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FIELD INVESTIGATION TEAM ACTIVITIES AT UNCONTROLLED HAZARDOUS SUBSTANCES FACILITIES — ZONE I

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FINAL REPORT

SCREENING SITE INSPECTION, PHASE II
STANADYNE, INC., DIESEL SYSTEMS GROUP
JACKSONVILLE, ONSLOW COUNTY, NORTH CAROLINA
EPA ID #: NCD084167444

Prepared Under
TDD No. F4-9004-54
CONTRACT NO. 68-01-7346

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FOR THE

WASTE MANAGEMENT DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

FEBRUARY 13, 1991

CERCLA

NUS CORPORATION
SUPERFUND DIVISION

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NOTICE

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TABLE OF CONTENTS

Section No.		Page
EXECUTIVE SUMMARY		**ES-1**
1.0	**INTRODUCTION**	**1**
1.1	Objectives	1
1.2	Scope of Work	1
2.0	**SITE CHARACTERIZATION**	**3**
2.1	Site Background and History	3
2.2	Site Description	5
	2.2.1 Site Features	5
	2.2.2 Waste Characteristics	5
3.0	**REGIONAL POPULATIONS AND ENVIRONMENTS**	**8**
3.1	Population and Land Use	8
	3.1.1 Demography	8
	3.1.2 Land Use	8
3.2	Surface Water	9
	3.2.1 Climatology	9
	3.2.2 Overland Drainage	9
	3.2.3 Potentially Affected Water Bodies	9
3.3	Groundwater	9
	3.3.1 Hydrogeology	9
	3.3.2 Aquifer Use	11
3.4	Summary of Potentially Affected Populations and Environments	12
4.0	**FIELD INVESTIGATION**	**14**
4.1	Sample Collection	14
	4.1.1 Sample Collection Methodology	14
	4.1.2 Duplicate Samples	14
	4.1.3 Description of Samples and Sample Locations	14
	4.1.4 Field Measurements	18
4.2	Sample Analysis	18
	4.2.1 Analytical Support and Methodology	18
	4.2.2 Analytical Data Quality	18
	4.2.3 Presentation of Analytical Results	27
	4.2.3.1 Soil Samples	27
	4.2.3.2 Sediment Samples	28
	4.2.4.3 Groundwater Sample	28
5.0	**SUMMARY**	**29**
REFERENCES		**30**

APPENDIX A Topographic Map
APPENDIX B Stratigraphy and Hydrogeology
APPENDIX C Analytical Results
APPENDIX D Site Inspection Report

TABLES

Number		Page
Table 1	Sample Codes, Locations, and Rationale	15
Table 2	Organic Analytical Results - Surface Soil Samples	19
Table 3	Inorganic Analytical Results - Surface Soil Samples	20
Table 4	Organic Analytical Results - Subsurface Soil Samples	21
Table 5	Inorganic Analytical Results - Subsurface Soil Samples	22
Table 6	Organic Analytical Results - Sediment Samples	23
Table 7	Inorganic Analytical Results - Sediment Samples	24
Table 8	Organic Analytical Results - Groundwater Sample	25
Table 9	Inorganic Analytical Results - Groundwater Sample	26

FIGURES

Figure 1	Site Location Map	4
Figure 2	Site Layout Map	6
Figure 3	Sample Location Map	17

EXECUTIVE SUMMARY

Stanadyne, Inc., Diesel Systems Group began operations at a facility located at 405 White Street, Jacksonville, North Carolina in 1977. Operations conducted at the facility include assembly and testing of diesel system components. Potentially hazardous wastes generated during operations include solvents and petroleum-based fluids.

The Stanadyne facility is located in the Atlantic Coastal Plain Physiographic Province and hydrogeologic regime. Sediments of Quaternary, Tertiary, and Cretaceous age underlie the facility to a depth of greater than 1,400 feet below land surface (bls). Groundwater occurs beneath the facility within four primary hydrologic units. The units are, in descending order, the surficial aquifer, the Castle Hayne aquifer, the Cretaceous Upper Sand unit, and the Cretaceous Lower Sand unit. The depth to the water table beneath the facility is generally less than 20 feet. The Castle Hayne aquifer is encountered at approximately 30 feet bls.

Groundwater in the area could potentially be affected by waste-handling practices at the facility. Within 3 miles of the facility, 17,297 persons obtain water from wells completed within the Castle Hayne aquifer. The nearest well currently in use is located 2.8 miles southeast of the facility.

Surface water run-off from the facility could potentially transport contaminants from the facility to the estuary of Northeast Creek and the New River located 2.15 miles downstream of the facility. Recreational fishing and boating occur along the estuary, and bioaccumulation of contaminants is possible.

Persons living near the Stanadyne facility could potentially be affected by air migration of volatile compounds from the facility. There are 47,924 persons living within 4 miles of the facility. There are several freshwater and saltwater wetland areas within 4 miles of the facility.

Soil and sediment samples were collected at the facility by FIT 4 in June 1990. Analysis of subsurface soil and sediment samples from areas downgradient of the main building at the facility detected numerous polyaromatic hydrocarbons at concentrations of 4 to 366 times the levels in background samples. Significant concentrations of iron, copper, and zinc were detected in one or more samples from various locations at the facility. A high concentration of iron was detected in a groundwater sample collected from an unused, private well located 0.2 mile south of the facility. Due to the

limited number of potentially affected targets near the Stanadyne, Inc. facility, FIT 4 recommends that no further remedial action be planned for this site.

1.0 INTRODUCTION

The NUS Corporation Region 4 Field Investigation Team (FIT) was tasked by the U.S. Environmental Protection Agency (EPA), Waste Management Division to conduct a Screening Site Inspection (SSI) at the Stanadyne, Inc., Diesel Systems Group site in Jacksonville, Onslow County, North Carolina. The investigation was performed under the authority of the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA). The task was performed to satisfy the requirements stated in Technical Directive Document (TDD) number F4-9004-54. The field investigation was conducted during the week of June 11, 1990.

1.1 OBJECTIVES

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

1.2 SCOPE OF WORK

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

- Obtain and review background materials relevant to HRS scoring of the site.
- Prepare a 4-mile radius map of the area from topographic maps.
- Obtain information on local water systems.
- Evaluate target populations associated with the groundwater, surface water, air, and onsite exposure pathways.
- Conduct a survey of private wells.

- Determine location and distance to nearest potable well.
- Develop a site sketch.
- Collect environmental samples.

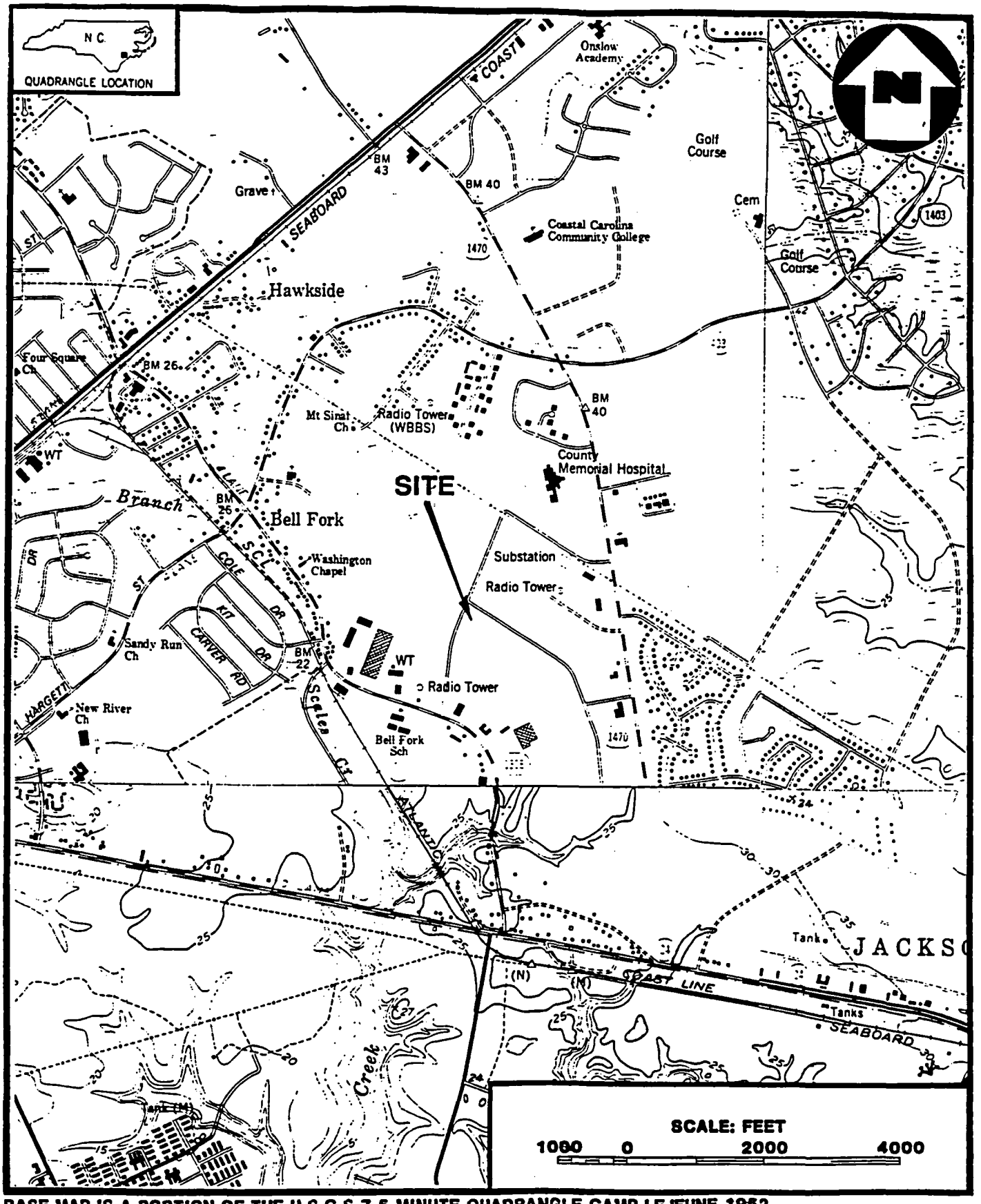
2.0 SITE CHARACTERIZATION

2.1 SITE BACKGROUND AND HISTORY

Stanadyne, Inc., Diesel Systems Group is located at 405 White Street, Jacksonville, North Carolina (34°45'24" N latitude, 77°23'22" W longitude) (Figure 1) (Refs. 1, 2, Appendix A). The facility began operations in 1977 (Ref. 1). Operations conducted at the facility have included assembly and testing of diesel system components, primarily pumps and injectors (Refs. 1, 3). Stanadyne Automotive has operated the facility since a corporate restructuring in 1989 (Ref. 4).

Potentially hazardous materials which have been used at the facility include tetrachloroethene, dichloromethane (also known as "methylene chloride"), trichloroethene, 1,1,1-trichloroethane, acetone, cutting fluid (Imperial 1010), calibration fluid (1487 CF), petroleum process oil (Mentor 28), Vertex 60-A oil, and Honilo 480 oil (Refs. 3, 5, 6, 7, 8, 9, 10, 11, 12). At the Jacksonville facility, waste solvents and oils are stored in drums located inside the main building or in a small shed located southeast of the main building (Refs. 1, 4, 13). Until 1983, the Jacksonville facility received waste solvents and oils from another Stanadyne facility located in New Bern, North Carolina (Refs. 4, 12). Until at least 1987, trichloroethene, 1,1,1-trichloroethane, and dichloromethane were distilled at the facility (Refs. 3, 12). It is not known if distillation is still used at the facility. Hazardous wastes are transported to a licensed facility for disposal (Refs. 4, 6, 7).

Stanadyne, Inc., Diesel Systems Group filed a RCRA Hazardous Waste Permit Part A application for the Jacksonville facility in November 1980, and was listed as a storage facility (Ref. 1). During an interim status inspection by the North Carolina Department of Human Resources in January 1982, several minor discrepancies concerning the contingency plan for the facility were noted. However, there were no violations directly involving the handling of hazardous waste at the facility (Ref. 3). The facility was found to be in full compliance during a reinspection in February 1982 (Ref. 14). In December 1982, the facility was reclassified as a hazardous waste generator and deleted as a storage facility (Ref. 15). During a RCRA inspection conducted by the North Carolina Department of Human Resources in January 1983, the facility was found to be in compliance with applicable RCRA regulations (Ref. 12). During a RCRA inspection conducted by the North Carolina Department of Environment, Health, and Natural Resources in September 1989, it was discovered that containers of hazardous waste were not closed during storage at the facility (Ref. 16). There have been no reported releases of hazardous materials or onsite disposal at the Jacksonville facility (Ref. 13). The facility is currently classified as a hazardous waste generator (Ref. 17).



BASE MAP IS A PORTION OF THE U.S.G.S 7.5 MINUTE QUADRANGLE CAMP LEJEUNE 1952, JACKSONVILLE SOUTH 1952, KELLUM 1977, JACKSONVILLE NORTH 1978, NORTH CAROLINA.

SITE LOCATION MAP
STANADYNE INC.
DIESEL SYSTEMS GROUP
JACKSONVILLE, NORTH CAROLINA

FIGURE 1

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2.2 SITE DESCRIPTION

2.2.1 Site Features

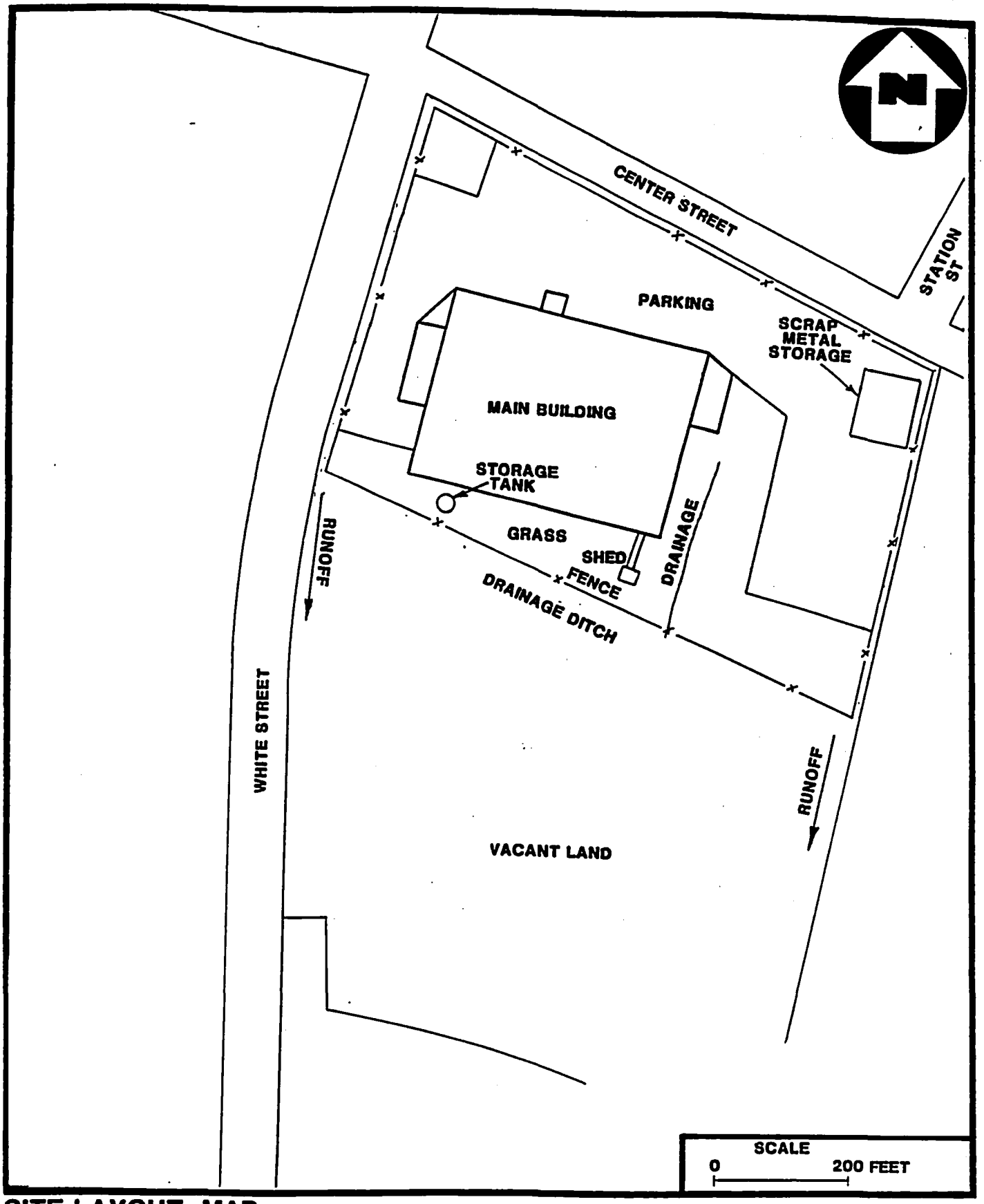
The Stanadyne, Inc. facility occupies a tract of approximately 20 acres in eastern Jacksonville, North Carolina. The main building, parking areas, and surrounding facilities occupy a 10-acre area on the north-northeast side of the property (Figure 2) (Refs. 3, 4, Appendix A). The remainder of the property is undeveloped (Ref. 4). The property slopes very gradually to the south (Appendix A). Drainage ditches are located on the west, south, and east sides of the facility immediately outside the perimeter fence (Ref. 4).

Paved parking areas are located west, north, and east of the main building. Scrap metal is stored on the paved area at the east side of the facility. An aboveground, oil-storage tank, surrounded by a concrete and earth berm, is located at the southwest corner of the main building. Flammable solvents are stored in a small storage shed located in a grassy area south of the main building (Ref. 4).

2.2.2 Waste Characteristics

Waste solvents generated during operations at the Stanadyne, Inc. facility have included tetrachloroethene, trichloroethene, 1,1,1-trichloroethane, dichloromethane ("methylene chloride"), and acetone (Refs. 3, 6, 7, 8). Until 1983, the facility received approximately 110 gallons per month of 1,1,1-trichloroethane and dichloromethane from another Stanadyne facility located in New Bern, North Carolina (EPA ID No. NCD980602445) (Refs. 4, 12). At the Jacksonville facility, trichloroethene, 1,1,1-trichloroethane, and dichloromethane are concentrated by distillation (Refs. 3, 12). Approximately 110 to 125 gallons of still bottoms were generated monthly in 1982 and 1983 (Refs. 2, 3). Approximately 13,450 pounds of all solvent waste (distilled and nondistilled) were generated in 1988 (Ref. 7).

In 1983, approximately 1,900 gallons of waste cutting fluids, calibration fluids, and other petroleum-based oils were generated monthly at the facility (Refs. 3, 9, 10, 11, 12). Until 1983, the Jacksonville facility received approximately 200 gallons of waste cutting oil per month from the Stanadyne facility in New Bern, North Carolina (Ref. 12). The oils are still used at the Jacksonville facility, but the volume of waste generated is not known (Ref. 4). The oils are flammable and potentially contain polycyclic aromatic hydrocarbons (Refs. 9, 10, 11, 18). Mentor 28 is a potential human carcinogen (Ref. 10). Analysis of a sample of a cutting-oil emulsion used at the facility (Imperial 1010) detected cyanide (3.7 parts per million). An EP-toxicity test of this fluid detected silver



SITE LAYOUT MAP
STANADYNE INC.
DIESEL SYSTEMS GROUP
JACKSONVILLE, NORTH CAROLINA

FIGURE 2

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(5.10 parts per million) (Ref. 5). The material was classified as hazardous waste under RCRA regulations and could not be discharged into the Jacksonville sewer system or disposed of at a sanitary landfill (Refs. 5, 19).

Until 1983, still bottoms and waste solvents were transported to disposal facilities by Triangle Resource Industries, Reidsville, North Carolina (EPA ID No. NCD000648451) (Refs. 3, 12). Until at least 1983, petroleum-based waste was sent to a Stanadyne facility in Hartford, Connecticut, for use as a fuel supplement (Ref. 12). Since 1983, wastes from the facility have been disposed of by Eco Flo, Inc., Greensboro, North Carolina (EPA ID No. NCD980842132) (Refs. 4, 6, 7).

3.0 REGIONAL POPULATIONS AND ENVIRONMENTS

3.1 POPULATION AND LAND USE

3.1.1 Demography

Stanadyne, Inc. is located in a commercial-industrial area of Jacksonville, North Carolina (Ref. 4). The city of Jacksonville has a population of 28,780 (1986 estimate) (Ref. 20). The Camp Lejeune Marine Corps Base, located more than 1 mile south and southeast of the facility, has a population of approximately 63,000 (Ref. 20, Appendix A).

The nearest residence is located 1,800 feet south of the facility (Appendix A). Within 1 mile of the facility are Bell Fork School, Onslow County Memorial Hospital, and Britthaven Nursing Home (Ref. 4, Appendix A). The population within 1 mile of the plant is 2,949 (Ref. 21). Within 4 miles of the Stanadyne facility are the city of Jacksonville, Camp Lejeune, and surrounding residential areas (Appendix A). The population within 4 miles of the facility is 47,924 (Ref. 21).

3.1.2 Land Use

Stanadyne, Inc. is located in a medium-density, commercial-industrial area (Ref. 4, Appendix A). Residential areas are located within 1 mile of the facility. ABC One-Hour Cleaners (EPA ID No. NCD981751126), a facility on the National Priorities List, is located 1.8 miles southeast of the Stanadyne facility (Ref. 22). Forest areas are located from 1 to 4 miles east and north of the property. Freshwater wetlands are located along Northeast Creek, Little Northeast Creek, and the New River, 1.7 to 4.0 miles east, northeast, and west of the facility. Saltwater wetlands are located in Northeast Creek and the New River, 2.1 to 4.0 miles southwest and southeast of the facility (Ref. 23, Appendix A).

Several state and federally protected endangered species are found in Onslow County, including the red-cockaded woodpecker (Picoides borealis), the rough-leaf loosestrife (Lysmachia asperulifolia), and Cooley's meadowrue (Thalictrum cooleyi) (Ref. 24). There are no designated areas of critical habitat within a 4-mile radius of the Stanadyne facility or within 15 miles downstream of the property (Ref. 25, Appendix A).

3.2 SURFACE WATER

3.2.1 Climatology

The climate in Jacksonville is generally humid with moderate temperatures. The average temperature varies from 46°F in January to 79°F in July (Ref. 26, pp. 1, 13). The average annual precipitation is 56 inches, with an average of 8 inches precipitation in July, the wettest month (Ref. 26, pp. 40, 43). The average annual evaporation is 42 inches, resulting in a net annual precipitation of 14 inches (Ref. 26, pp. 43, 63). The 1-year, 24-hour rainfall is 3.7 inches (Ref. 27, p. 93).

3.2.2 Overland Drainage

Surface water run-off from the Stanadyne facility flows to drainage ditches located along the east, west, and south sides of the fenced portion of the property (Figure 2) (Ref. 4). Flow continues southward via the drainage ditches for 0.5 mile and enters Scales Creek. Flow continues south and west via Scales Creek for 1.65 miles and enters Northeast Creek. Flow continues to the southwest via Northeast Creek for 1.3 miles and enters the New River, where flow continues to over 15 miles downstream of the Stanadyne facility (Appendix A).

3.2.3 Potentially Affected Water Bodies

There are no known surface water intakes within 15 miles downstream of the Stanadyne property (Ref. 28). Recreational fishing and boating occur along Northeast Creek and the New River (Ref. 4). Northeast Creek and the New River are characterized as a mid-salinity, estuarine habitat from 1.9 to 4.0 miles downstream of the Stanadyne facility and as a high-salinity, estuarine habitat beyond 4 miles downstream (Ref. 23, Appendix A).

3.3 GROUNDWATER

3.3.1 Hydrogeology

The Stanadyne, Inc. facility is located in the Atlantic Coastal Plain Physiographic Province and hydrogeologic setting at an elevation of 30 feet above mean sea level (Ref. 29, pp. 270, 271; Appendix A). The facility is underlain to a depth of greater than 1,400 feet below land surface (bls) by sediments of Quaternary, Tertiary, and Cretaceous age which dip generally to the southeast (Refs. 30, pp. 27, 28, 29; 31, p. 8; Appendix A). The formations found beneath the Stanadyne facility are, in descending order, undifferentiated Quaternary and Miocene sediments, the River Bend Formation,

the Castle Hayne Formation, the Beaufort Formation, the Peedee Formation, the Black Creek Formation, the Middendorf Formation, the Cape Fear Formation, and the Lower Cretaceous Series (Refs. 30, pp. 27, 28, 29; 31, p. 8; Appendix B).

Undifferentiated sediments of Quaternary and Miocene age consisting of sand, silt, and clay occur from the surface to a depth of approximately 10 feet bls beneath the Stanadyne facility (Refs. 31, p. 8, plates 4, 5; 32; Appendices A, B). The River Bend Formation consists of calcareous sand and shell limestone with thin, clay beds throughout the formation (Refs. 30, pp. 28, 33; 31, pp. 8, 36, plates 4, 5). The River Bend Formation occurs at approximately 10 to 210 feet bls beneath the facility (Ref. 31, pp. 8, 34, plates 4, 5). The Castle Hayne Formation consists of shell limestone, marl, calcareous sand, and clay and occurs at approximately 210 to 290 feet bls beneath the Stanadyne plant (Refs. 30, p. 32; 31, p. 8, plates 4, 5). The Beaufort Formation consists of fine, glauconitic sand interbedded with layers of clay, silt, and marl and occurs at approximately 290 to 410 feet bls beneath the property (Refs. 30, p. 32; 31, p. 37, plates 4, 5). The Peedee Formation consists of lenticular beds of dark green or gray, medium- to coarse-grained, quartz sand, with thin layers of clay, dark-gray silt, and indurated shell (Ref. 30, pp. 31, 46). The Peedee Formation occurs at approximately 410 to 580 feet bls beneath the Stanadyne facility (Refs. 30, pp. 44, 46, 54, 55; 31, p. 37, plates 4, 5). The Black Creek, Middendorf, and Cape Fear formations consist of glauconitic sand, silt, dark gray clay, and lenticular gravel deposits (Refs. 30, pp. 28, 62, 65; 31, p. 8). The Black Creek, Middendorf, and Cape Fear formations occur at approximately 580 to 1,380 feet bls beneath the plant (Refs. 30, pp. 54, 55, 62, 63, 64; 31, p. 8; Appendix A). The Lower Cretaceous Series consists primarily of sand and silt interbedded with silty clay (Ref. 30, p. 30). The unnamed stratum of lower Cretaceous age occurs at approximately 1,380 to 1,430 feet bls and unconformably overlies the pre-Cretaceous basement rock (Refs. 30, pp. 29, 62, 63, 64; 31, p. 8).

Sediments underlying the Stanadyne facility are subdivided into separate hydrogeologic units on the basis of hydraulic conductivity. Some hydrogeologic units are composed of sediments of different geologic formations (Ref. 30, pp. 28, 35). In Onslow County, there are four primary hydrogeologic units. The units are, in descending order, the surficial aquifer, the Castle Hayne aquifer, the Cretaceous Upper Sand unit, and the Cretaceous Lower Sand unit (Refs. 30, pp. 28, 35; 31, p. 8; Appendix B).

The unconfined, surficial aquifer consists of the saturated section of sediments overlying the first significant clay layer below the land surface (Ref. 30, p. 41). The surficial aquifer is approximately 30 feet thick beneath the Stanadyne facility (Ref. 31, plates 4, 5; Appendix A). The depth to the water table exhibits seasonal variation from a few feet to 20 feet bls (Refs. 30, p. 41; 31, p. 11). Recharge to the aquifer occurs by downward percolation of direct precipitation (Ref. 30, p. 11).

In the Jacksonville area, the Castle Hayne aquifer includes all or part of the River Bend Formation, the Castle Hayne Formation, and the Beaufort Formation (Refs. 30, pp. 28, 44; 31, p. 8). A distinct aquifer may occur within the Beaufort Formation in some areas, but it is usually considered to be part of the Castle Hayne aquifer system (Refs. 30, pp. 28, 44; 31, pp. 8, 37). The top of the Castle Hayne aquifer occurs at approximately 30 feet bls beneath the Stanadyne property, and the unit is approximately 380 feet thick (Refs. 30, p. 47; 31, plates 4, 5). The Castle Hayne aquifer is confined by a relatively thin silt and clay layer (Ref. 30, p. 46). The hydraulic conductivity of sediments similar to those found in the confining layer is in the range of 1.0×10^{-7} to 1.0×10^{-5} cm/sec (Ref. 33, p. 29). The potentiometric surface of the Castle Hayne aquifer is approximately 10 feet bls beneath the Stanadyne facility (Refs. 30, p. 48; 31, plate 2; Appendix A). Recharge to the Castle Hayne aquifer occurs by seepage from the surficial aquifer through the confining layer and by infiltration of direct precipitation in outcrop areas (Refs. 30, p. 46; 31, pp. 33, 35). Locally, groundwater within the Castle Hayne aquifer flows toward pumping wells and, more generally, toward the New River and Northeast Creek which are in direct contact with the aquifer (Refs. 30, pp. 46, 48; 31, pp. 11, 33, 37, plate 2). The mean transmissivity of the aquifer is 8,750 ft^2/day (Ref. 30, p. 52).

A confining layer present within the upper Peedee Formation separates the Castle Hayne aquifer from the underlying Cretaceous Upper Sand unit (Ref. 30, p. 46). The Cretaceous Upper Sand unit consists of water-bearing sands within the Peedee Formation (Refs. 30, pp. 51, 52; 31, p. 8). The Cretaceous Upper Sand unit occurs at approximately 455 to 580 feet bls beneath the Stanadyne property, and the potentiometric surface is approximately 20 feet bls (Ref. 30, pp. 54, 55, 56; Appendix A). The mean transmissivity of the hydrogeologic unit is 1,050 ft^2/day (Ref. 30, p. 52). Silt and clay deposits within the Black Creek Formation separate the Cretaceous Upper Sand unit from the Cretaceous Lower Sand unit (Refs. 30, pp. 28, 62, 65; 31, p. 8). The Cretaceous Lower Sand unit consists of the water-bearing sands and clays within the Black Creek, Middendorf, and Cape Fear formations and is approximately 650 feet thick beneath the Stanadyne plant (Refs. 30, pp. 62, 64; 31, p. 8). The potentiometric surface of the Cretaceous Lower Sand unit is also approximately 20 feet bls beneath the facility, and the mean transmissivity is 2,750 ft^2/day (Ref. 30, pp. 52, 66). The Cretaceous Lower Sand unit is underlain by a confining layer within the Lower Cretaceous Series (Refs. 30, p. 65; 31, p. 8).

3.3.2 Aquifer Use

Residences within 3 miles of the Stanadyne facility are served by three municipal water systems: the Camp Lejeune Water System, the Jacksonville Municipal Water System, and the Onslow County Water System (Ref. 4, Appendix A).

The Camp Lejeune Water System is supplied by over 100 wells completed within the Castle Hayne aquifer (Refs. 4; 31, pp. 13, 63, 64). The well depths average 152 to 162 feet, and the screened intervals average 84 feet (Refs. 4; 31, p. 19). There are several treatment plants which serve various areas of the base (Refs. 4; 31, pp. 12, 17). Each treatment plant is routinely supplied by a particular group of wells (Refs. 4; 31, p. 12). Within 3 miles of the Stanadyne facility are wellfields for two of the Camp Lejeune treatment plants and distribution subsystems: Holcomb Boulevard and Tarawa Terrace-Montford Point (or "Camp Johnson"). The nearest, active, municipal well (Camp Lejeune #704) is located in the Holcomb Boulevard wellfield 2.8 miles southeast of the Stanadyne facility (Ref. 4; Appendix A). The Holcomb Boulevard subsystem serves approximately 8,139 persons (Ref. 31, p. 12). All wells operated by the Tarawa Terrace-Montford Point subsystem are temporarily closed due to tetrachloroethene contamination problems related to another facility in Jacksonville (Refs. 4, 22). The residences which would normally be served by wells located in the Tarawa Terrace-Montford Point field (9,158 persons) now obtain water from the Holcomb Boulevard subsystem (Ref. 31, p. 12, 13). The Marine Corps Air Station ("Airfield") subsystem serves a large area of the base southwest of the Stanadyne facility (Ref. 4; Appendix A). However, wells for this subsystem are located over 4 miles from the facility (Appendix A).

Wells supplying the Jacksonville and Onslow County systems are located northwest of Jacksonville, over 4 miles from the Stanadyne property (Ref. 4; Appendix A). These wells obtain water from the Peedee aquifer (Cretaceous Upper Sand unit) and the Black Creek aquifer (Cretaceous Lower Sand unit), which contain salt water in areas south and east of the Stanadyne facility (Refs. 4; 31, p. 9; 34). Although some residences within 3 miles of the Stanadyne facility have private wells for lawn and garden irrigation, none of the wells are known to supply drinking water (Ref. 4).

3.4 SUMMARY OF POTENTIALLY AFFECTED POPULATIONS AND ENVIRONMENTS

The surface water, groundwater, and air migration pathways are of concern at the Stanadyne facility. The onsite exposure pathway is not of concern at the facility. The facility is securely fenced, and access by unauthorized individuals is unlikely (Ref. 4).

The surface water migration pathway is of concern due to the possibility that contaminants could be transported to the New River and Northeast Creek estuary located beyond 2.15 miles downstream of the facility (Ref. 23, Appendix A). Recreational fishing and boating occur along the estuary, and contamination of the food chain is possible (Ref. 4).

The groundwater migration pathway is of concern due to the shallow depth to groundwater within the surficial aquifer beneath the facility (Refs. 30, p. 41; 31, p. 11). The Castle Hayne aquifer is also

relatively near the surface, and the thin confining layer above the aquifer permits leakage from the overlying surficial aquifer (Refs. 30, p. 46; 31, pp. 33, 35, plates 4, 5). Several municipal wells located in the Tarawa Terrace area within 2 miles of the facility are not being used temporarily due to tetrachloroethene contamination problems (Refs. 4. 22). Municipal wells within 3 miles of the Stanadyne facility supply water to 17,297 persons (Refs. 4; 31, pp. 12, 13; Appendix A).

The air migration pathway is of concern due to the volatility of contaminants potentially present at the facility (Refs. 4, 9, 11). The population within 4 miles of the facility is 47,924 (Ref. 21). Several freshwater and saltwater wetland areas are located within 4 miles of the facility (Ref. 23, Appendix A).

4.0 FIELD INVESTIGATION

The purpose of this sampling investigation was to identify and characterize contaminants which may be present in the environment as a result of activities that were conducted at Stanadyne, Inc. The field investigation was conducted during the week of June 11, 1990.

4.1 SAMPLE COLLECTION

4.1.1 Sample Collection Methodology

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

4.1.2 Duplicate Samples

John Alexander, Engineering Manager of Stanadyne Automotive, accepted duplicate samples.

4.1.3 Description of Samples and Sample Locations

FIT 4 collected 14 environmental samples from a number of strategic onsite and offsite locations. A surface soil sample, a subsurface soil sample, and a sediment sample were collected from uncontaminated areas of the property. These samples (SI-SS-01, SI-SB-01, and SI-SD-01) were designated as background samples. Four surface soil, four subsurface soil, and two sediment samples were collected from potentially contaminated areas. Surface soil samples were collected at depths of 3 to 8 inches below land surface (bls). Subsurface soil samples were collected at depths of 4 to 6 feet bls. Sediment samples were collected from drainage ditches located along the perimeter of the facility. The groundwater sample was collected from a private well south of Bell Fork Road, 0.2 mile south of the facility (downgradient), at a depth of 50 feet bls (Castle Hayne aquifer). Sample codes, locations, and rationale are presented in Table 1, and sample locations are shown in Figure 3.

TABLE 1

SAMPLE CODES, LOCATIONS, AND RATIONALE
STANADYNE, INC., DIESEL SYSTEMS GROUP
JACKSONVILLE, ONSLOW COUNTY, NORTH CAROLINA

Sample Code	Sample Type	Location	Rationale
SI-SS-01	Surface Soil	On site, near the northwest corner of facility, 3-4" below land surface (bls)	To establish background parameters
SI-SS-02	Surface Soil	On site, near the southwest corner of facility, near storage tank, 4-8" bls	To determine the presence or absence of contaminants
SI-SS-03	Surface Soil	On site, southeast of the main building, 3-8" bls	To determine the presence or absence of contaminants
SI-SS-04	Surface Soil	On site, east of the main building, 4-8" bls	To determine the presence or absence of contaminants
SI-SS-05	Surface Soil	On site, north of the main building, 3-4" bls	To determine the presence or absence of contaminants
SI-SB-01	Subsurface Soil	On site, near the northwest corner of facility, 4.5' bls	To establish background parameters
SI-SB-02	Subsurface Soil	On site, near the southwest corner of facility, near storage tank, 4-5' bls	To determine the presence or absence of contaminants
SI-SB-03	Subsurface Soil	On site, southeast of the main building, 4' bls	To determine the presence or absence of contaminants
SI-SB-04	Subsurface Soil	On site, east of the main building, 6' bls	To determine the presence or absence of contaminants
SI-SB-05	Subsurface Soil	On site, north of the main building, 4.5' bls	To determine the presence or absence of contaminants
SI-SD-01	Sediment	Off site, north-northwest of facility, in drainage ditch	To establish background parameters
SI-SD-02	Sediment	On site, west-southwest corner of facility, in drainage ditch	To determine the presence or absence of contaminants
SI-SD-03	Sediment	On site, southeast corner of facility, in drainage ditch	To determine the presence or absence of contaminants

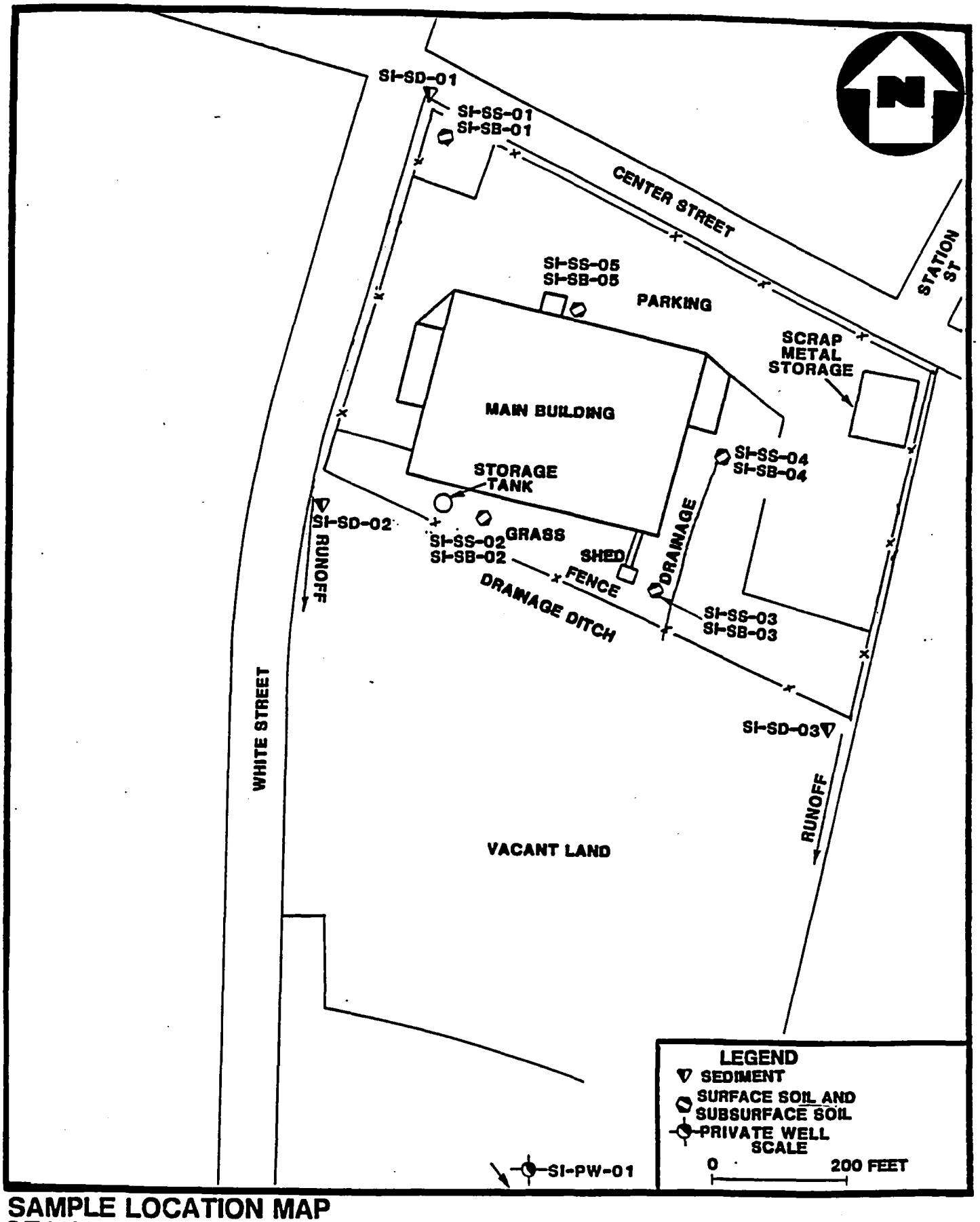
SI - Stanadyne, Inc.
SS - Surface soil
SB - Subsurface soil
SD - Sediment
PW - Private well

TABLE 1

SAMPLE CODES, LOCATIONS, AND RATIONALE
STANADYNE, INC., DIESEL SYSTEMS GROUP
JACKSONVILLE, ONSLOW COUNTY, NORTH CAROLINA

Sample Code	Sample Type	Location	Rationale
SI-PW-01	Private Well	Off site, downgradient, 0.2 mile south of facility, approximately 50' bls (Castle Hayne aquifer); not used for potable water	To determine the presence or absence of contaminants

SI - Stanadyne, Inc.
SS - Surface soil
SB - Subsurface soil
SD - Sediment
PW - Private well



SAMPLE LOCATION MAP
STANADYNE INC.
DIESEL SYSTEMS GROUP
JACKSONVILLE, NORTH CAROLINA

FIGURE 3

NUS CORPORATION

4.1.4 Field Measurements

The pH, temperature, and conductivity were recorded for the groundwater sample from the private well (SI-PW-01) at the time of sample collection. The pH was 6.75; the temperature was 20°C, and the conductivity was 306 umhos/cm.

4.2 SAMPLE ANALYSIS

4.2.1 Analytical Support and Methodology

All samples were analyzed under the Contract Laboratory Program (CLP) and analyzed for all parameters in the Target Compound List (TCL). Organic analysis of soil and water samples was performed by IT Corporation, Cerritos, California. Inorganic analysis of soil and water samples was performed by Orlando Laboratories, Orlando, Florida.

All laboratory analyses and laboratory quality assurance procedures used during this investigation were in accordance with standard procedures and protocols as specified in the Analytical Support Branch Operations and Quality Assurance Manual, United States Environmental Protection Agency, Region IV, Environmental Services Division, revised June 1, 1985; or as specified by the existing United States Environmental Protection Agency standard procedures and protocols for the contract analytical laboratory program.

4.2.2 Analytical Data Quality

All analytical data were subjected to a quality assurance review as described in the EPA Environmental Services Division laboratory data evaluation guidelines. As shown in Tables 2 through 9, some of the organic and inorganic parameters were assigned estimated concentrations and flagged with a "J". This indicates that the qualitative analysis was acceptable, but the reported concentration should not be considered accurate. A few other analytes were noted as being detected based on the presumptive evidence of their presence and flagged with an "N". Although the compound was tentatively identified, its detection cannot be used as a positive identification to its presence. Analytes flagged with a "(1)" are tentatively identified compounds not on the CLP TCL. These compounds are reported only as detected in individual samples, and no MQL was determined. The complete analytical data sheets are presented in Appendix C.

TABLE 2

SUMMARY OF ORGANIC ANALYTICAL RESULTS
SURFACE SOIL SAMPLES
STANADYNE, INC., DIESEL SYSTEMS GROUP
JACKSONVILLE, ONSLOW COUNTY, NORTH CAROLINA

PARAMETERS (ug/kg)	Background	On Site			
	SI-SS-01	SI-SS-02	SI-SS-03	SI-SS-04	SI-SS-05
PURGEABLE COMPOUNDS					
TOLUENE	7	11	11	-	4J
UNIDENTIFIED COMPOUNDS/No.	10J/1	5J/1	6J/1	-	-
EXTRACTABLE COMPOUNDS					
BENZOIC ACID	930J	-	-	-	-
UNIDENTIFIED COMPOUNDS/NO.	10,000J/19	200J/1	800J/4	-	700J/1
BENZENE ACETIC ACID(1)	200JN				
PESTICIDE\PCB COMPOUNDS					
BETA-BHC	11U	9.1	8J	-	-

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

TABLE 3

SUMMARY OF INORGANIC ANALYTICAL RESULTS
SURFACE SOIL SAMPLES
STANADYNE, INC., DIESEL SYSTEMS GROUP
JACKSONVILLE, ONSLOW COUNTY, NORTH CAROLINA

PARAMETERS (mg/kg)	Background	On Site			
	SI-SS-01	SI-SS-02	SI-SS-03	SI-SS-04	SI-SS-05
ALUMINUM	9000	17,000	6300	11,000	4400
BARIUM	18J	17J	-	-	-
CHROMIUM	9.1	15	7.8	12	6
IRON	2900	9200	4000	6000	1600
LEAD	31J	6.1J	7.1J	5.6J	5.5
MAGNESIUM	460J	610J	250J	330J	290J
MANGANESE	5.4	9.1	6.3	4.5	5.6
VANADIUM	10	26	11	17	6.5

- Material analyzed for but not detected above minimum quantitation limit
J Estimated value

TABLE 4

SUMMARY OF ORGANIC ANALYTICAL RESULTS
SUBSURFACE SOIL SAMPLES
STANADYNE, INC., DIESEL SYSTEMS GROUP
JACKSONVILLE, ONSLOW COUNTY, NORTH CAROLINA

PARAMETERS (ug/kg)	Background	On Site			
	SI-SB-01	SI-SB-02	SI-SB-03	SI-SB-04	SI-SB-05
PURGEABLE COMPOUNDS					
CARBON DISULFIDE	9	-	-	-	-
TOLUENE	4J	-	-	2J	3J
UNIDENTIFIED COMPOUNDS/NO.	200J/1	40J/3	-	-	-
EXTRACTABLE COMPOUNDS					
2-METHYLNAPHTHALENE	400U	1600J	-	-	-
FLUORENE	400U	570J	-	-	-
PHENANTHRENE	400U	920J	-	-	-
UNIDENTIFIED COMPOUNDS/NO.	200J/1	300,000J/20	-	-	-
PETROLEUM PRODUCT(1)		N			
PESTICIDE\PCB COMPOUNDS					
BETA-BHC	9.5J	-	-	-	-

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

TABLE 5

SUMMARY OF INORGANIC ANALYTICAL RESULTS
SUBSURFACE SOIL SAMPLES
STANADYNE, INC., DIESEL SYSTEMS GROUP
JACKSONVILLE, ONSLOW COUNTY, NORTH CAROLINA

PARAMETERS (mg/kg)	Background	On Site			
	SI-SB-01	SI-SB-02	SI-SB-03	SI-SB-04	SI-SB-05
ALUMINUM	6200	12,000	9300	11,000	11,000
ARSENIC	6.3	2.5	3.6	-	-
BARIUM	20UJ	17J	-	-	-
CHROMIUM	8	13	9.7	14	12
COBALT	2.5	3.4	2.6	-	-
IRON	4000	15,000	26,000	1300	1300
LEAD	5J	6.6J	8.4J	5.6J	4.7J
MAGNESIUM	210J	340J	200J	280J	260J
MANGANESE	9.6	5.2	4.5	6.7	9.6
VANADIUM	11	30	16	13	13

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

TABLE 6

SUMMARY OF ORGANIC ANALYTICAL RESULTS
SEDIMENT SAMPLES
STANADYNE, INC., DIESEL SYSTEMS GROUP
JACKSONVILLE, ONSLOW COUNTY, NORTH CAROLINA

PARAMETERS (ug/kg)	Background	On Site	
	SI-SD-01	SI-SD-02	SI-SD-03
PURGEABLE COMPOUNDS			
TETRAMETHYL PENTANE(1)		20JN	
EXTRACTABLE COMPOUNDS			
PHENANTHRENE	360U	12,000	260J
FLUORANTHENE	71J	26,000	510
PYRENE	67J	13,000	400J
BENZO(A)ANTHRACENE	360U	6000J	95J
CHRYSENE	47J	11,000J	300J
BIS(2-ETHYLHEXYL) PHTHALATE	360U	1600J	-
BENZO(B AND/OR K)FLUORANTHENE	91J	12,000J	540J
BENZO-A-PYRENE	38J	1400J	170J
INDENO (1,2,3-CD) PYRENE	360U	3200J	130J
BENZO(GHI)PERYLENE	360U	-	110J
BENZOFLUORANTHENE (NOT B OR K)	-	-	600JN
UNIDENTIFIED COMPOUNDS/NO.	-	700,000J/20	5000J/13
PETROLEUM PRODUCT(1)		N	
PESTICIDE\PCB COMPOUNDS			
BETA-BHC	43U	370	-

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

TABLE 7

SUMMARY OF INORGANIC ANALYTICAL RESULTS
SEDIMENT SAMPLES
STANADYNE, INC., DIESEL SYSTEMS GROUP
JACKSONVILLE, ONSLOW COUNTY, NORTH CAROLINA

PARAMETERS (mg/kg)	Background	On Site	
	SI-SD-01	SI-SD-02	SI-SD-03
ALUMINUM	4500	6200	14,000
ANTIMONY	20UJ	-	-
BARIUM	7UJ	-	19J
CALCIUM	8500J	2900J	-
CHROMIUM	6.5	16	16
COPPER	6U	41	-
IRON	2000	4200	10,000
LEAD	47J	41J	8.1
MAGNESIUM	360J	260J	560J
MANGANESE	5.6	6.5	10
NICKEL	2.4U	4.6	-
VANADIUM	8.1	15	23
ZINC	20UJ	120J	-

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

TABLE 8

SUMMARY OF ORGANIC ANALYTICAL RESULTS
GROUNDWATER SAMPLE
STANADYNE, INC., DIESEL SYSTEMS GROUP
JACKSONVILLE, ONSLOW COUNTY, NORTH CAROLINA

PARAMETERS (ug/l)	Off Site Private Well	Trip Blank
	SI-PW-01	SI-TB-01
PURGEABLE COMPOUNDS		
TOLUENE	-	6

- Material analyzed for but not detected above minimum quantitation limit

TABLE 9

SUMMARY OF INORGANIC ANALYTICAL RESULTS
GROUNDWATER SAMPLE
STANADYNE, INC., DIESEL SYSTEMS GROUP
JACKSONVILLE, ONSLOW COUNTY, NORTH CAROLINA

PARAMETERS (ug/l)	Off Site Private Well	Preservative Blank
	SI-PW-01	SI-PB-01
CALCIUM	44,000	-
IRON	3500	-
LEAD	6J	-
MAGNESIUM	1200	-
MANGANESE	17	-
ZINC	450J	-

- Material analyzed for but not detected above minimum quantitation limit

J Estimated value

4.2.3 Presentation of Analytical Results

The following sections present a discussion of the analytical results from the environmental samples collected during the investigation at Stanadyne, Inc. The results of the soil samples are presented in Tables 2 through 5. The results of the sediment samples are presented in Tables 6 and 7. The groundwater results are presented in Tables 8 and 9. Any sample results for a particular parameter greater than 3 times the background level for the parameter or greater than three times the minimum quantitation limit (MQL) are considered to be significant.

4.2.3.1 Soil Samples

Five surface soil samples were collected and analyzed. No organic CLP target compounds were detected at significant concentrations in any of the samples (Table 2). Benzoic acid and benzene acetic acid, a nontarget compound, were tentatively identified in the background sample (SI-SS-01). Several unidentified organic compounds were detected in the background sample (SI-SS-01), as well as in samples collected near the storage tank in the southwest corner of the facility (SI-SS-02), southeast of the main building (SI-SS-03), and north of the main building (SI-SS-05). The source of the benzene acetic acid and unidentified compounds and the relationship of these compounds to the site is undetermined. The sample collected near the southwest corner of the facility (SI-SS-02) contained a significant concentration of iron (3.2 times the concentration in the background sample) (Table 3). The elevated concentration may be attributed to grinding operations and to waste-handling practices at the facility (Ref. 5).

Five subsurface soil samples were collected and analyzed. The sample collected from near the southwest corner of the facility (SI-SB-02) contained a significant, estimated concentration of 2-methylnaphthalene, 4.0 times the background concentration (Table 4). Polycyclic aromatic hydrocarbons such as 2-methylnaphthalene are present in petroleum products (Ref. 18). The elevated concentration in sample SI-SB-02 may be attributed to waste-handling practices at the facility (Refs. 9, 10, 11, 18). The sample collected near the southwest corner of the facility (SI-SB-02) contained 20 unidentified, organic compounds at an estimated concentration of 300,000 ug/kg. The source and relationship of these compounds to the site is undetermined. Significant concentrations of iron were detected in the sample collected near the southwest corner of the facility (SI-SB-02) and in the sample collected southeast of the main building (SI-SB-03), 3.8 and 6.5 times the background, respectively (Table 5). The elevated concentrations may be attributed to grinding operations and waste-handling practices at the facility (Ref. 5).

4.2.3.2 Sediment Samples

Three sediment samples were collected and analyzed. The sample collected from the west-southwest corner of the facility (SI-SD-02) contained significant concentrations of phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, bis-(2-ethylhexyl) phthalate, benzo(b and/or k)fluoranthene, benzo-a-pyrene, indeno(1,2,3-cd)pyrene, and benzo(ghi)perylene, ranging from 4.4 to 366 times the background or estimated background concentrations (Table 6). The sample collected from the southeast corner of the facility (SI-SD-03) contained significant concentrations of fluoranthene, pyrene, chrysene, benzo(b and/or k)fluoranthene, and benzo(a)pyrene, ranging from 4.7 to 7.2 times the background concentrations. The elevated concentrations in these samples may be attributed to waste-handling practices at the facility (Refs. 9, 10, 11, 18). Several unidentified, organic compounds were detected in the sample collected at the west-southwest corner of the facility (SI-SD-02) and in the sample collected at the southeast corner of the facility (SI-SD-03). A significant concentration of the pesticide beta-BHC (8.6 times the MQL) was also detected in sample SI-SD-02 (Ref. 35). The source and relationship of these compounds to the site is undetermined.

The sample collected at the west-southwest corner of the facility (SI-SD-02) contained significant concentrations of copper (6.8 times the MQL) and zinc (an estimated concentration of 6.0 times the estimated MQL) (Table 7). The sample collected at the southeast corner of the facility (SI-SD-03) contained a significant concentration of iron, 5.0 times the background concentration. The elevated concentrations of copper, zinc, and iron may be attributed to grinding operations and waste-handling practices at the facility (Ref. 5).

4.2.3.3 Groundwater Sample

No organic CLP target compounds were detected at significant concentrations in the groundwater sample collected from a private well located 0.2 mile south of the facility (SI-PW-01) (Table 8). The private well sample contained iron at a concentration of 12 times the standard for potable water set by the North Carolina Department of Environment, Health, and Natural Resources (Table 9) (Ref. 36).

5.0 SUMMARY

The Stanadyne, Inc., Diesel Systems Group facility in Jacksonville, North Carolina, has operated since 1977. Operations conducted at the facility include assembly and testing of diesel system components. Potentially hazardous wastes generated during operations include solvents and petroleum-based fluids.

The surface water migration pathway is of concern at the facility due to the potential transport of contaminants to Northeast Creek and the New River located beyond 2.15 miles downstream of the facility. Recreational fishing and boating occur along the surface migration pathway, and contamination of the food chain is possible.

The groundwater migration pathway is of concern due to the shallow depth of the Castle Hayne aquifer, the primary source of water for Camp Lejeune Marine Corps Base. Wells completed within the Castle Hayne aquifer, within 3 miles of the Stanadyne facility, supply water to 17,297 persons. The Tarawa Terrace and Montford Point wellfields, located within 2 miles of the facility, are temporarily closed due to contamination problems related to another facility in Jacksonville. The nearest well currently in use is located 2.8 miles southeast of the facility.

The air migration pathway is of concern due to the volatility of materials used at the facility. The population within 4 miles of the facility is 47,924. Freshwater and saltwater wetlands are present in several areas within 4 miles of the facility.

The field investigation conducted at the Stanadyne facility consisted of the collection of 14 environmental samples including surface soil, subsurface soil, sediment, and groundwater. Analytical results indicate the presence of significant concentrations of several polycyclic aromatic hydrocarbons in one subsurface soil sample and two sediment samples collected downgradient of the facility. Due to the limited number of potentially affected targets near the facility, FIT 4 recommends that no further remedial action be planned for Stanadyne, Inc., Diesel Systems Group.

REFERENCES

1. EPA Hazardous Waste Permit Application (EPA Form 3510-1) for Stanadyne, Inc., Diesel Systems Group, Jacksonville, North Carolina. Filed by Paul H. Wabrek, Vice President/General Manager, November 18, 1980.

2. Potential Hazardous Waste Site Preliminary Assessment (EPA Form 2070-12) for Stanadyne, Inc., Diesel Systems Group, Jacksonville, North Carolina. Filed by D. Mark Durway, North Carolina Department of Human Resources, September 17, 1987.

3. Ray Church, North Carolina Department of Human Resources, memorandum with attachment to O.W. Strickland, North Carolina Department of Human Resources, January 29, 1982. Subject: Interim inspection at Stanadyne, Inc., Jacksonville, North Carolina.

4. NUS Corporation Field Logbook No. F4-2369 for Stanadyne, Inc., Diesel Systems Group, TDD No. F4-9004-54. Documentation of field activities and facility reconnaissance, June 11-12, 1990.

5. Bob Benson, Stanadyne, Inc., letter with attachment to O.W. Strickland, North Carolina Department of Human Resources, April 29, 1981. Subject: Analysis of cutting fluid used at the Jacksonville facility.

6. North Carolina Hazardous Waste Manifest Number 21A for Stanadyne, Inc., Jacksonville, North Carolina. Filed by Norman Preston, Stanadyne, Inc., November 2, 1983.

7. North Carolina Department of Human Resources 1988 Hazardous Waste Generator Annual (Part B) Report (NCNHR Form DHS 3037) for Stanadyne, Inc., Jacksonville, North Carolina. Filed by Bob Benson, Stanadyne, Inc., March 7, 1989.

8. R.T. Morrison and R.N. Boyd, Organic Chemistry (Boston, Massachusetts: Allyn and Bacon, Inc., 1973).

9. Material Safety Data Sheet for 1487 Calibration Fluid. Issued by Rock Valley Oil and Chemical Company, January 19, 1990.

10. Material Safety Data Sheet for Mentor 28 Petroleum Process Oil. Issued by Exxon Company, USA, June 1, 1989.

11. Material Safety Data Sheet for Isopar L Petroleum Solvent. Issued by Exxon Company, USA, November 4, 1988.

12. Raymond L. Church, North Carolina Department of Human Resources, memorandum with attachment to O.W. Strickland, North Carolina Department of Human Resources, January 25, 1983. Subject: RCRA inspection at Stanadyne, Inc., Jacksonville, North Carolina.

13. D. Mark Durway, North Carolina Department of Human Resources, memorandum to file September 16, 1987. Subject: Telephone conversation with Robert Benson, Stanadyne, Inc., concerning waste-handling practices at the Jacksonville facility.

14. Ray Church, North Carolina Department of Human Resources, memorandum to O.W. Strickland, North Carolina Department of Human Resources, February 18, 1982. Subject: Reinspection of Stanadyne, Inc. facility, Jacksonville, North Carolina.

15. O.W. Strickland, North Carolina Department of Human Resources, letter to Robert Benson, Stanadyne, Inc., December 21, 1982. Subject: Reclassification of facility as a generator.

16. Jerry Rhodes, North Carolina Department of Human Resources, letter to Bob Benson, Stanadyne, Inc., October 23, 1989. Subject: Notice of Violation, Docket Number 89-338.

17. North Carolina Department of Human Resources, Solid and Hazardous Waste Management, Alphabetic List of Hazardous Waste Facilities, March 16, 1990.

18. J.J. Elliott and M.T. Melchior, "Petroleum (Composition)," Kirk-Othmer Encyclopedia of Chemical Technology, 3rd edition, Volume 17 (New York: John Wiley & Sons, 1983).

19. William Paige, North Carolina Department of Human Resources, letter to Robert Benson, Stanadyne, Inc., May 13, 1981. Subject: Classification of synthetic cutting fluid mix as hazardous waste.

20. U.S. Bureau of the Census, South-1986 Population and 1985 Per Capita Income Estimates for Counties and Incorporated Places, Current Population Reports, Series P-26, No. 86-S-SC (Washington, D.C.: GPO, 1988).

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

22. Steve Nohrstedt, U.S. Environmental Protection Agency, telephone conversation with William E. Vasser, NUS Corporation, November 26, 1990. Subject: Location of ABC One-Hour Cleaners and contaminants present.

23. U.S. Fish and Wildlife Service, Atlantic Coast Ecological Inventory 1:250,000-Scale Map of Beaufort, North Carolina, Publication 34076-A1-EI-250 (1980).

24. North Carolina Natural Heritage Program Element List for Onslow County, North Carolina, February 16, 1990.

25. North Carolina Natural Heritage Program Natural Areas Database for Onslow County, North Carolina, July 5, 1989.

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

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

28. William E. Vasser, NUS Corporation, memorandum to file for Stanadyne, Inc., Diesel Systems Group (Jacksonville), November 19, 1990. Subject: Surface water intakes in Onslow County, North Carolina.

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

30. James Narkunas, Groundwater Evaluation in the Central Coastal Plain of North Carolina (Raleigh, North Carolina: North Carolina Department of Natural Resources and Community Development, 1980).

31. D.A. Harned, O.B. Lloyd, Jr., and M.W. Treece, Jr., Assessment of Hydrologic and Hydrogeologic Data at Camp Lejeune Marine Corps Base, North Carolina, Water-Resources Investigations Report 89-4096 (Raleigh, North Carolina: U.S. Geological Survey, 1989).

32. U.S. Department of Agriculture, Soil Conservation Service, Onslow County Soil Survey Map Sheet 24, with Soil Interpretation Records and Soil Identification Legend (1984).

33. R. Allan Freeze and John A. Cherry, Groundwater (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1979).

34. Bill Harvey, Onslow County Water Department, telephone conversation with William E. Vasser, NUS Corporation, June 21, 1990. Subject: Location and depth of wells and number of connections served by system.

35. Fumio Matsumura, Toxicology of Insecticides (New York: Plenum Press, 1975).

36. North Carolina Administrative Code Title 15, Department of Environment, Health, and Natural Resources, Division of Environmental Management, Subchapter 2L, Classifications and Water Quality Standards Applicable to the Groundwaters of North Carolina, Sections .0100, .0200, and .0300 (December 1989).

APPENDIX A

JACKSONVILLE NORTH, N. C.
N3445—W7722.5/7.5
1978
AMS 5553 IV SW—SERIES V842
KELLUM, N. C.
N3445—W7715/7.5
1977
AMS 5553 IV SE—SERIES V842
LEGEND
CAMP LEJEUNE WATER SYSTEMS
CJ CAMP JOHNSON
HB NORTH HOLCOMB BLVD.
AF AIRFIELD
JACKSONVILLE WATER SYSTEM
ONSLOW COUNTY WATER SYSTEM
COMMUNITY WELLS
STANADYNE, INC.
DIESEL SYSTEMS GROUP
PRIVATE WELL-01
(UNUSED)
1-MILE RADIUS
2-MILE RADIUS
3-MILE RADIUS
4-MILE RADIUS
ABC ONE-HOUR CLEANERS
(NPL SITE)
MONTFORD POINT
WELL FIELD
TARAWA TERRACE WELL FIELD
NEAREST WELL
(#704)
HB
CJ
AF
NEW RIVER
JACKSONVILLE
WHITE OAK
Paradise Isle
Midway Park
Piney Green
Pumpkin Center
Kellum
Wilson Bay
Wilson Island
Jacks Pt
Mumford Pt
Paradise Pt
Ragged Pt
PETERS POINT FIELD GLIDER BASE
NORTHEAST CREEK
SOUTHWEST CREEK
Wolf Swamp
Moon Creek
Little Northeast Cr
Wallace Creek
MORGAN
SCALE 1:24 000
1 MILE
7000 FEET
1 KILOMETRE
JACKSONVILLE SOUTH, N. C.
NW/4 NEW RIVER 15' QUADRANGLE
N3437.5—W7722.5/7.5
1952
PHOTOINSPECTED 1971
AMS 5553 III NW—SERIES V 842
CAMP LEJEUNE, N. C.
34077-F3-TF-024
1952
PHOTOREVISED 1971
DMA 5553 III NE—SERIES V842

APPENDIX B

STRATIGRAPHY AND HYDROGEOLOGY

STANADYNE , INC.

