous and methamorphic rocks as those present in the Piedmont. However, in the Coastal Plain they are covered by unconcolidated sedimentary deposits which range in thickness from a few feet along the Fall Line to about 10,000 ft. at Cape Hatteras. (See the geologic section in PHYSICAL SETTING OF THE GROUND-WATER SYSTEM.) The sediments underlying the Coastal Plain include sand, clay, beds composed of seashells, and limestone.


84°
83°
82°
81°
80°
79°
78°
77°
76°
36°
35°
34°
VIRGINIA
TENNESSEE
GEORGIA
SOUTH CAROLINA
ATLANTIC OCEAN
ALBEMARLE SOUND
PAMLICO SOUND
Ty
Qpl
Tc
Kbc
Kl
Kp
TR
EXPLANATION
QUATERNARY
Qpl Surficial sands and clays
TERTIARY
Ty Yorktown Formation (clays and shell beds)
Tc Castle Hayne Limestone (sandy to dense limestone)
CRETACEOUS
Kp PeeDee Formation (sands, clays, limestones)
Kbc Black Creek Formation (sands, clays, and marls)
Kl "Tuscaloosa" Formation equivalent (sands and clays)
TRIASSIC
TR Triassic rocks (sandstone and conglomerates)
PRECAMBRIAN TO PALEOZOIC
Metamorphosed volcanic rocks
Granitic intrusives
Metamorphosed sedimentary and volcanic rocks
Gneiss and schist
Mostly micaceous schist and gneiss
0 10 20 30 40 50 100 MILES
0 20 40 60 80 160 KILOMETERS

Rock Units and Aquifers in the Piedmont and Mountains

US 70 DRUM DUMP
NC D981472624



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.

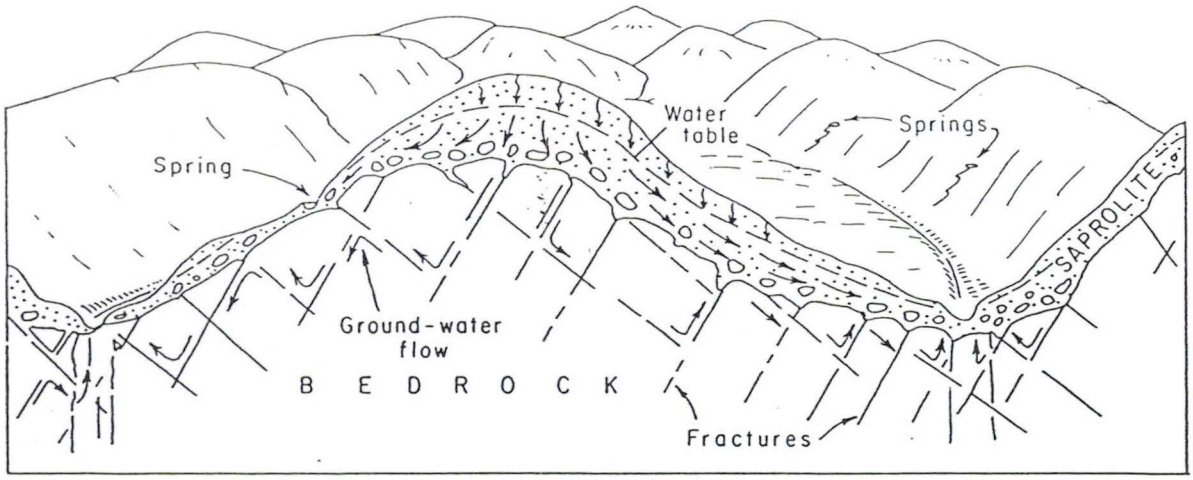
The bedrock underlying the Piedmont and mountains consists of many different types of igneous and metamorphosed igneous and sedimentary rocks. The Generalized Geological Map of North Carolina accompanying the discussion of WATER-BEARING ROCKS divides the bedrock in the Piedmont and mountains into six 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.

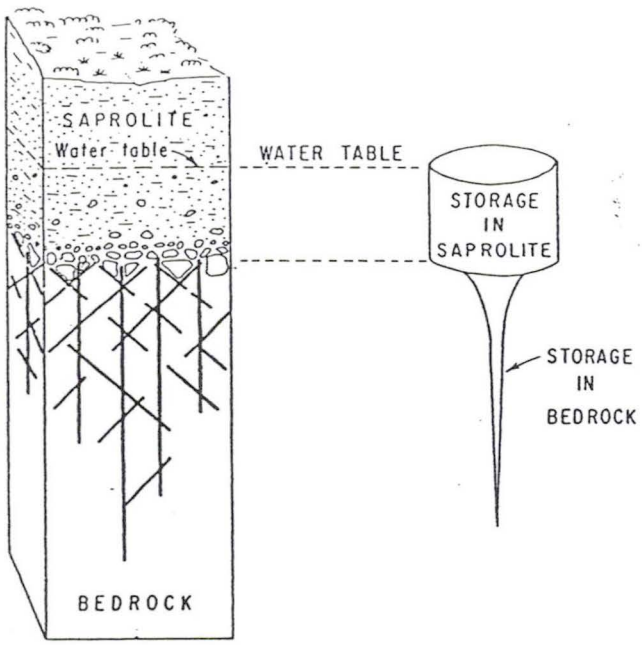
Faults are formed during earthquakes and generally contain larger and more extensive openings than those developed along joints. Joints, however, are far more numerous than faults.

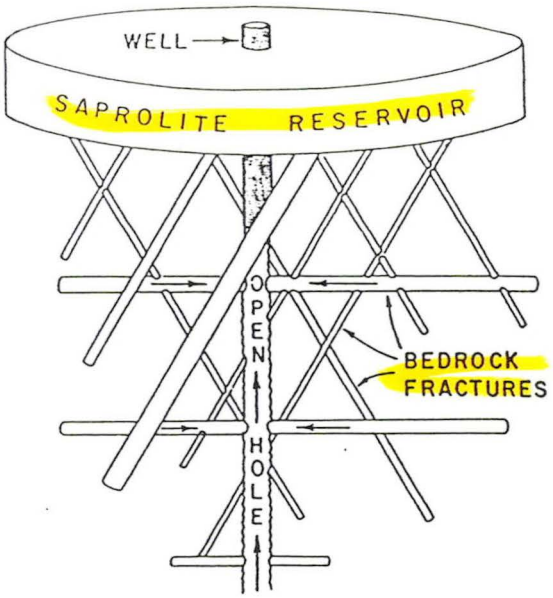
Fractures (joints and faults) are more abundant under valleys, draws, and other surface depressions than under hills. In fact, geologists assume that it is the presence of fractures that determined the position of valleys in the first place. Fractures tend to be more closely-spaced and the openings developed 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.

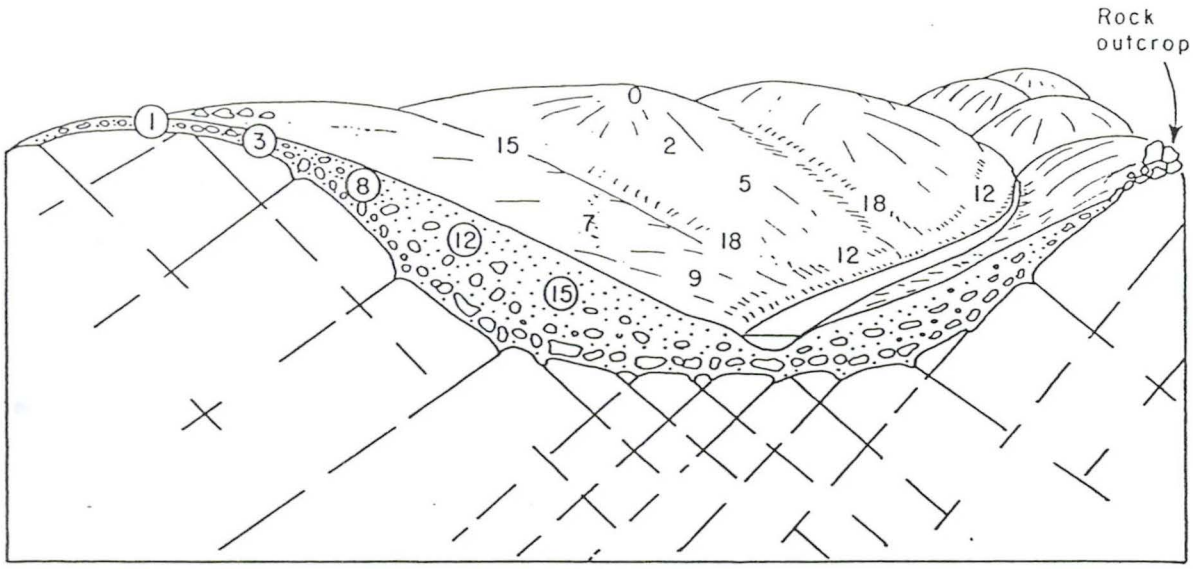
The yield of a well drawing from fractured bedrock depends on several factors. The most important of these are believed to be:

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.

Selecting Well Sites in the Piedmont and Mountains



5 Number related to topographic position
(8) Number related to saprolite thickness

Most ground-water supplies in the Piedmont and mountains are obtained from wells that are cased through the saprolite and finished with open holes in the bedrock. The yield of these wells depends on the number and size of the fractures they penetrate. Therefore, where moderate to large supplies of water are needed, well sites should be selected at the places where fractures appear to be most abundant.

H. E. LeGrand, of the U.S. Geological Survey, attempted in 1967 to indicate the relative favorability of well sites in the Piedmont and mountains by assigning point values to areas on the basis of saprolite thickness and topographic position. The point values assigned by LeGrand to features of the land surface that suggest thickness of saprolite and to different topographic positions are shown below. Selected values of each are also indicated on the above sketch.

Features of land surface related to saprolite thickness	Point value
Bare rock-almost no soil	0-2
Some rock outcrops-very thin soil	2-6
A few rock outcrops-thin soil	6-9
No fresh outcrops-moderately thick soil	9-12
No rock outcrops-thick soil	12-15

Topographic position	Point value
Steep ridge top	0
Upland steep slope	2
Rounded upland	4
Midpoint of ridge slope	5
Gentle upland slope	7
Broad flat upland	8
Lower part of upland slope	9
Valley bottom of flood plain	12
Draw with small catchment	15
Draw with large catchment	18

The point values for saprolite thickness and topographic position are added and the total is used in conjunction with the following table to estimate the chance of obtaining different yields. (The following table is an abbreviated and slightly modified version of the table prepared by LeGrand.)

Total points assigned to a site	Average yield (gal/min)	Chance of success, in percent, for a well to yield at least—				
		3 gal/min	10 gal/min	25 gal/min	50 gal/min	75 gal/min
5	3	50	20	5	3	—
10	6	65	40	15	15	—
15	15	80	55	30	15	—
20	25	90	70	50	25	20
25	40	93	80	65	45	35
30	60	96	90	75	55	45

Most of the wells used in LeGrand's analysis were drilled to obtain water for domestic needs at the sites most convenient to the well owners. Thus, no special attempt was made to select the most favorable sites. We know that the chances of success can be greatly improved if wells are not only located in valleys but also at places where the topography suggests the presence of intersecting fractures. In fact, recent studies suggest that where best technology is applied in the selection of well sites, an average yield of 150 gal/min can be expected.

Reference: LeGrand, H. E., 1967. Ground water of the Piedmont and Blue Ridge Provinces in the Southeastern States: U.S. Geological Survey Circular 538.

June 18, 1987

To: File

From: Pat DeRosa PD

Re: US 70 Drum Dump
NCD 981472624

On June 17, 1987, I spoke by telephone with Mario Deluca, Associate Agricultural Extension Agent, McDowell County, (704) 652-7121, regarding usage of groundwater for irrigation of food crops in McDowell County. Mr. Deluca said he knows of no irrigation wells in the county.

PD/pw/0384b

1 July 1987

TO: File

FROM: Pat DeRosa PD

RE: US 70 Drum Dump
NC D981472624

On June 22, 1987, I spoke by telephone with Carol Walsh, OSC, EPA Region IV, Emergency and Remedial Response Branch, Atlanta, GA (404) 347-2216, regarding the removal action at the subject site. She recounted the following sequence of events: EPA emergency response personnel moved up to the site on March 9, 1987 and began staging and temporary storage of the drums. Fifty-five 55-gallon drums of solid material and four 55-gallon drums of liquids were found at the site. No form of containment was observed. Composite waste and soil samples were collected on March 13-14, 1987. Drums were moved to the Burke County Landfill on Kirksey Road on March 16-17, 1987. On receipt of the sampling results, drums were overpacked on April 14-15, 1987 and shipped off-site for disposal.

PD/tb/0384b

and Environmental Control

Emergency & Holidays: (803)734-5424

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Form Approved. OMS No. 2050-0 Ref. 16 B

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's U.S. EPA ID No. VICTM R0001334 Manifest Document No. 1613

2. Page 1 of 1

Information in the shaded areas is not required by Federal law, but is by State law.

3. Generator's Name and Mailing Address
USEPA Reg II / Hwy 20 site
345 Courtland St., Atlanta 6430365

4. Generator's Phone (404)

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: St. Joseph Motor Lines

6. U.S. EPA ID Number: GAD042092241

C. State Transporter's ID

D. Transporter's Phone

7. Transporter 2 Company Name

8. U.S. EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
Thermal Oxidation Corp
Railroad St.
Roebuck, SC

10. U.S. EPA ID Number: SCD003360393

G. State Facility's ID

H. Facility's Phone: 803-576-6521

11. U.S. DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste Number
a. Waste Flammable Liquid, NOS, Flammable Liquid, UN1993 (EPA Ignitable)	4	DM	500	LB	U239 U080
b.					
c.					
d.					

Chlorobenzene

J. Additional Descriptions for Materials Listed Above
a. T0-06195-1351
b.
c.
d.

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Bill Haztech PO# 876154636
WO # 6691

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and the laws of the State of South Carolina.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: Cara J. Walsh - For the EPA Administrator
Signature: Cara J. Walsh
Month Day Year: 04 18 87

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: G Riley Jr
Signature: G. Riley Jr
Month Day Year: 04 15 87

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Month Day Year

FACILITY

19. Discrepancy Indication Space
a ___ lbs. c ___ lbs.
b ___ lbs. d ___ lbs.

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name
Signature
Month Day Year

EPA Form 8700-22 (Rev. 9/86) Previous Editions are Obsolete [DHEC 1988 (Rev. 10/86)]

South Carolina Department
and Environmental Control

2600 Bull Street, Columbia, SC 29201
Phone: (803) 734-5200
Emergency & Holidays: (803) 734-5424
S.C. DEPT. OF HEALTH

(2)

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Form Approved OMB No. 2050-0039 Expires 9-30-88

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's U.S. EPA ID No. A C T M P C 0 0 1 3 3 4 1 6 3 6 A
Manifest Document No.
2. Page 1 of 1

Information in the shaded areas is not required by Federal law, but is by State law.

3. Generator's Name and Mailing Address
U S EPA Region IV / Hwy 70 Site
845 Cornwallis Dr., ATLANTA, GA 30365
4. Generator's Phone (404) 347-3931

A. State Manifest Document Number
B. State Generator's ID

5. Transporter 1 Company Name
ST. JOSEPH MOTOR LINES
6. U.S. EPA ID Number
G A D 0 4 2 0 9 7 2 6 1
C. State Transporter's ID
D. Transporter's Phone 404-452-7744

7. Transporter 2 Company Name
8. U.S. EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
LOSX
Rt. 1, Box 255
Pinewood, SC 29125
10. U.S. EPA ID Number
S C D 0 0 7 0 3 7 5 9 3 5
G. State Facility's ID
H. Facility's Phone 803-452-5003

11. U.S. DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste Number
a. HAZARDOUS WASTE, SOLID, NOS, CORROSIVE, NA9189 (D007)	36	DM	1800	P	D007
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above
a. TIW-0293-4-4101
b.
c.
d.

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
BILL HAZTECH PO # 876183636
WO# 66911 [redacted] SWE [redacted] SWE

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and the laws of the State of South Carolina.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: FOR THE EPA CAROL J. WALSH Administrator
Signature: Carol J. Walsh
Month Day Year: 04/14/87

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: L. RILEY JR
Signature: L. Riley Jr
Month Day Year: 04/15/87

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name:
Signature:
Month Day Year:

FACILITY

19. Discrepancy Indication Space
MANIFEST # 0636A
J-A PW-02934-4101
a. 16640 lbs. c. lbs.
b. lbs. d. lbs.

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: BRENDA RIGDON
Signature: Brenda Rigdon
Month Day Year: 04/16/87

EPA Form 8700-22 (Rev. 9/86) Previous Editions are Obsolete [DHEC 1988 (Rev. 10/86)]

2

Ref. 17

NC
GW-B-12

GEOLOGY AND GROUND-WATER RESOURCES of the MORGANTON AREA NORTH CAROLINA

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GROUND WATER BULLETIN NUMBER 12

North Carolina
Department of Water Resources

CERCLA CERCLA

RALEIGH
MARCH
1967

GEOLOGY AND GROUND-WATER RESOURCES of the MORGANTON AREA NORTH CAROLINA

By

Carlton T. Sumsion
Geologist, U. S. Geological Survey

Chemical Quality of Water Section
By
R. L. Laney
Chemist, U. S. Geological Survey

GROUND WATER BULLETIN NUMBER 12

NORTH CAROLINA
DEPARTMENT OF WATER RESOURCES
George E. Pickett, *Director*

Division of Ground Water
Harry M. Peek, *Chief*

PREPARED COOPERATIVELY BY THE GEOLOGICAL SURVEY
UNITED STATES DEPARTMENT OF THE INTERIOR
AND THE
NORTH CAROLINA DEPARTMENT OF WATER RESOURCES

MARCH 1967

GEOLOGY AND GROUND-WATER RESOURCES OF THE MORGANTON AREA, NORTH CAROLINA

By

Carlton T. Sumsion

ABSTRACT

The Morganton area, located in the west-central part of North Carolina, comprises Avery, Burke, Caldwell, McDowell, Mitchell, Watauga, and Yancey Counties. The area includes 2,522 square miles apportioned between the Blue Ridge and inner Piedmont physiographic provinces. From southeast to northwest, the topographic relief of gentle hills and broad valleys of the inner Piedmont gives way to the steep eastern front of the Blue Ridge, beyond which more subdued slopes toward the west prevail. Streams and drainage courses are of geologically subsequent development on fracture systems which have clearly defined patterns throughout most of the area.

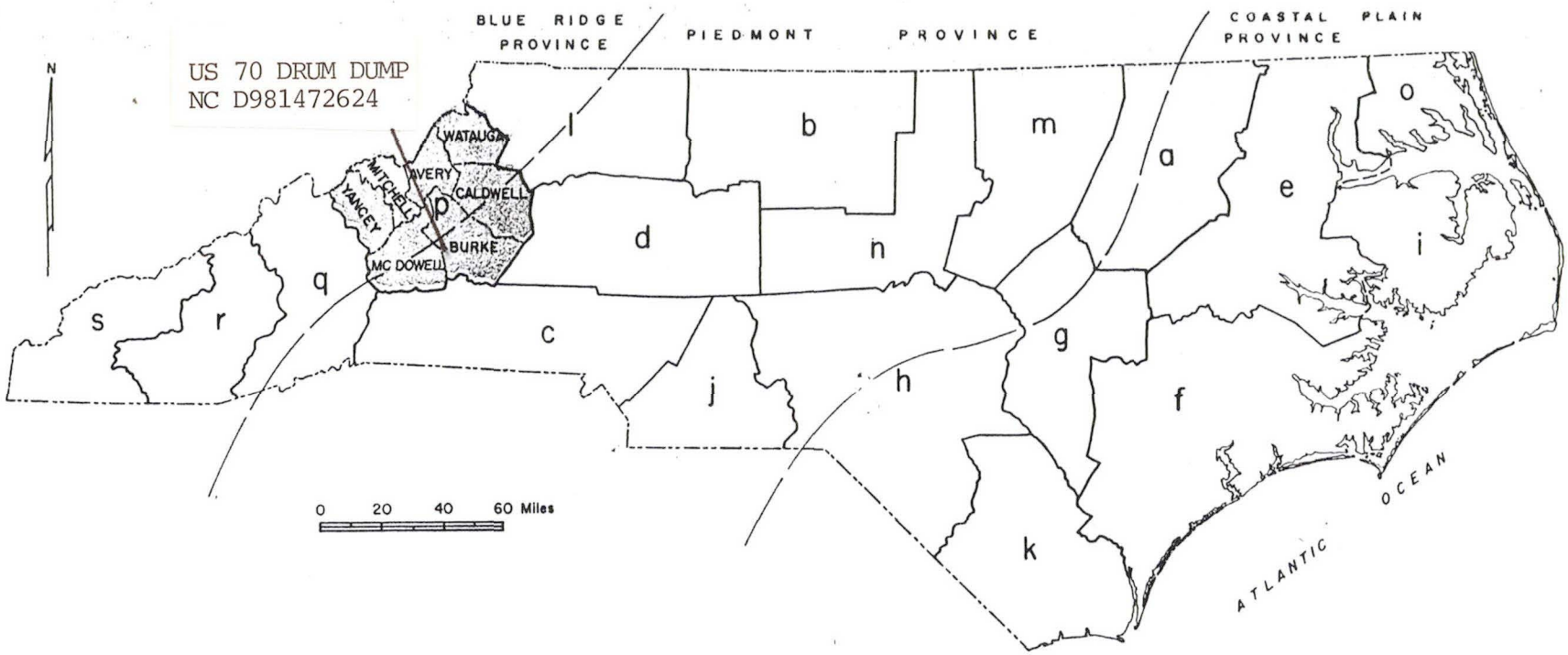
Metamorphic and igneous rocks underlying the area range in composition from quartzite to gabbro. Gneissic, schistose, pyroclastic, and quartzitic rocks are the most prominent lithologic types. Structural trends in the area are varied, but generally are oriented north to northeast.

Ground water is obtained from weathered rock or saprolite and alluvium by dug and bored wells. Drilled wells derive ground water from joint and shear openings in unweathered bedrock. Wells drilled in low, flat areas and narrow, linear valleys have greater yields than wells drilled on high ground or slopes. The present rate of ground-water withdrawal has only local effect on the height of the water table. The amount of ground water contained in bedrock decreases with depth, hence drilling wells deeper than about 300 feet usually will not substantially increase well yields.