JACKSONVILLE , NORTH CAROLINA

	STRATUM	DEPTH (FEET)	HYDROLOGIC UNIT	DEPTH (FEET)
SAND , SILT , CLAY	UNDIFFERENTIATED SEDIMENTS	0-10	SURFICIAL AQUIFER	0-30
SAND , SHELL LIMESTONE , CLAY	RIVER BEND FORMATION	10-180	CASTLE HAYNE AQUIFER	30-380
SHELL LIMESTONE , MARL , SAND , CLAY	CASTLE HAYNE FORMATION	180-260		
GLAUCONITIC SAND , CLAY , SILT , MARL	BEAUFORT FORMATION	260-380		
QUARTZ SAND , CLAY , SILT , SHELL	PEEDEE FORMATION	380-580	CONFINING UNIT	380-455
			CRETACEOUS UPPER SAND UNIT	455-580
GLAUCONITIC SAND , SILT , CLAY , GRAVEL	BLACK CREEK FORMATION	580-1380	CONFINING UNIT	580-730
	MIDDENDORF FORMATION		CRETACEOUS LOWER SAND UNIT	730-1380
	CAPE FEAR FORMATION			
SAND , SILT , SILTY CLAY	LOWER CRETACEOUS SERIES	1380-1430	CONFINING UNIT	1380-1430
-----	PRE-CRETACEOUS ROCK	>1430	-------	>1430

(SEE TEXT AND REFERENCES)

APPENDIX C

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

METALS DATA REPORT 08/06/90

** PROJECT NO. 90-529 SAMPLE NO. 47681 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: W RILEY **
** SOURCE: STANADYNE INC CITY: JACKSONVIL ST: NC **
** STATION ID: SS-01 COLLECTION START: 06/11/90 1252 STOP: 00/00/00 **
** CASE NUMBER: 14283 SAS NUMBER: MD NUMBER: T650 **

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
9000	ALUMINUM	5.4	MANGANESE
20UJ	ANTIMONY	.13U	MERCURY
2U	ARSENIC	2.9U	NICKEL
18J	BARIUM	230U	POTASSIUM
.26U	BERYLLIUM	.26UJ	SELENIUM
.26U	CADMIUM	.26U	SILVER
1200UJ	CALCIUM	1200UJ	SODIUM
9.1	CHROMIUM	1U	THALLIUM
1.3U	COBALT	NA	TIN
5U	COPPER	10	VANADIUM
2900	IRON	30UJ	ZINC
31J	LEAD	24	PERCENT MOISTURE
460J	MAGNESIUM		

REMARKS ***REMARKS***

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.
*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/06/90

SPECIFIED ANALYSIS DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47681 SAMPLE TYPE: SOIL	PROG ELEM: NSF COLLECTED BY: W RILEY
SOURCE: STANADYNE INC	CITY: JACKSONVIL ST: NC
STATION ID: SS-01	COLLECTION START: 06/11/90 1252 STOP: 00/00/00
CASE.NO.: 14283 SAS NO.:	D. NO.: T650 MD NO: T650

RESULTS	UNITS	PARAMETER
.20U	MG/KG	CYANIDE

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

METALS DATA REPORT 08/06/90

PROJECT NO. 90-529 SAMPLE NO. 47685 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SS-02
CASE NUMBER: 14283 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1450 STOP: 00/00/00
MD NUMBER: T654

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
17000	ALUMINUM*	9.1	MANGANESE
20UJ	ANTIMONY	.12U	MERCURY
2U	ARSENIC	2.5U	NICKEL
17J	BARIUM*	570U	POTASSIUM
.23U	BERYLLIUM	.23UJ	SELENIUM
.23U	CADMIUM	.23U	SILVER
140UJ	CALCIUM	900UJ	SODIUM
15	CHROMIUM*	.46U	THALLIUM
2U	COBALT	NA	TIN
2U	COPPER	26	VANADIUM*
9200	IRON*	7UJ	ZINC
6.1J	LEAD	13	PERCENT MOISTURE
610J	MAGNESIUM		

REMARKS ***REMARKS***

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.
*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/06/90

SPECIFIED ANALYSIS DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47685 SAMPLE TYPE: SOIL
PROG ELEM: NSF COLLECTED BY: W RILEY
SOURCE: STANADYNE INC
CITY: JACKSONVIL ST: NC
STATION ID: SS-02
COLLECTION START: 06/11/90 1450 STOP: 00/00/00
CASE.NO.: 14283 SAS NO.:
D. NO.: T654 MD NO: T654

RESULTS	UNITS	PARAMETER
.17U	MG/KG	CYANIDE

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

METALS DATA REPORT 08/06/90

** PROJECT NO. 90-529 SAMPLE NO. 47686 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: W RILEY **
** SOURCE: STANADYNE INC CITY: JACKSONVIL ST: NC **
** STATION ID: SS-03 COLLECTION START: 06/11/90 1520 STOP: 00/00/00 **
** CASE NUMBER: 14283 SAS NUMBER: MD NUMBER: T655 **

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
6300	ALUMINUM	6.3	MANGANESE
10UJ	ANTIMONY	.11U	MERCURY
2U	ARSENIC	2.4U	NICKEL
20UJ	BARIUM	280U	POTASSIUM
.21U	BERYLLIUM	.21UJ	SELENIUM
.21U	CADMIUM	.21U	SILVER
900UJ	CALCIUM	890UJ	SODIUM
7.8	CHROMIUM	.43U	THALLIUM
1.1U	COBALT	NA	TIN
3U	COPPER	11	VANADIUM
4000	IRON	5UJ	ZINC
7.1J	LEAD	06	PERCENT MOISTURE
250J	MAGNESIUM		

REMARKS ***REMARKS***

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.
*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.
08/06/90

SPECIFIED ANALYSIS DATA REPORT

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** PROJECT NO. 90-529 SAMPLE NO. 47686 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: W RILEY **
** SOURCE: STANADYNE INC CITY: JACKSONVIL ST: NC **
** STATION ID: SS-03 COLLECTION START: 06/11/90 1520 STOP: 00/00/00 **
** CASE.NO.: 14283 SAS NO.: D. NO.: T655 MD NO: T655 **

****

RESULTS	UNITS	PARAMETER
0.2UJ	MG/KG	CYANIDE

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA. 08/06/90

METALS DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47689 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: W RILEY
SOURCE: STANADYNE INC CITY: JACKSONVIL ST: NC
STATION ID: SS-04 COLLECTION START: 06/11/90 1600 STOP: 00/00/00
CASE NUMBER: 14283 SAS NUMBER: MD NUMBER: T674

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
11000	ALUMINUM	4.5	MANGANESE
20UJ	ANTIMONY	.11U	MERCURY
2U	ARSENIC	3U	NICKEL
20UJ	BARIUM	490U	POTASSIUM
.22U	BERYLLIUM	.22UJ	SELENIUM
.22U	CADMIUM	.22U	SILVER
560UJ	CALCIUM	910UJ	SODIUM
12	CHROMIUM	.45U	THALLIUM
1.1U	COBALT	NA	TIN
3U	COPPER	17	VANADIUM
6000	IRON	7UJ	ZINC
5.6J	LEAD	11	PERCENT MOISTURE
330J	MAGNESIUM		

REMARKS ***REMARKS***

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*K-ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE GIVEN *L-ACTUAL VALUE IS KNOWN TO BE GREATER THAN VALUE GIVEN
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*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/06/90

SPECIFIED ANALYSIS DATA REPORT

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**   PROJECT NO. 90-529   SAMPLE NO. 47689  SAMPLE TYPE: SOIL        PROG ELEM: NSF   COLLECTED BY: W RILEY                **
**   SOURCE: STANADYNE INC                                           CITY: JACKSONVIL             ST: NC                   **
**   STATION ID: SS-04                                               COLLECTION START: 06/11/90  1600   STOP: 00/00/00     **
**   CASE.NO.: 14283         SAS NO.:                                D. NO.: T674                MD NO: T674               **
**                                                                                                                         **
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RESULTS	UNITS	PARAMETER
.17U	MG/KG	CYANIDE

FOOTNOTES
*A-AVERAGE VALUE   *NA-NOT ANALYZED   *NAI-INTERFERENCES   *J-ESTIMATED VALUE   *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

METALS DATA REPORT 08/06/90

** PROJECT NO. 90-529 SAMPLE NO. 47683 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: W RILEY **
** SOURCE: STANADYNE INC CITY: JACKSONVIL ST: NC **
** STATION ID: SS-05 COLLECTION START: 06/11/90 1410 STOP: 00/00/00 **
** CASE NUMBER: 14283 SAS NUMBER: MD NUMBER: T652 **

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
4400	ALUMINUM	5.6	MANGANESE
9.9UJ	ANTIMONY	.11U	MERCURY
.42U	ARSENIC	2.3U	NICKEL
8UJ	BARIUM	230U	POTASSIUM
.21U	BERYLLIUM	.21UJ	SELENIUM
1U	CADMIUM	.21U	SILVER
3600J	CALCIUM	860UJ	SODIUM
6	CHROMIUM	.42U	THALLIUM
2U	COBALT	NA	TIN
3U	COPPER	6.5	VANADIUM
1600	IRON	5UJ	ZINC
5.5	LEAD	05	PERCENT MOISTURE
290J	MAGNESIUM		

REMARKS ***REMARKS***

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.
*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/06/90

SPECIFIED ANALYSIS DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47683 SAMPLE TYPE: SOIL	PROG ELEM: NSF COLLECTED BY: W RILEY
SOURCE: STANADYNE INC	CITY: JACKSONVIL ST: NC
STATION ID: SS-05	COLLECTION START: 06/11/90 1410 STOP: 00/00/00
CASE.NO.: 14283 SAS NO.:	D. NO.: T652 MD NO: T652

RESULTS	UNITS	PARAMETER
.16U	MG/KG	CYANIDE

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

METALS DATA REPORT 08/06/90

PROJECT NO. 90-529 SAMPLE NO. 47682 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SB-01
CASE NUMBER: 14283 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1305 STOP: 00/00/00
MD NUMBER: T651

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
6200	ALUMINUM	9.6	MANGANESE
20UJ	ANTIMONY	.12U	MERCURY
6.3	ARSENIC	2.6U	NICKEL
20UJ	BARIUM	330U	POTASSIUM
.24U	BERYLLIUM	.24UJ	SELENIUM
1U	CADMIUM	.24U	SILVER
170UJ	CALCIUM	960UJ	SODIUM
8	CHROMIUM	1U	THALLIUM
2.5	COBALT	NA	TIN
3U	COPPER	11	VANADIUM
4000	IRON	7UJ	ZINC
5J	LEAD	16	PERCENT MOISTURE
210J	MAGNESIUM		

REMARKS ***REMARKS***

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*K-ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE GIVEN *L-ACTUAL VALUE IS KNOWN TO BE GREATER THAN VALUE GIVEN
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/06/90

SPECIFIED ANALYSIS DATA REPORT

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**   PROJECT NO. 90-529   SAMPLE NO. 47682  SAMPLE TYPE: SOIL        PROG ELEM: NSF   COLLECTED BY: W RILEY                       **
**   SOURCE: STANADYNE INC                                            CITY: JACKSONVIL                ST: NC                      **
**   STATION ID: SB-01                                                COLLECTION START: 06/11/90  1305   STOP: 00/00/00           **
**   CASE.NO.: 14283          SAS NO.:                                D. NO.: T651                MD NO: T651                     **
**                                                                                                                                **
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RESULTS	UNITS	PARAMETER
.18U	MG/KG	CYANIDE

FOOTNOTES
*A-AVERAGE VALUE   *NA-NOT ANALYZED   *NAI-INTERFERENCES   *J-ESTIMATED VALUE   *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

METALS DATA REPORT 08/06/90

PROJECT NO. 90-529 SAMPLE NO. 47687 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SB-02
CASE NUMBER: 14283 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1500 STOP: 00/00/00
MD NUMBER: T672

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
12000	ALUMINUM	5.2	MANGANESE
20UJ	ANTIMONY	.13U	MERCURY
2.5	ARSENIC	2.8U	NICKEL
17J	BARIUM	510U	POTASSIUM
1U	BERYLLIUM	.25UJ	SELENIUM
.25U	CADMIUM	.25U	SILVER
130UJ	CALCIUM	1100UJ	SODIUM
13	CHROMIUM	.50U	THALLIUM
3.4	COBALT	NA	TIN
3U	COPPER	30	VANADIUM
15000	IRON	7UJ	ZINC
6.6J	LEAD	20	PERCENT MOISTURE
840J	MAGNESIUM		

REMARKS ***REMARKS***

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*K-ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE GIVEN *L-ACTUAL VALUE IS KNOWN TO BE GREATER THAN VALUE GIVEN
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/06/90

SPECIFIED ANALYSIS DATA REPORT

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**   PROJECT NO. 90-529   SAMPLE NO. 47687  SAMPLE TYPE: SOIL      PROG ELEM: NSF   COLLECTED BY: W RILEY                **
**   SOURCE: STANADYNE INC                                         CITY: JACKSONVIL             ST: NC                    **
**   STATION ID: SB-02                                             COLLECTION START: 06/11/90  1500   STOP: 00/00/00      **
**   CASE.NO.: 14283            SAS NO.:                           D. NO.: T672                 MD NO: T672               **
**                                                                                                                          **
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RESULTS	UNITS	PARAMETER
.19U	MG/KG	CYANIDE

FOOTNOTES
*A-AVERAGE VALUE   *NA-NOT ANALYZED   *NAI-INTERFERENCES   *J-ESTIMATED VALUE   *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

METALS DATA REPORT 08/06/90

** PROJECT NO. 90-529 SAMPLE NO. 47688 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: W RILEY **
** SOURCE: STANADYNE INC CITY: JACKSONVIL ST: NC **
** STATION ID: SB-03 COLLECTION START: 06/11/90 1530 STOP: 00/00/00 **
** CASE NUMBER: 14283 SAS NUMBER: MD NUMBER: T673 **

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
9300	ALUMINUM	4.5	MANGANESE
20UJ	ANTIMONY	.12U	MERCURY
3.6	ARSENIC	2.7U	NICKEL
8UJ	BARIUM	300U	POTASSIUM
.25U	BERYLLIUM	1UJ	SELENIUM
.25U	CADMIUM	1U	SILVER
110UJ	CALCIUM	1100UJ	SODIUM
9.7	CHROMIUM	.50U	THALLIUM
2.6	COBALT	NA	TIN
2U	COPPER	16	VANADIUM
26000	IRON	5UJ	ZINC
6.4J	LEAD	19	PERCENT MOISTURE
200J	MAGNESIUM		

REMARKS ***REMARKS***

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.
*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/06/90

SPECIFIED ANALYSIS DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47688 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SB-03
CASE.NO.: 14283 SAS NO.:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1530 STOP: 00/00/00
D. NO.: T673 MD NO: T673

RESULTS	UNITS	PARAMETER
0.2UJ	MG/KG	CYANIDE

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

METALS DATA REPORT 08/06/90

PROJECT NO. 90-529 SAMPLE NO. 47690 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SB-04
CASE NUMBER: 14283 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1605 STOP: 00/00/00
MD NUMBER: T675

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
11000	ALUMINUM	6.7	MANGANESE
20UJ	ANTIMONY	.13U	MERCURY
.54U	ARSENIC	2.9U	NICKEL
20UJ	BARIUM	790U	POTASSIUM
.27U	BERYLLIUM	.27UJ	SELENIUM
.27U	CADMIUM	.27U	SILVER
110UJ	CALCIUM	1200UJ	SODIUM
14	CHROMIUM	.54U	THALLIUM
1.3U	COBALT	NA	TIN
3U	COPPER	13	VANADIUM
1300	IRON	5UJ	ZINC
5.6J	LEAD	25	PERCENT MOISTURE
280J	MAGNESIUM		

REMARKS ***REMARKS***

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.
*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/06/90

SPECIFIED ANALYSIS DATA REPORT

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**  PROJECT NO. 90-529   SAMPLE NO. 47690  SAMPLE TYPE: SOIL      PROG ELEM: NSF   COLLECTED BY: W RILEY          **
**  SOURCE: STANADYNE INC                                          CITY: JACKSONVIL           ST: NC               **
**  STATION ID: SB-04                                              COLLECTION START: 06/11/90  1605  STOP: 00/00/00 **
**  CASE.NO.: 14283          SAS NO.:                              D. NO.: T675               MD NO: T675          **
**                                                                                                                  **
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RESULTS	UNITS	PARAMETER
.20U	MG/KG	CYANIDE

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

METALS DATA REPORT 08/06/90

** PROJECT NO. 90-529 SAMPLE NO. 47684 SAMPLE TYPE: SOIL
** SOURCE: STANADYNE INC
** STATION ID: SB-05
** CASE NUMBER: 14283 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1420 STOP: 00/00/00
MD NUMBER: T653

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
11000	ALUMINUM	9.6	MANGANESE
20UJ	ANTIMONY	.12U	MERCURY
.48U	ARSENIC	2.7U	NICKEL
20UJ	BARIUM	440U	POTASSIUM
.24U	BERYLLIUM	.24UJ	SELENIUM
.24U	CADMIUM	.24U	SILVER
80UJ	CALCIUM	990UJ	SODIUM
12	CHROMIUM	.48U	THALLIUM
1.2U	COBALT	NA	TIN
3U	COPPER	13	VANADIUM
1300	IRON	5UJ	ZINC
4.7J	LEAD	17	PERCENT MOISTURE
260J	MAGNESIUM		

REMARKS ***REMARKS***

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.
*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/06/90

SPECIFIED ANALYSIS DATA REPORT

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**   PROJECT NO. 90-529    SAMPLE NO. 47684  SAMPLE TYPE: SOIL       PROG ELEM: NSF    COLLECTED BY: W RILEY            **
**   SOURCE: STANADYNE INC                                           CITY: JACKSONVIL            ST: NC                    **
**   STATION ID: SB-05                                               COLLECTION START: 06/11/90  1420   STOP: 00/00/00     **
**   CASE.NO.: 14283           SAS NO.:                              D. NO.: T653               MD NO: T653                **
**                                                                                                                         **
*** * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * ***
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RESULTS	UNITS	PARAMETER
.18U	MG/KG	CYANIDE

FOOTNOTES
*A-AVERAGE VALUE   *NA-NOT ANALYZED   *NAI-INTERFERENCES   *J-ESTIMATED VALUE   *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.

METALS DATA REPORT

*** ***
** PROJECT NO. 90-529 SAMPLE NO. 47678 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: W RILEY **
** SOURCE: STANADYNE INC CITY: JACKSONVIL ST: NC **
** STATION ID: SD-01 COLLECTION START: 06/11/90 1015 STOP: 00/00/00 **
** CASE NUMBER: 14283 SAS NUMBER: MD NUMBER: T647 **
** **
*** ***

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
4500	ALUMINUM	5.6	MANGANESE
20UJ	ANTIMONY	.11U	MERCURY
.44U	ARSENIC	2.4U	NICKEL
7UJ	BARIUM	120U	POTASSIUM
.22U	BERYLLIUM	1.1UJ	SELENIUM
.22U	CADMIUM	.22U	SILVER
8500J	CALCIUM	910UJ	SODIUM
6.5	CHROMIUM	1U	THALLIUM
1.1U	COBALT	NA	TIN
6U	COPPER	8.1	VANADIUM
2000	IRON	20UJ	ZINC
47U	LEAD	08	PERCENT MOISTURE
360J	MAGNESIUM		

REMARKS ***REMARKS***

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.
*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/06/90

SPECIFIED ANALYSIS DATA REPORT

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**   PROJECT NO. 90-529   SAMPLE NO. 47678  SAMPLE TYPE: SOIL        PROG ELEM: NSF   COLLECTED BY: W RILEY                **
**   SOURCE: STANADYNE INC                                            CITY: JACKSONVIL              ST: NC                  **
**   STATION ID: SD-01                                                COLLECTION START: 06/11/90  1015   STOP: 00/00/00     **
**   CASE.NO.: 14283          SAS NO.:                                D. NO.: T647                MD NO: T647               **
**                                                                                                                          **
*** * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * ***
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RESULTS	UNITS	PARAMETER
.16U	MG/KG	CYANIDE

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*K-ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE GIVEN *L-ACTUAL VALUE IS KNOWN TO BE GREATER THAN VALUE GIVEN
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

METALS DATA REPORT 08/06/90

PROJECT NO. 90-529 SAMPLE NO. 47679 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SD-02
CASE NUMBER: 14283 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1025 STOP: 00/00/00
MD NUMBER: T648

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
6200	ALUMINUM	6.5	MANGANESE
20UJ	ANTIMONY	.16U	MERCURY
.65U	ARSENIC	4.6	NICKEL
20UJ	BARIUM	270U	POTASSIUM
.33U	BERYLLIUM	1UJ	SELENIUM
.33U	CADMIUM	.33U	SILVER
2900J	CALCIUM	1400UJ	SODIUM
16	CHROMIUM	1U	THALLIUM
1.6U	COBALT	NA	TIN
41	COPPER	15	VANADIUM
4200	IRON	120J	ZINC
41J	LEAD	39	PERCENT MOISTURE
260J	MAGNESIUM		

REMARKS ***REMARKS***

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.
*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/06/90

SPECIFIED ANALYSIS DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47679 SAMPLE TYPE: SOIL	PROG ELEM: NSF COLLECTED BY: W RILEY
SOURCE: STANADYNE INC	CITY: JACKSONVIL ST: NC
STATION ID: SD-02	COLLECTION START: 06/11/90 1025 STOP: 00/00/00
CASE.NO.: 14283 SAS NO.:	D. NO.: T648 MD NO: T648

RESULTS	UNITS	PARAMETER
.24U	MG/KG	CYANIDE

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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*U-MATERIAL WAS ANALYZED FOR BUT NOT DETECTED. THE NUMBER IS THE MINIMUM QUANTITATION LIMIT.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

METALS DATA REPORT 08/06/90

** PROJECT NO. 90-529 SAMPLE NO. 47680 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: W RILEY **
** SOURCE: STANADYNE INC CITY: JACKSONVIL ST: NC **
** STATION ID: SD-03 COLLECTION START: 06/11/90 1155 STOP: 00/00/00 **
** CASE NUMBER: 14283 SAS NUMBER: MD NUMBER: T649 **

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
14000	ALUMINUM	10	MANGANESE
20UJ	ANTIMONY	.14U	MERCURY
2U	ARSENIC	3.1U	NICKEL
19J	BARIUM	600U	POTASSIUM
.29U	BERYLLIUM	1UJ	SELENIUM
.29U	CADMIUM	.29U	SILVER
280UJ	CALCIUM	760UJ	SODIUM
16	CHROMIUM	1U	THALLIUM
1.4U	COBALT	NA	TIN
6U	COPPER	23	VANADIUM
10000	IRON	20UJ	ZINC
8.1	LEAD	30	PERCENT MOISTURE
560J	MAGNESIUM		

REMARKS ***REMARKS***

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.
*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/06/90

SPECIFIED ANALYSIS DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47680 SAMPLE TYPE: SOIL
PROG ELEM: NSF COLLECTED BY: W RILEY
SOURCE: STANADYNE INC
CITY: JACKSONVIL ST: NC
STATION ID: SD-03
COLLECTION START: 06/11/90 1155 STOP: 00/00/00
CASE.NO.: 14283 SAS NO.:
D. NO.: T649 MD NO: T649

RESULTS	UNITS	PARAMETER
.21U	MG/KG	CYANIDE

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

METALS DATA REPORT 08/06/90

PROJECT NO. 90-529 SAMPLE NO. 47677 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: W RILEY
SOURCE: STANADYNE INC CITY: JACKSONVIL ST: NC
STATION ID: PW-01 COLLECTION START: 06/11/90 1122 STOP: 00/00/00
CASE NUMBER: 14283 SAS NUMBER: MD NUMBER: T646

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
110U	ALUMINUM	17	MANGANESE
47U	ANTIMONY	.20U	MERCURY
2U	ARSENIC	11U	NICKEL
20U	BARIUM	1300U	POTASSIUM
1U	BERYLLIUM	1U	SELENIUM
2U	CADMIUM	1U	SILVER
44000	CALCIUM	6100UJ	SODIUM
4U	CHROMIUM	2U	THALLIUM
5U	COBALT	NA	TIN
30U	COPPER	1U	VANADIUM
3500	IRON	450J	ZINC
60	LEAD		
1200	MAGNESIUM		

REMARKS ***REMARKS***

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*K-ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE GIVEN *L-ACTUAL VALUE IS KNOWN TO BE GREATER THAN VALUE GIVEN
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/06/90

SPECIFIED ANALYSIS DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47677 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: W RILEY
SOURCE: STANADYNE INC CITY: JACKSONVIL ST: NC
STATION ID: PW-01 COLLECTION START: 06/11/90 1122 STOP: 00/00/00
CASE.NO.: 14283 SAS NO.: D. NO.: T646 MD NO: T646

RESULTS	UNITS	PARAMETER
1.5U	UG/L	CYANIDE

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

METALS DATA REPORT 08/06/90

PROJECT NO. 90-529 SAMPLE NO. 47691 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: W RILEY
SOURCE: STANADYNE INC CITY: JACKSONVIL ST: NC
STATION ID: PB-01 COLLECTION START: 06/11/90 0800 STOP: 00/00/00
CASE NUMBER: 14283 SAS NUMBER: MD NUMBER: T676

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
30U	ALUMINUM	1U	MANGANESE
47U	ANTIMONY	.20U	MERCURY
2U	ARSENIC	11U	NICKEL
4U	BARIUM	1200U	POTASSIUM
1U	BERYLLIUM	1U	SELENIUM
1U	CADMIUM	1U	SILVER
570U	CALCIUM	2400UJ	SODIUM
3U	CHROMIUM	2U	THALLIUM
5U	COBALT	NA	TIN
7U	COPPER	1U	VANADIUM
20U	IRON	20UJ	ZINC
1UJ	LEAD		
60U	MAGNESIUM		

REMARKS ***REMARKS***

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*K-ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE GIVEN *L-ACTUAL VALUE IS KNOWN TO BE GREATER THAN VALUE GIVEN
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*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/06/90

SPECIFIED ANALYSIS DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47691 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: W RILEY
SOURCE: STANADYNE INC CITY: JACKSONVIL ST: NC
STATION ID: PB-01 COLLECTION START: 06/11/90 0800 STOP: 00/00/00
CASE.NO.: 14283 SAS NO.: D. NO.: T676 MD NO: T676

RESULTS	UNITS	PARAMETER
1.5U	UG/L	CYANIDE

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*K-ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE GIVEN *L-ACTUAL VALUE IS KNOWN TO BE GREATER THAN VALUE GIVEN
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47681 SAMPLE TYPE:
SOURCE:
STATION ID: SS-01

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1252 STOP: 00/00/00

CASE NO.: 14283 SAS NO.: D. NO.: T650

UG/KG	ANALYTICAL RESULTS
14U	CHLOROMETHANE
14U	BROMOMETHANE
14U	VINYL CHLORIDE
14U	CHLOROETHANE
8U	METHYLENE CHLORIDE
14U	ACETONE
7U	CARBON DISULFIDE
7U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
7U	1,1-DICHLOROETHANE
7U	1,2-DICHLOROETHENE (TOTAL)
7U	CHLOROFORM
7U	1,2-DICHLOROETHANE
14U	METHYL ETHYL KETONE
7U	1,1,1-TRICHLOROETHANE
7U	CARBON TETRACHLORIDE
14U	VINYL ACETATE
7U	BROMODICHLOROMETHANE

UG/KG	ANALYTICAL RESULTS
7U	1,2-DICHLOROPROPANE
7U	CIS-1,3-DICHLOROPROPENE
7U	TRICHLOROETHENE(TRICHLOROETHYLENE)
7U	DIBROMOCHLOROMETHANE
7U	1,1,2-TRICHLOROETHANE
7U	BENZENE
7U	TRANS-1,3-DICHLOROPROPENE
7U	BROMOFORM
14U	METHYL ISOBUTYL KETONE
14U	METHYL BUTYL KETONE
7U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
7U	1,1,2,2-TETRACHLOROETHANE
7	TOLUENE
7U	CHLOROBENZENE
7U	ETHYL BENZENE
7U	STYRENE
7U	TOTAL XYLENES
27	PERCENT MOISTURE

Background

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.
*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

MISCELLANEOUS PURGEABLE ORGANICS - DATA REPORT

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**   PROJECT NO. 90-529   SAMPLE NO. 47681  SAMPLE TYPE:          PROG ELEM: NSF   COLLECTED BY: W RILEY        **
**   SOURCE:                                                      CITY: JACKSONVIL           ST: NC             **
**   STATION ID: SS-01                                            COLLECTION START: 06/11/90  1252   STOP: 00/00/00 **
**   CASE.NO.: 14283          SAS NO.:                            D. NO.: T650               MD NO: T650        **
**                                                                                                             **
*** * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * ***
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ANALYTICAL RESULTS UG/KG

10J   1-UNIDENTIFIED COMPOUND*

FOOTNOTES
*A-AVERAGE VALUE   *NA-NOT ANALYZED   *NAI-INTERFERENCES   *J-ESTIMATED VALUE   *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.
*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

EXTRACTABLE ORGANICS DATA REPORT 08/23/90

** PROJECT NO. 90-529 SAMPLE NO. 47681 SAMPLE TYPE:
** SOURCE:
** STATION ID: SS-01
**
** CASE NO.: 14283 SAS NO.:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1252 STOP: 00/00/00

D. NO.: T650

UG/KG	ANALYTICAL RESULTS
450U	PHENOL
450U	BIS(2-CHLOROETHYL) ETHER
450U	2-CHLOROPHENOL
450U	1,3-DICHLOROBENZENE
450U	1,4-DICHLOROBENZENE
450U	BENZYL ALCOHOL
450U	1,2-DICHLOROBENZENE
450U	2-METHYLPHENOL
450U	BIS(2-CHLOROISOPROPYL) ETHER
450U	(3-AND/OR 4-)METHYLPHENOL
450U	N-NITROSODI-N-PROPYLAMINE
450U	HEXACHLOROETHANE
450U	NITROBENZENE
450U	ISOPHORONE
450U	2-NITROPHENOL
450U	2,4-DIMETHYLPHENOL
930J	BENZOIC ACID
450U	BIS(2-CHLOROETHOXY) METHANE
450U	2,4-DICHLOROPHENOL
450U	1,2,4-TRICHLOROBENZENE
450U	NAPHTHALENE
450U	4-CHLOROANILINE
450U	HEXACHLOROBUTADIENE
450U	4-CHLORO-3-METHYLPHENOL
450U	2-METHYLNAPHTHALENE
450U	HEXACHLOROCYCLOPENTADIENE (HCCP)
450U	2,4,6-TRICHLOROPHENOL
2200U	2,4,5-TRICHLOROPHENOL
450U	2-CHLORONAPHTHALENE
2200U	2-NITROANILINE
450U	DIMETHYL PHTHALATE
450U	ACENAPHTHYLENE
450U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
2200U	3-NITROANILINE
450U	ACENAPHTHENE
2200U	2,4-DINITROPHENOL
2200U	4-NITROPHENOL
450U	DIBENZOFURAN
450U	2,4-DINITROTOLUENE
450U	DIETHYL PHTHALATE
450U	4-CHLOROPHENYL PHENYL ETHER
450U	FLUORENE
2200U	4-NITROANILINE
2200U	2-METHYL-4,6-DINITROPHENOL
450U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
450U	4-BROMOPHENYL PHENYL ETHER
450U	HEXACHLOROBENZENE (HCB)
2200U	PENTACHLOROPHENOL
450U	PHENANTHRENE
450U	ANTHRACENE
450U	DI-N-BUTYLPHTHALATE
450U	FLUORANTHENE
450U	PYRENE
450U	BENZYL BUTYL PHTHALATE
900U	3,3'-DICHLOROBENZIDINE
450U	BENZO(A)ANTHRACENE
450U	CHRYSENE
450U	BIS(2-ETHYLHEXYL) PHTHALATE
450U	DI-N-OCTYLPHTHALATE
450U	BENZO(B AND/OR K)FLUORANTHENE
450U	BENZO-A-PYRENE
450U	INDENO (1,2,3-CD) PYRENE
450U	DIBENZO(A,H)ANTHRACENE
450U	BENZO(GHI)PERYLENE
27	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.
*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47681 SAMPLE TYPE: PROG ELEM: NSF COLLECTED BY: W RILEY
SOURCE: CITY: JACKSONVIL ST: NC
STATION ID: SS-01 COLLECTION START: 06/11/90 1252 STOP: 00/00/00
CASE.NO.: 14283 SAS NO.: D. NO.: T650 MD NO: T650

ANALYTICAL RESULTS UG/KG

200JN	BENZENE ACETIC ACID
10000J	19 UNIDENTIFIED COMPOUNDS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*K-ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE GIVEN *L-ACTUAL VALUE IS KNOWN TO BE GREATER THAN VALUE GIVEN
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

PESTICIDES/PCB'S DATA REPORT 08/23/90

PROJECT NO. 90-529 SAMPLE NO. 47681 SAMPLE TYPE:
SOURCE:
STATION ID: SS-01
CASE NUMBER: 14283 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1252 STOP: 00/00/00
D NUMBER: T650

UG/KG	ANALYTICAL RESULTS
11U	ALPHA-BHC
11U	BETA-BHC
11U	DELTA-BHC
11U	GAMMA-BHC (LINDANE)
11U	HEPTACHLOR
11U	ALDRIN
11U	HEPTACHLOR EPOXIDE
11U	ENDOSULFAN I (ALPHA)
22U	DIELDRIN
22U	4,4'-DDE (P,P'-DDE)
22U	ENDRIN
22U	ENDOSULFAN II (BETA)
22U	4,4'-DDD (P,P'-DDD)
22U	ENDOSULFAN SULFATE
22U	4,4'-DDT (P,P'-DDT)

UG/KG	ANALYTICAL RESULTS
110U	METHOXYCHLOR
22U	ENDRIN KETONE
	CHLORDANE (TECH. MIXTURE) /1
110U	GAMMA-CHLORDANE /2
110U	ALPHA-CHLORDANE /2
220U	TOXAPHENE
110U	PCB-1016 (AROCLOR 1016)
110U	PCB-1221 (AROCLOR 1221)
110U	PCB-1232 (AROCLOR 1232)
110U	PCB-1242 (AROCLOR 1242)
110U	PCB-1248 (AROCLOR 1248)
220U	PCB-1254 (AROCLOR 1254)
220U	PCB-1260 (AROCLOR 1260)
27	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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*C-CONFIRMED BY GCMS 1. WHEN NO VALUE IS REPORTED, SEE CHLORDANE CONSTITUENTS.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47685 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SS-02

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1450 STOP: 00/00/00

CASE NO.: 14283 SAS NO.: D. NO.: T654

UG/KG	ANALYTICAL RESULTS
11U	CHLOROMETHANE
11U	BROMOMETHANE
11U	VINYL CHLORIDE
11U	CHLOROETHANE
20U	METHYLENE CHLORIDE
11U	ACETONE
6U	CARBON DISULFIDE
6U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
6U	1,1-DICHLOROETHANE
6U	1,2-DICHLOROETHENE (TOTAL)
6U	CHLOROFORM
6U	1,2-DICHLOROETHANE
11U	METHYL ETHYL KETONE
6U	1,1,1-TRICHLOROETHANE
6U	CARBON TETRACHLORIDE
11U	VINYL ACETATE
6U	BROMODICHLOROMETHANE

UG/KG	ANALYTICAL RESULTS
6U	1,2-DICHLOROPROPANE
6U	CIS-1,3-DICHLOROPROPENE
6U	TRICHLOROETHENE(TRICHLOROETHYLENE)
6U	DIBROMOCHLOROMETHANE
6U	1,1,2-TRICHLOROETHANE
6U	BENZENE
6U	TRANS-1,3-DICHLOROPROPENE
6U	BROMOFORM
11U	METHYL ISOBUTYL KETONE
11U	METHYL BUTYL KETONE
6U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
6U	1,1,2,2-TETRACHLOROETHANE
11	TOLUENE
6U	CHLOROBENZENE
6U	ETHYL BENZENE
6U	STYRENE
6U	TOTAL XYLENES
12	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*K-ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE GIVEN *L-ACTUAL VALUE IS KNOWN TO BE GREATER THAN VALUE GIVEN
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

MISCELLANEOUS PURGEABLE ORGANICS - DATA REPORT

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**   PROJECT NO. 90-529   SAMPLE NO. 47685  SAMPLE TYPE: SOIL        PROG ELEM: NSF   COLLECTED BY: W RILEY                 **
**   SOURCE: STANADYNE INC                                           CITY: JACKSONVIL             ST: NC                    **
**   STATION ID: SS-02                                               COLLECTION START: 06/11/90  1450   STOP: 00/00/00      **
**   CASE.NO.: 14283          SAS NO.:                               D. NO.: T654                 MD NO: T654               **
**                                                                                                                          **
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ANALYTICAL RESULTS UG/KG

5J 1-UNIDENTIFIED COMPOUND

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

EXTRACTABLE ORGANICS DATA REPORT 08/23/90

** PROJECT NO. 90-529 SAMPLE NO. 47685 SAMPLE TYPE: SOIL
** SOURCE: STANADYNE INC
** STATION ID: SS-02
**
** CASE NO.: 14283 SAS NO.:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1450 STOP: 00/00/00

D. NO.: T654

UG/KG	ANALYTICAL RESULTS
370U	PHENOL
370U	BIS(2-CHLOROETHYL) ETHER
370U	2-CHLOROPHENOL
370U	1,3-DICHLOROBENZENE
370U	1,4-DICHLOROBENZENE
370U	BENZYL ALCOHOL
370U	1,2-DICHLOROBENZENE
370U	2-METHYLPHENOL
370U	BIS(2-CHLOROISOPROPYL) ETHER
370U	(3-AND/OR 4-)METHYLPHENOL
370U	N-NITROSODI-N-PROPYLAMINE
370U	HEXACHLOROETHANE
370U	NITROBENZENE
370U	ISOPHORONE
370U	2-NITROPHENOL
370U	2,4-DIMETHYLPHENOL
1800U	BENZOIC ACID
370U	BIS(2-CHLOROETHOXY) METHANE
370U	2,4-DICHLOROPHENOL
370U	1,2,4-TRICHLOROBENZENE
370U	NAPHTHALENE
370U	4-CHLOROANILINE
370U	HEXACHLOROBUTADIENE
370U	4-CHLORO-3-METHYLPHENOL
370U	2-METHYLNAPHTHALENE
370U	HEXACHLOROCYCLOPENTADIENE (HCCP)
370U	2,4,6-TRICHLOROPHENOL
1800U	2,4,5-TRICHLOROPHENOL
370U	2-CHLORONAPHTHALENE
1800U	2-NITROANILINE
370U	DIMETHYL PHTHALATE
370U	ACENAPHTHYLENE
370U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
1800U	3-NITROANILINE
370U	ACENAPHTHENE
1800U	2,4-DINITROPHENOL
1800U	4-NITROPHENOL
370U	DIBENZOFURAN
370U	2,4-DINITROTOLUENE
370U	DIETHYL PHTHALATE
370U	4-CHLOROPHENYL PHENYL ETHER
370U	FLUORENE
1800U	4-NITROANILINE
1800U	2-METHYL-4,6-DINITROPHENOL
370U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
370U	4-BROMOPHENYL PHENYL ETHER
370U	HEXACHLOROBENZENE (HCB)
1800U	PENTACHLOROPHENOL
370U	PHENANTHRENE
370U	ANTHRACENE
370U	DI-N-BUTYLPHTHALATE
370U	FLUORANTHENE
370U	PYRENE
370U	BENZYL BUTYL PHTHALATE
750U	3,3'-DICHLOROBENZIDINE
370U	BENZO(A)ANTHRACENE
370U	CHRYSENE
370U	BIS(2-ETHYLHEXYL) PHTHALATE
370U	DI-N-OCTYLPHTHALATE
370U	BENZO(B AND/OR K)FLUORANTHENE
370U	BENZO-A-PYRENE
370U	INDENO (1,2,3-CD) PYRENE
370U	DIBENZO(A,H)ANTHRACENE
370U	BENZO(GHI)PERYLENE
12	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.
*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47685 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SS-02
CASE.NO.: 14283 SAS NO.:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1450 STOP: 00/00/00
D. NO.: T654 MD NO: T654

ANALYTICAL RESULTS UG/KG

200J 1-UNIDENTIFIED COMPOUND

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47685 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SS-02
CASE NUMBER: 14283 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1450 STOP: 00/00/00
D. NUMBER: T654

UG/KG	ANALYTICAL RESULTS
9.1U	ALPHA-BHC
9.1	BETA-BHC*
9.1U	DELTA-BHC
9.1U	GAMMA-BHC (LINDANE)
9.1U	HEPTACHLOR
9.1U	ALDRIN
9.1U	HEPTACHLOR EPOXIDE
9.1U	ENDOSULFAN I (ALPHA)
18U	DIELDRIN
18U	4,4'-DDE (P,P'-DDE)
18U	ENDRIN
18U	ENDOSULFAN II (BETA)
18U	4,4'-DDD (P,P'-DDD)
18U	ENDOSULFAN SULFATE
18U	4,4'-DDT (P,P'-DDT)

UG/KG	ANALYTICAL RESULTS
91U	METHOXYCHLOR
18U	ENDRIN KETONE
	CHLORDANE (TECH. MIXTURE) /1
91U	GAMMA-CHLORDANE /2
91U	ALPHA-CHLORDANE /2
180U	TOXAPHENE
91U	PCB-1016 (AROCLOR 1016)
91U	PCB-1221 (AROCLOR 1221)
91U	PCB-1232 (AROCLOR 1232)
91U	PCB-1242 (AROCLOR 1242)
91U	PCB-1248 (AROCLOR 1248)
180U	PCB-1254 (AROCLOR 1254)
180U	PCB-1260 (AROCLOR 1260)
12	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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*C-CONFIRMED BY GCMS 1. WHEN NO VALUE IS REPORTED, SEE CHLORDANE CONSTITUENTS.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47686 SAMPLE TYPE:
SOURCE:
STATION ID: SS-03

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1520 STOP: 00/00/00

CASE NO.: 14283 SAS NO.: D. NO.: T655

UG/KG	ANALYTICAL RESULTS
11U	CHLOROMETHANE
11U	BROMOMETHANE
11U	VINYL CHLORIDE
11U	CHLOROETHANE
10U	METHYLENE CHLORIDE
11U	ACETONE
5U	CARBON DISULFIDE
5U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
5U	1,1-DICHLOROETHANE
5U	1,2-DICHLOROETHENE (TOTAL)
5U	CHLOROFORM
5U	1,2-DICHLOROETHANE
11U	METHYL ETHYL KETONE
5U	1,1,1-TRICHLOROETHANE
5U	CARBON TETRACHLORIDE
11U	VINYL ACETATE
5U	BROMODICHLOROMETHANE

UG/KG	ANALYTICAL RESULTS
5U	1,2-DICHLOROPROPANE
5U	CIS-1,3-DICHLOROPROPENE
5U	TRICHLOROETHENE(TRICHLOROETHYLENE)
5U	DIBROMOCHLOROMETHANE
5U	1,1,2-TRICHLOROETHANE
5U	BENZENE
5U	TRANS-1,3-DICHLOROPROPENE
5U	BROMOFORM
11U	METHYL ISOBUTYL KETONE
11U	METHYL BUTYL KETONE
5U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
5U	1,1,2,2-TETRACHLOROETHANE
11	TOLUENE
5U	CHLOROBENZENE
5U	ETHYL BENZENE
5U	STYRENE
5U	TOTAL XYLENES
6	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.
*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

MISCELLANEOUS PURGEABLE ORGANICS - DATA REPORT

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**   PROJECT NO. 90-529    SAMPLE NO. 47686  SAMPLE TYPE:            PROG ELEM: NSF   COLLECTED BY: W RILEY                    **
**   SOURCE:                                                         CITY: JACKSONVIL                ST: NC                    **
**   STATION ID: SS-03                                               COLLECTION START: 06/11/90  1520   STOP: 00/00/00         **
**   CASE.NO.: 14283            SAS NO.:                             D. NO.: T655                MD NO: T655                   **
**                                                                                                                             **
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ANALYTICAL RESULTS UG/KG

6J 1-UNIDENTIFIED

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*K-ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE GIVEN *L-ACTUAL VALUE IS KNOWN TO BE GREATER THAN VALUE GIVEN
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

EXTRACTABLE ORGANICS DATA REPORT 08/23/90

PROJECT NO. 90-529 SAMPLE NO. 47686 SAMPLE TYPE:
SOURCE:
STATION ID: SS-03

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1520 STOP: 00/00/00

CASE NO.: 14283 SAS NO.: D. NO.: T655

UG/KG	ANALYTICAL RESULTS
350U	PHENOL
350U	BIS(2-CHLOROETHYL) ETHER
350U	2-CHLOROPHENOL
350U	1,3-DICHLOROBENZENE
350U	1,4-DICHLOROBENZENE
350U	BENZYL ALCOHOL
350U	1,2-DICHLOROBENZENE
350U	2-METHYLPHENOL
350U	BIS(2-CHLOROISOPROPYL) ETHER
350U	(3-AND/OR 4-)METHYLPHENOL
350U	N-NITROSODI-N-PROPYLAMINE
350U	HEXACHLOROETHANE
350U	NITROBENZENE
350U	ISOPHORONE
350U	2-NITROPHENOL
350U	2,4-DIMETHYLPHENOL
1700U	BENZOIC ACID
350U	BIS(2-CHLOROETHOXY) METHANE
350U	2,4-DICHLOROPHENOL
350U	1,2,4-TRICHLOROBENZENE
350U	NAPHTHALENE
350U	4-CHLOROANILINE
350U	HEXACHLOROBUTADIENE
350U	4-CHLORO-3-METHYLPHENOL
350U	2-METHYLNAPHTHALENE
350U	HEXACHLOROCYCLOPENTADIENE (HCCP)
350U	2,4,6-TRICHLOROPHENOL
1700U	2,4,5-TRICHLOROPHENOL
350U	2-CHLORONAPHTHALENE
1700U	2-NITROANILINE
350U	DIMETHYL PHTHALATE
350U	ACENAPHTHYLENE
350U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
1700U	3-NITROANILINE
350U	ACENAPHTHENE
1700U	2,4-DINITROPHENOL
1700U	4-NITROPHENOL
350U	DIBENZOFURAN
350U	2,4-DINITROTOLUENE
350U	DIETHYL PHTHALATE
350U	4-CHLOROPHENYL PHENYL ETHER
350U	FLUORENE
1700U	4-NITROANILINE
1700U	2-METHYL-4,6-DINITROPHENOL
350U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
350U	4-BROMOPHENYL PHENYL ETHER
350U	HEXACHLOROBENZENE (HCB)
1700U	PENTACHLOROPHENOL
350U	PHENANTHRENE
350U	ANTHRACENE
350U	DI-N-BUTYLPHTHALATE
350U	FLUORANTHENE
350U	PYRENE
350U	BENZYL BUTYL PHTHALATE
700U	3,3'-DICHLOROBENZIDINE
350U	BENZO(A)ANTHRACENE
350U	CHRYSENE
350U	BIS(2-ETHYLHEXYL) PHTHALATE
350U	DI-N-OCTYLPHTHALATE
350U	BENZO(B AND/OR K)FLUORANTHENE
350U	BENZO-A-PYRENE
350U	INDENO (1,2,3-CD) PYRENE
350U	DIBENZO(A,H)ANTHRACENE
350U	BENZO(GHI)PERYLENE
G	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.
*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

*** ***
** PROJECT NO. 90-529 SAMPLE NO. 47686 SAMPLE TYPE: PROG ELEM: NSF COLLECTED BY: W RILEY **
** SOURCE: CITY: JACKSONVIL ST: NC **
** STATION ID: SS-03 COLLECTION START: 06/11/90 1520 STOP: 00/00/00 **
** CASE.NO.: 14283 SAS NO.: D. NO.: T655 MD NO: T655 **
** **
*** ***

ANALYTICAL RESULTS UG/KG

800J 4-UNIDENTIFIED COMPOUNDS.

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

PESTICIDES/PCB'S DATA REPORT

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** PROJECT NO. 90-529    SAMPLE NO. 47686  SAMPLE TYPE:          PROG ELEM: NSF   COLLECTED BY: W RILEY          **
** SOURCE:                                                        CITY: JACKSONVIL          ST: NC              **
** STATION ID: SS-03                                              COLLECTION START: 06/11/90  1520   STOP: 00/00/00  **
** CASE NUMBER: 14283          SAS NUMBER:                         D. NUMBER: T655                              **
**
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UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
8.5U	ALPHA-BHC	85U	METHOXYCHLOR
8.0J	BETA-BHC*	17U	ENDRIN KETONE
8.5U	DELTA-BHC		CHLORDANE (TECH. MIXTURE) /1
8.5U	GAMMA-BHC (LINDANE)	85U	GAMMA-CHLORDANE /2
8.5U	HEPTACHLOR	85U	ALPHA-CHLORDANE /2
8.5U	ALDRIN	170U	TOXAPHENE
8.5U	HEPTACHLOR EPOXIDE	85U	PCB-1016 (AROCLOR 1016)
8.5U	ENDOSULFAN I (ALPHA)	85U	PCB-1221 (AROCLOR 1221)
17U	DIELDRIN	85U	PCB-1232 (AROCLOR 1232)
17U	4,4'-DDE (P,P'-DDE)	85U	PCB-1242 (AROCLOR 1242)
17U	ENDRIN	85U	PCB-1248 (AROCLOR 1248)
17U	ENDOSULFAN II (BETA)	170U	PCB-1254 (AROCLOR 1254)
17U	4,4'-DDD (P,P'-DDD)	170U	PCB-1260 (AROCLOR 1260)
17U	ENDOSULFAN SULFATE	6	PERCENT MOISTURE
17U	4,4'-DDT (P,P'-DDT)		

REMARKS

REMARKS

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47689 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SS-04

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1600 STOP: 00/00/00

CASE NO.: 14283 SAS NO.: D. NO.: T674

UG/KG	ANALYTICAL RESULTS
11U	CHLOROMETHANE
11U	BROMOMETHANE
11U	VINYL CHLORIDE
11U	CHLOROETHANE
7U	METHYLENE CHLORIDE
11U	ACETONE
6U	CARBON DISULFIDE
6U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
6U	1,1-DICHLOROETHANE
6U	1,2-DICHLOROETHENE (TOTAL)
6U	CHLOROFORM
6U	1,2-DICHLOROETHANE
11U	METHYL ETHYL KETONE
6U	1,1,1-TRICHLOROETHANE
6U	CARBON TETRACHLORIDE
11U	VINYL ACETATE
6U	BROMODICHLOROMETHANE

UG/KG	ANALYTICAL RESULTS
6U	1,2-DICHLOROPROPANE
6U	CIS-1,3-DICHLOROPROPENE
6U	TRICHLOROETHENE(TRICHLOROETHYLENE)
6U	DIBROMOCHLOROMETHANE
6U	1,1,2-TRICHLOROETHANE
6U	BENZENE
6U	TRANS-1,3-DICHLOROPROPENE
6U	BROMOFORM
11U	METHYL ISOBUTYL KETONE
11U	METHYL BUTYL KETONE
6U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
6U	1,1,2,2-TETRACHLOROETHANE
6U	TOLUENE
6U	CHLOROBENZENE
6U	ETHYL BENZENE
6U	STYRENE
6U	TOTAL XYLENES
12	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

EXTRACTABLE ORGANICS DATA REPORT 08/23/90

** PROJECT NO. 90-529 SAMPLE NO. 47689 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: W RILEY **
** SOURCE: STANADYNE INC CITY: JACKSONVIL ST: NC **
** STATION ID: SS-04 COLLECTION START: 06/11/90 1600 STOP: 00/00/00 **
**
** CASE NO.: 14283 SAS NO.: D. NO.: T674 **

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
370U	PHENOL	1800U	3-NITROANILINE
370U	BIS(2-CHLOROETHYL) ETHER	370U	ACENAPHTHENE
370U	2-CHLOROPHENOL	1800U	2,4-DINITROPHENOL
370U	1,3-DICHLOROBENZENE	1800U	4-NITROPHENOL
370U	1,4-DICHLOROBENZENE	370U	DIBENZOFURAN
370U	BENZYL ALCOHOL	370U	2,4-DINITROTOLUENE
370U	1,2-DICHLOROBENZENE	370U	DIETHYL PHTHALATE
370U	2-METHYLPHENOL	370U	4-CHLOROPHENYL PHENYL ETHER
370U	BIS(2-CHLOROISOPROPYL) ETHER	370U	FLUORENE
370U	(3-AND/OR 4-)METHYLPHENOL	1800U	4-NITROANILINE
370U	N-NITROSODI-N-PROPYLAMINE	1800U	2-METHYL-4,6-DINITROPHENOL
370U	HEXACHLOROETHANE	370U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
370U	NITROBENZENE	370U	4-BROMOPHENYL PHENYL ETHER
370U	ISOPHORONE	370U	HEXACHLOROBENZENE (HCB)
370U	2-NITROPHENOL	1800U	PENTACHLOROPHENOL
370U	2,4-DIMETHYLPHENOL	370U	PHENANTHRENE
1800U	BENZOIC ACID	370U	ANTHRACENE
370U	BIS(2-CHLOROETHOXY) METHANE	370U	DI-N-BUTYLPHTHALATE
370U	2,4-DICHLOROPHENOL	370U	FLUORANTHENE
370U	1,2,4-TRICHLOROBENZENE	370U	PYRENE
370U	NAPHTHALENE	370U	BENZYL BUTYL PHTHALATE
370U	4-CHLOROANILINE	750U	3,3'-DICHLOROBENZIDINE
370U	HEXACHLOROBUTADIENE	370U	BENZO(A)ANTHRACENE
370U	4-CHLORO-3-METHYLPHENOL	370U	CHRYSENE
370U	2-METHYLNAPHTHALENE	370U	BIS(2-ETHYLHEXYL) PHTHALATE
370U	HEXACHLOROCYCLOPENTADIENE (HCCP)	370U	DI-N-OCTYLPHTHALATE
370U	2,4,6-TRICHLOROPHENOL	370U	BENZO(B AND/OR K)FLUORANTHENE
1800U	2,4,5-TRICHLOROPHENOL	370U	BENZO-A-PYRENE
370U	2-CHLORONAPHTHALENE	370U	INDENO (1,2,3-CD) PYRENE
1800U	2-NITROANILINE	370U	DIBENZO(A,H)ANTHRACENE
370U	DIMETHYL PHTHALATE	370U	BENZO(GHI)PERYLENE
370U	ACENAPHTHYLENE	12	PERCENT MOISTURE
370U	2,6-DINITROTOLUENE		

REMARKS ***REMARKS***

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

PESTICIDES/PCB'S DATA REPORT 08/23/90

PROJECT NO. 90-529 SAMPLE NO. 47689 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SS-04
CASE NUMBER: 14283 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1600 STOP: 00/00/00
D NUMBER: T674

UG/KG	ANALYTICAL RESULTS
9.1U	ALPHA-BHC
9.1U	BETA-BHC
9.1U	DELTA-BHC
9.1U	GAMMA-BHC (LINDANE)
9.1U	HEPTACHLOR
9.1U	ALDRIN
9.1U	HEPTACHLOR EPOXIDE
9.1U	ENDOSULFAN I (ALPHA)
18U	DIELDRIN
18U	4,4'-DDE (P,P'-DDE)
18U	ENDRIN
18U	ENDOSULFAN II (BETA)
18U	4,4'-DDD (P,P'-DDD)
18U	ENDOSULFAN SULFATE
18U	4,4'-DDT (P,P'-DDT)

UG/KG	ANALYTICAL RESULTS
91U	METHOXYCHLOR
18U	ENDRIN KETONE
	CHLORDANE (TECH. MIXTURE) /1
91U	GAMMA-CHLORDANE /2
91U	ALPHA-CHLORDANE /2
180U	TOXAPHENE
91U	PCB-1016 (AROCLOR 1016)
91U	PCB-1221 (AROCLOR 1221)
91U	PCB-1232 (AROCLOR 1232)
91U	PCB-1242 (AROCLOR 1242)
91U	PCB-1248 (AROCLOR 1248)
180U	PCB-1254 (AROCLOR 1254)
180U	PCB-1260 (AROCLOR 1260)
12	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47683 SAMPLE TYPE:
SOURCE:
STATION ID: SS-05

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1410 STOP: 00/00/00

CASE NO.: 14283 SAS NO.: D. NO.: T652

UG/KG	ANALYTICAL RESULTS
12U	CHLOROMETHANE
12U	BROMOMETHANE
12U	VINYL CHLORIDE
12U	CHLOROETHANE
7U	METHYLENE CHLORIDE
12U	ACETONE
6U	CARBON DISULFIDE
6U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
6U	1,1-DICHLOROETHANE
6U	1,2-DICHLOROETHENE (TOTAL)
6U	CHLOROFORM
6U	1,2-DICHLOROETHANE
12U	METHYL ETHYL KETONE
6U	1,1,1-TRICHLOROETHANE
6U	CARBON TETRACHLORIDE
12U	VINYL ACETATE
6U	BROMODICHLOROMETHANE

UG/KG	ANALYTICAL RESULTS
6U	1,2-DICHLOROPROPANE
6U	CIS-1,3-DICHLOROPROPENE
6U	TRICHLOROETHENE(TRICHLOROETHYLENE)
6U	DIBROMOCHLOROMETHANE
6U	1,1,2-TRICHLOROETHANE
6U	BENZENE
6U	TRANS-1,3-DICHLOROPROPENE
6U	BROMOFORM
12U	METHYL ISOBUTYL KETONE
12U	METHYL BUTYL KETONE
6U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
6U	1,1,2,2-TETRACHLOROETHANE
4J	TOLUENE
6U	CHLOROBENZENE
6U	ETHYL BENZENE
6U	STYRENE
6U	TOTAL XYLENES
17	PERCENT MOISTURE

REMARKS

REMARKS

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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

EXTRACTABLE ORGANICS DATA REPORT 08/23/90

PROJECT NO. 90-529 SAMPLE NO. 47683 SAMPLE TYPE:
SOURCE:
STATION ID: SS-05

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1410 STOP: 00/00/00

CASE NO.: 14283 SAS NO.: D. NO.: T652

UG/KG	ANALYTICAL RESULTS
350U	PHENOL
350U	BIS(2-CHLOROETHYL) ETHER
350U	2-CHLOROPHENOL
350U	1,3-DICHLOROBENZENE
350U	1,4-DICHLOROBENZENE
350U	BENZYL ALCOHOL
350U	1,2-DICHLOROBENZENE
350U	2-METHYLPHENOL
350U	BIS(2-CHLOROISOPROPYL) ETHER
350U	(3-AND/OR 4-)METHYLPHENOL
350U	N-NITROSODI-N-PROPYLAMINE
350U	HEXACHLOROETHANE
350U	NITROBENZENE
350U	ISOPHORONE
350U	2-NITROPHENOL
350U	2,4-DIMETHYLPHENOL
1700U	BENZOIC ACID
350U	BIS(2-CHLOROETHOXY) METHANE
350U	2,4-DICHLOROPHENOL
350U	1,2,4-TRICHLOROBENZENE
350U	NAPHTHALENE
350U	4-CHLOROANILINE
350U	HEXACHLOROBUTADIENE
350U	4-CHLORO-3-METHYLPHENOL
350U	2-METHYLNAPHTHALENE
350U	HEXACHLOROCYCLOPENTADIENE (HCCP)
350U	2,4,6-TRICHLOROPHENOL
1700U	2,4,5-TRICHLOROPHENOL
350U	2-CHLORONAPHTHALENE
1700U	2-NITROANILINE
350U	DIMETHYL PHTHALATE
350U	ACENAPHTHYLENE
350U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
1700U	3-NITROANILINE
350U	ACENAPHTHENE
1700U	2,4-DINITROPHENOL
1700U	4-NITROPHENOL
350U	DIBENZOFURAN
350U	2,4-DINITROTOLUENE
350U	DIETHYL PHTHALATE
350U	4-CHLOROPHENYL PHENYL ETHER
350U	FLUORENE
1700U	4-NITROANILINE
1700U	2-METHYL-4,6-DINITROPHENOL
350U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
350U	4-BROMOPHENYL PHENYL ETHER
350U	HEXACHLOROBENZENE (HCB)
1700U	PENTACHLOROPHENOL
350U	PHENANTHRENE
350U	ANTHRACENE
350U	DI-N-BUTYLPHTHALATE
350U	FLUORANTHENE
350U	PYRENE
350U	BENZYL BUTYL PHTHALATE
690U	3,3'-DICHLOROBENZIDINE
350U	BENZO(A)ANTHRACENE
350U	CHRYSENE
350U	BIS(2-ETHYLHEXYL) PHTHALATE
350U	DI-N-OCTYLPHTHALATE
350U	BENZO(B AND/OR K)FLUORANTHENE
350U	BENZO-A-PYRENE
350U	INDENO (1,2,3-CD) PYRENE
350U	DIBENZO(A,H)ANTHRACENE
350U	BENZO(GHI)PERYLENE
5	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

*** ***
** PROJECT NO. 90-529 SAMPLE NO. 47683 SAMPLE TYPE: PROG ELEM: NSF COLLECTED BY: W RILEY **
** SOURCE: CITY: JACKSONVIL ST: NC **
** STATION ID: SS-05 COLLECTION START: 06/11/90 1410 STOP: 00/00/00 **
** CASE.NO.: 14283 SAS NO.: D. NO.: T652 MD NO: T652 **
** **
*** ***

ANALYTICAL RESULTS UG/KG

700J 1-UNIDENTIFIED COMPOUND.

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

PESTICIDES/PCB'S DATA REPORT 08/23/90

PROJECT NO. 90-529 SAMPLE NO. 47683 SAMPLE TYPE:
SOURCE:
STATION ID: SS-05
CASE NUMBER: 14283 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1410 STOP: 00/00/00
D. NUMBER: T652

UG/KG	ANALYTICAL RESULTS
8.4U	ALPHA-BHC
8.4U	BETA-BHC
8.4U	DELTA-BHC
8.4U	GAMMA-BHC (LINDANE)
8.4U	HEPTACHLOR
8.4U	ALDRIN
8.4U	HEPTACHLOR EPOXIDE
8.4U	ENDOSULFAN I (ALPHA)
17U	DIELDRIN
17U	4,4'-DDE (P,P'-DDE)
17U	ENDRIN
17U	ENDOSULFAN II (BETA)
17U	4,4'-DDD (P,P'-DDD)
17U	ENDOSULFAN SULFATE
17U	4,4'-DDT (P,P'-DDT)

UG/KG	ANALYTICAL RESULTS
84U	METHOXYCHLOR
17U	ENDRIN KETONE
	CHLORDANE (TECH. MIXTURE) /1
84U	GAMMA-CHLORDANE /2
84U	ALPHA-CHLORDANE /2
170U	TOXAPHENE
84U	PCB-1016 (AROCLOR 1016)
84U	PCB-1221 (AROCLOR 1221)
84U	PCB-1232 (AROCLOR 1232)
84U	PCB-1242 (AROCLOR 1242)
84U	PCB-1248 (AROCLOR 1248)
170U	PCB-1254 (AROCLOR 1254)
170U	PCB-1260 (AROCLOR 1260)
5	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.
*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.
*C-CONFIRMED BY GCMS 1. WHEN NO VALUE IS REPORTED, SEE CHLORDANE CONSTITUENTS.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47682 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SB-01

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1305 STOP: 00/00/00

CASE NO.: 14283 SAS NO.: D. NO.: T651

UG/KG	ANALYTICAL RESULTS
12U	CHLOROMETHANE
12U	BROMOMETHANE
12U	VINYL CHLORIDE
12U	CHLOROETHANE
10U	METHYLENE CHLORIDE
30U	ACETONE
9	CARBON DISULFIDE
6U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
6U	1,1-DICHLOROETHANE
6U	1,2-DICHLOROETHENE (TOTAL)
6U	CHLOROFORM
6U	1,2-DICHLOROETHANE
12U	METHYL ETHYL KETONE
6U	1,1,1-TRICHLOROETHANE
6U	CARBON TETRACHLORIDE
12U	VINYL ACETATE
6U	BROMODICHLOROMETHANE

UG/KG	ANALYTICAL RESULTS
6U	1,2-DICHLOROPROPANE
6U	CIS-1,3-DICHLOROPROPENE
6U	TRICHLOROETHENE(TRICHLOROETHYLENE)
6U	DIBROMOCHLOROMETHANE
6U	1,1,2-TRICHLOROETHANE
6U	BENZENE
6U	TRANS-1,3-DICHLOROPROPENE
6U	BROMOFORM
12U	METHYL ISOBUTYL KETONE
12U	METHYL BUTYL KETONE
6U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
6U	1,1,2,2-TETRACHLOROETHANE
4J	TOLUENE
6U	CHLOROBENZENE
6U	ETHYL BENZENE
6U	STYRENE
6U	TOTAL XYLENES
17	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

EXTRACTABLE ORGANICS DATA REPORT 08/23/90

** PROJECT NO. 90-529 SAMPLE NO. 47682 SAMPLE TYPE: SOIL
** SOURCE: STANADYNE INC
** STATION ID: SB-01
**
** CASE NO.: 14283 SAS NO.:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1305 STOP: 00/00/00

D. NO.: T651

UG/KG	ANALYTICAL RESULTS
400U	PHENOL
400U	BIS(2-CHLOROETHYL) ETHER
400U	2-CHLOROPHENOL
400U	1,3-DICHLOROBENZENE
400U	1,4-DICHLOROBENZENE
400U	BENZYL ALCOHOL
400U	1,2-DICHLOROBENZENE
400U	2-METHYLPHENOL
400U	BIS(2-CHLOROISOPROPYL) ETHER
400U	(3-AND/OR 4-)METHYLPHENOL
400U	N-NITROSODI-N-PROPYLAMINE
400U	HEXACHLOROETHANE
400U	NITROBENZENE
400U	ISOPHORONE
400U	2-NITROPHENOL
400U	2,4-DIMETHYLPHENOL
1900U	BENZOIC ACID
400U	BIS(2-CHLOROETHOXY) METHANE
400U	2,4-DICHLOROPHENOL
400U	1,2,4-TRICHLOROBENZENE
400U	NAPHTHALENE
400U	4-CHLOROANILINE
400U	HEXACHLOROBUTADIENE
MQL 400U	4-CHLORO-3-METHYLPHENOL
400U	2-METHYLNAPHTHALENE
400U	HEXACHLOROCYCLOPENTADIENE (HCCP)
400U	2,4,6-TRICHLOROPHENOL
1900U	2,4,5-TRICHLOROPHENOL
400U	2-CHLORONAPHTHALENE
1900U	2-NITROANILINE
400U	DIMETHYL PHTHALATE
400U	ACENAPHTHYLENE
400U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
1900U	3-NITROANILINE
400U	ACENAPHTHENE
1900U	2,4-DINITROPHENOL
1900U	4-NITROPHENOL
400U	DIBENZOFURAN
400U	2,4-DINITROTOLUENE
400U	DIETHYL PHTHALATE
400U	4-CHLOROPHENYL PHENYL ETHER
MQL 400U	FLUORENE
1900U	4-NITROANILINE
1900U	2-METHYL-4,6-DINITROPHENOL
400U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
400U	4-BROMOPHENYL PHENYL ETHER
400U	HEXACHLOROBENZENE (HCB)
1900U	PENTACHLOROPHENOL
MQL 400U	PHENANTHRENE
400U	ANTHRACENE
400U	DI-N-BUTYLPHTHALATE
400U	FLUORANTHENE
400U	PYRENE
400U	BENZYL BUTYL PHTHALATE
800U	3,3'-DICHLOROBENZIDINE
400U	BENZO(A)ANTHRACENE
400U	CHRYSENE
400U	BIS(2-ETHYLHEXYL) PHTHALATE
400U	DI-N-OCTYLPHTHALATE
400U	BENZO(B AND/OR K)FLUORANTHENE
400U	BENZO-A-PYRENE
400U	INDENO (1,2,3-CD) PYRENE
400U	DIBENZO(A,H)ANTHRACENE
400U	BENZO(GHI)PERYLENE
17	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47682 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SB-01
CASE.NO.: 14283 SAS NO.:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1305 STOP: 00/00/00
D. NO.: T651 MD NO: T651

ANALYTICAL RESULTS UG/KG

200J 1-UNIDENTIFIED COMPOUND *

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

PESTICIDES/PCB'S DATA REPORT 08/23/90

PROJECT NO. 90-529 SAMPLE NO. 47682 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SB-01
CASE NUMBER: 14283 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1305 STOP: 00/00/00
D NUMBER: T651

UG/KG	ANALYTICAL RESULTS
9.6U	ALPHA-BHC
9.5J	BETA-BHC
9.6U	DELTA-BHC
9.6U	GAMMA-BHC (LINDANE)
9.6U	HEPTACHLOR
9.6U	ALDRIN
9.6U	HEPTACHLOR EPOXIDE
9.6U	ENDOSULFAN I (ALPHA)
19U	DIELDRIN
19U	4,4'-DDE (P,P'-DDE)
19U	ENDRIN
19U	ENDOSULFAN II (BETA)
19U	4,4'-DDD (P,P'-DDD)
19U	ENDOSULFAN SULFATE
19U	4,4'-DDT (P,P'-DDT)

UG/KG	ANALYTICAL RESULTS
96U	METHOXYCHLOR
19U	ENDRIN KETONE
	CHLORDANE (TECH. MIXTURE) /1
96U	GAMMA-CHLORDANE /2
96U	ALPHA-CHLORDANE /2
190U	TOXAPHENE
96U	PCB-1016 (AROCLOR 1016)
96U	PCB-1221 (AROCLOR 1221)
96U	PCB-1232 (AROCLOR 1232)
96U	PCB-1242 (AROCLOR 1242)
96U	PCB-1248 (AROCLOR 1248)
190U	PCB-1254 (AROCLOR 1254)
190U	PCB-1260 (AROCLOR 1260)
17	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

PURGEABLE ORGANICS DATA REPORT 08/23/90

PROJECT NO. 90-529 SAMPLE NO. 47687 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SB-02

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1500 STOP: 00/00/00

CASE NO.: 14283 SAS NO.: D. NO.: T672

UG/KG	ANALYTICAL RESULTS
12U	CHLOROMETHANE
12U	BROMOMETHANE
12U	VINYL CHLORIDE
12U	CHLOROETHANE
6U	METHYLENE CHLORIDE
20U	ACETONE
6U	CARBON DISULFIDE
6U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
6U	1,1-DICHLOROETHANE
6U	1,2-DICHLOROETHENE (TOTAL)
6U	CHLOROFORM
6U	1,2-DICHLOROETHANE
12U	METHYL ETHYL KETONE
6U	1,1,1-TRICHLOROETHANE
6U	CARBON TETRACHLORIDE
12U	VINYL ACETATE
6U	BROMODICHLOROMETHANE

UG/KG	ANALYTICAL RESULTS
6U	1,2-DICHLOROPROPANE
6U	CIS-1,3-DICHLOROPROPENE
6U	TRICHLOROETHENE(TRICHLOROETHYLENE)
6U	DIBROMOCHLOROMETHANE
6U	1,1,2-TRICHLOROETHANE
6U	BENZENE
6U	TRANS-1,3-DICHLOROPROPENE
6U	BROMOFORM
12U	METHYL ISOBUTYL KETONE
12U	METHYL BUTYL KETONE
6U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
6U	1,1,2,2-TETRACHLOROETHANE
6U	TOLUENE
6U	CHLOROBENZENE
6U	ETHYL BENZENE
6U	STYRENE
6U	TOTAL XYLENES
19	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

MISCELLANEOUS PURGEABLE ORGANICS - DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47687 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SB-02
CASE.NO.: 14283 SAS NO.:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1500 STOP: 00/00/00
D. NO.: T672 MD NO: T672

ANALYTICAL RESULTS UG/KG

40J 3-UNIDENTIFIED COMPOUNDS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47687 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SB-02

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1500 STOP: 00/00/00

CASE NO.: 14283 SAS NO.: D. NO.: T672

UG/KG	ANALYTICAL RESULTS
1600U	PHENOL
1600U	BIS(2-CHLOROETHYL) ETHER
1600U	2-CHLOROPHENOL
1600U	1,3-DICHLOROBENZENE
1600U	1,4-DICHLOROBENZENE
1600U	BENZYL ALCOHOL
1600U	1,2-DICHLOROBENZENE
1600U	2-METHYLPHENOL
1600U	BIS(2-CHLOROISOPROPYL) ETHER
1600U	(3-AND/OR 4-)METHYLPHENOL
1600U	N-NITROSODI-N-PROPYLAMINE
1600U	HEXACHLOROETHANE
1600U	NITROBENZENE
1600U	ISOPHORONE
1600U	2-NITROPHENOL
1600U	2,4-DIMETHYLPHENOL
7900U	BENZOIC ACID
1600U	BIS(2-CHLOROETHOXY) METHANE
1600U	2,4-DICHLOROPHENOL
1600U	1,2,4-TRICHLOROBENZENE
1600U	NAPHTHALENE
1600U	4-CHLOROANILINE
1600U	HEXACHLOROBUTADIENE
1600U	4-CHLORO-3-METHYLPHENOL
1600J	2-METHYLNAPHTHALENE
1600U	HEXACHLOROCYCLOPENTADIENE (HCCP)
1600U	2,4,6-TRICHLOROPHENOL
7900U	2,4,5-TRICHLOROPHENOL
1600U	2-CHLORONAPHTHALENE
7900U	2-NITROANILINE
1600U	DIMETHYL PHTHALATE
1600U	ACENAPHTHYLENE
1600U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
7900U	3-NITROANILINE
1600U	ACENAPHTHENE
7900U	2,4-DINITROPHENOL
7900U	4-NITROPHENOL
1600U	DIBENZOFURAN
1600U	2,4-DINITROTOLUENE
1600U	DIETHYL PHTHALATE
1600U	4-CHLOROPHENYL PHENYL ETHER
570J	FLUORENE
7900U	4-NITROANILINE
7900U	2-METHYL-4,6-DINITROPHENOL
1600U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
1600U	4-BROMOPHENYL PHENYL ETHER
1600U	HEXACHLOROBENZENE (HCB)
7900U	PENTACHLOROPHENOL
920J	PHENANTHRENE
1600U	ANTHRACENE
1600U	DI-N-BUTYLPHTHALATE
1600U	FLUORANTHENE
1600U	PYRENE
1600U	BENZYL BUTYL PHTHALATE
3300U	3,3'-DICHLOROBENZIDINE
1600U	BENZO(A)ANTHRACENE
1600U	CHRYSENE
1600U	BIS(2-ETHYLHEXYL) PHTHALATE
1600U	DI-N-OCTYLPHTHALATE
1600U	BENZO(B AND/OR K)FLUORANTHENE
1600U	BENZO-A-PYRENE
1600U	INDENO (1,2,3-CD) PYRENE
1600U	DIBENZO(A,H)ANTHRACENE
1600U	BENZO(GHI)PERYLENE
19	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
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*K-ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE GIVEN *L-ACTUAL VALUE IS KNOWN TO BE GREATER THAN VALUE GIVEN
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47687 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SB-02
CASE.NO.: 14283 SAS NO.:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1500 STOP: 00/00/00
D. NO.: T672 MD NO: T672

ANALYTICAL RESULTS UG/KG

*N PETROLEUM PRODUCT
300000J ~20 UNIDENTIFIED COMPOUNDS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

PESTICIDES/PCB'S DATA REPORT 08/23/90

PROJECT NO. 90-529 SAMPLE NO. 47687 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SB-02
CASE NUMBER: 14283 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1500 STOP: 00/00/00
D. NUMBER: T672

UG/KG	ANALYTICAL RESULTS
9.9U	ALPHA-BHC
11U	BETA-BHC
9.9U	DELTA-BHC
9.9U	GAMMA-BHC (LINDANE)
9.9U	HEPTACHLOR
9.9U	ALDRIN
9.9U	HEPTACHLOR EPOXIDE
9.9U	ENDOSULFAN I (ALPHA)
20U	DIELDRIN
20U	4,4'-DDE (P,P'-DDE)
20U	ENDRIN
20U	ENDOSULFAN II (BETA)
20U	4,4'-DDD (P,P'-DDD)
20U	ENDOSULFAN SULFATE
20U	4,4'-DDT (P,P'-DDT)

UG/KG	ANALYTICAL RESULTS
99U	METHOXYCHLOR
20U	ENDRIN KETONE
	CHLORDANE (TECH. MIXTURE) /1
99U	GAMMA-CHLORDANE /2
99U	ALPHA-CHLORDANE /2
200U	TOXAPHENE
99U	PCB-1016 (AROCLOR 1016)
99U	PCB-1221 (AROCLOR 1221)
99U	PCB-1232 (AROCLOR 1232)
99U	PCB-1242 (AROCLOR 1242)
99U	PCB-1248 (AROCLOR 1248)
200U	PCB-1254 (AROCLOR 1254)
200U	PCB-1260 (AROCLOR 1260)
19	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*K-ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE GIVEN *L-ACTUAL VALUE IS KNOWN TO BE GREATER THAN VALUE GIVEN
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*C-CONFIRMED BY GCMS 1. WHEN NO VALUE IS REPORTED, SEE CHLORDANE CONSTITUENTS.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47688 SAMPLE TYPE:
SOURCE:
STATION ID: SB-03

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1530 STOP: 00/00/00

CASE NO.: 14283 SAS NO.: D. NO.: T673

UG/KG	ANALYTICAL RESULTS
13U	CHLOROMETHANE
13U	BROMOMETHANE
13U	VINYL CHLORIDE
13U	CHLOROETHANE
6U	METHYLENE CHLORIDE
13U	ACETONE
6U	CARBON DISULFIDE
6U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
6U	1,1-DICHLOROETHANE
6U	1,2-DICHLOROETHENE (TOTAL)
6U	CHLOROFORM
6U	1,2-DICHLOROETHANE
13U	METHYL ETHYL KETONE
6U	1,1,1-TRICHLOROETHANE
6U	CARBON TETRACHLORIDE
13U	VINYL ACETATE
6U	BROMODICHLOROMETHANE

UG/KG	ANALYTICAL RESULTS
6U	1,2-DICHLOROPROPANE
6U	CIS-1,3-DICHLOROPROPENE
6U	TRICHLOROETHENE(TRICHLOROETHYLENE)
6U	DIBROMOCHLOROMETHANE
6U	1,1,2-TRICHLOROETHANE
6U	BENZENE
6U	TRANS-1,3-DICHLOROPROPENE
6U	BROMOFORM
13U	METHYL ISOBUTYL KETONE
13U	METHYL BUTYL KETONE
6U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
6U	1,1,2,2-TETRACHLOROETHANE
6U	TOLUENE
6U	CHLOROBENZENE
6U	ETHYL BENZENE
6U	STYRENE
6U	TOTAL XYLENES
22	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.
*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

EXTRACTABLE ORGANICS DATA REPORT 08/23/90

** PROJECT NO. 90-529 SAMPLE NO. 47688 SAMPLE TYPE: PROG ELEM: NSF COLLECTED BY: W RILEY
** SOURCE: CITY: JACKSONVIL ST: NC
** STATION ID: SB-03 COLLECTION START: 06/11/90 1530 STOP: 00/00/00
**
** CASE NO.: 14283 SAS NO.: D. NO.: T673