One-hundred and ten water analyses are used to determine the chemical quality of the ground water in the Morganton area. Generally, ground water is slightly acid, contains less than 150 ppm dissolved solids, is soft (less than 50 ppm hardness as $CaCO_3$), and contains less

than 0.3 ppm iron. Due to differences in duration of water-rock contact, dissolved solids are highest in water from drilled wells and dug wells and least in water from springs. Based on concentrations of chloride and nitrate, dug wells are considerably more susceptible to contamination than springs or drilled wells in the Morganton area.

Chemical analyses of ground water in the Morganton area can be divided into five types by use of pattern diagrams. Ground-water types can be mapped but are shown to extend across and change within boundaries of rock units.



a. Halifax area, Bulletin 51
b. Greensboro area, Bulletin 55
c. Charlotte area, Bulletin 63
d. Statesville area, Bulletin 68
e. Greenville area, Bulletin 73
f. Wilmington area, Ground-Water Bulletin 1
g. Goldsboro area, Ground-Water Bulletin 2
h. Fayetteville area, Ground-Water Bulletin 3
i. Swanquarter area, Ground-Water Bulletin 4
j. Monroe area, Ground-Water Bulletin 5
k. Southport area, Ground-Water Bulletin 6
l. Northwestern N.C. area, report in preparation
m. Raleigh area, report in preparation
n. Durham area, report in preparation
o. Elizabeth City area, report in preparation
p. Morganton area, described in this report
q. Asheville area, report in preparation
r. Waynesville area, report in preparation
s. Murphy area, report in preparation

Figure 1. Index map of North Carolina showing area of investigation by counties and physiographic divisions.

GEOLOGY

Introduction

The Morganton area is underlain by a complex assemblage of metamorphic rock types. These rocks were mapped on a reconnaissance basis during this investigation. In order to facilitate map representation of rock types for their relation to quantity and quality of ground water, rock classification in this report is based on composition and physical identification rather than stratigraphic relationships. Stratigraphy in the Morganton area is complex and, in places, obscure due to recurrent regional metamorphism. Boundary transitions between rock types may be defined within a few inches or feet, or they may be represented by wide zones in which the rock types are intermixed and interlayered, showing only a progressive change in dominant rock type. Generally the change in type is gradational and the contact between types is indeterminate. Hence, rock-type boundaries should be considered approximate on the geologic map (pl. 2).

The succession of geologic events which brought about the existing complex of lithologies within the inner Piedmont and Blue Ridge provinces is not yet clearly understood. Heterogeneity of rock types associated with compositional layering indicates a diverse sedimentary and igneous origin in an environment of rapid deposition. Relict sedimentary structures, current bedding and graded bedding, are present in some compositional layers. After the deposition of these intermixed sedimentary and igneous rocks, they underwent recurrent regional metamorphism by compression which has transformed them by heat and directed pressure into a folded complex of gneisses and schists. Many of the pegmatite dikes or veins within the metamorphic complex are probably by-products of this metamorphic heat and pressure. Basic igneous stocks and dikes of gabbro and diabase intruded the metamorphic-rock complex later, mainly within the Blue Ridge part of the Morganton area. The elevation and ensuing erosion of the rock complex for a very long time is evident from the beveled appearance of the inner Piedmont and the dissected aspect of the Blue Ridge province. Throughout the inner Piedmont and in many places within the Blue Ridge province deep weathering of bedrock has produced a thick residual mantle. Mechanical weathering, though effective in exposing bedrock in areas of greater relief, is

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less effective than the action of chemical weathering in most of the area.

Areal Distribution and Character of Rocks

Pegmatite

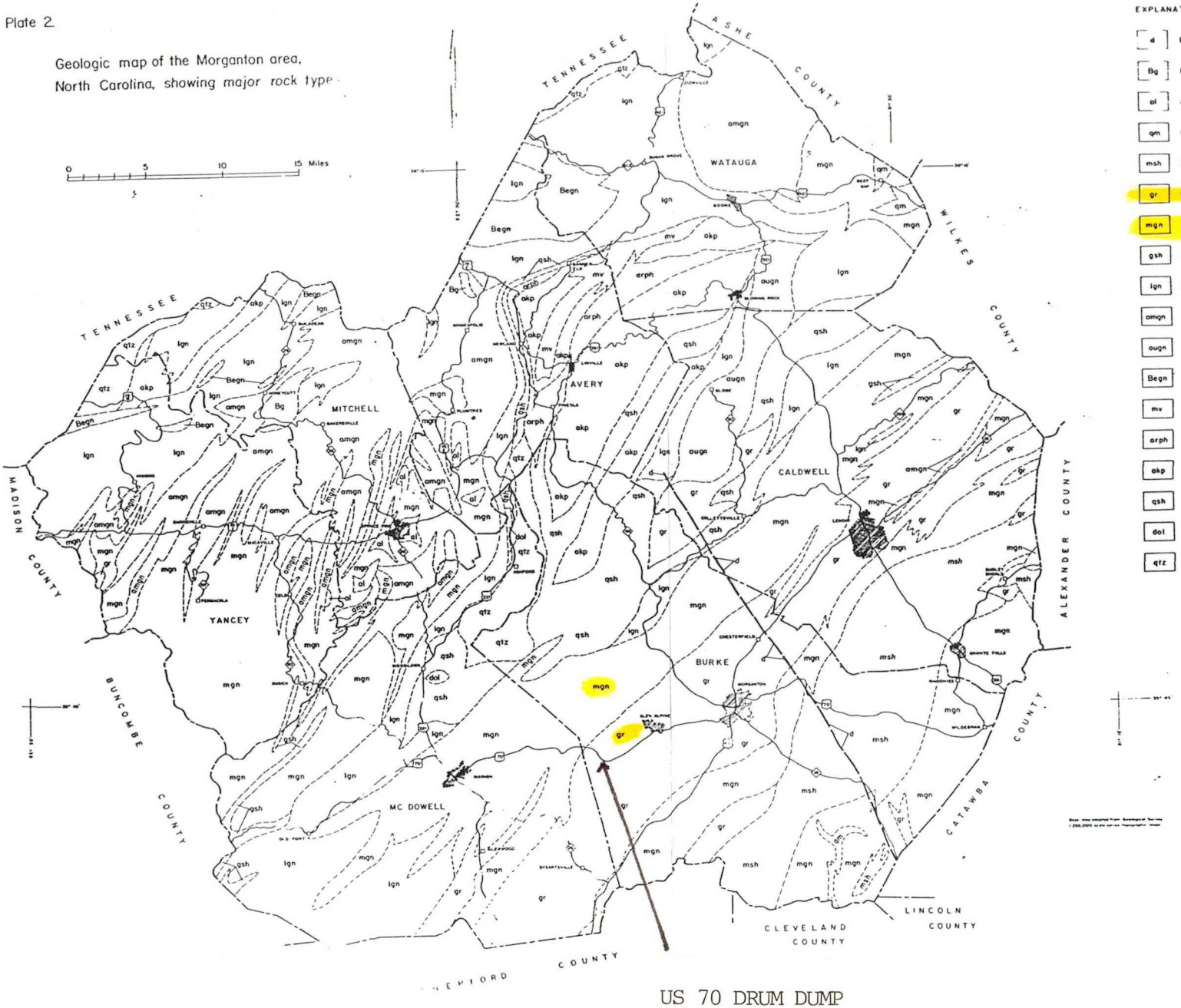
Veins or dikes of this rock type are irregular, light-colored, coarsely crystalline quartz, feldspar, and mica. In the red-brown saprolite mantle pegmatites appear as contrasting light-gray to white masses of clay. Pegmatite veins or dikes are formed by the solidification of highly mineralized, volatile solutions which originated at high temperatures and pressures. Although they are commonly considered to be by-products of igneous intrusion, their temperatures and pressures of origin are not inconsistent with those likely undergone by the host rocks during regional metamorphism. Crystals in pegmatites are of mineralogic interest because they are usually large and well formed. These veins or dikes are common in most of the metamorphic rock types of the Morganton area. They range in thickness from a few inches to many feet and may be traced for greater linear distances, but they are not large enough to define on the geologic map.

Bakersville Gabbro and diabase dikes

Gabbro is a dark gray, greenish, or black rock, finely crystalline. The rock is said to have a diabasic texture when its fine laths of plagioclase are enclosed in augite. Gabbro and diabase rocks weather to a dark-red earth, and weathered bedrock exposures show characteristically rounded exfoliation surfaces. West of Bakersville in the vicinity of Red Hill, Mitchell County, a small gabbro stock has intruded metamorphic rocks west of Elk Park in Avery County. In these same areas numerous small diabase dikes, apparently related to the intrusive stocks, strike northwestward, roughly parallel to structural trends of amphibolite gneiss and layered gneiss which the dikes intrude. These dikes are not large enough to define on the geologic map. A diabase dike unrelated to the gabbro stocks is shown on the geologic map in Burke and Caldwell Counties because of its great length and apparent continuity. It strikes about N. 35° W., roughly normal to regional structural trends. The width of this dike, where it can be seen in outcrops, ranges from less than 10 feet to nearly 30 feet (fig. 4).

Plate 2.

Geologic map of the Morganton area, North Carolina, showing major rock type



US 70 DRUM DUMP
NC D981472624

Granitic gneiss

Outcrops of this heterogeneous complex are generally granite gneiss. Intermixed and interlayered with the granite gneiss are biotite-muscovite schist, amphibolite gneiss and schist, compositionally layered gneiss, micaceous quartzite, dolomitic gneiss, and quartz-biotite-monzonite gneiss. Boundary transitions of this complex rock type are generally wide zones which show only a progressive change in dominant components. The granitic gneiss complex weathers to a reddish-clay residuum. This complex extends from southeastern McDowell County northeastward through central Burke and Caldwell Counties.

Quartz-biotite gneiss

This mica gneiss complex consists predominately of quartz-biotite gneiss and schist, compositionally layered gneiss, schistose quartzite, dolomitic gneiss, quartz-monzonite gneiss, and micaceous crystalline limestone. Its boundary transitions are rarely well defined. The mica gneiss complex weathers to reddish-clay saprolite which contains schistose layers of light-brown decayed mica. As shown on the geologic map, quartz-biotite gneiss is the most extensive rock type in the Morganton area.

Garnet-mica schist

This schist is varied in color from green, to gray, and rust. Dark-gray graphitic layers are not uncommon in this unit. Contacts of this rock are sharply defined where they are exposed. The garnet-mica schist weathers to a reddish clay in which much of the original schistosity is preserved. Several elongate units of this garnetiferous, quartz-muscovite schist extend northeastward from western McDowell County into southern Yancey County. A compositionally similar unit occurs in eastern Caldwell County.

Layered gneiss

As with other metamorphic-rock complexes in the Morganton area, the layered-gneiss complex has a wholly heterogeneous aspect (figs. 6 and 7). It is distinguished by primary compositional layering. In outcrops tens of feet wide it is generally gray, feldspathic, quartzose rock with sharply defined compositional layers which have continuity and

schistose quartzites; light-colored, schistose, pyroclastic rocks; mica schist; layered gneiss; mica gneiss; dark-gray phyllite; graphitic schist; light-gray quartzite; dolomitic, quartzitic rocks; and light-colored, feldspathic quartzite. They weather to varied shades of red, sandy clay. Designated as schistose, quartzitic rocks on the geologic map, they extend northeastward from McDowell County through Burke, Caldwell, and Watauga Counties.

Dolomite and limestone

Where it is exposed in quarries, bedding in the light-gray, dense, crystalline dolomite is massive, with only local thin beds and dark-gray, argillaceous partings. Linville Caverns, north of Ashford in McDowell County, is a network of solution channels developed on joint systems within the dolomite. Near Woodlawn, McDowell County, the dolomite is quarried for road metal. A small outcrop of light-gray and white dolomite, too small to define on the geologic map, is exposed in a railroad cut about $1\frac{1}{2}$ miles northwest of Bandanna in Mitchell County. Dark-blue and dark-gray, foliated, micaceous, crystalline limestone outcrops, too small to define on the geologic map, occur north and west of Marion in McDowell County (fig. 10). These small limestone outcrops appear to be aligned on a trend of approximately N. 55° E., consistent with regional structural trends.

Quartzite

The light-tan and white, massive- and cross-bedded, fine-grained quartzite locally contains dark-gray and dark-green, graphitic, argillaceous partings (fig. 11). It weathers to a light-colored, sandy earth, in some places resembling unmetamorphosed, friable sandstone. The quartzite is exposed in a large, dissected anticline near the central part of the Morganton area. A similar quartzite, coarse-grained, containing varied amounts of feldspathic constituents, light-colored pyroclastic layers, with dark-gray and black argillaceous interbeds, occurs in northern Mitchell, Watauga, and Yancey Counties.

Saprolite

Mechanical and chemical weathering of rocks in the Morganton area has formed an extensive residual mantle of soils and saprolite. Saprolite, or decomposed rock, in this area developes best on gneissic and

schistose rocks containing feldspar or amphibolite minerals as these are very unstable in the presence of air and moisture. As weathering progresses, soluble products of weathering (and some colloids) are continually removed by ground-water circulation. The residuum of clay minerals, oxides of iron and aluminum, quartz, and other insoluble accessory minerals, with partly weathered rock constituents, compose saprolite. Where the mantle is more deeply developed and least affected by erosion, it may comprise a zone of soils, an intensely weathered zone of saprolite, and a transitional zone between saprolite and unweathered rock. Relict schistosity or foliation and partly weathered laminae of mica are common where the mantle has been undisturbed. The thickness of the mantle in the Morganton area ranges from less than 1 foot to over 100 feet. The saprolite mantle is deepest and best developed over low areas of the inner Piedmont and in areas of subdued relief in parts of the Blue Ridge upland.

Alluvial sediments

Much of the surface material throughout the Morganton area has been transported varied distances by alluvial processes. In the larger stream valleys coarsely stratified sediments of sizes ranging from clay to small boulders form alluvial deposits up to 50 feet thick. Auger-hole transections to test for thickness and character of sediments and for ground-water occurrence in the Catawba and Yadkin River valleys penetrated varied thicknesses of alluvium consisting of high percentages of clay. Rapid weathering processes may be partly responsible for the large amounts of clay in stream-valley sediments. Terrace deposits of coarse gravel and boulders are present along most of the larger perennial streams.

GROUND-WATER HYDROLOGY

The Hydrologic Cycle

The constant circulation of water vapor and water between the earth and the atmosphere is called the hydrologic cycle. Heat from the sun causes water from the oceans and the rivers, lakes, and soil of the land to evaporate into the atmosphere. The oceans cover about three-fourths of the earth's surface, but nearly $5\frac{1}{2}$ times as much water is evaporated from the oceans as from the land surfaces. The amount of water vapor the atmosphere is able to hold depends on its temperature; as its temperature increases the atmosphere can retain more moisture. Relative humidity is the amount of water vapor in the air compared with the maximum amount of water vapor that the air could hold at a given temperature. When moisture in the atmosphere attains a relative humidity of 100 percent, the saturation point, either by cooling or acquisition of water vapor, conditions are favorable for precipitation that may fall as rain, sleet, hail, or snow. Dew is an important source of moisture for plants in arid regions. Water from precipitation on the land surfaces may run off into lakes and streams and return to the oceans, or some may infiltrate the soil and percolate downward to the zone of saturation from whence it may move laterally to reappear at lower surfaces as seeps and springs or streams, or precipitation may evaporate after falling on the earth and return directly to the atmosphere (fig. 15). This transfer of moisture between the earth and the atmosphere through many complex and divergent routes is unending.

The water table

Subsurface water is that which has infiltrated the earth's surface or the soil layer. It may be used and transpired by plants, it may be evaporated directly from the soil, or it may percolate downward to the zone of saturation where it becomes part of the ground-water reservoir. Subsurface water in the unsaturated zone, known as the zone of aeration, occurs in three layers: the soil layer, an intermediate layer, and a lower layer or capillary fringe which lies directly over the zone of saturation or ground-water reservoir (fig. 15). When sufficient water has infiltrated the soil layer to overcome the molecular attraction of soil particles, it will begin to percolate downward through the

intermediate layer by the pull of gravity. The capillary fringe consists of water held above the zone of saturation by capillary attraction; in fine silts or clayey earth it may rise several feet and in coarse gravel it may rise less than an inch. The upper surface of the zone of saturation is known as the water table. The zone of saturation is the vast system of ground-water reservoirs in permeable rock that provide water to seeps, springs, and effluent streams, and to wells. Configuration of the water table is generally a subdued reflection of topographic relief, although it may be discontinuous between joint and shear systems in bedrock. The bottom of the zone of saturation is obscure; it may be defined conditionally as the greatest depth at which ground-water circulation occurs in joint and shear systems.

Occurrence of ground water

Ground water in the Morganton area occurs in the deeply weathered residual mantle or saprolite and in joints or shear openings in bedrock. Trend of ground-water movement in saprolite or bedrock openings is more or less directly from higher interfluvial places in topography, and the water table, to lower areas, generally to effluent perennial streams. Rate of ground-water movement is dependent on hydraulic gradient and permeability of the water-saturated zone. Where relict schistosity is present in saprolite, it influences the movement of ground water, as transmission takes place more freely parallel to relict schistose layers than normal to them. Shallow wells in saprolite have long been a source of ground water for domestic use wherever the weathered mantle is of sufficient thickness and permeability to yield ground water. Although this shallow source of water continues to be of significance for individual domestic water supplies, it seldom provides sufficient water for industrial or municipal applications. Aerial photographs and topographic maps show many subsequent streams of the Morganton area in rectangular-trellis patterns which are, by reconnaissance field data, indicative of underlying joint and shear systems in bedrock. Circulation of ground water along joint and shear systems causes enlargement of these linear openings by solution with consequent increasing permeability, particularly in gneissic rock types which contain calcic plagioclase and in dolomitic rocks. Surficially the increase in permeability is manifested by development of linear depressions over the underlying

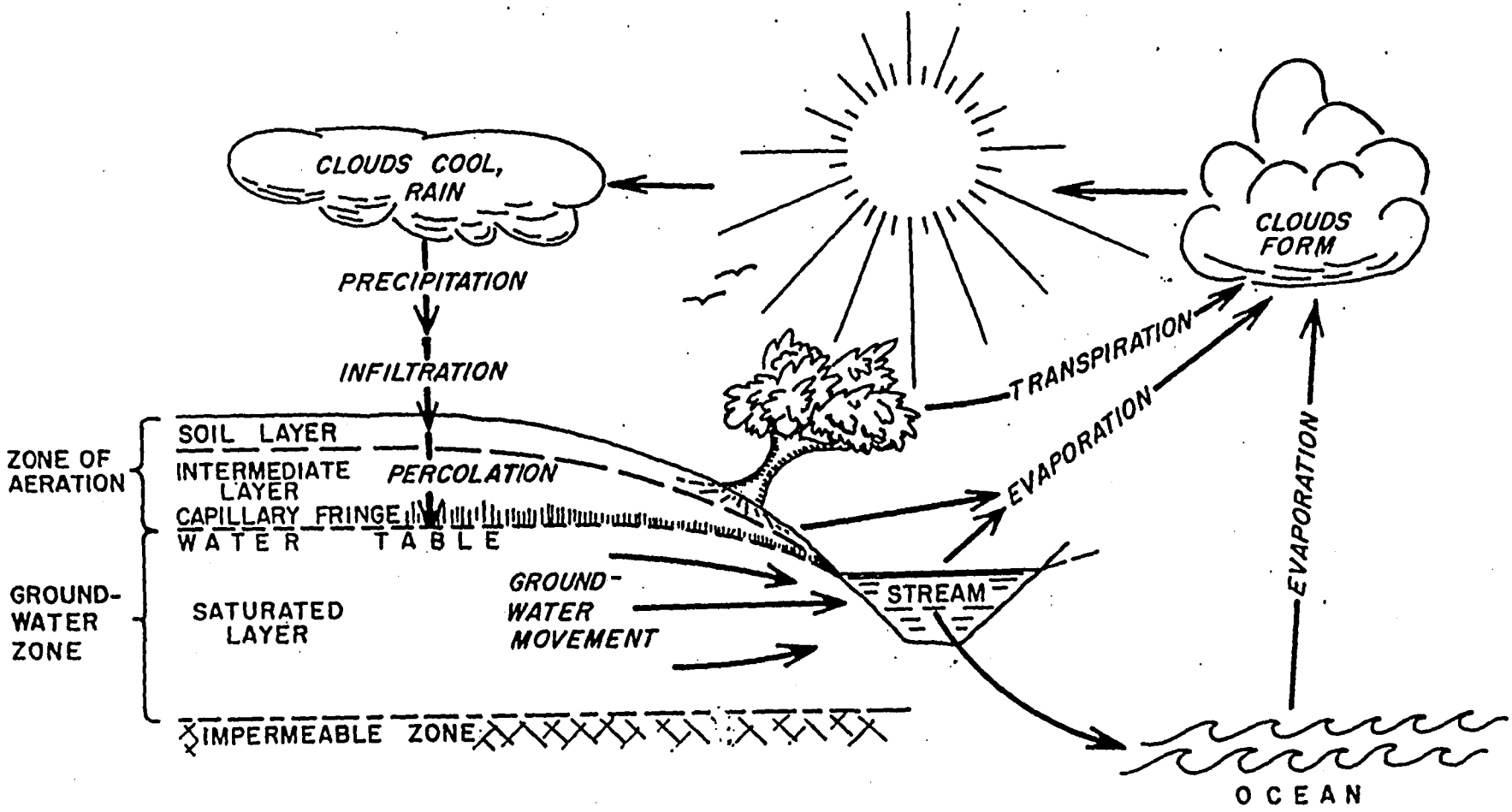


Figure 15. Simplified diagram of the hydrologic cycle and subsurface water zones.

pattern of joint and shear systems. These linear depressions, generally in rectangular patterns, are persistent for considerable distances and range in width from tens of feet to about a quarter of a mile. They may or may not retain perennial streams, depending on topographic circumstances. These linear zones of relatively high permeability are most obvious in the inner Piedmont, but they are present throughout the Morganton area and represent the best sites for development of ground water (pl. 1).