UG/KG	ANALYTICAL RESULTS
420U	PHENOL
420U	BIS(2-CHLOROETHYL) ETHER
420U	2-CHLOROPHENOL
420U	1,3-DICHLOROBENZENE
420U	1,4-DICHLOROBENZENE
420U	BENZYL ALCOHOL
420U	1,2-DICHLOROBENZENE
420U	2-METHYLPHENOL
420U	BIS(2-CHLOROISOPROPYL) ETHER
420U	(3-AND/OR 4-)METHYLPHENOL
420U	N-NITROSODI-N-PROPYLAMINE
420U	HEXACHLOROETHANE
420U	NITROBENZENE
420U	ISOPHORONE
420U	2-NITROPHENOL
420U	2,4-DIMETHYLPHENOL
2100U	BENZOIC ACID
420U	BIS(2-CHLOROETHOXY) METHANE
420U	2,4-DICHLOROPHENOL
420U	1,2,4-TRICHLOROBENZENE
420U	NAPHTHALENE
420U	4-CHLOROANILINE
420U	HEXACHLOROBUTADIENE
420U	4-CHLORO-3-METHYLPHENOL
420U	2-METHYLNAPHTHALENE
420U	HEXACHLOROCYCLOPENTADIENE (HCCP)
420U	2,4,6-TRICHLOROPHENOL
2100U	2,4,5-TRICHLOROPHENOL
420U	2-CHLORONAPHTHALENE
2100U	2-NITROANILINE
420U	DIMETHYL PHTHALATE
420U	ACENAPHTHYLENE
420U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
2100U	3-NITROANILINE
420U	ACENAPHTHENE
2100U	2,4-DINITROPHENOL
2100U	4-NITROPHENOL
420U	DIBENZOFURAN
420U	2,4-DINITROTOLUENE
420U	DIETHYL PHTHALATE
420U	4-CHLOROPHENYL PHENYL ETHER
420U	FLUORENE
2100U	4-NITROANILINE
2100U	2-METHYL-4,6-DINITROPHENOL
420U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
420U	4-BROMOPHENYL PHENYL ETHER
420U	HEXACHLOROBENZENE (HCB)
2100U	PENTACHLOROPHENOL
420U	PHENANTHRENE
420U	ANTHRACENE
420U	DI-N-BUTYLPHTHALATE
420U	FLUORANTHENE
420U	PYRENE
420U	BENZYL BUTYL PHTHALATE
850U	3,3'-DICHLOROBENZIDINE
420U	BENZO(A)ANTHRACENE
420U	CHRYSENE
420U	BIS(2-ETHYLHEXYL) PHTHALATE
420U	DI-N-OCTYLPHTHALATE
420U	BENZO(B AND/OR K)FLUORANTHENE
420U	BENZO-A-PYRENE
420U	INDENO (1,2,3-CD) PYRENE
420U	DIBENZO(A,H)ANTHRACENE
420U	BENZO(GHI)PERYLENE
22	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*K-ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE GIVEN *L-ACTUAL VALUE IS KNOWN TO BE GREATER THAN VALUE GIVEN
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47688 SAMPLE TYPE:
SOURCE:
STATION ID: SB-03
CASE NUMBER: 14283 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1530 STOP: 00/00/00
D NUMBER: T673

UG/KG	ANALYTICAL RESULTS
10U	ALPHA-BHC
10U	BETA-BHC
10U	DELTA-BHC
10U	GAMMA-BHC (LINDANE)
10U	HEPTACHLOR
10U	ALDRIN
10U	HEPTACHLOR EPOXIDE
10U	ENDOSULFAN I (ALPHA)
21U	DIELDRIN
21U	4,4'-DDE (P,P'-DDE)
21U	ENDRIN
21U	ENDOSULFAN II (BETA)
21U	4,4'-DDD (P,P'-DDD)
21U	ENDOSULFAN SULFATE
21U	4,4'-DDT (P,P'-DDT)

UG/KG	ANALYTICAL RESULTS
100U	METHOXYCHLOR
21U	ENDRIN KETONE
	CHLORDANE (TECH. MIXTURE) /1
100U	GAMMA-CHLORDANE /2
100U	ALPHA-CHLORDANE /2
210U	TOXAPHENE
100U	PCB-1016 (AROCLOR 1016)
100U	PCB-1221 (AROCLOR 1221)
100U	PCB-1232 (AROCLOR 1232)
100U	PCB-1242 (AROCLOR 1242)
100U	PCB-1248 (AROCLOR 1248)
210U	PCB-1254 (AROCLOR 1254)
210U	PCB-1260 (AROCLOR 1260)
22	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47690 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SB-04

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1605 STOP: 00/00/00

CASE NO.: 14283 SAS NO.: D. NO.: T675

UG/KG	ANALYTICAL RESULTS
13U	CHLOROMETHANE
13U	BROMOMETHANE
13U	VINYL CHLORIDE
13U	CHLOROETHANE
7U	METHYLENE CHLORIDE
20U	ACETONE
7U	CARBON DISULFIDE
7U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
7U	1,1-DICHLOROETHANE
7U	1,2-DICHLOROETHENE (TOTAL)
7U	CHLOROFORM
7U	1,2-DICHLOROETHANE
13U	METHYL ETHYL KETONE
7U	1,1,1-TRICHLOROETHANE
7U	CARBON TETRACHLORIDE
13U	VINYL ACETATE
7U	BROMODICHLOROMETHANE

UG/KG	ANALYTICAL RESULTS
7U	1,2-DICHLOROPROPANE
7U	CIS-1,3-DICHLOROPROPENE
7U	TRICHLOROETHENE(TRICHLOROETHYLENE)
7U	DIBROMOCHLOROMETHANE
7U	1,1,2-TRICHLOROETHANE
7U	BENZENE
7U	TRANS-1,3-DICHLOROPROPENE
7U	BROMOFORM
13U	METHYL ISOBUTYL KETONE
13U	METHYL BUTYL KETONE
7U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
7U	1,1,2,2-TETRACHLOROETHANE
2J	TOLUENE
7U	CHLOROBENZENE
7U	ETHYL BENZENE
7U	STYRENE
7U	TOTAL XYLENES
25	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

EXTRACTABLE ORGANICS DATA REPORT 08/23/90

PROJECT NO. 90-529 SAMPLE NO. 47690 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SB-04

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1605 STOP: 00/00/00

CASE NO.: 14283 SAS NO.: D. NO.: T675

UG/KG	ANALYTICAL RESULTS
440U	PHENOL
440U	BIS(2-CHLOROETHYL) ETHER
440U	2-CHLOROPHENOL
440U	1,3-DICHLOROBENZENE
440U	1,4-DICHLOROBENZENE
440U	BENZYL ALCOHOL
440U	1,2-DICHLOROBENZENE
440U	2-METHYLPHENOL
440U	BIS(2-CHLOROISOPROPYL) ETHER
440U	(3-AND/OR 4-)METHYLPHENOL
440U	N-NITROSODI-N-PROPYLAMINE
440U	HEXACHLOROETHANE
440U	NITROBENZENE
440U	ISOPHORONE
440U	2-NITROPHENOL
440U	2,4-DIMETHYLPHENOL
2100U	BENZOIC ACID
440U	BIS(2-CHLOROETHOXY) METHANE
440U	2,4-DICHLOROPHENOL
440U	1,2,4-TRICHLOROBENZENE
440U	NAPHTHALENE
440U	4-CHLOROANILINE
440U	HEXACHLOROBUTADIENE
440U	4-CHLORO-3-METHYLPHENOL
440U	2-METHYLNAPHTHALENE
440U	HEXACHLOROCYCLOPENTADIENE (HCCP)
440U	2,4,6-TRICHLOROPHENOL
2100U	2,4,5-TRICHLOROPHENOL
440U	2-CHLORONAPHTHALENE
2100U	2-NITROANILINE
440U	DIMETHYL PHTHALATE
440U	ACENAPHTHYLENE
440U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
2100U	3-NITROANILINE
440U	ACENAPHTHENE
2100U	2,4-DINITROPHENOL
2100U	4-NITROPHENOL
440U	DIBENZOFURAN
440U	2,4-DINITROTOLUENE
440U	DIETHYL PHTHALATE
440U	4-CHLOROPHENYL PHENYL ETHER
440U	FLUORENE
2100U	4-NITROANILINE
2100U	2-METHYL-4,6-DINITROPHENOL
440U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
440U	4-BROMOPHENYL PHENYL ETHER
440U	HEXACHLOROBENZENE (HCB)
2100U	PENTACHLOROPHENOL
440U	PHENANTHRENE
440U	ANTHRACENE
440U	DI-N-BUTYLPHTHALATE
440U	FLUORANTHENE
440U	PYRENE
440U	BENZYL BUTYL PHTHALATE
880U	3,3'-DICHLOROBENZIDINE
440U	BENZO(A)ANTHRACENE
440U	CHRYSENE
440U	BIS(2-ETHYLHEXYL) PHTHALATE
440U	DI-N-OCTYLPHTHALATE
440U	BENZO(B AND/OR K)FLUORANTHENE
440U	BENZO-A-PYRENE
440U	INDENO (1,2,3-CD) PYRENE
440U	DIBENZO(A,H)ANTHRACENE
440U	BENZO(GHI)PERYLENE
25	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47690 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SB-04
CASE NUMBER: 14283 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1605 STOP: 00/00/00
D. NUMBER: T675

UG/KG	ANALYTICAL RESULTS
11U	ALPHA-BHC
11U	BETA-BHC
11U	DELTA-BHC
11U	GAMMA-BHC (LINDANE)
11U	HEPTACHLOR
11U	ALDRIN
11U	HEPTACHLOR EPOXIDE
11U	ENDOSULFAN I (ALPHA)
21U	DIELDRIN
21U	4,4'-DDE (P,P'-DDE)
21U	ENDRIN
21U	ENDOSULFAN II (BETA)
21U	4,4'-DDD (P,P'-DDD)
21U	ENDOSULFAN SULFATE
21U	4,4'-DDT (P,P'-DDT)

UG/KG	ANALYTICAL RESULTS
110U	METHOXYCHLOR
21U	ENDRIN KETONE
	CHLORDANE (TECH. MIXTURE) /1
110U	GAMMA-CHLORDANE /2
110U	ALPHA-CHLORDANE /2
210U	TOXAPHENE
110U	PCB-1016 (AROCLOR 1016)
110U	PCB-1221 (AROCLOR 1221)
110U	PCB-1232 (AROCLOR 1232)
110U	PCB-1242 (AROCLOR 1242)
110U	PCB-1248 (AROCLOR 1248)
210U	PCB-1254 (AROCLOR 1254)
210U	PCB-1260 (AROCLOR 1260)
25	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

PURGEABLE ORGANICS DATA REPORT 08/23/90

PROJECT NO. 90-529 SAMPLE NO. 47684 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SB-05

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1420 STOP: 00/00/00

CASE NO.: 14283 SAS NO.: D. NO.: T653

UG/KG	ANALYTICAL RESULTS
12U	CHLOROMETHANE
12U	BROMOMETHANE
12U	VINYL CHLORIDE
12U	CHLOROETHANE
20U	METHYLENE CHLORIDE
30U	ACETONE
6U	CARBON DISULFIDE
6U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
6U	1,1-DICHLOROETHANE
6U	1,2-DICHLOROETHENE (TOTAL)
6U	CHLOROFORM
6U	1,2-DICHLOROETHANE
12U	METHYL ETHYL KETONE
6U	1,1,1-TRICHLOROETHANE
6U	CARBON TETRACHLORIDE
12U	VINYL ACETATE
6U	BROMODICHLOROMETHANE

UG/KG	ANALYTICAL RESULTS
6U	1,2-DICHLOROPROPANE
6U	CIS-1,3-DICHLOROPROPENE
6U	TRICHLOROETHENE(TRICHLOROETHYLENE)
6U	DIBROMOCHLOROMETHANE
6U	1,1,2-TRICHLOROETHANE
6U	BENZENE
6U	TRANS-1,3-DICHLOROPROPENE
6U	BROMOFORM
12U	METHYL ISOBUTYL KETONE
12U	METHYL BUTYL KETONE
6U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
6U	1,1,2,2-TETRACHLOROETHANE
3J	TOLUENE
6U	CHLOROBENZENE
6U	ETHYL BENZENE
6U	STYRENE
6U	TOTAL XYLENES
16	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
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*K-ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE GIVEN *L-ACTUAL VALUE IS KNOWN TO BE GREATER THAN VALUE GIVEN
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

EXTRACTABLE ORGANICS DATA REPORT 08/23/90

** PROJECT NO. 90-529 SAMPLE NO. 47684 SAMPLE TYPE: SOIL
** SOURCE: STANADYNE INC
** STATION ID: SB-05
**
** CASE NO.: 14283 SAS NO.:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1420 STOP: 00/00/00

D. NO.: T653

UG/KG	ANALYTICAL RESULTS
390U	PHENOL
390U	BIS(2-CHLOROETHYL) ETHER
390U	2-CHLOROPHENOL
390U	1,3-DICHLOROBENZENE
390U	1,4-DICHLOROBENZENE
390U	BENZYL ALCOHOL
390U	1,2-DICHLOROBENZENE
390U	2-METHYLPHENOL
390U	BIS(2-CHLOROISOPROPYL) ETHER
390U	(3-AND/OR 4-)METHYLPHENOL
390U	N-NITROSODI-N-PROPYLAMINE
390U	HEXACHLOROETHANE
390U	NITROBENZENE
390U	ISOPHORONE
390U	2-NITROPHENOL
390U	2,4-DIMETHYLPHENOL
1900U	BENZOIC ACID
390U	BIS(2-CHLOROETHOXY) METHANE
390U	2,4-DICHLOROPHENOL
390U	1,2,4-TRICHLOROBENZENE
390U	NAPHTHALENE
390U	4-CHLOROANILINE
390U	HEXACHLOROBUTADIENE
390U	4-CHLORO-3-METHYLPHENOL
390U	2-METHYLNAPHTHALENE
390U	HEXACHLOROCYCLOPENTADIENE (HCCP)
390U	2,4,6-TRICHLOROPHENOL
1900U	2,4,5-TRICHLOROPHENOL
390U	2-CHLORONAPHTHALENE
1900U	2-NITROANILINE
390U	DIMETHYL PHTHALATE
390U	ACENAPHTHYLENE
390U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
1900U	3-NITROANILINE
390U	ACENAPHTHENE
1900U	2,4-DINITROPHENOL
1900U	4-NITROPHENOL
390U	DIBENZOFURAN
390U	2,4-DINITROTOLUENE
390U	DIETHYL PHTHALATE
390U	4-CHLOROPHENYL PHENYL ETHER
390U	FLUORENE
1900U	4-NITROANILINE
1900U	2-METHYL-4,6-DINITROPHENOL
390U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
390U	4-BROMOPHENYL PHENYL ETHER
390U	HEXACHLOROBENZENE (HCB)
1900U	PENTACHLOROPHENOL
390U	PHENANTHRENE
390U	ANTHRACENE
390U	DI-N-BUTYLPHTHALATE
390U	FLUORANTHENE
390U	PYRENE
390U	BENZYL BUTYL PHTHALATE
790U	3,3'-DICHLOROBENZIDINE
390U	BENZO(A)ANTHRACENE
390U	CHRYSENE
390U	BIS(2-ETHYLHEXYL) PHTHALATE
390U	DI-N-OCTYLPHTHALATE
390U	BENZO(B AND/OR K)FLUORANTHENE
390U	BENZO-A-PYRENE
390U	INDENO (1,2,3-CD) PYRENE
390U	DIBENZO(A,H)ANTHRACENE
390U	BENZO(GHI)PERYLENE
1G	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
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*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 QUANTITATION LIMIT.
*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

PESTICIDES/PCB'S DATA REPORT 08/23/90

PROJECT NO. 90-529 SAMPLE NO. 47684 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SB-05
CASE NUMBER: 14283 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1420 STOP: 00/00/00
D NUMBER: T653

UG/KG	ANALYTICAL RESULTS
9.5U	ALPHA-BHC
9.5U	BETA-BHC
9.5U	DELTA-BHC
9.5U	GAMMA-BHC (LINDANE)
9.5U	HEPTACHLOR
9.5U	ALDRIN
9.5U	HEPTACHLOR EPOXIDE
9.5U	ENDOSULFAN I (ALPHA)
19U	DIELDRIN
19U	4,4'-DDE (P,P'-DDE)
19U	ENDRIN
19U	ENDOSULFAN II (BETA)
19U	4,4'-DDD (P,P'-DDD)
19U	ENDOSULFAN SULFATE
19U	4,4'-DDT (P,P'-DDT)

UG/KG	ANALYTICAL RESULTS
95U	METHOXYCHLOR
19U	ENDRIN KETONE
	CHLORDANE (TECH. MIXTURE) /1
95U	GAMMA-CHLORDANE /2
95U	ALPHA-CHLORDANE /2
190U	TOXAPHENE
95U	PCB-1016 (AROCLOR 1016)
95U	PCB-1221 (AROCLOR 1221)
95U	PCB-1232 (AROCLOR 1232)
95U	PCB-1242 (AROCLOR 1242)
95U	PCB-1248 (AROCLOR 1248)
190U	PCB-1254 (AROCLOR 1254)
190U	PCB-1260 (AROCLOR 1260)
16	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*K-ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE GIVEN *L-ACTUAL VALUE IS KNOWN TO BE GREATER THAN VALUE GIVEN
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*C-CONFIRMED BY GCMS 1. WHEN NO VALUE IS REPORTED, SEE CHLORDANE CONSTITUENTS.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

PURGEABLE ORGANICS DATA REPORT 08/23/90

PROJECT NO. 90-529 SAMPLE NO. 47678 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SD-01

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1015 STOP: 00/00/00

CASE NO.: 14283 SAS NO.: D. NO.: T647

UG/KG	ANALYTICAL RESULTS
11U	CHLOROMETHANE
11U	BROMOMETHANE
11U	VINYL CHLORIDE
11U	CHLOROETHANE
20U	METHYLENE CHLORIDE
11U	ACETONE
5U	CARBON DISULFIDE
5U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
5U	1,1-DICHLOROETHANE
5U	1,2-DICHLOROETHENE (TOTAL)
5U	CHLOROFORM
5U	1,2-DICHLOROETHANE
11U	METHYL ETHYL KETONE
5U	1,1,1-TRICHLOROETHANE
5U	CARBON TETRACHLORIDE
11U	VINYL ACETATE
5U	BROMODICHLOROMETHANE

UG/KG	ANALYTICAL RESULTS
5U	1,2-DICHLOROPROPANE
5U	CIS-1,3-DICHLOROPROPENE
5U	TRICHLOROETHENE(TRICHLOROETHYLENE)
5U	DIBROMOCHLOROMETHANE
5U	1,1,2-TRICHLOROETHANE
5U	BENZENE
5U	TRANS-1,3-DICHLOROPROPENE
5U	BROMOFORM
11U	METHYL ISOBUTYL KETONE
11U	METHYL BUTYL KETONE
5U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
5U	1,1,2,2-TETRACHLOROETHANE
5U	TOLUENE
5U	CHLOROBENZENE
5U	ETHYL BENZENE
5U	STYRENE
5U	TOTAL XYLENES
8	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

EXTRACTABLE ORGANICS DATA REPORT 08/23/90

PROJECT NO. 90-529 SAMPLE NO. 47678 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SD-01

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1015 STOP: 00/00/00

CASE NO.: 14283 SAS NO.: D. NO.: T647

UG/KG	ANALYTICAL RESULTS
360U	PHENOL
360U	BIS(2-CHLOROETHYL) ETHER
360U	2-CHLOROPHENOL
360U	1,3-DICHLOROBENZENE
360U	1,4-DICHLOROBENZENE
360U	BENZYL ALCOHOL
360U	1,2-DICHLOROBENZENE
360U	2-METHYLPHENOL
360U	BIS(2-CHLOROISOPROPYL) ETHER
360U	(3-AND/OR 4-)METHYLPHENOL
360U	N-NITROSODI-N-PROPYLAMINE
360U	HEXACHLOROETHANE
360U	NITROBENZENE
360U	ISOPHORONE
360U	2-NITROPHENOL
360U	2,4-DIMETHYLPHENOL
1700U	BENZOIC ACID
360U	BIS(2-CHLOROETHOXY) METHANE
360U	2,4-DICHLOROPHENOL
360U	1,2,4-TRICHLOROBENZENE
360U	NAPHTHALENE
360U	4-CHLOROANILINE
360U	HEXACHLOROBUTADIENE
360U	4-CHLORO-3-METHYLPHENOL
360U	2-METHYLNAPHTHALENE
360U	HEXACHLOROCYCLOPENTADIENE (HCCP)
360U	2,4,6-TRICHLOROPHENOL
1700U	2,4,5-TRICHLOROPHENOL
360U	2-CHLORONAPHTHALENE
1700U	2-NITROANILINE
360U	DIMETHYL PHTHALATE
360U	ACENAPHTHYLENE
360U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
1700U	3-NITROANILINE
360U	ACENAPHTHENE
1700U	2,4-DINITROPHENOL
1700U	4-NITROPHENOL
360U	DIBENZOFURAN
360U	2,4-DINITROTOLUENE
360U	DIETHYL PHTHALATE
360U	4-CHLOROPHENYL PHENYL ETHER
360U	FLUORENE
1700U	4-NITROANILINE
1700U	2-METHYL-4,6-DINITROPHENOL
360U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
360U	4-BROMOPHENYL PHENYL ETHER
360U	HEXACHLOROBENZENE (HCB)
1700U	PENTACHLOROPHENOL
360U	PHENANTHRENE
360U	ANTHRACENE
360U	DI-N-BUTYLPHTHALATE
71J	FLUORANTHENE
67J	PYRENE
360U	BENZYL BUTYL PHTHALATE
720U	3,3'-DICHLOROBENZIDINE
360U	BENZO(A)ANTHRACENE
47J	CHRYSENE
360U	BIS(2-ETHYLHEXYL) PHTHALATE
360U	DI-N-OCTYLPHTHALATE
91J	BENZO(B AND/OR K)FLUORANTHENE
38J	BENZO-A-PYRENE
360U	INDENO (1,2,3-CD) PYRENE
360U	DIBENZO(A,H)ANTHRACENE
360U	BENZO(GHI)PERYLENE
8	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*K-ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE GIVEN *L-ACTUAL VALUE IS KNOWN TO BE GREATER THAN VALUE GIVEN
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47678 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SD-01
CASE.NO.: 14283 SAS NO.:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1015 STOP: 00/00/00
D. NO.: T647 MD NO: T647

ANALYTICAL RESULTS UG/KG

2000J 9 UNIDENTIFIED COMPOUNDS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*K-ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE GIVEN *L-ACTUAL VALUE IS KNOWN TO BE GREATER THAN VALUE GIVEN
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47678 SAMPLE TYPE: SOIL
SOURCE: STANADYNE INC
STATION ID: SD-01
CASE NUMBER: 14283 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1015 STOP: 00/00/00
D. NUMBER: T647

UG/KG	ANALYTICAL RESULTS
43U	ALPHA-BHC
43U	BETA-BHC
43U	DELTA-BHC
43U	GAMMA-BHC (LINDANE)
43U	HEPTACHLOR
43U	ALDRIN
43U	HEPTACHLOR EPOXIDE
43U	ENDOSULFAN I (ALPHA)
87U	DIELDRIN
87U	4,4'-DDE (P,P'-DDE)
87U	ENDRIN
87U	ENDOSULFAN II (BETA)
87U	4,4'-DDD (P,P'-DDD)
87U	ENDOSULFAN SULFATE
87U	4,4'-DDT (P,P'-DDT)

UG/KG	ANALYTICAL RESULTS
430U	METHOXYCHLOR
87U	ENDRIN KETONE
	CHLORDANE (TECH. MIXTURE) /1
430U	GAMMA-CHLORDANE /2
430U	ALPHA-CHLORDANE /2
870U	TOXAPHENE
430U	PCB-1016 (AROCLOR 1016)
430U	PCB-1221 (AROCLOR 1221)
430U	PCB-1232 (AROCLOR 1232)
430U	PCB-1242 (AROCLOR 1242)
430U	PCB-1248 (AROCLOR 1248)
870U	PCB-1254 (AROCLOR 1254)
870U	PCB-1260 (AROCLOR 1260)
8	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47679 SAMPLE TYPE:
SOURCE:
STATION ID: SD-02

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1025 STOP: 00/00/00

CASE NO.: 14283 SAS NO.: D. NO.: T648

UG/KG	ANALYTICAL RESULTS
18U	CHLOROMETHANE
18U	BROMOMETHANE
18U	VINYL CHLORIDE
18U	CHLOROETHANE
10U	METHYLENE CHLORIDE
80U	ACETONE
9U	CARBON DISULFIDE
9U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
9U	1,1-DICHLOROETHANE
9U	1,2-DICHLOROETHENE (TOTAL)
9U	CHLOROFORM
9U	1,2-DICHLOROETHANE
18U	METHYL ETHYL KETONE
9U	1,1,1-TRICHLOROETHANE
9U	CARBON TETRACHLORIDE
18U	VINYL ACETATE
9U	BROMODICHLOROMETHANE

UG/KG	ANALYTICAL RESULTS
9U	1,2-DICHLOROPROPANE
9U	CIS-1,3-DICHLOROPROPENE
9U	TRICHLOROETHENE(TRICHLOROETHYLENE)
9U	DIBROMOCHLOROMETHANE
9U	1,1,2-TRICHLOROETHANE
9U	BENZENE
9U	TRANS-1,3-DICHLOROPROPENE
9U	BROMOFORM
18U	METHYL ISOBUTYL KETONE
18U	METHYL BUTYL KETONE
9U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
9U	1,1,2,2-TETRACHLOROETHANE
9U	TOLUENE
9U	CHLOROBENZENE
9U	ETHYL BENZENE
9U	STYRENE
9U	TOTAL XYLENES
44	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

MISCELLANEOUS PURGEABLE ORGANICS - DATA REPORT

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**   PROJECT NO. 90-529    SAMPLE NO. 47679  SAMPLE TYPE:            PROG ELEM: NSF    COLLECTED BY: W RILEY                **
**   SOURCE:                                                         CITY: JACKSONVIL              ST: NC                   **
**   STATION ID: SD-02                                               COLLECTION START: 06/11/90  1025   STOP: 00/00/00      **
**   CASE.NO.: 14283          SAS NO.:                               D. NO.: T648                  MD NO: T648              **
**                                                                                                                          **
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ANALYTICAL RESULTS UG/KG

20JN TETRAMETHYL PENTANE

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

EXTRACTABLE ORGANICS DATA REPORT 08/23/90

PROJECT NO. 90-529 SAMPLE NO. 47679 SAMPLE TYPE:
SOURCE:
STATION ID: SD-02

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1025 STOP: 00/00/00

CASE NO.: 14283 SAS NO.: D. NO.: T648

UG/KG	ANALYTICAL RESULTS
11000U	PHENOL
11000U	BIS(2-CHLOROETHYL) ETHER
11000U	2-CHLOROPHENOL
11000U	1,3-DICHLOROBENZENE
11000U	1,4-DICHLOROBENZENE
11000U	BENZYL ALCOHOL
11000U	1,2-DICHLOROBENZENE
11000U	2-METHYLPHENOL
11000U	BIS(2-CHLOROISOPROPYL) ETHER
11000U	(3-AND/OR 4-)METHYLPHENOL
11000U	N-NITROSODI-N-PROPYLAMINE
11000U	HEXACHLOROETHANE
11000U	NITROBENZENE
11000U	ISOPHORONE
11000U	2-NITROPHENOL
11000U	2,4-DIMETHYLPHENOL
54000U	BENZOIC ACID
11000U	BIS(2-CHLOROETHOXY) METHANE
11000U	2,4-DICHLOROPHENOL
11000U	1,2,4-TRICHLOROBENZENE
11000U	NAPHTHALENE
11000U	4-CHLOROANILINE
11000U	HEXACHLOROBUTADIENE
11000U	4-CHLORO-3-METHYLPHENOL
11000U	2-METHYLNAPHTHALENE
11000U	HEXACHLOROCYCLOPENTADIENE (HCCP)
11000U	2,4,6-TRICHLOROPHENOL
54000U	2,4,5-TRICHLOROPHENOL
11000U	2-CHLORONAPHTHALENE
54000U	2-NITROANILINE
11000U	DIMETHYL PHTHALATE
11000U	ACENAPHTHYLENE
11000U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
54000U	3-NITROANILINE
11000U	ACENAPHTHENE
54000U	2,4-DINITROPHENOL
54000U	4-NITROPHENOL
11000U	DIBENZOFURAN
11000U	2,4-DINITROTOLUENE
11000U	DIETHYL PHTHALATE
11000U	4-CHLOROPHENYL PHENYL ETHER
11000U	FLUORENE
54000U	4-NITROANILINE
54000U	2-METHYL-4,6-DINITROPHENOL
11000U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
11000U	4-BROMOPHENYL PHENYL ETHER
11000U	HEXACHLOROBENZENE (HCB)
54000U	PENTACHLOROPHENOL
12000	PHENANTHRENE
11000U	ANTHRACENE
11000U	DI-N-BUTYLPHTHALATE
26000	FLUORANTHENE
13000	PYRENE
11000U	BENZYL BUTYL PHTHALATE
22000U	3,3'-DICHLOROBENZIDINE
6000J	BENZO(A)ANTHRACENE
11000J	CHRYSENE
1600J	BIS(2-ETHYLHEXYL) PHTHALATE
11000U	DI-N-OCTYLPHTHALATE
12000J	BENZO(B AND/OR K)FLUORANTHENE
1400J	BENZO-A-PYRENE
3200J	INDENO (1,2,3-CD) PYRENE
11000U	DIBENZO(A,H)ANTHRACENE
11000U	BENZO(GHI)PERYLENE
26	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*K-ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE GIVEN *L-ACTUAL VALUE IS KNOWN TO BE GREATER THAN VALUE GIVEN
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47679 SAMPLE TYPE:
SOURCE:
STATION ID: SD-02
CASE.NO.: 14283 SAS NO.:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1025 STOP: 00/00/00
D. NO.: T648 MD NO: T648

ANALYTICAL RESULTS UG/KG

[redacted]

700000J 20 UNIDENTIFIED COMPOUNDS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47679 SAMPLE TYPE:
SOURCE:
STATION ID: SD-02
CASE NUMBER: 14283 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1025 STOP: 00/00/00
D NUMBER: T648

UG/KG	ANALYTICAL RESULTS
220U	ALPHA-BHC
370	BETA-BHC
220U	DELTA-BHC
220U	GAMMA-BHC (LINDANE)
220U	HEPTACHLOR
220U	ALDRIN
220U	HEPTACHLOR EPOXIDE
220U	ENDOSULFAN I (ALPHA)
430U	DIELDRIN
430U	4,4'-DDE (P,P'-DDE)
430U	ENDRIN
430U	ENDOSULFAN II (BETA)
430U	4,4'-DDD (P,P'-DDD)
430U	ENDOSULFAN SULFATE
430U	4,4'-DDT (P,P'-DDT)

UG/KG	ANALYTICAL RESULTS
2200U	METHOXYCHLOR
430U	ENDRIN KETONE
	CHLORDANE (TECH. MIXTURE) /1
2200U	GAMMA-CHLORDANE /2
2200U	ALPHA-CHLORDANE /2
4300U	TOXAPHENE
2200U	PCB-1016 (AROCLOR 1016)
2200U	PCB-1221 (AROCLOR 1221)
2200U	PCB-1232 (AROCLOR 1232)
2200U	PCB-1242 (AROCLOR 1242)
2200U	PCB-1248 (AROCLOR 1248)
4300U	PCB-1254 (AROCLOR 1254)
4300U	PCB-1260 (AROCLOR 1260)
26	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.
*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.
*C-CONFIRMED BY GCMS 1. WHEN NO VALUE IS REPORTED, SEE CHLORDANE CONSTITUENTS.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47680 SAMPLE TYPE: SOIL
SOURCE:
STATION ID: SD-03

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1155 STOP: 00/00/00

CASE NO.: 14283 SAS NO.: D. NO.: T649

UG/KG	ANALYTICAL RESULTS
17U	CHLOROMETHANE
17U	BROMOMETHANE
17U	VINYL CHLORIDE
17U	CHLOROETHANE
20U	METHYLENE CHLORIDE
30U	ACETONE
8U	CARBON DISULFIDE
8U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
8U	1,1-DICHLOROETHANE
8U	1,2-DICHLOROETHENE (TOTAL)
8U	CHLOROFORM
8U	1,2-DICHLOROETHANE
17U	METHYL ETHYL KETONE
8U	1,1,1-TRICHLOROETHANE
8U	CARBON TETRACHLORIDE
17U	VINYL ACETATE
8U	BROMODICHLOROMETHANE

UG/KG	ANALYTICAL RESULTS
8U	1,2-DICHLOROPROPANE
8U	CIS-1,3-DICHLOROPROPENE
8U	TRICHLOROETHENE(TRICHLOROETHYLENE)
8U	DIBROMOCHLOROMETHANE
8U	1,1,2-TRICHLOROETHANE
8U	BENZENE
8U	TRANS-1,3-DICHLOROPROPENE
8U	BROMOFORM
17U	METHYL ISOBUTYL KETONE
17U	METHYL BUTYL KETONE
8U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
8U	1,1,2,2-TETRACHLOROETHANE
8U	TOLUENE
8U	CHLOROBENZENE
8U	ETHYL BENZENE
8U	STYRENE
8U	TOTAL XYLENES
41	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

EXTRACTABLE ORGANICS DATA REPORT 08/23/90

PROJECT NO. 90-529 SAMPLE NO. 47680 SAMPLE TYPE: SOIL
SOURCE:
STATION ID: SD-03

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1155 STOP: 00/00/00

CASE NO.: 14283 SAS NO.: D. NO.: T649

UG/KG	ANALYTICAL RESULTS
470U	PHENOL
470U	BIS(2-CHLOROETHYL) ETHER
470U	2-CHLOROPHENOL
470U	1,3-DICHLOROBENZENE
470U	1,4-DICHLOROBENZENE
470U	BENZYL ALCOHOL
470U	1,2-DICHLOROBENZENE
470U	2-METHYLPHENOL
470U	BIS(2-CHLOROISOPROPYL) ETHER
470U	(3-AND/OR 4-)METHYLPHENOL
470U	N-NITROSODI-N-PROPYLAMINE
470U	HEXACHLOROETHANE
470U	NITROBENZENE
470U	ISOPHORONE
470U	2-NITROPHENOL
470U	2,4-DIMETHYLPHENOL
2300U	BENZOIC ACID
470U	BIS(2-CHLOROETHOXY) METHANE
470U	2,4-DICHLOROPHENOL
470U	1,2,4-TRICHLOROBENZENE
470U	NAPHTHALENE
470U	4-CHLOROANILINE
470U	HEXACHLOROBUTADIENE
470U	4-CHLORO-3-METHYLPHENOL
470U	2-METHYLNAPHTHALENE
470U	HEXACHLOROCYCLOPENTADIENE (HCCP)
470U	2,4,6-TRICHLOROPHENOL
2300U	2,4,5-TRICHLOROPHENOL
470U	2-CHLORONAPHTHALENE
2300U	2-NITROANILINE
470U	DIMETHYL PHTHALATE
470U	ACENAPHTHYLENE
470U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
2300U	3-NITROANILINE
470U	ACENAPHTHENE
2300U	2,4-DINITROPHENOL
2300U	4-NITROPHENOL
470U	DIBENZOFURAN
470U	2,4-DINITROTOLUENE
470U	DIETHYL PHTHALATE
470U	4-CHLOROPHENYL PHENYL ETHER
470U	FLUORENE
2300U	4-NITROANILINE
2300U	2-METHYL-4,6-DINITROPHENOL
470U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
470U	4-BROMOPHENYL PHENYL ETHER
470U	HEXACHLOROBENZENE (HCB)
2300U	PENTACHLOROPHENOL
260J	PHENANTHRENE
470U	ANTHRACENE
470U	DI-N-BUTYLPHTHALATE
510	FLUORANTHENE
400J	PYRENE
470U	BENZYL BUTYL PHTHALATE
940U	3,3'-DICHLOROBENZIDINE
95J	BENZO(A)ANTHRACENE
300J	CHRYSENE
470U	BIS(2-ETHYLHEXYL) PHTHALATE
470U	DI-N-OCTYLPHTHALATE
540J	BENZO(B AND/OR K)FLUORANTHENE
170J	BENZO-A-PYRENE
130J	INDENO (1,2,3-CD) PYRENE
470U	DIBENZO(A,H)ANTHRACENE
110J	BENZO(GHI)PERYLENE
30	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47680 SAMPLE TYPE: SOIL
SOURCE:
STATION ID: SD-03
CASE.NO.: 14783 SAS NO.:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1155 STOP: 00/00/00
D. NO.: T649 MD NO: T649

ANALYTICAL RESULTS UG/KG

600JN	BENZOFLUORANTHENE (NOT B OR K)
5000J	13 UNIDENTIFIED COMPOUNDS

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47680 SAMPLE TYPE: SOIL
SOURCE:
STATION ID: SD-03
CASE NUMBER: 14283 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1155 STOP: 00/00/00
D. NUMBER: T649

UG/KG	ANALYTICAL RESULTS
11U	ALPHA-BHC
11U	BETA-BHC
11U	DELTA-BHC
11U	GAMMA-BHC (LINDANE)
11U	HEPTACHLOR
11U	ALDRIN
11U	HEPTACHLOR EPOXIDE
11U	ENDOSULFAN I (ALPHA)
23U	DIELDRIN
23U	4,4'-DDE (P,P'-DDE)
23U	ENDRIN
23U	ENDOSULFAN II (BETA)
23U	4,4'-DDD (P,P'-DDD)
23U	ENDOSULFAN SULFATE
23U	4,4'-DDT (P,P'-DDT)

UG/KG	ANALYTICAL RESULTS
110U	METHOXYCHLOR
23U	ENDRIN KETONE
	CHLORDANE (TECH. MIXTURE) /1
110U	GAMMA-CHLORDANE /2
110U	ALPHA-CHLORDANE /2
230U	TOXAPHENE
110U	PCB-1016 (AROCLOR 1016)
110U	PCB-1221 (AROCLOR 1221)
110U	PCB-1232 (AROCLOR 1232)
110U	PCB-1242 (AROCLOR 1242)
110U	PCB-1248 (AROCLOR 1248)
230U	PCB-1254 (AROCLOR 1254)
230U	PCB-1260 (AROCLOR 1260)
30	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47677 SAMPLE TYPE:
SOURCE:
STATION ID: PW-01

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1122 STOP: 00/00/00

CASE NO.: 14283 SAS NO.: D. NO.: T646

UG/L	ANALYTICAL RESULTS
10UR	CHLOROMETHANE
10U	BROMOMETHANE
10U	VINYL CHLORIDE
10U	CHLOROETHANE
7U	METHYLENE CHLORIDE
10U	ACETONE
5U	CARBON DISULFIDE
5U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
5U	1,1-DICHLOROETHANE
5U	1,2-DICHLOROETHENE (TOTAL)
5U	CHLOROFORM
5U	1,2-DICHLOROETHANE
10U	METHYL ETHYL KETONE
5U	1,1,1-TRICHLOROETHANE
5U	CARBON TETRACHLORIDE
10U	VINYL ACETATE
5U	BROMODICHLOROMETHANE

UG/L	ANALYTICAL RESULTS
5U	1,2-DICHLOROPROPANE
5U	CIS-1,3-DICHLOROPROPENE
5U	TRICHLOROETHENE(TRICHLOROETHYLENE)
5U	DIBROMOCHLOROMETHANE
5U	1,1,2-TRICHLOROETHANE
5U	BENZENE
5U	TRANS-1,3-DICHLOROPROPENE
5U	BROMOFORM
10U	METHYL ISOBUTYL KETONE
10U	METHYL BUTYL KETONE
5U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
5U	1,1,2,2-TETRACHLOROETHANE
5U	TOLUENE
5U	CHLOROBENZENE
5U	ETHYL BENZENE
5U	STYRENE
5U	TOTAL XYLENES

REMARKS

REMARKS

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47677 SAMPLE TYPE:
SOURCE:
STATION ID: PW-01

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1122 STOP: 00/00/00

CASE NO.: 14283 SAS NO.: D. NO.: T646

UG/L	ANALYTICAL RESULTS
10U	PHENOL
10UR	BIS(2-CHLOROETHYL) ETHER
10U	2-CHLOROPHENOL
10U	1,3-DICHLOROBENZENE
10U	1,4-DICHLOROBENZENE
10U	BENZYL ALCOHOL
10U	1,2-DICHLOROBENZENE
10U	2-METHYLPHENOL
10U	BIS(2-CHLOROISOPROPYL) ETHER
10U	(3-AND/OR 4-)METHYLPHENOL
10U	N-NITROSODI-N-PROPYLAMINE
10U	HEXACHLOROETHANE
10U	NITROBENZENE
10U	ISOPHORONE
10U	2-NITROPHENOL
10U	2,4-DIMETHYLPHENOL
50U	BENZOIC ACID
10U	BIS(2-CHLOROETHOXY) METHANE
10U	2,4-DICHLOROPHENOL
10U	1,2,4-TRICHLOROBENZENE
10U	NAPHTHALENE
10U	4-CHLOROANILINE
10U	HEXACHLOROBUTADIENE
10U	4-CHLORO-3-METHYLPHENOL
10U	2-METHYLNAPHTHALENE
10U	HEXACHLOROCYCLOPENTADIENE (HCCP)
10U	2,4,6-TRICHLOROPHENOL
50U	2,4,5-TRICHLOROPHENOL
10U	2-CHLORONAPHTHALENE
50U	2-NITROANILINE
10UR	DIMETHYL PHTHALATE
10U	ACENAPHTHYLENE
10U	2,6-DINITROTOLUENE

UG/L	ANALYTICAL RESULTS
50U	3-NITROANILINE
10U	ACENAPHTHENE
50U	2,4-DINITROPHENOL
50U	4-NITROPHENOL
10U	DIBENZOFURAN
10U	2,4-DINITROTOLUENE
10U	DIETHYL PHTHALATE
10U	4-CHLOROPHENYL PHENYL ETHER
10U	FLUORENE
50U	4-NITROANILINE
50U	2-METHYL-4,6-DINITROPHENOL
10U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
10U	4-BROMOPHENYL PHENYL ETHER
10U	HEXACHLOROBENZENE (HCB)
50U	PENTACHLOROPHENOL
10U	PHENANTHRENE
10U	ANTHRACENE
10U	DI-N-BUTYLPHTHALATE
10U	FLUORANTHENE
10U	PYRENE
10U	BENZYL BUTYL PHTHALATE
20U	3,3'-DICHLOROBENZIDINE
10U	BENZO(A)ANTHRACENE
10U	CHRYSENE
10U	BIS(2-ETHYLHEXYL) PHTHALATE
10U	DI-N-OCTYLPHTHALATE
10UJ	BENZO(B AND/OR K)FLUORANTHENE
10U	BENZO-A-PYRENE
10U	INDENO (1,2,3-CD) PYRENE
10U	DIBENZO(A,H)ANTHRACENE
10UJ	BENZO(GHI)PERYLENE

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47677 SAMPLE TYPE:
SOURCE:
STATION ID: PW-01
CASE NUMBER: 14283 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 1122 STOP: 00/00/00
D NUMBER: T646

UG/L	ANALYTICAL RESULTS
0.05U	ALPHA-BHC
0.05U	BETA-BHC
0.05U	DELTA-BHC
0.05U	GAMMA-BHC (LINDANE)
0.05U	HEPTACHLOR
0.05U	ALDRIN
0.05U	HEPTACHLOR EPOXIDE
0.05U	ENDOSULFAN I (ALPHA)
0.10U	DIELDRIN
0.10U	4,4'-DDE (P,P'-DDE)
0.10U	ENDRIN
0.10U	ENDOSULFAN II (BETA)
0.10U	4,4'-DDD (P,P'-DDD)
0.10U	ENDOSULFAN SULFATE
0.10U	4,4'-DDT (P,P'-DDT)

UG/L	ANALYTICAL RESULTS
0.50U	METHOXYCHLOR
0.10U	ENDRIN KETONE
	CHLORDANE (TECH. MIXTURE) /1
0.50U	GAMMA-CHLORDANE /2
0.50U	ALPHA-CHLORDANE /2
1.00U	TOXAPHENE
0.50U	PCB-1016 (AROCLOR 1016)
0.50U	PCB-1221 (AROCLOR 1221)
0.50U	PCB-1232 (AROCLOR 1232)
0.50U	PCB-1242 (AROCLOR 1242)
0.50U	PCB-1248 (AROCLOR 1248)
1.00U	PCB-1254 (AROCLOR 1254)
1.00U	PCB-1260 (AROCLOR 1260)

REMARKS

REMARKS

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47691 SAMPLE TYPE: SURFACEWA
SOURCE: STANADYNE INC
STATION ID: PB-01
CASE NO.: 14283 SAS NO.:

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 0800 STOP: 00/00/00
D. NO.: T676

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
10UR	CHLOROMETHANE	5U	1,2-DICHLOROPROPANE
10U	BROMOMETHANE	5U	CIS-1,3-DICHLOROPROPENE
10U	VINYL CHLORIDE	5U	TRICHLOROETHENE(TRICHLOROETHYLENE)
10U	CHLOROETHANE	5U	DIBROMOCHLOROMETHANE
8U	METHYLENE CHLORIDE	5U	1,1,2-TRICHLOROETHANE
20U	ACETONE	5U	BENZENE
5U	CARBON DISULFIDE	5U	TRANS-1,3-DICHLOROPROPENE
5U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	5U	BROMOFORM
5U	1,1-DICHLOROETHANE	10U	METHYL ISOBUTYL KETONE
5U	1,2-DICHLOROETHENE (TOTAL)	10U	METHYL BUTYL KETONE
5U	CHLOROFORM	5U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
5U	1,2-DICHLOROETHANE	5U	1,1,2,2-TETRACHLOROETHANE
10U	METHYL ETHYL KETONE	.6	TOLUENE
5U	1,1,1-TRICHLOROETHANE	5U	CHLOROBENZENE
5U	CARBON TETRACHLORIDE	5U	ETHYL BENZENE
10U	VINYL ACETATE	5U	STYRENE
5U	BROMODICHLOROMETHANE	5U	TOTAL XYLENES

Incorrect code.
Should be TB-01

WEU
11/26/90

REMARKS

REMARKS

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

EXTRACTABLE ORGANICS DATA REPORT 08/23/90

PROJECT NO. 90-529 SAMPLE NO. 47691 SAMPLE TYPE: SURFACEWA
SOURCE: STANADYNE INC
STATION ID: PB-01

PROG ELEM: NSF COLLECTED BY: W RILEY
CITY: JACKSONVIL ST: NC
COLLECTION START: 06/11/90 0800 STOP: 00/00/00

CASE NO.: 14283 SAS NO.: D. NO.: T676

UG/L	ANALYTICAL RESULTS
10U	PHENOL
10UR	BIS(2-CHLOROETHYL) ETHER
10U	2-CHLOROPHENOL
10U	1,3-DICHLOROBENZENE
10U	1,4-DICHLOROBENZENE
10U	BENZYL ALCOHOL
10U	1,2-DICHLOROBENZENE
10U	2-METHYLPHENOL
10U	BIS(2-CHLOROISOPROPYL) ETHER
10U	(3-AND/OR 4-)METHYLPHENOL
10U	N-NITROSODI-N-PROPYLAMINE
10U	HEXACHLOROETHANE
10U	NITROBENZENE
10U	ISOPHORONE
10U	2-NITROPHENOL
10U	2,4-DIMETHYLPHENOL
50U	BENZOIC ACID
10U	BIS(2-CHLOROETHOXY) METHANE
10U	2,4-DICHLOROPHENOL
10U	1,2,4-TRICHLOROBENZENE
10U	NAPHTHALENE
10U	4-CHLOROANILINE
10U	HEXACHLOROBUTADIENE
10U	4-CHLORO-3-METHYLPHENOL
10U	2-METHYLNAPHTHALENE
10U	HEXACHLOROCYCLOPENTADIENE (HCCP)
10U	2,4,6-TRICHLOROPHENOL
50U	2,4,5-TRICHLOROPHENOL
10U	2-CHLORONAPHTHALENE
50U	2-NITROANILINE
10UR	DIMETHYL PHTHALATE
10U	ACENAPHTHYLENE
10U	2,6-DINITROTOLUENE

REMARKS

UG/L	ANALYTICAL RESULTS
50U	3-NITROANILINE
10U	ACENAPHTHENE
50U	2,4-DINITROPHENOL
50U	4-NITROPHENOL
10U	DIBENZOFURAN
10U	2,4-DINITROTOLUENE
10U	DIETHYL PHTHALATE
10U	4-CHLOROPHENYL PHENYL ETHER
10U	FLUORENE
50U	4-NITROANILINE
50U	2-METHYL-4,6-DINITROPHENOL
10U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
10U	4-BROMOPHENYL PHENYL ETHER
10U	HEXACHLOROBENZENE (HCB)
50U	PENTACHLOROPHENOL
10U	PHENANTHRENE
10U	ANTHRACENE
10U	DI-N-BUTYLPHTHALATE
10U	FLUORANTHENE
10U	PYRENE
10U	BENZYL BUTYL PHTHALATE
20U	3,3'-DICHLOROBENZIDINE
10U	BENZO(A)ANTHRACENE
10U	CHRYSENE
10U	BIS(2-ETHYLHEXYL) PHTHALATE
10U	DI-N-OCTYLPHTHALATE
10UJ	BENZO(B AND/OR K)FLUORANTHENE
10U	BENZO-A-PYRENE
10U	INDENO (1,2,3-CD) PYRENE
10U	DIBENZO(A,H)ANTHRACENE
10UJ	BENZO(GHI)PERYLENE

REMARKS

Incorrect code!
Shold be TB-01
WEV
11/26/90

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.
*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/23/90

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 90-529 SAMPLE NO. 47691 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: W RILEY
SOURCE: STANADYNE INC CITY: JACKSONVIL ST: NC
STATION ID: PB-01 COLLECTION START: 06/11/90 0800 STOP: 00/00/00
CASE NUMBER: 14283 SAS NUMBER: D. NUMBER: T676

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
0.05U	ALPHA-BHC	0.50U	METHOXYCHLOR
0.05U	BETA-BHC	0.10U	ENDRIN KETONE
0.05U	DELTA-BHC		CHLORDANE (TECH. MIXTURE) /1
0.05U	GAMMA-BHC (LINDANE)	0.50U	GAMMA-CHLORDANE /2
0.05U	HEPTACHLOR	0.50U	ALPHA-CHLORDANE /2
0.05U	ALDRIN	1.00U	TOXAPHENE
0.05U	HEPTACHLOR EPOXIDE	0.50U	PCB-1016 (AROCLOR 1016)
0.05U	ENDOSULFAN I (ALPHA)	0.50U	PCB-1221 (AROCLOR 1221)
0.10U	DIELDRIN	0.50U	PCB-1232 (AROCLOR 1232)
0.10U	4,4'-DDE (P,P'-DDE)	0.50U	PCB-1242 (AROCLOR 1242)
0.10U	ENDRIN	0.50U	PCB-1248 (AROCLOR 1248)
0.10U	ENDOSULFAN II (BETA)	1.00U	PCB-1254 (AROCLOR 1254)
0.10U	4,4'-DDD (P,P'-DDD)	1.00U	PCB-1260 (AROCLOR 1260)
0.10U	ENDOSULFAN SULFATE		
0.10U	4,4'-DDT (P,P'-DDT)		

Incorrect code; Should be TB-01.
WEW 11/26/90

REMARKS ***REMARKS***

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*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 QUANTITATION LIMIT.
*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT BE PRESENT. RESAMPLING AND REANALYSIS IS NECESSARY FOR VERIFICATION.
*C-CONFIRMED BY GCMS 1. WHEN NO VALUE IS REPORTED, SEE CHLORDANE CONSTITUENTS.

APPENDIX D

Site Inspection Report

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NC	D 084167444

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Stanadyne, Inc., Diesel Systems Group	405 White Street

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG. DIST.
Jacksonville	NC	28540	Onslow		

09 COORDINATES LATITUDE	LONGITUDE	10 TYPE OF OWNERSHIP (Check one)
34 45 34.0	077 33 32.0	X 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
06 11 90 (MONTH DAY YEAR)	X ACTIVE ☐ INACTIVE	1977 (BEGINNING YEAR), Present (ENDING YEAR) ☐ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)
☐ A. EPA X B. EPA CONTRACTOR NUS Corporation (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
Walter Riley	Chemist	NUS Corp.	(404) 938-7710
09 OTHER INSPECTORS	**10 TITLE**	**11 ORGANIZATION**	**12 TELEPHONE NO**
Larry Grier	Field Technician	NUS Corp	(404) 938-7710
Ron Wilde	Biologist	NUS Corp	(404) 938-7710
Terry Ryland	Geologist	NUS Corp	(404) 938-7710
Eddie Vasser	Chemist	NUS Corp	(404) 935-7710
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
John M. Alexander	Engineering Manager	c/o Stanadyne Automotive, Jacksonville, NC	
Evert Baird	Stanadyne Corporate Office	Stanadyne Automotive, Hartford, Connecticut	(203) 683-4570
Don Harris	Plant Manager	c/o Stanadyne Automotive, Jacksonville, North Carolina	( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
X PERMISSION ☐ WARRANT	0830 (6/11/90)	Warm and sunny

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Debbie Vaughn-Wright	U.S.E.P.A. - Atlanta	(404) 347-5065

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
William E. Vasser		NUS Corp.	(404) 938-7710	11/19/90 (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	D084167444

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

A SOLID
B POWDER, FINES
X C SLUDGE
E SLURRY
X F LIQUID
G GAS
D OTHER _____ (Specify)

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

TONS 67
CUBIC YARDS _____
NO. OF DRUMS 415

03 WASTE CHARACTERISTICS (Check all that apply)

X A TOXIC
B CORROSIVE
C RADIOACTIVE
D PERSISTENT
E SOLUBLE
F INFECTIOUS
X G FLAMMABLE
H IGNITABLE
X 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	X		See "Solvents"
OLW	OILY WASTE	2,400 ~~[illegible]~~	gallons	Calibrating fluids + cutting fluids
SOL	SOLVENTS	13,450	pounds	Solvents + "Still Bottoms" (Sludge)
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	tetrachloroethene	127-18-4	Drums	Unknown	
SOL/SLU	trichloroethene	79-01-6	Distillation / Drums	unknown	
SOL/SLU	1,1,1-trichloroethane	25323-89-1	Distillation / Drums	Unknown	
SOL/SLU	dichloromethane	75-09-2	Distillation / Drums	Unknown	
SOL	acetone	67-64-1	Drums	Unknown	
OLW	paraffinic oil	—	Drums	Unknown	
OLW	naphthenic oil	—	Drums	Unknown	
OLW	petroleum distillate	8002-05-9	Drums	Unknown	
OLW	petroleum naphtha	—	Drums	Unknown	

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)

EPA + State file materials, NUS field logbook.

EPA

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

I. IDENTIFICATION
01 STATE: NC | 02 SITE NUMBER: D 084162444

II. HAZARDOUS CONDITIONS AND INCIDENTS

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

Chlorinated solvents could potentially reach ground water if spilled; contaminated wells in Tarawa Terrace area (~~[illegible]~~ already attributed to ABC One Hour Cleaners site, ~~2.4~~ 1.8 miles Southeast of Stanadyne facility).

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

Perennial surface water (Scales Creek) occurs 0.5 mile downstream of facility; Polyaromatic hydrocarbons detected in sediments near facility could be transported to perennial surface water bodies.

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

Some solvents used at facility are very volatile.

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

Cutting fluids + calibration fluids are flammable.

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

Workers could be exposed to hazardous materials if handled improperly. Nearest residence ≈ 1,800 feet south of facility. Facility is securely fenced.

01 X F CONTAMINATION OF SOIL — 02 X OBSERVED (DATE 8/11/90) — ☐ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: 10 (Acres) — 04 NARRATIVE DESCRIPTION

Organic + inorganic contaminants were found in soil, which could be attributed to operations at facility. (2-methylnaphthalene and iron)

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

Active municipal water supply wells are located from 2.8 to 4.0 miles from the facility; Contamination in wells at Tarawa Terrace (~~2.4~~ 1.8 miles Southeast of Stanadyne) not related to activities at Stanadyne.

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

Workers could be exposed to hazardous materials if handled improperly

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

Population within 1 mile is 2,949. Nearest residence is located 1,800 feet south of facility.

EPA

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

I. IDENTIFICATION
01 STATE: NC | 02 SITE NUMBER: D084167444

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 X J DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE _____) — X POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION
Damage to flora possible if uncontrolled release of materials should occur.

01 X K DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE _____) — X POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION
Damage to fauna possible, especially estuarine aquatic life, if uncontrolled release of materials should occur.

01 X L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE _____) — X POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION
Some recreational fishing occurs from 2.15 to over 15.0 miles downstream of facility; poly~~aromatic~~ cyclic aromatic hydrocarbons detected in sediments near facility could be transported to perinnial surface water bodies and ingested by fish, etc.

01 X M. UNSTABLE CONTAINMENT OF WASTES (Spills, Runoff, Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE _____) — X POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: Unknown — 04 NARRATIVE DESCRIPTION
Potential, but never reported; however, polycyclic aromatic hydrocarbons were detected in surface soil and sediment samples (WGU) at facility.

01 X N DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE _____) — X POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION
Potential, but never reported

01 X O CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 X OBSERVED (DATE 6/11/90) — ~~X~~ POTENTIAL WGU — ☐ ALLEGED
04 NARRATIVE DESCRIPTION
Several poly~~aromatic~~ cyclic aromatic hydrocarbons detected in sediment samples, which could be attributed to practices at the facility

01 ☐ P ILLEGAL UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION
Never alleged or reported

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS
None

III. TOTAL POPULATION POTENTIALLY AFFECTED: Unknown

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)
EPA + State file materials, Laboratory analytical results, NUS field logbook.

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NC	D054167444

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			X	RCRA Part A filed 11/15/80
E RCRA INTERIM STATUS			X	Currently a "generator"
F SPCC PLAN				
G STATE (Specify)				
H LOCAL (Specify)				
I OTHER (Specify)				
J NONE				

III. SITE DESCRIPTION

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

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

05 OTHER

X A BUILDINGS ON SITE

06 AREA OF SITE

10 acres developed (+10 acres, undeveloped)

07 COMMENTS

Distillation used to concentrate waste solvents before short term storage.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

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

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

Waste storage
↳ Drums stored inside main building.
Fresh Mentor 28 fluid stored in above ground tank, outside (southwest) of main building. → Surrounded by concrete and earth berm.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☐ YES X NO

02 COMMENTS

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

EPA + State file materials, NUS field logbook.

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NC	D084167444

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 2.8 (mi)
B >4.0 (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 17,297

03 DISTANCE TO NEAREST DRINKING WATER WELL 2.8 (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
10 (ft)	(generally) South	30 (ft)	"High" (gpd)	☐ YES ☒ NO

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

Camp Lejeune wells in Tarawa Terrace (less than 2 miles south + SE of facility) temporarily closed due to contamination problems. Nearest active wells located in Holcomb Blvd. well field, 2.8 - 4.0 miles from facility. Castle Hayne aquifer

10 RECHARGE AREA

☒ YES ☐ NO

COMMENTS Percolation of rainfall contributes to recharge of Castle Hayne aquifer.

11 DISCHARGE AREA

☒ YES ☐ NO

COMMENTS Castle Hayne aquifer discharges to Northeast Creek + the New River

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
Scales Creek	☐	0.5 (mi)
Northeast Creek	☐	2.15 (mi)
New River	☐	3.45 (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 2,949 NO. OF PERSONS	B. 31,296 NO. OF PERSONS	C 33,786 NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION 0.34 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE ≈ 8,000

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

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

Facility located in commercial-industrial area, but residences are located within 1 mile. Within 1 mile are Britthaven Nursing Home, Onslow County Hospital, + Ball Fork School. Within 4 miles are the City of Jacksonville, Camp Lejeune, and the New River Estuary.

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NC	D 054167444

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

A 10^{-6} – 10^{-4} cm/sec B 10^{-4} – 10^{-6} cm/sec X C 10^{-4} – 10^{-3} cm/sec ☐ D GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

X 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
1,430 (ft)	Unknown (ft)	Unknown

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
14 (in)	3.7 (in)	1 %	South (generally)	1 %

09 FLOOD POTENTIAL: SITE IS IN Unknown YEAR FLOODPLAIN

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

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A 2.15 (downstream) (mi)

OTHER: B ~~1.4~~ 1.5 (straight line distance) (mi) NEV

12 DISTANCE TO CRITICAL HABITAT (of endangered species): Unknown ~~>1.5~~ NEV (mi)

ENDANGERED SPECIES: Unknown

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. <0.1 (mi)	B. 0.34 (mi)	C. >4.0 (mi)	D. >4.0 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Elevation at facility is 30 feet above Mean Sea level. Terrain slopes Very gradually to the South. Drainage ditches constructed to improve drainage. Coastal streams draining area are near sea level.

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

EPA + State file materials, topographic map

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NC	D084167444

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER	1 (off-site, private well)		Results Presented in SSI, Phase II Report
SURFACE WATER	0		
WASTE	0	Organic analysis: IT Corporation Cerritos, CA	
AIR	0		
RUNOFF	0		
SPILL	0	Inorganic analysis: Orlando Labs. Orlando, FL	
SOIL	10		
VEGETATION	0		
OTHER - Sediment	3		

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
~~Groundwater: pH~~	~~6.~~ WEV
~~temperature~~	
~~conductivity~~	well

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☐ AERIAL

02 IN CUSTODY OF NUS Corporation - Atlanta
Name of organization or individual

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS NUS Corporation - Atlanta

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

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

EPA + State file materials, NUS field logbook.

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NC	D084167444

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER
Standard Automotive	

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

05 CITY	06 STATE	07 ZIP CODE
Jacksonville	NC	28540

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

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER
Standard Automotive	

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE
Hartford	CN	

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (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

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)

EPA + State file Materials

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NC	D 084167444

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

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

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

N/A

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NC	D054167444

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
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

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

N/A

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NC	D 084167444

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED 04 DESCRIPTION ~~Not Known~~ NED Never required	02 DATE	03 AGENCY
01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED 04 DESCRIPTION Never required	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	02 DATE	03 AGENCY
01 ☐ G. WASTE DISPOSED ELSEWHERE 04 DESCRIPTION	02 DATE	03 AGENCY
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 Never required	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	D084167444

II PAST RESPONSE ACTIVITIES Continued

01 ☐ R BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Never required

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

EPA + State file Materials

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NC	D 084167 444

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY ENFORCEMENT ACTION YES (X) NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY ENFORCEMENT ACTION

No significant waste handling discrepancies reported
No spills reported. No onsite disposal reported or alleged.

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

EPA + State file materials.

EPA FORM 2070-13 (7-81)

APPENDIX

I. FEEDSTOCKS

CAS Number	Chemical Name
1. 7664-41-7	Ammonia
2. 7440-36-0	Antimony
3. 1309-64-4	Antimony Trioxide
4. 7440-38-2	Arsenic
5. 1327-53-3	Arsenic Trioxide
6. 21109-95-5	Barium Sulfide
7. 7726-95-6	Bromine
8. 106-99-0	Butadiene
9. 7440-43-9	Cadmium
10. 7782-50-5	Chlorine
11. 12737-27-8	Chromite
12. 7440-47-3	Chromium
13. 7440-48-4	Cobalt
14. 1317-38-0	Cupric Oxide
15. 7758-98-7	Cupric Sulfate
16. 1317-39-1	Cuprous Oxide
17. 74-85-1	Ethylene
18. 7647-01-0	Hydrochloric Acid
19. 7664-39-3	Hydrogen Fluoride
20. 1335-25-7	Lead Oxide
21. 7439-97-6	Mercury
22. 74-82-8	Methane
23. 91-20-3	Napthalene
24. 7440-02-0	Nickel
25. 7697-37-2	Nitric Acid
26. 7723-14-0	Phosphorus
27. 7778-50-9	Potassium Dichromate
28. 1310-58-3	Potassium Hydroxide
29. 115-07-1	Propylene
30. 10588-01-9	Sodium Dichromate
31. 1310-73-2	Sodium Hydroxide
32. 7646-78-8	Stannic Chloride
33. 7772-99-8	Stannous Chloride
34. 7664-93-9	Sulfuric Acid
35. 108-88-3	Toluene
36. 1330-20-7	Xylene
37. 7646-85-7	Zinc Chloride
38. 7733-02-0	Zinc Sulfate

II. HAZARDOUS SUBSTANCES

CAS Number	Chemical Name
1. 75-07-0	Acetaldehyde
2. 64-19-7	Acetic Acid
3. 108-24-7	Acetic Anhydride
4. 75-86-5	Acetone Cyanohydrin
5. 506-96-7	Acetyl Bromide
6. 75-36-5	Acetyl Chloride
7. 107-02-8	Acrolein
8. 107-13-1	Acrylonitrile
9. 124-04-9	Adipic Acid
10. 309-00-2	Aldrin
11. 10043-01-3	Aluminum Sulfate
12. 107-18-6	Allyl Alcohol
13. 107-05-1	Allyl Chloride
14. 7664-41-7	Ammonia
15. 631-61-8	Ammonium Acetate
16. 1863-63-4	Ammonium Benzoate
17. 1066-33-7	Ammonium Bicarbonate
18. 7789-09-5	Ammonium Bichromate
19. 1341-49-7	Ammonium Bifluoride
20. 10192-30-0	Ammonium Bisulfite
21. 1111-78-0	Ammonium Carbamate
22. 12125-02-9	Ammonium Chloride
23. 7788-98-9	Ammonium Chromate
24. 3012-65-5	Ammonium Citrate, Dibasic
25. 13826-83-0	Ammonium Fluoborate
26. 12125-01-8	Ammonium Fluoride
27. 1336-21-6	Ammonium Hydroxide
28. 6009-70-7	Ammonium Oxalate
29. 16919-19-0	Ammonium Silicofluoride
30. 7773-06-0	Ammonium Sulfamate
31. 12135-76-1	Ammonium Sulfide
32. 10196-04-0	Ammonium Sulfite
33. 14307-43-8	Ammonium Tartrate
34. 1762-95-4	Ammonium Thiocyanate
35. 7783-18-8	Ammonium Thiosulfate
36. 628-63-7	Amyl Acetate
37. 62-53-3	Aniline
38. 7647-18-9	Antimony Pentachloride
39. 7789-61-9	Antimony Tribromide
40. 10025-91-9	Antimony Trichloride
41. 7783-56-4	Antimony Trifluoride
42. 1309-64-4	Antimony Trioxide
43. 1303-32-8	Arsenic Disulfide
44. 1303-28-2	Arsenic Pentoxide
45. 7784-34-1	Arsenic Trichloride
46. 1327-53-3	Arsenic Trioxide
47. 1303-33-9	Arsenic Trisulfide
48. 542-62-1	Barium Cyanide
49. 71-43-2	Benzene
50. 65-85-0	Benzoic Acid
51. 100-47-0	Benzonitrile
52. 98-88-4	Benzoyl Chloride
53. 100-44-7	Benzyl Chloride
54. 7440-41-7	Beryllium
55. 7787-47-5	Beryllium Chloride
56. 7787-49-7	Beryllium Fluoride
57. 13597-99-4	Beryllium Nitrate
58. 123-86-4	Butyl Acetate
59. 84-74-2	n-Butyl Phthalate
60. 109-73-9	Butylamine
61. 107-92-6	Butyric Acid
62. 543-90-8	Cadimium Acetate
63. 7789-42-6	Cadmium Bromide
64. 10108-64-2	Cadmium Chloride
65. 7778-44-1	Calcium Arsenate
66. 52740-16-6	Calcium Arsenite
67. 75-20-7	Calcium Carbide
68. 13765-19-0	Calcium Chromate
69. 592-01-8	Calcium Cyanide
70. 26264-06-2	Calcium Dodecylbenzene Sulfonate
71. 7778-54-3	Calcium Hypochlorite
72. 133-06-2	Captan
73. 63-25-2	Carbaryl
74. 1563-66-2	Carbofuran
75. 75-15-0	Carbon Disulfide
76. 56-23-5	Carbon Tetrachloride
77. 57-74-9	Chlordane
78. 7782-50-5	Chlorine
79. 108-90-7	Chlorobenzene
80. 67-66-3	Chloroform
81. 7790-94-5	Chlorosulfonic Acid
82. 2921-88-2	Chlorpyrifos
83. 1066-30-4	Chromic Acetate
84. 7738-94-5	Chromic Acid
85. 10101-53-8	Chromic Sulfate
86. 10049-05-5	Chromous Chloride
87. 544-18-3	Cobaltous Formate
88. 14017-41-5	Cobaltous Sulfamate
89. 56-72-4	Coumaphos
90. 1319-77-3	Cresol
91. 4170-30-3	Crotonaldehyde
92. 142-71-2	Cupric Acetate
93. 12002-03-8	Cupric Acetoarsenite
94. 7447-39-4	Cupric Chloride
95. 3251-23-8	Cupric Nitrate
96. 5893-66-3	Cupric Oxalate
97. 7758-98-7	Cupric Sulfate
98. 10380-29-7	Cupric Sulfate Ammoniated
99. 815-82-7	Cupric Tartrate
100. 506-77-4	Cyanogen Chloride
101. 110-82-7	Cyclohexane
102. 94-75-7	2,4-D Acid
103. 94-11-1	2,4-D Esters
104. 50-29-3	DDT
105. 333-41-5	Diazinon
106. 1918-00-9	Dicamba
107. 1194-65-6	Dichlobenil
108. 117-80-6	Dichlone
109. 25321-22-6	Dichlorobenzene (all isomers)
110. 266-38-19-7	Dichloropropane (all isomers)
111. 26952-23-8	Dichloropropene (all isomers)
112. 8003-19-8	Dichloropropene-Dichloropropane Mixture
113. 75-99-0	2-2-Dichloropropionic Acid
114. 62-73-7	Dichlorvos
115. 60-57-1	Dieldrin
116. 109-89-7	Diethylamine
117. 124-40-3	Dimethylamine
118. 25154-54-5	Dinitrobenzene (all isomers)
119. 51-28-5	Dinitrophenol
120. 25321-14-6	Dinitrotoluene (all isomers)
121. 85-00-7	Diquat
122. 298-04-4	Disulfoton
123. 330-54-1	Diuron
124. 27176-87-0	Dodecylbenzenesulfonic Acid
125. 115-29-7	Endosulfan (all isomers)
126. 72-20-8	Endrin and Metabolites
127. 106-89-8	Epichlorohydrin
128. 563-12-2	Ethion
129. 100-41-4	Ethyl Benzene
130. 107-15-3	Ethylenediamine
131. 106-93-4	Ethylene Dibromide
132. 107-06-2	Ethylene Dichloride
133. 60-00-4	EDTA
134. 1185-57-5	Ferric Ammonium Citrate
135. 2944-67-4	Ferric Ammonium Oxalate
136. 7705-08-0	Ferric Chloride

II. HAZARDOUS SUBSTANCES

CAS Number	Chemical Name
137. 7783-50-8	Ferric Fluoride
138. 10421-48-4	Ferric Nitrate
139. 10028-22-5	Ferric Sulfate
140. 10045-89-3	Ferrous Ammonium Sulfate
141. 7758-94-3	Ferrous Chloride
142. 7720-78-7	Ferrous Sulfate
143. 206-44-0	Fluoranthene
144. 50-00-0	Formaldehyde
145. 64-18-6	Formic Acid
146. 110-17-8	Fumaric Acid
147. 98-01-1	Furfural
148. 86-50-0	Guthion
149. 76-44-8	Heptachlor
150. 118-74-1	Hexachlorobenzene
151. 87-68-3	Hexachlorobutadiene
152. 67-72-1	Hexachloroethane
153. 70-30-4	Hexachlorophene
154. 77-47-4	Hexachlorocyclopentadiene
155. 7647-01-0	Hydrochloric Acid (Hydrogen Chloride)
156. 7664-39-3	Hydrofluoric Acid (Hydrogen Fluoride)
157. 74-90-8	Hydrogen Cyanide
158. 7783-06-4	Hydrogen Sulfide
159. 78-79-5	Isoprene
160. 42504-46-1	Isopropanolamine Dodecylbenzenesulfonate
161. 115-32-2	Kelthane
162. 143-50-0	Kepone
163. 301-04-2	Lead Acetate
164. 3687-31-8	Lead Arsenate
165. 7758-95-4	Lead Chloride
166. 13814-96-5	Lead Fluoborate
167. 7783-46-2	Lead Fluoride
168. 10101-63-0	Lead Iodide
169. 18256-98-9	Lead Nitrate
170. 7428-48-0	Lead Stearate
171. 15739-80-7	Lead Sulfate
172. 1314-87-0	Lead Sulfide
173. 592-87-0	Lead Thiocyanate
174. 58-89-9	Lindane
175. 14307-35-8	Lithium Chromate
176. 121-75-5	Malthion
177. 110-16-7	Maleic Acid
178. 108-31-6	Maleic Anhydride
179. 2032-65-7	Mercaptodimethur
180. 592-04-1	Mercuric Cyanide
181. 10045-94-0	Mercuric Nitrate
182. 7783-35-9	Mercuric Sulfate
183. 592-85-8	Mercuric Thiocyanate
184. 10415-75-5	Mercurous Nitrate
185. 72-43-5	Methoxychlor
186. 74-93-1	Methyl Mercaptan
187. 80-62-6	Methyl Methacrylate
188. 298-00-0	Methyl Parathion
189. 7786-34-7	Mevinphos
190. 315-18-4	Mexacarbate
191. 75-04-7	Monoethylamine
192. 74-89-5	Monomethylamine
193. 300-76-5	Naled
194. 91-20-3	Naphthalene
195. 1338-24-5	Naphthenic Acid
196. 7440-02-0	Nickel
197. 15699-18-0	Nickel Ammonium Sulfate
198. 37211-05-5	Nickel Chloride
199. 12054-48-7	Nickel Hydroxide
200. 14216-75-2	Nickel Nitrate
201. 7786-81-4	Nickel Sulfate
202. 7697-37-2	Nitric Acid
203. 98-95-3	Nitrobenzene
204. 10102-44-0	Nitrogen Dioxide
205. 25154-55-6	Nitrophenol (all isomers)
206. 1321-12-6	Nitrotoluene
207. 30525-89-4	Paraformaldehyde
208. 56-38-2	Parathion
209. 608-93-5	Pentachlorobenzene
210. 87-86-5	Pentachlorophenol
211. 85-01-8	Phenanthrene
212. 108-95-2	Phenol
213. 75-44-5	Phosgene
214. 7664-38-2	Phosphoric Acid
215. 7723-14-0	Phosphorus
216. 10025-87-3	Phosphorus Oxychloride
217. 1314-80-3	Phosphorus Pentasulfide
218. 7719-12-2	Phosphorus Trichloride
219. 7784-41-0	Potassium Arsenate
220. 10124-50-2	Potassium Arsenite
221. 7778-50-9	Potassium Bichromate
222. 7789-00-6	Potassium Chromate
223. 7722-64-7	Potassium Permanganate
224. 2312-35-8	Propargite
225. 79-09-4	Propionic Acid
226. 123-62-6	Propionic Anhydride
227. 1336-36-3	Polychlorinated Biphenyls
228. 151-50-8	Potassium Cyanide
229. 1310-58-3	Potassium Hydroxide
230. 75-56-9	Propylene Oxide
231. 121-29-9	Pyrethrins
232. 91-22-5	Quinoline
233. 108-46-3	Resorcinol
234. 7446-08-4	Selenium Oxide
235. 7761-88-8	Silver Nitrate
236. 7631-89-2	Sodium Arsenate
237. 7784-46-5	Sodium Arsenite
238. 10588-01-9	Sodium Bichromate
239. 1333-83-1	Sodium Bifluoride
240. 7631-90-5	Sodium Bisulfite
241. 7775-11-3	Sodium Chromate
242. 143-33-9	Sodium Cyanide
243. 25155-30-0	Sodium Dodecylbenzene Sulfonate
244. 7681-49-4	Sodium Fluoride
245. 16721-80-5	Sodium Hydrosulfide
246. 1310-73-2	Sodium Hydroxide
247. 7681-52-9	Sodium Hypochlorite
248. 124-41-4	Sodium Methylate
249. 7632-00-0	Sodium Nitrate
250. 7558-79-4	Sodium Phosphate, Dibasic
251. 7601-54-9	Sodium Phosphate, Tribasic
252. 10102-18-8	Sodium Selenite
253. 7789-06-2	Strontium Chromate
254. 57-24-9	Strychnine and Salts
255. 100-420-5	Styrene
256. 12771-08-3	Sulfur Monochloride
257. 7664-93-9	Sulfuric Acid
258. 93-76-5	2,4,5-T Acid
259. 2008-46-0	2,4,5-T Amines
260. 93-79-8	2,4,5-T Esters
261. 13560-99-1	2,4,5-T Salts
262. 93-72-1	2,4,5-TP Acid
263. 32534-95-5	2,4,5-TP Acid Esters
264. 72-54-8	TDE
265. 95-94-3	Tetrachlorobenzene
266. 127-18-4	Tetrachloroethane
267. 78-00-2	Tetraethyl Lead
268. 107-49-3	Tetraethyl Pyrophosphate
269. 7446-18-6	Thallium (I) Sulfate
270. 108-88-3	Toluene
271. 8001-35-2	Toxaphene
272. 12002-48-1	Trichlorobenzene (all isomers)
273. 52-68-6	Trichlorfon
274. 25323-89-1	Trichloroethane (all isomers)
275. 79-01-6	Trichloroethylene
276. 25167-82-2	Trichlorophenol (all isomers)
277. 27323-41-7	Triethanolamine Dodecylbenzenesulfonate
278. 121-44-8	Triethylamine
279. 75-50-3	Trimethylamine
280. 541-09-3	Uranyl Acetate
281. 10102-06-4	Uranyl Nitrate
282. 1314-62-1	Vanadium Pentoxide
283. 27774-13-6	Vanadyl Sulfate
284. 108-05-4	Vinyl Acetate
285. 75-35-4	Vinylidene Chloride
286. 1300-71-6	Xylenol
287. 557-34-6	Zinc Acetate
288. 52628-25-8	Zinc Ammonium Chloride
289. 1332-07-6	Zinc Borate
290. 7699-45-8	Zinc Bromide
291. 3486-35-9	Zinc Carbonate
292. 7646-85-7	Zinc Chloride
293. 557-21-1	Zinc Cyanide
294. 7783-49-3	Zinc Fluoride
295. 557-41-5	Zinc Formate
296. 7779-86-4	Zinc Hydrosulfite
297. 7779-88-6	Zinc Nitrate
298. 127-82-2	Zinc Phenolsulfonate
299. 1314-84-7	Zinc Phosphide
300. 16871-71-9	Zinc Silicofluoride
301. 7733-02-0	Zinc Sulfate
302. 13746-89-9	Zirconium Nitrate
303. 16923-95-8	Zirconium Potassium Fluoride
304. 14644-61-2	Zirconium Sulfate
305. 10026-11-6	Zirconium Tetrachloride

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SUPERFUND SECTION

REFERENCES

SCREENING SITE INSPECTION, PHASE II
STANADYNE, INC., DIESEL SYSTEMS GROUP
JACKSONVILLE, ONSLOW COUNTY, NORTH CAROLINA
EPA ID #: NCD084167444

Please print or type in the unshaded areas only
(Fill-in areas are spaced for elite type, i.e., 12 chars/inch).

Form Approved OMB No. 158-R0175

FORM 1 GENERAL

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

F N C D 0 8 4 1 6 7 4 4 4 3 D

LABEL ITEMS

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

-02533

REFERENCE # 1

NOV 13 10 54 AM '86

EWOS

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

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

SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED	SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X		B. Does or will this facility *(either existing or proposed)* include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	(1)
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)		X		D. Is this a proposed facility *(other than those described in A or B above)* which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)	X			F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X		J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP DIESEL SYSTEMS GROUP - STANADYNE, INC.

IV. FACILITY CONTACT

A. NAME & TITLE *(last, first, & title)*	B. PHONE *(area code & no.)*
2 BENSON, ROBERT, FACILITY ENG.	919 353 3666

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 PO BOX 5084

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 JACKSONVILLE	NC	28540

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 405 WHITE STREET

B. COUNTY NAME

ONSLOW

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE *(if known)*
6 JACKSONVILLE	NC	28540	

CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

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

A. FIRST	B. SECOND
3519 (specify) Fuel Injection Systems	(specify)
C. THIRD	**D. FOURTH**
(specify)	(specify)

VIII. OPERATOR INFORMATION

A. NAME: DIESEL SYSTEMS GROUP - STANADYNE, INC.

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

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

D. PHONE (area code & no.): A 919 353 3666

E. STREET OR P.O. BOX: 405 WHITE STREET

F. CITY OR TOWN: JACKSONVILLE

G. STATE: NC

H. ZIP CODE: 28540

IX. INDIAN LAND

Is the facility located on Indian lands? ☐ YES ☒ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water): 9 N	D. PSD (Air Emissions from Proposed Sources): 9 P
B. UIC (Underground Injection of Fluids): 9 U	E. OTHER (specify): 9 (specify)
C. RCRA (Hazardous Wastes): 9 R	F. OTHER (specify): 9 (specify)

XI. MAP

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

XII. NATURE OF BUSINESS (provide a brief description)

Diesel Systems assembly and test.

XIII. CERTIFICATION (see instructions)

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

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
Paul H. Wabrek, Vice President & General Manager	Paul H. Wabrek	11/18/80

COMMENTS FOR OFFICIAL USE ONLY

C

...in the unshaded areas only
...aced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-S80004

U.S. ENVIRONMENTAL PROTECTION AGENCY

EPA HAZARDOUS WASTE PERMIT APPLICATION

Consolidated Permits Program

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

I. EPA I.D. NUMBER

F	N	C	D	0	8	4	1	6	7	4	4	4	3	1

FOR OFFICIAL USE ONLY

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

II. FIRST OR REVISED APPLICATION

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

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

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

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

C	YR.	MO.	DAY
8	77	07	01

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

YR.	MO.	DAY

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

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

[ ] 1. FACILITY HAS INTERIM STATUS

[ ] 2. FACILITY HAS A RCRA PERMIT

III. PROCESSES — CODES AND DESIGN CAPACITIES

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

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

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

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER *(barrel, drum, etc.)*	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER *(Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Item III-C.)*	T04	GALLONS PER DAY OR LITERS PER DAY

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ENF...
5 3 4

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

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

C		T/A	C
C	DUP		1

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT	2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S 0 2	600	G		5				
X-2	T 0 3	20	E		6				
1	S 0 1	2750	G		7				
2					8				
3					9				
4					10				

Continued from the front.

III. PROCESSES *(continued)*

C. SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES *(code "T04")*. FOR EACH PROCESS ENTERED INCLUDE DESIGN CAPACITY.

IV. DESCRIPTION OF HAZARDOUS WASTES

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

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

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

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

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

D. **PROCESSES**

1. PROCESS CODES:
   For listed hazardous waste: For each **listed** hazardous waste entered in column A select the code*(s)* from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.
   For non—listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code*(s)* from the list of process codes contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non—listed hazardous wastes that possess that characteristic or toxic contaminant.
   Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code*(s)*.

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

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

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

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

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
X-1	K054	900	P	T03 D80	
X-2	D002	400	P	T03 D80	
X-3	D001	100	P	T03 D80	
X-4	D002				included with above

CONTINUE ON PAGE 3

Enter ... page before completing if you ... more than 26 wastes to list. Form Approved OMB No. 158-S80004

EPA I.D. NUMBER (enter from page 1): 0 8 4 1 6 7 4 4 4 3 1 (T/A: 3, C: 1)

FOR OFFICIAL USE ONLY: W DUP | 2 DUP

IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
1	F 0 0 2	13,446	P	S 0 1	
2	F 0 0 3	4404	P	S 0 1	
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
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18					
19					
20					
21					
22					
23					
24					
25					
26					

EPA Form 3510-3 (6-80) CONTINUE ON REVERSE

Continued from the front.

IV. DESCRIPTION OF HAZARDOUS WASTE (Continued)

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE 3.

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

F N C D 0 8 4 1 6 7 4 4 4 T/A 3 C 6

V. FACILITY DRAWING

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

VI. PHOTOGRAPHS

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

VII. FACILITY GEOGRAPHIC LOCATION

LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*
3 4 4 5 2 4 0	C 7 7 2 3 – 2 2 0 –

VIII. FACILITY OWNER

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

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

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. *(area code & no.)*
E Diesel Systems Group - Stanadyne, Inc.	9 1 9 - 3 5 3 - 3 6 6 6

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE
F 405 White Street	G Jacksonville	N C	2 8 5 4 0

IX. OWNER CERTIFICATION

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

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
Paul H. Wabrek, Vice President & General Manager	Paul H. Wabrek	11/18/80

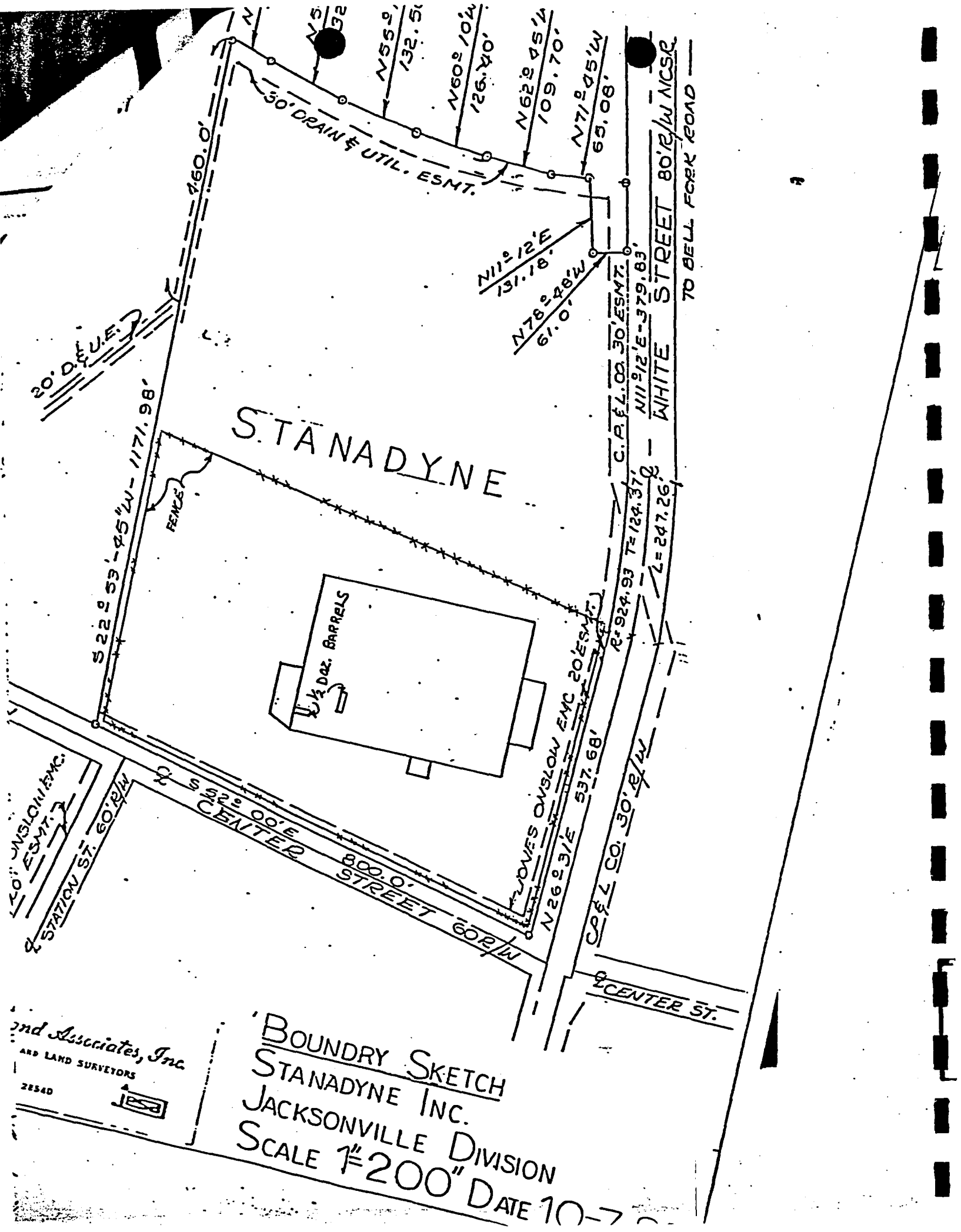
X. OPERATOR CERTIFICATION

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

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
Paul H. Wabrek, Vice President & General Manager	Paul H. Wabrek	11/18/80

CONTINUE ON PAGE 5

Hawkside
Bell Fork
STANADYNE
Substation
Radio Tower
Radio Tower (WBBS)
County Memorial Hospital
Washington Chapel
Mt Sinai Ch
New River Ch
Bell Fork Sch
Coastal Carolina Community College
Golf Course
Cem
Gravel
SEABOARD
COAST LINE
JACKSONV
1 MILE RADIUS
77°22'30"
34°45'
Scales Creek
NORTHEAST CREEK
Ruins
Piling
Foul
Tanks
FOR DETAIL BOUNDRY INFORMATION
SEE BOUNDRY SKETCH ATTACHED
MAP SHOWING 1-MILE RADIUS
STANADYNE INC. JACKSONVILLE DIVIS
JACKSONVILLE TWP. ONSLOW CO. N
JAMES E. STEWART AND ASSOCIATES, INC.
ENGINEERING — SURVEYING — LAND PLANNING
JACKSONVILLE, NORTH CAROLINA


N55° 32'
N55° 32' 132.50'
N60° 10' 126.40'
N62° 45' 109.70'
N71° 45' 65.08'
30' DRAIN & UTIL. ESMT.
160.0'
N11° 12' E 131.18'
N78° 48' W 61.0'
C.P.&L. CO. 30' ESMT.
N11° 12' E - 379.83'
WHITE STREET 80' R/W NCSR
TO BELL FORK ROAD
20' D.E. U.E.
STANADYNE
FENCE
S22° 59' 45" W - 1171.98'
½ DAR. BARRELS
R = 924.93 T = 124.37'
L = 247.26'
JONES ONSLOW EMC 20' ESMT.
N26° 31' E 537.68'
CP&L CO. 30' R/W
S32° 00' E 800.0'
CENTER STREET 60' R/W
STATION ST. 60' R/W
CENTER ST.
and Associates, Inc
AND LAND SURVEYORS
2E54D
BOUNDRY SKETCH
STANADYNE INC.
JACKSONVILLE DIVISION
SCALE 1" = 200" DATE 10-7

REFERENCE # 2

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NC	D084167444

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Stanadyne, Inc. - Diesel Systems Group	405 White Street

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Jacksonville	NC	28540	Onslow	67	03

09 COORDINATES LATITUDE	LONGITUDE
34 45 24.__	__77 23 22.__

10 DIRECTIONS TO SITE (Starting from nearest public road)

From downtown Jacksonville, take NC Highway 24 east for approx. 2 miles. Turn left onto SR 1470 (which leads to County Memorial Hospital) and go approx. 1 mile north. Find facility 0.25 miles to the west on nearby White Street.

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)
Diesel Systems Group - Stanadyne, Inc.	405 White Street

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
Jacksonville	NC	28540	(919) 353-3666

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

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

13 TYPE OF OWNERSHIP (Check one)

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

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

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

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

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION

☐ YES DATE __/__/__ (MONTH DAY YEAR)
☒ NO

BY (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)

CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)

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

03 YEARS OF OPERATION

1976 (BEGINNING YEAR) | _____ (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

Facility is situated on a 20 acre property. Plant assembles and tests diesel components, primarily pumps and injectors. Wastes generated include spent trichloroethane, trichloroethylene, methylene chloride, and related still bottoms.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

No known spills or incidents of on-site disposal. Facility has never stored wastes or chemicals outside the plant building. Stanadyne is a RCRA large quantity generator.

V. PRIORITY ASSESSMENT

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

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

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
Robert C. Benson	Facility engineer at Stanadyne	(919)353-3666

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
D. Mark Durway	NC S&HWMgmt	CERCLA	(919) 733-2801	9 17 87 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NC	D084167444

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

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

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

TONS _____
CUBIC YARDS UNKNOWN
NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

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

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	125	gal/mo	still bottoms
OLW	OILY WASTE			
SOL	SOLVENTS	UNKNOWN		
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	1,1,1- trichlorethane	71556			
SOL	trichloroethylene	79016			
SOL	methylene chloride	75092			

V. FEEDSTOCKS (See Appendix for CAS Numbers)

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

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

1) Records at NC S&HWMgmt, Raleigh, NC.
2) Doug Holyfield of NC S&HWMgmt, pers. comm., 4-19-85.
3) Robert C. Benson, facility engineer at Stanadyne, pers. comm., 9-16-87.

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

DIVISION OF HEALTH SERVICES
EASTERN REGIONAL OFFICE
404 St. Andrews Street
Greenville, N.C. 27834
(919) 756-1343

RECEIVED
FEB 1 1982
SOLID & HAZARDOUS WASTE MANAGEMENT BRANCH

January 29, 1982

REFERENCE # 3

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

FROM: Ray Church, District Sanitarian
Eastern Regional Office

RE: Interim Status Inspection
Diesel Systems Group - Stanadyne, Inc.
P.O. Box 5084
405 White Street
Jacksonville, NC 28540
Onslow County
EPA ID# NCD084167444
Contact: Mr. Bob Benson, Facility Engineer

The following violations of Interim Status Standards for the Stanadyne, Inc. Company were identified during an inspection of that facility on January 19, 1982:

1. Failure to make arrangements with the appropriate local authorities. (265.37)

2. Failure to include arrangements agreed to by local authorities in the contingency plan as required by (265.52(c))

3. Failure to submit copies of the contingency plan to local authorities. (265.53(b))

A compliance date of March 19, 1982 was established and agreed upon by Mr. Benson and myself. On or about that date a reinspection will be performed to check for compliance.

sle

1. Facility Information

Diesel Systems Group - Stanadyne, Inc.
P.O. Box 5084
405 White Street
Jacksonville, NC 28540
Onslow County
EPA ID# NCD084167444

2. Facility Contact

Edwin Reffelt, Facility Service Foreman
(919) 353-3666

Bob Benson, Facility Engineer
(919) 353-3666

3. Survey Participants

Edwin Reffelt, Facility Service Foreman
Bob Benson, Facility Engineer
Raymond L. Church, Jr., District Sanitarian

4. Date of Inspection

January 19, 1982

5. Applicable Regulations

40 CFR Parts 262 and 265 Subpart I F.R. May 19, 1980 and Amendments.

6. Purpose of Survey

RCRA compliance inspection including review of records and site survey. Regulatory requirements covered included those contained in 40 CFR Part 262, Generator Standards and Part 265 Subpart I. Use and Management of Containers.

7. Facility Description

The Diesel System Group - Stanadyne, Inc. facility occupies ten acres of a 20 acre site adjacent to White Street in Jacksonville, NC.

This facility assembles and tests diesel components, primarily pumps and injectors. The facility began operation at this location in 1977.

The hazardous waste produced at this facility which were listed in the Part A are: F001 waste trichloroethylene (U228) and 1,1,1 trichloroethane (U226); F002 methylene chloride; and waste acetone (U002). The F001 and F002 still bottoms are generated at the rate of approximately 110 gallons per month. Acetone is being purged from the system and therefore the generation rate was not available.

These wastes are currently being transported, stored and disposed of by Triangle Resource Inductries of Riedsville, NC. TRI has a contract with this facility to pick up their waste approximately every 60 days.

8. Documentation of Site Deficiencies

Failure to make arrangements with the appropriate local authorities. (265.37)

Failure to include arrangements agreed to by local authorities in the contingency plan as required by (265.52(c))

Failure to submit copies of the contingency plan to local authorities. (265.53(b))

9. Compliance Schedule

A compliance date of March 19, 1982 was established and agreed upon by Mr. Benson and myself. On or about that date a reinspection will be performed to check for compliance.

REFERENCE # 4

"Rite in the Rain"®

ALL-WEATHER

LEVEL

Notebook No.: 311

F4-2316 9

TDD No. F4-9004-54
Standard Fuel Oil Systems
Jacksonville, Onslow County, North Carolina
P. M. Walter Riley

LOGBOOK REQUIREMENTS
REVISED - NOVEMBER 29, 1988

NOTE: ALL LANGUAGE SHOULD BE FACTUAL AND OBJECTIVE

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

Work Plan, Study Plan and Safety Plan read and Understood.

William E. Vasser — William E. Vasser
LARRY GRIER — Larry Grier
Ronald A Wilk — Ronald A Wilk
Terry Ryland — Terry Ryland
Walt Riley — Walter Riley

0800 Collected Trip and Preservative Blanks. Prior to going to site

0830 Arrived at Stinnaford Met with Don Hanna Plant Manager Everfast Corp. Office, John Alexander Eng. Manager.

Walter Riley 6/11/90

0941 ~~Two~~ Additional Sampling locations were added - 3 sediments

0950 Ron Wilde and Terry Ryland Sampled SD 01, SD 02, and SD-03.

SD-01 located at ditch on North ~~west~~ east corner. Sample taken from moist area off of ditch.

SD-02 located on ditch ~~[illegible]~~ southwest ~~[illegible]~~ corner

SD-03 located at Ditch on South ~~west~~ east corner.

Walter Riley 6/11/90

1010 Five photos were taken of the general area.

3 Photos to Give Panoramic View of Building

1 - Drainage ditch at SE Corner

1 - Scrap Metal Storage area, NE Corner

Weather conditions warm and sunny.

0835 The Transdyne facility is on fairly flat property. The vegetation is not stressed. The facility is in a fenced area. The facility consist of ~~[illegible]~~ one large building. The med workers present.

0840 OVA and HNU calibrated

OVA 309901

HNU 770264

0850 Conducted site survey with plant personnel samplers and instruments. There were no readings above background on OVA and HNU

Walter Riley 6/11/90

4	Sample Code	Time 6/11/90	Field Notes	Comments	Description	Samplers	Entered By
located at ditch at NW Corner	SD-01	10:15	OVA, None above background Silty Sand		Silty Sand	Ron Wilde Terry Ryland	WR
Located at ditch at SE Corner.	SD-02	10:25	OVA, 300ppm petroleum smell		Dark Clay/ Sand Organic Matter.	Ron Wilde Terry Ryland	WR
	SD-03	11:55	OVA No Reading		Orange Clay + Sand	Ron Wilde Terry Ryland	WR
	PW-01	11:22	Private Ph 6.73 Jane D.	Well Cond. 36 Sturdavant	Temp. 20°C from resident located at 110 Bell Fork Rd Jacksonville NC.	Ron Wilde Eddie Vassar	W.R.
	SS-01	12:55	HNU, No Sample coll at North	Reading taken located at Corner	High Organic + Sand 3-4 in bls	Ron Wilde Eddie Vassar Terry Ryland	WR
	SB-01	13:05	HNU, No Sample coll at Northern	Reading taken + Corner	Depth 4.5 ft Clay + Sandy Soil Sample taken at Saturated Zone	Ron Wilde Eddie Vassar Terry Ryland	WR
	SS-05	14:10	HNU, No Sample at location on of building	Reading East Side	Sandy Soil 3-4 in BLS	Ron Wilde Eddie Vassar Terry Ryland	WR
Walter Riley 6/11/90					Walter Riley 6/11/90		S

6 PH Conductivity meter
Calibrated PH 4.00, 7.00, 10.00
Conductivity @ 2.00, Calibrated at 10:15

Time	Temp.	PH	Cond.
11:05	23°C	6.74	313
11:10	21°C	6.75	304
11:15	20°C	6.73	306

Sample collected from garden hose due to inadequate space in well house.

11:20 Collected VOA's
Split with Consultant

11:22 Collected Cter bottles and gallon bottles
split with Consultant

~~the~~ Mr. James B. Sturdavant wanted results from private well sampled

pH S/N. K8975221
+Conductivity meter

Walter Riley 6/11/90

10:50 Stopped for private well sample. First Check at Cut ~~[illegible]~~ Across Sports: Then across Street at Beige house Then house next door M. James B. Sturdavant, Well approx. 50 ft deep He declined Splits.

James B. Sturdavant
Address: 710 Bell Fork Rd.
Jacksonville, NC.
28540

Phone: 919-353-5179

Well is not being used very often. Pump has only a small pressure tank.

Walter Riley 6/11/90

8	Sample Code	Time	Field Comments	Notes/	Description	Samplers	Entered By
	SB-05	~~14:00~~ 14:20	Sand Soil Depth ~~4 feet~~ Depth at 4.5 ft No HNU Reading above Bkgd	Light Gray ~~Sandy~~ Sandy Soil and Silty Saturated Zone		Ron Wilde Terry Ryland Eddie Vasser	WR
	SS-02	14:50	Brown Hard No Reading above Bkgd	Sample taken on 4 ft	Sample taken 4-8 in in the hollow land Vor surface from dark brick Sandy Clay Soil	Ron Wilde Terry Ryland Eddie Vasser	WR
	SB-02	15:00	Hard Reading Sppm Clay, Sand Clay and	Red ~~two~~ Orange	Approx. Depth 4-5 ft of Saturated Zone	Ron Wilde Terry Ryland Eddie Vasser	WR
	SS-03	15:20	Sandy Dry	Silty Gray	Sample taken at 3 to 8 inches	Ron Wilde Terry Ryland Eddie Vasser	WR
	SB-03	15:30	Sample at Zone	taken Saturated Orange Clay	Depth approx. 4 ft	Ron Wilde Terry Ryland Eddie Vasser	WR

Walter Riley 6/11/90 Walter Riley 6/11/90

10

6/11/90

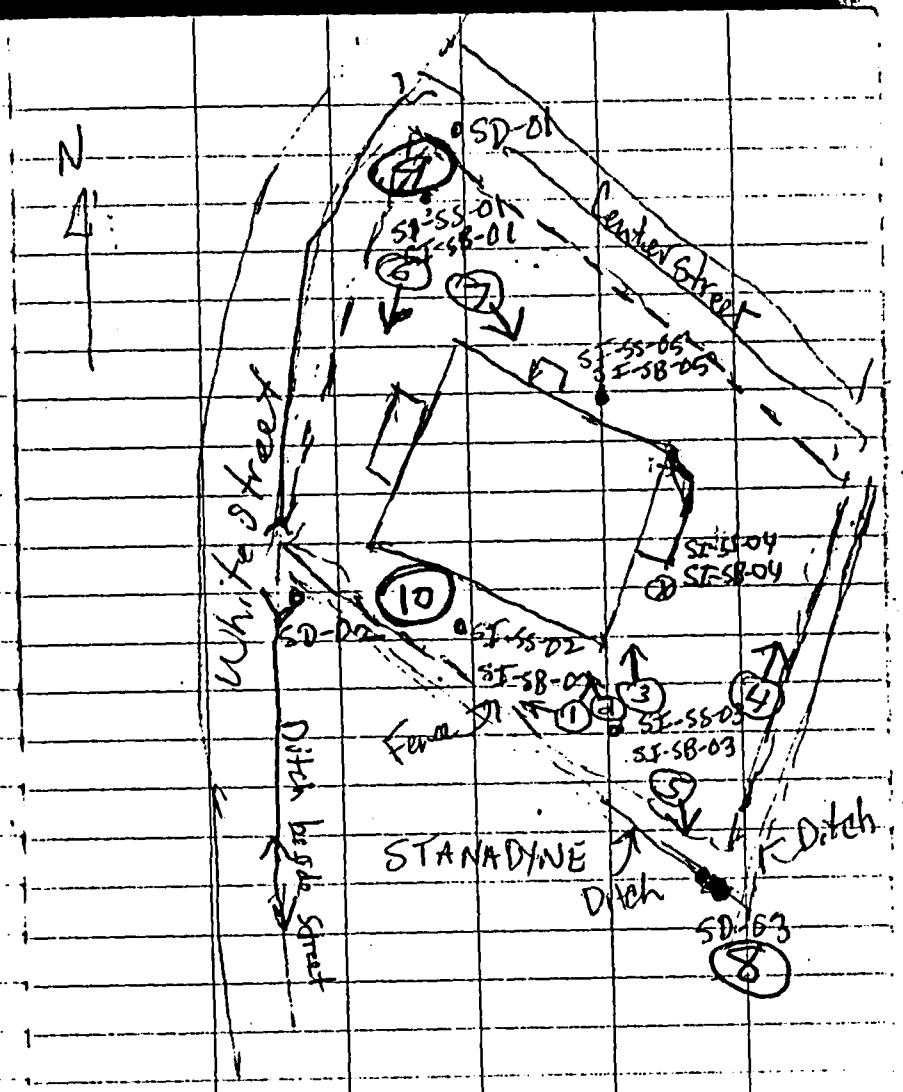
14:25 - Took 2 Photos of North & West Sides of Facility

16:21 Samples transferred to John M. Alexander 6/11/90 919-353-3666

Split Samples transferred

16:27 Jeff Eymandi Ray F. Weston

Walter Riley 6/11/90



Walter Riley 6/11/90

11

Sample Code	Time	Field Notes Comments	Description	Sampler	Entered By
SS-01	16:00	Brownish Red Sandy Soil Hrm No reading above background	Soil sample take 4-8 inches bls.	Eddie Vasser Terry Ryland	WR
SB-04	16:05	Whitish Clay Soil, No VOX reading	Sample taken approx. 6 ft.	Eddie Vasser Terry Ryland	WR

Walter Riley 6/11/90

Walter Riley 6/11/90

14

6/12/90

0850 Arrived at City of Jacksonville Public Utility. The number of meters 10,786 Approximately

0900 Met with Al Hartman of Public Water Dept. Well range depth of of 600 ft.
Also Shallow well 300-400 feet.
Pleistocene Formation

Service area covers entire City of Jacksonville plus outlying area.

Some private wells - 60 to 100 ~~private~~ feet.

Camp Lejeune has three on system. Approx 100 wells.

0930 Arrived at County Water System.
14000 - 17000 Customers.

0948 No commercial fishing from Jacksonville Mostly Sheeds Farm and Swain's Jacksonville Onslow County Chamber of Commerce.

1049 Arrived at Camp Lejeune
The average depth is 152 ft.

Information contained in U.S. Geological Survey Water Resources Investigations Report 88-4096 "Assessment of Hydrological and Hydrologic Data at Camp Lejeune Marine Corps Base, North Carolina.

6/12/90 Walter Riley

6/12/90 Walter Riley 15

16 6/12/90

Possibly one private well in the Area.
39 wells in the Main Base area. Bldg 20
18 Bldg 620.
7 Tarawa Terrace Closed Temporarily
23 near air base.

Approx. 50,000 persons (military personnel) and 13,000 dependents

Approximately 13 of the wells are contaminated
Sam Miller want copy of Report
Camp Lejeune Water Dept

6/12/90 Walter Riley

Standdyne Elec, Diesel Systems Group no longer exist. What was Standdyne Elec became MOEN Inc. a private Co. Standdyne New Bern, Sanford and Kinston facilities became Moen Inc. The remainder of Standdyne Elec. became Standdyne Automotive. Standdyne Automotive became is a privately held Co. Standdyne Elec. became private in Feb. 1988. Standdyne Automotive became private in Feb 16, 1989. Moen Inc is also private. Waste from the Standdyne facility is currently being transported by Ecolib of Greensboro N.C. The Jacksonville facility has not received waste from the New Bern facility since 1983.

6/2/ Walter Riley

18

06/13/90
Organic spike soil DT644
sign for by Sam McIver
06/12/90 - 1050 am. Never
received. Chain of Custody
Record #4-15150
Relinquished by Debbie Colquitt

6/22/90

Additional photos of activities
at Stanadyne Inc are
now described and coded.

(8) Photo of sediment
Sample collection, SESD-03

(9) Soil sample collection,
ST-SS-01
(WKV)

(10) Subsoil sample collection,
ST-SB-02

06/13/90 Larry Shier

6/22/90
W.E. Vassar 19

8/1/90

Additional notes about Standalyne Property...

Mentor Oil and similar oils are stored in an aboveground tank on the southwest side of the building in the area where SS-02/SB-02 were collected. The tank is surrounded by a concrete secondary containment berm.

Southeast of the main building is a small shed where solvents are stored. There is a ventilation fan in the building.

A large part of the east end of the facility is paved parking area.

Parking areas are also located on the north & west sides of the main building. The area south of the building & immediately east (between building & parking area)

8/1/90 (CBSU)

8/1/90

is a grassy area.

The area in the northwest corner of the property is grassy.

Surface runoff from the property enters drainage ditches located west, south, and east of the facility. About ½ of the runoff entering the south side ditch flows to the west side ditch and ½ flows to the east side ditch. Water in both ditches eventually reaches Scales Creek. (See Topo Map.)

Property owned by Standalyne south of the south ditch (outside of the fence) is mostly open, undeveloped land with some pine trees.

8/1/90 (WSS)

8/1/90

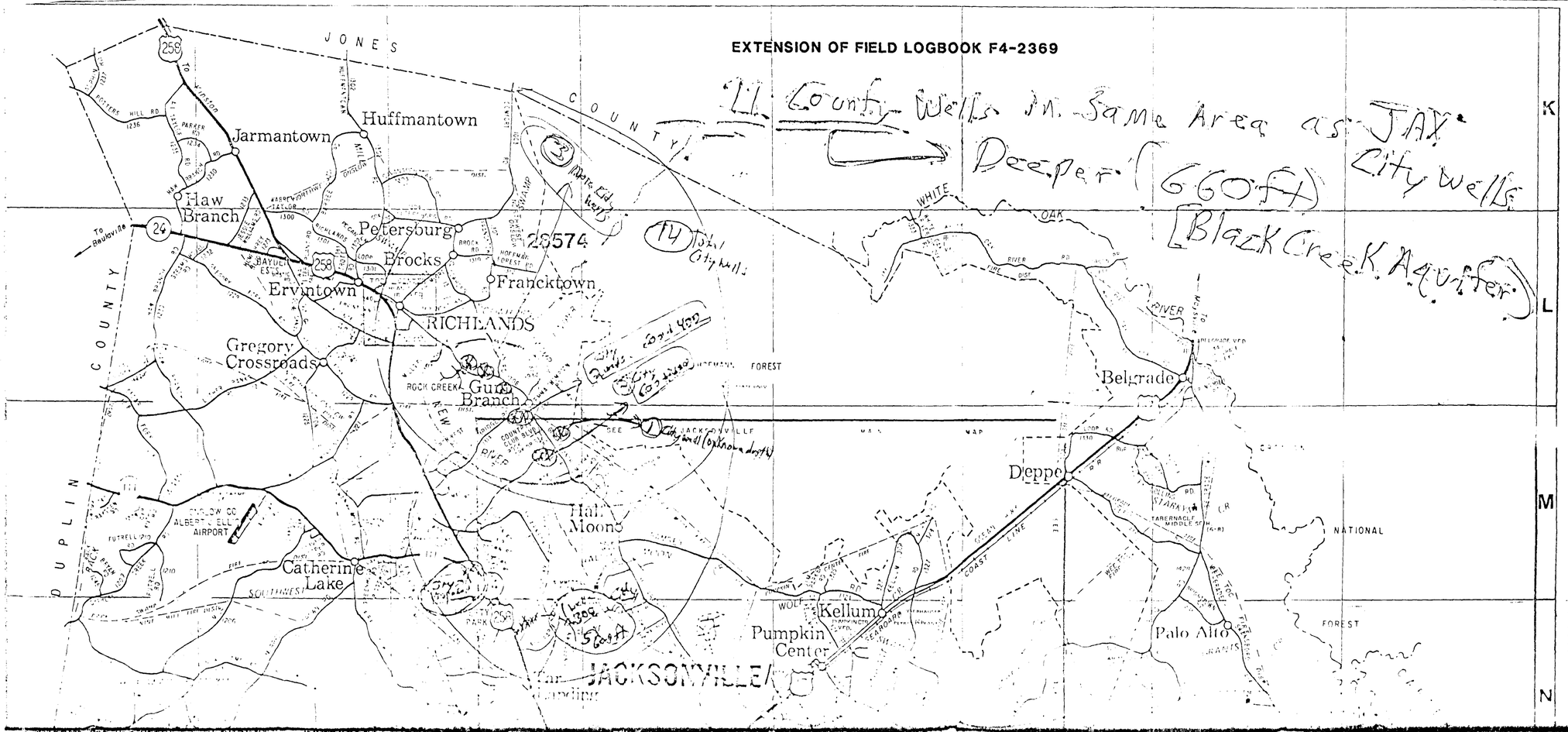
→ Britthaven Nursing Home is located about 0.2 mile NNE of facility.
(Not shown on topo map!)

→ Recreational boaters were observed in Northeast Creek & the New River.

WEW 8/1/90

8/1/90

EXTENSION OF FIELD LOGBOOK F4-2369



ONSLOW COUNTY INDEX

1ST ST S12
2ND ST R14, S12
3RD ST R14, S12
4TH RD P14
4TH ST R14, S12
5TH ST R14, S12
6TH ST R14, S12
7TH ST R14, S12
8TH ST R14, S12
9TH ST R14, S12
10TH ST R14
11TH ST R14
12TH ST R14
13TH ST R14
14TH ST R14
15TH ST R14
16TH ST R14
17TH ST R14
18TH ST R14
21ST ST R13
22ND ST R13
23RD ST R13
24TH ST R13

A
"A" ST S12
ACCESS RD Q12
A.T. TAYLOR RD K7
ALPHIN RD K7
ANDERMORA RD O7
ANITA DR N13
ARAGONA BLVD N10
ASH CT O13
ASPEN LN N9
AVERY O13
AVON DR O13

B
"B" ST S12
BANKS BRIDGE RD L8
BANNERMAN'S MILL RD M8
BARBEE RD L8
BARBOUR RD O13
BATCHELOR'S DR M10
[illegible]

[illegible]
BELGRADE SWANSBORO RD M13, N13, 14, O14
BEN WILLIAMS RD N8
BILL CANADY RD R11
BILLY HUDSON RD M9
BISHOP RD S9
BLUE CREEK RD N9, O8
BOOKER T. WASHINGTON BLVD Q10
BOOTH RD L8
BRAMSTER BLVD O11
BRANCH RD M9
BRIGHTWOOD RD M13
BROADWAY ST S12
BROOK RD L9
BROWN RD M9
BRYAN RD M7, 10
BUMPS CREEK RD R11
BUTTERNUT LN N9

C
CAMP QUEEN RD O13
CANADY LN R11
CANAL ST S12
[illegible]

FREEMAN AVENUE RD N13
FRESHWATER DR P13
FULCHERS LANDING LOOP RD Q11
FULCHERS LANDING RD R11
FUTRELL RD M7

G
GALLOWAY JONES RD N12
GIBSON BRIDGE RD L12
GLANCY RD P14
GOOSE CREEK RD P13
GOULD RD N9
GRANTS CREEK RD N12
GRANT ST S11
GRAY ST R13
GRAY TOWN RD N9
GREAT NECK LANDING RD P13
GREEN ST R13
GREENWOOD RD N8
GREGORY FORK RD L8
GREY POINT RD P9, 10
GUM BRANCH RD L9, M9, N10
GURGANUS RD N7
GUS HORNE RD R9
GUTHREY RD P14

H
HADLEY COLLINS RD M12, 13
HALF MOON CHURCH RD M10
HALL LN R11
HALL POINT RD R11
HALL TOWN RD N11
HAMMOCK BEACH RD O14, P14
HARBOR POINT RD S10
HARDISON RD S9
HARDY GRAHAM RD P7
HARGETT ST N10
HARRIS CREEK LOOP RD O8
HARRIS CREEK RD O8
HARTHER DR N9
HAWS BRANCH RD K7, L7
[illegible]

[illegible]
HILTON SANDERS RD P9
HINES FARM RD N9
HINES STAND SOUND CHURCH RD S9
HINESTOWN RD N9
HOBBS DR N9
HOLCOMB RD O11
HOLLY SHELTER RD O8
HOWELL RD O13
HOFFMAN FOREST RD L9
HOLLY RIDGE SNEADS FERRY RD S9
HOWARD RD M9
HUBERT BLVD O12, 13
HUFFMANTOWN RD K8
HUMPHREY BLVD L8
HUMPHREY RD O9
HURST CIR P11

I
IVYBRIDGE DR O13

J
JAMES ST P11
JESSIE WILLIAMS RD L8
JIM BLAKE RD N9
JIM ENGLISH RD N7
JIM PARKER RD M11
[illegible]

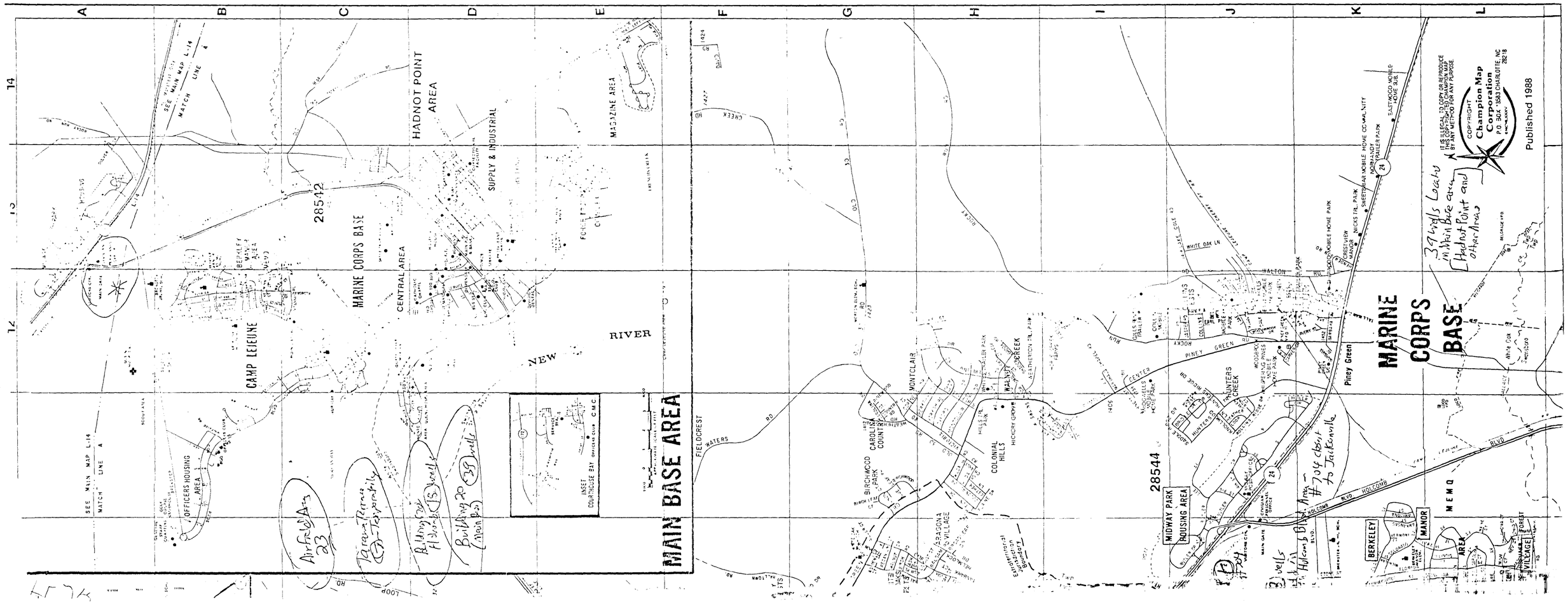
P
PADGETT RD ..... [illegible]
PARKER RD ..... K
PARKETOWN RD ..... [illegible]
PARK LN ..... [illegible]
PARROT SWAMP LOOP RD ..... [illegible]
PECAN LN ..... [illegible]
PENINSULA MANOR RD ..... [illegible]
PERU RD ..... [illegible]
PETERSBURG RD ..... [illegible]
PIERCE RD ..... [illegible]
PICKETT RD ..... [illegible]
PINE ..... [illegible]
PINETOWN RD ..... [illegible]
PINE VALLEY RD ..... [illegible]
PINEVIEW RD ..... [illegible]
PINEY GREEN RD ..... N11, [illegible]
PINEY GROVE BAPTIST CHURCH RD ..... [illegible]
PONY FARM RD ..... [illegible]
POPE LN ..... [illegible]
POPLAR DR S ..... [illegible]
PORT DR ..... [illegible]
POTTERS HILL RD ..... [illegible]
PRESTON WELLS RD ..... [illegible]
PUMPKIN CENTER PINEY GREEN RD ..... N

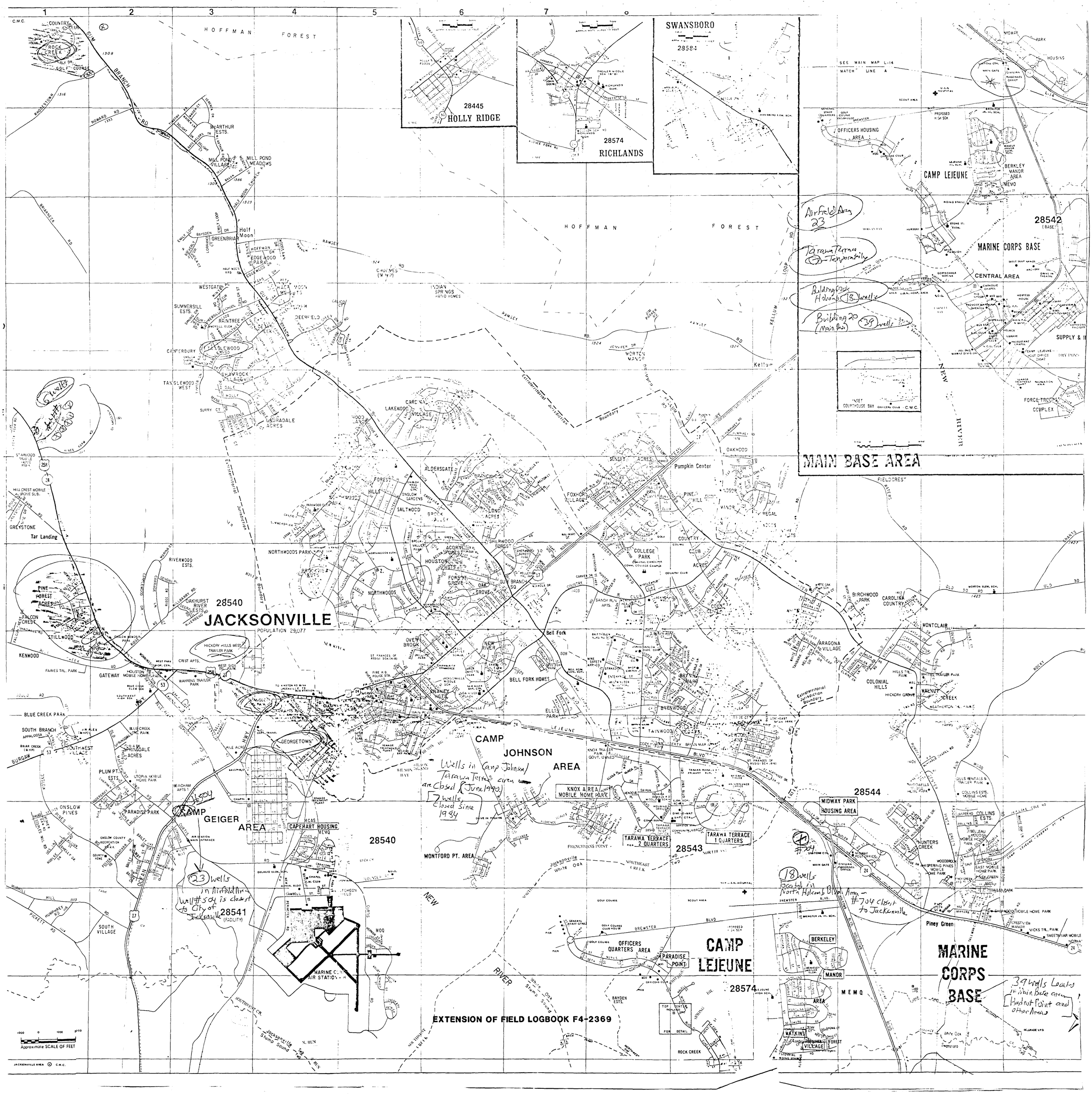
Q
QUAIL LN ..... [illegible]
QUAIL TR ..... O
QUEENS CREEK RD ..... P
QUEENS HAVEN RD ..... P
QUEENS RD ..... O

R
RALIEN ST ..... S
RAMSEY RD M10
RANGE RD ..... Q
RAVENELL ..... R
RAYNOR AV ..... [illegible]
REEVES ST ..... S
REIGEL DR ..... O
REVIVAL CENTER RD ..... [illegible]
RHODESTOWN FIRE DEPT. RD ..... [illegible]
RHODESTOWN RD ..... [illegible]
RICHARD RIGGS RD ..... [illegible]
[illegible]

[illegible]
RIVER DR L9, R11
RIVER REACH DR O1
RIVER RD P11, R1
ROCK CREEK DR S ..... M
ROCKY RUN RD O1
RUBY'S LN M1

S
SANDERS DR O1
SAND RIDGE RD O11, P1
SCOTT JENKINS RD ..... O
SEAGULL LN R1
SEASHORE DR P1
SETH WILLIAMS BLVD O1
SEWELL RD ..... P
SHAMROCK DR N9
SHELL ROCK LANDING ..... [illegible]
SHEPARD RD R9
SHORE DR S6
SILANCE RD ..... O
SINGLETON ST S7
SLOAN ST S1
SMALLWOOD RD P1
SMITH RD N12, 13
SNEADS FERRY RD ..... P12, Q12, R9, R
SPICER RD M1
SPRINGHILL RD ..... [illegible]




JACKSONVILLE
POPULATION 29,077
28540
28541
(FACILITY)
28542
(BASE)
28543
28544
28574
28445
HOLLY RIDGE
RICHLANDS
SWANSBORO
MAIN BASE AREA
MARINE CORPS BASE
CAMP LEJEUNE
CAMP JOHNSON AREA
CAMP GEIGER AREA
MARINE CORPS AIR STATION
HOFFMAN FOREST
EXTENSION OF FIELD LOGBOOK F4-2369
Wells in Camp Johnson/ Tarawa Terrace area are Closed (June 1990) 7 wells Closed Since 1994
23 wells in Airfield Area well #504 is closest to City of Jacksonville
18 wells located in North Holcomb Blvd Area — #704 closest to Jacksonville
39 wells Located in Main Base area [Hadnot Point and other Areas]
Airfield Area 23
Tarawa Terrace (7) Temporarily
Building 820 Holcomb (18) wells
Building 20 (Main Base) (39) wells

Case No. 14283

Low Concentration (Yes/No)

Organics

	Airbill No.	Lab	Media
14-4	7005044421	IT CORPORATION CERRITOS, CA	Soil Water
14-5	7005044432	~~ORLANDO LABORATORIES~~ ORLANDO, FL.	Soil Water

TOD # F4-9004-54
Date 6/11/90 By Whom: E. Vasser
Time 10:00 # keyed to map: (1)
Location Panoramic View of Facility
Picture of: South grassy area.

TOD # F4-9004-54
Date 6/11/90 By Whom: E. Vasser
Time 10:02 # keyed to map: (2)
Location Panoramic View of facility
Picture of: SE Corner of Main building

TOD # F4-9004-54
Date 6/11/90 By Whom: E. Vasser
Time 10:04 # keyed to map: (3)
Location Panoramic View of facility
Picture of: East Grassy area.

TDD # F4-9004-54
Date 6/11/90 By Whom: E Vasser
Time: 10:04 # keyed to map: (4)
Location: East paved area, fence
Picture of: Scrap Metal storage area

TDD # F4-9004-54
Date 6/11/90
Time 10:06 E. Vasser
Location SE Corner of facility (5)
Picture of: Drainage ditch

TDD # F4-9004-54
Date 6/11/90 (West) (6) E Vasser
Time 14:25
Location West End of Facility (6)
Picture of: Parking area, front of building (West)

TDD # F4-9004-54
Date 6/11/90 By Whom: E Vasser
Time: 14:26 # keyed to map: (7)
Location: North Pond area
Picture of: Loading Dock area

TDD # F4-9004-54
Date 6/11/90 By Whom: E. Vasser
Time 11:55 # keyed to map: (8)
Location: SE drainage ditch
Picture of: ST-SD-03 (WSU)

TDD # F4-9004-54
Date 6/11/90 By whom: E. Vasser
Time 12:52 # keyed to map: (9)
Location: NW Corner lawn
Picture of: ST-SS-01

TBD # F4-9004-54
Date 6/11/90 By Whom E. Vasser
Time 15:00 # keyed to map: (10)
Location South side of main building
Picture of: SI-SB-02

TBD #
Date By Whom
Time # keyed to map
Location
Picture of:

TBD #
Date By Whom
Time # keyed to map
Location
Picture of:

TBD #
Date By Whom
Time # keyed to map
Location
Picture of:

TBD #
Date By Whom
Time # keyed to map
Location
Picture of:

Stanadyne diesel systems

REFERENCE # 5

RECEIVED
MAY 6 1981
SOLID & HAZARDOUS WASTE MANAGEMENT BRANCH

April 29, 1981

Mr. O. W. Strickland, Head
Solid Waste Management
Environmental Health Section
P. O. Box 2091
Raleigh, NC 27602

Dear Mr. Strickland:

Attached is a waste analysis performed by Moore, Gardner & Associates, Inc. on a water soluble cutting fluid that is used in our manufacturing process. The EP toxicity test indicates the metals to be below the EPA limits; however, some of the metals are above the limits set by the City of Jacksonville, Water and Sewage Department. Can this product be disposed of in a public landfill?

The product is a synthetic cutting fluid mixed to a ratio of 19-1 - 19 parts water to one part cutting fluid. The operation performed is a grinding operation.

Very truly yours,

Bob Benson
Supervisor, Facility Engineering

/pec
Attachment
cc: Mr. Rick Learey, Onslow County Manager

1200 gal - tanks

DIESEL SYSTEMS GROUP - STANADYNE, INC.
P. O. BOX 5084, JACKSONVILLE, NORTH CAROLINA 28540, PHONE: 919/353-3666

ROOSA MASTER StartMaster

110 WEST WALKER AVENUE
ASHEBORO, N. C. 27203

TELEPHONE (919) 625-6111
P. O. BOX 728

Owner & Location: Diesel Systems Group
Stanadyne Division
405 White Street
Jacksonville, NC 28540

Laboratory: Moore, Gardner & Associates, Inc.
Environmental Laboratory
110 West Walker Avenue
Asheboro, North Carolina 27203
USEPA Lab # NC002
NCNRCD Lab # 18

Sample Collected By: James E. Gill, MGA

Date Sampled: 2/7/81

Date Received in Lab: 2/9/81

Sample Location: Imperial 1010 Cutting fluid emulsion from recirculating sump

Physical Characteristics:

solid	XX liquid	semi-solid

Layering:

XX none	bilayer	multilayer

Analyst: Kenneth L. Jesneck
Patty Smith
Stephanie Trogdon

Date of Analysis: 2/9/81

Client I.D. # 280000(505) - 15470

E P Toxicity Scan
for
Hazardous Waste

Hazardous Waste Testing Procedure:

The dewatered sludge was analyzed for the eight (8) metals, four (4) pesticides, and two (2) herbicides listed in the regulations and according to the extraction and filtration procedures detailed in CFR, Vol. 45, No. 98, Monday, May 19, 1980, pp. 33121-33128.

Analytical Instruments Used:

Mettler H-32 Analytical Balance
Boekel Desiccator
Fisher Isotemp Oven
Corning AG-11 Glass Still
Millipore Pressure Filtration and Extraction Assembly
Perkin-Elmer 056 Recorder
Fisher Accumet Model 520 pH meter
Orion 605 Electrode Control & Specific ion Probes
B & L Spectronic 70 Spectrophotometer
Perkin-Elmer 503 Atomic Absorption Spectrophotometer
Perkin-Elmer Sigma 2B Gas Chromatograph

Leachate Test Procedure:

Acetic Acid required was determined from one composite sludge sample.

Sample Wt.

mls of .5N Acetic Acid required to adjust to 5.0±0.2 at different time intervals.	
	initial
	15 min.
	30 min.
	1 hr.
	2 hr.
	3 hr.
	4 hr.
	24 hr.
	28 hr.
	total

NO EXTRACTION
% Solids
< 0.5 %

Initial pH: 8.8

Final pH:

Test Results:

EPA hazardous waste number	Contaminant	Maximum Concentration (mg/l)	Direct Analyses (mg/l)	E P Leachate Analyses (mg/l)
D004	Arsenic	5.0	0.013	0.010
D005	Barium	100.0		1.54
D006	Cadmium	1.0	0.045	0.06
D007	Chromium	5.0	0.85	1.38
	Chromium, Hexvalent			
D008	Lead	5.0	0.10	0.52
D009	Mercury	0.2	0.0098	0.0055
D010	Selenium	1.0		0.024
D011	Silver	5.0	1.20	5.10
D012	Endrin (1,2,3,4,10,10-hexachloro-1,7-epoxy-1,4,4a,5,6,7,8,8a-octahyro-1,4-endo, endo-5,8-dimethano naphthalene)	0.02		
D013	Lindane (1,2,3,4,5,6-hexachlorocyclohexane, gamma isomer.)	0.4		
D014	Methoxychlor (1,1,1-Trichloro-2,2-bis p-methoxyphenyl ethane).	10.0		
D015	Toxaphene ($C_{10}H_{10}Cl_9$, Technical chlorinated Camphene, 67-69 percent chlorine).	0.5		
D016	2,4-D, (2,4-Dichlorophenoxyacetic acid).	10.0		
D017	2,4,5-TP Silvex (2,4,5-Trichlorophenoxypropionic acid).	1.0		

% solids =

TOC =

TIC =

Cyanides = 3.7 mg/l

Flash Point = No Flash @ 140°F

Direct Analyses on Copper = 0.80 mg/l
Nickel = 0.20 mg/l
Zinc = 2.3 mg/l

COD = 281,000 mg/l

Oil & Grease = 1122 mg/l

% Moisture = 91.46 %

Certification Statement:

I have personally examined and am familiar with the information submitted in this certification, and I hereby certify under penalty of law that this information is true, accurate, and complete.

Kenneth L. Jesneck
Laboratory Technician
G.C. Anaylst

Walter L. Miller
Asst. Director of Laboratory Services

Stephanie S. Trogdon
Laboratory Technician
A.A. Analyst

Patty Smith
Laboratory Technician
A.A. Analyst

NORTH CAROLINA HAZARDOUS WASTE MANIFEST

Doct. No. 21A

A. IDENTIFICATION INFORMATION

	EPA ID NO.	NAME	ADDRESS	TELEPHONE
GENERATOR	NCD004167444	Stanadyne, Inc.	P.O. Box 5004 Jacksonville, NC 28540	919-353-3666
TRANSPORTER 1	ALD007972730	EcoFlo	2755 [illegible] Greensboro, NC 27407	919-855-7185
TRANSPORTER 2	ALD00622464	Chemical Waste Mgmt.	Emelle, Alabama	(4)
TSDF*				

B. WASTE INFORMATION

CONTAINER (S) NO.	CONTAINER (S) TYPE	DOT DESCRIPTION/CLASS/ID NO.	TOTAL QUANTITY	WEIGHT	EPA WASTE CODE NUMBER	DISCREPANCY INFORMATION
1	55 gal Drum	Oil Petroleum Sledge Open Top Drum-NA-1270	55 gal		N/A	
9	55 gal	Trichlorethane 111 ORMA UN2831	450 gal	4.50%.	U-226	
4	55 gal	Dichlorothane ORMA UN1593	220 gal	9976	[illegible]-080	

C. EMERGENCY NUMBERS

NATIONAL RESPONSE CENTER: 1 - 800 - 424 - 8802

GENERATOR: ( ) DISPOSER: ( ) N. C. HIGHWAY PATROL (919) 733 - 3861

D. SPECIAL HANDLING/EXCEPTION REPORT/DISCREPANCY REPORT (NO.)

1. Trichloreethane 111 Do Not Open In Confined Space
2. Dichloromethane Do Not Open In Confined Space

REFERENCE # 6

(IF NEEDED, USE ADD

E. CERTIFICATIONS

THIS IS TO CERTIFY THAT THE ABOVE-NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION AND THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY.

Norman Preston AUTHORIZED REPRESENTATIVE OF GENERATOR	Norman Preston GENERATOR REPRESENTATIVE'S SIGNATURE	11-2-83 DATE

THIS IS TO CERTIFY ACCEPTANCE OF THE HAZARDOUS WASTE SHIPMENT DESCRIBED ABOVE.

MELVIN BIVENS AUTHORIZED REPRESENTATIVE OF TRANSPORTER 1	[illegible] TRANSPORTER REPRESENTATIVE'S SIGNATURE	11/2 DATE
AUTHORIZED REPRESENTATIVE OF TRANSPORTER 2	TRANSPORTER REPRESENTATIVE'S SIGNATURE	DATE

THIS IS TO CERTIFY ACCEPTANCE OF THE HAZARDOUS WASTE SHIPMENT DESCRIBED ABOVE FOR

☐ TREATMENT ☐ STORAGE OR ☐ DISPOSAL

AUTHORIZED REPRESENTATIVE OF TSDF	Steve Anderson TSDF REPRESENTATIVE'S SIGNATURE	11/11 DATE

*TSDF - TREATMENT, STORAGE, OR DISPOSAL FACILITY

DHS FORM 2980 (10/80)
SOLID AND HAZARDOUS WASTE

(INSTRUCTIONS ON BACK SHEET)

FOR ADDITIONAL INFORMATION:
CONTACT MANIFEST SYSTEM
SOLID & HAZARDOUS WASTE MANAGEMENT BRANCH
N. C. DEPARTMENT OF HUMAN RESOURCES
P. O. BOX 2091, RALEIGH, N.C. 27602
(919) 733 - 2178

(10)

N. C. DEPARTMENT OF HUMAN RESOURCES
DIVISION OF HEALTH SERVICES

RECEIVED MAR 10 1989

N. C. 1988 HAZARDOUS WASTE GENERATOR THAT DOES ON-SITE TREATMENT, STORAGE, OR DISPOSAL-TSD FACILITY ANNUAL (PART B) REPORT*

Four Digit Standard Industrial Classification (SIC) No. For Operations In Your Company That Generated The Waste 3519

REFERENCE # 7

I. Installation EPA ID Number: N C D 0 8 4 1 6 7 4 4 4

II. Name of Installation: Stanadyne, Inc.

III. Location of Installation: 405 White Street
(Street or Route Number)

Jacksonville (City or Town) Onslow (County) North Carolina (State) 28540 (Zip Code)

IV. Installation Contact: Bob Benson (Name) 919/353-3666 (Area Code) (Phone Number)

V. Waste Identification:

	A. EPA Waste No.	B. Description of Waste/ Chemical Name	1. Haz. Waste Water or Remedial Action Waste	C. Quantity Generated (LBS)	D. Amount of Waste by Handling Method: 1. Handling Method Code	2. Quantity Stored**/Treated Disposed, or Recovered On-Site (LBS)	Shipped to off-Site Treatment, Disposal, or Recovery Facility: 3. Handling Method Code	4. Quantity (LBS)	5. Facility EPA I.D. Number / Recovery Facility Name
1	F001	Methylene -		21,745	T05	R 11,495	T05	10,250	NCD980842132
2		chloride							
3	F002	Trichloroe-		600	S01		T05	600	NCD980842132
4		thane III							
5	F002	Tetrachloroe-		1,000	S01		T05	1,000	NCD980842132
6		thylene							
7	F003	Acetone		1,600	S01		T05	1,600	NCD980842132
8									
9									
10									
11									
12									

(If more space is needed check _____ and complete attachment 1)

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

Bob Benson (Signature) Bob BENSON (Print or Type Name) 3-7-89 (Date Signed)

DHS 3037 (Revised 1-89) Doc No. 0352A

REFERENCE # 8

Third Edition

ORGANIC CHEMISTRY

ROBERT THORNTON MORRISON

ROBERT NEILSON BOYD

New York University

ALLYN AND BACON, INC.

BOSTON
LONDON
SYDNEY
TORONTO

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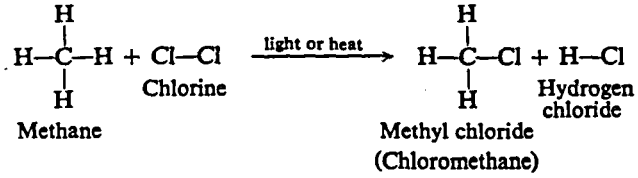
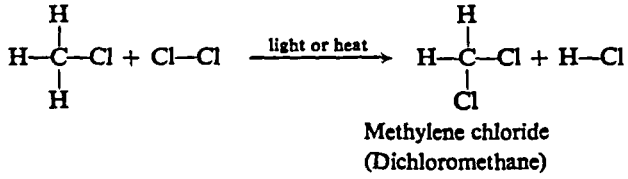
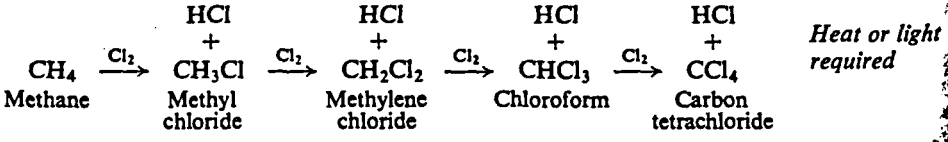
methane, and the hydrogen atom thus replaced is found combined with a second atom of chlorine.



The methyl chloride can itself undergo further substitution to form more hydrogen chloride and CH_2Cl_2, *dichloromethane* or *methylene chloride* (CH_2 = methylene).



In a similar way, chlorination may continue to yield $CHCl_3$, *trichloromethane* or *chloroform*, and CCl_4, *tetrachloromethane* or *carbon tetrachloride*. These last two compounds are already familiar to us, chloroform as an anesthetic, and carbon tetrachloride as a non-flammable cleaning agent and the fluid in certain fire extinguishers.



2.8 Control of chlorination

Chlorination of methane may yield any one of four organic products, depending upon the stage to which the reaction is carried. Can we control this reaction so that methyl chloride is the principal organic product? That is, can we limit the reaction to the first stage, *mono*chlorination?

We might at first expect—naïvely, as it turns out—to accomplish this by providing only one mole of chlorine for each mole of methane. But let us see what happens if we do so. At the beginning of the reaction there is only methane for the chlorine to react with, and consequently only the first stage of chlorination takes place. This reaction, however, yields methyl chloride, so that as the reaction proceeds methane disappears and methyl chloride takes its place.

As the proportion of methyl chloride grows, it competes with the methane for the available chlorine. By the time the concentration of methyl chloride exceeds that of methane, chlorine is more likely to attack methyl chloride than methane, and the second stage of chlorination becomes more important than the first. A large amount of methylene chloride is formed, which in a similar way is chlorinated to chloroform and this, in turn, is chlorinated to carbon tetrachloride. When we finally work up the reaction product, we find that it is a mixture of all four chlorinated methanes together with some unreacted methane.

(Sec. 4.20)? We shall discuss this question in more detail later (Sec. 7.1), but for the moment we can say this. In the important quality of *isolability*, geometric isomers resemble configurational isomers, and for a very good reason: in both cases interconversion requires bond breaking—a π bond in the case of geometric isomers.

5.7 Higher alkenes

As we can see, the butylenes contain one carbon and two hydrogens more than propylene, which in turn contains one carbon and two hydrogens more than ethylene. The alkenes, therefore, form another homologous series, the increment being the same as for the alkanes: CH_2. The general formula for this family is C_nH_{2n}.

As we ascend the series of alkenes, the number of isomeric structures for each member increases even more rapidly than in the case of the alkane series; in addition to variations in the carbon skeletons, there are variations in the position of the double bond for a given skeleton, and the possibility of geometric isomerism.

Problem 5.1 Neglecting enantiomerism, draw structures of (a) the six isomeric pentylenes (C_5H_{10}); (b) the four chloropropylenes (C_3H_5Cl); (c) the eleven chlorobutylenes (C_4H_7Cl). Specify as *Z* or *E* each geometric isomer.