Dug and bored wells

The oldest source of ground water in this area is from wells dug in the water-bearing saprolite or flood-plain alluvium. Bored wells differ from the older dug wells only in the manner in which they are excavated and in their slightly greater depths; they are usually augered through saprolite to or nearly to bedrock. Dug and bored wells are the source of domestic water supplies for individual farms or outlying residences not availed of municipal water systems. Of 125 dug and bored wells inventoried, the average depth is 35 feet and the average depth to the water table is 23 feet. The deepest bored well in the area is 150 feet and the greatest depth to the water table is 120 feet. Insufficient data preclude any estimate of yields from these wells except that they provide enough water for domestic use. Quality of ground water from dug and bored wells is generally comparable to that from drilled wells as relating to hardness or dissolved minerals. Risk of contamination in shallow wells is greater because of their obvious nearness to possible surface sources of contamination. Bored wells, and perhaps some dug wells, will continue to be a source of domestic supplies for new residences in outlying areas. Caution should be taken to locate a dug or bored well at sufficient elevation or distance from any septic tank, sewage field, barn, stable, sty, or similar source of contamination. Tests for possible contamination of household-water supplies from shallow wells should be made at fairly frequent intervals. Water-table fluctuations are shown from monthly measurements of 26 dug or bored observation wells in the Morganton area, mostly in the inner Piedmont province, in figures 17, 19, 21, 23, 25, and 29.

Drilled wells

Drilled wells are a source of ground water for individual, industrial, and municipal water systems throughout the area. They are drilled and cased through the residual saprolite mantle and obtain ground water from fractures or similar openings in unweathered bedrock. The available quantity of ground water from drilled wells is dependent on the degree to which the source rock is fractured and permeable to ground-water movement. At greater depths, beyond about 300 feet, fractures or similar openings in bedrock decrease in size and number; hence the average optimum depth of drilled wells is not over 300 feet (table 4). Inventories of drilled wells show that most are about 6 inches in diameter. Larger well diameters will provide greater yields due to increased number of intersected rock openings and greater rock surface from which ground water will be available. A few industrial and municipal wells are 8 or 12 inches in diameter. Drilled wells will generally yield greater quantities of water from topographically low or flat areas and from draws or swales, as these features generally represent differential weathering of more fractured and permeable underlying bedrock (table 5). No attempt has been made to relate yield of wells to the many rock types of the area due to the deficiency of representative wells in each rock type. Fractures and similar openings appear to be of more consequence to yield of drilled wells than rock type. Hardness of ground water from drilled wells is generally low. Locally, dissolved iron may be sufficient to preclude ground water from some industrial uses. Iron in ground water of this area is probably derived from pyroxene, amphibole, and iron-sulphide minerals. Iron may also come from ground water contact with well casing, pump parts, and other iron objects. Where the well head is properly sealed, possibility of contamination of water in drilled wells from surface sources is unlikely. Present rates of ground-water withdrawal have no discernable effect on the water table. Ground-water use in the Morganton area is negligible in comparison to the amount of water available as recharge.

Springs

High annual precipitation in the area of this investigation favors a large number of springs, particularly in the Blue Ridge province. Saturation of residual mantle and fracture zones in bedrock results in discharge of ground water from the storage reservoirs where the water table

TABLE 4. Average yield of drilled wells according to depth in the Morganton area.

Range in depth (feet)	Number of wells	Average depth (feet)	Average yield (gpm)	Average yield per foot of well
0-100	130	76	13.0	0.17
101-200	164	145	14.5	0.10
201-300	42	245	19.5	0.08
Deeper than 300	41	377	17.5	0.05
All wells	377	156	15.0	0.10

is intersected by land surface, usually in draws or on slopes where the mantle-bedrock contact is exposed. Rate of spring discharge is dependent on hydraulic gradient of the water table and permeability where the spring issues from the ground-water reservoir. Fluctuation of spring discharge is dependent on the size and permeability of the reservoir or source rock, and on variations in precipitation. Springs from large underground reservoirs of relatively low permeability will show less fluctuation than those issuing from small underground reservoirs of relatively high permeability. Where springs are common in the Morganton area they are used for domestic and municipal water supplies. Most springs used are of small discharge, 1 to 3 gallons per minute, and the water is usually retained in a large-capacity storage tank against greater-than-discharge demands of short duration. Quality of spring water in the Blue Ridge province is generally very good, as it contains few dissolved mineral substances. Due to the near-surface origin of spring water, contamination is a possibility not to be overlooked. Use of springs for domestic and public water supplies should receive equal consideration with respect to possible pollution as shallow dug or bored wells. Monthly fluctuations of 37 observation springs in the area, mostly in the Blue Ridge province, are shown in figures 17, 19, 21, 23, 25, 27, and 29.

Municipal water supplies

In the Morganton area there are 22 towns or communities supplied by municipal water systems. Ten of these municipal systems obtain water

Burke County

(Area, 506 square miles; 1960 population, 52,701)

Burke County is in the southeastern part of the area of investigation (fig. 1). It is mostly within the inner Piedmont province, but in the northwest it lies in part on the steep eastern slope of the Blue Ridge province. Topography in Burke County is of greatly contrasting relief; from monadnock-like hills separated by broad valleys in the inner Piedmont to high-gradient, deeply dissected slopes on the Blue Ridge front. Altitudes range from less than 1,000 feet above mean sea level at several places on the southeast boundary to 4,350 feet on Long Arm Mountain in northwest Burke County near Linville Falls. Burke County lies within the Catawba River drainage basin. Streams and drainage courses generally appear to be of subsequent development as they are closely related to geologic structural features; joint and shear systems are coincident to most streams.

The largest towns are Morganton, the county seat, Glen Alpine, Drexel, Valdese, and Hildebran. The economy is predominantly agricultural; about 27 percent of the county area is farmland. Forest products supplement agriculture. Manufacturing, mainly of textiles and furniture, is localized in and near the larger towns. The northwest tip of Burke County is crossed by the Blue Ridge Parkway.

Metamorphic rock types in Burke County are heterogeneous, but mica gneiss, mica schist, granitic gneiss, and shistose quartzite predominate. Structural trends of these rocks are generally oriented northeastward (pl. 2). A unique diabase dike strikes nearly normal to the regional structural trend in the eastern part of Burke County. Monadnock-like hills and steep, dissected slopes appear to be errosional remnants rather than structural features. The residual mantle of weathered bedrock or saprolite is well developed over most of the inner Piedmont part of Burke County.

Drilled wells furnish much of the domestic, industrial, and municipal water supplies, but surface-water storage provides the greatest quantities of industrial and municipal water in Burke County. Principal sources of surface water are the impoundments of the Catawba River in Lake Rhodhiss and the Henry Fork of the Catawba River. The Lake James impoundment of the Catawba River is primarily a source of hydroelectric

power. Most drilled wells in Burke County are less than 200 feet deep. Of 62 such wells the average depth is 137 feet and average yield 14 gallons per minute. Wells having the highest yields are in: Low, flat areas; narrow, linear valleys; or draws. Dug and bored wells are common in outlying areas. Of 32 dug and bored wells the average depth is 40 feet and the average depth to the water table is 27 feet. Data of yields from the dug and bored wells are insufficient to provide a statistical representation. Springs are not as commonly used in Burke County as in counties wholly within the Blue Ridge province. Glen Alpine and Rhodhiss are the only communities in Burke County which use ground water for municipal supplies. All other municipal water systems use surface run-off which is filtered, chlorinated, and additionally treated before use.

Analyses of ground water from Burke County are shown in table 9. Water from wells 59 and 104 contained iron in excess of 0.3 ppm. High nitrate and chloride concentration occurred in water from wells 3, 16, 62, 72, 88, 112, and 113. Well 62 contains water having nitrate concentrations greater than 45 ppm.

64

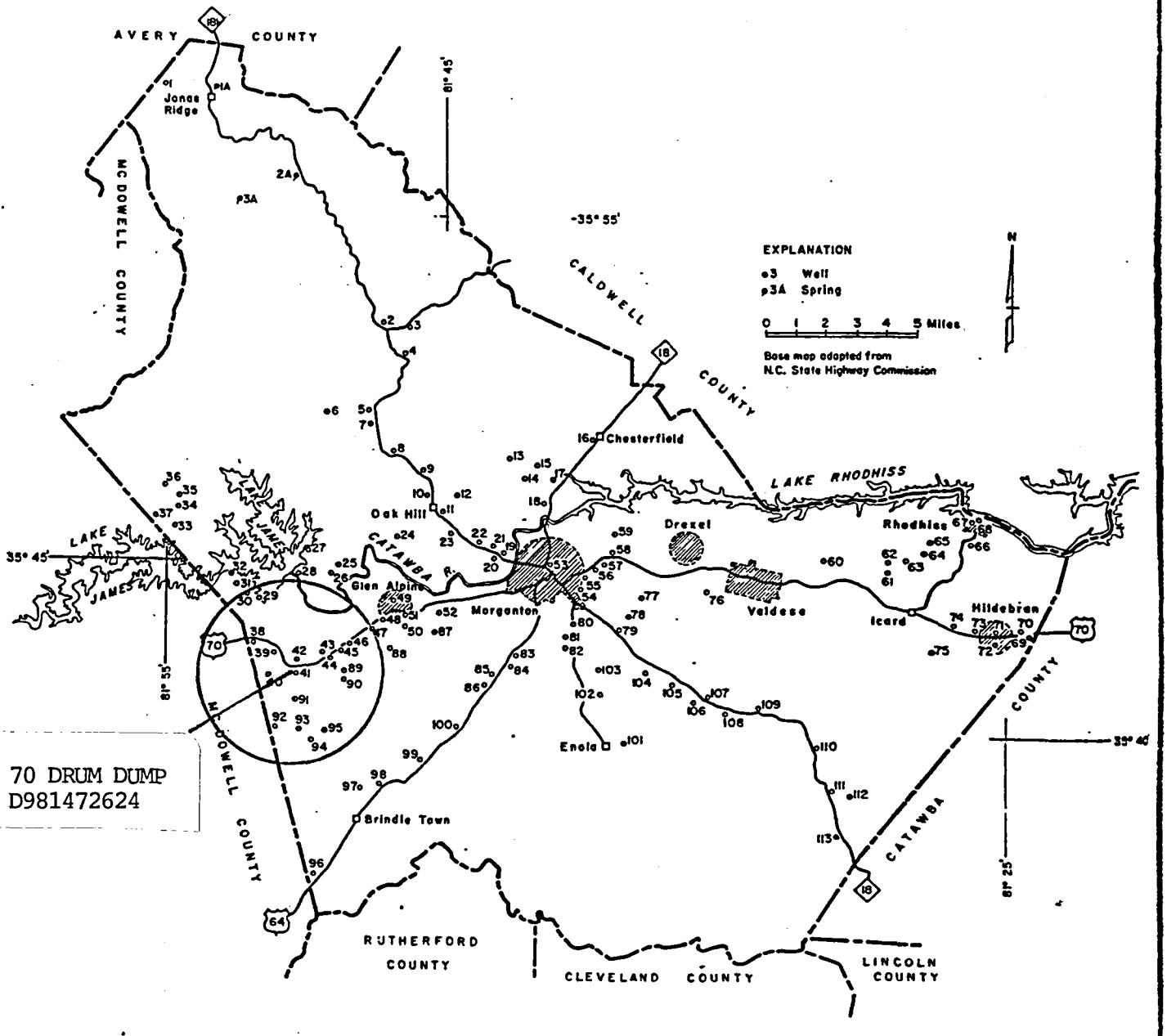


Figure 18. Map of Burke County showing locations of wells and springs.

TABLE 9. RECORDS OF WELLS IN BURKE COUNTY

Well No.	Location	Owner	Type of Well	Depth (ft)	Diameter (in)	Depth of casing (ft)	Water-bearing material	Water level (ft)	Yield (gpm)	Drawdown (ft)	Topography	Remarks
1	2.7 Mi. W of Jonas Ridge	Blue Ridge Parkway	Drilled	200	6	10	Quartzite	24	40.0	105 ft. after 20 min.	Draw	Water came from six different intervals
2	12.5 Mi. NW of Morganton	Optimist Park	do	120	6	40	Layered gneiss	80	35.0		Slope	Bedrock @ 40 feet
3	13.4 Mi. NW of Morganton	E. Sanders	Dug	33	30		Saprolite	16			Flat	Observation well
4	11.0 Mi. NW of Morganton	H. Perry	Bored	32	30	32	do	17			do	
5	1.6 Mi. SE of Table Rock	P. Kinkaid	Drilled	70	6	70	Layered gneiss	20	20.0		do	
6	1.8 Mi. SW of Table Rock	G. W. Crouch	do	105	6	65	Quartzite	70			Slope	
7	8.5 Mi. NW of Morganton	J. A. McGimsey	Bored	56	24	56	Saprolite	48	5.0		do	
8	7.0 Mi. NW of Morganton	W. D. Lowder	Dug	50	30	50	do	35			do	
9	6.0 Mi. NW of Morganton	C. D. Nichols	Bored	70	30	70	do	50			do	Bottom on bedrock
10	5.1 Mi. NW of Morganton	S. Miller	do	80	30	80	do				Draw	
11	4.5 Mi. NW of Morganton	B. Galloway	do	45	30	45	do	35			Slope	
12	1.0 Mi. E of Oak Hill	P. Beek	Drilled	200	6	72	Granitic gneiss	70	3.0		do	
13	5.0 Mi. N of Morganton	E. Weaver	do	127	6	58	do		6.0		do	
14	4.0 Mi. N of Morganton	C. Webb	do	163	6	129	do	25	10.0		Flat	
15	3.8 Mi. NE of Morganton	T. Dooley	do	114	6	42	do	40	4.0		Slope	
16	5.3 Mi. NE of Morganton	G. B. Arney	Dug	45	36		Saprolite	15			Flat	Observation well
17	3.4 Mi. NE of Morganton	P. Jones	Drilled	150	6	80	Granitic gneiss	65	20.0		Flat	
18	2.5 Mi. NE of Morganton	H. M. Speas	do	219	6	45	do	75	20.0		Slope	
19	1.5 Mi. NW of Morganton	J. C. Smith	do	132	6	90	do	90	7.0		do	
20	1.7 Mi. NW of Morganton	L. Shuffler	do	150	6	60	do	60	7.5		do	
21	2.5 Mi. NW of Morganton	C. Suddith	do	152	6	100	do	90	15.0		Flat	Hard water
22	2.9 Mi. NW of Morganton	E. Davis	Bored	92	30	92	Saprolite	74			Slope	
23	4.0 Mi. NW of Morganton	L. Silvers	do	52	30	52	do	44			do	
24	8.7 Mi. NW of Morganton	R. L. LaFevers	Drilled	73	6	44	Granitic gneiss	40	3.5		do	
25	2.5 Mi. NW of Glen Alpine	P. Dale	do	170	6	80	do	62	20.0		Draw	
26	2.5 Mi. NW of Glen Alpine	P. Dale	do	107	6	55	Mica gneiss	50	1.0		Slope	
27	3.5 Mi. NW of Glen Alpine	C. Browning	do	115	6	75	do	35	20.0		Flat	
28	5.0 Mi. NW of Glen Alpine	J. C. Smith	do	165	6	43	do	35	4.0		Slope	
29	1.0 Mi. N of Bridgewater	J. Carswell	do	131	6	90	Granitic gneiss	60	9.5		do	
30	1.3 Mi. N of Bridgewater	J. Carswell	do	135	6	85	Mica gneiss	60	7.0		do	
31	1.8 Mi. NW of Bridgewater	T. Rich	do	115	6	60	do		4.5		do	
32	2.1 Mi. NW of Bridgewater	H. F. Bobbett	do	175	6	55	do	45	6.0		do	
33	0.8 Mi. W of Longtown	J. C. Dellinger	do	75	6	30	do	6	8.0		Flat	
34	0.8 Mi. N of Longtown	W. P. Case	do	165	6	150	do	50	10.0		Draw	
35	1.1 Mi. N of Longtown	B. M. Bristol	do	140	6	116	Schistose quartzite	50	6.0		Slope	
36	1.6 Mi. N of Longtown	H. Edwards	do	184	6	120	Mica gneiss	65	15.0		Draw	
37	1.8 Mi. NW of Longtown	R. Edwards	do	165	6	140	do	80	25.0		do	
38	1.2 Mi. S of Bridgewater	G. Himphill	do	215	6	60	do	40	4.5		Slope	Hard water
39	6.0 Mi. SW of Glen Alpine	C. Carswell	Bored	60	30	60	Saprolite				do	
40	6.5 Mi. SW of Glen Alpine	J. McElarth	Drilled	300 (110)	6	45	Granitic gneiss	35	40.0		Flat	Drilled to 300 ft. and gravel filled to 110 ft.
41	6.0 Mi. SW of Glen Alpine	J. Patton	do	210	6	78	do	45	15.0		do	

TABLE 9. RECORDS OF WELLS IN BURKE COUNTY (Continued)

Well No.	Location	Owner	Type of Well	Depth (ft)	Diameter (in)	Depth of casing (ft)	Water-bearing material	Water level (ft)	Yield (gpm)	Drawdown (ft)	Topography	Remarks
42	4.6 Mi. SW of Glen Alpine	J. Farris	Drilled	140	6	60	Granitic gneiss	----	30.0	----	Draw	
43	3.5 Mi. SW of Glen Alpine	M. A. Taylor	do	141	6	46	do	45	25.0	----	do	
44	2.7 Mi. SW of Glen Alpine	R. McNeilley	do	122	6	60	do	30	30.0	----	Flat	
45	2.2 Mi. SW of Glen Alpine	W. Taylor	do	333	6	65	do	50	4.0	----	Slope	
46	1.9 Mi. SW of Glen Alpine	W. Taylor	do	315	6	85	do	55	4.5	----	do	Hard water
47	1.0 Mi. SW of Glen Alpine	T. Clontz	do	100	6	60	do	35	9.0	----	Flat	
48	0.5 Mi. SW of Glen Alpine	T. Rich	do	150	6	60	do	65	5.5	----	Slope	
49	Glen Alpine	Town of Glen Alpine	do	355	8	----	do	----	255	----	Draw	Yield questionable
50	0.7 Mi. S of Glen Alpine	O. Brach	do	119	6	86	do	60	20.0	----	do	
51	0.5 Mi. SE of Glen Alpine	J. F. Proctor	do	86	6	43	Granitic gneiss	----	10.0	----	Flat	
52	1.5 Mi. E of Glen Alpine	Church	do	300	6	75	do	60	5.0	----	Slope	
53	Morganton	B. Busic	do	124	6	80	do	70	20.0	----	Draw	
54	1.5 Mi. SE of Morganton	N. Epley	do	176	6	70	do	30	4.0	----	Slope	
55	1.8 Mi. SE of Morganton	H. Towery	do	275	6	60	do	60	----	----	do	Hard water
56	2.2 Mi. E of Morganton	C. H. Bumgarner	do	150	6	80	do	65	12.0	----	Flat	
57	2.4 Mi. E of Morganton	J. S. Kinkaid	do	90	6	16	do	25	20.0	----	do	
58	2.2 Mi. E of Morganton	J. Farris	do	71	6	30	do	33	20.0	----	do	
59	4.0 Mi. NE of Morganton	C. Leonhardt	do	235	6	55	do	95	----	----	Slope	
60	Rutherford College	Valdese Gen. Hospital	do	400	8	----	Mica schist	----	----	----	Flat	
61	3.7 Mi. SW of Rhodhiss	C. Tunmire	do	65	5	----	do	25	----	----	do	
62	3.3 Mi. SW of Rhodhiss	Zimmerman	Dug	62	4'x4'	----	Saprolite	52	----	----	do	Observation well
63	3.0 Mi. SW of Rhodhiss	O. Mabry	do	45	5'x5'	45	do	39	----	----	do	
64	2.5 Mi. SW of Rhodhiss	E. M. Aikens	Drilled	51	36	51	do	23	----	----	do	
65	2.1 Mi. SW of Rhodhiss	L. Brown	do	75	6	----	Mica schist	62	3.0	----	Slope	
66	1.1 Mi. S of Rhodhiss	Smith-Moore Co.	Bored	35	24	35	Saprolite	23	----	----	do	
67	Rhodhiss	Rhodhiss Mills	Drilled	151	6	----	Mica gneiss	38	20.0	----	Flat	Water has high iron content
68	Rhodhiss	do	do	846	8	----	do	32	35.0	----	do	
69	1.2 Mi. E of Hildebran	Church	do	134	6	60	do	64	11.0	----	do	
70	0.9 Mi. E of Hildebran	J. S. Hildebran	Dug	42	48	----	Saprolite	30	----	----	Slope	
71	Hildebran	Quaker Meadows Mills	Drilled	370	8	252	Mica gneiss	53	20.0	205 ft. after 3 hrs. @ 20 gpm	Flat	Water treated for iron content
72	Hildebran	Clines Mills	Dug	45	48	----	Saprolite	30	----	----	Slope	Observation well
73	0.9 Mi. W of Hildebran	Southern Desk Co. #2	Drilled	200	8	----	Mica gneiss	30	100.0	----	Draw	Ideal well location
74	1.5 Mi. W of Hildebran	R. Stilwell	Bored	30	18	30	Saprolite	15	----	----	Flat	
75	2.3 Mi. SW of Hildebran	J. B. Sweet	Drilled	180	6	----	Mica gneiss	15	100.0	----	Draw	
76	8.0 Mi. E of Morganton	L. Hiergesull	do	149	6	74	do	55	10.0	----	Slope	
77	5.0 Mi. E of Morganton	M. Selzer	do	120	6	75	Granitic gneiss	35	7.0	----	Flat	
78	4.0 Mi. SE of Morganton	R. Moxley	do	298	6	85	do	28	5.0	----	Hilltop	
79	4.2 Mi. SE of Morganton	P. Smith	Bored	36	6	36	Saprolite	10	----	----	Flat	
80	2.7 Mi. S of Morganton	F. Duckworth	Drilled	120	6	40	Granitic gneiss	30	20.0	----	Flat	
81	3.1 Mi. S of Morganton	F. Mull	do	132	6	70	do	----	----	----	do	
82	3.4 Mi. S of Morganton	J. C. Digh	do	133	6	106	do	45	12.0	----	Slope	
83	3.1 Mi. SW of Morganton	J. Duckworth	do	145	6	110	do	55	6.0	----	do	