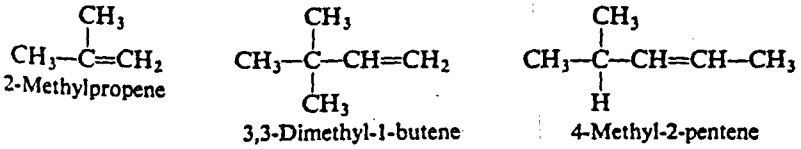
5.8 Names of alkenes

Common names are seldom used except for three simple alkenes: *ethylene*, *propylene*, and *isobutylene*. The various alkenes of a given carbon number are, however, sometimes referred to collectively as the *pentylenes* (*amylenes*), *hexylenes*, *heptylenes*, and so on. (One sometimes encounters the naming of alkenes as derivatives of ethylene: as, for example, *tetramethylethylene* for $(CH_3)_2C{=}C(CH_3)_2$.) Most alkenes are named by the IUPAC system.

The rules of the IUPAC system are:

1. Select as the parent structure the longest continuous chain *that contains the carbon–carbon double bond*; then consider the compound to have been derived from this structure by replacement of hydrogen by various alkyl groups. The parent structure is known as *ethene*, *propene*, *butene*, *pentene*, and so on, depending upon the number of carbon atoms; each name is derived by changing the ending *-ane* of the corresponding alkane name to **-ene**:

$H_2C{=}CH_2$	$CH_3{-}CH{=}CH_2$	$CH_3CH_2CH{=}CH_2$	$CH_3CH{=}CHCH_3$
Ethene	Propene	1-Butene	2-Butene (*cis-* or *trans-*)



2-Methylpropene; 3,3-Dimethyl-1-butene; 4-Methyl-2-pentene (*cis- or trans-*)

2. Indicate by a number the position of the double bond in the parent chain. Although the double bond involves two carbon atoms, designate its position by the number of the *first* doubly-bonded carbon encountered when numbering from the end of the chain nearest the double bond; thus *1-butene* and *2-butene*.

SECTION 1 - MANUFACTURER INFORMATION

MANUF/DIST : Rock Valley Oil and Chemical Co.
1911 Windsor Road EMERGENCY PHONE.....: 815-654-2400
PREPARATION/REVISION DATE: 01-19-90
Rockford, IL 61111
PREPARER/CONTACT: Claude Ingrassia

TRADE NAME/SYNONYMS...: 1487 Calibration Fluid
CHEMICAL NAME/SYNONYMS: NOT APPLICABLE
CHEMICAL FAMILY.....: Petroleum hydrocarbon
FORMULA.....: Proprietary
PRODUCT CODE.....:

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

REFERENCE # 9

```
*************************
                        *
  HEALTH........ 1      *
  FLAMMABILITY.. 2      *
  REACTIVITY.... 0      *
  PROTECTION....        *
*                       *
*************************
```

SECTION 2 - HAZARDOUS INGREDIENTS

THIS PRODUCT CONTAINS HAZARDOUS INGREDIENTS : NO

CHEMICAL/COMMON NAME	CAS-NUMBER	%	PEL-OSHA	TLV-ACGIH
Solvent refined paraffinic oil	64741-88-4	10-25	5 mg/m3	N/I
Hydrotreated naphthenic oil	64742-52-5	10-20	5 mg/m3	N/I
Petroleum hydrocarbon distillate	8008-20-6	60-90	500 ppm	100 ppm
Proprietary additive mixture	N/A	>1	N/A	N/I

THIS PRODUCT CONTAINS CARCINOGENS (NTP, IARC, or OSHA):NO

CHEMICAL/COMMON NAME	CAS-NUMBER	%	NTP	IARC	OSHA
N/A	N/A	N/A	N/A	N/A	N/A

SECTION 3 - HEALTH HAZARD DATA

HEALTH EFFECTS (Acute And Chronic)-
ACUTE: Eyes: May cause mild eye irritation.
Skin: Mild irritation with prolonged or repeated contact.
Inhalation: Vapors can irritate the mucous membranes and cause pulmonary irritation, dizziness and nausea.
Ingestion: This product is judged to have an acute oral LD50 (rat) greater than 5g/kg of body weight and an acute dermal LD50 (rabbit) greater than 3.16g/kg of body weight.
CHRONIC: Eyes: Irritation
Skin: Dermatitis

Inhalation: Irritation to mucuous membranes.

PRIMARY ROUTES OF ENTRY-
Dermal; Eye; Inhalation; Ingestion

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE-
Effects of Overexposure: High vapor concentrations (greater than approx. 1000 ppm) are irritating to the eyes and respiratory tract, may cause headaches and dizziness, are anesthetic, and may have other central nervous system effects.

EMERGENCY FIRST AID PROCEDURES-
INHALATION: Remove victim to fresh air, call a physician. If victim is unconscious or not breathing, apply artificial respiration, get medical help.
EYES: Flush thoroughly with water for 15 minutes; get medical attention if irritation or burning persists.
SKIN: Remove contaminated clothing, wash affected areas with mild soap and water. If irritation develops or persists, get medical attention.
INGESTION: Give victim large quantities of milk or water, nothing else. DO NOT induce vomiting. Get medical attention.

SECTION 4 - CHEMICAL DATA

BOILING POINT (F)....: N/D
VAPOR PRESSURE (mmHg): <1
VAPOR DENSITY (AIR=1): >>1
SPECIFIC GRAVITY (WATER=1).....: 0.82
PERCENT VOLATILE BY VOLUME (%).....: 50-7
EVAPORATION RATE (Ethyl Ethere=1): <<1

SOLUBILITY IN WATER-
Insoluble

APPEARANCE AND ODOR INFORMATION-
Light amber liquid with mild odor.

SECTION 5 - PHYSICAL HAZARD DATA

FLASH POINT (Method Used): 167 F (TCC) FLAMMABLE LIMITS : Lel=1.0% UEL=6.0%

EXTINGUISHING MEDIA-
Foam; CO2; Dry Chemical; Water spray (fog); Halon

SPECIAL FIRE FIGHTING PROCEDURES-
Recommend self-contained breathing apparatus with a full facepiece operated in a pressure-demand mode and full body protective clothing. Treat as an oil fire. Water may be used to keep fire-exposed containers cool until fire is out

UNUSUAL FIRE AND EXPLOSION HAZARDS-
A vapor accumulation would flash and/or explode if ignited. Never weld on or near drum, even if empty.

INCOMPATIBILITY (Materials To Avoid)-
Avoid strong oxidizers such as chlorine and oxygen, heat and sources of ignition.

HAZARDOUS DECOMPOSITION PRODUCTS-
Combustion produces oxides of carbon along with smoke.

WILL HAZARDOUS POLYMERIZATION OCCUR-
No

CONDITIONS TO AVOID FOR POLYMERIZATION-
N/A

IS THE PRODUCT STABLE-
Yes

CONDITIONS TO AVOID FOR STABILITY-
N/A

SECTION 6 - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED-
SMALL SPILL: Keep away from ignition sources (electrical, hot surfaces, etc.) Pick up spill with absorbent material.
ARGE SPILL: Contain spill to prevent entry into drains, sewers and waterways. Ventilate and keep traffic from area. Remove with absorbent material (or flush or vacuum) to closed container.

WASTE DISPOSAL METHODS-
Recovered material should be packaged, labeled, transported, disposed or reclaimed in compliance with applicable laws and regulations and in conformance with good safety and engineering practices. Reclaim where possible.

SECTION 7 - EXPOSURE CONTROL INFORMATION

VENTILATION-
LOCAL EXHAUST: N/I
SPECIAL.....: N/I
MECHANICAL (General): Recommended
OTHER.....: N/I

RESPIRATORY PROTECTION-
Where exposure likely to exceed acceptable limits, use NIOSH/OSHA approved equipment. Select respirators based on form and concentration of contaminant in air. Adhere to 29 CFR 1910.134

PROTECTIVE GLOVES-
Chem/solvent resistant for prolonged contact.

OTHER PROTECTIVE EQUIPMENT-
Boots, aprons, chem-resistant suits where deemed necessary to avoid contact during prolonged exposure. Use goggles or full face shield.

.THER ENGINEERING CONTROLS-
Classified as an "Oil" under Coast Guard regulations and the Clean Water Act. Spills entering a waterway that cause a sheen on the water surface must be reported to the U.S. Coast Guard National Resource Center, 1-800-424-8802.

WORK PRACTICES-
N/I

HYGIENIC PRACTICES-
Employees must practice good personal hygiene, washing exposed skin several times daily and laundering contaminated clothing before reuse.

SECTION 8 - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE-
"Empty" containers retain residue (liquid and/or vapors) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.
Keep product away from heat, sparks, pilot lights, static electricity, and open flame.

MAINTENANCE PRECAUTIONS-
N/I

OTHER PRECAUTIONS-
N/A

ADDITIONAL COMMENTS-
DOT HAZARD CLASSIFICATION: Combustible liquid
DOT SHIPPING NAME: Kerosene or kerosene mixture
DOT I.D. No: NA 1223 UN No: UN 1223

The information presented herein is believed to be factual. It has been derived from the work and opinions of persons believed to be qualified experts; however, nothing contained in this information is to be taken as a warranty or representation for which Rock Valley Oil & Chemical Co. bears legal responsibility. The user should review any recommendations in the specific context of the intended use to determine if they are appropriate.

N/A=Not applicable; N/I=No information; N/D=Not determined

EXXON COMPANY, U.S.A.
A DIVISION OF EXXON CORPORATION

DATE ISSUED: 06/01/89
SUPERSEDES DATE: 10/14/88

MATERIAL SAFETY DATA SHEET

EXXON COMPANY, U.S.A. P.O. BOX 2180 HOUSTON, TX 77252-2180

A. IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME
MENTOR 28

PRODUCT CODE
355000 - 03200

CHEMICAL NAME
Petroleum Process Oil

CAS NUMBER
64742-30-9

PRODUCT APPEARANCE AND ODOR
Clear water-white liquid
Mild kerosene odor

REFERENCE # 10

MEDICAL EMERGENCY TELEPHONE NUMBER
(713) 656-3424

B. COMPONENTS AND HAZARD INFORMATION

COMPONENTS	CAS NO. OF COMPONENTS	APPROXIMATE CONCENTRATION
Chemically neutralized middle distillate, petroleum	64742-30-9	100%

See Section E for Health and Hazard Information.

See Section H for additional Environmental Information.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

Health	Flammability	Reactivity	BASIS
1	1	0	Recommended by Exxon

EXPOSURE LIMIT FOR TOTAL PRODUCT	BASIS
5 mg/m3 for oil mist in air	OSHA Regulation 29 CFR 1910.1000

This value is currently under review for this type of product.

C. PRIMARY ROUTES OF ENTRY AND EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT
If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.

SKIN
In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water.

INHALATION
Vapor pressure is very low. Vapor inhalation under ambient conditions is normally not a problem. If overcome by vapor from hot product, immediately remove from exposure and call a physician. If breathing is irregular or has stopped, start resuscitation; administer oxygen, if available. If overexposed to oil mist, remove from further exposure until excessive oil mist condition subsides.

INGESTION
If ingested, DO NOT induce vomiting; call a physician immediately.

D. FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT (MINIMUM)
110°C (230°F)
ASTM D 93, Pensky Martens Closed Cup

AUTOIGNITION TEMPERATURE
Greater than 204°C (400°F)
ASTM E 659

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION

Health	Flammability	Reactivity	BASIS
1	1	0	Recommended by Exxon

HANDLING PRECAUTIONS
Use product with caution around heat, sparks, pilot lights, static electricity, and open flame.

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)
Estimated values: Lower Flammable Limit 0.9% Upper Flammable Limit 7%

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES
Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials", Eighth Edition (1984):

Use water spray, dry chemical, foam or carbon dioxide to extinguish the fire. Use water to keep fire-exposed containers cool. If a leak or spill has not ignited, use water spray to disperse the vapors and to provide protection for men attempting to stop a leak. Water spray may be used to flush spills away from exposures. Minimize breathing of gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS
Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

"EMPTY" CONTAINER WARNING
"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

E. HEALTH AND HAZARD INFORMATION

VARIABILITY AMONG INDIVIDUALS
Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure)
Prolonged or repeated skin contact may cause skin irritation.

NATURE OF HAZARD AND TOXICITY INFORMATION

Prolonged or repeated skin contact with this product tends to remove skin oils, possibly leading to irritation and dermatitis; however, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant" by OSHA criteria.

Product contacting the eyes may cause eye irritation.

Results from a lifetime mouse skin painting study with this product show that 9 mice of an original group of 50 developed skin tumors. The substance was painted on the shaved backs of mice three times a week for the lifetime of the animals with no washing between applications. All tumors noted appeared during the latter portion of the typical 2-year lifespan of the animals. In view of these findings, there may be a potential risk of skin cancer to humans from prolonged or repeated skin contact with this product in the absence of good personal hygiene.

Limited studies on oils that are very active carcinogens have shown that washing the animals' skin with soap and water between applications greatly reduces tumor formation. These studies demonstrate the effectiveness of cleansing the skin after contact.

Potential risks to humans can be minimized by observing good work practices and personal hygiene procedures generally recommended for petroleum products. See Section I for recommended protection and precautions.

Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death.

This product is judged to have an acute oral LD50 (rat) greater than 5 g/kg of body weight, and an acute dermal LD50 (rabbit) greater than 3.16 g/kg of body weight.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE

None Recognized

F. PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE
IBP Approximately 202°C (395°F)
by ASTM D 2887

SPECIFIC GRAVITY (15.6 C/15.6 C)
0.85

MOLECULAR WEIGHT
Approximately 231

pH
Essentially neutral

POUR, CONGEALING OR MELTING POINT
-6°C (20°F)
Pour Point by ASTM D 97

VISCOSITY
41 SSU @ 100°F

VAPOR PRESSURE
Less than 5 mm Hg @ 20°C

VAPOR DENSITY (AIR = 1)
Greater than 5

PERCENT VOLATILE BY VOLUME
Negligible from open container in 4 hours @ 38°C (100°F)

EVAPORATION RATE @ 1 ATM. AND 25 C (77 F) (n-BUTYL ACETATE = 1)
Less than 0.01

SOLUBILITY IN WATER @ 1 ATM. AND 25 C (77 F)
Negligible; less than 0.1%

G. REACTIVITY

This product is stable and will not react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite.

H. ENVIRONMENTAL INFORMATION

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Recover free product. Add sand, earth or other suitable absorbent to spill area. Minimize breathing vapors. Minimize skin contact. Open all windows and doors. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses, or extensive land areas.
Assure conformity with applicable governmental regulations.

THE FOLLOWING INFORMATION MAY BE USEFUL IN COMPLYING WITH VARIOUS STATE AND FEDERAL LAWS AND REGULATIONS UNDER VARIOUS ENVIRONMENTAL STATUTES:

REPORTABLE QUANTITY (RQ), EPA REGULATION 40 CFR 302 (CERCLA Section 102)
No RQ for product or any constituent greater than 1% or 0.1% (carcinogen).

THRESHOLD PLANNING QUANTITY (TPQ), EPA REGULATION 40 CFR 355 (SARA Sections 301-304)
No TPQ for product or any constituent greater than 1% or 0.1% (carcinogen).

TOXIC CHEMICAL RELEASE REPORTING, EPA REGULATION 40 CFR 372 (SARA Section 313)
No toxic chemical is present greater than 1% or 0.1% (carcinogen).

HAZARDOUS CHEMICAL REPORTING, EPA REGULATION 40 CFR 370 (SARA Sections 311-312)

	Acute Hazard	Chronic Hazard	Fire Hazard	Pressure Hazard	Reactive Hazard	Not Applicable
EPA HAZARD CLASSIFICATION CODE:		XXX				

I. PROTECTION AND PRECAUTIONS

VENTILATION
Use local exhaust to capture vapor, mists or fumes, if necessary. Provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. No smoking, flame or other ignition sources.

RESPIRATORY PROTECTION
Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

PROTECTIVE GLOVES
Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION
Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT
Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing, which could result in prolonged or repeated skin contact.

WORK PRACTICES / ENGINEERING CONTROLS
Keep containers closed when not in use. Do not store near heat, sparks, flame or strong oxidants.

In order to prevent fire or explosion hazards, use appropriate equipment.

Information on electrical equipment appropriate for use with this product may be found in the latest edition of the National Electrical Code (NFPA-70). This document is available from the National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

PERSONAL HYGIENE
Minimize breathing vapor, mist or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before re-use. Remove contaminated shoes and thoroughly clean before re-use; discard if oil-soaked. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

J. TRANSPORTATION AND OSHA RELATED LABEL INFORMATION

TRANSPORTATION INCIDENT INFORMATION
For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation Emergency Response Guidebook for Hazardous Materials Incidents, DOT P 5800.3.

DOT IDENTIFICATION NUMBER
Not applicable

OSHA REQUIRED LABEL INFORMATION
In compliance with hazard and right-to-know requirements, the following OSHA Hazard Warnings should be found on a label, bill of lading or invoice accompanying this shipment.

WARNING!

- LONG-TERM, REPEATED EXPOSURE MAY CAUSE SKIN CANCER

Note: Product label will contain additional non-OSHA related information.

The information and recommendations contained herein are, to the best of Exxon's knowledge and belief, accurate and reliable as of the date issued. Exxon does not warrant or guarantee their accuracy or reliability, and Exxon shall not be liable for any loss or damage arising out of the use thereof.

The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use. If buyer repackages this product, legal council should be consulted to insure proper health, safety and other necessary information is included on the container.

The Environmental Information included under Section H hereof as well as the Hazardous Materials Identification System (HMIS) and National Fire Protection Association (NFPA) ratings have been included by Exxon Company, U.S.A. in order to provide additional health and hazard classification information. The ratings recommended are based upon the criteria supplied by the developers of these rating systems, together with Exxon's interpretation of the available data.

FOR ADDITIONAL INFORMATION ON HEALTH EFFECTS CONTACT:
DIRECTOR OF INDUSTRIAL HYGIENE
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 3157
HOUSTON, TX 77252-2180
(713) 656-2443

FOR OTHER PRODUCT INFORMATION CONTACT:
MANAGER, MARKETING TECHNICAL SERVICES
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 2355
HOUSTON, TX 77252-2180
(713) 656-5949

EXXON COMPANY, U.S.A.
A DIVISION OF EXXON CORPORATION

DATE ISSUED: 06/01/89
SUPERSEDES DATE: 11/04/88

MATERIAL SAFETY DATA SHEET

EXXON COMPANY, U.S.A. P.O. BOX 2180 HOUSTON, TX 77252-2180

A. IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME
ISOPAR L

PRODUCT CODE
133465 - 00637

CHEMICAL NAME
Petroleum Solvent

CAS NUMBER
64742-48-9

PRODUCT APPEARANCE AND ODOR
Clear water-white liquid
Essentially odorless

REFERENCE # 11

MEDICAL EMERGENCY TELEPHONE NUMBER
(713) 656-3424

B. COMPONENTS AND HAZARD INFORMATION

COMPONENTS	CAS NO. OF COMPONENTS	APPROXIMATE CONCENTRATION
This product can be defined as: Hydrotreated heavy naphtha, petroleum	64742-48-9	100%

It consists predominantly of C11-C13 isoparaffinic hydrocarbons.

C11-C15 saturated hydrocarbons	Mixture	99+%
C8+ aromatics	Mixture	Less than 0.2%

See Section E for Health and Hazard Information.

See Section H for additional Environmental Information.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

Health	Flammability	Reactivity	BASIS
1	2	0	Recommended by Exxon

EXPOSURE LIMIT FOR TOTAL PRODUCT	BASIS
300 ppm (2100 mg/m3) for an 8-hour workday	Recommended by Exxon

C. PRIMARY ROUTES OF ENTRY AND EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT
If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.

SKIN
In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water.

INHALATION
If overcome by vapor, remove from exposure and call a physician immediately. If breathing is irregular or has stopped, start resuscitation, administer oxygen, if available.

INGESTION
If ingested, DO NOT induce vomiting; call a physician immediately.

D. FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT (MINIMUM)
COMBUSTIBLE - Per DOT 49 CFR 173.115
60°C (140°F)
ASTM D 56, Tag Closed Cup

AUTOIGNITION TEMPERATURE
Approximately 338°C (640°F)
ASTM D 2155

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION

Health	Flammability	Reactivity	BASIS
1	2	0	Recommended by Exxon

HANDLING PRECAUTIONS
This liquid is volatile and gives off invisible vapors. Either the liquid or vapor may settle in low areas or travel some distance along the ground or surface to ignition sources where they may ignite or explode.

Keep product away from ignition sources, such as heat, sparks, pilot lights, static electricity, and open flames.

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)
Estimated values: Lower Flammable Limit 0.6% Upper Flammable Limit 7%

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES
Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials", Eighth Edition (1984):

Use dry chemical, foam or carbon dioxide to extinguish the fire. Water may be ineffective, but water should be used to keep fire-exposed containers cool. If a leak or spill has ignited, use water spray to disperse the vapors and to protect men attempting to stop a leak. Water spray may be used to flush spills away from exposures. Minimize breathing of gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

NOTE: The inclusion of the phrase "water may be ineffective" is to indicate that although water can be used to cool and protect exposed material, water may not extinguish the fire unless used under favorable conditions by experienced fire fighters trained in fighting all types of flammable liquid fires.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS
Fumes, smoke, carbon monoxide, aldehydes and other decomposition products, in the case of incomplete combustion.

"EMPTY" CONTAINER WARNING
"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

E. HEALTH AND HAZARD INFORMATION

VARIABILITY AMONG INDIVIDUALS
Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure)
High vapor concentrations (greater than approximately 1000 ppm) are irritating to the eyes and the respiratory tract, and may cause headaches, dizziness, anesthesia, drowsiness, unconsciousness, and other central nervous system effects, including death.

NATURE OF HAZARD AND TOXICITY INFORMATION
Prolonged or repeated skin contact with this product tends to remove skin oils, possibly leading to irritation and dermatitis; however, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant" by OSHA criteria.

Product contacting the eyes may cause eye irritation.

Laboratory animal studies have shown that prolonged and repeated inhalation exposure to light hydrocarbon vapors in the same naphtha boiling range as this product can produce adverse kidney effects in male rats. However, these effects were not observed in similar studies with female rats and male and female mice and in limited studies with other animal species. Additionally, in a number of human studies, there was no clinical evidence of such effects at normal occupational levels. It is therefore highly unlikely that the kidney effects observed in male rats have significant implications for humans exposed at or below the recommended vapor limits in the workplace.

Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death.

This product is judged to have an acute oral LD50 (rat) greater than 5 g/kg of body weight, and an acute dermal LD50 (rabbit) greater than 3.16 g/kg of body weight.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE
Petroleum Solvents/Petroleum Hydrocarbons - Skin contact may aggravate an existing dermatitis.

F. PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE
Approximately 185-206°C (365-403°F)

SPECIFIC GRAVITY (15.6 C/15.6 C)
0.77

MOLECULAR WEIGHT
171

pH
Essentially neutral

POUR, CONGEALING OR MELTING POINT
Less than -18°C (0°F)
Pour Point by ASTM D 97

VISCOSITY
1.61 cP @ 25°C ASTM D 445

VAPOR PRESSURE
Less than 10 mm Hg @ 25°C
ASTM D 2879

VAPOR DENSITY (AIR = 1)
Greater than 5

PERCENT VOLATILE BY VOLUME
100 @ 1 atm. and 25°C (77°F)

EVAPORATION RATE @ 1 ATM. AND 25 C (77 F) (n-BUTYL ACETATE = 1)
Less than 0.1

SOLUBILITY IN WATER @ 1 ATM. AND 25 C (77 F)
Negligible; less than 0.1%

G. REACTIVITY

This product is stable and will not react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite.

H. ENVIRONMENTAL INFORMATION

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Shut off and eliminate all ignition sources. Keep people away. Recover free product. Add sand, earth or other suitable absorbent to spill area. Minimize breathing vapors. Minimize skin contact. Ventilate confined spaces. Open all windows and doors. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses, or extensive land areas.
Assure conformity with applicable governmental regulations. Continue to observe precautions for volatile, combustible vapors from absorbed material.

THE FOLLOWING INFORMATION MAY BE USEFUL IN COMPLYING WITH VARIOUS STATE AND FEDERAL LAWS AND REGULATIONS UNDER VARIOUS ENVIRONMENTAL STATUTES:

REPORTABLE QUANTITY (RQ), EPA REGULATION 40 CFR 302 (CERCLA Section 102)
No RQ for product or any constituent greater than 1% or 0.1% (carcinogen).

THRESHOLD PLANNING QUANTITY (TPQ), EPA REGULATION 40 CFR 355 (SARA Sections 301-304)
No TPQ for product or any constituent greater than 1% or 0.1% (carcinogen).

TOXIC CHEMICAL RELEASE REPORTING, EPA REGULATION 40 CFR 372 (SARA Section 313)
No toxic chemical is present greater than 1% or 0.1% (carcinogen).

HAZARDOUS CHEMICAL REPORTING, EPA REGULATION 40 CFR 370 (SARA Sections 311-312)

	Acute Hazard	Chronic Hazard	Fire Hazard	Pressure Hazard	Reactive Hazard	Not Applicable
EPA HAZARD CLASSIFICATION CODE:	XXX		XXX			

I. PROTECTION AND PRECAUTIONS

VENTILATION
Use only with ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. No smoking, flame or other ignition sources.

RESPIRATORY PROTECTION
Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

PROTECTIVE GLOVES
Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION
Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT
Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing, which could result in prolonged or repeated skin contact.

WORK PRACTICES / ENGINEERING CONTROLS
Keep containers closed when not in use. Do not store near heat, sparks, flame or strong oxidants. To prevent fire or explosion risk from static accumulation and discharge, effectively ground product transfer system in accordance with the National Fire Protection Association standard for petroleum products.

In order to prevent fire or explosion hazards, use appropriate equipment.

Information on electrical equipment appropriate for use with this product may be found in the latest edition of the National Electrical Code (NFPA-70). This document is available from the National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

PERSONAL HYGIENE
Minimize breathing vapor or mist. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before re-use. Remove contaminated shoes and thoroughly clean and dry before re-use. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

J. TRANSPORTATION AND OSHA RELATED LABEL INFORMATION

TRANSPORTATION INCIDENT INFORMATION
For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation Emergency Response Guidebook for Hazardous Materials Incidents, DOT P 5800.3.

DOT IDENTIFICATION NUMBER
Petroleum Naphtha / Combustible Liquid / UN 1255

OSHA REQUIRED LABEL INFORMATION
In compliance with hazard and right-to-know requirements, the following OSHA Hazard Warnings should be found on a label, bill of lading or invoice accompanying this shipment.

DANGER!

COMBUSTIBLE

Note: Product label will contain additional non-OSHA related information.

The information and recommendations contained herein are, to the best of Exxon's knowledge and belief, accurate and reliable as of the date issued. Exxon does not warrant or guarantee their accuracy or reliability, and Exxon shall not be liable for any loss or damage arising out of the use thereof.

The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use. If buyer repackages this product, legal council should be consulted to insure proper health, safety and other necessary information is included on the container.

The Environmental Information included under Section H hereof as well as the Hazardous Materials Identification System (HMIS) and National Fire Protection Association (NFPA) ratings have been included by Exxon Company, U.S.A. in order to provide additional health and hazard classification information. The ratings recommended are based upon the criteria supplied by the developers of these rating systems, together with Exxon's interpretation of the available data.

FOR ADDITIONAL INFORMATION ON HEALTH EFFECTS CONTACT:
DIRECTOR OF INDUSTRIAL HYGIENE
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 3157
HOUSTON, TX 77252-2180
(713) 656-2443

FOR OTHER PRODUCT INFORMATION CONTACT:
MANAGER, MARKETING TECHNICAL SERVICES
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 2355
HOUSTON, TX 77252-2180
(713) 656-5949

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

DIVISION OF HEALTH SERVICES
EASTERN REGIONAL OFFICE
404 St. Andrews Street
Greenville, N.C. 27834
(919) 756-1343

(5)

RECEIVED
JAN 26 1983
SOLID & HAZARDOUS WASTE MANAGEMENT BRANCH

January 25, 1983

REFERENCE # 12

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

FROM: Raymond L. Church
Eastern Regional Office

RE: RCRA Inspection Report
Diesel Systems Group - Stanadyne, Inc.
P.O. Box 5084
405 White Street
Jacksonville, NC 28540
Onslow County
EPA ID# NCD084167444
Contact: Robert C. Benson, Facility Engineer
(919) 353-3666

A RCRA Inspection was conducted at the Diesel Systems Group, Stanadyne, Inc. Jacksonville facility on Tuesday January 18, 1983.

The facility was found to be in compliance with the RCRA Interim Status Standards.

Mr. Benson was requested to forward test results performed on waste cutting oils and calibration fluids to this office upon receipt from laboratory.

sle

Samples received by K.L.

RCRA Inspection Reprot

1. Facility Information

Diesel Systems Group - Stanadyne, Inc.
P.O. Box 5084
405 White Street
Jacksonville, NC 28540
Onslow County
EPA ID# NCD084167444

2. Responsible Officials

Robert C. Benson, Facility Engineer; (919) 353-3666
Edwin Reffelt, Facility Service Foreman

3. Survey Participants

Robert C. Benson, Facility Engineer
Edwin Reffelt, Facility Service Foreman
Ray Church, District Sanitarian, Division of Health Services

4. Date of Inspection

January 18, 1983

5. Applicable Regulations

No Change

6. Purpose of Survey

No Change

7. Facility Description

The Stanadyne, Inc. facility in Jacksonville, NC received a change in status under RCRA on December 21, 1982. The facility is now listed as a generator only and is no longer permitted under Interim Status as a TSDF.

The waste generated by this facility include 1,1,1-tri-chloroethane still bottoms (F002) at a rate of approximately 70 gallons/month and methylene chloride still bottoms (F002) at approximately 55 gallons/month. The facility also receives waste 1,1,1-tri-chloroethane and methylene chloride from the New Bern Stanadyne facility (NCD980602445) at a rate of 55 gallons per month of each waste. The waste are distilled at the Jacksonville facility and the resultant still bottoms are removed on an average of 60 days by Triangle Resource Industries, Riedsville, NC, NCD000648451. In the past year these waste have been disposed at M & M Chemical Co., Gadsden, Ala.; Chemical Waste Management, Emelle, Ala.; and B.F.I. Waste Systems, Inc., Livingston, La.

An additional waste, cutting oil, is received at the Jacksonville facility from the New Bern Plant. The rate of generation is 1,000 gallons/month. Recent test performed to determine if the material could be treated by the Jacksonville POTW indicated the presence of cyanide at 0.9 mg/l.

Additional analysis are currently being performed to determine alternative disposal methods. At present the cutting oil is being handled by TRI Industries as a Poison B and is disposed of at SCA, Pinewood, SC.

Waste calibrating oils are generated at each facility, approximately 200 gallons/month at the New Bern facility and 1,900 gallons/month at the Jacksonville Plant. The oil contains the following trade name oils:

Mentor #28 F.P. 255°F
Viscar Calibrating fluid 1487C F.P. 160-175°F
Vertex 60-A F.P. 290°F
Honilo 480 F.P. 250°F

The calibrating fluids are currently being combined and shipped to the Diesel Systems Group, Stanadyne, Inc. Hartford, CT plant to be used as a fuel supplement. Mr. Benson was advised to have an E.P. Toxicity test run to determine if the calibrating fluids should be considered hazardous.

8. Documentation of Site Deficiencies

The facility was in compliance with the Interim Status Standards.

9. Compliance Schedule/Recommendations

Results of E.P. Toxicity test performed on calibrating fluids and cutting oils should be forwarded to this office upon receipt.

REFERENCE # 13

16 September 1987

TO: File

FROM: D. Mark Durway DMD.

RE: Stanadyne Inc., Jacksonville, NC (NC D084167444)

In a telephone conversation today, Robert C. Benson, facility engineer at Stanadyne (tel. 919/353-3666), told me that there have never been releases of hazardous substances or incidents of on-site disposal at the Stanadyne facility in Jacksonville. He said that the facilty was new when Stanadyne purchased it in 1977. Regarding drum storage, Mr. Benson said that drums of hazardous substances have never been stored outside the facility building. Stanadyne is a RCRA large quantity generator which generates 1,1,1-trichloroethane and methylene chloride still bottoms.

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

(3)

DIVISION OF HEALTH SERVICES
EASTERN REGIONAL OFFICE
404 St. Andrews Street
Greenville, N.C. 27834
(919) 756-1343

RECEIVED
FEB 19 1982
SOLID & HAZARDOUS WASTE MANAGEMENT BRANCH

February 18, 1982

REFERENCE # 14

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

FROM: Ray Church, District Sanitarian
Eastern Regional Office

RE: Compliance Inspection
Diesel Systems Group - Stanadyne, Inc.
P.O. Box 5084
405 White Street
Jacksonville, NC 28540
Onslow County
EPA ID# NCD084167444
Contact Mr. Bob Benson, Facility Engineer

On Wednesday, February 10, 1982 the Stanadyne Company, Inc. was reinspected to check for RCRA compliance. The Interim Status Standard violation were outlined in your letter to Mr. Benson on February 8, 1982.

My inspection revealed that ~~all previous violations~~ of the RCRA I.S.S. have been ~~corrected.~~

sle

Keith

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

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

REFERENCE # 15

(5)

Date: December 21, 1982

Mr. Robert Benson
Stanadyne, Inc.
P.O. Box 5084
Jacksonville, NC 28540

Re: Facility ID No. NCD 084 167 444

Dear

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

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

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

Cordially,

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

OWS

cc: Doug McCurry
EPA Region IV
Emil Breckling
Ray Church

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

I ①

State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

ENTERED
NOV 5 1989
DATA PROCESSING

October 23, 1989

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

NOTICE OF VIOLATION
Docket #89-338

Mr. Bob Benson
Stanadyne Diesel Systems
405 White Street
Jacksonville, North Carolina

REFERENCE # 16

NCD 084 167 444

Dear Mr. Benson:

On December 18, 1980 the State of North Carolina, Hazardous Waste Section (State) was authorized to operate the State RCRA hazardous waste program under the Solid Waste Management Act (Act), N.C.G.S. 130A, Article 9 and rules promulgated thereto at 10 NCAC 10F, (Rules) in lieu of the federal RCRA program. Stanadyne Diesel Systems, Jacksonville, North Carolina North Carolina is classified as a generator of hazardous waste and subject to the requirements of 40 CFR 262 codified at 10 NCAC 10F .0030.

On September 27, 1989, Mr. Jerry Parks, Waste Management Specialist with this office inspected your facility for compliance with North Carolina Hazardous Waste Management Rules. During that inspection the following violations were noted:

A. 40 CFR 262.34(a)(4), codified at 10 NCAC 10F .0030, states that a generator may accumulate hazardous waste on-site for 90 days or less without a permit or without having interim status, provided that the generator complies with the requirements for owner or operators in Subparts C and D in 40 CFR Part 265, and with Section 265.16.

1. 40 CFR 265.16(c), codified at 10 NCAC 10F .0033, states that facility personnel must take part in an annual review of the initial training required in paragraph (a) of this section.

Stanadyne Diesel Systems is in violation of 40 CFR 262.34(a)(4), codified at 10 NCAC 10F .0030, referenced at 40 CFR 265.16(c), codified at 10 NCAC 10F .0033, in that facility personnel have

not taken part in an annual review of the initial training required in paragraph (a) of this section.

B. 40 CFR 262.34(c)(1), codified at 10 NCAC 10F .0030, states that a generator may accumulate as much as 55 gallons of hazardous waste or one quart of acutely hazardous waste listed in 261.33(e), in containers at or near any point of generation where wastes initially accumulate, which is under the control of the operator of the process generating the waste, without a permit or interim status and without complying with paragraph (a) of this section provided he complies with Sections 265.171, 265.172, and 265.173(a) of this chapter; and marks his containers either with the words "Hazardous Waste" or with other words that identify the contents of the containers.

40 CFR 265.173(a), codified at 10 NCAC 10F .0033, states that a container holding hazardous waste must always be closed during storage, except when it is necessary to add or remove waste.

Stanadyne Diesel Systems is in violation of 40 CFR 262.34(c)(1), codified at 10 NCAC 10F .0030, referenced at 40 CFR 265.173(a), codified at 10 NCAC 10F .0033, in that containers holding hazardous waste were not closed during storage.

COMPLIANCE SCHEDULE

By November 21, 1989 you shall comply with the following requirements:

A. Comply with 40 CFR 262.34(a)(4), by conducting an annual review of the initial training required in paragraph (a) of this section as referenced by 40 CFR 265.16(c).

B. Comply with 40 CFR 262.34(c)(1), codified at 10 NCAC 10F .0030, by ensuring that all hazardous waste containers are kept closed at all times except when adding or removing waste per the requirements of 40 CFR 265.173(a).

If the requirements noted above are not met, pursuant to N.C.G.S. 130A-22(a) and 10 NCAC 10G .0701 - .0707, an administrative penalty of up to $10,000.00 per day may be assessed for violation of the hazardous waste law or regulations.

Sincerely,

Jerry Rhodes

Jerry Rhodes, Chief
Hazardous Waste Section
Solid Waste Management Division

JR/dd/LP42

cc: Larry Perry
Central Files
Jerry Parks

										SG S TRN TR 01 08	AREA NUMBER
NCD042891689	SPRINGS MILLS INC SPRINGFIELD JOON RALPH MGR WTR & WSTW	HIGHWAY 79 LAUREL HILL	28351	GENERAL DELIVERY LAUREL HILL	NC	28351	X				803 547-2901
NCD003214574	SPRUANCE SOUTHERN INC BLYLER, MIKE	HIGHWAY 52 SOUTH WINSTON-SALEM	27102	ROUTE 9 BOX 305-D WINSTON-SALEM	NC	27107	X				919 764-0940
NCD003951078	SQUARE D COMPANY PHILLIPS, DAVID	128 BINGHAM ROAD ASHEVILLE	28806	PO BOX 5107 ASHEVILLE	NC	28802	X				704 252-0300
NCD067203752	SQUARE D COMPANY BUCHANAN, BILL	HIGHWAY 64 KNIGHTDALE	27545	PO BOX 27446 RALEIGH	NC	27611	X		X		919 266-3671
NCD101773000	SQUARE D COMPANY HYATT, PAMELA	1809 AIRPORT ROAD MONROE	28110	PO BOX 5002 MONROE	NC	28110	X				704 283-7411
NCD991278730	SQUIBB E R & SONS VARLEY, DAVE	FLOWERS ROAD KENLY	27542	1000 SQUIBB DRIVE KENLY	NC	27542	X				919 284-5131
NCD004073362	ST JOE CONTAINER COMPANY TAYLOR LEWIS ENG COORDINA	1201 WESTINGHOUSE BLVD CHARLOTTE	28217	PO BOX 7248 CHARLOTTE	NC	28217	X				904 227-1171
NCD981744840	STACK POLE COMPONENTS COMPANY O'QUINN, MARK	2504 NORTH BLVD RALEIGH	27604	2504 NORTH BLVD RALEIGH	NC	27604	E				919 821-5296
NCD932082406	STACLEAN DIFFUSER COMPANY JOHNSON, JUDY	2200 OLD WILKESBORO ROAD SALISBURY	28144	PO DRAWER 1147 SALISBURY	NC	28145	X				704 636-8697
NCD982118408	STADIUM CLEANERS POLLARD, SCOTT	205 EAST 10TH STREET GREENSVILLE	27834	205 EAST 10TH STREE GREENSVILLE	NC	27834	E				919 758-2701
NCD041047936	STAMEY CHRYSLER-PLYMOUTH DODGE DECK, KENNETH	SUGAR HILL ROAD & I 40 WE MARION	28752	PO BOX 249 MARION	NC	28752	X				704 652-2858
[redacted]	STANADYNE INC DIESEL SYSTEMS G BENSON ROBERT FACILITY EN	405 WHITE STREET JACKSONVILLE	[redacted]	PO BOX 5084 JACKSONVILLE	NC	28540	X				919 353-3666
NCD091567065	STANADYNE INC DIESEL SYSTEMS G VAHNI RANDOLPH MGR FAC EN	CLARKS NECK RD ROUTE 3 WASHINGTON	27889	PO BOX 1105 WASHINGTON	NC	27889	X				919 975-2553
NCD982162950	STANDARD COMMERCIAL TOBACCO CO CORBETT, R.S.	2201 MILLER ROAD WILSON	27893	PO BOX 450 WILSON	NC	27894	E				919 291-5507
NCD981932031	STANDARD FLEXIBLE PACKAGING CO PHILLIPS, JOHN	HIGHWAY 73 WEST MOUNT GILEAD	27306	PO BOX 1007 MOUNT GILEAD	NC	27306	X				919 439-6137
NCD054284518	STANDARD PACKAGING & PRINTING JONES, CRAIG	HIGHWAY 73 WEST MT. GILEAD	27306	PO BOX 706 MT. GILEAD	NC	27306	X				919 439-6137
NCD109146430	STANDARD PRODUCTS GOLDSBORO MOTAMARI, MIKE	308 FEDELON TRAIL GOLDSBORO	27530	308 FEDELON TRAIL GOLDSBORO	NC	27530	X				919 735-5394

REFERENCE # 17

FACILITY ID	FACILITY NAME	FACILITY ADDRESS		MAILING ADDRESS			TELEPHONE

REFERENCE # 18

KIRK-OTHMER

ENCYCLOPEDIA OF CHEMICAL TECHNOLOGY

THIRD EDITION

VOLUME 17

PEROXIDES AND PEROXY COMPOUNDS, INORGANIC
TO
PIPING SYSTEMS

1807 175 YEARS OF PUBLISHING 1982

A WILEY-INTERSCIENCE PUBLICATION
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COMPOSITION

The term petroleum, literally, rock oil, is applied to the deposits of oily material found in the upper strata of the earth's crust. Petroleum was formed by a complex and incompletely understood series of chemical reactions from organic material laid down in previous geological eras. Large deposits have been found in widely different parts of the world and their chemical composition varies greatly. Consequently, no single composition of petroleum can be defined. It is not surprising that the composition varies, since the local distribution of plant, animal, and marine life is quite varied and, presumably, was similarly varied when the petroleum precursors were formed. Furthermore, the geological history of each deposit is different and allows for varying chemistry to have occurred as the organic matter originally deposited matured into petroleum. Despite this overall variability in composition, many features are common to the composition of these different crude oils. As discussed below, a great variety of molecular types including many individual compounds are found in petroleums, although in widely varying proportions.

The elemental compositions of petroleum vary greatly from crude oil to crude oil. Carbon and hydrogen make up the bulk, but other elements present include sulfur (trace to 8%), nitrogen (trace to 1.6%), oxygen (trace to 1.8%), and nickel and vanadium (trace to 1000 ppm). The elements are combined to form a complex mixture of organic compounds that range in molecular weight from 16 (methane) to several thousands. For any given crude oil, the elements are not evenly distributed over the entire boiling range. Sulfur is found throughout, but its concentration tends to increase with rising boiling point. Nitrogen and oxygen are found predominantly in the higher boiling fractions and in the residuum, whereas nickel and vanadium are concentrated heavily in the residuum.

Today, petroleum is the world's main source of energy and petrochemical feedstock (see Feedstocks). Crude oil rarely is used in the form produced at the well, but is converted in refineries into a wide range of products, such as gasoline, kerosene, diesel fuel, jet fuel, domestic and industrial fuel oils, together with petrochemical feedstocks such as ethylene, propylene, the butenes, butadiene, and isoprene. These feedstocks are important, for they form the basis for, among others, the plastics, elastomer, and artificial-fiber industries. Conversion processes include catalytic isomerization, catalytic reforming and cracking, and catalytic hydrodesulfurization to yield environmentally acceptable fuel oils. Efficient conversion of crude to a product distribution that matches demand requires a detailed knowledge of the molecular composition of the crude feedstocks in order that process conditions can be varied appropriately. There are also nonprocess needs for a thorough understanding of the composition of petroleum. One such need relates to the genesis of petroleum, both from a scientific and a practical point of view of petroleum exploration and production. Another is environmental, since increasing concern for the quality of the environment has led to questions as to whether petroleum contains potentially hazardous components.

It is improbable that there ever will be a complete, compound-by-compound analysis of a crude oil. The most intensive efforts have been carried out under the auspices of API, where several research programs to characterize petroleum have been organized. The pioneering project, American Petroleum Institute Research Project 6 (APIRP-6) (1–4), began in 1925. It concentrated on a single U.S. crude (Ponca City,

Oklahoma) and resulted in the separation and identification of some two hundred individual hydrocarbons, mostly in the lower boiling range of the crude oil. Several years later, APIRP-48 (5) resulted in the isolation and identification of numerous sulfur-containing compounds, whereas nitrogen compounds were studied in APIRP-20 (6) and APIRP-52 (7). The last project, APIRP-60 (8), was organized to study the heavy ends of petroleum, the compounds with the highest boiling points, and the material that is not distillable (residuum). The 370–535°C distillate cut from five different crude oils was examined as part of this program, and the data reported are the most detailed available for such high boiling material. This study illustrates the complexity of the composition of petroleum and the difficulties involved in its determination. A considerable amount of other work has also been reported, but these API projects remain one of the largest and most important sources of information on the composition of petroleum.

Figure 1 depicts the chemical composition of a typical crude oil. The lower boiling fractions are predominantly saturated hydrocarbons whereas the higher boiling fractions and the residuum are dominated by aromatic and polar compounds (defined here as nitrogen- and/or oxygen-containing compounds).

Sulfur compounds are not shown as a separate class because they cannot be isolated and identified as a distinct class. This illustrates that any classification of chemical types in petroleum is inherently tied to a separation technique and to the available characterization techniques. Furthermore, the applicable separation and characterization techniques are strongly dependent on boiling range. In Figure 1, three ranges of volatility are indicated for which different techniques are applicable. For the lowest boiling range (<150°C), compound-by-compound separation is generally possible. Separations of Ponca City crude oil in the APIRP-6 were carried out by the best technology available, ie, distillation, extraction, recrystallization, complexation with urea, and column chromatography. A sufficient quantity of each compound was isolated, permitting determination of its structure by refractive index, elemental analysis, and a variety of other physical characterization methods. Since that time, great advances have been made in separation and characterization techniques. Modern

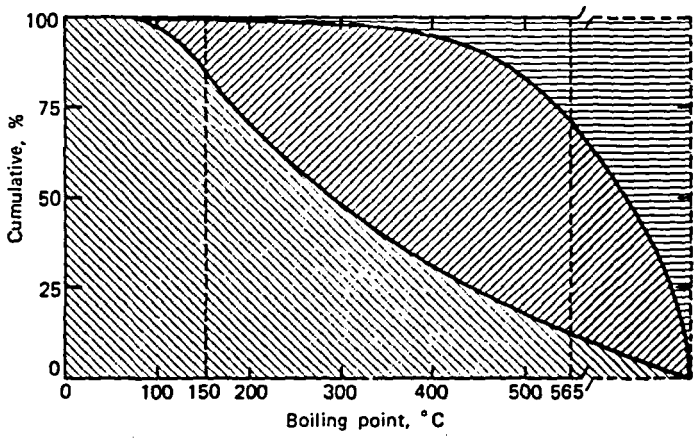
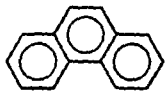
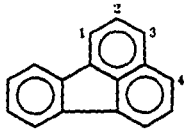


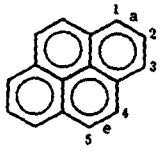
Figure 1. Compound-type distribution for a typical crude oil. ▧ Alkanes and thioalkanes. ▨ Aromatics and thioaromatics. ▤ Polars (N and/or O, with or without S). ▭ Residuum.

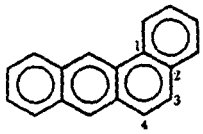
weight alkenes in a Pennsylvania crude and a recent study (13) confirms the presence of such alkenes but at significantly lower concentrations than previously reported. The alkenes found have predominantly *trans* double bonds located in branched-chain or cyclic structures, the most stable forms for alkenes. The study reaffirms the rarity of alkenes, which are chemically quite active, in petroleum. Trace quantities of higher molecular weight polycyclic cycloalkenes, such as hopenes and sterenes, have been reported (10). The presence of such cycloalkenes provides important clues to the genesis of petroleum.

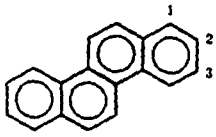
On the other hand, aromatic compounds of almost every known type have been found in petroleum. Benzene and each of its alkylbenzene derivatives through the twenty isomeric C_{10}-alkyl isomers were isolated from Ponca City crude, together with several C_{11} isomers. Indane and tetrahydronaphthalene together with a number of their methyl isomers have also been isolated, as have naphthalene and its 1- and 2-methyl, ethyl, and propyl derivatives and many of its homologues. Biphenyl and several of its derivatives have been identified, as has diphenylethane. However, biphenyl and its derivatives are present in smaller quantities than naphthalene and its derivatives. Many other individual multiring condensed aromatic compounds have also been identified (14), including phenanthrene, fluoranthene, pyrene, benz[*a*]anthracene, chrysene, triphenylene, benzopyrenes, perylene and benzo[*ghi*]perylene, together with some of their alkyl derivatives. Anthracene does not appear to be present in crude oil.

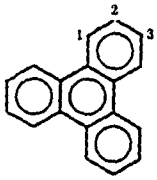

phenanthrene

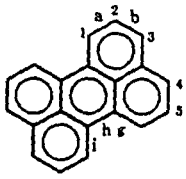

fluoranthene


pyrene


benz[*a*]anthracene


chrysene


triphenylene

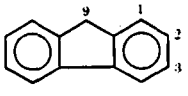

perylene

It is customary in petroleum chemistry to use the term aromatic for any molecule that contains an aromatic ring. However, for larger molecules, the actual fraction of the carbon in the aromatic part of the molecule can be quite small. The nonaromatic part of the carbon skeleton can consist of long or short *n*- or isoalkyl side chains, one or more cycloparaffin rings attached to the aromatic rings, or any combination of these structures. Thus a high molecular weight "naphthalene" could be an alkylcycloalkylnaphthalene, probably containing a variety of alkyl substituents and as many as eight cycloparaffin groups.

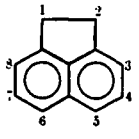
A large number of aromatic types is present at higher molecular weights (8). The bulk (74–83%) of the material in the monoaromatic (benzenoid) concentrate from all five crudes studied consists of alkylcycloalkylbenzenes, ranging from alkyl monocycloalkylbenzenes to alkyl nonacycloalkylbenzenes. The alkylbenzene concentration

is 4.6–12.6%. The diaromatic (naphthenoid) concentrate consists mostly of alkylcycloalkylnaphthalenes, containing 1–8 cycloparaffin rings, and alkylacenaphthalenes, and only 2.5–4.7% of the fractions are alkylnaphthalenes. The composition of the aromatic compounds in the polyaromatic-polar concentrate proved too complex to be characterized completely by mass spectrometry alone, although some 42 homologous series were identified.

As with the saturated-hydrocarbon fraction, instrumental methods have been developed that allow for a rapid compound-type analysis of aromatic concentrates. A mass-spectrometry method (ASTM D 1658) gives the carbon-number distribution of aromatic compounds in a liquid boiling up to 177°C, corresponding to the benzene-to-C_9 aromatic compounds. Another method (ASTM D 2425) covers the boiling range from 200 to 340°C, giving an analysis in terms of alkylbenzenes, indanes/tetralins, naphthalenes, acenaphthalenes, and condensed tricyclic aromatic compounds. A third mass-spectrometry procedure (ASTM D 3239) covers the boiling range 200–540°C and gives an analysis for 18 aromatic types, including pyrenes, chrysenes, perylenes, fluorenes, phenanthrenes, naphthalenes, benzenes, acenaphthenes, and dibenzanthracenes (15).



fluorene



acenaphthene

The amount of aromatic material varies considerably between crudes and a very wide range of compound types occur in any one crude. Aromatic compounds occur throughout the entire distillation range, with 2–7 or more condensed aromatic rings.

Sulfur, Nitrogen, and Oxygen Compounds

Sulfur Compounds. Sulfur is found in all crudes in concentrations ranging from trace to 8.0%, with most crudes in the 0.5–1.5% range. It is present in a wide range of aliphatic and aromatic compounds and also as elemental sulfur, hydrogen sulfide, and carbonyl sulfide (COS). The concentration of sulfur and sulfur compounds increases steadily with rising boiling point. In some oils, the highest boiling fractions contain sufficient sulfur for there to be an average of at least one sulfur atom per molecule. Although most sulfur compounds in petroleum seem to contain only one sulfur atom per molecule, types containing two sulfur atoms per molecule have been isolated in APIRP-48 (5), and identified by high resolution mass spectrometry in higher boiling material (16). A number of molecular species containing two sulfur atoms were identified in the aromatic, diaromatic, and polyaromatic-polar cuts obtained during APIRP-60, though in low concentrations (8). Some molecules containing three sulfur atoms were also tentatively identified in the same work. Both aliphatic and aromatic sulfur compounds are found in petroleum and, as with the hydrocarbon fraction, a large number of individual compounds have been isolated and identified in the lower boiling fractions. The APIRP-48 study appears to be the single largest contributor

The Genesis of Petroleum

Petroleum is generated from a variety of organic precursors laid down with the sediment in sedimentary basins and buried under further layers of sediment (9–10). Over a period of time, usually measured in millions (10^6) of years, these organic precursors are converted into petroleum by the processes of diagenesis and catagenesis. During diagenesis, which occurs below 50°C, the originally deposited organic material undergoes conversion by such processes as microbial action, and simple chemical reactions, including condensation, cyclization, and polymerization. Most petroleum is formed during catagenesis at 50–200°C. These processes include thermocatalytic cracking, decarboxylation, and hydrogen disproportionation. Frequently, the oil formed by these processes is not found subsequently in the rocks where the precursors were first laid down, but it has migrated from the source rocks to reservoir rocks. The recent advances in the ability to obtain detailed compositional information has been of great value not only in relating source and reservoir, but also in answering the fundamental scientific question of the form of the precursors and the mechanisms of conversion (see Fuels, survey).

By a combination of column chromatography, gas chromatography, and mass spectrometry, a number of compounds have been identified in petroleum that are referred to as biological markers or geochemical fossils (10). These biomarkers are compounds whose basic carbon skeleton has survived the chemical changes that occurred during the transformation of the petroleum precursors to petroleum, and whose structure can be related to the chemical structures frequently found in terrestrial and marine life. Such compounds are predominantly alkanes, and include the isoprenoids pristane and phytane.

In 1979, a series of isoprenoid hydrocarbons that possess an unusual head-to-head linkage was found in petroleum (34), a linkage that was only recently discovered in living organisms. The recent addition of advanced computer-based data systems to gc–ms systems improves the ability to characterize structurally these trace amounts of biomarkers, but such a determination is still an extremely complex and difficult task. Geochemistry is an exciting area of current petroleum research.

BIBLIOGRAPHY

"Petroleum Composition," in *ECT* 1st ed., Vol. 10, pp. 92–97, by A. N. Sachanen, Socony-Vacuum Oil Co., Inc.; "Petroleum Composition," in *ECT* 2nd ed., Vol. 14, pp. 845–855, by R. H. Hunt and M. J. O'Neal, Shell Oil Company.

1. F. D. Rossini, B. J. Mair, and A. J. Streiff, *Hydrocarbons from Petroleum*, Reinhold Publishing Corporation, New York, 1953.
2. F. D. Rossini, *J. Chem. Ed.* 37, 554 (1960).
3. F. F. H. Yew and B. J. Mair, *Anal. Chem.* 38, 231 (1966).
4. B. J. Mair and co-workers, *Science* 154, 1339 (1966).
5. H. T. Hall, C. J. Thompson, H. J. Coleman, and R. L. Hopkins, *Proc. Am. Pet. Inst.* 42(Sect. VIII), 19 (1962).
6. H. L. Lochte and E. R. Littmann, *Petroleum Acids and Bases*, Chemical Publishing Co., Inc., New York, 1955.
7. J. S. Ball, *Proc. Am. Pet. Inst.* 42(Sect. VIII), 27 (1962).
8. J. E. Dooley, D. E. Hirsch, C. J. Thompson, and C. C. Ward, *Hydrocarbon Process.* 53(11), 187 (1974).

on: Richard Pacifico

9. J. M. Hunt, *Petroleum Geochemistry and Geology*, W. H. Freeman & Co., San Francisco, Calif., 1979.
10. B. P. Tissot and D. H. Welte, *Petroleum Formation and Occurrence*, Springer-Verlag, New York, 1978.
11. K. H. Altgelt and T. H. Gouw, eds., *Chromatography in Petroleum Analysis*, Marcel Dekker, Inc., New York, 1979.
12. A. Hood and M. J. O'Neal in J. D. Waldron, ed., *Advances in Mass Spectrometry*, Vol. 1, Pergamon Press Ltd., London, Eng., 1959.
13. T. C. Hoering, *Chem. Geol.* 20, 1 (1977).
14. R. J. Pancirov and R. A. Brown, *1975 Conference on Prevention and Control of Oil Pollution, San Francisco*, American Petroleum Institute, 1975, pp. 103–113.
15. C. J. Robinson and G. L. Cook, *Anal. Chem.* 41, 1548 (1969).
16. H. E. Lumpkin and T. Aczel, *ACS Symp. Ser.* 70, 261 (1978).
17. R. A. Dean, *Proc. Am. Pet. Inst.* 42(Section VIII), 54 (1962).
18. D. A. Ferguson and L. A. Luke, *Chromatographia* 12(4), 197 (1979).
19. H. V. Drushel, *Anal. Chem.* 41, 569 (1969).
20. H. V. Drushel, *Anal. Chem.* 27, 495 (1955).
21. L. R. Snyder, B. E. Buell, and H. E. Howard, *Anal. Chem.* 40, 1303 (1968).
22. A. W. Peters and J. B. Bendoraitis, *Anal. Chem.* 48, 968 (1976).
23. L. R. Snyder, *Anal. Chem.* 41, 314 (1969).
24. D. M. Jewell and G. K. Harting, *Proc. Am. Pet. Inst.* 42(Sect. VIII), 92 (1962).
25. J. F. McKay, J. H. Weber, and D. R. Latham, *Anal. Chem.* 48, 891 (1976).
26. L. R. Snyder, *Acc. Chem. Res.* 3, 290 (1970).
27. W. K. Seifert, E. J. Gallegos, and R. M. Teeter, *J. Am. Chem. Soc.* 94, 5880 (1972).
28. L. W. Corbett and V. Petrossi, *Ind. Eng. Chem. Prod. Res. Dev.* 17(4), 342 (1978).
29. J. F. McKay, P. J. Amend, P. M. Harnsberger, T. E. Cogswell, and D. R. Latham, *Prepr. Div. Fuel Chem. Am. Chem. Soc.* 21(7), 52 (1976).
30. J. F. McKay, P. J. Amend, T. E. Cogswell, P. M. Harnsberger, R. B. Erickson, and D. R. Latham in P. C. Uden, S. Siggia, and H. B. Hensen, eds., *Analytical Chemistry of Liquid Fuel Sources*, Advances in Chemistry Series #170, American Chemical Society, 1978, p. 128.
31. O. I. Milner, *Analysis of Petroleum for Trace Elements*, Pergamon Press, New York, 1963.
32. E. W. Baker in G. Eglinton and M. T. J. Murphy, eds., *Organic Geochemistry*, Springer-Verlag, New York, 1969, p. 464.
33. R. A. Hofstader, O. I. Milner, and J. H. Runnels, eds., *Analysis of Petroleum for Trace Metals*, Advances in Chemistry Series, #156, American Chemical Society, Washington, D.C., 1976.
34. J. M. Moldowan and W. K. Seifert, *Science* 204, 169 (1979).

J. J. ELLIOTT
M. T. MELCHIOR
Exxon Research and Engineering Company

On slow Dwnc

REFERENCE # 19

May 13, 1981

Diesel System Group -
Stanadyne, Inc.
P.O. Box 5034
Jacksonville, NC 28540

RE: Synthetic Cutting Fluid Mix

Dear Mr. Benson:

The Division of Health Services has reviewed your request of April 29, 1981 for characterization of the above referenced waste.

Based upon the submitted documents, this waste appears to be hazardous as defined by the current RCRA regulations. This determination is based upon the waste meeting at least one of the below Criteria For Identifying A Hazardous Waste:

Subpart D - List of Hazardous Waste

☐ Section 261.31 Hazardous waste from nonspecific sources.

EPA Hazardous Waste No.

☐ Section 261.32 Hazardous waste from specific sources.

EPA Hazardous Waste No.

☐ Section 261.33 Discarded Commercial Chemical Products, Off-Specification Species, Containers, and Spill Residues.

EPA Hazardous Waste No.

Subpart C - Characteristics of Hazardous Waste

☐ Ignitable

☐ Corrosive

☐ Reactive

☑ EP Toxicity (Silver > 5.0ppm)
(EPA Waste No. D011)

Since the above material is a hazardous waste, disposal in a sanitary landfill cannot be permitted. Proper disposal must be in accordance with the "Hazardous Waste Regulations."

If you have any additional questions,concerning this matter, please contact our office at (919) 733-2178.

Sincerely,

William Paige, Environmental Chemist
Solid and Hazardous Waste Management Branch
Environmental Health Section

WP:lc

CURRENT POPULATION REPORTS

REFERENCE # 20

Local Population Estimates

Series P-26, No. 86-S-SC

SOUTH

1986 Population and 1985 Per Capita Income Estimates for Counties and Incorporated Places

Issued March 1988

U.S. Department of Commerce
C. William Verity, Secretary
Robert Ortner, Under Secretary
for Economic Affairs

BUREAU OF THE CENSUS
John G. Keane, Director

BUREAU OF THE CENSUS
John G. Keane, Director
C.L. Kincannon, Deputy Director
William P. Butz, Associate Director for Demographic Fields
Roger A. Herriot, Senior Demographic and Housing Analyst

POPULATION DIVISION
Paula J. Schneider, Chief

SUGGESTED CITATION

U.S. Bureau of the Census, Current Population Reports, Series P-26, No. 86-S-SC, *South—1986 Population and 1985 Per Capita Income Estimates for Counties and Incorporated Places*, U.S. Government Printing Office, Washington, D.C., 1988.

For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Table 1. July 1, 1986, Population and Calendar Year 1985 Per Capita Income Estimates for States, Counties, and Subcounty Areas—Con.

[A dash "–" represents zero or rounds to zero. Table includes places incorporated since January 1, 1980, and reflects some annexations and consolidations since that date]

Area	Population				Estimated per capita money income (dollars)		
	July 1, 1986 (estimate)	April 1, 1980 (census)	Change, 1980 to 1986		1985	1979	Percent change, 1979 to 1985
			Number	Percent			
Macon County	23 000	20 178	2 800	14.0	8 936	5 671	57.6
Franklin	2 860	2 640	220	8.3	10 445	6 564	59.1
Highlands (pt.)	730	653	80	12.1	10 322	7 600	35.8
Madison County	17 400	16 827	600	3.6	7 183	4 670	53.4
Hot Springs	760	678	80	12.2	6 882	4 890	40.7
Marshall	810	809	10	0.6	6 809	4 416	54.2
Mars Hill	2 130	2 126	–	–	6 270	4 357	43.9
Martin County	26 500	25 948	600	2.3	7 192	4 781	50.4
Bear Grass	80	82	–	–3.7	7 192	4 781	50.4
Everetts	250	213	40	18.3	10 066	6 386	57.6
Hamilton	630	638	–	–0.6	6 459	4 451	45.1
Hassell	110	109	–	–	7 192	4 781	50.4
Jamesville	680	604	80	12.9	7 854	5 145	52.7
Oak City	430	475	–50	–9.9	7 003	4 757	47.2
Parmele	490	484	–	0.4	5 440	3 427	58.7
Robersonville	1 930	1 981	–60	–2.8	7 511	5 086	47.7
Williamston	6 370	6 159	210	3.5	7 344	5 031	46.0
Mecklenburg County	450 800	404 270	46 600	11.5	12 439	7 872	58.0
Charlotte	352 070	326 330	25 740	7.9	12 259	7 952	54.2
Cornelius	1 940	1 921	20	0.8	9 379	6 009	56.1
Davidson (pt.)	3 300	3 241	60	1.8	8 646	5 527	56.4
Huntersville	1 520	1 294	230	17.4	12 459	7 433	67.6
Matthews	6 070	1 648	4 420	268.2	11 642	6 956	67.4
Mint Hill	13 460	9 789	3 670	37.5	13 539	8 656	56.4
Pineville	3 160	1 525	1 640	107.3	10 530	6 283	67.6
Mitchell County	14 500	14 428	100	0.4	7 799	5 018	55.2
Bakersville	430	373	60	15.5	8 697	5 690	52.8
Spruce Pine	2 430	2 282	150	6.4	9 649	6 388	54.2
Montgomery County	24 000	22 469	1 500	6.8	7 817	5 128	52.4
Biscoe	1 570	1 334	240	18.0	7 726	5 135	50.5
Candor	940	868	70	7.7	8 647	6 165	40.3
Mount Gilead	1 500	1 423	70	5.1	8 417	5 609	50.1
Star	780	816	–40	–4.7	7 977	5 807	37.4
Troy	2 690	2 702	–10	–0.4	8 306	5 359	55.0
Moore County	55 800	50 505	5 300	10.5	10 412	6 545	59.1
Aberdeen	2 200	1 945	250	12.9	9 504	6 441	47.6
Cameron	280	225	50	22.2	7 056	4 305	63.9
Carthage	960	925	40	4.2	10 643	6 617	60.8
Foxfire	260	153	110	72.5	19 391	11 195	73.2
Pinebluff	1 050	935	110	12.0	9 115	5 886	54.9
Pinehurst	2 580	1 746	830	47.5	21 188	12 380	71.1
Robbins	1 450	1 256	190	15.4	8 401	5 819	44.4
Southern Pines	8 940	8 620	320	3.7	11 383	7 232	57.4
Vass	950	828	120	15.0	6 870	4 584	49.9
Whispering Pines	1 320	1 160	160	13.4	26 043	15 551	67.5
Nash County	71 400	67 183	4 200	6.3	10 031	6 043	66.0
Bailey	730	686	50	6.6	9 997	6 120	63.3
Battleboro (pt).	330	309	20	6.1	10 119	6 452	56.8
Castalia	380	358	30	7.0	6 260	3 974	57.5
Dortches	940	886	50	5.9	9 111	5 818	56.6
Middlesex	790	837	–50	–6.2	7 226	4 461	62.0
Nashville	3 370	3 024	350	11.4	9 980	6 321	57.9
Red Oak	420	314	100	32.5	8 805	5 610	57.0
Rocky Mount (pt.)	28 770	26 633	2 140	8.0	12 221	7 108	71.9
Sharpsburg (pt.)	770	661	110	16.2	11 604	6 892	68.4
Spring Hope	1 330	1 254	80	6.2	8 588	5 569	54.2
Whitakers (pt.)	390	432	–40	–9.0	8 451	5 373	57.3
New Hanover County	114 100	103 471	10 700	10.3	10 391	6 747	54.0
Carolina Beach	3 100	2 000	1 100	55.0	10 422	6 201	68.1
Kure Beach	1 020	611	410	67.4	12 012	7 024	71.0
Wilmington	54 430	52 273	2 160	4.1	9 358	6 391	46.4
Wrightsville Beach	2 970	2 910	60	1.9	17 975	11 796	52.4
Northampton County	22 400	22 196	200	1.1	7 033	4 610	52.6
Conway	660	678	–20	–2.9	8 729	6 046	44.4
Garysburg	1 540	1 434	110	7.6	5 210	3 265	59.6
Gaston	1 030	883	140	16.2	8 796	5 682	54.8
Jackson	690	720	–30	–3.7	8 518	5 378	58.3
Lasker	100	96	10	5.2	7 033	4 610	52.6
Rich Square	1 060	1 057	10	0.7	8 876	5 930	49.7
Seaboard	700	687	10	1.7	8 470	5 574	52.0
Severn	310	309	–	–1.0	7 955	5 567	42.9
Woodland	830	861	–30	–3.4	8 785	5 887	49.2
Onslow County	126 600	112 784	13 800	12.2	7 903	5 114	54.5
Holly Ridge	590	465	120	25.8	6 925	4 293	61.3
Jacksonville	28 780	23 406	5 370	23.0	9 586	6 166	55.4
Richlands	960	825	130	15.6	8 927	5 703	56.5
Swansboro	1 230	976	250	25.9	11 300	6 826	65.5
Orange County	84 600	77 058	7 500	9.7	11 064	6 927	59.7
Carrboro	9 490	8 039	1 460	18.1	9 934	6 106	62.6
Chapel Hill (pt.)	33 540	32 038	1 500	4.7	11 942	7 258	64.5
Durham (pt.)	10	11	–	–	0	0	–
Hillsborough	3 770	3 019	750	25.0	9 071	5 759	57.5
Mebane (pt.)	440	379	60	15.8	8 756	5 611	56.1

COVERAGE

STATE	COUNTY	STATE NAME	COUNTY NAME
37	103	North Carolina	Jones Co
37	133	North Carolina	Onslow Co

CENTER POINT AT STATE : 37 North Carolina
COUNTY : 133 Onslow Co

Press RETURN key to continue...

REFERENCE # 21

REGION OF THE COUNTRY

Zipcode found: 28543 at a distance of 3.1 Km

STATE	CITY NAME	COMMUNITY	FIPSCODE	LATITUDE	LONGITUDE
NC	JACKSONVILLE	TARAWA TERRACE	37133	34.7833	77.3783

Press RETURN key to continue ...

CENSUS DATA

Stanadyne
LATITUDE 34:45:24 LONGITUDE 77:23:22 1980 POPULATION

Miks

KM	0.00-.400	.400-.810	.810-1.60 (1)	1.60-3.20 (2)	3.20-4.80 (3)	4.80-6.40 (4)	SECTOR TOTALS
S 1	0	0	0	0	0	4454	4454
S 2	0	0	0	1576	2626	0	4202
S 3	0	0	0	3905	0	0	3905
S 4	0	0	0	0	0	1815	1815
S 5	0	0	0	8098	0	6103	14201
S 6	0	0	1240	0	0	0	1240
S 7	0	0	0	3218	4193	0	7411
S 8	0	1706	0	1553	5671	1766	10696
RING TOTALS	0	1706	1240	18350	12490	14138	47924

0-1 mile → 2946 ~~2946~~ ~~[illegible]~~

0-4 miks

Press RETURN key to continue ...

STAR STATION

INDEX NUMBER	STATION NAME	LATITUDE DEGREE	LONGITUDE DEGREE	PERIOD OF RECORD	STABILITY CLASSES	DISTANCE (km)

13754	CHERRY POINT NC	34.9000	76.8833	6 48.83
13748	WILMINGTON/NEW HANOV	34.2667	77.9167	6 72.75
13713	GOLDSBORO/SEYMOUR JN	35.3333	77.9667	6 82.83
13714	FT BRAGG/POPE/FAYETT	35.1667	79.0167	6155.00
13722	RALEIGH/RALEIGH-DURH	35.8667	78.7833	6176.56
93729	CAPE HATTERAS NC	35.2667	75.5500	6176.70
13717	MYRTLE BEACH SC	33.6833	78.9333	5185.29

Press RETURN key to continue ...

U.S. SOIL DATA
==========

STATE : NORTH CAROLINA

LATITUDE : 34:45:24 LONGITUDE : 77:23:22
THE STATION IS INSIDE H.U. 3030001

GROUND WATER ZONE	: 10			
RUNOFF SOIL TYPE	: 1			
EROSION	: 1.1950E-03			CM/MONTH
DEPTH TO GROUND WATER BETWEEN	: 3.0480E+02	AND	1.5240E+03	
FIELD CAPACITY FOR TOP SOIL	: 6.0000E-02			
EFFECTIVE POROSITY BETWEEN	: 2.0000E-02	AND	3.0000E-01	
SEEPAGE TO GROUNDWATER BETWEEN	: 4.6330E+03	AND	1.3900E+04	CM/MONTH
DISTANCE TO DRINKING WELL	: 2.0000E+04			CM

Press RETURN key to continue ...

U.S. CITY
==========

STATE	PLACE NAME	FIPSCODE	LATITUDE	LONGITUDE
NC	JACKSONVILLE	37133	34.7295	77.3771

Press RETURN key to continue ...

MENU: Geodata Handling Data List procedures

1. Site level retrieval of data (SITERET)
2. Access Census Data (CENSUS)
3. Determine County Coverage (COVERAGE)
4. Geographic Data Management (GEODM)
5. HUCODE/SOIL locator (HUCODE)
6. Convert to Lat/Long (LATLON)
7. Lookup/Examine Star Station Data (STAR)
8. Find US cities (USCITY)
9. Find Soil Survey Status of Counties (SSURVEY)

Enter an option number or a procedure name (in parentheses)
or a command: HELP, HELP option, BACK, CLEAR, EXIT, TUTOR
GEMS>

Enter an option number or a procedure name (in parentheses)
or a command: HELP, HELP option, BACK, CLEAR, EXIT, TUTOR
GEMS>

Enter an option number or a procedure name (in parentheses)
or a command: HELP, HELP option, BACK, CLEAR, EXIT, TUTOR
GEMS> EXIT

```
Type YES to confirm the EXIT command; type NO to restart GEMS
GEMS> YES
$
$ LOGOUT
 WRT          logged out at  1-JUN-1990 17:20:28.60
 Itemized resource charges, for this session, follow:

NODE:
```

NUS CORPORATION AND SUBSIDIARIES **TELECON NOTE**

CONTROL NO.	DATE: 11-26-90	TIME: 1120

DISTRIBUTION:

Stanadyne, Inc., Diesel Systems Group (Jacksonville, N.C.)

REFERENCE # 22

BETWEEN: Steve Nohrstedt	OF: U.S. EPA	PHONE: (404) 347-7791

AND: William E. Vasser, NUS Corporation

WEV

DISCUSSION:

ABC One Hour Cleaners, a NPL sit in Jacksonville, is located at LeJeune Boulevard across from Tarawa Terrace. (Described location on topo map). A plume of tetrachloroethene contaminant has been detected in groundwater flowing from the site toward the Tarawa Terrace municipal well field. The contamination detected in the wells is attributable to waste from the site.

EPA I.D No. NCD981751126

NUS 067 REVISED 0685

34076-A1-EI-250

Beaufort

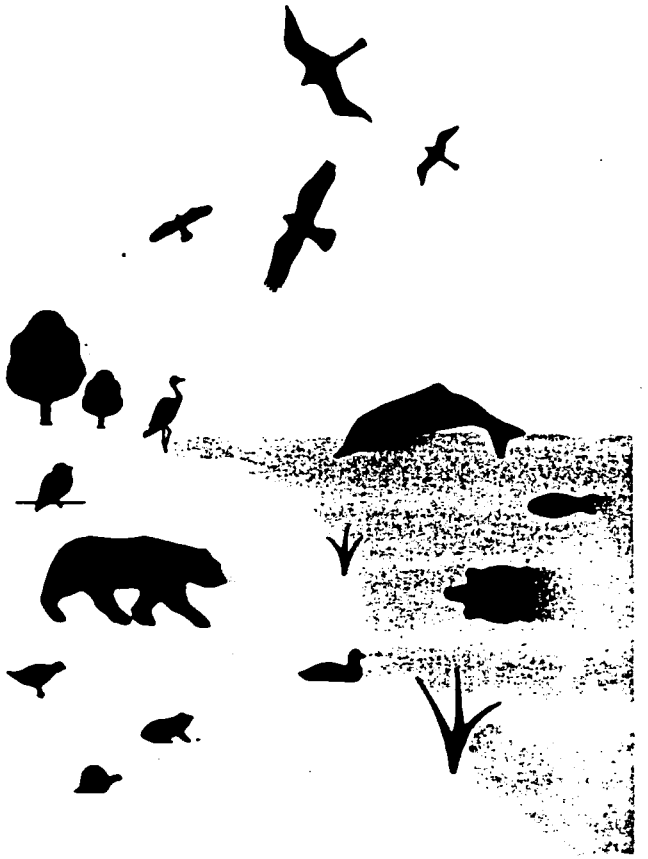
NORTH CAROLINA

(13)

1:250 000-scale map of

Atlantic Coast Ecological Inventory

REFERENCE # 23



Produced by

U. S. FISH AND WILDLIFE SERVICE

1980

147 Summer flounder
148 Southern flounder
149 Winter flounder
150 Rainbow smelt
151 Atlantic tomcod
152 Threadfin shad
153 Carp
154 Atlantic mackerel
155 Chain pickerel
156 White bass
157 Northern puffer
158 Silver perch
159 Florida pompano
160 Bluefish
161 Spanish mackerel
162 Cobia
163 Mullet
164 White crappie
165 Redear sunfish
166 Smallmouth bass
167 Yellow perch
168 Pumpkinseed
169 Atlantic halibut
170 Atlantic cod
171 Pollock
172 Haddock
173 Hake
174 Bluefin tuna
175 Walleye
176 Northern pike
177 Scup
178 Tautog
179 Atlantic spadefish
180 Bay anchovy
181 Butterfish
182 Little tunny
183 Atlantic bonito
184 Brown trout
185 Cunner
186 Yellowtail flounder
187 Gulf flounder
188 Pinfish
189 King mackerel
190 Pigfish
191 White grunt
192 Tripletail
193 Ladyfish
194 Snook
195 Jack
196 Snapper
197 Grouper
198 Sailfish
199 Great barracuda
200 Maryland darter (F)

REPTILES AND AMPHIBIANS (201–250)

201 Green sea turtle (F)
202 Loggerhead sea turtle (F)
203 Hawksbill turtle (F)
204 Atlantic ridley turtle (F)
205 Leatherback turtle (F)

MAMMALS (251–300)

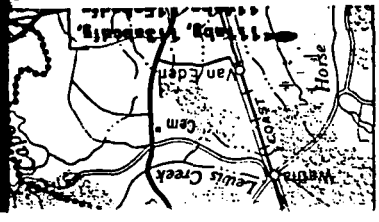
251 Florida manatee (F)
252 Atlantic bottlenose dolphin
253 Pigmy sperm whale
254 Short-finned pilot whale
255 Harbor seal
256 Gray seal
257 Right whale (F)
258 Atlantic spotted dolphin

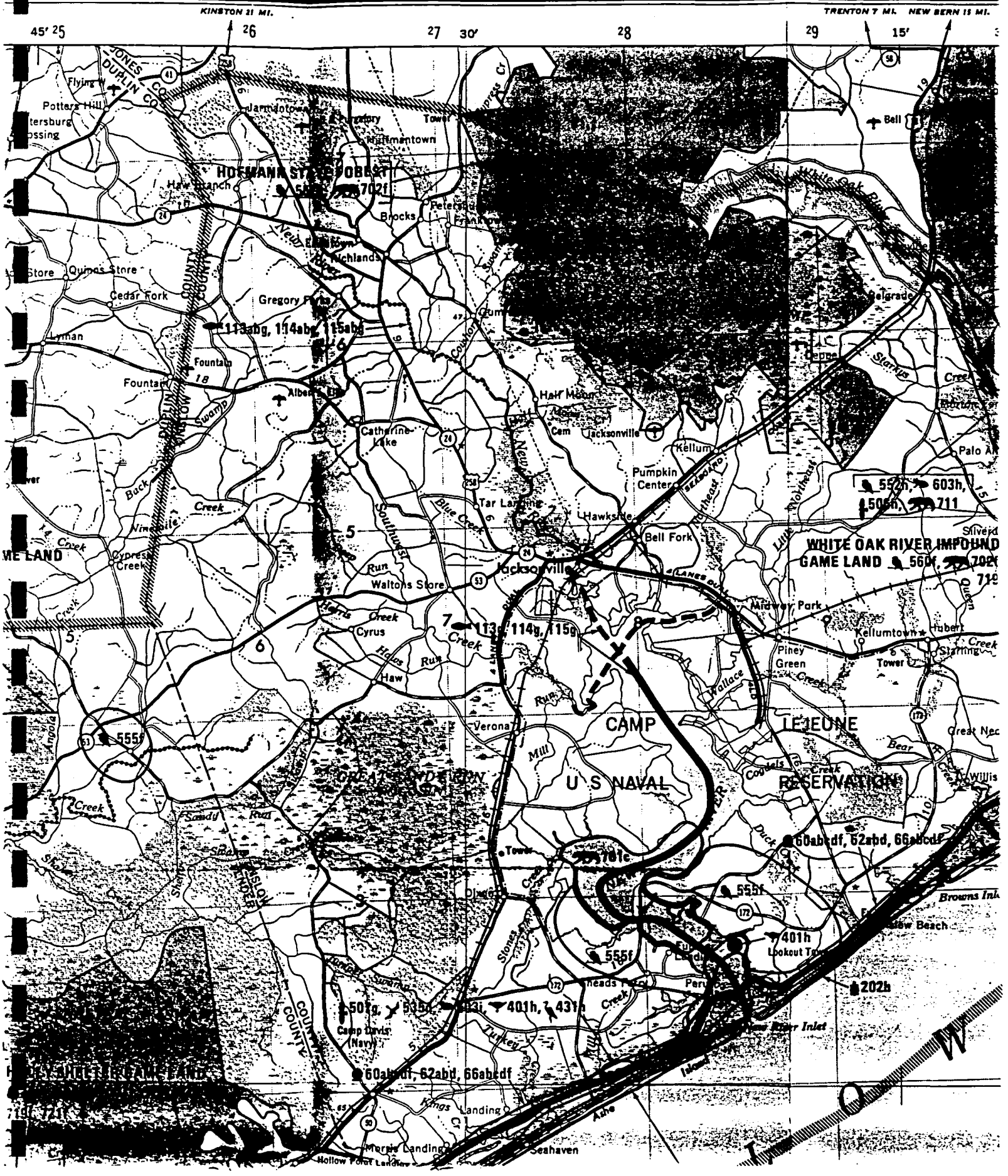
High salinity estuarine habitat (generally 16.5 to 30 parts per thousand); arrows used for wide estuaries.

Mid salinity estuarine habitat (generally 5 to 16.5 parts per thousand).

Low salinity estuarine habitat (generally 0.5 to 5 parts per thousand) and tidal freshwater.

Non-tidal freshwater riverine and creek habitat.




KINSTON 21 MI.
TRENTON 7 MI.
NEW BERN 15 MI.
45' 25
26
27
30'
28
29
15'
JONES CO
DUPLIN CO
Flying W
Potters Hill
Jamintown
Tower
Mullmantown
HOFMANN STATE FOREST
Haw Branch
Brocks
Peterson
Nichlands
Quinns Store
Cedar Fork
Gregory Fork
Lyman
Fountain
Albert
Swamp
Back
Creek
Cypress Creek
Catherine Lake
Half Moon
Jacksonville
Kellum
Pumpkin Center
Tar Landing
Hawksville
Bell Fork
Southwest
Blue Creek
Waltons Store
Cyrus
Haws Run
Haw
Verona
Mill
CAMP
LEJEUNE
U S NAVAL
RESERVATION
GREAT SWAMP
Midway Park
Kellumtown
Piney Green
Tower
Wallace
Bear
Coodels
Duck
Stones
Turkey
Kings Landing
Morris Landing
Hollow Point Landing
Seahaven
Camp Davis (Navy)
Belgrade
Starling
Silverd
Palo Alto
Bell
White Oak River
WHITE OAK RIVER IMPOUND
GAME LAND
Browns Inlet
Lookout Tower
New River Inlet
Inlet
Ashe
Queen
Great Neck
Willis
Sandy Run
Shaw
Stump
Mill
Newbern
Northeast
Little Northeast
SEABOARD
LANES BRIDGE
113abg, 114abg, 115abg
113g, 114g, 115g
702f
555f
781c
60abcdf, 62abd, 66abcdf
552h, 603h, 505h, 711
401h
202h
507g, 535f, 401h, 431h
60abcdf, 62abd, 66abcdf

Onslow

NORTH CAROLINA NATURAL HERITAGE PROGRAM ELEMENT LIST

REFERENCE # 24

scientific and common name	state stat	fed stat	state rank	glob rank
ALLIGATOR MISSISSIPPIENSIS	T	T/SA	S3	G5
AMERICAN ALLIGATOR				
AMMODRAMUS HENSLOWII	SC		S3	G4
HENSLOW'S SPARROW				
CARETTA CARETTA	T	LT	S2	G3
ATLANTIC LOGGERHEAD				
CHELONIA MYDAS	T	LELT	S1	G3
GREEN TURTLE				
CROTALUS ADAMANTEUS	E		S1	G5
EASTERN DIAMONDBACK RATTLESNAKE				
FELIS CONCOLOR	E		SH	G4
COUGAR				
HIMANTOPUS MEXICANUS	UNK		S2	G5
BLACK-NECKED STILT				
HYLA ANDERSONII		3C	S3	G4
PINE BARRENS TREEFROG				
HYPSOBLENNIUS IONTHAS	SC		S2	GU
FRECKLED BLENNY				
LATERALLUS JAMAICENSIS	UNK		S3	G5
BLACK RAIL				
NEOTOMA FLORIDANA FLORIDANA	SC		S1	G5T
EASTERN WOODRAT				
OPHISAURUS MIMICUS				
MIMIC GLASS LIZARD				
PICOIDES BOREALIS	E	LE	S2	G2
RED-COCKADED WOODPECKER				
PORPHYRULA MARTINICA	UNK		S1	G5
PURPLE GALLINULE				
URSUS AMERICANUS	SC		S3	G5
BLACK BEAR				
CALEPHELIS VIRGINIENSIS	UNK		S2?	G4
LITTLE METALMARK				
HESPERIA MESKEI	SR		S1	G?
MESKE'S SKIPPER				
MEGATHYMUS YUCCAE	UNK		S2?	G4
GIANT YUCCA SKIPPER				
POANES VIATOR	UNK		S3?	G5
BROAD-WINGED SKIPPER				
PROCAMBARUS PLUMIMANUS	SC			G?
CRAYFISH				
SATYRIUM KINGI	SR		S2S3	G3G
KING'S HAIRSTREAK				
SPHAGNUM FITZGERALDII	C		S2	G2
FITZGERALD'S PEATMOSS				
AGALINIS APHYLLA	C		S2	G3G
SCALE-LEAF GERARDIA				
AMARANTHUS PUMILUS	T	C2	S2	G2
SEABEACH AMARANTH				
ASCLEPIAS PEDICELLATA	C		S1	G3G
STALKED MILKWEED				
ASPLENIUM HETERORESILIENS	E	C2	S1	G2
CAROLINA SPLEENWORT				
CACALIA OVATA	SR		S1	G4G
SAVANNA INDIAN-PLANTAIN				

(Onslow)

NORTH CAROLINA NATURAL HERITAGE PROGRAM ELEMENT LIST

scientific and common name	state stat	fed stat	state rank	glob rank
CALAMOVILFA BREVIPILIS	E	C2	S1	G3
PINEBARRENS SANDREED				
CYPERUS TETRAGONUS	SR		S2	G4?
FOUR-ANGLED FLATSEDGE				
CYSTOPTERIS TENNESSEENSIS	E		S1	G5
TENNESSEE BLADDER-FERN				
DIONAEA MUSCIPULA	SR	3C	S3	G3
VENUS FLYTRAP				
ELEOCHARIS CELLULOSA	SR		S1	G4G5
GULFCOAST SPIKERUSH				
HALODULE BEAUDETTEI	SR		S1	G5
BEAUDETTE'S SHOALWEED				
LITSEA AESTIVALIS	SR	3C	S2	G4G5
PONDSPICE				
LOBELIA BOYKINII	C	C2	S1	G2
BOYKIN'S LOBELIA				
LUDWIGIA ALATA	SR		S2?	G3G4
WINGED SEEDBOX				
LYSIMACHIA ASPERULIFOLIA	E	LE	S2	G2
ROUGH-LEAF LOOSESTRIFE				
PARNASSIA CAROLINIANA	E	C2	S2	G2
CAROLINA GRASS-OF-PARNASSUS				
PLATANTHERA INTEGRA	T	3C	S1	G3G4
YELLOW FRINGELESS ORCHID				
RHEXIA ARISTOSA	T	C2	S2	G2
AWNED MEADOW-BEAUTY				
RHYNCHOSPORA TRACYI	SR		S2	G4
TRACY'S BEAKRUSH				
SAGERETIA MINUTIFLORA	C	3C	S1	G4
SMALL-FLOWERED BUCKTHORN				
SOLIDAGO PULCHRA	C	C1	S1	G1Q
CAROLINA GOLDENROD				
SOLIDAGO VERNA	E	C2	S2	G2?
SPRING-FLOWERING GOLDENROD				
SPOROBOLUS TERETIFOLIUS	T	C2	S2	G2?
WIRELEAF DROPSEED				
THALICTRUM COOLEYI	E	LE	S1	G1
COOLEY'S MEADOWRUE				
XYRIS BREVIFOLIA	SR		S1	G4G5
SHORT-LEAVED YELLOW-EYED GRASS				
XYRIS ELLIOTTII	SR		SH	G4
ELLIOTT'S YELLOW-EYED GRASS				

EXPLANATION OF SPECIES STATUS CODES

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

STATE STATUS

Plants:

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

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

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

Animals:

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

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

FEDERAL STATUS

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

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

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

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

GLOBAL RANK (STATE RANK)

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

G1 = Critically imperiled globally because of extreme rarity or otherwise very vulnerable to exinction throughout its range.

G2 = Imperiled globally because of rarity or otherwise vulnerable to extinction throughout its range.

G3 = Either very rare and local throughout its range, or found locally in a restricted area.

G4 = Apparently secure globally, though it may be quite rare in parts of its range (especially at the periphery).

G5 = Demonstrably secure globally, though it may be quite rare in parts of its range (especially at the periphery).

GU = Possibly in peril but status uncertain; need more information.

GX = Believed to be extinct throughout range.

Q = a suffix attached to the Global Rank indicating questionable taxonomic status.

T_ = an additional status for the subspecies or variety; the G rank then refers only to the species as a whole.

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

REFERENCE # 25

PAWPAW FLATS

COUNTYNAME: NCNORT
QUADNAME: SCOTLAND NECK, NORFLEET
DIRECTIONS: ALONG E SIDE OF US 258 FROM THE ROANOKE RIVER BRIDGE TO A POINT ABOUT 0.5 MI N OF BRIDGE
OWNER: UNION CAMP CORP.
SITEDESC:
HIGH NATURAL LEVEE COMMUNITY RELATIVELY HIGH-QUALITY AND CONTAINING MATURE, SECOND-GROWTH ALLUVIAL HARDWOODS. LARGE POPULATION OF PAWPAW/ASIMINA TRILOBA. LEVEE COMM. COMPOSED OF SUGARBERRY-GREEN ASH-SYCAMORE/PAWPAW/MIXED HERBS. BREEDING CERULEAN WARBLERS, WILD TURKEY, RED-SHOULDERED HAWKS.
SIZE: 390 PRIORITY: C
RANKCOMM: NATURAL COMMUNITIES, WILDLIFE HABITAT

PROTSTAT: NO PROTECTION STATUS

ROANOKE RIVER MEGASITE

COUNTYNAME: NCNORT NCBERT NCHALI NCMART
QUADNAME:
DIRECTIONS:

OWNER:
SITEDESC:

SIZE: 0 PRIORITY:
RANKCOMM:

PROTSTAT:

BROWN ISLAND

COUNTYNAME: NCONSL
QUADNAME: BROWNS INLET
DIRECTIONS: JUST WEST OF BEAR ISLAND

OWNER: DEPT. OF DEFENSE-CAMP LEJEUNE
SITEDESC:
AN UNINHABITED BARRIER ISLAND WHICH HAS AN OCEAN FRONT OF OVER 3 MILES. LOGGERHEAD TURTLES NEST ON THE BEACH. LITTLE BIOLOGICAL DATA AVAILABLE.

SIZE: 0 PRIORITY: C
RANKCOMM:

PROTSTAT: NO PROTECTION STATUS

CAMP LEJEUNE (GENERAL)

COUNTYNAME: NCONSL
QUADNAME: CAMP LEJEUNE, JACKSONVILLE SOUTH, OTHERS
DIRECTIONS: IN SOUTHERN ONSLOW COUNTY, SOUTH OF JACKSONVILLE. ROUGHLY EAST OF US 17 AND SOUTH OF US 24, ALONG THE NEW RIVER.
OWNER: DEPT. OF DEFENSE
SITEDESC:
INCLUDES ALL CAMP LEJEUNE LANDS NOT ON OTHER NAMED SITES. EXTENSIVE SWAMP, POCOSIN, FLATWOODS, ESTUARIES, AND BARRIER ISLANDS, WITH SAVANNAS AND LIMESINKS. NUMEROUS RARE AND ENDANGERED SPECIES, INCLUDING RED-COCKADED WOODPECKER, SEA TURTLES, ROUGH-LEAF LOOSISTRIFE, SEABEACH AMARANTH, AND POND SPICE.
SIZE: 0 PRIORITY: B
RANKCOMM: ENDANGERED AND RARE PLANT AND ANIMAL SPECIES, HIGH QUALITY AND RARE NATURAL COMMUNITY TYPES.
PROTSTAT: FEDERALLY LISTED SPECIES ARE PROTECTED.

CAMP LEJEUNE MACROSITE

COUNTYNAME: NCONSL
QUADNAME:
DIRECTIONS:

OWNER:
SITEDESC:

SIZE: 0 PRIORITY:
RANKCOMM:

PROTSTAT:

COOLEY'S MEADOWRUE POWERLINE SITE

COUNTYNAME: NCONSL
QUADNAME: HAWS RUN
DIRECTIONS: BETWEEN NC 50 ON THE W & A FIELD TO E. IN A LINEAR STRIP CA. 250 YDS LONG & 30 YDS WIDE UNDER AN ELECTRICAL POWERLINE.
OWNER: INTERNATIONAL PAPER CO.
SITEDESC:
VIGOROUS POPULATION OF THE STATE ENDANGERED PLANT, THALICTRUM COOLEYI. IN A POWERLINE RIGHT-OF-WAY NEAR SANDYRUN SWAMP. CP&L HAS EASEMENT AND HAS AGREED TO MANAGE FOR PLANT. SPECIES EXISTS IN ONLY 5 KNOWN SITES (INCLUDING THIS) WITHIN A 2.5 MILE RADIUS.
SIZE: 2 PRIORITY: A
RANKCOMM:

PROTSTAT: RHA. REGISTERED NATURAL AREA.

COOLEY'S MEADOWRUE TYPE LOCALITY

COUNTYNAME: NCONSL
QUADNAME: HAWS RUN
DIRECTIONS:

OWNER:
SITEDESC:

SIZE: 0 PRIORITY: B
RANKCOMM:

PROTSTAT:

HAMMOCKS BEACH STATE PARK

COUNTYNAME: NCONSL
QUADNAME: BROWN'S INLET, HUBERT, SWANSBORO
DIRECTIONS: APPROX. 5 MI SW OF SWANSBORO ON BEAR ISLAND

OWNER: NCDNRCD-HAMMOCKS BEACH SP
SITEDESC:
NATURAL BARRIER ISLAND EXHIBITS TYPICAL PLANT COMMUNITIES. FOUR RARE SPECIES ARE PRESENT: SALTMARSH GERARDIA, FOUR-ANGLED FLATSEDGE (SR), WINGED SEEDBOX (SR), & FLORIDA PELLITORY. LARGE LOGGERHEAD SEA TURTLE NESTING POPULATION. BIRD SPECIES INCLUDE OSPREY, LEAST TERN, BLACK SKIMMER, COMMON TERN & GULL-BILLED TERN.
SIZE: 870 PRIORITY: A
RANKCOMM: EXEMPLARY NATURAL COMMUNITIES, WILDLIFE HABITAT, RARE SPECIE

PROTSTAT: RHA, REGISTERED NATURAL AREA.

HAWKINS ISLAND

COUNTYNAME: NCONSL
QUADNAME: HUBERT
DIRECTIONS: IN BOGUE SOUND AT OUTLET OF QUEENS CREEK; ACCESS BY BOAT AT HIGH TIDE FROM SHELL ROCK OR GREAT NECK LANDINGS
OWNER: JAMES MACRAE
SITEDESC:
NATURAL ESTUARINE ISLAND COVERED BY LARGE SHELL MIDDEN DEPOSITED BY ABORIGINES. MARITIME FOREST OF LIVE OAK ON HIGH LAND. ZONATIONS OUTWARDS FROM FOREST THROUGH DISTINCT SHRUB ZONES DOMINATED BY WAX MYRTLE. THE RARE SMALL-FLOWERED BUCKTHORN (SAGERETIA MINUTIFLORA, SR), AND GROUNDSEL-TREE.
SIZE: 40 PRIORITY: C
RANKCOMM: NATURAL COMMUNITIES, RARE SPECIES

PROTSTAT: NO PROTECTION STATUS

HOFMANN FOREST CYPRESS NATURAL AREA

COUNTYNAME: NCONSL
QUADNAME: JACKSONVILLE NW
DIRECTIONS: IN JUNIPER SWAMP AREA OF HOFFMAN FOREST, NEAR JONES-ONSLOW COUNTY LINE.
OWNER: NC FORESTRY FOUNDATION & NCSU SCHOOL OF FORESTRY
SITEDESC:
EXCELLENT EXAMPLE OF A CYPRESS & BAY SWAMP FOREST SITUATED ON A STREAM HEAD. CLIMAX STAND OF VIRGIN BALD CYPRESS, ESTIMATED TO BE 1000 YRS OLD. CANOPY FORMED BY OAK-HICKORY COMMUNITY. SWAMP GUM-RED MAPLE BAY FOREST OCCURS IN BAY HEADS & SEEPAGE AREAS.
SIZE: 28 PRIORITY: B
RANKCOMM: EXEMPLARY NATURAL COMMUNITIES

PROTSTAT: RHA. REGISTERED NATURAL AREA. ALSO SAF REGISTERED NATURAL AREA.

HOFMANN FOREST NERE ELEXUS POND PINE NATURAL AREA

COUNTYNAME: NCONSL
QUADNAME: KELLUM
DIRECTIONS: ABOUT 12 MI NE OF JCT US 17 & NC 24 (IN JACKSONVILLE) NEAR DEPPE
OWNER: NC FORESTRY FOUNDATION & NCSU SCHOOL OF FORESTRY
SITEDESC:
LATE SUCCESSIONAL OLD-GROWTH POND PINE COMMUNITY REPRESENTING RELATIVELY UNDISTURBED PLANT COMMUNITY OF COASTAL PLAIN. VEGETATION CHARACTERIZED BY UNDERSTORY OF RED MAPLE, LOBLOLLY BAY, & A SHRUB LAYER OF FETTERBUSH & RED BAY. PRESENCE OF BROAD-LEAVED EVERGREEN SHRUBS TYPICAL OF POCOSINS. PEAT SUBSTRATE
SIZE: 25 PRIORITY: B
RANKCOMM: NATURAL COMMUNITY

PROTSTAT: RHA. REGISTERED NATURAL AREA. ALSO SAF REGISTERED NATURAL AREA.

HUGGINS (RUSSELLS) ISLAND

COUNTYNAME: NCONSL
QUADNAME: SWANSBORO
DIRECTIONS: IN THE MOUTH OF WHITE OAK RIVER. INSIDE BOGUE INLET

OWNER: PRIVATE
SITEDESC:
A NATURAL ESTUARINE ISLAND ABOUT 1-MILE LONG; PARTLY FORESTED. THE RARE SLITTLE-FLOWERED BUCKTHORN (SAGERETIA MINUTIFLORA, SR) GROWS ON THE ISLAND.

SIZE: 0 PRIORITY: C
RANKCOMM:

PROTSTAT: NO PROTECTION STATUS

LEJEUNE LONGLEAF RIDGE

COUNTYNAME: NCONSL
QUADNAME: NEW RIVER INLET
DIRECTIONS: S OF MARINES RD, APPROX. 0.6 MI SW OF JCT WITH SNEADS FERRY RD, BETWEEN FRENCH CREEK & DUCK CREEK
OWNER: DEPT. OF DEFENSE-CAMP LEJEUNE
SITEDESC:
A MATURE FOREST OF LONGLEAF PINES; A PINE FLATWOODS NATURAL COMMUNITY. ON A 3-YEAR BURN CYCLE. COLONY OF RED-COCKADED WOODPECKERS. CREEPING BLUEBERRY AND WIREGRASS ARE ABUNDANT; PYXIE MOSS ALSO PRESENT. MANY PINES WITH DBH OF 14 IN.; SOME PROBABLY 100 YEARS OLD.
SIZE: 68 PRIORITY: A
RANKCOMM: EXEMPLARY NATURAL COMMUNITY, ENDANGERED ANIMAL SPECIES

PROTSTAT: RHA(PARTIAL). REGISTERED NATURAL AREA.

LEJEUNE LOOSESTRIFE SITE

COUNTYNAME: NCONSL
QUADNAME: NEW RIVER INLET
DIRECTIONS:

OWNER:
SITEDESC:

SIZE: 0 PRIORITY: A
RANKCOMM:

PROTSTAT:

MAPLE HILL LIMESINK COMPLEX

COUNTYNAME: NCONSL
QUADNAME: MAPLE HILL
DIRECTIONS:

OWNER:
SITEDESC:
LIMESINK COMPLEX NORTH OF MAPLE HILL. NEEDS INVENTORY

SIZE: 0 PRIORITY: C
RANKCOMM: NATURAL COMMUNITIES, RARE PLANT SPECIES

PROTSTAT:

NATURAL BRIDGE

COUNTYNAME: NCONSL
QUADNAME: RICHLANDS
DIRECTIONS: ON TRIBUTARY OF NEW RIVER. NORTHWEST OF HALF MOON AND WEST OF HOFFMAN FOREST.
OWNER: PRIVATE
SITEDESC:
NO DATA AVAILABLE ON SITE; FIELD WORK IS NEEDED.

SIZE: 0 PRIORITY: C
RANKCOMM:

PROTSTAT:

NEW RIVER INLET NESTING ISLAND

COUNTYNAME: NCONSL
QUADNAME: NEW RIVER INLET
DIRECTIONS: IN THE NEW RIVER ABOUT 5 KM EAST OF SNEADS FERRY

OWNER: NC-DEPT. ADMINISTRATION
SITEDESC:
AN IMPORTANT NESTING SITE FOR GULL-BILLED TERNS. COMMON TERNS. LEAST TERNS. & BLACK SKIMMERS IN THE EARLY 1970'S. SINCE THEN. NUMBERS HAVE DECLINED. THE 1983 CENSUS INDICATED THE FOLLOWING NUMBER OF NESTS: 15 GREEN-BACKED HERON. 2 COMMON TERN. 96 LEAST TERN.
SIZE: 0 PRIORITY: C
RANKCOMM: SPECIAL WILDLIFE HABITAT

PROTSTAT: RHA. REGISTERED NATURAL AREA.

NEW RIVER LIMESTONE RAVINE

COUNTYNAME: NCONSL
QUADNAME: CATHERINE LAKE
DIRECTIONS: SMALL RAVINE RUNNING NW FROM NEW RIVER. JUST W OF SR 1314 BRIDGE.
OWNER:
SITEDESC:
SMALL, FLAT-BOTTOMED RAVINE, WITH LIMESTONE BLUFFS 5-10 FT. HIGH ON S SIDE. A FEW OUTCROPS OCCUR ON N SIDE. POPULATIONS OF TENNESSEE BLADDER FERN AND CAROLINA SPLEENWORT, BOTH STATE ENDANGERED. EXCELLENT EXAMPLES OF COASTAL PLAIN MARL OUTCROP AND BASIC MESIC FOREST NATURAL COMMUNITIES.
SIZE: 0 PRIORITY: B
RANKCOMM: RARE PLANT SPECIES, HIGH QUALITY RARE NATURAL COMMUNITIES.

PROTSTAT: NO PROTECTION STATUS.

ONSLOW BEACH (CAMP LEJEUNE)

COUNTYNAME: NCONSL
QUADNAME: NEW RIVER INLET, BROWNS INLET
DIRECTIONS: LYING ALONG THE OCEAN JUST SOUTHWEST OF BROWNS ISLAND.
COMPLETELY WITHIN CAMP LEJEUNE.
OWNER: DEPT. OF DEFENSE-CAMP LEJEUNE
SITEDESC:
A LONG MAINLAND BEACH (RARE IN NC) BUT CUT OFF FROM MAINLAND BY INTRACOASTAL WATERWAY. BEACH IS NEARLY 8 MILES LONG. LOGGERHEAD TURTLES NEST ON THE BEACH. AND IN 3 YEARS IN THE 1980'S A GREEN TURTLE HAS NESTED HERE. AMARANTHUS PUMILUS GROWS ON THE BEACH.
SIZE: 0 PRIORITY: B
RANKCOMM: RARE ANIMAL SPECIES, RARE PLANT SPECIES

PROTSTAT: NO PROTECTION STATUS

ROCK HOUSE CAVE NATURAL AREA

COUNTYNAME: NCONSL
QUADNAME: CATHERINE LAKE
DIRECTIONS: N OF CATHERINE LAKE, E OF SR 1222 ALONG CREEK FLOWING NE
BETW SR 1224 & SR 1223, 0.5 MI DOWNSTREAM OF SR 1222 BRIDGE
OWNER: H. DONALD SCOTT (+ OTHERS ?)
SITEDESC:
BEST EXAMPLES OF COASTAL PLAIN KARST TOPOGRAPHY IN NC, INCLUDING AN UNDERGROUND STREAM IN A CAVE SYSTEM, SMALLER CAVES, SINKS, & KARST WINDOWS. OUTSTANDING EXAMPLES OF COASTAL PLAIN MARL OUTCROP NATURAL COMMUNITIES OCCUR IN SINKHOLES. ON TOP OF LIMESTONE BLOCKS, AND ON OUTCROPS ALONG THE CREEK.
SIZE: 9 PRIORITY: B
RANKCOMM: GEOMORPHIC LANDFORMS, NATURAL COMMUNITIES

PROTSTAT: NO PROTECTION STATUS

SANDY RUN SWAMP RARE PLANT SITE

COUNTYNAME: NCONSL
QUADNAME: HAWS RUN
DIRECTIONS: FROM JCT. OF NC 50 AND SR 1104 DRIVE 0.25 MILES TO NW THEN
TURN WEST ON GATED TIMBER CO. ROAD. GO 0.75 MILES WEST.
OWNER: INTERNATIONAL PAPER
SITEDESC:
POWERLINE RIGHT OF WAY AND MOIST ROADSIDES. ALONG FIREBREAKS. IN PINE PLANTATION FIVE RARE SPECIES: AGALINIS APHYLLA, THALICTRUM COOLEYI. LUDWIGIA MICROCARPA. DIONAEA MUSCIPULA.

SIZE: 0 PRIORITY: A
RANKCOMM: RARE PLANT SPECIES

PROTSTAT: NO PROTECTION STATUS

STARRETTS MEADOW

COUNTYNAME: NCONSL
QUADNAME: HUBERT
DIRECTIONS: WEST SIDE OF NC 172, CA. HALF-WAY BETWEEN SENTRY GATE AND NC 24, CAMP LEJEUNE.
OWNER: DEPT. OF DEFENSE-CAMP LEJEUNE
SITEDESC:
AN UNUSUAL COMMUNITY THAT IS AN OPEN CYPRESS FOREST, WITH SOME PINE, OVER AN ABUNDANCE OF GRASSES AND FORBS; GENERALLY WET, OCCASIONALLY KNEE-DEEP. MANY CARNIVOROUS PLANTS. LOBELIA BOYKINII (G2 SPECIES) GROWS HERE, AS DOES RHYNCHOSPORA TRACYI.
SIZE: 0 PRIORITY: A
RANKCOMM: RARE PLANT SPECIES, NATURAL COMMUNITY

PROTSTAT: NO PROTECTION STATUS

WALLACE CREEK >4 (5)

COUNTYNAME: NCONSL
QUADNAME: CAMP LEJEUNE
DIRECTIONS: IN FLOODPLAIN OF WALLACE CREEK E OF PINEY GREEN RD. EXTENDING E TO SMITH RD & NC 24
OWNER: DEPT. OF DEFENSE-CAMP LEJEUNE
SITEDESC:
THE SWAMP IS AN OLD GROWTH BALD CYPRESS STAND GROWING IN A FORMER MILL POND. JUST UPSTREAM IS A SWAMP DOMINATED BY SWAMP BLACK GUM; AMERICAN ELM, RED MAPLE, AND SWEET GUM ALSO PRESENT. RARE SPECIES ARE PONTHIEVA RACEMOSA AND DRYOPTERIS LUDOVICIANA.
SIZE: 350 PRIORITY: A
RANKCOMM: NATURAL COMMUNITY, RARE PLANT SPECIES

PROTSTAT: RHA (PARTIAL). REGISTERED NATURAL AREA.

MORGAN CREEK SWAMP

COUNTYNAME: NCORA, NCDURH
QUADNAME: CHAPEL HILL
DIRECTIONS:

OWNER:
SITEDESC:

SIZE: 0 PRIORITY:
RANKCOMM:

PROTSTAT:

EXPLANATION OF NC NATURAL HERITAGE PROGRAM DATABASE OUTPUT

Probably the most important database kept by the N.C. Natural Heritage Program is the one that tracks occurrences of elements of natural diversity (rare animals, rare plants, geologic features, special animal habitats). The output (printout) you have received is a subset of this very large database. Each record (an occurrence) is printed out in a particular format, the structure of which is explained below.

EOCODE: Internal coding for the element occurrence. The first letter indicates the kind of element:

A=vertebrate animal	N=nonvascular plant
G=geologic feature	P=vascular plant
I=invertebrate animal	S=special animal habitat

For vertebrates, the second letter indicates the order (taxonomic), with A=amphibians, B=birds, F=fish, etc. For vascular plants, the second letter indicates whether the plant is a monocot (M), dicot (D), pteridophyte (P), or gymnosperm (G). For nonvascular plants, the second letter indicates whether the plant is a bryophyte (B) or lichen (L).

The last 3 digits, following the decimal point, are the number of that occurrence of the species in the database. For plants, numbers with an H are occurrences reported from before 1935 which have not been found since. In some cases, H has also been used to indicate very vague records, or populations known to have been extirpated.

NAME: Scientific name of the element.

COMNAME: Common name of the element.

FEDSTAT: Federal status of the species, from Endangered & Threatened Wildlife and Plants, April 10, 1987. 50 CFR 17.11 & 17.12. Department of Interior. Established by the Endangered Species Act of 1973, as amended.

LE = Taxa currently listed as Endangered
LT = Taxa currently listed as Threatened
PE = Taxa currently proposed for listing as Endangered
PT = Taxa currently proposed for listing as Threatened
Taxa under review for possible listing ("candidate species"):
C1 = Taxa with sufficient information to support listing
C2 = Taxa without sufficient information to support listing

STATESTAT: Status of the species in North Carolina. For plants, from Sutter, R.D., L. Mansberg, and J.H. Moore. 1983. Endangered, threatened, and rare plant species of North Carolina: a revised

list. ASB Bulletin 30:153-163, and updated lists of the Natural Heritage and Plant Conservation Programs.

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

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

For animals, from Cooper, J.E., S.S. Robinson, and J.B. Funderbu (Eds.). 1977. Endangered and Threatened Plants and Animals of North Carolina. N.C. Museum of Natural History, Raleigh, NC. 444 pages + i-xvi.

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

GRANK: Nature Conservancy "global rank."

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

SRANK: Nature Conservancy state rank. Coding similar to global ranks.

COUNTYNAME: Acronym for the county. In general, this is the first four letters of the county name.

QUADNAME: USGS quad map name, at 7.5 minute scale when available.

PRECISION: The precision with which the location can be mapped from the available information: S=seconds (hundreds of feet), M=minutes (up to 1.5 mile radius), G=general (to a place name only, or up to 5 mile radius).

LAT, LONG: Latitude and Longitude coordinates for the center of the occurrence.

LASTOBS: Year, month, and day the element was last observed.

DIRECTIONS: How to find the site.

GENDESC: General description. A word picture of the site, describing the habitat.

ELEV, SIZE: Elevation and size of the occurrence.

EODATA: Information on number, size, condition, and other relevant information on the element occurrence.

COMMENTS: Additional information on the occurrence, the site, or sources of information.

SITENAME: Name of the site as standardized by the Natural Heritage Program for internal use. Many sites do not have a name.

OWNER: Name of owner of the site (some abbreviations used).

SPECSTAT: Codes indicating special status of the site.
- AEC=Area of Environmental Concern
- DED=Dedicated State Nature Preserve
- ESN=National Estuarine Sanctuary
- EWA=Established Wilderness Area
- EAN=Conservation Easement
- NNL=National Natural Landmark
- NPK=National Park
- NPY=National Parkway
- NSH=National Seashore
- RHA=Registered Natural Heritage Area
- RNA=Research Natural Area (USFS)
- SPK=State Park (incl. State Natural Areas)
- ORW=Outstanding Resource Water
- WSR=Wild and Scenic River

...and a few others, infrequently used

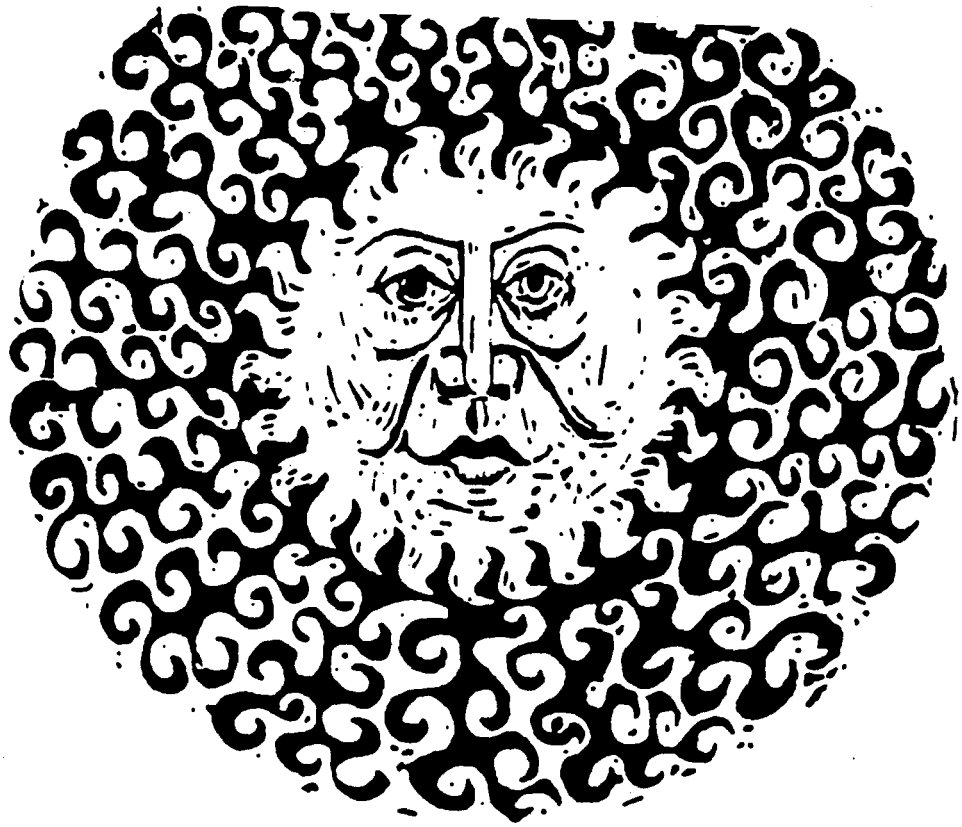
OWNERCOM: Comments on ownership.

PROTCOMM: Comments on need for additional protection for the element.

MGMTCOMM: Comments on need for management of the site for the element.

SOURCE: Best source of information on the element occurrence.

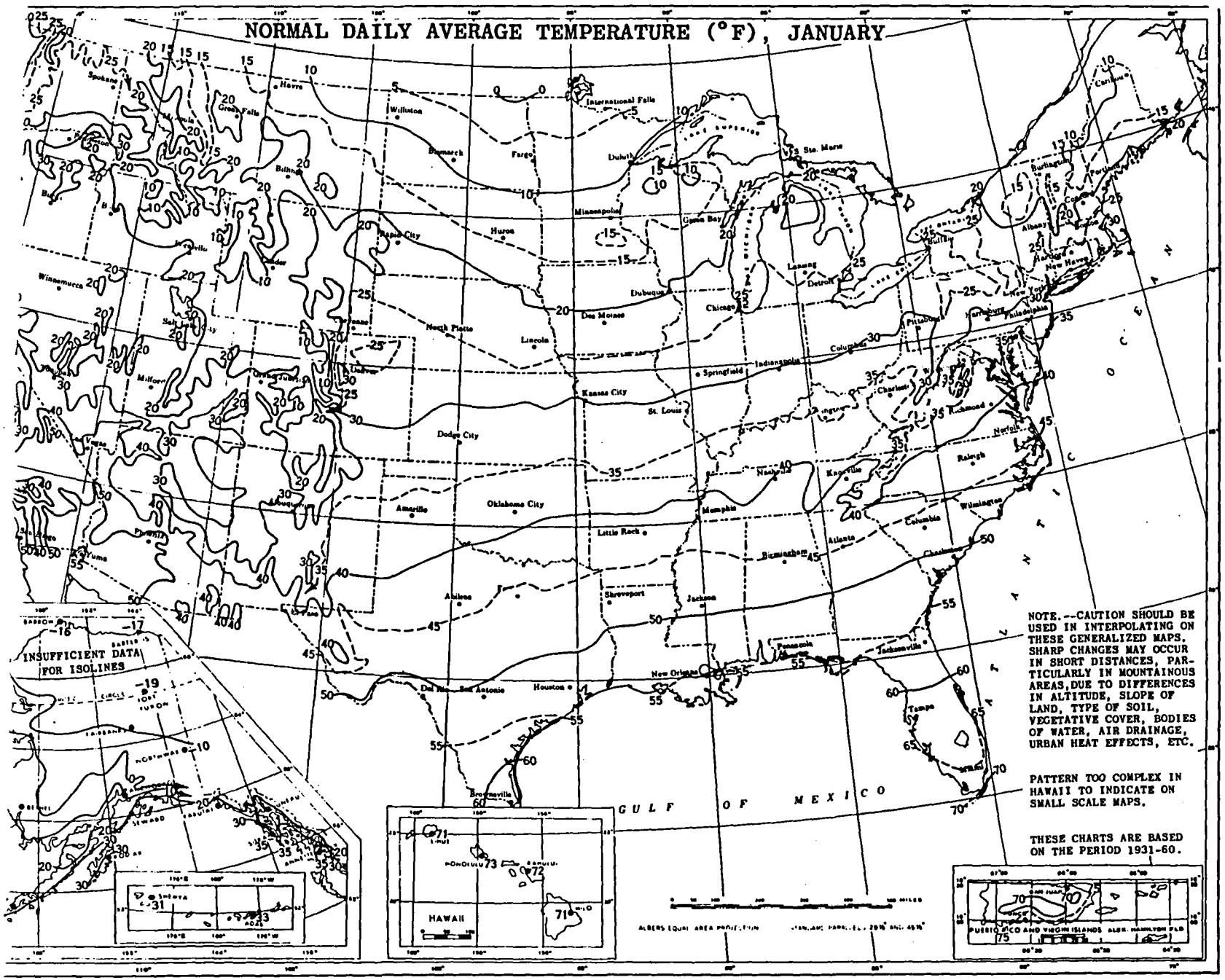
REFERENCE # 26

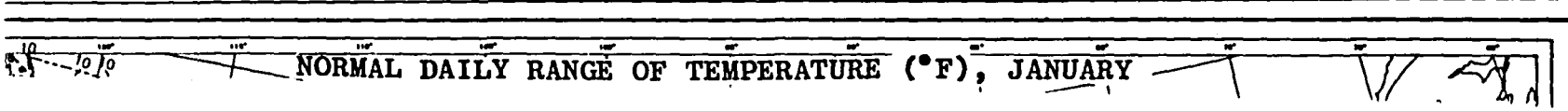


CLIMATIC ATLAS OF THE UNITED STATES

ıental Science Services Administration . Environmental Data

ANGE OF TEMPERATURE (°F), JANUARY





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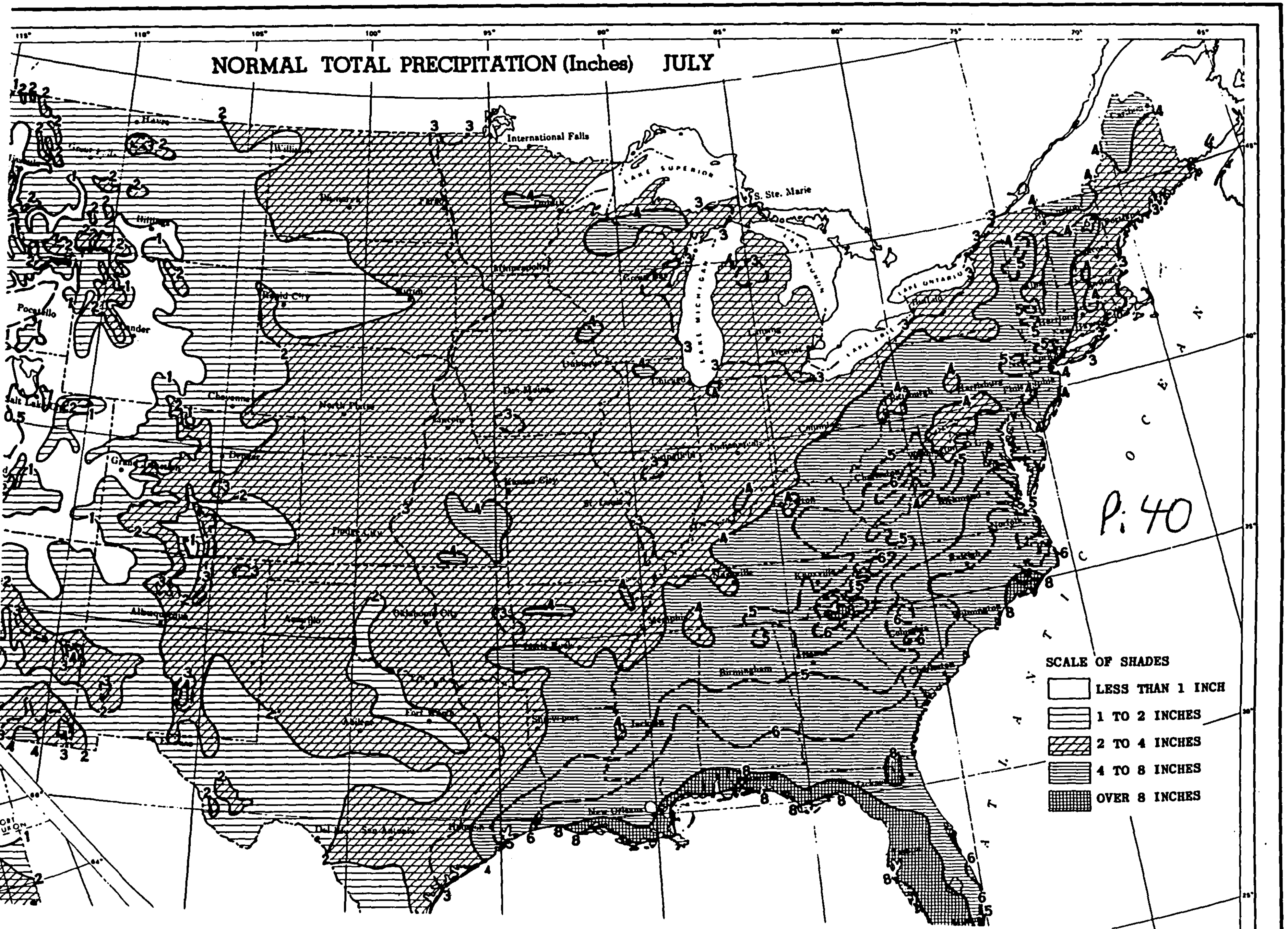

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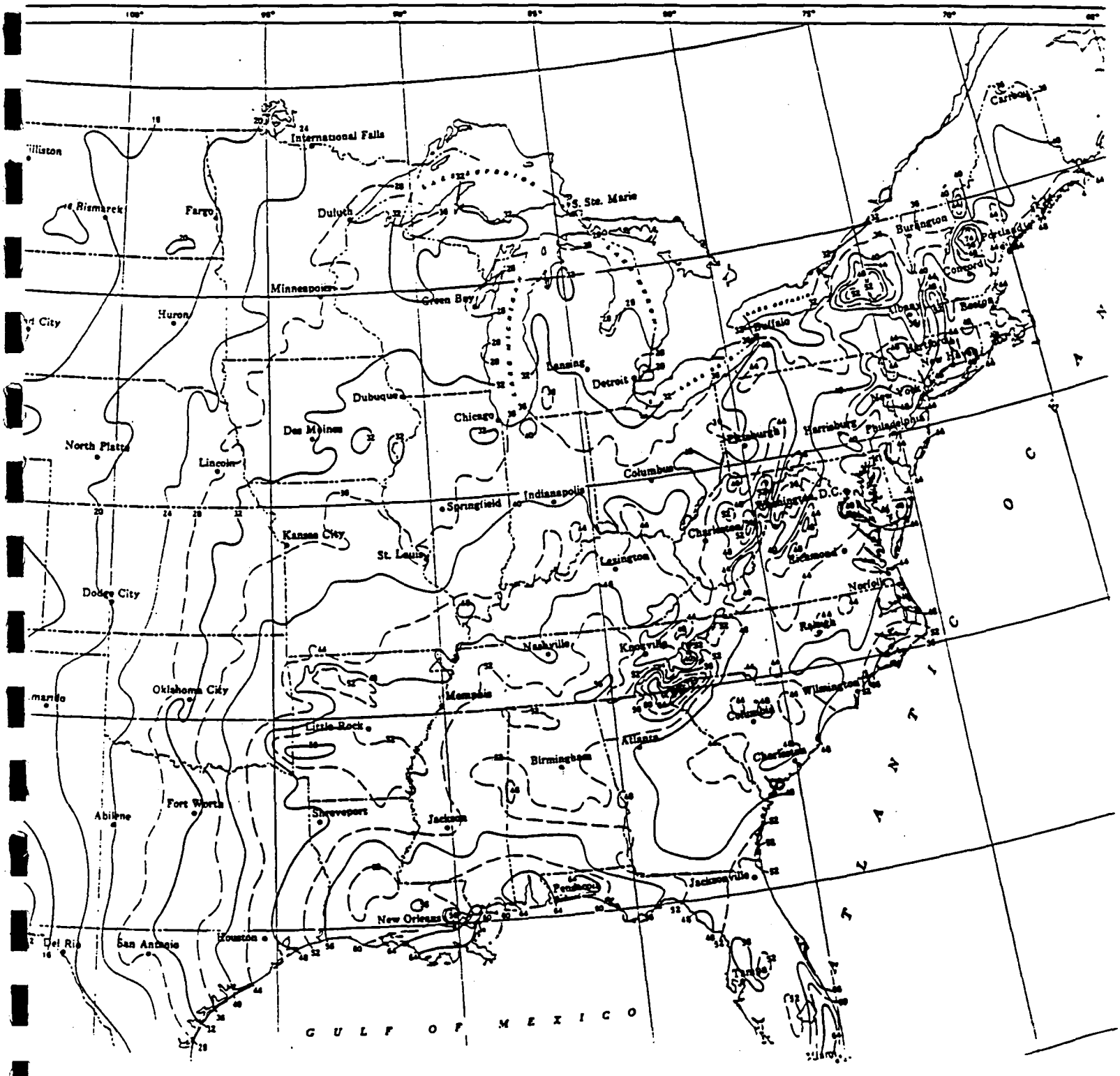

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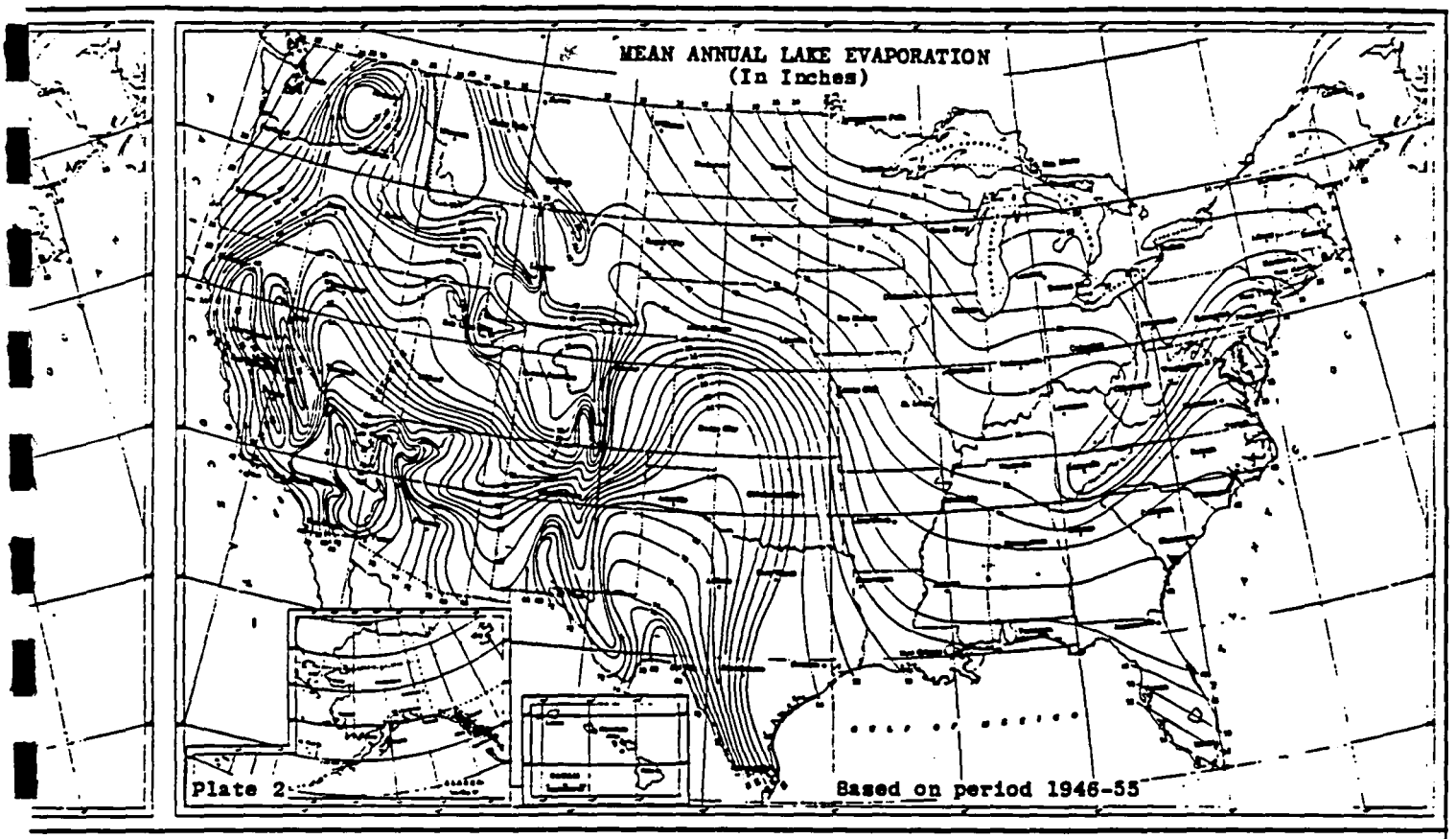

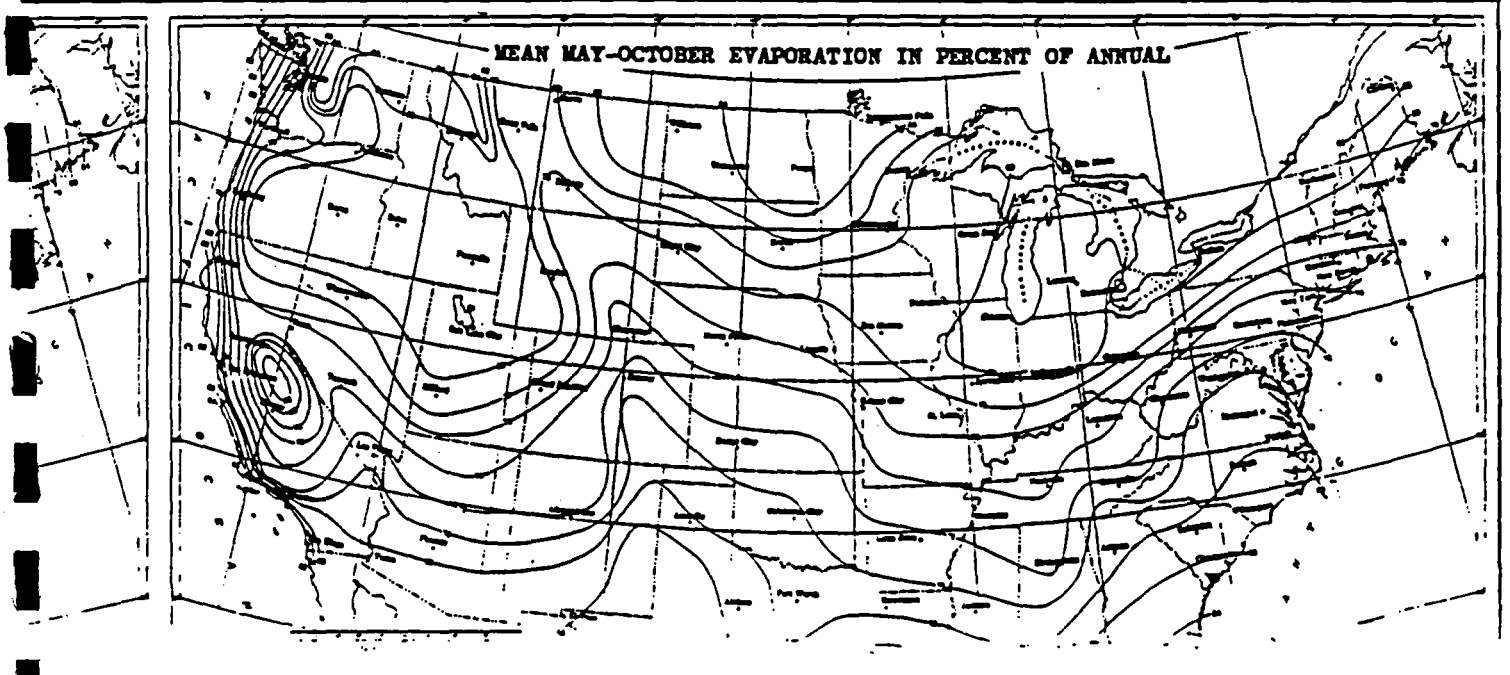

MENT OF COMMERCE
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U. W.

TECHNICAL PAPER NO. 40

RAINFALL FREQUENCY ATLAS OF THE UNITED STATES

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

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

REFERENCE # 27

PROPERT
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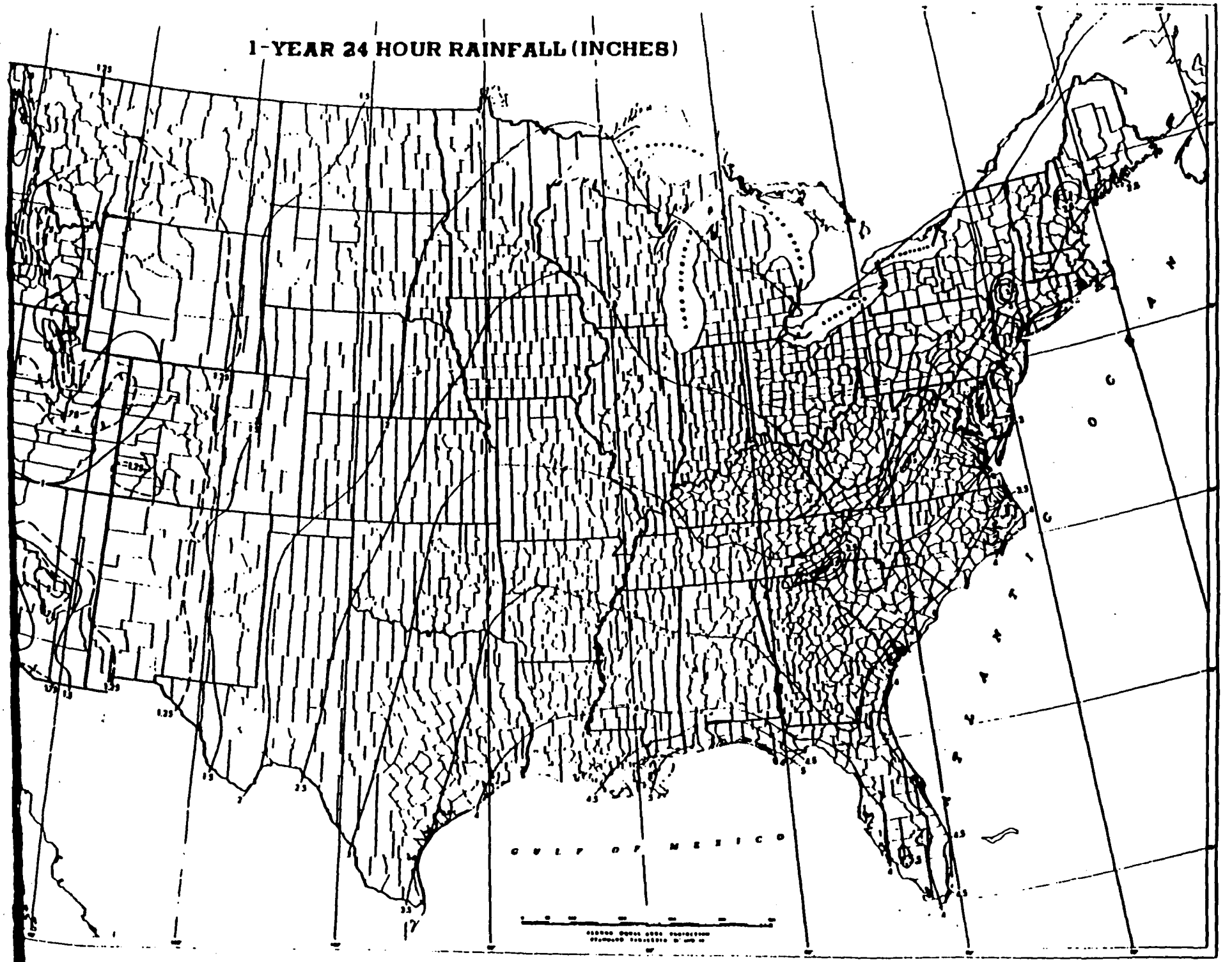
1-YEAR 24 HOUR RAINFALL (INCHES)



NUS CORPORATION
SUPERFUND DIVISION

REFERENCE # 28

PROJECT NOTES

TO: Stanadyne, Inc., Diesel Systems Group,
Jacksonville, N.C. (F4-9004-54)

DATE: November 19, 1990

FROM: William E. Vasser WEV

COPIES:

SUBJECT: Surface water intakes, Onslow County, North Carolina

North Carolina division of Health Services
Environmental Health Section
Water Supply Branch
Public Water Supply Data Sheet Printout (June 1990)
Surface Water Sources

Examination of the above mentioned computer printout showed no surface water intakes in Onslow County.

EPA-600/2-87-035
April 1987

REFERENCE # 29

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

by

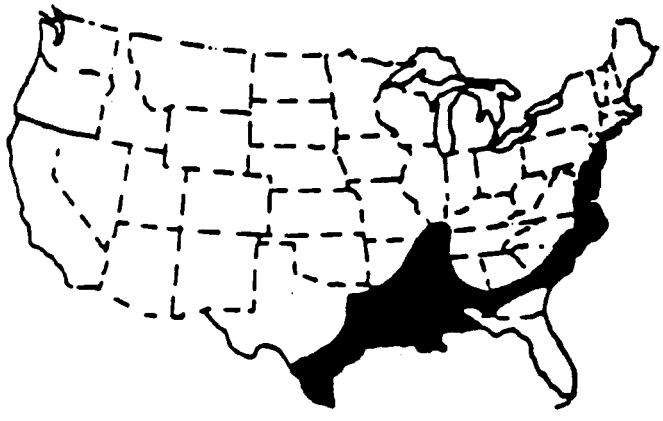
Linda Aller
Truman Bennett
Jay H. Lehr
Rebecca J. Petty
and
Glen Hackett
National Water Well Association
Dublin, Ohio 43017

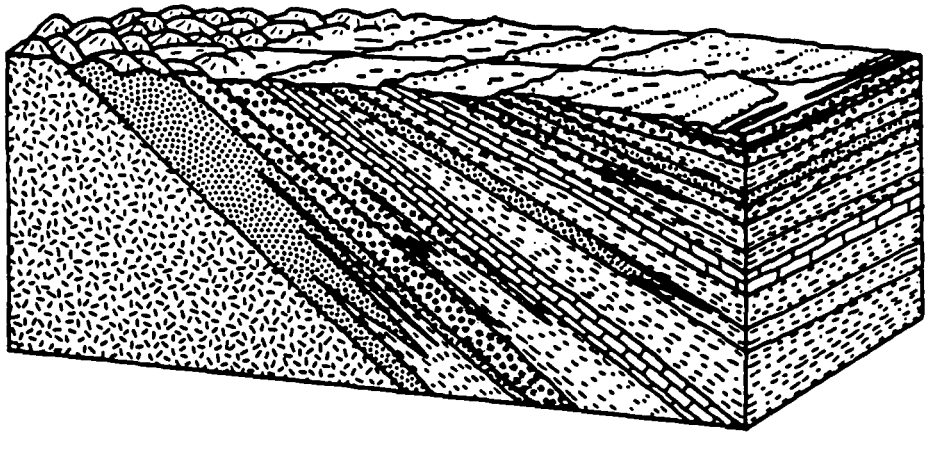
Cooperative Agreement CX-810715-01

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

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

10. ATLANTIC AND GULF COASTAL PLAIN GROUND-WATER REGION





10Aa	Regional Aquifers
10Ab	Unconsolidated & Semi-Consolidated Shallow Surficial Aquifer
10Ba	River Alluvium With Overbank Deposits
10Bb	River Alluvium Without Overbank Deposits
10C	Swamp

10. ATLANTIC AND GULF COASTAL PLAIN

(Complexly interbedded sand, silt, and clay)

The Atlantic and Gulf Coastal Plain region is an area of about 844,000 km^2 extending from Cape Cod, Massachusetts, on the north to the Rio Grande in Texas on the south. This Region does not include Florida and parts of the adjacent States; although those areas are a part of the Atlantic and Gulf Coastal Plain physiographic province, they together form a separate ground-water region. (See region 11, "Southeast Coastal Plain").

The Atlantic and Gulf Coastal Plain region ranges in width from a few kilometers near its northern end to nearly a thousand kilometers in the vicinity of the Mississippi River. The great width near the Mississippi reflects the effect of a major downwarped zone in the Earth's crust that extends from the Gulf of Mexico to about the confluence of the Mississippi and Ohio Rivers. This area is referred to as the Mississippi embayment.

The topography of the region ranges from extensive, flat, coastal swamps and marshes 1 to 2 m above sea level to rolling uplands, 100 to 250 m above sea level, along the inner margin of the region.

The region is underlain by unconsolidated sediments that consist principally of sand, silt, and clay transported by streams from the adjoining uplands. These sediments, which range in age from Jurassic to the present, range in thickness from less than a meter near the inner edge of the region to more than 12,000 m in southern Louisiana. The greatest thicknesses are along the seaward edge of the region and along the axis of the Mississippi embayment. The sediments were deposited on floodplains and as deltas where streams reached the coast and, during different invasions of the region by the sea, were reworked by waves and ocean currents. Thus, the sediments are complexly interbedded to the extent that most of the named geologic units into which they have been divided contain layers of the different types of sediment that underlie the region. These named geologic units (or formations) dip toward the coast or toward the axis of the Mississippi embayment, with the result that those that crop out at the surface form a series of bands roughly parallel to the coast or to the axis of the embayment. The oldest formations crop out along the inner margin of the region, and the youngest crop out in the coastal area.

Within any formation the coarsest grained materials (sand, at places interbedded with thin gravel layers) tend to be most abundant near source areas. Clay and silt layers become thicker and more numerous downdip.

80-2

REFERENCE # 30

GROUNDWATER EVALUATION IN THE CENTRAL COASTAL PLAIN OF NORTH CAROLINA

Ref.

REF.

DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT

1980

GROUNDWATER EVALUATION

IN THE

CENTRAL COASTAL PLAIN OF NORTH CAROLINA

By

James Narkunas

The preparation of this report was made possible through Grant No. 10740004 from the Coastal Plains Regional Commission. This data is the result of tax-supported research and as such is not copyrightable. It may be freely reprinted with the customary crediting of the source.