84	3.5 Mi. SW of Morganton--	J. C. Propst------	--do---	180	6	160	Granitic gneiss------	----	25.0	----	Flat---	
85	4.0 Mi. SW of Morganton--	P. Propst---------	--do---	220	6	65	--do---------	70	20.0	----	--do---	
86	4.5 Mi. SW of Morganton--	M. Propst---------	--do---	153	6	85	Mica gneiss--	58	6.5	----	Slope--	
87	5.0 Mi. SW of Morganton--	Hush Puppy Fish Camp----------	Bored--	14	24	14	Saprolite----	13	2.0	----	--do---	
88	1.4 Mi. S of Glen Alpine-	B. Self----------	Dug----	33	48	----	--do---------	28	----	----	Slope--	Observation well---
89	5.5 Mi. SW of Glen Alpine	T. Rich----------	Drilled	103	6	70	Granitic gneiss------	----	15.0	----	Flat---	
90	5.8 Mi. SW of Glen Alpine	J. O. Taylor------	--do---	165	6	50	--do---------	38	25.0	----	--do---	
91	6.1 Mi. SW of Glen Alpine	J. Allen----------	--do---	158	6	70	--do---------	65	3.0	----	Slope--	Bedrock @ 90 feet---
92	7.6 Mi. SW of Glen Alpine	P. Dooley---------	--do---	124	6	108	--do---------	----	5.0	----	--do---	
93	7.4 Mi. SW of Glen Alpine	Church----------	--do---	195	6	55	--do---------	62	3.0	----	--do---	
94	7.9 Mi. SW of Glen Alpine	H. Patton---------	--do---	132	6	50	--do---------	48	10.0	----	--do---	
95	7.5 Mi. SW of Glen Alpine	E. Tallent--------	--do---	225	6	20	--do---------	20	20.0	----	Flat---	
96	14.0 Mi. SW of Morganton-	W. C. Burns-------	Bored--	30	30	30	Saprolite----	20	----	----	--do---	Hard water---------
97	11.0 Mi. SW of Morganton-	B. Morrison-------	Drilled	100	6	60	Granitic gneiss------	----	25.0	----	--do---	
98	10.3 Mi. SW of Morganton-	C. B. Leonhardt---	Dug----	24	30	----	Saprolite----	20	----	----	Slope--	Observation well---
99	8.2 Mi. SW of Morganton--	L. J. Denton------	--do---	18	36	----	--do---------	14	----	----	Flat---	
100	6.6 Mi. SW of Morganton--	R. Rich----------	Drilled	105	6	20	Mica gneiss--	20	20.0	----	--do---	
101	6.8 Mi. S of Morganton---	W. Chapman--------	--do---	210	6	20	Mica gneiss--	----	15.0	----	--do---	Hard water---------
102	3.7 Mi. S of Morganton---	W. Chapman--------	--do---	120	6	60	Granitic gneiss------	----	10.0	----	--do---	
103	2.6 Mi. S of Morganton---	W. R. Mull--------	Dug----	55	40	----	Saprolite----	43	----	----	Slope--	
104	4.0 Mi. SE of Morganton--	J. E. Muehlhouser-	Drilled	185	6	115	Mica gneiss--	85	5.0	----	--do---	
105	5.0 Mi. SE of Morganton--	F. C. Port--------	--do---	175	30	160	--do---------	15	7.0	----	--do---	
106	6.0 Mi. SE of Morganton--	C. C. Shouppe-----	Dug----	20	30	3	--do---------	16	----	----	--do---	Dug in bedrock except for soil at surface----------
107	6.3 Mi. SE of Morganton--	M. Willis--------	--do---	22	36	22	Saprolite----	20	----	----	--do---	Observation well---
108	7.1 Mi. SE of Morganton--	W. R. Mull--------	Bored--	9	24	9	--do---------	7	----	----	--do---	
109	8.2 Mi. SE of Morganton--	Z. C. Peeler------	Dug----	12	30	12	--do---------	6	----	----	--do---	
110	10.7 Mi. SE of Morganton-	R. E. Moses-------	--do---	35	36	----	--do---------	20	----	----	--do---	
111	13.6 Mi. SE of Morganton-	R. Tallant--------	--do---	26	30	13	--do---------	16	----	----	--do---	
112	14.9 Mi. SE of Morganton-	B. Hildebran------	--do---	27	48	----	--do---------	24	----	----	Flat---	Observation well---
113	15.1 Mi. SE of Morganton-	W. H. Huffman-----	Bored	60	24	60	--do---------	30	----	----	--do---	

TABLE 10. RECORDS OF SPRINGS IN BURKE COUNTY

Well No.	Location	Owner	Type of Well	Depth (ft)	Diameter (in)	Depth of casing (ft)	Water-bearing material	Water level (ft)	Yield (gpm)	Drawdown (ft)	Topography	Remarks
1A	0.1 Mi. NE of Jonas Ridge	———					Arkose———		4.4		Slope—	49° F. - 4-9-62—
2A	3.1 Mi. SE of Jonas Ridge	———					—do———		3.5		Draw—	48° F. - 12-12-61 Observation spring———
3A	8.1 Mi. S of Jonas Ridge-	———					Quartzitic arkose———		1.7		—do—	45° F. - 4-10-62—

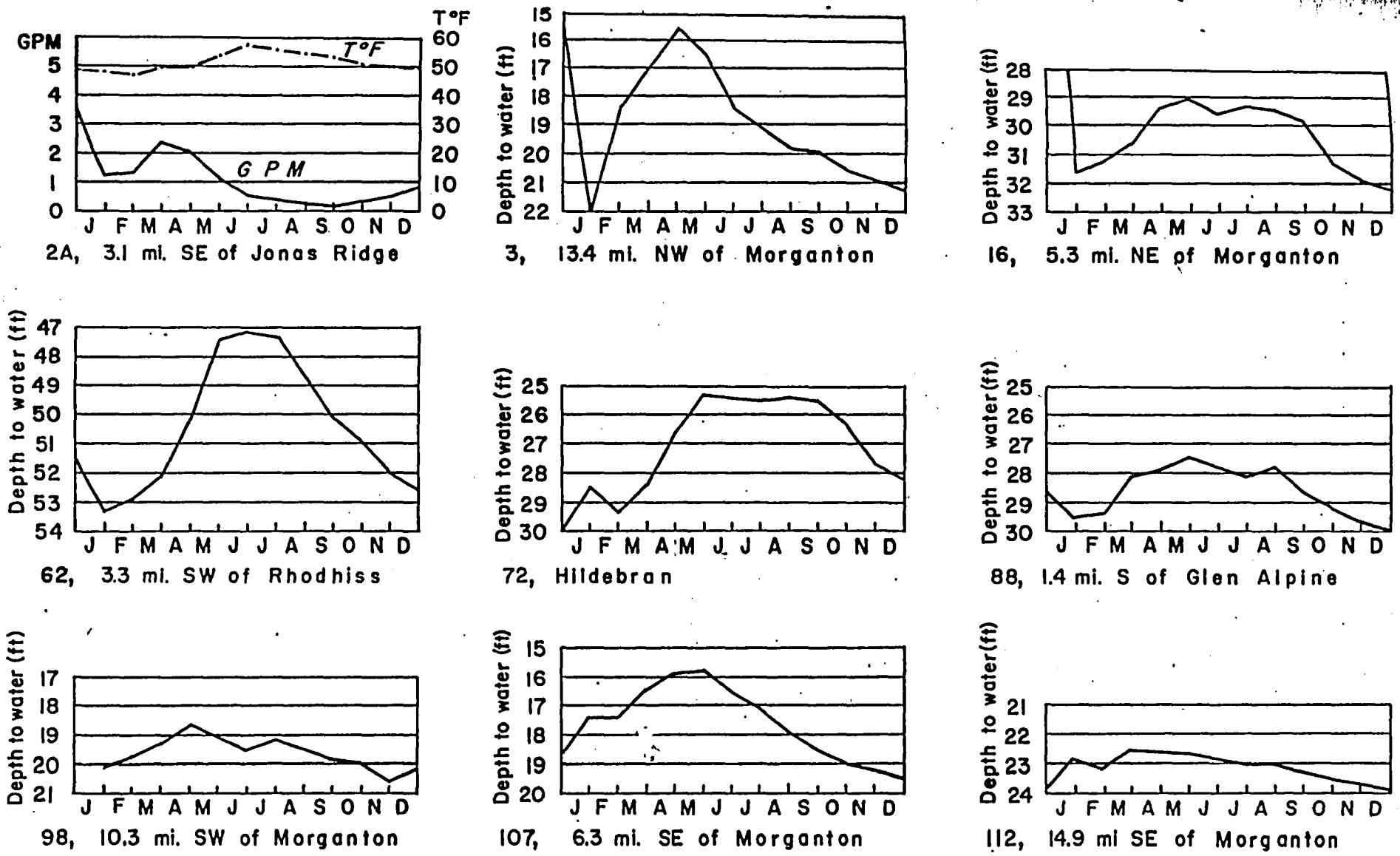


Figure 19. Burke County observation spring and well hydrographs, 1962.

TABLE 11.- CHEMICAL ANALYSES OF GROUND WATER FROM BURKE COUNTY

Chemical analyses, in parts per million

Number	Rock type	Water type	Source and depth (ft.)	Date of collection	Silica (SiO_2)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Lithium (Li)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Dissolved solids: Residue at 180°C	Dissolved solids: Calculated	Hardness as $CaCO_3$: Calcium, Magnesium	Hardness as $CaCO_3$: Non-carbonate	Specific conductance (micromhos at 25°C)	pH	Color
	1/	2/	3/																							
3	lgn	I	Du- 33	Jan. 16, 1962	8.4	0.1	0.12	--	5.6	2.1	3.8	2.9	0.1	23	7.8	3.8	0.1	1.7	0.5	--	48	24	4	67	6.3	10
16	gr	C	Du- 45	Jan. 16.....	5.5	.0	.02	--	16	3.7	25	4.0	.2	31	.2	53	.1	14	1.1	--	138	54	30	230	7.0	0
59	msh	II	Dr-400	Mar. 22, 1952	29	--	.48	0.00	17	1.7	7.4		--	69	6.9	1.1	.1	.0	--	98	98	49	--	130	7.1	5
62	msh	C	Du- 62	Jan. 16, 1962	4.9	.1	.09	--	1.3	2.1	45	5.7	.3	9	.8	52	.0	48	.0	--	164	12	5	283	5.3	5
67	mgn	II	Dr-151	Apr. 18, 1957	29	.0	.01	.00	17	2.7	5.5	3.6	.2	76	7.0	3.0	.2	.0	.1	105	108	54	0	140	6.9	0
68	msh	III	Dr-046	Apr. 18.....	15	.0	.01	.01	9.2	3.4	14	1.6	.4	64	6.4	6.8	.2	.8	.1	81	90	37	0	128	6.9	0
72	mgn	C	Du- 45	Jan. 16, 1962	4.3	.1	.04	--	1.9	1.2	21	2.0	.2	6	2.6	25	.0	19	.0	82	80	10	6	140	5.2	5
73	mgn	II	Dr-200	Jan. 12, 1963	25	--	.17	--	10	2.1	5.7	2.3	--	51	6.2	1.4	.2	.1	--	--	78	34	0	100	6.7	--
88	gr	I	Du- 33	Jan. 16, 1962	11	.0	.07	--	14	1.2	2.6	2.7	.1	45	1.8	2.4	.1	5.0	.8	68	64	40	3	80	6.9	10
98	mgn	I	Du- 24	Mar. 21.....	11	.0	.15	.02	13	1.1	1.6	1.0	.0	48	1.0	1.6	.0	.7	.0	55	55	38	0	93	6.6	--
104	mgn	IV	Dr-185	Jan. 12, 1963	27	--	.44	--	3.3	1.0	5.8	1.4	--	30	.2	1.0	.1	.0	--	--	55	12	0	52	6.3	--
112	mgn	C	Du- 27	Jan. 16, 1962	8.8	.1	.12	--	5.3	2.2	4.5	2.5	.1	18	1.8	9.7	.0	4.6	.0	--	49	22	8	74	6.2	5
113	mgn	II	B - 60	Jan. 12, 1963	12	--	.10	--	4.6	.3	3.3	2.4	--	20	.4	3.0	.1	3.0	--	--	39	13	0	49	5.9	--
2A	akp	D	S	Jan. 16, 1962	7.4	.0	.02	--	.6	.1	1.4	.5	.1	6	.2	.7	.0	.1	.0	--	14	2	0	11	6.7	5

1/ Rock Type

qm - quartz-monzonite gneiss
msh - sillimanite-mica schist
gr - granitic gneiss
mgn - quartz-biotite gneiss
lgn - layered gneiss
amgn - amphibolite gneiss
augn - augen gneiss
Begn - Beech Granite
arph - argillite and phyllite
akp - arkosic and pyroclastic rocks
qsh - schistose quartzitic rocks
qtz - quartzite

2/ Water Type

I - calcium, magnesium, sodium bicarbonate
II - calcium, sodium, magnesium bicarbonate
III - calcium-sodium, magnesium bicarbonate
IV - sodium, calcium, magnesium bicarbonate
V - magnesium, calcium, sodium bicarbonate
D - dissolved solids too low to reflect effects of lithology upon water composition
C - excessive chloride and/or nitrate masks effects of lithology upon water composition

3/ Source

S - spring
Dr - drilled well
Du - dug well
B - bored well

80

McDowell County

(Area, 442 square miles; 1960 population, 27,742)

McDowell County is situated in the southwest part of the area of investigation (fig. 1). In common with Burke and Caldwell Counties, it lies partly in the inner Piedmont province and partly in the Blue Ridge physiographic province. From southeast to northwest monadnock-like hills separated by moderately wide, linear valleys in southeast McDowell County yield to deeply dissected, rugged slopes of the eastern Blue Ridge front near the Catawba River. Altitudes range from less than 1,000 feet in the southeast corner to 5,665 feet above mean sea level on High Pinnacle at the northwest corner of the county. McDowell County lies mostly within the Catawba River drainage basin. Tributaries of the Broad River drain a small part of southern McDowell County. The Catawba River courses northeastward near the Blue Ridge-inner Piedmont boundary and is impounded in Lake James. Streams and drainage courses appear to be of subsequent development, as they are mostly coincident to joint and shear systems.

Marion, the county seat, is the largest town and Old Fort is the only other town of substantial size in McDowell County. Agriculture dominates the economy to which forest products are supplementary. About 23 percent of the county is farmland. Manufacturing, mainly of furniture and textiles, is localized in and near Marion and Old Fort. Quarrying, about 8 miles north of Marion, produces dolomite used mostly for road metal. The northwest boundary of McDowell County is traversed by nearly 40 miles of the scenic Blue Ridge Parkway.

Mica gneiss predominates in exposures of the complex metamorphic rock types of this area (pl. 2). Layered gneiss, granitic gneiss, and quartzite are other prominent rock types. Structural trends range from nearly north to northeast. A deeply weathered residual mantle of saprolite overlies most of the inner Piedmont part of McDowell County. Saprolite is thin or absent on the Blue Ridge front.

Surface water is the source of municipal supplies for Marion and Old Fort. The water is filtered, chlorinated, and additionally treated before use. Drilled wells furnish water to many farms and outlying residences. Most of the drilled wells are less than 200 feet deep. Of 27 such wells the average depth is 110 feet and the average yield is 14.5 gallons per minute. Drilled wells having the highest yields are

located in: low, flat areas; relatively narrow, linear valleys; or draws. Dug and bored wells are common throughout the inner Piedmont portion of McDowell County, providing domestic water for farms and residences. Of 60 dug and bored wells the average depth is 39 feet and the average depth to the water table is 27 feet. Insufficient data preclude statistical representation of yields from dug and bored wells. Springs are more commonly used in the Blue Ridge part of McDowell County. The community of Little Switzerland procures its municipal water supply from springs.

Analyses of ground water from McDowell County are shown in table 17. Water from wells 29 and 64 contained more than 0.3 ppm iron. Water from wells 39 and 64 contained high concentrations of chloride and/or nitrate. Analysis of water from well 6 is noteworthy. Water from this well had the highest pH (9.1) of any water sampled in the Morganton area, a strong "rotten egg" odor (hydrogen sulfide), and relatively high sodium and sulfate concentrations. This well probably is receiving water from pegmatite containing sodic feldspar and sulfides.

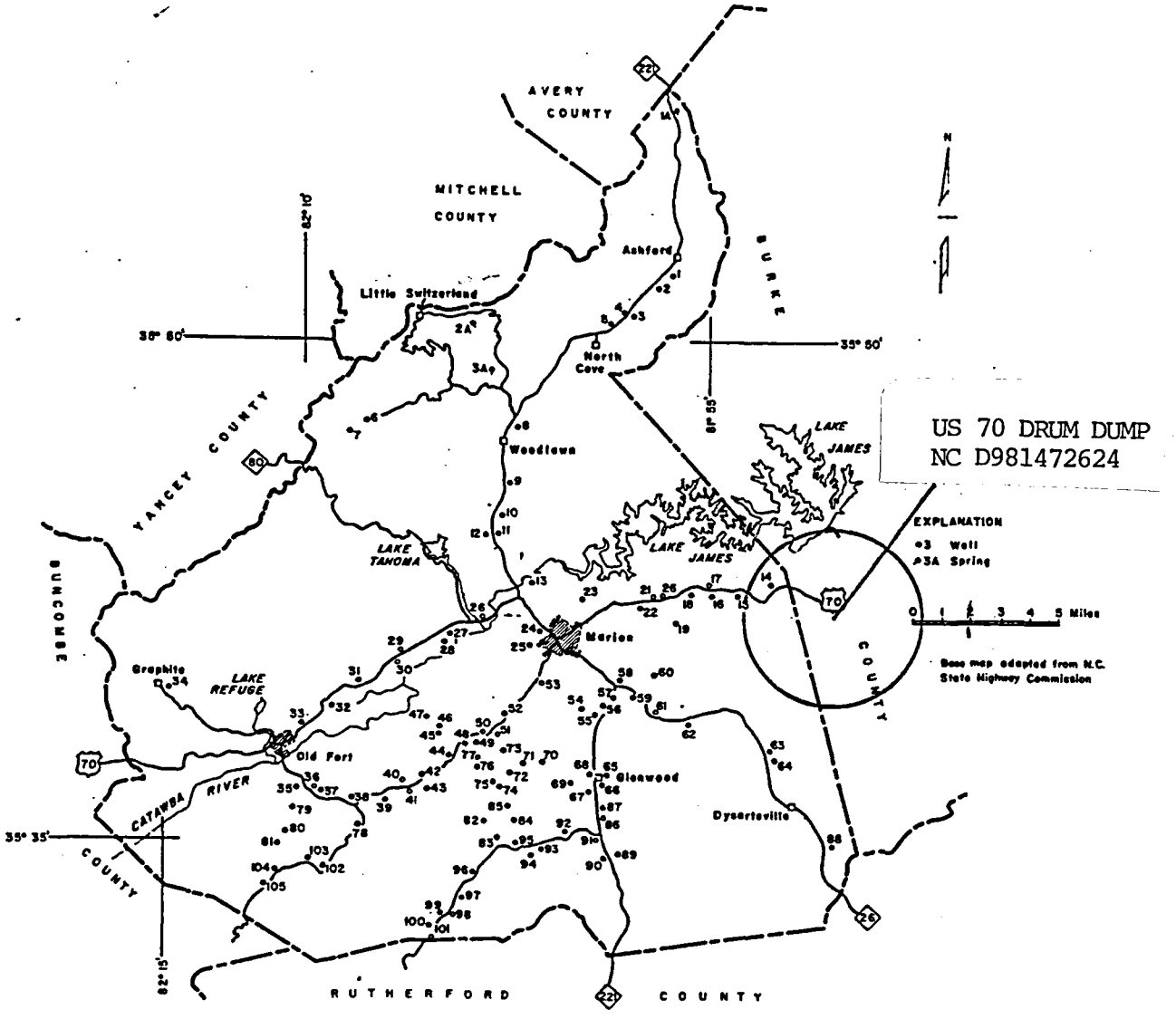


Figure 22. Map of McDowell County showing locations of wells and springs.