Copies of this report are available from the North Carolina Department of Natural Resources and Community Development, Office of Water Resources.

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of the stratigraphic units is to the northeast and the dip is to the southeast with a gradient between 10 and 30 feet per mile.

The third column in Table 1 illustrates those stratigraphic units present beneath the study area, and the sequence of their deposition.

Previously published reports by Brown (1959), LeGrand (1960), and Mundorff (1945) provide comprehensive discussions of the stratigraphic units or geologic formations underlying the study area. Therefore, a similar discussion will not be repeated here. Rather, the following sections are intended to provide only a brief description of each unit's lithology and areal extent.

Basement Complex

Although the basement complex is not a stratigraphic unit, it provides the surface upon which the sediments unconformably lie. The composition of the basement complex is similar or equivalent to the crystalline igneous or metamorphic rocks common to the Piedmont Province west of the Coastal Plain. A sample collected at a quarry at Fountain in western Pitt County was identified as calc-alkaline granite. Other samples collected during drilling operations in the area have been identified as highly metamorphosed schist and gneiss.

Figure 18 shows the elevations of the basement surface underlying the study area. Elevations range from 100 feet below sea level in northwestern Greene County to about 2100 feet below sea level in southeastern Jones County. The basement surface slopes toward the southeast at about 35 feet per mile.

Although the elevation contours suggest otherwise, the surface of the basement complex is irregular. This apparent discrepancy is due to

SYSTEM	SERIES	STRATIGRAPHIC UNIT	HYDROGEOLOGIC UNIT		HYDROGEOLOGIC PROPERTIES	DESCRIPTION AND EXTENT
QUATERNARY	RECENT	SURFICIAL	WATER TABLE		The deposits serve as an unconfined aquifer. The water table is shallow, ranging from land surface to within 20 feet of land surface even during dry periods. Water from this unit is soft and low in total dissolved solids. It is commonly corrosive and contains objectionable amounts of iron.	Surficial deposits consisting chiefly of sand, clay and gravel. Shell material is also present in the eastern part of the region. The relatively thin deposits overlie the entire area and range in thickness from a few feet to approximately 35 feet.
	PLEISTOCENE					
TERTIARY	MIOCENE	YORKTOWN	YORKTOWN		In the west, the Yorktown serves as a confining bed for those units below the water table aquifer. Small amounts of water are available from lenticular sand beds within the unit. In the east, the unit acts as a permeable semi confined aquifer capable of yielding moderate amounts of good quality water.	In the western part of the study area, the Yorktown unit consists of a dark blue, massive clay matrix containing abundant shells. In the eastern part, the unit consists of loose shells and limestone in a sand matrix. Some amounts of yellow to gray clay are also present. The unit occurs as scattered remnants in the west, and as a continuous unit east of Greenville, New Bern, Pollocksville and Jacksonville. The thickness of the unit ranges from 0 to 15 feet in the west to about 60 feet in the eastern part.
	OLIGOCENE	UNNAMED	CASTLE HAYNE AQUIFER SYSTEM	CASTLE HAYNE	The Castle Hayne Unit is a highly permeable semi-confined aquifer capable of yielding large amounts of water. It is an important aquifer in the eastern part of the area, but remains relatively undeveloped in the western part where better quality water is available at slightly greater depth. The unit yields a hard, calcium bicarbonate - type water.	The Castle Hayne Unit varies in lithology and consolidation from shell limestone to sand with shell fragments. It occurs as a continuous unit throughout Craven, Jones and Onslow counties, and also in southeastern Duplin and eastern Pitt Counties. The unit thickens to the south and east from its western limit to more than 400 feet in the eastern part of the shady area.
	EOCENE	CASTLE HAYNE				
	PALEOCENE	BEAUFORT				
CRETACEOUS	UPPER CRETACEOUS	PEEDEE	CRETACEOUS AQUIFER SYSTEM	CRETACEOUS UPPER SAND	This unit is a semi-confined aquifer whose water-bearing sands yield moderate amounts of water to municipal, industrial or agricultural wells. The water is a soft, sodium bicarbonate-type except in those areas where indurated calcareous beds cause it to be moderately hard. Heavy withdrawals from the Cretaceous Lower Sand Unit are reflected in leakage from the Upper Sand Unit.	The Cretaceous Upper Sand Unit consists of dark green or gray glauconitic or clayey sands interbedded with massive dark gray clay beds. Indurated shell beds are present throughout. The unit outcrops or is near the surface in Duplin, Greene, Lenoir and Pitt counties. It thickens to the east from its origin to between 60 and 80 feet. The unit is overlain unconformably by the Surficial, Yorktown or Castle Hayne Units and separated from them by a massive clay layer 20 to 30 feet thick.
		BLACK CREEK		CRETACEOUS LOWER SAND	The Cretaceous Lower Sand Unit is the principal aquifer in the area. It is a semi-confined aquifer capable of supplying large amounts of excellent quality water. The water is a soft sodium bicarbonate-type except in those areas where indurated calcareous beds cause it to be moderately hard. Heavy withdrawals have resulted in declining water levels and expanding cones of depression.	The Cretaceous Lower Sand Unit consists of glauconitic sand and dark gray massive clays. Lenticular gravel deposits are also present. The unit outcrops in the extreme western parts of Lenoir, Greene and Pitt Counties. It dips and thickens to the east ranging from 140 feet in the west to more than 700 feet in the east. It is separated from the Cretaceous Upper Sand Unit by a massive clay confining bed.
		TUSCALOOSA				

TABLE Summary of Hydrogeologic Units underlying the Central Coastal Plain Area

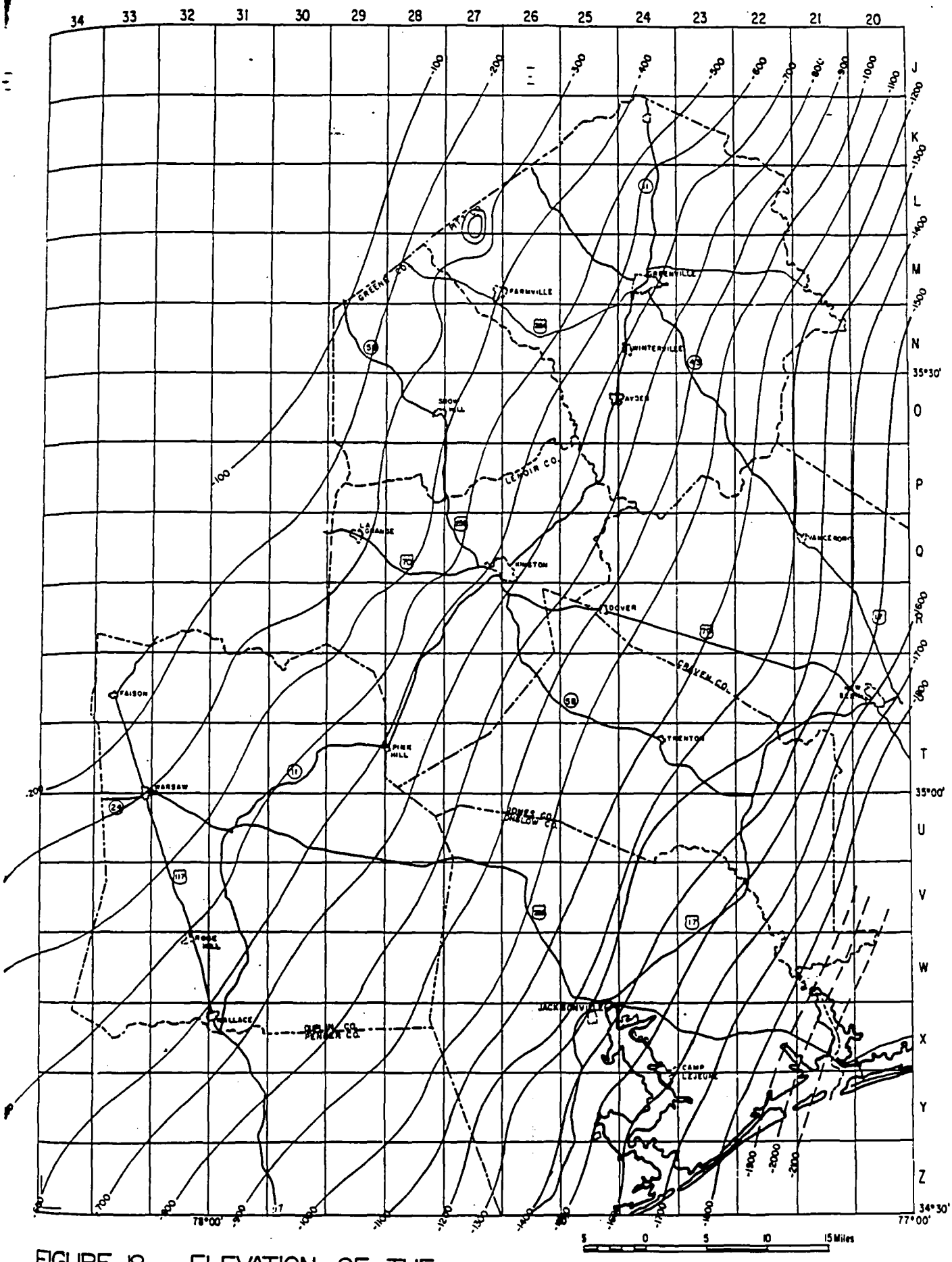

FIGURE 18 — ELEVATION OF THE TOP OF THE BASEMENT COMPLEX

the wide spacing of control points used in constructing the basement map. The case for an irregular surface is best substantiated in considering the fact that the basement complex at the quarry near Fountain is exposed at land surface, while a town well located within one-half mile of the quarry and at approximately the same elevation was drilled through 200 feet of sediment.

Lower Cretaceous Series

Rocks of the Lower Cretaceous Series underlie the entire central Coastal Plain and include the oldest sediments in the study area. The stra which are unnamed, consist primarily of sand and silt interbedded with sil clay and lie unconformably on the basement complex. The elevation of the top of the Lower Cretaceous strata ranges from 100 feet below sea level in northwestern Greene County to 1750 feet below sea level in southeastern Jones County. The rocks are between 200 and 400 feet thick and dip to the southeast at 26 feet per mile.

Upper Cretaceous Series

The Tuscaloosa formation is the lowermost stratigraphic unit in the Upper Cretaceous Series. The formation unconformably overlies the Lower Cretaceous rocks and is present throughout the study area. The composition of the formation varies considerably. It generally consists of medium-to coarse-grained quartz sand interbedded with sandy or silty clay. The sediments grade from silt, clay, and fine sand in the lower part of the formation to coarse sand interbedded with silt and clay in the upper portic The top of the formation ranges in elevation from slightly above sea level in southeastern Jones County. The formation thickens in a southeast direct from about 100 feet to 250 feet. The strata dip to the southeast at 25 fee

per mile.

Black Creek Formation

The Black Creek formation underlies the entire study area except northwestern Pitt and Greene Counties. It unconformably overlies the Tuscaloosa formation and outcrops, or is near land surface, in central Greene County and northwestern Lenoir and Duplin Counties. The formation, which includes the upper Snow Hill member and an unnamed lower member, varies in composition, but generally consists of gray lenticular sand interbedded with dark gray to black micaceous clays. The unnamed member commonly contains lignitized wood fragments and some glauconite, and the Snow Hill member contains thin shell beds and glauconite. The Black Creek formation ranges in elevation from 50 feet above sea level in central Greene County to 1000 feet below sea level in southeastern Jones County. The unit thickens from a feather-edge along its updip limit to about 500 feet near the study area's eastern boundary in Jones County. The top of the unit slopes to the southeast at 22 feet per mile.

Peedee Formation

The Peedee formation underlies the southeastern two-thirds of the study area. It is absent in northwestern Pitt, Lenoir, and Duplin Counties, and in all but a small section of Greene County. The unit conformably overlies the Black Creek formation, and outcrops in a 10 to 25 mile-wide belt extending from southeastern Pitt County to central and southern Duplin County. The unit is comprised of lenticular beds of dark green or gray, medium-to coarse-grained quartz sand with thin layers of clay, dark gray silt, and indurated shell. The elevation of the Peedee surface ranges from 50 feet above sea level in northeastern Lenoir County to about 700 feet below sea

level in southeastern Jones County. The unit thickens to the southeast from a feather-edge along its updip limit to about 300 feet in southeasterr Jones County. The surface of the Peedee dips toward the southeast at 15 feet per mile.

Beaufort Formation

The Beaufort formation unconformably overlies the Peedee and occurs in the eastern third of the study area. There is no significant outcrop of the Beaufort in the central Coastal Plain. The unit consists primarily of fine glauconitic sand interbedded with thin layers of clay, silt, and marl. The elevation of the Beaufort surface ranges from slightly below sea level in western Craven County to about 650 feet below sea level in southeastern Jones County. The unit thickens to the east from a feather edge along its updip limit to about 80 feet in southeastern Jones County. The top of the unit slopes generally to the east at about 15 feet per mile.

Castle Hayne Limestone

The Castle Hayne Limestone occurs in the southeastern two-fifths of the study area. It unconformably overlies the Beaufort formation, or where the Beaufort is absent, the Peedee formation. The formation outcrops in a belt 10 to 20 miles wide, extending through northwestern Craven, centr Jones, and northwestern Onslow Counties. The composition of the Castle Hay varies in lithology and consolidation. It consists of shell limestone, mar calcareous sand, and clay. The top of the unit ranges in elevation from 50 feet above sea level in central Jones County to 350 feet below sea level in the southeastern section. The Castle Hayne thickens to the southeast from a feather-edge along the unit's updip limit to more than 300 feet near the study area's southeastern boundary. The regional slope of the unit is towa the southeast at about 15 feet per mile.

Oligocene Series

Deposits of Oligocene Age comprise an unnamed stratigraphic unit in Onslow County and the southern two-thirds of Jones County. This unit unconformably overlies the Castle Hayne Limestone and is at or near the surface east of the Castle Hayne outcrop area. The unit, which is composed of shell limestone and calcareous sand, ranges in elevation from 40 feet above sea level in central Jones County to 60 feet below sea level in the southeastern part of the county. The unit thickens to the east from a feather-edge along its updip limit to more than 300 feet in southeastern Jones County. Its surface dips to the east at 12 feet per mile.

Miocene Series

The Yorktown formation occurs as a continuous unit east of Greenville, New Bern, Pollocksville, and Jacksonville, where it unconformably overlies the earlier stratigraphic units. It occurs only as scattered remnants throughout the remainder of the study area. The lithology of the Yorktown unit varies widely. Its updip section consists of a dark blue, massive clay matrix containing abundant shells. The eastern section is composed of loose shells and limestone in a sand matrix, with lesser amounts of yellow to gray clay. Elevations range from 70 feet above sea level in Greene County to 20 feet below sea level in southeastern Jones County. The unit thickens towards the east ranging from 0 to 15 feet in the updip section to about 60 feet in the eastern part. The surface of the unit dips to the east with a slope only slightly greater than that of the land surface.

Post Miocene Deposits

Undifferentiated deposits, ranging from Pleistocene to Recent, overlie most of the study area. These deposits include the youngest sediments

in the central Coastal Plain and consist of sand, silt, clay, and gravel. The relatively thin deposits are generally thickest in the interstream area in the southeastern part of the study area. The thickness of the Post Mioc Deposits typically range from a few feet to approximately 35 feet.

HYDROGEOLOGY

Hydrogeologic Units

Although the sediments below the water table are saturated with water, forming, in essence, one continuous groundwater reservoir, differences in their lithology and hydraulic properties suggest that sections of the sediments should be treated as separate entities. Since the stratigraphic units were differentiated on the basis of superposition, those units are not necessarily adequate in describing the groundwater regime. Therefore, units differentiated on the basis of other criteria are needed.

Sediments may be subdivided into separate hydrogeologic units on the basis of hydraulic conductivity and other hydrologic characteristics. Therefore, in most cases, the aquifers are separated from each other by semi-pervious clay layers. The subdivision of sediments into hydrogeologic units to differentiate between significant changes in hydraulic properties is necessarily oversimplified. The categorization of the sediments into several units does not suggest that the individual units are distinctly homogeneous. In reality, each unit is stratified and consists of complexly layered beds varying in lithology, texture, thickness and extent.

Table 1 shows the hydrogeologic units in the central Coastal Plain matched with their companion stratigraphic units. The hydrogeologic units generally coincide with the stratigraphic units, overlapping them in only two cases. Cross-sections of the hydrogeologic system underlying the study area are shown in Figures 19 through 23.

This report is primarily concerned with the hydrogeologic units of the Cretaceous aquifer system; however, the overlying hydrogeologic units will also be addressed due to the influence they have on the ground-

water regime of the Cretaceous system. The following sections describe the principle hydrogeologic units in order of increasing depth.

Water Table Hydrogeologic Unit

The Water Table hydrogeologic unit is continuous over the entire study area. At many locations, it is comprised of the saturated section of the Post Miocene Deposits which overlie the first significant clay layer. In the remaining areas, where the Post Miocene Deposits are absent, the Water Table Unit occurs above the first significant clay layer in outcrops of the older formations. The top of the unit is defined by the water table. The thickness of the unit ranges from less than 10 feet to more than 60 feet, with an average thickness of about 25 feet.

All groundwater within the Water Table Unit is unconfined. Due to the unconfined nature of the unit, the water table is free to fluctuate with changes in groundwater storage. Figure 24 shows the hydrographs of three wells which monitor water levels in the Water Table Unit. Water levels in this unit range from within a few feet of the land surface to more than 20 feet below land surface. The fluctuation of the water table is a function of the various climatological factors discussed earlier. This fact is reflected in the hydrographs by a shallow water table during the months when ET is low and recharge is occurring, and by a deeper water table during the summer and early fall when ET rates are high.

Recharge to the Water Table hydrogeologic unit occurs on the interfluves throughout the study area. Analysis by the water budget method (Figure 17) indicates that the maximum potential recharge to the unit is about 9.5 inches annually, or about 18 percent of annual precipitation.

FIGURE 23 — HYDROGEOLOGIC CROSS-SECTION D–D

The Water Table Unit serves an important function as a groundwater reservoir in the study area by discharging a large percentage of stored water as baseflow to sustain streams during dry periods, and by recharging the underlying confined aquifer system. Based on the unit's average thickness and specific yield of eight percent, the amount of retrievable water in storage in the Water Table Unit is estimated to be about 417 Mgal/mi^2. The Water Table Unit currently exhibits no evidence of stress from the large withdrawals occurring in the underlying confined aquifer systems.

The Water Table hydrogeologic unit is limited as a source of supply to a small number of domestic users. A thin zone of saturation and transmissivity values below 134 feet squared per day (ft^2/day) preclude development of the unit into a major source of water. Wells completed in the Water Table Unit are usually of the screened, drive-point variety, and yield between five and ten gallons per minute (gpm).

Yorktown Hydrogeologic Unit

The Yorktonw hydrogeologic unit is equivalent in extent and composition to the Yorktown stratigraphic unit. Throughout most of its extent within the study area, the Yorktown consists primarily of stratified clay and silt deposits. Mixtures of clay and silt material similar to those which are found in the Yorktown formation have hydraulic conductivity values in the range of 10^{-3} to 10^{-4} feet per day (ft/day). As a result, this section of the unit functions as part of a semi-pervious confining bed for the underlying aquifer systems. The confining bed separates the Water Table Unit from the underlying aquifer

FIGURE 24 - HYDROGRAPHS OF SELECTED WELLS IN THE WATER TABLE UNIT

systems and inhibits the percolation of water to the confined units.

The Yorktown grades eastward from predominately clay and silt deposits to lenticular sands interbedded with shells and clay. Due to the change in lithology, the water-bearing sand and shell beds of the hydrogeologic unit collectively serve as a confined aquifer. East of New Bern, the unit is capable of sustaining moderately high well yields. However, within the study area the Yorktown hydrogeologic unit has a lower hydraulic conductivity and attains a maximum thickness of only 60 feet resulting in correspondingly lower yield.

Recharge to the Yorktown is derived from the overlying Water Table Unit, or directly from precipitation where the Yorktown outcrops and forms part of the unconfined aquifer. The maximum amount of water available as recharge to the unit is equivalent to the amount of mobile water being stored in the Water Table Unit at any given time. The actual amount of recharge to the Yorktown depends on the vertical hydraulic conductivity and the magnitude of the hydraulic gradient.

Castle Hayne Hydrogeologic Unit

The Castle Hayne hydrogeologic unit includes all or parts of the Oligocene, Castle Hayne, and Beaufort stratigraphic units (Table 1). These three units are grouped together into a single aquifer system on the basis of gross similarities in their hydraulic conductivities and other hydrologic properties.

The unit occurs throughout the eastern half of the study area as delineated in Figure 25. The elevation of the top of the unit ranges from more than 40 feet above sea level along its updip limit to more than 40 feet below sea level just west of New Bern. The Castle Hayne strikes

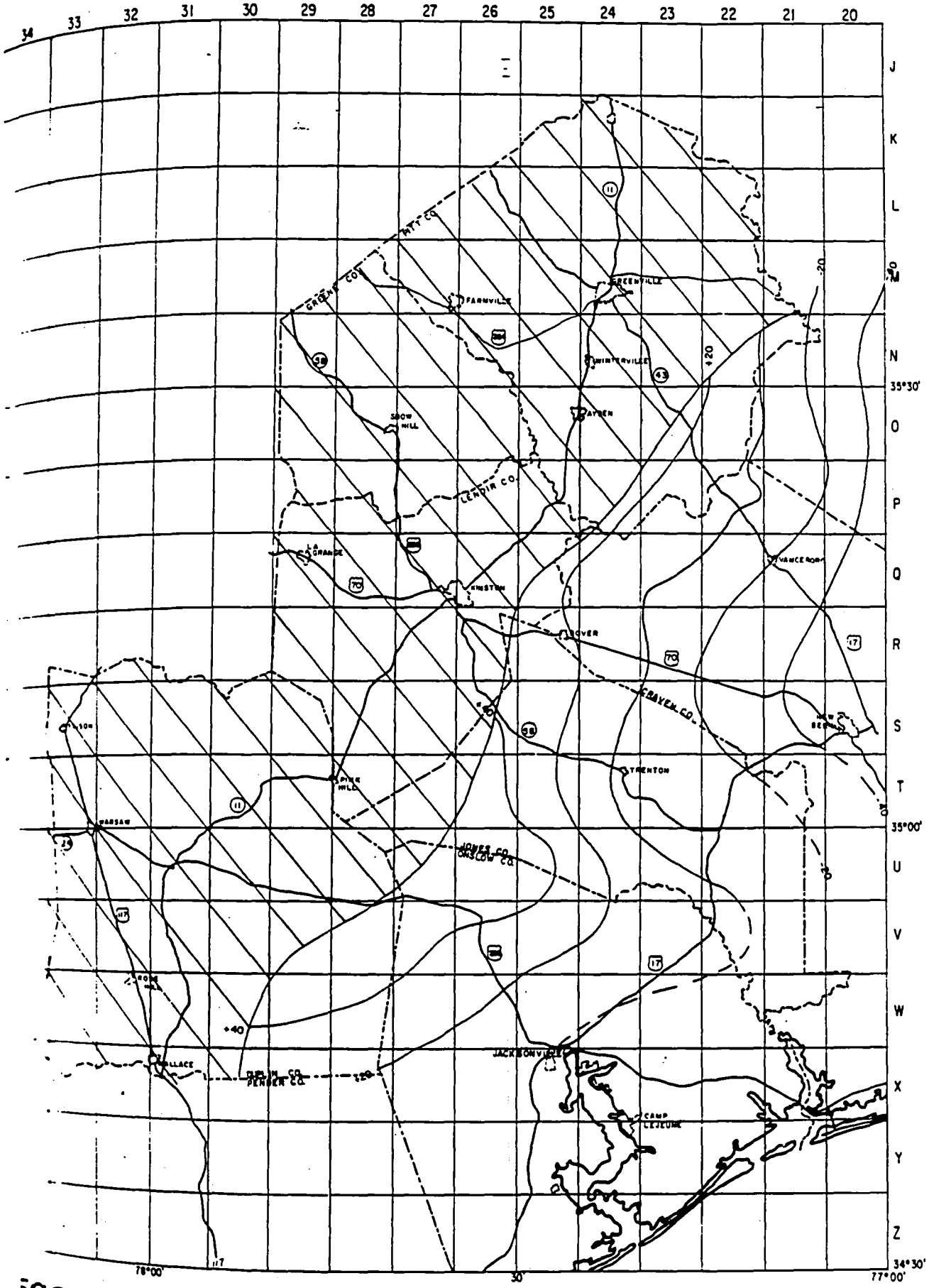

FIGURE 25 – ELEVATION OF THE TOP OF THE CASTLE HAYNE UNIT

northeast and dips southeast at approximately four feet per mile.

The Castle Hayne aquifer system becomes more deeply buried and thickens toward the southeast as illustrated in Figures 21, 22, 23, and 26. The thickness of the unit increases from a feather-edge along the updip limit to more than 400 feet in the southeastern corner of Jones County.

East of its outcrop or subcrop areas, the unit is confined by relatively thin,semi-pervious silt and clay deposits. Further east, the Castle Hayne is confined by the individual clay layers present throughout the overlying Yorktown aquifer. The Castle Hayne hydrogeologic unit is also underlain by a clay bed present within the Peedee stratigraphic unit. This semi-pervious confining bed which separates the Castle Hayne from the underlying Cretaceous aquifer system ranges in thickness from about 15 feet to more than 70 feet.

Groundwater within the Castle Hayne Unit occurs primarily under confined conditions. Figure 27 illustrates the elevation of the potentiometric surface in the Castle Hayne. Elevations range from 60 feet above sea level in northeastern Onslow County to approximately mean sea level along the banks of major streams and estuaries. Groundwater flows from the major recharge areas at the outcrop and interfluves to discharge areas along the major streams and their tributaries. The inverted V-shaped contours in Figure 27 indicate that segments of the Tar, Neuse, Trent, White Oak, and New Rivers are acting as line sinks for water draining from the unit. The segments are either entrenched in the Castle Hayne Unit or the Castle Hayne is discharging to the rivers by upward leakage through the overlying sediments.

The hydrographs of three monitor wells completed in the Castle

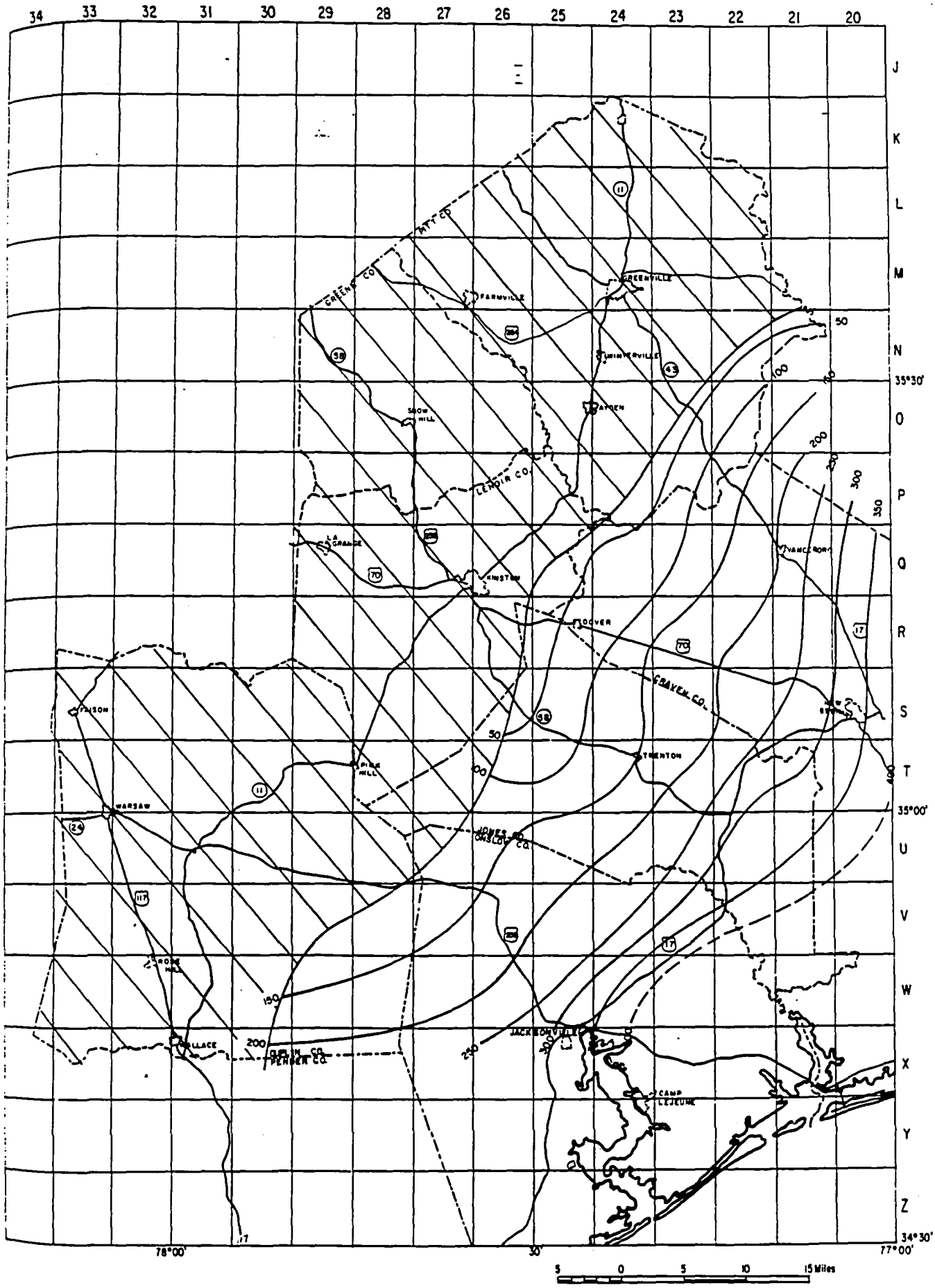

FIGURE 26 — THICKNESS OF THE CASTLE HAYNE UNIT

AQUIFER ABSENT

FIGURE 27 – ELEVATION OF THE POTENTIOMETRIC SURFACE IN THE CASTLE HAYNE UNIT IN 1979

Hayne Unit are shown in Figure 28. These hydrographs illustrate the seasonal fluctuations of the Castle Hayne potentiometric surface. As in the case of the Water Table Unit, the potentiometric surface exhibits a cycle of increasing water levels during the late fall, winter, and early spring, followed by decreasing water levels during the remainder of the year. Water levels in the Castle Hayne wells generally are within a few feet of the land surface to about 20 feet below land surface. The annual range of fluctuations in the potentiometric surface is usually between two and six feet. The absence of cones of depression in Figure 27 and of downward trends in the hydrographs indicates that the Castle Hayne is not being stressed by withdrawals from the Unit itself, or from the underlying Cretaceous aquifer system.

Except for that water which reaches the unit directly at the outcrop or subcrop areas, recharge to the Castle Hayne occurs in the form of leakage through the overlying confining bed. As a result, significant amounts of recharge, and ultimately, the long-term yield of the aquifer system, depend on those factors controlling the quantity of water that can leak through the confining bed from the overlying units. Leakage through the bed is governed by the thickness and vertical hydraulic conductivity of the confining bed, and the head difference between the Castle Hayne and the overlying source beds. Therefore, leakage to the Castle Hayne Unit varies with regional differences in the hydraulic properties of the aquifer system and its confining bed. Previous studies have calculated that recharge to the unit ranges from less than 200,000 gallons per day per square mile (gal/day/mi^2) (Floyd, 1969) to 382,000 gal/day/mi^2 (DeWiest and others, 1967, p.72). Recharge to the Castle Hayne Unit within the study area was estimated to average 240,000 gal/day/mi^2.

Table 2 shows typical values of transmissivity, storage coefficient, and specific capacity for the Castle Hayne aquifer system. Transmissivity was calcualted on the basis of data from eleven aquifer tests. The transmissivity of the unit ranges from 6,100 to 12,100 feet squared per day (ft^2/da) and averages 8,700 ft^2/da. These values represent the highest transmissivities of any hydrogeologic unit within the study area.

Sufficient data was available from two aquifer tests to estimate the storage coefficient of the aquifer system. The storage coefficient ranges from 2.6×10^{-3} to 7.4×10^{-5} and averages 1.3×10^{-3}.

The specific capacity after 24 hours of pumping was calculated using data from 20 six-inch wells. The values range from 0.61 gallons per minute per foot (gpm/ft) to 22.73 gpm/ft and average 9.54 gpm/ft.

The relatively high transmissivity values of the Castle Hayne Unit account for the fact that the yields of wells completed within this unit are among the highest in the study area. As a rule, well yields will increase towards the east and southeast as the unit becomes thicker and more deeply buried. Typically, the yields of municipal and industrial wells in the Castle Hayne Unit range from several hundred to 1000 gallons per minute (gpm).

Cretaceous Upper Sand Unit

The Cretaceous Upper Sand Unit and the Cretaceous Lower Sand Unit collectively form the Cretaceous aquifer system. The two units, which are separated by a semi-permeable confing bed, are treated as separate hydrogeologic units in this report, primarily on the basis of significant differences in the altitude of their respective potentiometric surfaces.

The Cretaceous Upper Sand Unit is comprised of the water-bearing

HYDROGEOLOGIC UNIT	TRANSMISSIVITY FT^2/ DAY		STORAGE COEFFICIENT (DIMENSION LESS)		SPECIFIC CAPACITY (6" WELL) GPM / FT	
	RANGE	MEAN	RANGE	MEAN	RANGE	MEAN
CASTLE HAYNE	6,100 to 12,100	8,750	7.4×10^{-5} to 2.6×10^{-3}	1.3×10^{-3}	0.61 to 22.73	9.54
UPPER CRETACEOUS SAND	400 to 1.950	1,050	1.0×10^{-4} to 1.7×10^{-4}	1.3×10^{-4}	0.61 to 3.93	1.89
LOWER CRETACEOUS SAND	1,400 to 5,750	2,750	2.5×10^{-5} to 6.7×10^{-4}	2.3×10^{-4}	0.61 to 12.50	4.50

TABLE 2 — TYPICAL HYDRAULIC PROPERTIES OF THE PRINCIPAL HYDROGEOLOGIC UNITS

sands which occur in the lower one-third to one-half of the Peedee stratigraphic unit. Individual sand layers, which are interbedded with clay, generally range from 5 to 20 feet in thickenss. The cumulative thickness of the sands in any section of the Cretaceous Upper Sand averages about 45 feet, or 55 to 60 percent of the total unit thickness. The maximum cumulative thickness encountered within the study area is about 85 feet.

The Cretaceous Upper Sand Unit occurs throughout the eastern three-fourths of the study area as shown in Figure 29. Elevation of the unit ranges from more than 50 feet above sea level along the updip limit to about 800 feet below sea level in southeastern Jones County. The unit strikes northeast and dips southeast at approximately 17 feet per mile.

Figures 21, 22, 23, and 30 show that the unit becomes thicker and more deeply buried towards the southeast. The thickness of the unit is irregular, but generally increases from a feather-edge along its updip limit to more than 100 feet in Onslow and Jones Counties.

East of its outcrop or subcrop, the Cretaceous Upper Sand is confined by overlying silt and clay deposits in the Peedee Unit. This confining bed, which is from 15 to 80 feet thick, separates the Cretaceous Upper Sand from the overlying Yorktown or Castle Hayne Units. The Cretaceous Upper Sand Unit is also underlain by a confining bed which occurs in the Black Creek stratigraphic unit. The lower confining bed separates the two sand units and ranges from about 30 feet to 150 feet in thickness.

Groundwater in the Cretaceous Upper Sand Unit occurs primarily under confined conditions. Figure 31 illustrates the elevation of the potentiometric surface in the Upper Sand Unit. Water-level elevations range from more than 100 feet above sea level in central Duplin County to about sea level near the Jacksonville well fields.

FIGURE 29 - ELEVATION OF THE TOP OF THE CRETACEOUS UPPER SAND UNIT

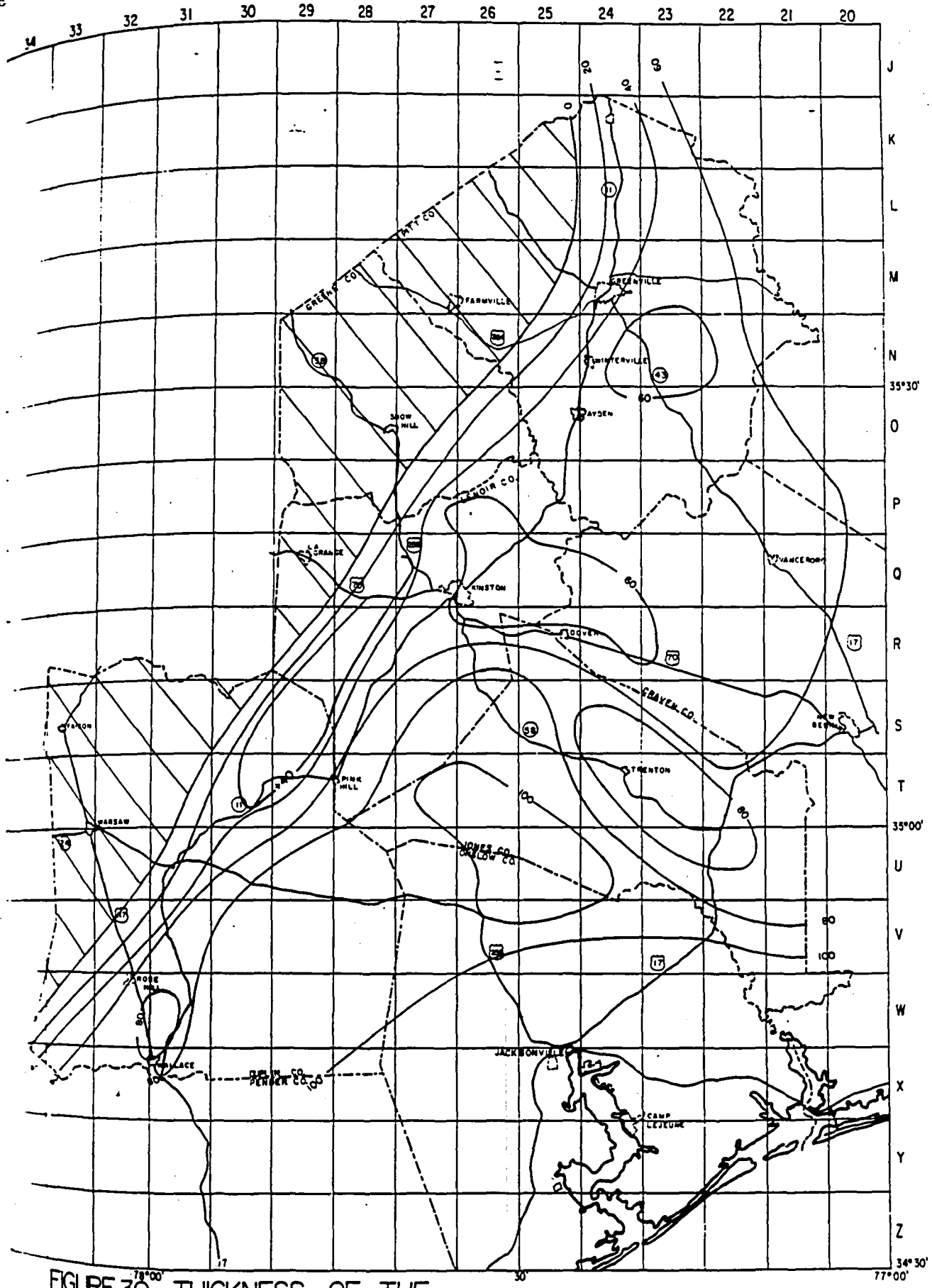

FIGURE 30—THICKNESS OF THE CRETACEOUS UPPER SAND UNIT

FIGURE 31— ELEVATION OF THE POTENTIOMETRIC SURFACE IN THE CRETACEOUS UPPER SAND UNIT IN 1979

Withdrawal of water from the Cretaceous Upper Sand Unit is limited to a small number of domestic and irrigation wells. Most wells within the study are usually completed in either the overlying Castle Hayne unit or the deeper Cretaceous Lower Sand Unit. Typically, the yields of wells in the Cretaceous Upper Sand are between 20 and 100 gpm.

Cretaceous Lower Sand Unit

The Cretaceous Lower Sand Unit comprises the lower part of the Cretaceous aquifer system and includes the water-bearing sands and clays of the Black Creek and Tuscaloosa stratigraphic units. Individual sand layers within the unit generally range from 5 to 20 feet in thickness, and the cumulative thickness of the sands in any section of the Cretaceous Lower Sand Unit averages 185 feet, or about 45 percent of the total unit thickness. The maximum cumulative thickness encountered in the study area is about 230 feet.

The unit underlies the entire study as shown in Figure 35. Elevations of the top of the unit range from more than 100 feet above sea level in northwestern Duplin County to more than 900 feet below sea level in southeastern Jones County. The unit strikes northeast and dips to the southeast at approximately 21 feet per mile.

Figures 21, 22, and 36 shows that the Cretaceous Lower Sand Unit becomes thicker and more deeply buried towards the southeast. The thickness of the unit increases from 200 feet along the western boundary of the study area to more than 700 feet in southeastern Jones County.

East of its outcrop and subcrop, the Cretaceous Lower Sand Unit is confined by overlying silt and clay deposits in the Black Creek stratigraphic unit, and by numerous clay beds occurring within the hydrogeologic unit itself.

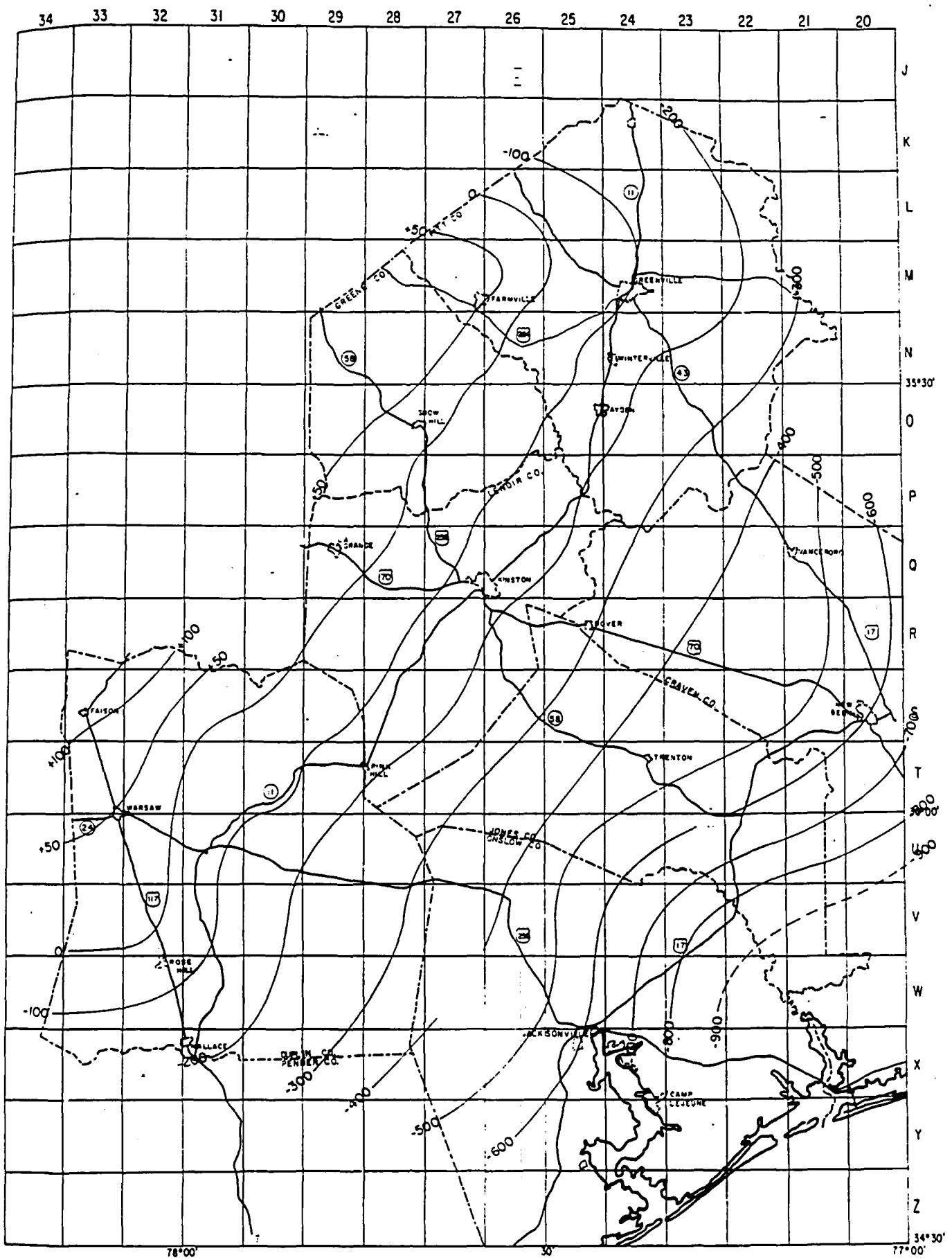

FIGURE 35 ELEVATION OF THE TOP OF THE CRETACEOUS LOWER SAND UNIT

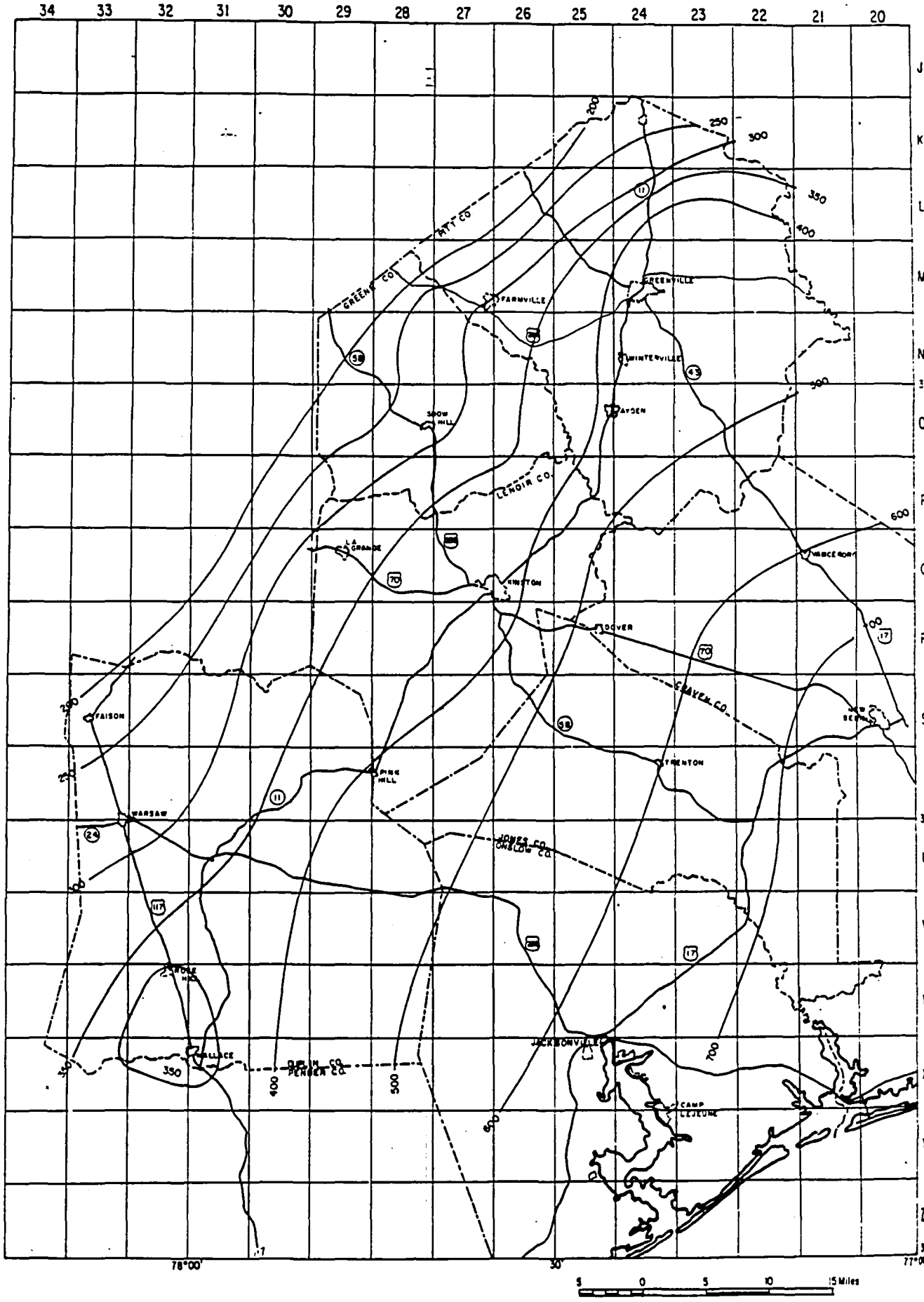

FIGURE 36 — THICKNESS OF THE CRETACEOUS LOWER SAND UNIT

The overlying confining bed is between 30 and 150 feet thick and separates the Cretaceous Lower Sand Unit from the Cretaceous Upper Sand Unit. The hydrogeologic unit is also underlain by a confining bed which occurs in the Tuscaloosa and Lower Cretaceous stratigraphic units.

Groundwater in the Cretaceous Lower Sand Unit occurs primarily under confined conditions. Figure 37 illustrates that elevations range from more than 210 feet above sea level to more than 70 feet below sea level near the pumping centers of Kinston and Greenville.

Under natural discharge conditions, the general direction of groundwater flow in the Cretaceous Lower Sand Unit would be toward the east and southeast, or in the same direction as the dip of the unit. However, in the study area, natural flow patterns do not exist, having been greatly modified by the large-scale withdrawal of water from this unit. In no part of the study area is the Cretaceous Lower Sand Unit unstressed by municipal or industrial pumping. Figure 37 shows deep and extensive cones of depression in the potentiometric surface of the unit. In about thirty-five percent, or about 1100 square miles of the study area, the potentiometric surface is below sea level. Large cones of depression exist in the vicinity of major pumping centers such as the communities of Kinston, Greenville, Jacksonville, and Cove City which supplies water to New Bern. Individual cones surrounding Kinston, Greenville, and Cove City have expanded to the point where they have coalesced to form a large, regional cone of depression. Continued expansion of the regional cone will ultimately result in its coalescing with the cone of depression formed by pumping at the Jacksonville well fields. Less extensive cones of depression have developed at the towns of Bethel, Farmville, Ayden, Walstonburg, LaGrange, Wallace, Rose Hill, and

FIGURE 37—ELEVATION OF THE POTENTIOMETRIC SURFACE IN THE CRETACEOUS LOWER SAND UNIT IN 1979

ASSESSMENT OF HYDROLOGIC AND HYDROGEOLOGIC DATA AT CAMP LEJEUNE MARINE CORPS BASE, NORTH CAROLINA

By Douglas A. Harned, Orville B. Lloyd, Jr., and M.W. Treece, Jr.

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entire Coastal Plain of North Carolina and furnished additional data that can be used for the proposed ground-water flow model in the third phase of this investigation. A similar study by Winner and Lyke (1989) focused on 14 counties of the Coastal Plain of North Carolina, including Onslow County and refined the framework developed for the RASA study. However, neither study focused primarily on the Castle Hayne aquifer, which is the water-supply aquifer for Camp Lejeune.

Hydrogeologic Setting

The sediments of the Coastal Plain consist of interbedded sands, clays, calcareous clays, shell beds, sandstone, and limestone (LeGrand, 1959). These sediments are layered in interfingering beds and lenses that gently dip and thicken to the east and include 10 aquifers and 9 confining units (fig. 2). In the Camp Lejeune area, the sediments are about 1,500 ft thick and overlie igneous and metamorphic basement rocks. These sediments were deposited in marine or near-marine environments (Brown and others, 1972).

The aquifers of the Camp Lejeune area are the surficial, Castle Hayne, Beaufort, Peedee, Black Creek, and upper and lower Cape Fear aquifers. They are separated by less permeable clay and silt beds (confining units) that serve to impede the flow of ground water between the aquifers. A generalized hydrogeologic section in Jones and Onslow Counties showing these units is given in figure 3.

The surficial aquifer is a series of sediments, primarily sand and clay, which commonly extend to depths of 50 to 100 ft. This unit is not used for water supply on the Base. In some areas, the surficial aquifer is reported to contain water contaminated by waste disposal practices, particularly in the northern and north-central developed areas of the Base (Putnam, 1983).

The principal water-supply aquifer for the Base is the series of sand and limestone beds that occur between 50 and 300 ft below land surface. This series of sediments generally is known as the Castle Hayne aquifer. The Castle Hayne aquifer is about 150 to 350 ft thick in the area and is the most productive aquifer in North Carolina. It is a critical water-supply source, not only for Camp Lejeune but also for the southern coast and east-central Coastal Plain as outlined in figure 4.

GEOLOGIC UNITS			HYDROGEOLOGIC UNITS
SYSTEM	SERIES	FORMATION	AQUIFER AND CONFINING UNIT
Quaternary	Holocene Pleistocene	Undifferentiated	Surficial aquifer
Tertiary	Pliocene	Yorktown Formation[1]	Yorktown confining unit
			Yorktown aquifer
	Miocene	Eastover Formation[1]	
		Pungo River Formation[1]	Pungo River confining unit
			Pungo River aquifer
		Belgrade Formation[2]	Castle Hayne confining unit
	Oligocene	River Bend Formation	Castle Hayne aquifer
	Eocene	Castle Hayne Formation	Beaufort confining unit[3]
	Paleocene	Beaufort Formation	Beaufort aquifer
			Peedee confining unit
Cretaceous	Upper Cretaceous	Peedee Formation	Peedee aquifer
			Black Creek confining unit
		Black Creek and Middendorf Formations	Black Creek aquifer
			Upper Cape Fear confining unit
		Cape Fear Formation	Upper Cape Fear aquifer
			Lower Cape Fear confining unit
			Lower Cape Fear aquifer
	Lower Cretaceous[1]	Unnamed deposits[1]	Lower Cretaceous confining unit
			Lower Cretaceous aquifer[1]
Pre-Cretaceous basement rocks		--	--

[1]Geologic and hydrologic units probably not present beneath Camp Lejeune.
[2]Constitutes part of the surficial aquifer and Castle Hayne confining unit in the study area.
[3]Estimated to be confined to deposits of Paleocene age in the study area.

Figure 2.--Generalized relation between geologic and hydrogeologic units in the Coastal Plain of North Carolina.

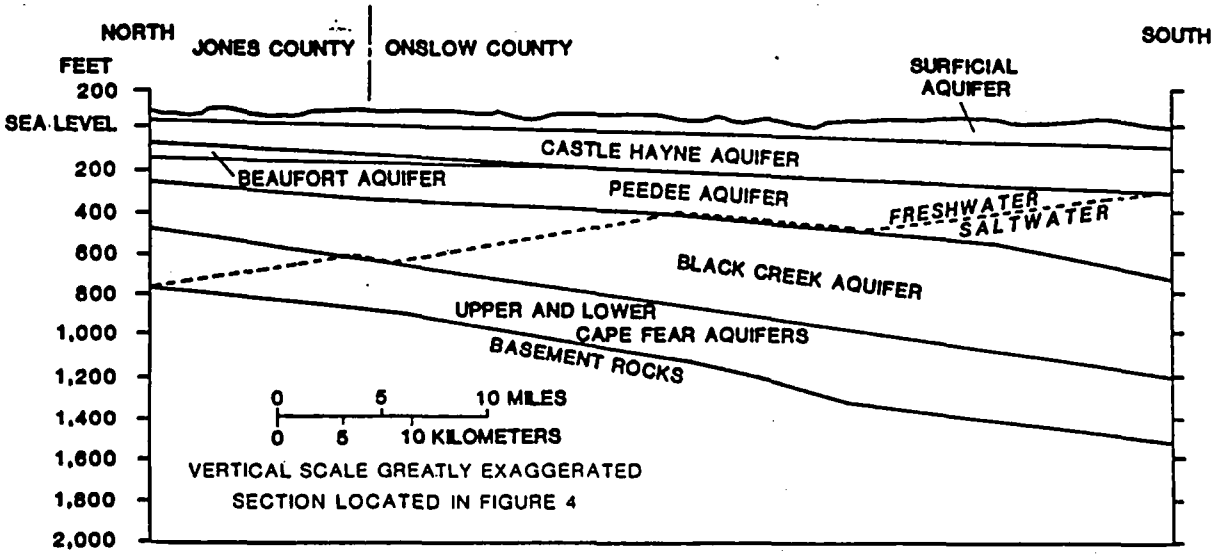


Figure 3.--Generalized hydrogeologic section through Jones and Onslow Counties, North Carolina.

Onslow County and Camp Lejeune lie in an area where the Castle Hayne aquifer contains freshwater (fig. 4), although the proximity of saltwater in deeper layers just below the aquifer and in the New River estuary is of concern in managing water withdrawals from the aquifer. Overpumping of the deeper parts of the aquifer could cause upconing of saltwater to occur. The aquifer contains water having less than 250 mg/L (milligrams per liter) chloride throughout the area of the Base.

The aquifers that lie below the Castle Hayne consist of a thick sequence of sand and clay. Although some of these aquifers are used for water supply elsewhere in the Coastal Plain, they contain saltwater in the Camp Lejeune area.

Rainfall that occurs in the Camp Lejeune area enters the ground in recharge areas, infiltrates the soil, and moves downward until it reaches the water table, which is the top of the saturated zone. In the saturated zone, ground water flows in the direction of lower hydraulic head, moving through the system to discharge areas like the New River and its tributaries (fig. 5) or the ocean.

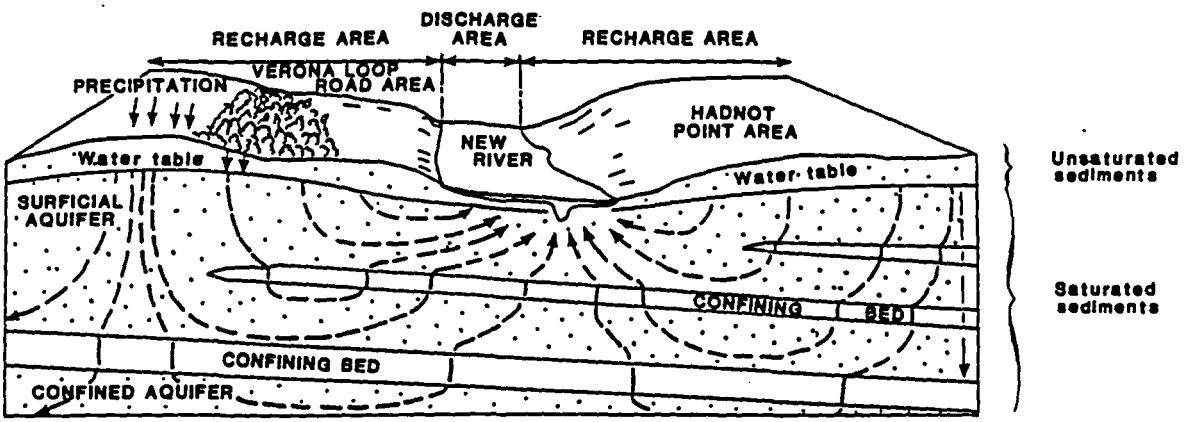


Figure 5.--A generalized sketch of ground-water movement through unconfined and confined aquifers beneath Camp Lejeune (modified from Winner, 1981).

Water levels in wells tapping the surficial aquifer vary seasonally. The surficial aquifer receives more recharge in the winter than in the summer when much of the water evaporates or is transpired by plants before it can reach the water table. Therefore, the water table generally is highest in the winter months and lowest in summer or early fall.

In confined aquifers, water is under hydraulic pressure or head and the level to which it rises in a tightly cased well is called the potentiometric surface. The hydraulic head in a confined aquifer, such as the Castle Hayne, shows a different pattern of variation over time than that in an unconfined aquifer. Some seasonal variation also is common in the water levels of the Castle Hayne aquifer, but the changes tend to be slower and over a smaller range than for water-table wells.

The principal ways that man causes changes in the ground-water flow system in the Camp Lejeune area include ground-water withdrawal from water-supply wells and covering recharge areas with impervious buildings and pavement, as in the Hadnot Point industrial area. The most significant of these is ground-water pumpage for water supply.

Water Use

Since the establishment of Camp Lejeune in the late 1930's, the sole source of water supply for the Base has been from wells. Initially, there were no treatment facilities, but by 1941 the Hadnot Point Water Treatment System was placed in operation with 21 wells on line. The total capacity of the plant was 7.30 Mgal/d; however, the maximum output from the plant in 1942 was 4.80 Mgal/d. The Hadnot Point Water System served the main part of the Base, including the regimental area, post troops area, industrial area, Naval Hospital, Paradise Point housing, Midway Park housing project, and the Camp Lejeune schools (Robison and Mann, 1977).

Some untreated water was used at scattered locations on the periphery of the Base until the early 1950's when a treatment facility was built at Tarawa Terrace. In the mid 1950's, water treatment plants were constructed at Onslow Beach and Montford Point. In the 1960's, water-treatment facilities were added at the Rifle Range area and at Courthouse Bay. The Holcomb Boulevard Treatment Plant, built in 1971 with a designed capacity of 2.0 Mgal/d, was expanded in 1987 to a total plant capacity of 5.0 Mgal/d. Much of the water demand has shifted from the Hadnot Point Plant to the Holcomb Boulevard Plant. Table 1 shows the physical characteristics of each treatment plant with the plant capacities, number of wells, and population served.

Table 1.--*Water-treatment plant capacity, number of wells, and population supplied, March 1987*
[Mgal/d, million gallons per day; data compiled from Marine Corps files]

Plant	Plant capacity (Mgal/d)	Number of wells	Population supplied
Hadnot Point	5.900	35	37,134
Holcomb Boulevard	2.304	8	8,139
Tarawa Terrace	1.152	6	6,196
Montford Point	.622	8	2,962
Marine Corps Air Station	4.081	26	10,315
Rifle Range	.648	4	348
Courthouse Bay	.864	5	3,091
Onslow Beach	.250	2	248

The amount of water used has increased with time and population. Over the years, more than 100 wells have been drilled to supply water to the Base for drinking and other Base operations. Since World War II, the Base has grown from a service population of around 25,000 to about 68,000 in 1986. However, the population increase and water demand have remained relatively constant over the past two decades.

Historical water-pumpage data for the Base are not available prior to 1970; however, records for the amount of water treated in recent years are complete. The amount of water treated at the water plants and distributed actually is less than the amount pumped due to conveyance losses. Conveyance losses are related to the efficiency of the system and the condition of the distribution lines. Most water-supply systems have an average conveyance loss of between 15 and 20 percent of the water withdrawals (Preston Maynard, NRCD, Division of Water Resources, oral commun., 1987). However, the conveyance loss for Camp Lejeune is unknown.

Most of the change in ground-water withdrawals during the past decade is due to a change in the distribution system instead of increased water demand. Pumping rates have decreased in the Hadnot Point area and increased in the Holcomb Boulevard system, indicating expansion of the latter treatment facility and the discontinuation of many supply wells in the Hadnot Point system. The amounts of raw water treated at each Base treatment plant, presented in figures 6 and 7, reflect these changes in pumpage because the amount of water treated by the individual water-treatment plants is related to the pumpage rate of the well fields.

The amount of raw water treated in 1975 totaled 7.14 Mgal/d for the nine water systems that were in operation (fig. 8). The Camp Geiger Water Treatment Plant was discontinued in 1977, and the supply wells in that system were interconnected with the Marine Corps Air Station (MCAS) system. In 1986, the amount of raw water treated totaled 7.23 Mgal/d for the eight treatment plants in operation. The data indicate that there has not been a substantial change in the amount of water treated in the past 12 years.

Water use varies seasonally, as shown in figure 9, with the greatest use in summer and the least in winter. Unfortunately, there are no data on water withdrawals from individual wells. Well data on pumping capacity,

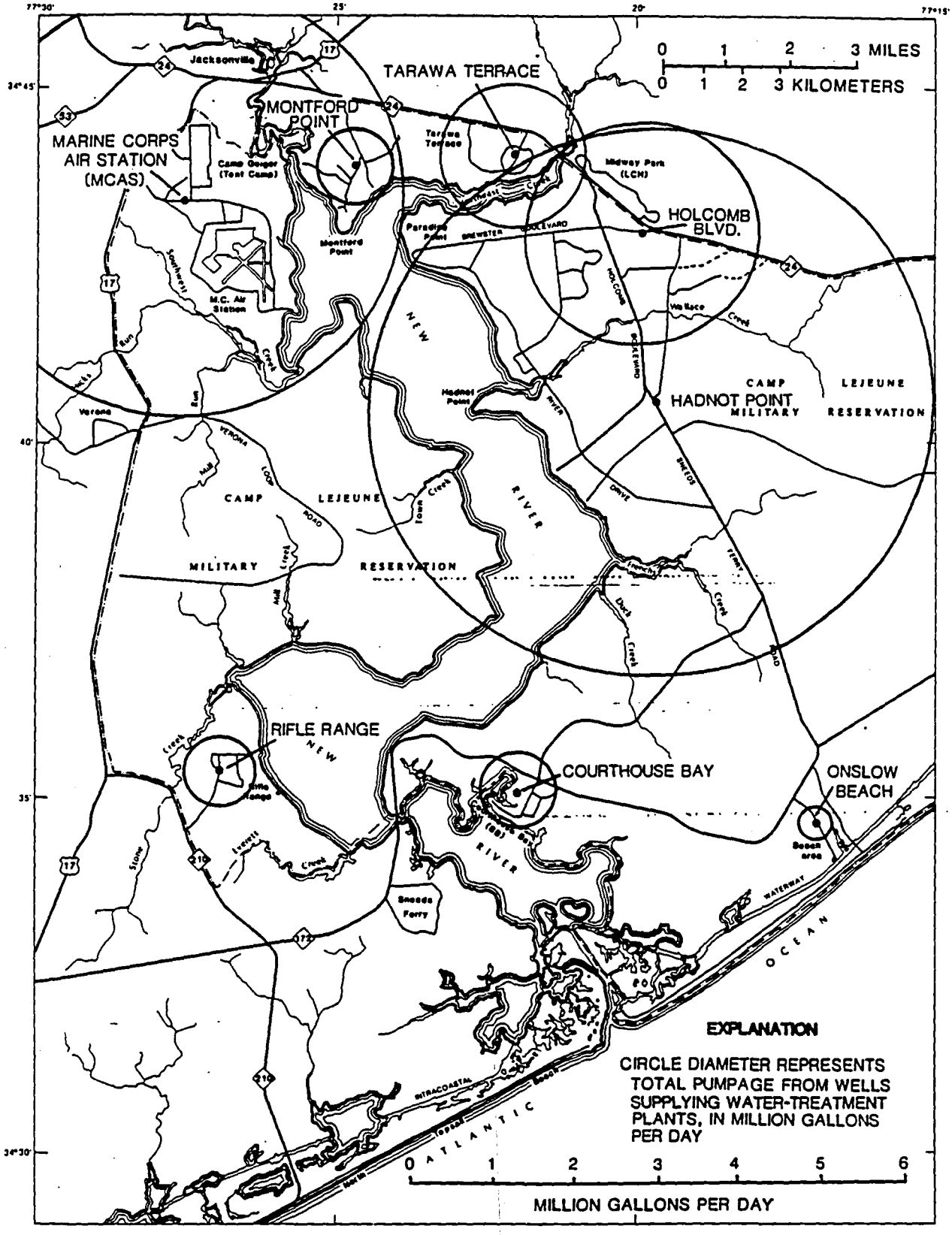


Figure 10.--Approximate centers of pumpage for wells that supply water-treatment plants, April 1987.

The high per capita use for the Rifle Range (632 gal/d) and Onslow Beach (444 gal/d) systems may be misleading because of difficulties in estimating the population served. For example, only 248 people resided at Onslow Beach; however, the beach was frequented by many people who used the facilities for recreational purposes. Whereas, the Hadnot Point and MCAS systems serve most of the commercial water users on the Base and about 69 percent of the total population. The other four systems (Holcomb Boulevard, Tarawa Terrace, Montford Point, and Courthouse Bay) serve residential users almost exclusively and have per capita use values ranging from 140 to 175 gal/d. Because Camp Lejeune is a Federal military installation, the billing and accounting structures are different from other public-supply systems, and accurate records of water distribution are not available.

Acknowledgments

Robert Alexander, of Staff Facilities at Camp Lejeune, served as the principal liaison between staff on the Marine Base, the U.S. Geological Survey, and Environmental Sciences and Engineering, Inc. Byron M. Frazelle and Golden S. Johnson of Camp Lejeune Utilities helped provide access to well-record data.

Richard Shiver, NRCD, Wilmington Office, provided well records and geophysical logs and coordinated the well drilling for the Hadnot Point NRCD Ground-Water Research Station wells. In addition, Michael J. Geden and Robert G. Gregory, of Environmental Sciences and Engineering, Inc., provided water-quality data for the water-supply wells in the NACIP study at the Base and allowed access to shallow monitoring wells.

HYDROLOGIC DATA

The general water-bearing and water-quality characteristics of the ground-water system for the Base can be compiled from a review of the existing hydrologic data. The following sections on well logs, well construction and pumping rates, specific capacity, transmissivity, and ground-water levels define the general water-bearing characteristics of the ground-water system; a section on specific conductance defines the general water-quality characteristics of the system. Most of the data used in this investigation are found in tables A and B in the Supplemental Data section of this report.

Well Logs

Geophysical and lithologic logs are used to determine the depth, thickness, and lithologic characteristics of the sediments that comprise the ground-water flow system. Wells where geophysical or lithologic logs or other data are available are shown in plate 1 and listed in table A. More than 100 logs are available for the developed areas of the Base. Because the average depth of water-supply wells on the Base is 162 ft and available log data seldom are deeper than 300 feet, the hydrology of the lower part of the water-supply aquifer is relatively unexplored. However, there are logs for a few wells in the area of the Base (T8, VPI-15, VPI-15a, RR-97, Y25q2, OT-22, and ON-OT-1-67) that can be used to trace the deeper layers. Borehole geophysical logs of 16 open wells on the Base and two new observation wells were run by the U.S. Geological Survey for this study.

Well Construction and Pumping Rates

Well-construction data and pumping-rate data were obtained for more than 160 wells from Camp Lejeune, NRCD, and U.S. Geological Survey files. These data provided the basis of the hydrogeologic framework analysis. The typical water-supply well on the Base has an average depth of 162 ft, is 8 in. in diameter, and has 37 ft of screen open to the aquifer. Typical supply-well construction is schematically depicted in figure 11 with other construction and production data.

The screened intervals, and in a few cases the open-hole intervals, in the water-supply wells give an indication of which parts of the aquifer are most productive. The screened intervals are spread out over 20 to 150 ft, indicating that the production zone interval in the water-supply aquifer is at least this thick. The average thickness of the screened zone of the 68 water-supply wells for which data were available is 84 ft. However, trends in the thickness of the zone cannot be determined readily from the screen data.

The pumping rate for the 89 Camp Lejeune wells for which data were available averaged 174 gal/min (gallons per minute), ranging from 40 to 450 gal/min. These rates vary from place to place, with Montford Point and MCAS wells having rates of around 130 gal/min and Hadnot Point wells having rates

of the wells, all the measured water levels are considered to be representative of the potentiometric surface in the Castle Hayne aquifer.

A potentiometric-surface map based on water levels measured during the April survey is shown in plate 2. A comparison of October and April water levels (table A) indicates that, except in areas where wells were being pumped, water levels measured in April following the winter recharge period generally were higher by 2 to 3 ft than water levels measured in October at the end of the growing season. Water levels in the Hadnot Point area show a localized hydraulic gradient toward pumping wells and a more general gradient toward the New River and Wallace Creek. Thus, it appears that ground water flows to discharge at the wells and area streams.