TABLE 15. RECORDS OF WELLS IN McDOWELL COUNTY

Well No.	Location	Owner	Type of Well	Depth (ft)	Diameter (in)	Depth of casing (ft)	Water bearing material	Water level (ft)	Yield (gpm)	Drawdown (ft)	Topography	Remarks
1	Ashford	S. C. Gouge	Bored	37	24	37	Alluvium	25	---	---	Flat	Hard water
2	1.1 Mi. S of Ashford	Sam Brown	do	27	24	27	do	20	---	---	do	Slightly hard water
3	1.5 Mi. N of North Cove	C. Weathers	Drilled	120	6	80	Quartzite	30	---	---	do	do
4	1.6 Mi. N of North Cove	J. G. Childers	Bored	40	30	40	do	20	---	---	do	
5	0.8 Mi. N of North Cove	B. McCall	do	16	30	16	Alluvium	10	---	---	do	Observation well
6	6.8 Mi. W of Woodlawn	N. C. State Fish Hatchery	Drilled	253	6	20	Amphibolite gneiss	4.9	12.0	---	Slope	SO_2 in water, not potable
7	7.2 Mi. W of Woodlawn	do	do	120	6	20	do	1	---	---	do	
8	0.6 Mi. N of Woodlawn	L. J. Robinson	do	190	6	150	Quartzite	25	---	---	do	
9	1.6 Mi. S of Woodlawn	Ray Byrd	Bored	16	30	16	Saprolite	4	---	---	Flat	Bedrock at 16 feet
10	2.7 Mi. N of Marion	Bill Nichols	do	7	18	7	Alluvium	2	---	---	do	Observation well
11	2.1 Mi. N of Marion	R. Lavender	do	60	30	60	Saprolite	5	---	---	Slope	
12	2.0 Mi. N of Marion	G. Biddix	do	12	30	12	do	3	---	---	Flat	
13	1.1 Mi. N of Marion	J. Lauder	Drilled	137	6	137	Layered gneiss	---	11.0	---	Slope	
14	6.6 Mi. E of Marion	K. Thombs	do	115	6	34	Biotite gneiss	72	9.0	---	Hilltop	
15	5.3 Mi. E of Marion	Z. B. Adams	Bored	40	30	40	do	25	---	---	Slope	
16	4.5 Mi. E of Marion	C. E. Edwards	Drilled	139	6	139	do	60	3.5	---	do	
17	4.3 Mi. E of Marion	G. Mace	do	130	6	130	do	---	---	---	do	Iron in water
18	3.8 Mi. E of Marion	O. Aldridge	do	68	6	68	Biotite gneiss	---	---	---	do	Slightly hard water
19	4.5 Mi. E of Marion	G. C. Welch	do	136	6	100	do	4	7.5	---	do	
20	4.0 Mi. E of Marion	Hollifield and Church	Bored	24	24	24	Saprolite	12	---	---	Flat	
21	3.7 Mi. E of Marion	G. Holland	do	16	24	16	do	7	---	---	do	Observation well
22	3.5 Mi. E of Marion	Lingerfelt	Dug	20	4'x4'	---	do	14	---	---	do	
23	2.0 Mi. NE of Marion	V. Davis	Drilled	237	6	100	Biotite gneiss	60	---	---	Slope	
24	0.7 Mi. NW of Marion	W. F. Morris	do	325	6	80	do	80	2.5	---	do	
25	1.0 Mi. W of Marion	J. G. Hollifield	Bored	67	24	67	Saprolite	54	7.0	---	do	
26	2.0 Mi. NW of Marion	P. E. Edwards	Drilled	84	6	74	Mica gneiss	---	20.0	---	Flat	
27	5.0 Mi. NW of Marion	G. Crawford	do	310	6	---	Layered gneiss	---	11.0	---	do	
28	5.2 Mi. W of Marion	W. V. Shuford	do	64	6	44	do	8	8.0	---	do	
29	6.2 Mi. W of Marion	Sam Parker	Dug	21	36	---	Saprolite	3	---	---	do	Observation well
30	5.5 Mi. NE of Old Fort	T. M. Burnett	Drilled	85	6	85	do	---	25.0	---	do	
31	4.0 Mi. NE of Old Fort	W. R. McDaniel	Dug	40	30	40	do	---	---	---	Slope	
32	2.8 Mi. NE of Old Fort	S. N. Allison	Drilled	57	6	35	Layered gneiss	32	---	---	do	
33	1.3 Mi. NE of Old Fort	R. E. Evans	do	63	6	50	do	---	75.0	---	Flat	
34	Graphite		Bored	19	18	19	Saprolite	11	---	---	Slope	
35	1.3 Mi. S of Old Fort	M. Wilson	Drilled	100	6	80	Layered gneiss	---	15.0	---	Slope	
36	1.3 Mi. SE of Old Fort	G. R. Early	do	120	6	60	do	---	8.5	---	do	
37	1.6 Mi. SE of Old Fort	T. B. Faw	Dug	36	36	36	Saprolite	30	8.0	---	Flat	Often cloudy
38	3.9 Mi. SE of Old Fort	Church	Bored	75	30	75	do	67	---	---	Slope	
39	4.8 Mi. SE of Old Fort	R. F. Cathey	Dug	48	40	---	do	43	---	---	do	Observation well
40	5.8 Mi. SE of Old Fort		Bored	28	30	28	do	12	---	---	Flat	
41	6.0 Mi. SE of Old Fort	J. Reel	Drilled	79	6	62	Mica gneiss	50	7.5	---	do	
42	6.3 Mi. SE of Old Fort	B. W. Simpson	do	115	6	75	do	15	---	---	do	
43	6.0 Mi. SE of Old Fort	A. F. Hill	Bored	45	30	45	Saprolite	27	---	---	Slope	
44	1.2 Mi. SW of Providence	F. J. Day	do	48	30	48	do	32	---	---	do	
45	2.0 Mi. W of Providence	C. Wall	Drilled	302	6	58	Layered gneiss	---	20.0	---	do	

State of North Carolina
Department of Natural Resources and Community Development
Mooresville Regional Office

James G. Martin, Governor
S. Thomas Rhodes, Secretary

Albert F. Hilton, Regional Manager

DIVISION OF ENVIRONMENTAL MANAGEMENT

July 7, 1987

Ms. Pat Derosa
Environmental Health Section
Solid & Hazardous Waste
P. O. Box 2091
Raleigh, N. C. 27602

Subject: Technical Assistance
Well Records
Burke County, N. C.

Dear Ms. Derosa:

In response to your request of July 5, 1987, enclosed is the following information:

Two well records within a three mile radius of the point .2 of a mile east of the intersection of Hwy. 70 and Dysartsville Road.

If you should have any questions, please do not hesitate to contact this Office at (704) 663-1699.

Sincerely,

Eric J. Klingel, Ph.D.
Hydrogeologic Regional Supervisor

EJK:pb

919 North Main Street, P.O. Box 950, Mooresville, N.C. 28115-0950 • Telephone 704-663-1699

An Equal Opportunity Affirmative Action Employer

NORTH CAROLINA DEPARTMENT OF WATER RESOURCES
DIVISION OF GROUND WATER
BOX 9392 - RALEIGH, N. C.

WELL RECORD

BK 1154 ✓

DRILLER: RALPH GROTTS REG. NO. LIC. NO.

1. LOCATION: TOWN GLEN ALPINE COUNTY BURKE
MAP: QUADRANGLE NO. L77

2. OWNER: BRENTWOOD WATER ASSOC.
ADDRESS:

3. TOPOGRAPHY: draw, slope, hill, valley, flat, ridge
4. RIG TYPE OR METHOD: AIR ROT. Use P.S.
5. TOTAL DEPTH: 365 ft. Date ~~Sept. 1969~~ 8-27-60
6. CASING: Depth 347 ft.; Diam. 6 in.; Type BLK.
Grout: Depth _____; Method _____
7. SCREEN: from (ft.) to (ft.) slot size type
8. WATER ZONES (depth): 210'
9. QUALITY: _____ TEMP: _____
10. STATIC WATER LEVEL: 10 ft. below top of casing which is 2 ft. (above, below) land surface. Date 8-27-60
11. YIELD: (gpm) 30 Flow, Pump, Bail, Est. (AIR)
12. PUMPING WATER LEVEL: _____ ft. after _____ hrs. pumping at _____ gpm. Spec. cap. _____ gpm/ft. of d
13. PUMP: type _____, Intake depth _____, Cap. _____ gpm, Hp. _____
14. REMARKS: Rock cuttings in files ✓ Topo elev = 1150

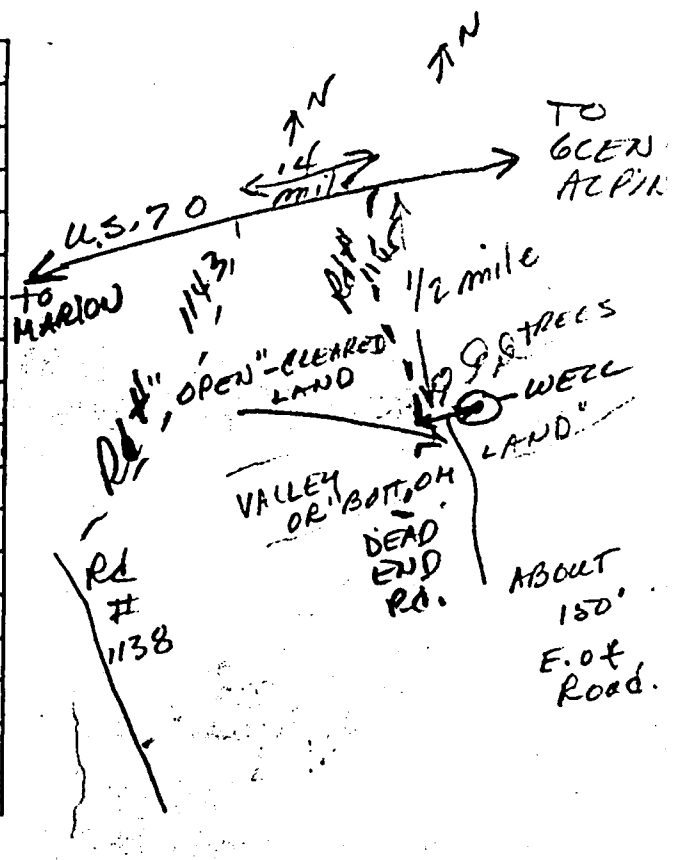
N

	L77m-1			
		⊙		

(place this sheet over correct square on map, match corners and circle a dot at well location.)

15. DRILL LOG:

Soil and Rock Formation	Depth From	Depth To

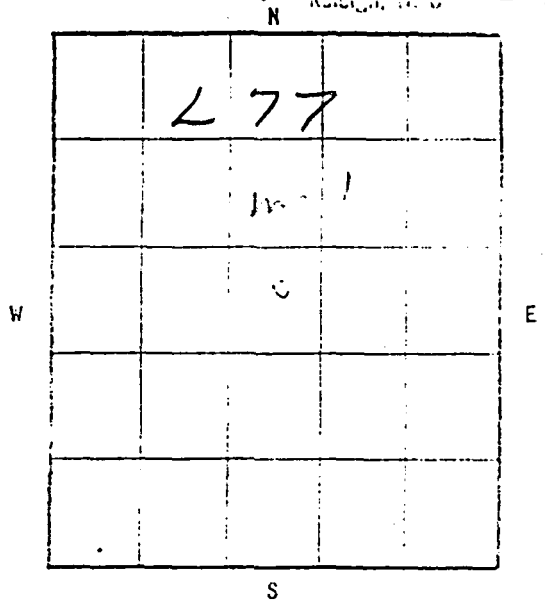


NORTH CAROLINA DEPARTMENT OF WATER RESOURCES
DIVISION OF GROUND WATER
BOX 8392 - RALEIGH, N. C.

WELL RECORD

DRILLER: RALPH SPOTTS REG. NO. 107 LIC. NO. 142 Permit #296

1. LOCATION: TOWN MORGANTON, N.C. COUNTY BURKE
   MAP: QUADRANGLE NO. L77
2. OWNER: BRENTWOOD WATER CORP.
   ADDRESS: MORGANTON, N.C. 28655
3. TOPOGRAPHY: draw, slope, hill, valley, flat, ridge
4. RIG TYPE OR METHOD: AIR-ROTARY
5. TOTAL DEPTH: 365 ft. Date 8-27-69
6. CASING: Depth 43 ft.; Diam. 6 in.; Type BLACK
   Grout: Depth _____; Method _____
7. SCREEN: from (ft.) to (ft.) slot size type
   _____ _____ _____ _____
   _____ _____ _____ _____
8. WATER ZONES (depth): 210'
9. QUALITY: _____ TEMP: _____
10. STATIC WATER LEVEL: 2 ft. below top of casing which is 2 ft. (above, below) land surface. Date 8-27-69
11. YIELD: (gpm) 30 Flow, Pump, Bail, AIR
12. PUMPING WATER LEVEL: _____ ft. after _____ hrs. pumping at _____ gpm. Spec. cap. _____ gpm/ft. of dd.
13. PUMP: type _____, Intake depth _____, Cap. _____ gpm, Hp. _____.
14. REMARKS: _____



(place this sheet over correct square on map, match corners and circle a dot at well location.)

15. DRILL LOG:

Soil and Rock Formation	Depth From	Depth To	Soil and Rock Formation	Depth From	Depth To
Soil	0	43			
Rock	43	365T			

White copy - Department of Water Resources; Blue - Driller's copy; Green - Owner's copy. Form GW-1

NORTH CAROLINA DEPARTMENT OF WATER RESOURCES
DIVISION OF GROUND WATER
BOX 9392 - RALEIGH, N. C.

WELL RECORD

BK1158

DRILLER: ~~Air Dro~~ RALPH CROTTS REG. NO. LIC. NO.

1. LOCATION: TOWN COUNTY BURKE L7 ~~L66~~
   MAP: QUADRANGLE NO.
2. OWNER: BRENTWOOD WATER ASSOC.
   ADDRESS: 07
3. TOPOGRAPHY: draw, (slope), hill, (valley), flat, ridge
4. RIG TYPE OR METHOD: AIR Use
5. TOTAL DEPTH: ____ ft. Date
6. CASING: Depth ____ ft.; Diam. ____ in.; Type
   Grout: Depth ____; Method
7. SCREEN: from (ft.) to (ft.) slot size type
8. WATER ZONES (depth):
9. QUALITY: TEMP:
10. STATIC WATER LEVEL: ____ ft. below top of casing which is ____ ft. (above, below) land surface. Date
11. YIELD: (gpm) Flow, Pump, Bail, Est.
12. PUMPING WATER LEVEL: ____ ft. after ____ hrs. pumping at ____ gpm. Spec. cap. ____ gpm/ft. of d
13. PUMP: type, Intake depth, Cap. ____ gpm, Hp. ____
14. REMARKS: Elec & gamma ray logged 11-6-69
    Sur. elev. 1100 ft.

N

	L7			
	~~L66~~ X-1			
	⊙			

(place this sheet over correct square on map, match corners and circle a dot at well location.)

15. DRILL LOG:

Soil and Rock Formation	Depth From	Depth To

~~[illegible]~~
Rock cuttings in DST 2 file ✓

see Raleigh for Drg's. log.

White co

4

NORTH CAROLINA DEPARTMENT OF WATER RESOURCES
DIVISION OF GROUND WATER
BOX 9392 - RALEIGH, N. C.

WELL RECORD

FEB 17 1970
Ground Water Division
Raleigh, N. C.

DRILLER: RALPH SPOTTS REG. NO. 107 LIC. NO. 145 Permit # 290

1. LOCATION: TOWN MORGANTON, N.C. COUNTY Burke

MAP: QUADRANGLE NO.

2. OWNER: BRENTWOOD WATER CORP
ADDRESS: MORGANTON, N.C. 28655

3. TOPOGRAPHY: draw, slope, hill, valley, flat, ridge

4. RIG TYPE OR METHOD: AIR ROTARY

5. TOTAL DEPTH: 300 ft. Date 10-24-69

6. CASING: Depth 51 ft.; Diam. 6 in.; Type Steel
Grout: Depth _____; Method _____

7. SCREEN: from (ft.) to (ft.) slot size type

8. WATER ZONES (depth): 145

9. QUALITY: _____ TEMP: _____

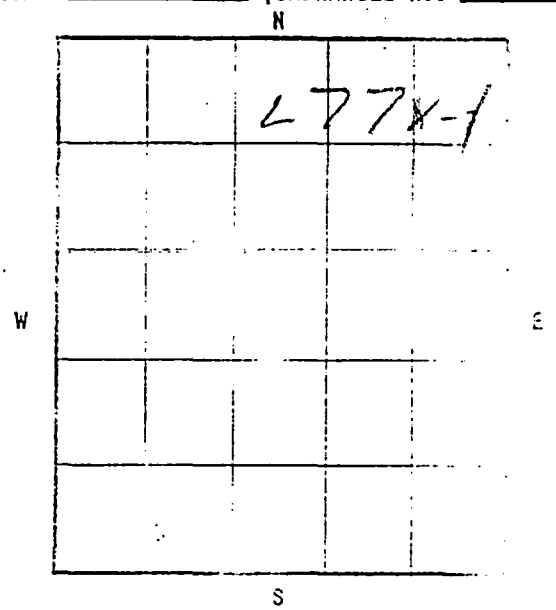
10. STATIC WATER LEVEL: 11 ft. below top of casing which is 1 ft. (above, below) land surface. Date 10-24-69

11. YIELD: (gpm) 35 Flow, Pump, Bail, ~~Air~~

12. PUMPING WATER LEVEL: _____ ft. after _____ hrs. pumping at _____ gpm. Spec. cap. _____ gpm/ft. of dd.

13. PUMP: type _____, Intake depth _____, Cap. _____ gpm, Hp. _____.

14. REMARKS:

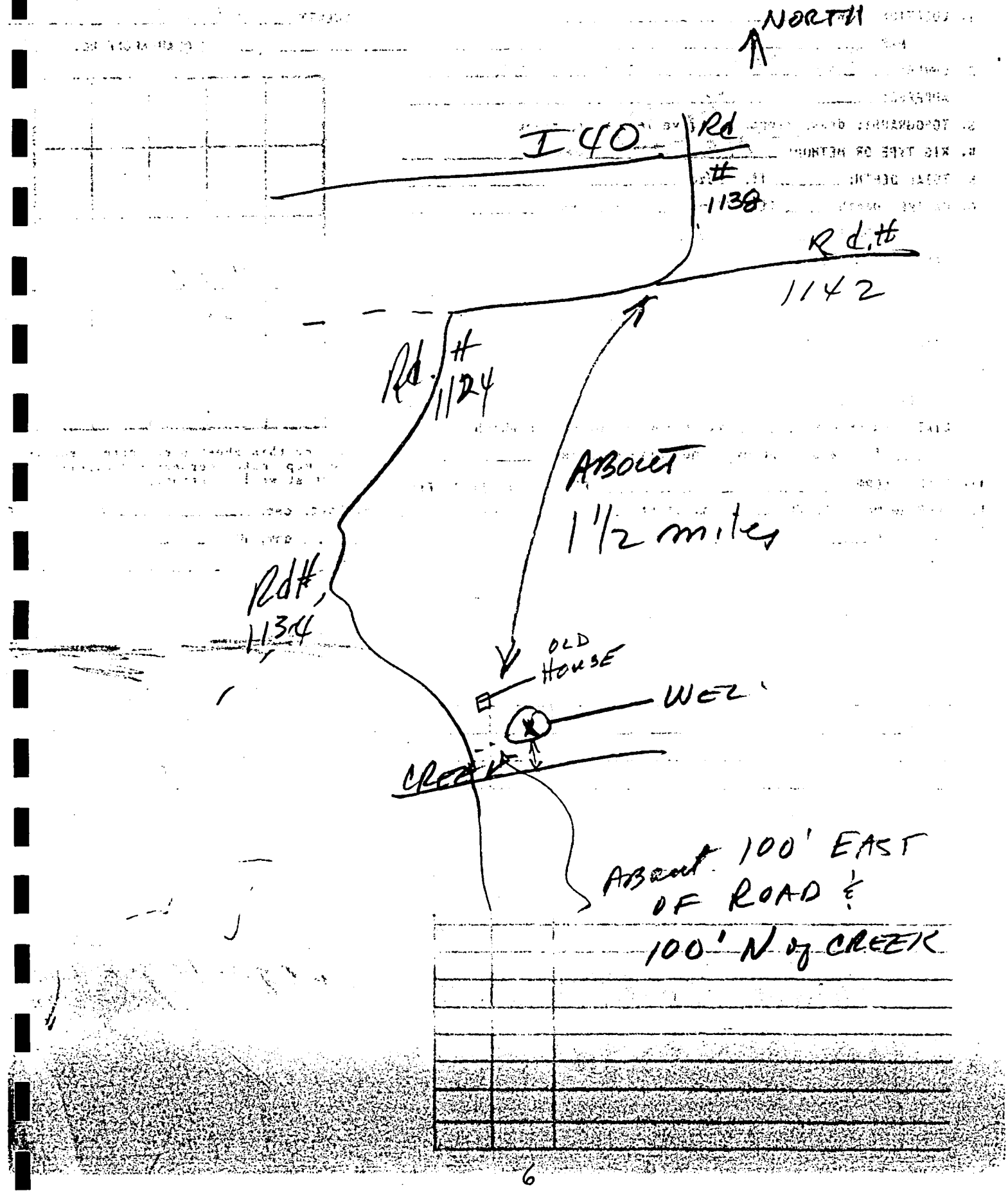


(place this sheet over correct square on map, match corners and circle a dot at well location.)

15. DRILL LOG:

Soil and Rock Formation	Depth From	Depth To	Soil and Rock Formation	Depth From	Depth To
SOIL	0	51			
ROCK	51	300			

White copy - Department of Water Resources; Blue - Driller's copy; Green - Owner's copy. Form GW-1


NORTH
I 40
Rd #
1138
Rd. #
1142
Rd. #
1124
ABOUT
1 1/2 miles
Rd#,
1134
OLD
HOUSE
WELL
CREEK
About 100' EAST
OF ROAD &
100' N of CREEK

22 June 1987

To: File

From: Pat DeRosa PD

Re: US 70 Drum Dump
NCD 981472624

On June 12, 1987, I spoke by telephone with Eric Klingel, Regional Hydrologist for Burke County, Groundwater Section, DEM, NC NRCD (704) 663-1699, regarding groundwater conditions surrounding the subject site. Mr. Klingel indicated that groundwater usage in the area is from the bedrock aquifer. He also explained that the saprolite overlying the bedrock serves as a groundwater reservoir. He indicated that there is no confining layer or hydraulic separation between the saprolite and bedrock.

On June 17, 1987, I spoke with Bob Crawford, Hydrogeological Technician working with Mr. Klingel. Mr. Crawford said that he had identified 13 well records within the site vicinity and provided the following information based on these records:

Average well depth = 252 ft.
Average static water level = 54 ft.
Average casing depth = 38 ft.

Mr. Crawford estimated the average hydraulic conductivity of the saprolite at 10-5 cm/sec.

PD/pw/0384b

June 16, 1987

To: File

From: Pat DeRosa PD

Re: US 70 Drum Dump
NCD 981472624

On June 12, 1987, I spoke by telephone with Wade Knox, Water Supply Engineer, NC DHR (704) 669-3361 regarding community water supplies in McDowell County. Mr. Knox knew of no community water system serving the portion of McDowell County within 3 miles of the subject site. The nearest community well systems identified, were greater than 3 miles from the site.

PD/pw/0384b

June 18, 1987

To: File

From: Pat DeRosa PD

Re: US 70 Drum Dump
NCD 981472624

On June 11, 1987, I spoke with Martha Moore, Water Supply Branch NC DHR, Raleigh, NC (919) 733-2321 regarding community well systems within 3 miles of the subject site. Based on a coordinate grid of latitudes and longitudes, no community well systems were identified in Burke County within 3 miles of the subject site.

PD/pw/0384b

15 June 1987

To: File

From: Pat DeRosa

Re: US 70 Drum Dump
NCD 981472624

On June 10, 1987, I spoke by telephone with Glen Berry, Chief Design Technician, Engineering Department, City of Morganton (704) 437-8863, to determine the extent of water distribution from Morganton. Mr. Berry indicated that the Glen Alpine water system is served and maintained by the City of Morganton. We discussed the extent of water distribution from Glen Alpine to the area within 3 miles of the site. These waterlines were marked on the USGS map. Mr. Berry indicated that water service closer to the site is provided by Brentwood Water System which also purchases water from Morganton.

PD/pw/0384b

June 16, 1987

To: File

From: Pat DeRosa PD

Re: US 70 Drum Dump
NCD 981472624

On June 11, 1987, I spoke by telephone with Danny Henson, Manager, Brentwood Water System (704) 584-4566 regarding water service within 3 miles of the subject site. Mr. Henson described the extent of the distribution lines in this area while I marked these on the USGS topographic map. Mr. Henson confirmed that Brentwood purchases its water from the City of Morganton and that they do not use any wells. He also indicated that although some residents within the distribution area still use wells, about 95% of the homes with access to city water have hooked up. The system serves a total of 2,034 units.