The rate and direction of ground water movement depends on the slope of the potentiometric surface, called the hydraulic gradient, and on the hydraulic characteristics of the aquifer. These factors vary locally as a result of spatial variability of the hydraulic characteristics of the aquifer and the proximity to a pumping well or natural discharge or recharge area. Hydraulic gradients in the Castle Hayne aquifer can be calculated for the Camp Lejeune area using water-level data from plate 2. In general, the hydraulic gradient in the Camp Lejeune area ranges from 5 to 15 ft/mi for areas unaffected by pumping. Within the cones of depression of pumped wells, the hydraulic gradients are much greater and may be as much as 150 to 200 ft/mi.

The ground-water velocity equation given by Lohman (1972, p. 10) can be used to calculate ground-water velocity. Estimates of hydraulic conductivity derived earlier, ranges of hydraulic gradients from plate 2, and an assumed porosity of 20 percent as estimated by Heath (1980) for the Castle Hayne, as used in this equation, indicate ground-water velocity for the Camp Lejeune area of 2 to 3 ft/d. Near pumped wells, where the hydraulic gradient is steeper, ground water could move 35 to 45 ft/d.

Recharge areas for the Castle Hayne aquifer occur in interstream areas (Heath, 1980). In the Camp Lejeune area, recharge probably occurs in most of the area above the 5-foot water-level contour shown in plate 2, except along streams.

A four-step process was used to help develop the hydrogeologic framework. First, a review of previous hydrogeologic studies for the area was completed. Second, available borehole geophysical-log data, well-location data, well-drilling and construction data, lithologic information, and selected data on water quality were compiled. Hydrogeologic sections were drawn from the geophysical-log data, lithologic data, and well-construction data. Third, aquifer and confining units were delineated on the cross sections. These units were identified through examination of the borehole geophysical logs and related data. Fourth, the cross sections and other well-log interpretations were used to map depths and thicknesses of aquifers and confining units. Areas where more data were needed were identified, and a plan for collecting these data was made.

The following discussion describes three hydrogeologic sections that were constructed to help delineate the aquifers and confining units in the area. The locations of these sections are shown in plate 4. These hydrogeologic sections are used to develop the framework, but conclusions regarding aquifer thickness and other physical characteristics based on these sections may be revised in future phases of this investigation as additional data become available.

Hydrogeologic Section A-A'

The delineation of aquifers and confining units in hydrogeologic section A-A' (plate 5) indicates a southeast dipping series of relatively thick aquifer units (sand and limestone beds) and thin confining units (clay beds) distributed throughout the section. Overall, about 15 percent of the upper 200 ft of the section is identified as potential confining units.

Two aquifers are shown in section A-A'. The surficial aquifer generally occurs in the upper 75 ft of the section and is underlain by the Castle Hayne aquifer. The total thickness of these units ranges from about 275 to 400 ft along section A-A'. It appears that no continuous confining unit or clay bed separates these two aquifers along this section.

The surficial aquifer is composed primarily of sand, silt, and clay of Quaternary and Miocene age, undifferentiated (fig. 2). The thickness of this aquifer ranges from zero in the channels of Northeast and Wallace

Creeks in the northern part of the section to 75 ft in the southern part between wells HP-640 and T-22 (plate 5). The aquifer extends from land surface to the top of the Castle Hayne aquifer or to the top of the first confining bed.

The Castle Hayne aquifer varies somewhat in lithology and thickness along the section (plate 5). The aquifer is composed primarily of sand and limestone of Oligocene and Middle Eocene age (Brown and others, 1972; Carter, 1983). The upper half of the aquifer is unconsolidated sand and the lower half is a mix of consolidated to partly consolidated sand and limestone. Thin clay layers occur throughout. The total thickness of the aquifer ranges from 300 ft in the northern part of the section to about 375 ft in the southern part of the section.

A preliminary evaluation indicates the top of the Castle Hayne aquifer generally corresponds with the upper surface of the Oligocene rocks and the bottom corresponds with the bottom of the Middle Eocene rocks. The altitude of the top of the aquifer ranges from about 20 ft above sea level in the north to 40 ft below sea level in the southern part of the section.

The thickness and distribution of the clay layers throughout the section are an indicator of the degree of hydrologic connection within an aquifer and between aquifers. It is inferred from the thin (5 to 20 ft thick) and discontinuous clay layers along Section A-A' that considerable leakage of water may occur across and around the clay layers.

Hydrogeologic Section B-B'

The surficial and Castle Hayne aquifers and confining units in hydrogeologic section B-B' (plate 5) dip gently to the east. The aquifer units are thick relative to the confining units distributed throughout the section. The confining units within and above the Castle Hayne aquifer range from around 24 percent of the section in the MCAS area to less than 20 percent in the area around Brewster Boulevard and State Route 24. The combined total thickness of the surficial and Castle Hayne aquifers ranges from about 195 to 360 ft in this section.

In general, the surficial aquifer occurs in the upper 40 ft of the section. There is a continuous confining unit between the surficial and the

Castle Hayne aquifers only in the easternmost part of the section in the Hadnot Point area. Elsewhere on this section, there appears to be no continuous confining unit or clay bed separating the two aquifers.

The Quaternary and Miocene (undifferentiated) deposits that constitute the surficial aquifer are generally thinner along hydrogeologic section B-B' than those shown in section A-A' (plate 5). The surficial aquifer is absent in the New River and Northeast Creek areas and is thickest (40 ft) in the eastern part of the section, in the Hadnot Point area.

The Castle Hayne aquifer varies in thickness and lithology across the section. The aquifer ranges in thickness from around 175 ft in the western part of the section in the MCAS area to almost 340 ft in the Hadnot Point area. As with section A-A', the lithology of the aquifer varies with depth. The upper part of the aquifer tends to be more unconsolidated than the lower half. Because the upper sandy layers of the Castle Hayne aquifer are not present in the western part of the section, limestone makes up a greater proportion of the aquifer in the MCAS area than in the eastern part of the section. The Oligocene sediments, including the upper part of the Castle Hayne aquifer, are in direct hydraulic connection with the New River and Northeast Creek. The altitude of the top of the aquifer ranges from about 15 ft above sea level to about 10 ft below sea level in the section.

The overall total thickness of the clay layers in this section (5 to 30 ft) is somewhat greater than that observed for section A-A'. The clay layers are thin and discontinuous in the upper and eastern parts of the section, and they are thicker and more continuous in the deeper and western parts of the section. A greater degree of hydraulic connection within the system is likely in the eastern part of section B-B'.

Below the Castle Hayne aquifer lie Paleocene rocks that comprise the Beaufort confining unit and Beaufort aquifer. The thickness of these units is about 30 and 90 ft, respectively, in well T-1 and about 15 and 40 ft, respectively, in well T-12 (plate 5).

Hydrogeologic Section C-C'

The surficial and Castle Hayne aquifers and confining units in hydrogeologic section C-C' (plate 5) show very little dip; the total

Table B.--*Records of construction, acceptance-test, specific-capacity, and estimated transmissivity data for selected wells in the Castle Hayne aquifer*

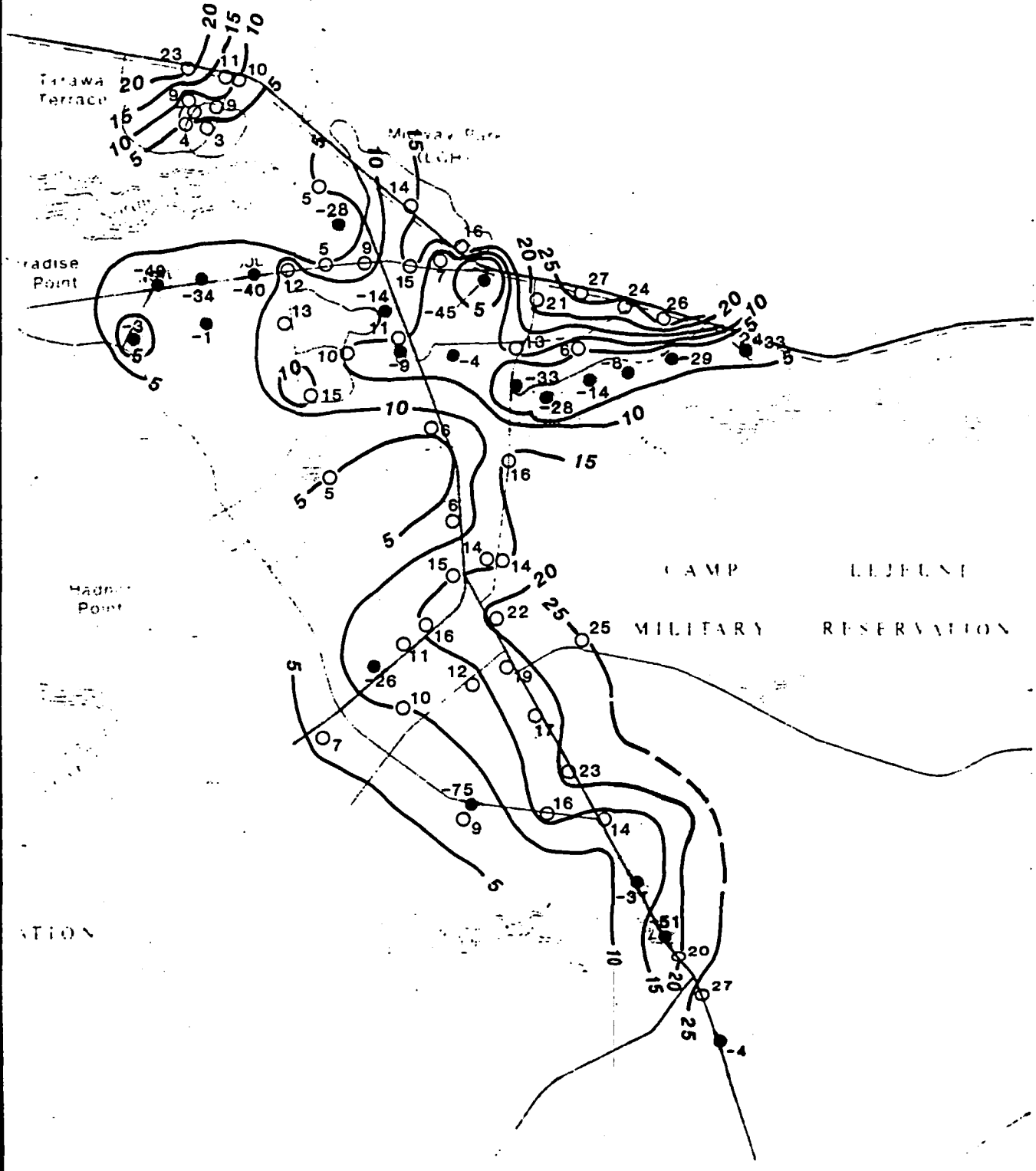
[Well number: Numbers are shown on well-location map (plate 1) and are those assigned by the U.S. Marine Corps or its contractors to identify wells constructed at the Base. USGS identification number: Numbers are comprised of degrees, minutes, and seconds of latitude (first 6 numbers) north of the equator and longitude (next 7 numbers) west of the zero meridian. Number right of decimal point is a sequential number for wells at designated location. ?, information uncertain]

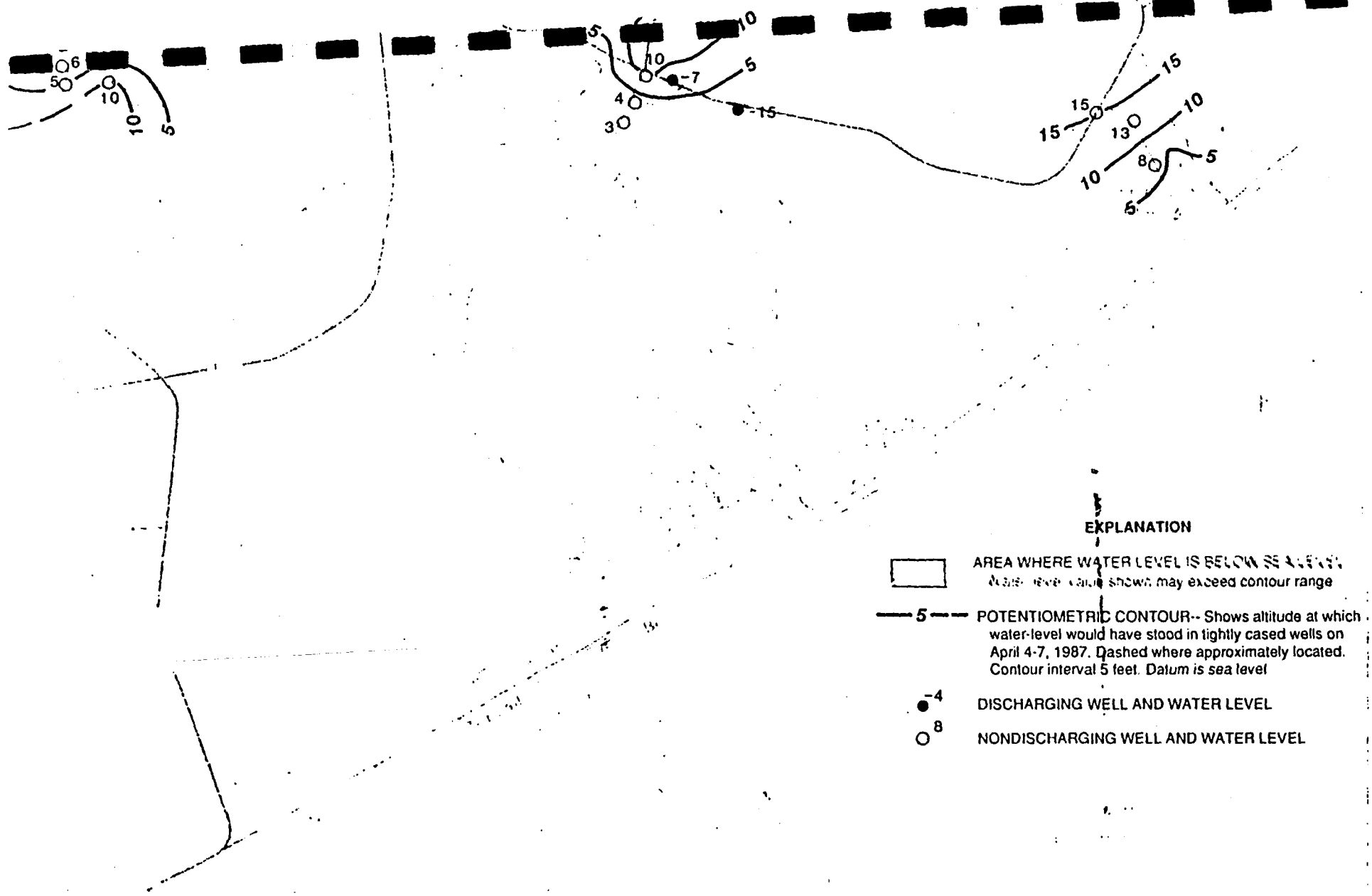
Well number	USGS identification number	Well depth (feet)	Well diameter (inches)	Total aquifer thickness (feet)	Screen length (feet)	Well-acceptance test data: Water-level drawdown during pumping (feet)	Well-acceptance test data: Pumping rate (gallons per minute)	Well-acceptance test data: Duration of pumping (minutes)	Specific capacity (pumping rate / drawdown)	Corrected specific capacity (corrected for partial penetration)	Estimated transmissivity (feet squared per day)
BB-43	3434550772148.1	60	8	275	30	34	170	1,560	5.0	30.3	8,900
BB-44	3435040772143.1	62	8	275	30	45	450	2,400	10.0	60.6	17,900
BB-222	3500010772049.1	185	10	275	50	34.9	329	1,440	9.4	36.0	10,600
HP-612	3442260772048.1	190	8	285	40	50.9	275	1,440	5.4	26.8	7,900
HP-614	3442470772124.1	235	8	285	45	65	323	1,440	4.9	22.4	6,600
HP-621	3442530771916.1	77	8	300	20	22	200	480?	9.1	83.1	24,500
HP-628	3439040771838.1	200	8	320	34	46.6	160	1,440	3.4	21.6	6,400
HP-629	3442540771912.1	240	8	300	45	36.7	210	1,250	5.7	26.9	7,900
HP-634	3440300771935.1	225	8	300	70	36	163	1,845	4.5	14.5	4,300
HP-636	3441190771929.1	227	8	300	65	31	211	2,160	6.8	23.5	6,900
HP-643	3443030772118.1	250	10	295	30	52	278	2,100	5.3	33.0	9,700
HP-644	3443040772100.1	255	10	300	30	57.2	246	1,920	4.3	27.3	8,100
HP-646	3443160772035.1	270	10	305	30	28.7	304	2,295	10.6	68.6	20,200
HP-647	3443030772017.1	200	10	305	30	50.8	500	1,590	9.8	63.4	18,700
HP-648	3442510771848.1	265	10	310	30	85.8	250	1,800	2.9	19.0	5,600
HP-649	3442440771822.1	284	10	310	30	97.7	257	1,680	2.6	17.0	5,000
HP-651	3441410771927.1	199	10	305	30	72	270	1,440	3.8	24.6	7,300
HP-652	3440190771848.1	183	10	320	30	99.0	218	1,950	2.2	14.8	4,400
HP-663	3442270771758.1	180	10	325	50	73.3	350	1,440	4.8	21.7	6,400

Table B.--*Records of construction, acceptance-test, specific-capacity, and estimated transmissivity data for selected wells in the Castle Hayne aquifer*--Continued

[Well number: Numbers are shown on well-location map (plate 1) and are those assigned by the U.S. Marine Corps or its contractors to identify wells constructed at the Base. USGS identification number: Numbers are comprised of degrees, minutes, and seconds of latitude (first 6 numbers) north of the equator and longitude (next 7 numbers) west of the zero meridian. Number right of decimal point is a sequential number for wells at designated location. ; 7, information uncertain]

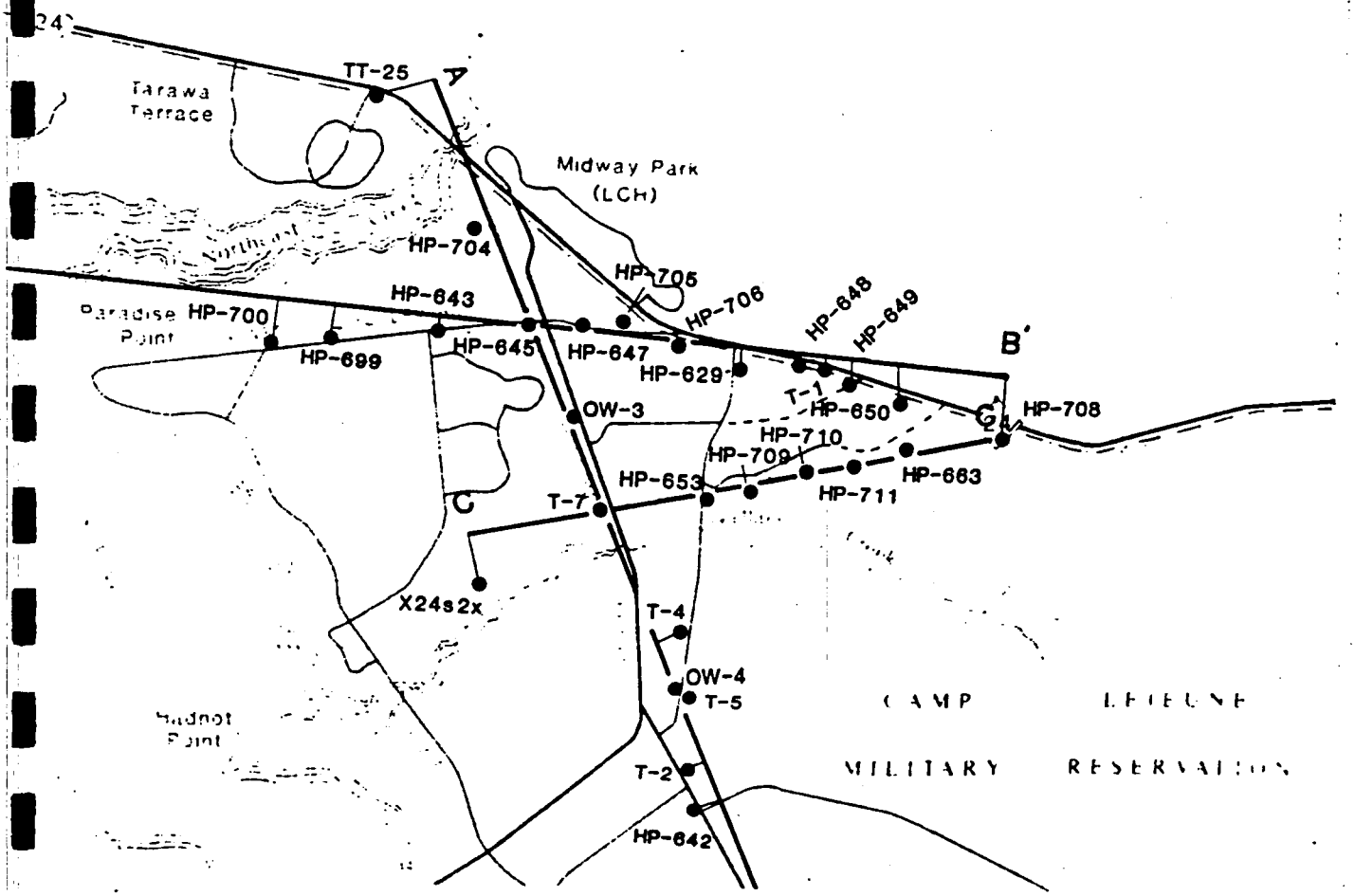
Well number	USGS identification number	Well depth (feet)	Well diameter (inches)	Total aquifer thickness (feet)	Screen length (feet)	Well-acceptance test data: Water-level drawdown during pumping (feet)	Pumping rate (gallons per minute)	Duration of pumping (minutes)	Specific capacity (pumping rate / drawdown)	Corrected specific capacity (corrected for partial penetration)	Estimated transmissivity (feet squared per day)
HP-699	3443000772141.1	124	10	275	40	44	250	1,440	5.7	26.2	7,700
HP-700	3442580772150.1	130	10	270	30	36.6	250	1,440	6.8	38.9	11,500
HP-701	3442330772204.1	110	10	275	30	34.5	250	1,440	7.2	41.9	12,400
HP-705	3443060772000.1	160	10	295	40	27.8	250	1,440	9.0	44.3	13,100
HP-706	3442580771930.1	176	10	300	50	66.6	250	1,440	3.8	15.8	4,700
HP-709	3442130771859.1	140	10	310	30	45.3	200	1,440	4.4	28.8	8,500
HP-710	3442110771843.1	140	10	310	30	39.1	200	1,440	5.1	33.4	9,900
HP-711	3442190771823.1	150	10	320	40	29.4	200	1,440	6.8	36.4	10,700
LCH-4006	3443270772017.1	140	8	295	42	54	540	1,440	10.0	49.2	14,500
LCH-4007	3443110771953.1	145	8	295	55	23.3	275	2,160	11.8	46.3	13,700
M-267	3443360772451.1	150	8	260	40	22	170	300	7.7	34.8	10,300
M-628	3444100772417.1	67	8	260	24 (Open hole)	23.4	70	1,440	3.0	20.7	6,100
RR-229	3435170772642.1	253	10	290	35	35.2	429	1,440	12.2	65.9	19,400
TT-25	3444190772143.1	200	8	280	40	30	150	1,440	5.0	24.3	7,200

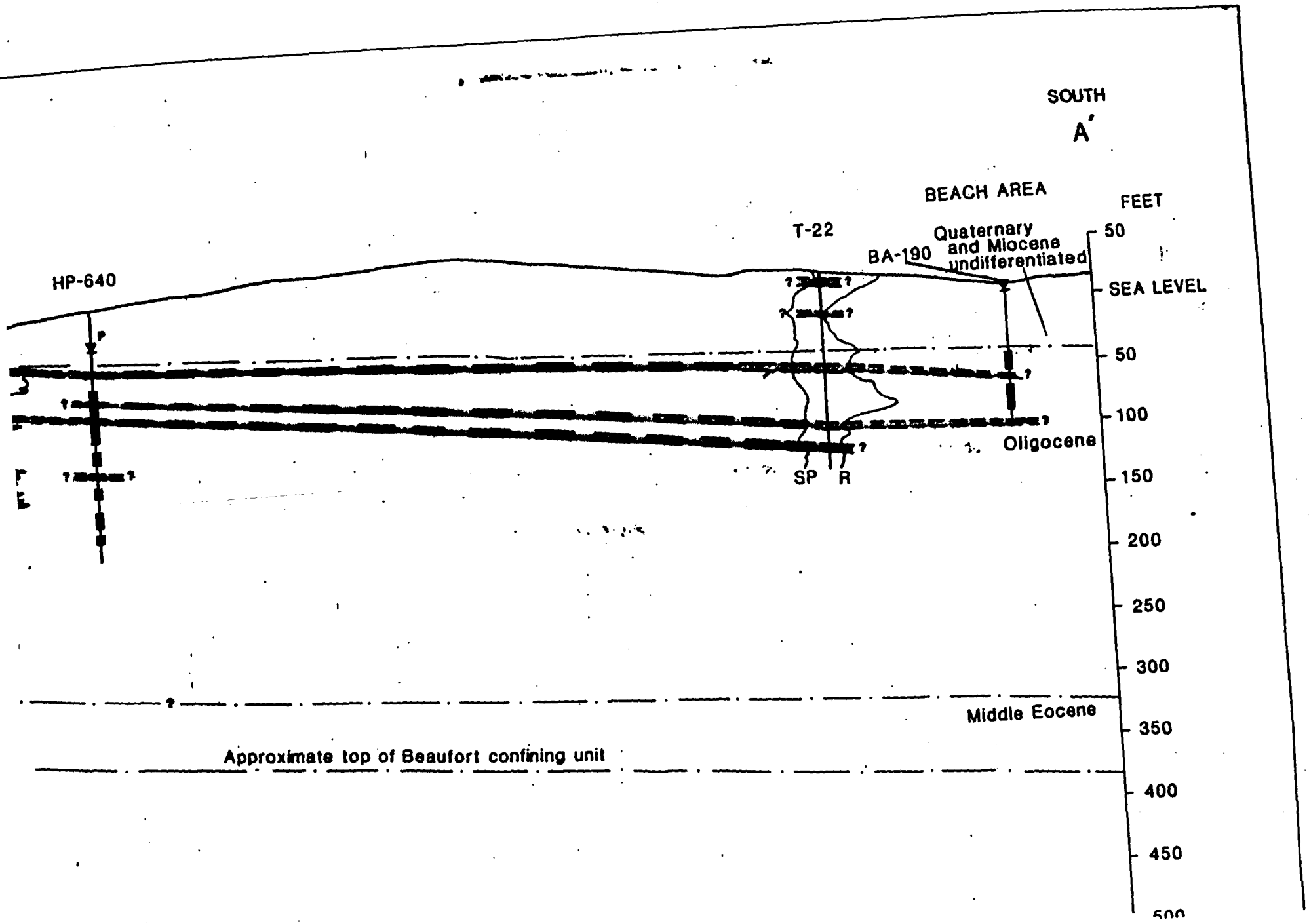

Terrace
Point
Point
CAMP
MILITARY
RESERVATION



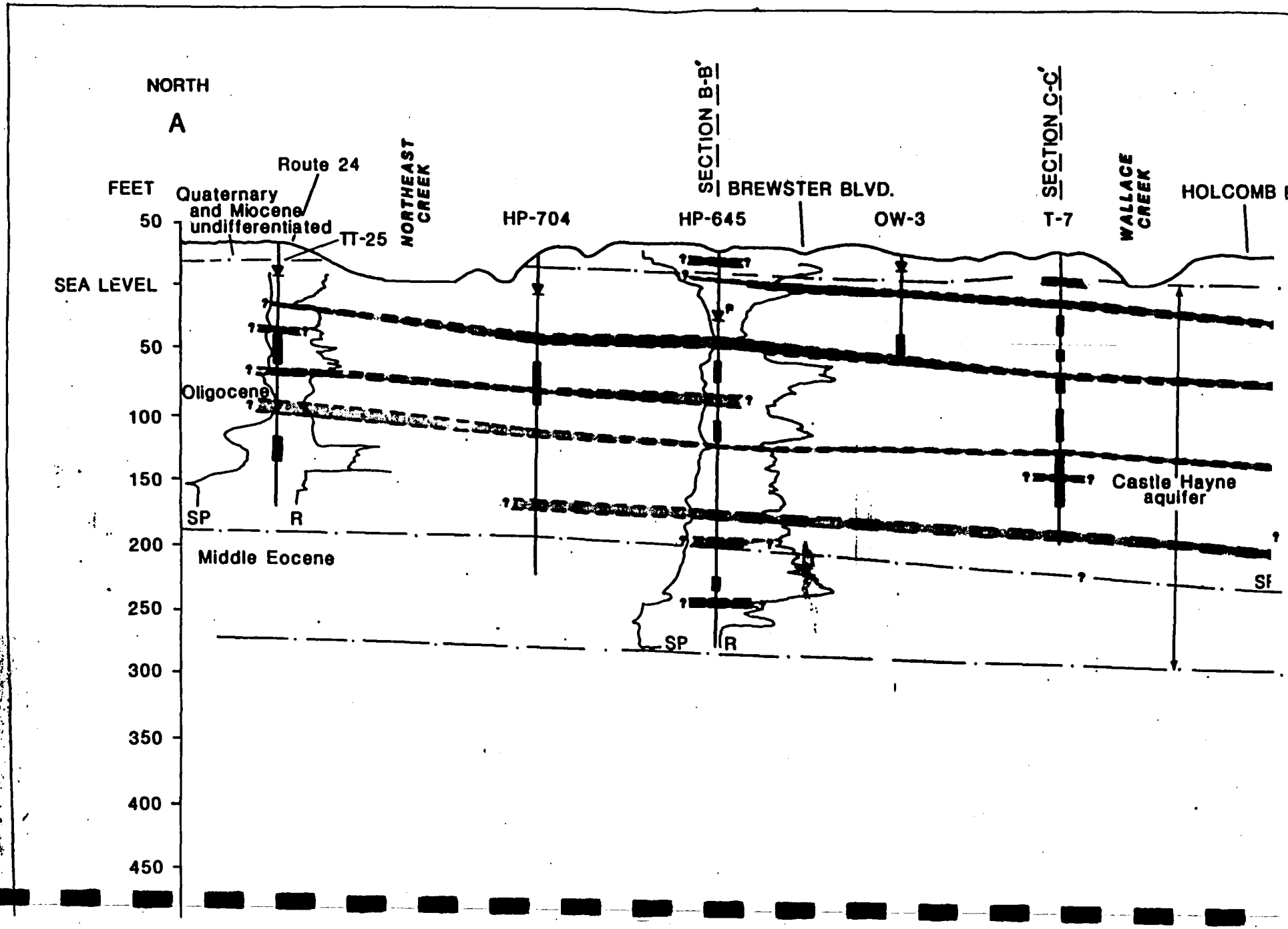
RIC SURFACE IN THE CASTLE HAYNE AQUIFER AT CAMP LEJEUNE, NORTH CAROLINA, APRIL 4-7, 1987

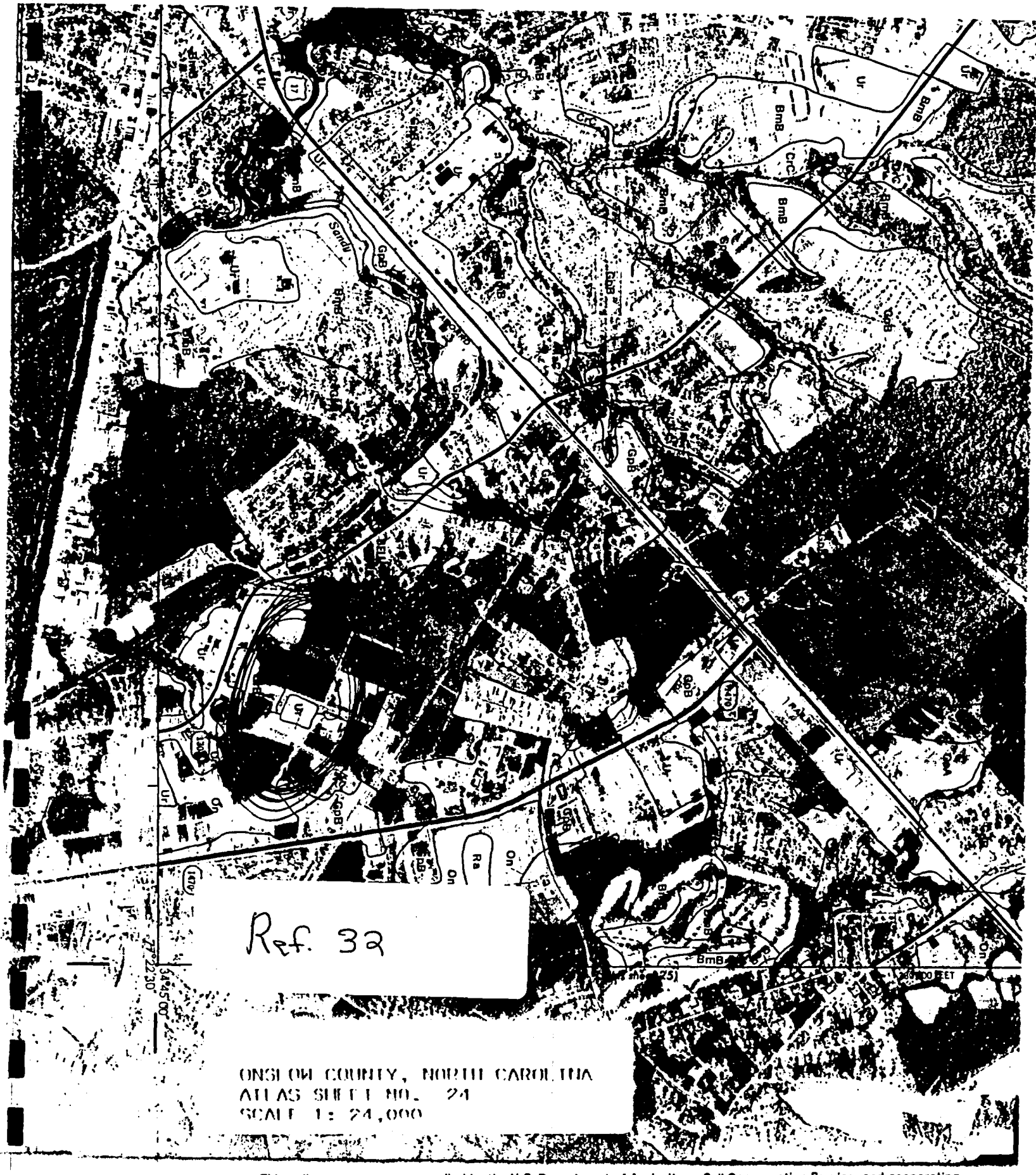
WATER-RESOURCES INVESTIGATIONS REPORT 89-4096
PLATE 4




SOUTH
A'
BEACH AREA
FEET
T-22
Quaternary and Miocene undifferentiated
BA-190
HP-640
50
SEA LEVEL
50
100
Oligocene
SP
R
150
200
250
300
Middle Eocene
350
Approximate top of Beaufort confining unit
400
450
500

DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY





This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1983 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

ONSLOW COUNTY

SOIL IDENTIFICATION LEGEND

Symbols	Soils
AnB (AlB)	Alpin fine sand, 1 to 6 percent slopes
AuB	Autryville loamy fine sand, 1 to 6 percent slopes
Ax	Axis mucky sandy loam
BmB (Bm)	Baymeade fine sand, 1 to 6 percent slopes
BaB	Baymeade-Urban Land Complex, 1 to 6 percent slopes
BH	Beaches-Hevhan association, 0 to 30 percent slopes
Bo (BoH)	Bohicket soils
Ca (CaL)	Carteret soils
Co	Corolla fine sand
CrB	Craven fine sandy loam, 1 to 4 percent slopes
CrC	Craven fine sandy loam, 4 to 8 percent slopes
Ct	Croatan muck
Da	Dorovan muck
Dc	Duckston fine sand
DU	Duneland sand
FoA	Foreston loamy fine sand, 0 to 2 percent slopes
GoA	Goldsboro fine sandy loam, 0 to 2 percent slopes
GpB	Goldsboro-Urban Land Complex, 0 to 5 percent slopes
Gt	Grifton fine sandy loam
KuB	Kureb fine sand, 1 to 6 percent slopes
La	Lafitte muck
Le	Lenoir loam
Ln	Leon fine sand

Symbols	Soils
Ly	Lynchburg fine sandy loam.
MaC	Marvyn loamy fine sand, 6 to 15 percent slopes
Mk	Muckalee loam
Mu	Murville fine sand
Ne (Fr)	Newhan fine sand, 2 to 30 percent slopes
NoA	Norfolk loamy fine sand, 0 to 2 percent slopes
NoB	Norfolk loamy fine sand, 2 to 6 percent slopes
On	Onslow loamy fine sand
Pa	Pactolus fine sand
Pn	Pantego mucky loam
Ra	Rains fine sandy loam
St	Stallings loamy fine sand
Sw	Swansboro fine sand
To	Torhunta fine sandy loam
Ur	Urban land
Ut (Pt)	Udorthents, wet, sandy (Pits)
Wa	Wando fine sand, 0 to 6 percent slopes
Wo	Woodington loamy fine sand
W	Water
Ya	Yaupon silty clay loam

NC0049

SOIL INTERPRETATIONS RECORD

MLRA(S): 153A
REV. WLB,REH, 5-84
SPODIC PALEUDULTS, FINE-LOAMY, SILICEOUS, THERMIC

ONSLOW SERIES

THE ONSLOW SERIES CONSISTS OF MODERATELY WELL DRAINED AND SOMEWHAT POORLY DRAINED SOILS ON NEARLY LEVEL TO GENTLY SLOPING UPLANDS OF THE COASTAL PLAIN. THE SURFACE LAYER IS VERY DARK GRAY LOAMY FINE SAND 4 IN. THICK. THE SUBSURFACE LAYER IS GRAY, VERY PALE BROWN AND REDDISH BROWN LOAMY FINE SAND 13 IN. THICK. THE SUBSOIL IS 51 IN. THICK. IT IS BROWNISH YELLOW FINE SANDY LOAM IN THE UPPER PART; BROWNISH YELLOW, LIGHT YELLOWISH BROWN, STRONG BROWN AND LIGHT GRAY SANDY CLAY LOAM IN THE MIDDLE; AND LIGHT GRAY SANDY CLAY LOAM IN THE LOWER PART. SLOPES ARE 0 TO 3 PERCENT.

ESTIMATED SOIL PROPERTIES (A)

DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHTO	FRACT >3 IN (PCT)	PERCENT OF MATERIAL LESS THAN 3" PASSING SIEVE NO. 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
0-17	LFS, LS	SM, SP-SM	A-2, A-3, A-4	0	100	95-100	60-100	5-38	-	NP
0-17	FSL, SL	SM, ML, SC, CL	A-2, A-4	0	100	95-100	70-100	30-55	<25	NP-10
17-53	SCL, SL, CL	SC, CL, SC, ML	A-2, A-4, A-6	0	100	95-100	60-100	30-55	<30	NP-17
53-80	VAR									

DEPTH (IN.)	CLAY (PCT)	MOIST BULK DENSITY (G/CM3)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	EROSION FACTORS K	T	WIND EROD. GROUP	ORGANIC MATTER (PCT)	CORROSIVITY STEEL	CONCRETE
0-17	2-8	1.60-1.75	6.0	0.07-0.11	3.6-5.5	-	LOW	.17	4	-	.5-2	HIGH	HIGH
0-17	5-15	1.45-1.65	2.0-6.0	0.11-0.15	3.6-5.5	-	LOW	.20	4	-	.5-2		
17-53	15-35	1.30-1.50	0.6-2.0	0.12-0.17	3.6-5.5	-	LOW	.24					
53-80													

FLOODING FREQUENCY	DURATION	MONTHS	HIGH WATER TABLE DEPTH (FT)	KIND	MONTHS	CEMENTED PAN DEPTH (IN)	HARDNESS	BEDROCK DEPTH (IN)	HARDNESS	SUBSIDENCE INITT. (IN)	TOTAL (IN)	HYDIC GRP	POTENT'L FROST ACTION
NONE			1.5-3.0	APPARENT	DEC-APR	-		>60		-		B	-

SANITARY FACILITIES (B)

SEPTIC TANK ABSORPTION FIELDS	SEVERE-WETNESS
SEWAGE LAGOON AREAS	SEVERE-WETNESS
SANITARY LANDFILL (TRENCH)	SEVERE-WETNESS
SANITARY LANDFILL (AREA)	SEVERE-SEEPAGE,WETNESS
DAILY COVER FOR LANDFILL	FAIR-WETNESS

BUILDING SITE DEVELOPMENT (B)

SHALLOW EXCAVATIONS	SEVERE-WETNESS
DWELLINGS WITHOUT BASEMENTS	MODERATE-WETNESS
DWELLINGS WITH BASEMENTS	SEVERE-WETNESS
SMALL COMMERCIAL BUILDINGS	MODERATE-WETNESS
LOCAL ROADS AND STREETS	MODERATE-WETNESS
LAWNS, LANDSCAPING AND GOLF FAIRWAYS	SL,FSL: MODERATE-WETNESS LS,LFS: MODERATE-WETNESS

CONSTRUCTION MATERIAL (B)

ROADFILL	FAIR-WETNESS
SAND	IMPROBABLE-EXCESS FINES
GRAVEL	IMPROBABLE-EXCESS FINES
TOPSOIL	SL,FSL: GOOD LS,LFS: FAIR-TOO SANDY

WATER MANAGEMENT (B)

POND RESERVOIR AREA	MODERATE-SEEPAGE
EMBANKMENTS DIKES AND LEVEES	SEVERE-PIPING,WETNESS
EXCAVATED PONDS AQUIFER FED	SL,FSL: MODERATE-SLOW REFILL LS,LFS: SEVERE-CUTBANKS CAVE
DRAINAGE	FAVORABLE
IRRIGATION	SL,FSL: WETNESS LS,LFS: WETNESS,FAST INTAKE
TERRACES AND DIVERSIONS	WETNESS
GRASSED WATERWAYS	SL,FSL: FAVORABLE LS,LFS: FAVORABLE

REGIONAL INTERPRETATIONS

ONSLOW SERIES

NC004

RECREATIONAL DEVELOPMENT (B)

CAMP AREAS	MODERATE-WETNESS	PLAYGROUNDS	0-2%: MODERATE-WETNESS 2-3%: MODERATE-SLOPE,WETNESS
PICNIC AREAS	MODERATE-WETNESS	PATHS AND TRAILS	MODERATE-WETNESS

CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

CLASS-DETERMINING PHASE	CAPA-BILITY	CORN (BU)		SOYBEANS (BU)		TOBACCO (LBS)		PEANUTS (LBS)		PASTURE (AUM)					
	INTRR	IRR.	INTRR	IRR.	INTRR	IRR.	INTRR	IRR.	INTRR	IRR.	INTRR	IRR.	INTRR	IRR.	INTRR	IRR.
ALL	2W		115		40		2700		3000		11					

WOODLAND SUITABILITY (C)

CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: COMMON TREES	SITE INDX	TREES TO PLANT
ALL	3O	SLIGHT	SLIGHT	SLIGHT			LOBLOLLY PINE	76	SLASH PINE
							SLASH PINE	80	LOBLOLLY PINE
							LONGLEAF PINE	67	

WINDBREAKS

CLASS-DETERMIN'G PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
	NONE							

WILDLIFE HABITAT SUITABILITY (D)

CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLD WILDLF	WOODLD WILDLF	WETLAND WILDLF	RANGELD WILDLF
LS,LFS	POOR	FAIR	GOOD	GOOD	GOOD	-	POOR	POOR	FAIR	GOOD	POOR	-
SL,FSL	GOOD	GOOD	GOOD	GOOD	GOOD	-	POOR	POOR	GOOD	GOOD	POOR	-

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE				
AMERICAN HOLLY	ILOP					
FLOWERING DOGWOOD	COFL2					
PERSIMMON	DIOSP					
GREENBRIER	SMILA2					
RED MAPLE	ACRU					
POTENTIAL PRODUCTION (LBS./AC. DRY WT):						
FAVORABLE YEARS						
NORMAL YEARS						
UNFAVORABLE YEARS						

FOOTNOTES

A RATINGS BASED ON SIMILAR SOILS. LINE 2 INCLUDES CL-ML, SM-SC; LINE 3 INCLUDES ML, CL-ML AND USDA TEXTURE FSL.
B RATINGS BASED ON NSH, PART II, SECTION 403, 3-78.
C WOODLAND RATINGS BASED ON SIMILAR SOILS IN WOODLAND PROGRESS REPORT W-16, JAN. 1970.
D WILDLIFE RATINGS BASED ON SOILS MEMO-74, JAN. 1972.

MLRA(S): 153A, 133A
REV. RAG,DLN, 5-84
AQUIC HAPLUDULTS, CLAYEY, MIXED, THERMIC

CRAVEN SERIES

THE CRAVEN SERIES CONSISTS OF MODERATELY WELL DRAINED SOILS ON NEARLY LEVEL TO SLOPING COASTAL PLAIN UPLANDS. IN A REPRESENTATIVE PROFILE, THE SURFACE LAYER IS GRAYISH BROWN SILT LOAM 7 INCHES THICK. THE SUBSURFACE LAYER IS LIGHT YELLOWISH BROWN SILT LOAM 2 INCHES THICK. THE SUBSOIL IS BROWNISH YELLOW SILTY CLAY LOAM IN THE UPPER PART. THE MIDDLE PART IS BROWNISH YELLOW SILTY CLAY AND LIGHT YELLOWISH BROWN CLAY. THE LOWER PART IS GRAY CLAY. THE SUBSOIL IS 45 INCHES THICK. IT IS UNDERLAIN BY BROWNISH YELLOW SANDY LOAM AND LOAMY SAND. SLOPES ARE 0 TO 12 PERCENT.

ESTIMATED SOIL PROPERTIES (A)

DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHTO	FRACT >3 IN (PCT)	PERCENT OF MATERIAL LESS THAN 3" PASSING SIEVE NO. 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
0-9	L, FSL, SIL	ML, CL-ML, SM, SM-SC	A-4	0	100	100	75-100	45-90	<35	NP-7
9-54	C, SIC, SICL	CH	A-7	0	100	100	90-100	65-98	51-70	24-43
54-80	SCL, SL, LS	SM, SM-SC, SC	A-2, A-4, A-6	0	100	95-100	50-100	15-49	<35	NP-15

DEPTH (IN.)	CLAY (PCT)	MOIST BULK DENSITY (G/CM3)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	EROSION FACTORS K	T	WIND EROD. GROUP	ORGANIC MATTER (PCT)	CORROSIVITY STEEL	CONCRETE
0-9	6-20	1.30-1.55	0.6-2.0	0.12-0.18	3.6-6.5	-	LOW	.37	5	-	.5-2	HIGH	HIGH
9-54	35-60	1.30-1.45	0.06-0.2	0.12-0.15	3.6-5.5	-	MODERATE	.32					
54-80	5-35	1.35-1.60	0.2-6.0	0.08-0.14	3.6-5.5	-	LOW	.32					

FLOODING FREQUENCY	DURATION	MONTHS	HIGH WATER TABLE DEPTH (FT)	KIND	MONTHS	CEMENTED PAN DEPTH (IN)	HARDNESS	BEDROCK DEPTH (IN)	HARDNESS	SUBSIDENCE INIT. (IN)	TOTAL (IN)	HYDR GRP	POTENT'L FROST ACTION
NONE			2.0-3.0	APPARENT	DEC-APR	-		>60		-		C	-

SANITARY FACILITIES (B)

SEPTIC TANK ABSORPTION FIELDS	SEVERE-WETNESS,PERCS SLOWLY
SEWAGE LAGOON AREAS	0-2%: SLIGHT 2-7%: MODERATE-SLOPE 7+%: SEVERE-SLOPE
SANITARY LANDFILL (TRENCH)	SEVERE-SEEPAGE,WETNESS,TOO CLAYEY
SANITARY LANDFILL (AREA)	SEVERE-WETNESS
DAILY COVER FOR LANDFILL	POOR-TOO CLAYEY,HARD TO PACK

BUILDING SITE DEVELOPMENT (B)

SHALLOW EXCAVATIONS	SEVERE-WETNESS
DWELLINGS WITHOUT BASEMENTS	0-8%: MODERATE-WETNESS,SHRINK-SWELL 8-12%: MODERATE-WETNESS,SHRINK-SWELL,SLOPE
DWELLINGS WITH BASEMENTS	SEVERE-WETNESS
SMALL COMMERCIAL BUILDINGS	0-4%: MODERATE-WETNESS,SHRINK-SWELL 4-8%: MODERATE-WETNESS,SHRINK-SWELL,SLOPE 8+%: SEVERE-SLOPE
LOCAL ROADS AND STREETS	SEVERE-LOW STRENGTH
LAWNS, LANDSCAPING AND GOLF FAIRWAYS	0-8%: SLIGHT 8-12%: MODERATE-SLOPE

CONSTRUCTION MATERIAL (B)

ROADFILL	POOR-LOW STRENGTH
SAND	IMPROBABLE-EXCESS FINES
GRAVEL	IMPROBABLE-EXCESS FINES
TOPSOIL	POOR-THIN LAYER

WATER MANAGEMENT (B)

POND RESERVOIR AREA	0-3%: MODERATE-SEEPAGE 3-8%: MODERATE-SEEPAGE,SLOPE 8+%: SEVERE-SLOPE
EMBANKMENTS DIKES AND LEVEES	MODERATE-HARD TO PACK,WETNESS
EXCAVATED PONDS AQUIFER FED	SEVERE-SLOW REFILL
DRAINAGE	0-3%: PERCS SLOWLY 3+%: PERCS SLOWLY,SLOPE
IRRIGATION	0-3%: WETNESS,PERCS SLOWLY 3+%: WETNESS,PERCS SLOWLY,SLOPE
TERRACES AND DIVERSIONS	0-8%: ERODES EASILY,WETNESS 8+%: SLOPE,ERODES EASILY,WETNESS
GRASSED WATERWAYS	0-8%: ERODES EASILY,PERCS SLOWLY 8+%: SLOPE,ERODES EASILY,PERCS SLOWLY

REGIONAL INTERPRETATIONS

RECREATIONAL DEVELOPMENT (B)

CAMP AREAS	0-8%: MODERATE-WETNESS,PERCS SLOWLY 8-12%: MODERATE-SLOPE,WETNESS,PERCS SLOWLY	PLAYGROUNDS	0-2%: MODERATE-WETNESS,PERCS SLOWLY 2-6%: MODERATE-SLOPE,WETNESS,PERCS SLOWLY 6+%: SEVERE-SLOPE
PICNIC AREAS	0-8%: MODERATE-WETNESS,PERCS SLOWLY 8-12%: MODERATE-SLOPE,WETNESS,PERCS SLOWLY	PATHS AND TRAILS	0-8%: SLIGHT 8-12%: SEVERE-ERODES EASILY

CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

CLASS-DETERMINING PHASE	CAPA-BILITY	COTTON LINT (LBS)		CORN (BU)		TOBACCO (LBS)		SOYBEANS (BU)		WHEAT (BU)		PEANUTS (LBS)		GRASS-CLOVER (AUM)	
		NTRR	IRR.	NTRR	IRR.	NTRR	IRR.	NTRR	IRR.	NTRR	IRR.	NTRR	IRR.	NTRR	IRR.
0-1%	2W	600		115		2700		45		55		2900		10.0	
1-4%	3E	500		105		2500		40		50		2800		10.0	
4-8%	4E	-		-		-		-		-		-		8.0	
8-12%	6E	-		-		-		-		-		-		7.5	
4-12% CL,SEV ER	6E	-		-		-		-		-		-		7.5	

WOODLAND SUITABILITY (C)

CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: COMMON TREES	SITE INDX	TREES TO PLANT
ALL	3W	SLIGHT	MODERATE	SLIGHT			LOBLOLLY PINE	81 *	LOBLOLLY PINE
							LONGLEAF PINE	67 *	SLASH PINE
							WATER OAK	-	
							SWEETGUM	-	
							WHITE OAK	-	
							SOUTHERN RED OAK	-	
							RED MAPLE	-	
							BLACKGUM		
							YELLOW-POPLAR		

WINDBREAKS

CLASS-DETERMIN'G PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
	NONE							

WILDLIFE HABITAT SUITABILITY (D)

CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	POTENTIAL AS HABITAT FOR: WETLAND PLANTS	SHALLOW WATER	OPENLD WILDLF	WOODLD WILDLF	WETLAND WILDLF	RANGELD WILDLF
0-2%	GOOD	GOOD	GOOD	GOOD	GOOD	-	POOR	GOOD	GOOD	GOOD	POOR	-
2-6%	GOOD	GOOD	GOOD	GOOD	GOOD	-	POOR	IV. POOR	GOOD	GOOD	IV. POOR	-
6-12%	FAIR	GOOD	GOOD	GOOD	GOOD	-	IV. POOR	IV. POOR	GOOD	GOOD	IV. POOR	-

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE				
AMERICAN HOLLY	ILOP					
FLOWERING DOGWOOD	COFL2					
INKBERRY	ILGL					
LARGE GALLBERRY	ILCO					
SOUTHERN BAYBERRY	MYCE					
SOURWOOD	OXAR					
BLUEBERRY	VACCI					
GRAPE	VITIS					
CAROLINA JESSAMINE	GESE					
HONEYSUCKLE	LONIC					
SUMMERSWEET CLETHRA	CLAL3					
VIRGINIA CREEPER	PAQU2					
POISON-IVY	RHRA					
REDBAY	PEBO					
POTENTIAL PRODUCTION (LBS./AC. DRY WT):						
FAVORABLE YEARS						
NORMAL YEARS						
UNFAVORABLE YEARS						

FOOTNOTES

A EST. BASED ON TEST DATA OF 1 PEDON FROM PITT CO., 2 PEDONS FROM CRAVEN CO., N.C.;0-9" INCLUDES USDA TEXTURE VFSL;54-

B RATINGS BASED ON NSH, PART II, SECTION 403, 3-78.

C RATINGS BASED ON WOODLAND PROGRESS REPORT W-16, JAN. 1970

D WILDLIFE RATINGS BASED ON SOILS MEMORANDUM-74, JAN. 1972

* SITE INDEX IS A SUMMARY OF 5 OR MORE MEASUREMENTS ON THIS SOIL.

Ref. 33

R. Allan Freeze

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

John A. Cherry

Department of Earth Sciences
University of Waterloo
Waterloo, Ontario

GROUNDWATER

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

Table 2.2 Range of Values of Hydraulic Conductivity and Permeability

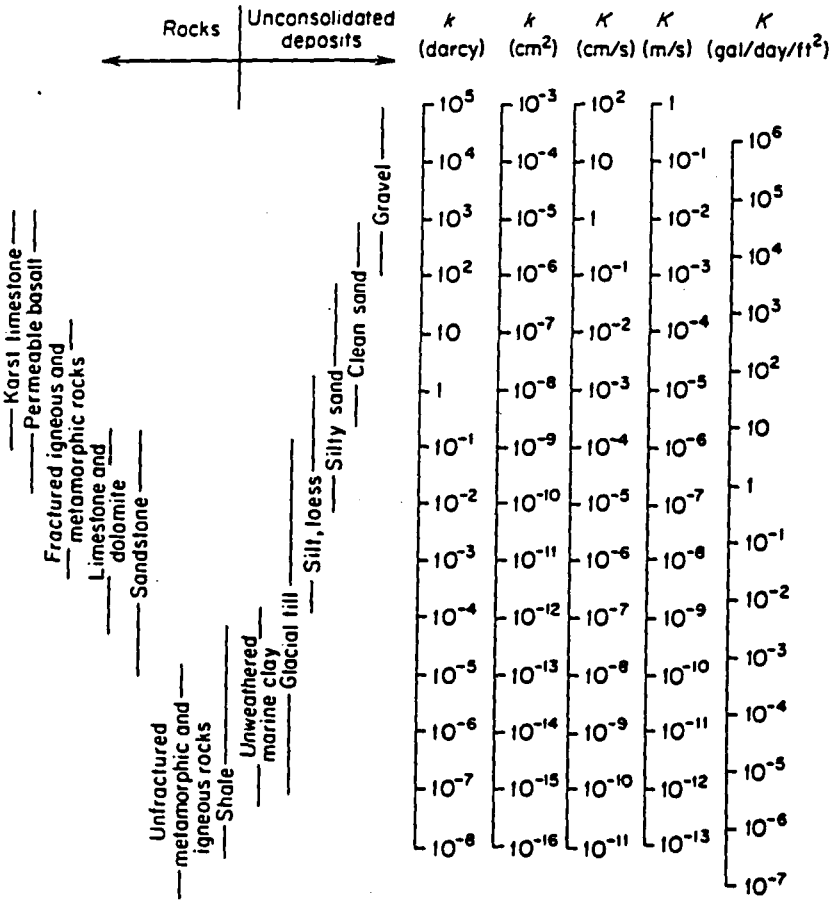


Table 2.3 Conversion Factors for Permeability and Hydraulic Conductivity Units

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

*To obtain k in ft^2, multiply k in cm^2 by 1.08×10^{-3}.

NUS CORPORATION AND SUBSIDIARIES **TELECON NOTE**

CONTROL NO.	DATE: 6/21/90	TIME: 8:15

DISTRIBUTION: Stanadyne, Inc. - Jacksonville, N.C.

REFERENCE # 34

BETWEEN: Bill Harvey	OF: Onslow County Water Department	PHONE: (919) 455-0722

AND: William E. Vasser, NUS Corporation

WEV

DISCUSSION:

The county system has 11 wells located near Gum Branch, near the Jacksonville city wells. The county wells are deeper (about 660 feet), reaching the Black Creek aquifer.

The county system supplies water to most residences in non-incorporated Onslow County, as well as to the towns of Holly Ridge and Swansboro. A summary of the system follows:

13,073	Residential connections
429	Multi-user connections
	[4,403 units]
3	Municipal customers
	[1,184 units]
535	Commercial connections
304	Residences connected, but not being billed yet
14,304	Total Accounts

15,525 Total connections (W.E.Vasser)
(14,341 + 1,184)

REFERENCE # 35

Toxicology of Insecticides

Fumio Matsumura

Department of Entomology
University of Wisconsin-Madison
Madison, Wisconsin

PLENUM PRESS • NEW YORK AND LONDON

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To Professor A. W. A.
pioneering

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Chlorobenzilate® is a yellow crystalline solid with a melting point of 35–37°C. It is soluble in most organic solvents and slightly soluble in water. It is hydrolyzed by alkalis and strong acids. It is not generally toxic to insects. Residues of this material are known to be persistent in the field. Its mammalian toxicity (rat, oral LD_{50}) is 3100–4850 mg/kg.

3.2.2. Benzene Hexachloride

BHC, benzene hexachloride or 1,2,3,4,5,6-hexachlorocyclohexane, has the empirical formula $C_6H_6Cl_6$ and was first prepared in 1825 by Michael Faraday, who did not recognize its insecticidal properties. In 1912, Van der Linden discovered four isomers. In 1942, Dupire and Raucourt in France and Slade in England both discovered the insecticidal properties of BHC. The British group isolated the toxic γ-isomer and named it *lindane* in honor of Van der Linden.

Generally speaking, the isomers of BHC are relatively stable. They are stable to light, high temperature, hot water, and acid, although they are dechlorinated in alkali. Lindane is relatively soluble in water (10 ppm; Gunther *et al.*, 1968) for this group of compounds. It is approximately 100 times more volatile than DDT and therefore has a fumigant action. Its vapor pressure is 9.4×10^{-6} mm Hg at 20°C (Balsom, 1947).

BHC consists of a mixture of six chemically distinct isomers and heptachlorocyclohexanes and octachlorocyclohexanes. Crude BHC can be prepared by the chlorination of benzene in the presence of ultraviolet light (Slade, 1945). It is a grayish or brown amorphous solid with a characteristic musty odor. This odor gives an off-flavor to fruits and potatoes which somewhat limits its agricultural use. Crude BHC begins to melt at 65°C. The water solubility of crude BHC is in the range of 10–32 ppm.

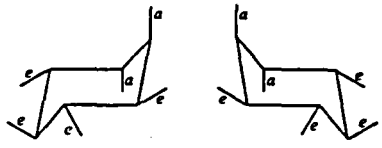
The toxicity of BHC is proportional to the content of its toxic element, the γ-isomer. This isomer, by contact, stomach, or fumigant action, is about 50–10,000 times more effective than the other isomers (Back, 1951; Metcalf, 1947). It is toxic to mammals, with an acute oral LD_{50} in rats of 125 mg/kg (Sherman, 1948). Preparations that contain at least 99% of the γ-isomer are called lindane. Furthermore, the isomers of BHC have different actions. The γ- and α-isomers are stimulants of the central nervous system, with the principal symptom being convulsions. The β- and δ-isomers are depressants of the central nervous system. Like DDT, BHC is capable of rapid penetration of the insect cuticle; however, the biochemical reaction by which BHC is toxic differs from that of DDT.

There are eight theoretically possible isomers, and five of them, including a pair of optical isomers, have relatively strainless bonds and predominate

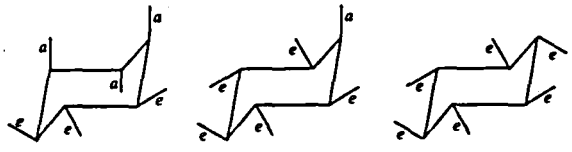
in technical mixtures (Daasch, 1947). These isomers are present in technical BHC in approximately the following amounts:

α	65–70%
β	5–6%
γ	13%
δ	6%

The spatial configurations of the predominant isomers of BHC, indicating the type of bonds present on each, are



α MIRROR PAIR



γ-ISOMER δ-ISOMER β-ISOMER

There are almost no other chlorinated cyclohexane derivatives which can be used for insecticidal purposes; trichloro-, heptachloro-, octochloro-, and enneachlorobenzenes are practically nontoxic. Nor are hexamethyl- and hexaethylcyclohexanes good insecticides.

3.2.3. Cyclodiene Compounds

Cyclodiene compounds are the collective group of synthetic cyclic hydrocarbons consisting of such important insecticides as chlordane, heptachlor, aldrin, dieldrin, and endosulfan. A number of cyclodiene compounds are produced by the Diels–Alder reaction.

CHLORDANE (CHLORDAN)

Technical chlordane is a dark amber viscous liquid with a cedar-like odor. It contains approximately 60% chlordane, with the remainder being

NORTH CAROLINA ADMINISTRATIVE CODE

TITLE 15
DEPARTMENT OF ENVIRONMENT, HEALTH, & NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL MANAGEMENT

REFERENCE # 36

SUBCHAPTER 2L

CLASSIFICATIONS AND WATER QUALITY STANDARDS APPLICABLE TO THE GROUNDWATERS OF NORTH CAROLINA

SECTION .0100, .0200, AND .0300

CURRENT THROUGH DECEMBER [illegible] 1988
ENVIRONMENTAL MANAGEMENT COMMISSION
RALEIGH, NORTH CAROLINA

GW

SECTION .0200 - CLASSIFICATIONS AND WATER QUALITY STANDARDS

.0201 GROUNDWATER CLASSIFICATIONS

The classifications which may be assigned to the groundwaters will be those specified in the following series of classifications:

(1) Class GA waters; usage and occurrence:
- (a) Best Usage. Existing or potential source of drinking water supply for humans.
- (b) Conditions Related to Best Usage. This class is intended for those groundwaters in which chloride concentrations are equal to or less than 250 mg/l, and which are considered suitable for drinking in their natural state, but which may require treatment to improve quality related to natural conditions.
- (c) Occurrence. In the saturated zone.

(2) Class GSA waters; usage and occurrence:
- (a) Best Usage. Existing or potential source of water supply for potable mineral water and conversion to fresh waters.
- (b) Conditions Related to Best Usage. This class is intended for those groundwaters in which the chloride concentrations due to natural conditions is in excess of 250 mg/l, but which otherwise may be considered suitable for use as potable water after treatment to reduce concentrations of naturally occurring substances.
- (c) Occurrence. In the saturated zone.

(3) Class GC waters: usage and occurrence:
- (a) Best Usage. Source of water supply for purposes other than drinking.
- (b) Conditions Related to Best Usage. This class includes those groundwaters that do not meet the quality criteria of waters having a higher classification and for which efforts to restore in-situ to a higher classification would not be technologically feasible, or not in the best interest of the public.
- (c) Occurrence. In the saturated zone, as determined by the Commission on a case by case basis.

History Note: Statutory Authority G.S. 143-214.1; 143B-282(2);
Eff. June 10, 1979;
Amended Eff. August 1, 1989; September 1, 1984; December 30, 1983.

.0202 WATER QUALITY STANDARDS

(a) The water quality standards for the groundwaters of the state are those specified in this Rule. They are the maximum allowable concentrations resulting from any discharge of contaminants to the land or waters of the state, which may be tolerated without creating a threat to human health or which would otherwise render the groundwater unsuitable for its intended best usage. Where groundwater quality standards have been exceeded due to man's activities, restoration efforts shall be designed to restore groundwater quality to the level of the standard or as closely thereto as is practicable.

(b) The maximum allowable concentrations for contaminants specified in Paragraphs (g) and (h) of this Rule shall be as listed, except that:
- (1) Where the maximum allowable concentration of a substance is less than the limit of detectability, the substance shall not be permitted in detectable concentrations.
- (2) Where two or more substances exist in combination, the Director shall consider the effects of chemical interactions and may establish maximum concentrations at values less than those established in accordance with Paragraphs (c) and (g) of this Rule. In the absence of information to the contrary, the carcinogenic risks associated with carcinogens present shall be considered additive and the toxic effects associated with non-carcinogens present shall also be considered additive.
- (3) Where naturally occurring substances exceed the established standard, the standard will be the naturally occurring concentration as determined by the Director.

(c) Substances which are not naturally occurring and for which no standard is specified shall not be permitted in detectable concentrations in Class GA or Class GSA groundwaters. Any person may petition the Director to establish an interim maximum allowable concentration for an unspecified substance, however, the burden of demonstrating those concentrations of the substance which correspond to the levels described in Paragraph (d) of this Rule rests with the petitioner. The petitioner shall submit all toxicological and epidemiological data, study results, and calculations necessary to establish

a standard in accordance with the procedure prescribed in Paragraph (d) of this Rule. Within three months after the establishment of an interim maximum allowable concentration for a substance by the Director, the Director shall initiate action to consider adoption of a standard for that substance.

(d) Maximum allowable concentrations for substances in Class GA and Class GSA waters are established as the lesser of:

(1) Systemic threshold concentration calculated as follows: [Reference Dose (mg/kg/day) x 70 kg (adult body weight) x Relative Source Contribution (.10 for inorganics; .20 for organics)] / [2 liters/day (avg. water consumption)];
(2) Concentration which corresponds to an incremental lifetime cancer risk of $1x10^{-6}$;
(3) Taste threshold limit value;
(4) Odor threshold limit value;
(5) Maximum contaminant level; or
(6) National secondary drinking water standard.

(e) The following references, in order of preference, shall be used in establishing concentrations of substances which correspond to levels described in Paragraph (d) of this Rule.

(1) Integrated Risk Information System (U.S. EPA).
(2) Health Advisories (U.S. EPA Office of Drinking Water).
(3) Other health risk assessment data published by U.S. EPA.
(4) Other appropriate, published health risk assessment data.

(f) Water quality standards specified in Paragraphs (g) and (h) of this Rule and interim maximum allowable concentrations established pursuant to Paragraph (c) of this Rule shall be reviewed on a biennial basis. Appropriate modifications to established standards will be made in accordance with the procedure prescribed in Paragraph (d) of this Rule where modifications are considered appropriate based on data published subsequent to the previous review.

(g) Class GA Standards. Where not otherwise indicated, the standard refers to the total concentration in milligrams per liter of any constituent.

(1) acrylamide (propenamide): 0.00001
(2) arsenic: 0.05
(3) barium: 1.0
(4) benzene: 0.001
(5) bromoform (tribromomethane): 0.00019
(6) cadmium: 0.005
(7) carbofuran: 0.036
(8) carbon tetrachloride: 0.0003
(9) chlordane: 2.7×10^{-5}
(10) chloride: 250.0
(11) chlorobenzene: 0.3
(12) chloroform (trichloromethane): 0.00019
(13) 2-chlorophenol: 0.0001
(14) chromium: 0.05
(15) cis-1,2-dichloroethene: 0.07
(16) coliform organisms (total): 1 per 100 milliliters
(17) color: 15 color units
(18) copper: 1.0
(19) cyanide: 0.154
(20) 2, 4-D (2,4-dichlorophenoxy acetic acid): 0.07
(21) 1,2-dibromo-3-chloropropane: 2.5×10^{-5}
(22) dichlorodifluoromethane (Freon-12; Halon): 0.00019
(23) 1,2-dichloroethane (ethylene dichloride): 0.00038
(24) 1,1-dichloroethylene (vinylidene chloride): 0.007
(25) 1,2-dichloropropane: 0.00056
(26) p-dioxane (1,4-diethylene dioxide): 0.007
(27) dioxin: 2.2×10^{-10}
(28) dissolved solids (total): 500
(29) endrin: 0.0002
(30) epichlorohydrin (1-chloro-2,3-epoxypropane): 0.00354
(31) ethylbenzene: 0.029
(32) ethylene dibromide (EDB; 1,2-dibromoethane): 0.05×10^{-5}

(33) ethylene glycol: 7.0
(34) flouride: 2.0
(35) foaming agents: 0.5
(36) gross alpha particle activity (including radium-226 but excluding radon and uranium): 15 pCi/l
(37) heptachlor: 7.6×10^{-5}
(38) heptachlor epoxide: 3.8×10^{-5}
(39) hexachlorobenzene (perchlorobenzene): 0.00002
(40) n-hexane: 14.3
(41) iron: 0.3
(42) lead: 0.05
(43) lindane: 2.65×10^{-5}
(44) manganese: 0.05
(45) mercury: 0.0011
(46) metadichlorobenzene (1,3-dichlorobenzene): 0.62
(47) methoxychlor: 0.1
(48) methylene chloride (dichloromethane): 0.005
(49) methyl ethyl ketone (MEK; 2-butanone): 0.17
(50) nickel: 0.15
(51) nitrate: (as N) 10.0
(52) nitrite: (as N) 1.0
(53) orthodichlorobenzene (1,2-dichlorobenzene): 0.62
(54) oxamyl: 0.175
(55) paradichlorobenzene (1,4-dichlorobenzene): 0.0018
(56) pentachlorophenol: 0.22
(57) pH: 6.5 - 8.5
(58) radium-226 and radium-228 (combined): 5 pCi l
(59) selenium: 0.01
(60) silver: 0.05
(61) styrene (ethenylbenzene): 1.4×10^{-5}
(62) sulfate: 250.0
(63) tetrachloroethylene (perchloroethylene; PCE): 0.0007
(64) toluene (methylbenzene): 1.0
(65) toxaphene: 3.1×10^{-5}
(66) 2, 4, 5,-TP (Silvex): 0.01
(67) trans-1,2-dichloroethene: 0.07
(68) 1,1,1-trichloroethane (methyl chloroform): 0.2
(69) trichloroethylene (TCE): 0.0028
(70) vinyl chloride (chloroethylene): 1.5×10^{-5}
(71) xylenes (o-, m-, and p-): 0.4
(72) zinc: 5.0

(h) Class GSA Standards. The standards for this class shall be the same as those for Class GA except as follows:

(1) chloride: allowable increase not to exceed 100 percent of the natural quality concentration.
(2) total dissolved solids: 1000 mg/l.

(i) Class GC Waters.

(1) The concentrations of substances which, at the time of classification exceed water quality standards, shall not be permitted to increase. For all other substances, concentrations shall not be caused or permitted to exceed the established standard.
(2) The concentrations of substances which, at the time of classification, exceed water quality standards shall not cause or contribute to the contravention of groundwater or surface water quality standards in adjoining waters of a different class.
(3) Concentrations of specific substances, which exceed the established standard at the time of classification, shall be listed in Section .0300 of this Subchapter.

History Note: Statutory Authority G.S. 143-214.1; 143B-282(2);
Eff. June 10, 1979;
Amended Eff. August 1, 1989; September 1, 1984; December 30, 1983.