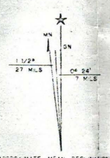
PD/pw/0384b

MAP COMPILED BY STEREOPHOTOGRAMMETRIC METHODS IN ACCORDANCE WITH NATIONAL MAPPING STANDARDS

BY

LANDMARK ENGINEERING CO., INC.

CONSULTING & PHOTOGRAMMETRIC ENGINEERS
P. O. BOX 668 CARY, N. C.
PHOTOGRAPHY DATE: 1/27/75 PROJECT NO. 75-1



APPROXIMATE MEAN DECLINATION AT THE CENTER OF THE COUNTY 1956

	17	33
	16	32
	15	31

SHEET INDEX

400 0 400 800 1200 1600 FEET

SCALE: 1" = 400'

2000' GRID BASED ON NORTH CAROLINA STATE PLANE COORDINATE SYSTEM

PROPERTY OF BURKE COUNTY, NORTH CAROLINA
MAPS NOT TO BE REPRODUCED, WITHOUT WRITTEN PERMISSION FROM BURKE COUNTY PLANNING OR TAX DEPARTMENT.

3 miles only 67
2 miles only 160
gw only 32

PREPARED FOR AND PROPERTY OF

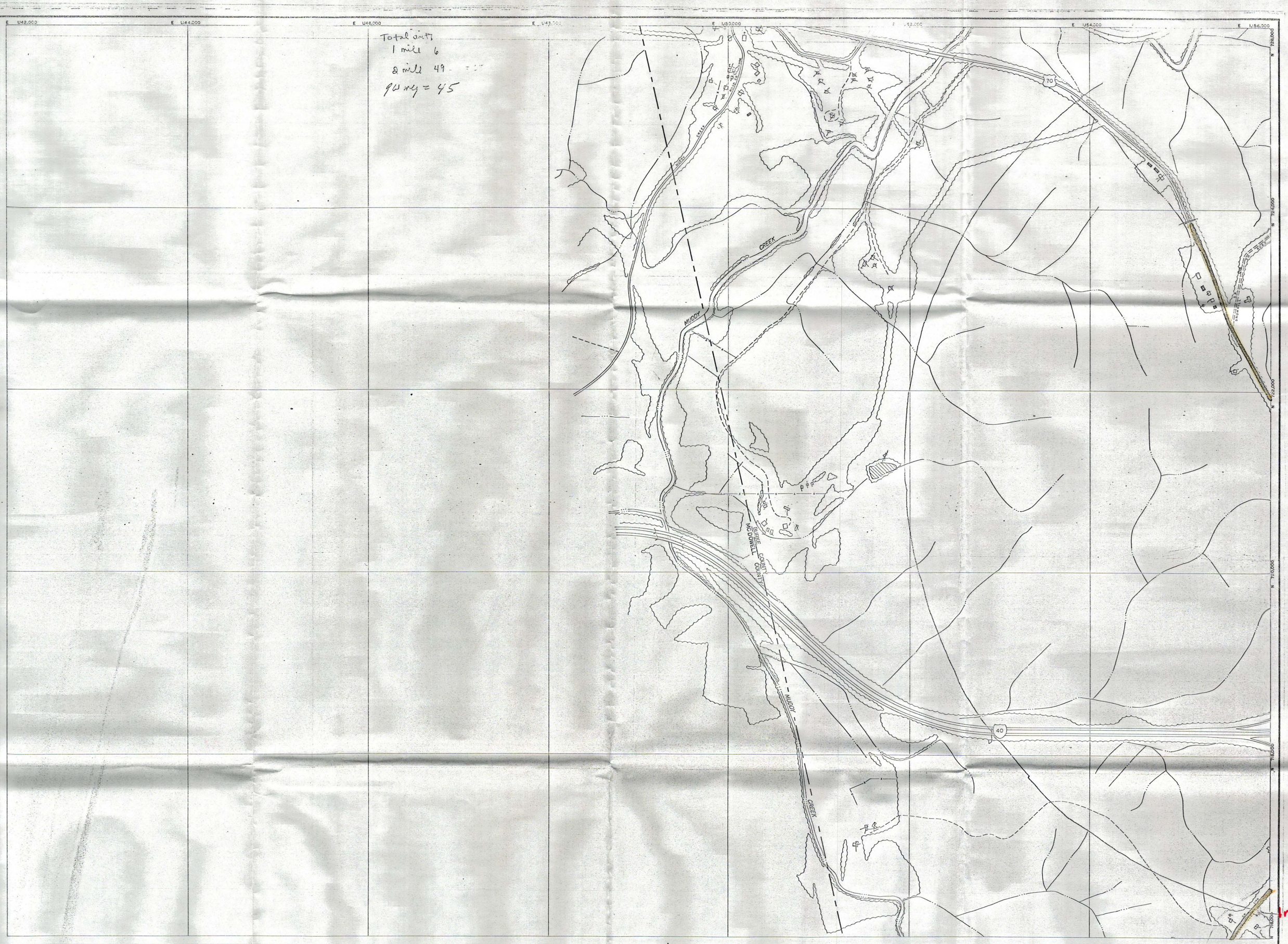
BURKE COUNTY

NORTH CAROLINA

= water distribution lines

TOWNSHIP
MAP NO.
DATE

Total units
1 mile 6
2 mile 49
gw ny = 45



MAP COMPILED BY STEREOPHOTOGRAMMETRIC METHODS
IN ACCORDANCE WITH NATIONAL MAPPING STANDARDS

BY

LANDMARK ENGINEERING CO., INC.

CONSULTING & PHOTOGRAMMETRIC ENGINEERS
P. O. BOX 668 CARY, N. C.
PHOTOGRAPHY DATE: 1/27/75 PROJECT NO. 75-1

MN
GN
1 1/2°
27 MLS
0° 24'
7 MLS

APPROXIMATE MEAN DECLINATION AT
THE CENTER OF THE COUNTY 1956

	18	34
	17	33
	16	32

SHEET INDEX

400 0 400 800 1200 1600 FEET
SCALE: 1" = 400'

2000' GRID BASED ON NORTH CAROLINA STATE PLANE COORDINATE SYSTEM

PROPERTY OF BURKE COUNTY, NORTH CAROLINA.
MAPS NOT TO BE REPRODUCED, WITHOUT WRITTEN PERMISSION
FROM BURKE COUNTY PLANNING OR TAX DEPARTMENT.

PREPARED FOR AND PROPERTY OF

BURKE COUNTY

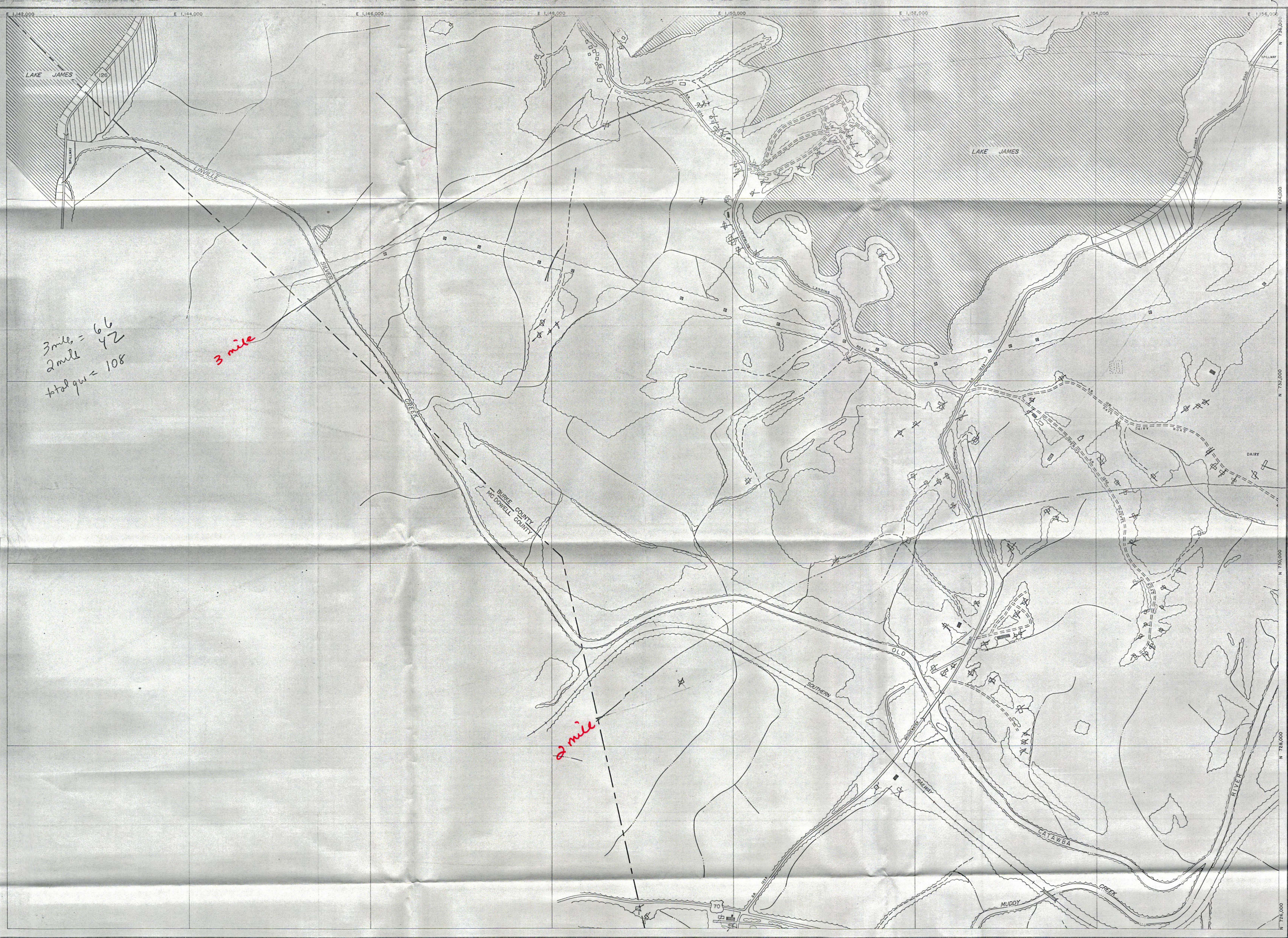
NORTH CAROLINA

= water distribution lines

TOWNSHIP

MAP NO.

DATE



3 mile = 66
2 mile = 42
total gw = 108

MAP COMPILED BY STEREOPHOTOGRAMMETRIC METHODS
IN ACCORDANCE WITH NATIONAL MAPPING STANDARDS

BY

LANDMARK ENGINEERING CO., INC.

CONSULTING & PHOTOGRAMMETRIC ENGINEERS
P. O. BOX 668 CARY, N. C.
PHOTOGRAPHY DATE: 1/27/75 PROJECT NO. 75-1

MN GN
1 1/2°
27 MILS
0° 24'
7 MILS

APPROXIMATE MEAN DECLINATION AT
THE CENTER OF THE COUNTY 1956

5	19	35
	18	34
	17	33

SHEET INDEX

400 0 400 800 1200 1600 FEET
SCALE 1" = 400'

2000' GRID BASED ON NORTH CAROLINA STATE PLANE COORDINATE SYSTEM

PROPERTY OF BURKE COUNTY, NORTH CAROLINA
MAPS NOT TO BE REPRODUCED, WITHOUT WRITTEN PERMISSION
FROM BURKE COUNTY PLANNING OR TAX DEPARTMENT.

PREPARED FOR AND PROPERTY OF

BURKE COUNTY

NORTH CAROLINA

TOWNSHIP

MAP NO.

DATE

3 mile

2 mile

MAP COMPILED BY STEREOPHOTOGRAMMETRIC METHODS
IN ACCORDANCE WITH NATIONAL MAPPING STANDARDS

BY

LANDMARK ENGINEERING CO., INC.

CONSULTING & PHOTOGRAMMETRIC ENGINEERS
P. O. BOX 668 CARY, N. C.
PHOTOGRAPHY DATE: 1/27/75 PROJECT NO 75-1

MN GN
1 1/2° 27 MLS
OR 26° 7 MLS

APPROXIMATE MEAN DECLINATION AT
THE CENTER OF THE COUNTY 1956

19	35	50
18	34	49
17	33	48

SHEET INDEX

400 0 400 800 1200 1600 FEET
SCALE: 1" = 400'

2000' GRID BASED ON NORTH CAROLINA STATE PLANE COORDINATE SYSTEM

PROPERTY OF BURKE COUNTY, NORTH CAROLINA
MAPS NOT TO BE REPRODUCED WITHOUT WRITTEN PERMISSION
FROM BURKE COUNTY PLANNING OR TAX DEPARTMENT.

PREPARED FOR AND PROPERTY OF

BURKE COUNTY

NORTH CAROLINA

= water distribution lines

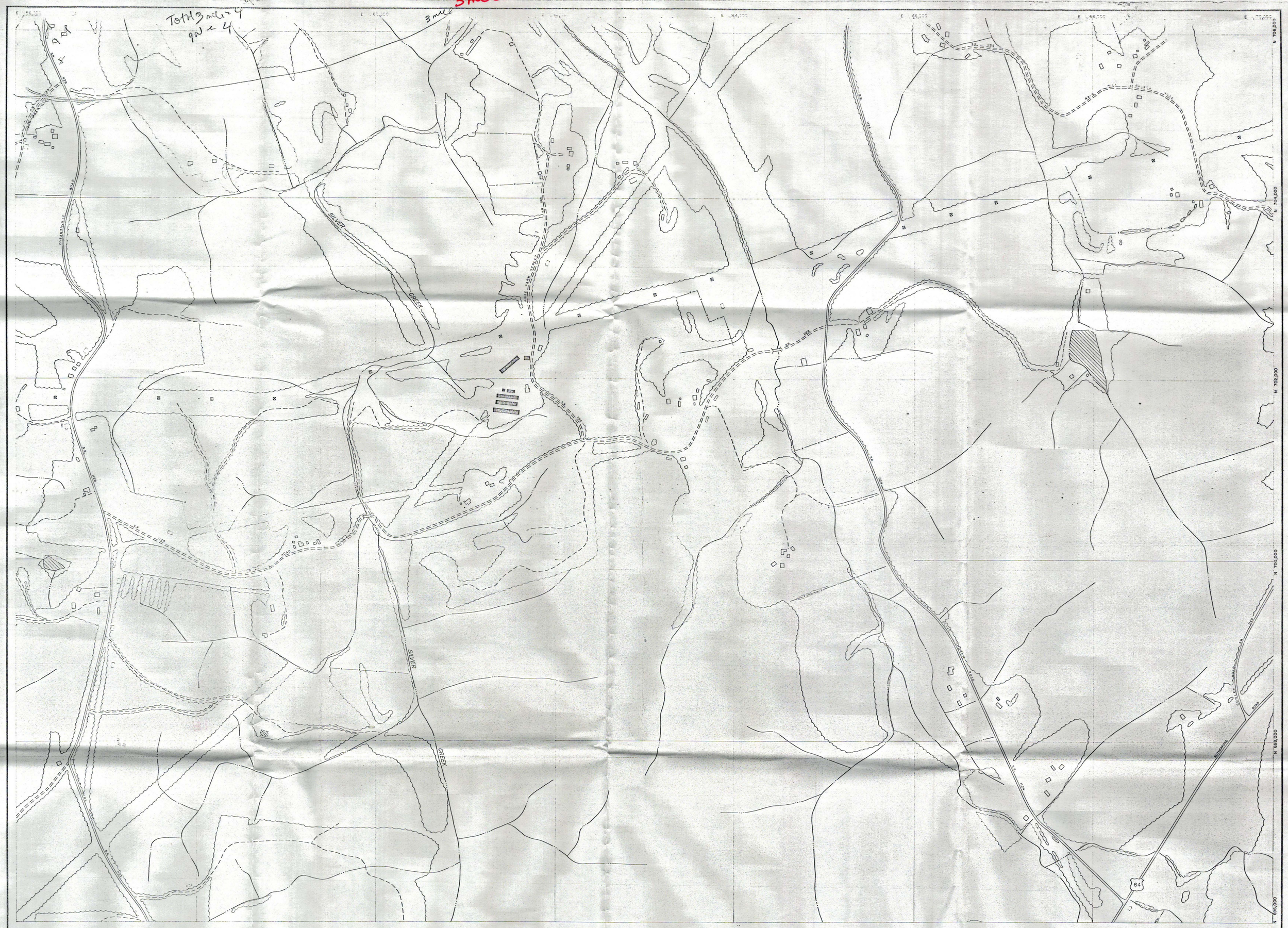
Total 3 mi = 123
Total 2 = 58
gw = 114

TOWNSHIP
MAP NO.
DATE

3 mile

Total 3 mile = 4
9W = 4

3 mile



MAP COMPILED BY STEREOPHOTOGRAMMETRIC METHODS
IN ACCORDANCE WITH NATIONAL MAPPING STANDARDS

BY

LANDMARK ENGINEERING CO., INC.

CONSULTING & PHOTOGRAMMETRIC ENGINEERS
P. O. BOX 668 CARY, N. C.
PHOTOGRAPHY DATE 1/27/75 PROJECT NO. 75-1

APPROXIMATE MEAN DECLINATION AT
THE CENTER OF THE COUNTY 1956

16	32	47
15	31	46
	30	45

SHEET INDEX

400 0 400 800 1200 1600 FEET
SCALE 1" = 400'

2000' GRID BASED ON NORTH CAROLINA STATE PLANE COORDINATE SYSTEM

PROPERTY OF BURKE COUNTY, NORTH CAROLINA
MAPS NOT TO BE REPRODUCED WITHOUT WRITTEN PERMISSION
FROM BURKE COUNTY PLANNING OR TAX DEPARTMENT

PREPARED FOR AND PROPERTY OF

BURKE COUNTY

NORTH CAROLINA

TOWNSHIP

MAP NO.

DATE

Total 2 mile = 146
Total 3 mile = 182
Total qu = 184

2 mile

3 mile

MAP COMPILED BY STEREOPHOTOGRAMMETRIC METHODS IN ACCORDANCE WITH NATIONAL MAPPING STANDARDS

BY

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CONSULTING & PHOTOGRAMMETRIC ENGINEERS
P O BOX 668 CARY, N C
PHOTOGRAPHY DATE 1/27/75 PROJECT NO 75-1

MN 1/2° 27 MILS
SN 04 24' 1 MILS

APPROXIMATE MEAN DECLINATION AT THE CENTER OF THE COUNTY 1956

17	33	48
16	32	47
15	31	46

SHEET INDEX

400 0 400 800 1200 1600 FEET
SCALE 1" = 400'

2000' GRID BASED ON NORTH CAROLINA STATE PLANE COORDINATE SYSTEM

PROPERTY OF BURKE COUNTY, NORTH CAROLINA
MAPS NOT TO BE REPRODUCED WITHOUT WRITTEN PERMISSION FROM BURKE COUNTY PLANNING OR TAX DEPARTMENT.

PREPARED FOR AND PROPERTY OF

BURKE COUNTY

NORTH CAROLINA

= water distribution lines

TOWNSHIP

MAP NO.

DATE

Total 1 mile = 304
2 mile = 2%
3 mile = 48
gw = 175

DRY PONES COMMUNITY

1 mile

2 mile

MAP COMPILED BY STEREOPHOTOGRAMMETRIC METHODS IN ACCORDANCE WITH NATIONAL MAPPING STANDARDS

BY

LANDMARK ENGINEERING CO., INC.

CONSULTING & PHOTOGRAMMETRIC ENGINEERS
P. O. BOX 668 CARY, N. C.
PHOTOGRAPHY DATE 1/27/75 PROJECT NO. 75-1

MN GN
1 1/2° 27 MILS
0° 24' 7 MILS

APPROXIMATE MEAN DECLINATION AT THE CENTER OF THE COUNTY 1956.

18	34	49
17	33	48
16	32	47

SHEET INDEX

400 0 400 800 1200 1600 FEET
SCALE 1" = 400'

2000' GRID BASED ON NORTH CAROLINA STATE PLANE COORDINATE SYSTEM

PROPERTY OF BURKE COUNTY, NORTH CAROLINA.
MAPS NOT TO BE REPRODUCED, WITHOUT WRITTEN PERMISSION FROM BURKE COUNTY PLANNING OR TAX DEPARTMENT.

PREPARED FOR AND PROPERTY OF

BURKE COUNTY

NORTH CAROLINA

= water distribution lines

TOWNSHIP

MAP NO.

DATE

3 mile

Total units 3 mile = 5
GW unit Zone 5

MAP COMPILED BY STEREOPHOTOGRAMMETRIC METHODS
IN ACCORDANCE WITH NATIONAL MAPPING STANDARDS

BY

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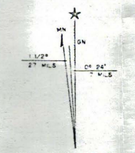
P. O. BOX 668 CARY, N. C.
PHOTOGRAPHY DATE: 1/27/75 PROJECT NO 75-1



APPROXIMATE MEAN DECLINATION AT
THE CENTER OF THE COUNTY 1956

20	36	51
19	35	50
18	34	49

SHEET INDEX

400 0 400 800 1200 1600 FEET
SCALE: 1" = 400'

2000' GRID BASED ON NORTH CAROLINA STATE PLANE COORDINATE SYSTEM

PROPERTY OF BURKE COUNTY, NORTH CAROLINA
MAPS NOT TO BE REPRODUCED WITHOUT WRITTEN PERMISSION
FROM BURKE COUNTY PLANNING OR TAX DEPARTMENT.

PREPARED FOR AND PROPERTY OF

BURKE COUNTY

NORTH CAROLINA

TOWNSHIP

MAP NO.

DATE

Total units 3 miles = 54
gw only = 5

3 mile

MAP COMPILED BY STEREOPHOTOGRAMMETRIC METHODS IN ACCORDANCE WITH NATIONAL MAPPING STANDARDS

BY

LANDMARK ENGINEERING CO., INC.

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P.O. BOX 668 CARY, N.C.
PHOTOGRAPHY DATE 1/27/75 PROJECT NO 75-1

APPROXIMATE MEAN DECLINATION AT THE CENTER OF THE COUNTY 1956

35	50	64
34	49	63
33	48	62

SHEET INDEX

400 0 400 800 1200 1600 FEET
SCALE: 1" = 400'

2000' GRID BASED ON NORTH CAROLINA STATE PLANE COORDINATE SYSTEM

PROPERTY OF BURKE COUNTY, NORTH CAROLINA
MAPS NOT TO BE REPRODUCED, WITHOUT WRITTEN PERMISSION FROM BURKE COUNTY PLANNING OR TAX DEPARTMENT

PREPARED FOR AND PROPERTY OF

BURKE COUNTY

NORTH CAROLINA

= water distribution lines

TOWNSHIP

MAP NO.

DATE

Total 3 mile = 56
gal = 15

3 mile

MAP COMPILED BY STEREOPHOTOGRAMMETRIC METHODS
IN ACCORDANCE WITH NATIONAL MAPPING STANDARDS

BY

LANDMARK ENGINEERING CO., INC.

CONSULTING & PHOTOGRAMMETRIC ENGINEERS
P. O. BOX 668 CARY, N. C.
PHOTOGRAPHY DATE: 1/27/75 PROJECT NO. 75-1

MN GN
1 1/2° 27 MILS
0° 24' 7 MILS

APPROXIMATE MEAN DECLINATION AT THE CENTER OF THE COUNTY 1956

34	49	63
33	48	62
32	47	61

SHEET INDEX

400 0 400 800 1200 1600 FEET
SCALE 1" = 400

2000' GRID BASED ON NORTH CAROLINA STATE PLANE COORDINATE SYSTEM

PROPERTY OF BURKE COUNTY, NORTH CAROLINA
MAPS NOT TO BE REPRODUCED, WITHOUT WRITTEN PERMISSION
FROM BURKE COUNTY PLANNING OR TAX DEPARTMENT.

PREPARED FOR AND PROPERTY OF

BURKE COUNTY

NORTH CAROLINA

TOWNSHIP

MAP NO.

DATE

July 20, 1987

TO: File

FROM: Pat DeRosa PD

RE: US 70 Drum Dump
NC D981472624

On July, 9, 1987, I spoke by telephone with Louise Greg, Burke County Tax Office (704) 437-1287, regarding the 1987 tax maps I had received from her office. She explained the map symbols as below:

Commercial buildings: Blackened.
Industrial buildings: Hashed.
Residential buildings: Blank.
High power lines: Boxed "x".
Fence line: "x".

0418b/PD/pd

July 20, 1987

TO: File

FROM: Pat DeRosa PD

RE: US 70 Drum Dump
NC D981472624

On July 10, 1987, I spoke by telephone with Danny Henson, Manager, Brentwood Water System (704) 584-4566, to clarify the location of water distribution lines within a 3-mile radius of the subject site. From his description, I marked the water distribution lines in yellow on the topographic map and subsequently marked these lines on the Burke County Tax Maps as well.

0418b/PD/pd

July 20, 1987

TO: File

FROM: Pat DeRosa

RE: US 70 Drum Dump
NC D981472624

On July 10, 1987, I spoke by telephone with Joe Silver, Land Records Manager, McDowell County Tax Office (704) 652-7121, regarding tax maps indicating the location of residences within McDowell County. Mr. Silver said that no such maps were currently available, however, the 1980 US Census would provide a fair estimate of population density. He estimated that 60 - 80 homes are currently located in the portion of McDowell County within 3 miles of the subject site.

0418b/PD/pd

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RALEIGH, NORTH CAROLINA 27602

Ref. 28

Fifth Edition, 1984

North Carolina State Government

Statistical Abstract

North Carolina State Data Center

Research and Planning Services
Office of State Budget and Management

Table 8

URBAN AND RURAL DISTRIBUTION OF THE POPULATION OF NORTH CAROLINA COUNTIES
YEARS 1950, 1960, 1970, 1980

County	1950 Percent Urban	1950 Percent Rural	1960 Percent Urban	1960 Percent Rural	1970[a] Percent Urban	1970[a] Percent Rural	1980 Percent Urban	1980 Percent Rural
State Total	33.7%	66.3%	39.5%	60.5%	45.5%	54.5%	48.0%	52.0%
Alamance	41.5	58.5	51.2	48.8	60.9	39.1	64.6	35.4
Alexander	-	100.0	-	100.0	-	100.0	3.4	96.6
Alleghany	-	100.0	-	100.0	-	100.0	-	100.0
Anson	12.7	87.3	15.0	85.0	16.9	83.1	16.4	83.6
Ashe	-	100.0	-	100.0	-	100.0	-	100.0
Avery	-	100.0	-	100.0	-	100.0	-	100.0
Beaufort	32.9	67.1	27.6	72.4	24.9	75.1	20.9	79.1
Bertie	-	100.0	-	100.0	-	100.0	-	100.0
Bladen	-	100.0	-	100.0	-	100.0	11.6	88.4
Brunswick	-	100.0	-	100.0	-	100.0	12.3	87.7
Buncombe	47.0	53.0	52.7	47.3	52.2	47.8	62.9	37.1
Burke	24.3	75.7	23.0	77.0	28.5	71.5	34.8	65.2
Cabarrus	66.0	34.0	67.7	32.3	64.0	36.0	62.6	37.4
Caldwell	18.2	81.8	26.0	74.0	30.9	69.1	28.4	71.6
Camden	-	100.0	-	100.0	-	100.0	-	100.0
Carteret	36.2	63.8	31.0	69.0	27.2	72.8	19.9	80.1
Caswell	-	100.0	-	100.0	-	100.0	-	100.0
Catawba	33.7	66.3	44.1	55.9	42.9	57.1	55.8	44.2
Chatham	9.8	90.2	16.6	83.4	15.9	84.1	13.3	86.7
Cherokee	-	100.0	-	100.0	-	100.0	-	100.0
Chowan	35.6	64.4	38.0	62.0	44.3	55.7	42.7	57.3
Clay	-	100.0	-	100.0	-	100.0	-	100.0
Cleveland	35.3	64.7	38.9	61.1	34.0	66.0	28.5	71.5
Columbus	8.4	91.6	9.6	90.4	8.9	91.1	16.2	83.8
Craven	32.4	67.6	26.7	73.3	55.2	44.8	49.6	50.4
Cumberland	39.7	60.3	47.3	52.7	76.1	23.9	86.6	13.4
Currituck	-	100.0	-	100.0	-	100.0	-	100.0
Dare	-	100.0	-	100.0	-	100.0	-	100.0
Davidson	39.7	60.3	39.4	60.6	37.1	62.9	33.4	66.6
Davie	-	100.0	-	100.0	13.4	86.6	10.7	89.3
Duplin	-	100.0	0.1	99.9	14.9	85.1	14.2	85.8
Durham	20.2	79.8	75.6	24.4	75.9	24.1	80.2	19.8
Edgecombe	40.7	59.3	42.9	57.1	47.1	52.9	45.9	54.1
Forsyth	65.8	34.2	69.2	30.8	68.8	31.2	75.2	24.8
Franklin	8.1	91.9	10.0	90.0	11.0	89.0	10.8	89.2
Gaston	55.2	44.8	61.8	38.2	71.0	29.0	69.1	30.9
Gates	-	100.0	-	100.0	-	100.0	-	100.0
Graham	-	100.0	-	100.0	-	100.0	-	100.0
Granville	21.0	79.0	21.1	78.9	32.7	67.3	34.8	65.2
Greene	-	100.0	-	100.0	-	100.0	-	100.0
Guilford	66.0	34.0	76.1	23.9	76.7	23.3	75.9	24.1
Halifax	24.1	75.9	32.7	67.3	36.5	63.5	37.1	62.9
Harnett	20.3	79.7	22.3	77.7	22.5	77.5	23.0	77.0
Haywood	27.1	72.9	28.3	71.7	27.9	72.1	24.5	75.5
Henderson	19.7	80.3	16.3	83.7	28.0	72.0	19.4	80.6
Hertford	16.7	83.3	31.8	68.2	36.6	63.4	33.8	66.2
Hoke	-	100.0	18.7	81.3	19.3	80.7	17.8	82.2
Hyde	-	100.0	-	100.0	-	100.0	-	100.0
Iredell	42.7	57.3	42.8	57.2	44.2	55.8	33.0	67.0
Jackson	-	100.0	-	100.0	-	100.0	-	100.0
Johnston	12.5	87.5	19.9	80.1	22.9	77.1	26.8	73.2
Jones	-	100.0	-	100.0	-	100.0	-	100.0
Lee	42.6	57.4	46.1	53.9	38.5	61.5	40.2	59.8
Lenoir	39.9	60.1	44.9	55.1	45.0	55.0	47.4	52.6
Lincoln	19.7	80.3	19.8	80.2	16.2	83.8	11.5	88.5
McDowell	21.9	78.1	12.5	87.5	30.6	69.4	10.5	89.5
Macon	-	100.0	-	100.0	-	100.0	13.1	86.9
Madison	-	100.0	-	100.0	-	100.0	-	100.0
Martin	17.8	82.2	25.5	74.5	26.6	73.4	23.7	76.3
Mecklenburg	71.5	28.5	78.0	22.0	79.6	20.4	87.6	12.4
Mitchell	-	100.0	18.0	82.0	-	100.0	-	100.0
Montgomery	-	100.0	-	100.0	-	100.0	12.0	88.0
Moore	12.9	87.1	14.2	85.8	15.2	84.8	23.8	76.2
Nash	24.7	75.3	28.4	71.6	32.2	67.8	40.0	60.0
New Hanover	71.2	28.8	69.0	31.0	69.5	30.5	86.7	13.3
Northampton	-	100.0	-	100.0	-	100.0	-	100.0
Onslow	18.2	81.8	20.5	79.5	57.5	42.5	64.6	35.4
Orange	26.7	73.3	29.3	70.7	50.3	49.7	57.5	42.5
Pamlico	-	100.0	-	100.0	-	100.0	-	100.0
Pasquotank	52.1	47.9	54.9	53.6	52.4	46.4	49.2	50.8
Pender	-	100.0	-	100.0	-	100.0	0.1	99.9
Perquimans	-	100.0	-	100.0	-	100.0	-	100.0
Person	17.7	82.3	19.5	80.5	20.7	79.3	25.8	74.2
Pitt	30.8	69.2	42.8	57.2	50.0	50.0	49.7	50.3
Polk	-	100.0	-	100.0	-	100.0	-	100.0
Randolph	15.2	84.8	25.3	74.7	30.2	69.8	30.3	69.7
Richmond	34.3	65.7	33.6	66.4	33.4	66.6	40.0	60.0
Robeson	10.5	89.5	20.3	79.7	27.3	72.7	29.3	70.7
Rockingham	38.5	61.5	41.1	58.9	44.7	55.3	40.3	59.7
Rowan	41.1	58.9	47.2	52.8	42.1	57.9	44.2	55.8
Rutherford	33.4	66.6	31.1	68.9	30.1	69.9	28.6	71.4
Sampson	8.9	91.1	15.5	84.5	15.9	84.1	15.2	84.8
Scotland	27.1	72.9	32.7	67.3	32.9	67.1	36.0	64.0
Stanly	31.8	68.2	30.0	70.0	26.0	74.0	31.1	68.9
Stokes	-	100.0	-	100.0	-	100.0	26.5	73.5
Surry	28.4	71.6	20.6	79.4	25.0	75.0	16.3	83.7
Swain	-	100.0	-	100.0	-	100.0	-	100.0
Transylvania	25.7	74.3	29.7	70.3	26.6	73.4	22.7	77.3
Tyrrell	-	100.0	-	100.0	-	100.0	-	100.0
Union	24.1	75.9	24.4	75.6	25.3	74.7	21.7	78.3
Vance	34.3	65.7	39.8	60.2	42.5	57.5	36.8	63.2
Wake	53.1	46.9	63.2	36.8	69.6	30.4	71.8	28.2
Warren	-	100.0	-	100.0	-	100.0	-	100.0
Washington	34.0	66.0	34.6	65.4	34.0	66.0	30.9	69.1
Watauga	16.2	83.8	21.0	79.0	37.4	62.6	32.2	67.8
Wayne	39.2	60.8	40.8	59.2	46.7	53.3	64.4	35.6
Wilkes	9.7	90.3	9.3	90.7	6.8	93.2	10.9	89.1
Wilson	42.2	57.8	49.8	50.2	51.1	48.9	54.5	45.5
Yadkin	-	100.0	-	100.0	-	100.0	-	100.0
Yancey	-	100.0	-	100.0	-	100.0	-	100.0

(a) Urban-rural percentages for 1970 were not corrected for all those counties which had population corrections after the 1970 urban-rural figures were published but were corrected in selected counties by the Bureau of the Census.

SOURCE: Office of State Budget and Management, Research and Planning Services, U.S. Department of Commerce, Bureau of the Census.

Table 9

URBAN AND RURAL DISTRIBUTION OF 1980 POPULATION
AND PERCENT CHANGE FROM 1970, BY COUNTY

County	Total Population		Urban Population			Rural Population		
	1980 Census Of Population[a]	% Change 1970-1980[b]	Total 1980	% Of County	% Change From 1970[b]	Total 1980	% Of County	% Change From 1970[b]
State Total	5,881,766	15.7%	2,822,852	48.0%	22.2%	3,058,914	52.0%	10.4%
Alamance	99,319	2.9	64,196	64.6	9.3	35,123	35.4	-6.7
Alexander	24,999	28.4	842	3.4	NA	24,157	96.6	24.1
Alleghany	9,587	17.9	0	0	0	9,587	100.0	17.9
Anson	25,649	9.2	4,206	16.4	5.8	21,443	83.6	9.9
Ashe	22,325	14.1	0	0	0	22,325	100.0	14.1
Avery	14,409	13.9	0	0	0	14,409	100.0	13.9
Beaufort	40,355	12.2	8,418	20.9	-6.1	31,937	79.1	18.2
Bertie	21,024	2.4	0	0	0	21,024	100.0	2.4
Bladen	30,491	15.2	3,551	11.6	NA	26,940	88.4	1.7
Brunswick	35,777	47.7	4,405	12.3	NA	31,372	87.7	29.5
Buncombe	160,934	10.9	101,281	62.9	33.9	59,653	37.1	-14.0
Burke	72,504	20.1	25,261	34.8	47.0	47,243	65.2	9.4
Cabarrus	85,895	15.1	53,803	62.6	12.6	32,092	37.4	19.5
Caldwell	67,746	19.5	19,216	28.4	9.6	48,530	71.6	23.9
Camden	5,829	6.9	0	0	0	5,829	100.0	6.9
Carteret	41,092	30.0	8,185	19.9	-4.8	32,907	80.1	43.1
Caswell	20,705	8.7	0	0	0	20,705	100.0	8.7
Catawba	105,208	15.8	58,750	55.8	50.9	46,458	44.2	-10.5
Chatham	33,415	13.1	4,446	13.3	-5.2	28,969	86.7	16.5
Cherokee	18,933	15.9	0	0	0	18,933	100.0	15.9
Chowan	12,558	16.7	5,357	42.7	12.4	7,201	57.3	20.1
Clay	6,619	27.8	0	0	0	6,619	100.0	27.8
Cleveland	83,435	15.0	23,740	28.5	-3.7	59,695	71.5	24.6
Columbus	51,037	8.7	8,275	16.2	97.3	42,762	83.8	0
Craven	71,043	13.6	35,228	49.6	2.0	35,815	50.4	27.9
Cumberland	247,160	16.6	213,919	86.6	32.6	33,241	13.4	-34.4
Currituck	11,089	59.0	0	0	0	11,089	100.0	59.0
Dare	13,377	91.2	0	0	0	13,377	100.0	91.2
Davidson	113,162	18.3	37,836	33.4	6.7	75,326	66.6	25.2
Davie	24,599	30.5	2,637	10.7	4.3	21,962	89.3	34.5
Duplin	40,952	7.7	5,796	14.2	2.6	35,156	85.8	8.6
Durham	152,785	15.2	122,470	80.2	21.5	30,315	19.8	-5.0
Edgecombe	55,988	7.0	25,712	45.9	4.2	30,276	54.1	9.4
Forsyth	243,683	13.3	183,137	75.2	24.2	60,546	24.8	-9.6
Franklin	30,055	12.1	3,238	10.8	10.1	26,817	89.2	12.3
Gaston	162,568	9.5	112,378	69.1	6.7	50,190	30.9	16.5
Gates	8,875	4.1	0	0	0	8,875	100.0	4.1
Graham	7,217	10.0	0	0	0	7,217	100.0	10.0
Granville	34,043	3.9	11,843	34.8	10.5	22,200	65.2	0.7
Greene	16,117	7.7	0	0	0	16,117	100.0	7.7
Guilford	317,154	9.9	240,860	75.9	8.8	76,294	24.1	13.4
Halifax	55,286	2.6	20,531	37.1	4.5	34,755	62.9	1.5
Harnett	59,570	19.9	13,710	23.0	22.9	45,860	77.0	19.1
Haywood	46,495	11.5	11,396	24.5	-2.1	35,099	75.5	16.7
Henderson	58,580	36.9	11,346	19.4	-5.5	47,234	80.6	53.4
Hertford	23,368	-4.4	7,894	33.8	-8.3	15,474	66.2	3.7
Hoke	20,383	24.0	3,630	17.8	14.2	16,753	82.2	26.4
Hyde	5,873	5.4	0	0	0	5,873	100.0	5.4
Iredell	82,538	14.3	27,197	33.0	-14.7	55,341	67.0	37.3
Jackson	25,811	19.5	0	0	0	25,811	100.0	19.5

Johnston	70,59[illegible]	[illegible]	[illegible]	[illegible]	33.9	[illegible]	[illegible]	[illegible]
Jones	9,705	-0.8	0	0	0	9,705	100.0	-0.8
Lee	36,718	20.5	14,773	40.2	26.1	21,945	59.8	17.0
Lenoir	59,819	8.4	28,381	47.4	14.1	31,438	52.6	3.6
Lincoln	42,372	29.6	4,879	11.5	-7.8	37,493	88.5	36.9
McDowell	35,135	14.6	3,684	10.5	-60.7	31,451	89.5	47.9
Macon	20,178	27.8	2,640	13.1	NA	17,538	86.9	11.1
Madison	16,827	5.1	0	0	0	16,827	100.0	5.1
Martin	25,948	4.9	6,159	23.7	-6.3	19,789	76.3	9.0
Mecklenburg	404,270	14.0	353,956	87.6	25.3	50,314	12.4	-30.3
Mitchell	14,428	7.3	0	0	0	14,428	100.0	7.3
Montgomery	22,469	16.6	2,702	12.0	NA	19,767	88.0	2.6
Moore	50,505	29.3	12,041	23.8	102.8	38,464	76.2	16.2
Nash	67,153	13.6	26,883	40.0	41.3	40,270	60.0	0.4
New Hanover	103,471	24.7	89,734	86.7	55.7	13,737	13.3	-45.8
Northampton	22,584	-2.2	0	0	0	22,584	100.0	-5.9
Onslow	112,784	9.4	72,891	64.6	23.0	39,893	35.4	-9.0
Orange	77,055	33.9	44,326	57.5	52.8	32,729	42.5	14.0
Pamlico	10,398	9.8	0	0	0	10,398	100.0	9.8
Pasquotank	28,462	6.1	14,004	49.2	-0.5	14,458	50.8	13.4
Pender	22,215	22.4	24	0.1	NA	22,191	99.9	22.3
Perquimans	9,486	13.6	0	0	0	9,486	100.0	13.6
Person	29,164	12.5	7,532	25.8	40.3	21,632	74.2	5.3
Pitt	90,146	22.0	44,808	49.7	21.3	45,338	50.3	22.7
Polk	12,984	10.6	0	0	0	12,984	100.0	10.6
Randolph	91,728	20.1	27,774	30.3	20.4	63,954	69.7	20.0
Richmond	45,481	14.0	18,210	40.0	36.5	27,271	60.0	2.7
Robeson	101,610	19.8	29,789	29.3	28.6	71,821	70.7	16.5
Rockingham	83,426	15.2	33,597	40.3	3.8	49,829	59.7	24.5
Rowan	99,186	10.2	43,806	44.2	15.5	55,380	55.8	6.3
Rutherford	53,787	13.6	15,368	28.6	7.7	38,419	71.4	16.2
Sampson	49,687	10.5	7,552	15.2	5.5	42,135	84.8	11.5
Scotland	32,273	19.8	11,606	36.0	31.0	20,667	64.0	14.4
Stanly	48,517	13.3	15,110	31.1	35.8	33,407	68.9	5.4
Stokes	33,086	39.1	8,757	26.5	NA	24,329	73.5	2.3
Surry	59,449	15.6	9,666	16.3	-24.8	49,783	83.7	29.1
Swain	10,283	16.4	0	0	0	10,283	100.0	30.8
Transylvania	23,417	18.8	5,323	22.7	1.5	18,094	77.3	25.0
Tyrrell	3,975	4.4	0	0	0	3,975	100.0	4.4
Union	70,380	28.6	15,254	21.7	10.1	55,126	78.3	34.9
Vance	36,748	12.4	13,522	36.8	-2.7	23,226	63.2	23.6
Wake	301,327	31.6	216,334	71.8	36.0	84,993	28.2	22.4
Warren	16,232	2.7	0	0	0	16,232	100.0	2.7
Washington	14,801	5.4	4,571	30.9	-4.3	10,230	69.1	10.4
Watauga	31,666	35.3	10,191	32.2	16.4	21,475	67.8	46.6
Wayne	97,054	13.6	62,539	64.4	56.9	34,515	35.6	-24.2
Wilkes	58,657	18.4	6,419	10.9	91.2	52,238	89.1	13.2
Wilson	63,132	9.8	34,424	54.5	17.3	28,708	45.5	2.0
Yadkin	28,439	15.6	0	0	0	28,439	100.0	15.6
Yancey	14,934	18.3	0	0	0	14,934	100.0	18.3

(a) Corrections to the 1980 counts for Pender and Randolph counties are not shown due to unavailability of corrections for urban and rural parts.

(b) Corrections to the 1970 Census for total urban and rural population are taken into account in computation of percentages.

NA Not Applicable.

SOURCE: U.S. Department of Commerce, Bureau of the Census.
Office of State Budget and Management, Research and Planning Services.

Ref. 29

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NC	D981472624

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
U.S. 70 Drum Dump	U.S. 70

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Morganton	NC	28655	Burke	12	10

09 COORDINATES: LATITUDE 35° 41' 53" | LONGITUDE 81° 50' 17"

10 DIRECTIONS TO SITE (Starting from nearest public road) Take I-40 east of Morganton to the Lake James/ Marsartville Rd. Exit. Take a right at the top of exit; take this rd. to US 70. Take a rt. on U.S. 70. Go approximately .2 miles, site is on the right.

III RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)
Jim Crawley	

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
			(704) 584-2627 (W) (704) 584-2694 (H)

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)
[X] A. PRIVATE [ ] B. FEDERAL: _____ (Agency) [ ] C. STATE [ ] D. COUNTY [ ] E. MUNICIPAL
[ ] F. OTHER: _____ (Specify) [ ] G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply) (CERCLA 103c)
[ ] A. RCRA 3001 DATE RECEIVED: [ ] B. UNCONTROLLED WASTE SITE DATE RECEIVED [ ] C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION BY (Check all that apply)
[ ] YES DATE [ ] A. EPA [ ] B. EPA CONTRACTOR [ ] C. STATE [ ] D. OTHER CONTRACTOR
[ ] E. LOCAL HEALTH OFFICIAL [ ] F. OTHER: _____
[X] NO CONTRACTOR NAME(s): _____

02 SITE STATUS (Check one)
[ ] A. ACTIVE [X] B. INACTIVE [ ] C. UNKNOWN

03 YEARS OF OPERATION
_____ | _____ [ ] UNKNOWN
BEGINNING YEAR ENDING YEAR

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED NC Dept. of Transportation was working on a drainage ditch under U.S. 70 and a backhoe operator uncovered 25-30 drums. Contents of drums is unknown; some are empty, some have material resembling dried paint, some have a grease like material, some have a granular

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION material. A few drums were broken open by the backhoe operator and the contents spilled out. If hazardous wastes are present they can leak into the soil & groundwater. Groundwater could be used by some of the surrounding residences.

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) [X] B. MEDIUM (Inspection required) [ ] C. LOW (Inspection 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
Beth Masters, Waste Mgmt. Specialist	NC DHR/DHS SHW Mgmt. Branch	(704) 688-4237

02 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	ORGANIZATION	03 TELEPHONE NUMBER	08 DATE
Mary Giguere/Lee Crosby	NC DHR/DHS	SHW Mgmt. Br.	(919) 733-2801	07/03/86

FORM 2070-12 (7-81)

3 July 1986

TO: File

FROM: Mary Giguere MG

RE: U.S. 70 Drum Dump

A telephone conversation was held with Keith Masters of the NC DHR/DHS Solid and Hazardous Waste Mgmt. Branch about the U.S. 70 Drum Dump site. Mr. Masters had been to the site and had gathered information about the site. The following is the information relayed to me about the site.

1) The site was discovered on July 2, 1986, by a backhoe team from NC Department of Transportation (DOT). The backhoe operator was trying to clear debris from the entrance to a drainage pipe running under U.S. 70 when he hit the drums.

2) Nick Waters and Dale Murphy from Burke County Emergency Management [(704) 436-1911], Mike Parker from NRCD-DEM Mooresville Office and Keith Masters and Larry Fox from DHR/DHS Solid and Haz. Waste Mgmt. Branch responded to DOT's request for help.

3) There are 25-30 drums on the site. They are positioned at the bottom of an embankment for U.S. 70. Some of the drums are empty, some contained dried paint waste, some contain a white granular substance and some contain a grease like substance with a greenish cast.

4) Some of the material was spilled when the backhoe pierced a drum. The DOT backhoe operator said that one drum contained liquid but it coagulated when exposed to the air. The backhoe operator also reported a strong ammonia or chlorine odor in the air. The operator is reported to have had a rash break out on his arms.

5) DOT employees copied down the following information from five drums:

   A) Trylox H00-25
      493-43-450
   B) 20-18-55-75RSC
      DOT 17BST0
   C) Acetic Acid 36
      0-T-20-A-1
   D) Lot 88654T40N500
      RACA
   E) Synthron

6) Synthron is a company with a facility in Morganton. Synthron's president, Dr. Larry Bott, came to the site and after looking at the drums said that none of the material present was from Synthron.

/

7) There are no streams within a mile of the site. The site is against the road embankment so the area might hold surface water.

8) Three samples were collected by Burke County Emergency Management and three samples were collected by Keith Masters and Larry Fox. These have been sent by NC Courier to Mack Henderson NC DHR/DHS SHW Mgmt. Branch.

9) Property owners from the current owner going back approx. 15 years:
Jan Crawley
Mrs. Johnny Baker
Thomas Mack Ray
Jack Farris

10) The contact persons at DOT are: Harold Stalcup and Larry Taylor
(704) 652-3344

11) Directions to the site:
Take I-40 west of Morganton to the Dysartville/Lake James Exit. Take a right onto Dysartville Road, at U.S. 70 take another right. Go approximately .2 miles and site will be on the right.

MG/tb/0193b

Ref. 32

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

21 August 1986

Ms. Carol Walsh
Emergency Response and Control Section
U.S Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, GA 30365

Dear Ms. Walsh:

SUBJECT: US 70 Drum Dump
NC D981472624

As per our telephone conversation this afternoon, please find the following enclosed:

1. PA and documentation.
2. Laboratory results received to date.
3. Summary Trip Report for SI conducted July 8, 1986.
4. Site photo.

If you have any questions please contact me at (919) 733-2801.

Sincerely,

Pat DeRosa, Waste Management Specialist
CERCLA Unit
Solid and Hazardous Waste Management Branch
Environmental Health Section

PD/tb/0221b

Enclosures

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

6 October 1986

Ms. Carol Walsh
Emergency Response and Control Section
US EPA
345 Courtland Street, N.E.
Atlanta, GA 30365

Dear Ms. Walsh:

Subject: US 70 Drum Dump
NC D981472624

As per our telephone conversation this morning, please find enclosed the results of inorganic analyses performed on samples collected at the subject site.

If you have any questions, please contact me at (919) 733-2801.

Sincerely,

Pat DeRosa

Pat DeRosa, Waste Management Specialist
CERCLA Unit
Solid and Hazardous Waste Management Branch
Environmental Health Section

PD/tb/0184b

Enclosures

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

30 October 1986

Ms. Carol Walsh
Emergency Response and Control Section
U.S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, GA 30365

Dear Ms. Walsh:

Subject: US 70 Drum Dump
NC D981472624

As per our telephone conversation this morning, please find the following enclosed for your review:

1. Results of organic chemical analyses performed on samples collected at the subject site.

2. Chemical and toxicological data on hexamethylenetetramine, an organic contaminant measured on site.

Please contact me at your earliest convenience so that we may proceed with appropriate action at this site. I may be reached at (919) 733-2801.

Sincerely,

Pat DeRosa

Pat DeRosa, Waste Management Specialist
CERCLA Unit
Solid and Hazardous Waste Management Branch
Environmental Health Section

PD/tb/0193

Enclosures

31 October 1986

TO: Lee Crosby

FROM: Pat DeRosa PD

RE: US 70 Drum Dump
NC D981472624

Laboratory analyses of samples collected at the subject site on July 8, 1986 have been completed. These results indicate methenamine (hexamethylenetetramine CAS #100970) at approximately 7,833 ppb - 28,542 ppm in waste sampled at the site. This compound is not listed as a hazardous substance under CERCLA (FR Vol. 48, No. 102, Table 302.4, May 25, 1983). Methenamine is a moderately toxic irritant to skin, eyes, and mucous membranes. It is water soluble. It poses a moderate fire hazard when exposed to heat or flame and liberates formaldehyde on decomposition. Its major industrial use is in the manufacture of phenolic resins.

I have contacted Carol Walsh, Emergency Response and Control Section, US EPA Region IV regarding these findings.

PD/tb/0184b

2 December 1986

TO: Lee Crosby

FROM: Pat DeRosa PD

RE: US 70 Drum Dump
NC D981472624

I spoke by telephone with Carol Walsh, Emergency Response and Control Section, EPA Region IV, (404) 347-2216 regarding the subject site. She plans to initiate an immediate removal action through ERCS. She will visit the site on Thursday, December 11, 1986 to determine equipment needs and to identify a staging area for the drums. The staging area should limit public accessibility to the waste and provide an area where drums can be sampled and temporarily stored until appropriate treatment or disposal actions can be taken. She indicated that once staging was initiated, EPA would see the removal through to final disposition whether or not the waste was deemed hazardous.

PD/tb/pc

cc: Doug Holyfield
Julian Foscue

2 March 1987

TO: Lee Crosby

FROM: Pat DeRosa PD

RE: US 70 Drum Dump
NC D981472624

Carol Walsh, the EPA OSC for this site, phoned this afternoon with an update on the subject site. Carol said she plans to visit the site on Wednesday, March 3, 1987 with the response manager or foreman to plan removal. She will return to the site on Monday, March 9, 1987 to initiate removal and staging. She has been in touch with Nick Waters, Burke County Emergency Management, and Jim Fulver, NC DOT, regarding the start-up of the removal action.

PD/tb/0187b

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
NC	D981472624

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
US 70 Drum Dump	US 70

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Morganton	NC	28655	Burke	12	10

09 COORDINATES LATITUDE	LONGITUDE	10 TYPE OF OWNERSHIP (Check one)
3 5 4 1 5 3.	0 8 1 5 1 1 7	☒ 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
7 / 8 / 86 (MONTH DAY YEAR)	☐ ACTIVE ☒ INACTIVE	--- / --- (BEGINNING YEAR / ENDING YEAR) X 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.
Pat DeRosa	Waste Management Spec.	NC S & HWMBr	(919) 733-2801

09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Mary Giguere	Industrial Hygienist	NC S & HWMBr	(919) 733-2801
Lee Crosby	Environmental Chemist	NC S & HWMBR	(919) 733-2801
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Jim Crawley	Owner	US 70, Morganton, NC	(704) 584-0627
Elgie McGalliard	Neighbor	US 70, Morganton, NC	(704) 584-4300
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	0950 - 1125	Sunny, no wind, 90° F

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
Jim Crawley	property owner	(704) 584-0627

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Pat DeRosa	NC DHR	S & HWM Br	(919) 733-2801	7 / 21 / 87 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NC	D981472624

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

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

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

TONS _____

CUBIC YARDS _____

NO. OF DRUMS 59 (55-gal)

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			
SOL	SOLVENTS			See list below
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
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
SOL	Chlorobenzene	108907	Drums dumped	70.96	ppm
SOL	Ethylbenzene	100414	in culvert	10005	ppm
SOL	Methylene chloride	75092		86.63	ppm
SOL	Toluene	108883		28.88	ppm
SOL	Trichlonethylene	79016		103.7	ppm
SOL	Xylene	1330207		3139	ppm
SOL	1, 2 - Dichlorobenzene	95501		346	ppm
SOL	1, 3 - Dichlorobenzene	541731		183	ppm
SOL	1, 4 - Dichlorobenzene	106467		387	ppm
SOL	1,2,4 -Trichlorobenzene	120821		3.46 - 85	ppm
OOC	PCB 1254	11097691		298	ppb
SOL	Tetrachloroethylene	127184		79	ppb
OOC	Bis(2-ethylhexyl) phthalate	117817		224	mg/kg
OOC	Methenamine	100970	*Not a listed CERCLA	7.8-832	mg/kg
MES	Lead	7439921	haz. sub.	25.8	ppm

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)

(See attached)

Ref. 2-4, 6, 11, 15, 16, 29, 30

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NC	D981472624

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 XX A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — XX POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ~3125 — 04 NARRATIVE DESCRIPTION

None detected in nearest well sampled July 8, 1986

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

No surface water sampling is known to have been conducted. Nearest surface water, Reedy Creek, is 1.75 miles from site.

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

Odors were reported at the site, however, no significant deflection was measured using the HNu.

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

Waste has been removed.

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

Waste has been removed.

01 XX F. CONTAMINATION OF SOIL — 02 X OBSERVED (DATE: 7-8-87) — ☐ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ (Acres) — 04 NARRATIVE DESCRIPTION

Soil contamination with bis (2-ethylhexyl)phthalate was measured.

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

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

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

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NC	D981472624

II. HAZARDOUS CONDITIONS AND INCIDENTS *(Continued)*

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

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

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

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES *(Spills/Runoff/Standing liquids, Leaking drums)* — 02 ☒ OBSERVED (DATE: 7/8/87) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
Uncontained drums were observed blocking a culvert under US 70.

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

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

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

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

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

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

(See attached)

Ref. 2, 3, 6, 11, 15, 16.

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NC	D981472624

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				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☒ J. NONE				No known permits

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		
☐ G. LANDFARM		
☒ H. OPEN DUMP	59	55-gal drums
☐ 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: ~.034 (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.

Drums, with no other containment, were found dumped at the bottom of an embankment on the south side of US 70. Drums were blocking culvert under the highway. Some drums were open and spilled.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☒ YES ☐ NO

02 COMMENTS

Drums and waste were highly accessible from US 70 or neighboring homes. Site was unfenced. Waste was removed March - April 1987.

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

(See attached)

Ref. 3, 11, 15

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NC	D981472624

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)

	SURFACE	WELL
COMMUNITY	A. ☒	B. ☐
NON-COMMUNITY	C. ☐	D. ☒

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A. ☐	B. ☐	C. ☒
D. ☒	E. ☐	F. ☐

03 DISTANCE TO SITE

A. 10 (mi)
B. .076 (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 3125

03 DISTANCE TO NEAREST DRINKING WATER WELL .076 (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
~52 (ft)	-----	~52 (ft)	--- (gpd)	☐ YES ☒ NO

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

Private wells serve an estimated 3125 residents within 3 miles of the site. Most of these residents have no alternate water source. Wells average ~175' deep with 63' casing.

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

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
Reedy Creek	☐	1.75 (mi)
Muddy Creek	☐	2.25 (mi)
Catawba River	☐	4 (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. 1178 NO. OF PERSONS	B. 4030 NO. OF PERSONS	C. 6627 NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION .038 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE ~1800

04 DISTANCE TO NEAREST OFF-SITE BUILDING .038 (mi)

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

The site is approximately 10 miles west of Morganton and 3 miles west of Glen Alpine. This is a lightly populated rural residential/commercial area.

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NC	D981472624

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
63 (ft)	(default) 6 (ft)	----

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
16 (in)	3.5 (in)	2 %	south	2.3 %

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. > 2 (mi)

OTHER: B. > 1 (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

> 1 (mi)

ENDANGERED SPECIES: NA

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. .15 (mi)	B. .038 (mi)	C. unk. (mi)	D. < 1 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The site is located at the bottom of an embankment on the south side of US 70. Drums were located in the mouth of the culvert under the highway. The site is surrounded by the rolling hills characteristic of western piedmont region of N.C.

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

(See attached)

Ref. 1, 3, 6, 8-14, 17, 19-28.

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NC	D981472624

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER	1	State Laboratory of Public Health	10-16-86
SURFACE WATER		NC DHR, Raleigh, NC	
WASTE	5	State Laboratory of Public Health	10-16-86
AIR		NC DHR, Raleigh, NC	
RUNOFF			
SPILL			
SOIL	3	State Laboratory of Public Health	10-16-86
VEGETATION		NC DHR, Raleigh, NC	
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☐ AERIAL

02 IN CUSTODY OF NC CERCLA Unit (Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Attached

V. OTHER FIELD DATA COLLECTED *(Provide narrative description)*

HNu - bkgd ~1 ppm

No significant increase measured.

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

(See attached)

Ref. 2, 11

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NC	D981472624

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER
Jim Crawley	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
US Hwy 70, Rt. 2, Box 414A	

05 CITY	06 STATE	07 ZIP CODE
Morganton	NC	28655

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC 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)

01 NAME	02 D+B NUMBER
Mrs. Johnny Baker	

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

05 CITY	06 STATE	07 ZIP CODE
Morganton	NC	

01 NAME	02 D+B NUMBER
Thomas Mack Ray	

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

05 CITY	06 STATE	07 ZIP CODE
Morganton	NC	

01 NAME	02 D+B NUMBER
Jack Farris	

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

05 CITY	06 STATE	07 ZIP CODE
Morganton	NC	

IV. REALTY OWNER(S) (If applicable; list most recent first)

01 NAME	02 D+B NUMBER

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

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

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

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

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

05 CITY	06 STATE	07 ZIP CODE

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

(See attached)

Ref. 11.

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NC	D981472624

II. CURRENT OPERATOR (Provide if different from owner)			OPERATOR'S PARENT COMPANY (If applicable)		
01 NAME Not in operation		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
NC	D981472624

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER	
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
Unknown			
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
Unknown			
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
NC	D981472624

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ C. PERMANENT WATER SUPPLY PROVIDED 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ D. SPILLED MATERIAL REMOVED 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ E. CONTAMINATED SOIL REMOVED 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☒ F. WASTE REPACKAGED 04 DESCRIPTION Waste overpacked & shipped off site for disposal	02 DATE 4/14/87	03 AGENCY US EPA
01 ☒ G. WASTE DISPOSED ELSEWHERE 04 DESCRIPTION Waste removed for temporary storage.	02 DATE 3/16/87	03 AGENCY US EPA
01 ☐ H. ON SITE BURIAL 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ I. IN SITU CHEMICAL TREATMENT 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ J. IN SITU BIOLOGICAL TREATMENT 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ K. IN SITU PHYSICAL TREATMENT 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ L. ENCAPSULATION 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ M. EMERGENCY WASTE TREATMENT 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ N. CUTOFF WALLS 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ P. CUTOFF TRENCHES/SUMP 04 DESCRIPTION	02 DATE	03 AGENCY
01 ☐ Q. SUBSURFACE CUTOFF WALL 04 DESCRIPTION	02 DATE	03 AGENCY

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NC	D981472624

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

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

(See attached)

Ref. 15, 16

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NC	D981472624

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☒ YES ☐ NO

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

US EPA Region IV conducted a removal action at the site beginning March 9, 1987. Drums were moved to the Burke County Landfill on Kirksey Rd. for temporary storage on March 16-17, 1987. On receipt of sampling results, drums were overpacked on April 14-15, 1987 and shipped off site for disposal.

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

(See attached)

Ref 15.

EPA FORM 2070-13 (7-81)

APPENDIX E

SITE SAFETY PLAN

SITE SAFETY PLAN

A. GENERAL INFORMATION

Site Name US 70 Drum Dump Site Number NC D981472624
Location US 70 approx. 2 miles east of the Burke/McDowell County Line Date 7/7/86

Purpose of Visit ____ PA X SI ____ Other

Proposed Date of Inspection 7/8/86

Date of Briefing 7/7/86

Priority Ranking ____ Low X Medium ____ High

Site Investigation Team

Personnel	Responsibilities
Pat DeRosa	sampling
Mary Giguere	sampling
Lee Crosby	observing

PLAN PREPARATION:
Prepared By Mary Giguere Mary Giguere

Approved By Lee Crosby

B. SITE/WASTE CHARACTERISTICS

Waste Type(s) ? Liquid ? Solid ? Sludge ? Gas

Characteristics ? Corrosive ? Ignitable ____ Radioactive
? Volatile ? 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	EFFECT(S)
hazards on this site are	
unknown. One drum is	
marked: Acetic acid.	Skin corrosive

Facility Description: Size _____ Buildings none

Disposal Methods Being Investigated surface dumping of drums

Unusual Features on Site (dike integrity, power lines, terrain etc.):
drums are stacked on an embankment, site is overgrown. Some drums are at a precarious angle

History of the Site: site is an embankment for US Highway 70 at an entrance to a culvert under the road. Drums are rusted, it is estimated that they have been in place for ten to fifteen years. It is estimated that there are 20 - 30 drums present.

C. HAZARD EVALUATION

The site presents unknown chemical hazards. The site has no apparent odors and cannot be considered a confined space. The site will be sampled using full face respirators with acid gas/OV cartridges, saranex coated tyveks, double gloves (latex inner and PVC outer) and rubber boots. This site does contain safety hazards. No drum will be sampled that is not easily accessible. No climbing over or onto drums will be permitted. Caution will be exercised at all times. HNu will be used. If readings of greater than 10 ppm above background are detected site will be vacated.

D. WORK PLAN INSTRUCTION

Map or Sketch Attached? No
Perimeter Identified? Yes
Command Post Identified? No
Zones of Contamination Identified? No

Personal Protective Equipment

Level of Protection _____A _____B X C _____D

Modifications full face resp. with OV/acid gas cartridges saranex coated tyveks, rubber boots, double PVC gloves. Gloves and boots will be taped.

Surveillance Equipment:

X	H Nu		Detector Tubes and Pumps
	Explosimeter		O2 Meter
	TLD		(Radiation Monitor)

Decontamination Procedures

	Level A	Segregated equipment drop, boot cover and glove wash, boot cover and glove rinse, tape removal, suit and hard hat removal, SCBA backpack removal, inner glove wash, inner glove removal, inner clothing removal, field wash, redress
	Level B	Segregated equipment drop, boot cover and glove wash,boot cover and glove rinse, tape removal. boot cover removal outer glove removal, suit/safety removal, SCBA backpack removal, inner glove wash, inner glove rinse, facepiece removal, inner glove removal, inner clothing removal, field wash, redress.
X	Level C	Segregated equipment drop, boot cover and glove wash, boot cover and glove rinse, tape removal, boot cover removal, outer glove removal,suit/safety boot wash, suit/safety boot rinse (Canister or Mask Change), safety boot removal, splash suit removal, inner glove wash, inner glove rinse, facepiece removal, inner glove removal, inner clothing removal. field wash redress.
	Level D	Segregated equipment drop. boot and glove wash, boot and glove rinse.

Modifications trash will be left on site.

Work Schedule/ Limitations private well, background soil, waste concentrate samples

EMERGENCY PRECAUTIONS

Acute Exposure Symptoms	First Aid
eyes	irrigate immediately
skin	soap and water wash
inhalation	fresh air & artificial resp.
ingestion	medical attention

US 70

Hospital (Address and Phone Number)

Grace Hospital (704) 438-2000

2201 S. Sterling Street, Morganton, NC

Emergency Transportation Systems (Phone Numbers)

Fire use 911

Ambulance use 911

Rescue Squad use 911

Emergency Route to Hospital Take US 70 west approx. .2 miles, take a left, get on 40 east to Morganton, take Hwy. 18 east, after getting onto Hwy. 18, hospital will be on the right in about on block.

PREVAILING WEATHER CONDITIONS AND FORECAST sunny with a high in the upper 90s or low 100s.

EQUIPMENT CHECKLIST

X	Air purifying respirator	X	First Aid Kit
X	Cartridges for respirator	X	3 gal. Distilled H2O
	3M 8710 Respirator	X	Personal Protective Clothing
	02 Indicator		
	Detector Tube & Pump	X	Boots or Boot Covers
X	Eye Wash Unit	X	Coveralls (tyvek)
X	H Nu	X	Eye Protection
X	pH Meter		Hard Hat
	Explosimeter	X	Decontamination Materials.
	Radioactive Monitor		

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 Medical 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